Class A Operator: An individual who has primary responsibility to operate and maintain the underground storage tank system. The Class A Operator's responsibilities include managing resources and personnel to achieve and maintain compliance with UST regulatory requirements as required under EPD rules or GUSTA.

Class B Operator: An individual who has responsibility for implementing daily operations, maintenance, and record keeping for one or more UST facilities. The Class B Operator's responsibilities include knowledge of release detection method; release prevention equipment; all relevant equipment for compliance standards; record keeping; reporting requirements and training personnel for appropriate response to UST emergencies as required under EPD rules or GUSTA.

Class C Operator: An individual who is the first line response to events indicating UST emergency conditions, including but not limited to taking appropriate action in response to emergencies or alarms caused by spills or release from an UST system.
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Underground Storage Tank Operator Testing Rule Goes Into Effect in Georgia

On August 26th, the Board of Natural Resources approved a new environmental rule that requires operators of underground storage tanks to demonstrate competency regarding how to operate their tanks in compliance with environmental rules. This change to the Rules for Underground Storage Tank Management Chapter 391-3-15 went into effect September 25, 2009 and will affect thousands of operators of UST systems in Georgia. To view the new rule, please go to www.gaepd.org, click on Rules and scroll down to the Rules for Underground Storage Tank Management.

Federal law mandated this new rule. The US Energy Policy Act (Energy Act) signed by President George W. Bush on August 8, 2005 requires all States that receive federal grant money for their UST programs to ensure that all operators of UST systems demonstrate competency on how to comply with UST rules so environmental releases can be prevented.

The new rule divides UST operators into three classes depending upon job responsibilities -- Class A, B and C. Only the Class A and Class B operators will require testing. **UST operators will have until August 8, 2012 to pass the test.**

The EPD Underground Storage Tank Management Program is now developing the Georgia UST Operator Test. Once this test is in place, all that any UST operator will have to do to meet the requirements of the new rule is to take and pass the test. A free web-based study guide is being developed by EPD to help UST operators prepare for the test. If operators fail the test they are required to take an EPD approved third party training class and then retake the test.

For UST operators who have passed the test but whose USTs are later found to be significantly out of compliance during an EPD inspection, retraining of the operators will be required. This may be conducted immediately by the EPD inspector at the site at the conclusion of the inspection, or depending on the seriousness of the violations, EPD may require third party training and additional testing of the operators.

There will be several testing centers located throughout the State. EPD expects the test will be ready by mid-2010. More specifics about availability of the test will be announced by EPD early next year.

After August 8, 2012, UST operators that cannot present certification that they have passed the test are subject to having their fuel supply cut off until testing is completed. Obviously operator training is very important and should not be ignored.

Below are some Frequently Asked Questions (FAQs) about the new rule.
Q: What is the Georgia Underground Storage Tank (UST) Operator Test?
A: The US Energy Policy Act of 2005 contains a provision that UST operators must have training or testing to operate a UST system. In accordance with the Act, Georgia has created a test of the UST operator’s competency.

Q: Who has to be tested?
A: Persons having primary and daily responsibility for the onsite operation and maintenance of the USTs. These are the Class A and Class B operators.

Q: Are there different testing requirements for the Class A and Class B operators?
A: No. Class A and Class B operators will take the same test. The test is currently in development and is not ready at this time.

Q: When do I have to be tested by?
A: If you are a current UST operator, testing must be completed before August 8, 2012. After August 8, 2012 if you become a UST operator you must complete testing within 30 days of you becoming an operator. Class C operators must be trained in their duties prior to them assuming those duties.

Q: Does the A or B operator have to be on site all the time?
A: No. There must only be a Class C operator on site. A person can be a Class A or Class B for multiple sites.

Q: What is a Class C operator?
A: The Class C operators is/are the person(s) onsite that are responsible for emergency response to a leak or a fire. Essentially, this means clerical personnel at UST dispensing stations. At least one Class C operator must be on site at all times when the facility is open.

Q: Do the Class C operators have to take a test?
A: No. The Class C operators will be trained in their duties by the Class A or Class B operators.

Q: Is there any retesting or updating of training required?
A: Yes. Class A and Class B operators must retake the test every 7 years. Also, if a site is found to be significantly out of compliance, then retraining/retesting will be part of the corrective action to come back into compliance.

Q: What if I don’t pass the test the first time?
A: If operators do not pass the test, then they will be required to attend an EPD approved third party training class. After completion of the class, then they will be required to retake the test.

Q: How do I know what I need to study to pass the test?
A: EPD is producing a free study guide that will be on our website. The study guide will also be located in print form at each of the EPD offices and
selected public libraries throughout the State. You may also, but are not required to, attend an EPD approved third party training program prior to taking the test. Note: there are additional fees associated with third party training classes.

Q: Where do I find and contact the EPD approved third party trainers?
A: Once EPD approves third party operator trainers they will also be posted on our website.

Q: I already have been accepted as a certified UST operator in another state. Do I have to take Georgia’s test as well?
A: Georgia has a reciprocity clause that allows operators that have completed UST operator certification in other States that have an EPA approved operator training program to operate in Georgia without having to take the Georgia UST Operator Test if those requirements are similar to Georgia’s. This is to reduce the burden on multi-state operators from having to take multiple training or testing. EPD will publish a list of states with which we have reciprocity on the website.

Q: When are the tests scheduled?
A: The test is available anytime the testing centers are open for business. You may have to contact the testing center first to schedule an appointment due to high demand.

Q: Where are the testing centers?
A: The locations of the testing centers throughout the State will be located on our website once the development of the test is complete.

Q: How long does the test take?
A: The test takes 1½ hours and is open book.

Q: How much does the test cost?
A: The current cost to take the test is $75.00.

Q: What happens if I fail to take the test by the deadline?
A: UST facilities without a certified Class A and Class B operator will have their annual registration certificate revoked and that facility will no longer be allowed to receive fuel deliveries.
IMPORTANT NOTICE REGARDING THESE RULES:

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RULES
OF
GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

CHAPTER 391-3-15
UNDERGROUND STORAGE TANK MANAGEMENT

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Effective 10/29/01
391-3-15-.01 General Provisions. Amended.

(1) Purpose. These Rules and Regulations (Rules) are promulgated for the purpose of protecting and enhancing the quality of Georgia's environment and of protecting the public health, safety, and well-being of its citizens, and of instituting and maintaining a comprehensive Statewide program for the management of regulated substances stored in underground tanks.

(2) Authority.

(a) These Rules are issued under the authority of the Georgia Underground Storage Tank Act (GUSTA), Official Code of Georgia Annotated (O.C.G.A.) §12-13-1 et seq. (1988), as amended.

(b) The Director of the Environmental Protection Division (Director) or his authorized representative or an authorized contractor or agent of the Department upon presentation of his credentials, shall have a right to enter upon, into or through premises of persons subject to GUSTA, or premises whereon a violation of GUSTA or these Rules is reasonably believed to be occurring or causing impact or is reasonably believed to be about to occur or cause impact. The Director or his authorized representative shall have the right to investigate, take samples, copy all records relating to underground storage tanks, and inspect in accordance with the following purposes:

1. to determine whether any person subject to the requirements of GUSTA is in compliance with these Rules;

2. to investigate conditions relating to underground storage tanks (UST) or UST management practices where the Director is in possession of information sufficient to form a reasonable belief that a violation of GUSTA or these Rules is occurring or is about to occur; or

3. to determine whether there has been a violation of any of the provisions of GUSTA or these Rules, or any permit or order issued pursuant to GUSTA and these Rules.

(c) In the event any person does not consent to an inspection or investigation, the Director or his authorized representative may seek to obtain a warrant authorizing the inspection or investigation pursuant to O.C.G.A. §12-13-8(b) and §12-2-2(d).

(d) EPD or its contractors may enter upon the property of the owner or operator, at such time and in such manner as deemed necessary, to effectuate the necessary corrective action to protect health and the environment.

(e) The Director, an authorized employee of the Department, or an authorized contractor or agent of the Department, upon presentation of his or her credentials, shall have a right to enter upon, to, or through premises of persons subject to GUSTA or premises whereon a release of a regulated substance in violation of GUSTA or the rules and regulations
adopted pursuant to GUSTA is reasonably believed to be occurring or is reasonably believed to have previously occurred to investigate, take samples, copy all records relating to storage of regulated substances in underground storage tanks, and inspect for compliance with the requirements imposed under GUSTA or these Rules, or any permit or order issued pursuant to GUSTA or these Rules in order to determine whether such a current release or past release exists and to conduct appropriate corrective action for any release which may currently exist or may have existed.

(3) Reference

(a) Any reference in these Rules to standards, procedures, and requirements of Title 40 of the Code of Federal Regulations (40 CFR) Part 280 (2000) shall constitute the full adoption by reference of the Part, Subpart, and Paragraph so referenced including any notes and appendices as may be associated, unless otherwise stated.

(b) When used in any such provisions as may be adopted from 40 CFR Part 280 (2000): implementing agency or state implementing agency shall mean Environmental Protection Division (EPD); and Regional Administrator or Director of the implementing agency shall mean Director of the Environmental Protection Division. Unless specifically indicated otherwise, any reference to implementation by, submissions to, or inspections, investigations or enforcement by the EPA in such Regulations as may be adopted by reference by these Rules shall be construed to mean EPD unless such interpretation would be inconsistent with the intent of the Georgia Underground Storage Tank Act (GUSTA).

(c) Any reference in 40 CFR Part 280 (2000), or in any provisions adopted by reference from 40 CFR Part 280 (2000), to EPA forms or reports shall mean EPD forms and reports as may be provided by the Director.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.

391-3.15-.02 Definitions, UST Exclusions, and UST Deferrals. Amended.

(1) Definitions. 40 CFR §§280.12 and 280.92 (2000) are hereby incorporated by reference. The following words or terms shall have the meanings set forth herein when used in these Rules:

(a) "Board" means the Board of Natural Resources of the State of Georgia.

(b) "Control of" means either the right or authority to govern receipt or removal from an underground storage tank any regulated substances.

(c) "Controlling interest" means direct or indirect ownership of at least 50 percent of the voting stock of another entity.

(d) "Corrective action" means those activities required for response to and cleanup of releases of regulated substances from underground storage tanks, including, but not limited
to, initial response, initial abatement measures and site check, initial site characterization, free product removal, investigations for soil and groundwater cleanup, and preparation and implementation of a corrective action plan.

(e) "Department" means the Department of Natural Resources of the State of Georgia.

(f) "Director" means the Director of the Environmental Protection Division of the Department of Natural Resources.

(g) "EPD" means the Environmental Protection Division of the Department of Natural Resources of the State of Georgia.


(i) "Guarantor" means any person, other than the owner or operator, who provides evidence of financial responsibility for an owner or operator.

(j) "Jobber" means anyone who distributes petroleum product from a bulk storage plant to an UST owner or operator, or purchases petroleum product from a terminal for distribution to an UST owner or operator.

(k) "Nonoperational storage tank" means any UST in which regulated substances were not deposited or from which regulated substances were not dispensed after November 8, 1984.

(l) "Operator" means any person in control of, or having responsibility for, the daily operation of an UST.

(m) "Owner" means, in the case of an UST system in use on November 8, 1984, or brought into use or capable of being used after that date, any person who owns an UST system used for or capable of being used for the storage or dispensing of regulated substances and, in the case of any UST system in use before November 8, 1984, but no longer in use or capable of being used on or after November 8, 1984, any person who owned such UST immediately before the discontinuation of its use; provided, however, such term shall not include any person who, without participating in the management of an underground storage tank and otherwise not engaged in petroleum production, refining, and marketing, holds indicia of ownership primarily to protect that person's security interest in the underground storage tank.

(n) "Participating owner or operator" means an owner or operator of an UST who participates in the GUST Trust Fund as a financial assurance mechanism.

(o) "Person" means an individual, trust, firm, joint-stock company, joint-venture, corporation, including a government corporation, partnership, association, municipality,
commission, political subdivision, or any agency, board, department, or bureau of this State or of any other state or of the Federal government.

(p) "Petroleum" means petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

(q) "Petroleum product" means petroleum, including gasoline, gasohol, diesel fuel, fuel oils including #2 fuel oil, kerosene, and jet turbine fuel.

(r) "Plume" means the area of groundwater containing concentrations of petroleum constituents or other regulated substances above Estimated Quantitation Limits as established in Test Methods for Evaluating Solid Waste (United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, SW-846, Third Edition, as revised) or in an alternate method approved by EPD.

(s) "Regulated substance" means any substance defined in §101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C., §9601, as amended by P.L. 99-499, 1986, et seq., and petroleum, including crude oil or any fraction thereof which is liquid at the standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), but not including any substance regulated as a hazardous waste under the Georgia Hazardous Waste Management Act, O.C.G.A. 12-8-60, as amended.

(t) "Release" means any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an UST into groundwater, surface water, or subsurface soils.

(u) "Release Response" means, in addition to certain corrective action activities, those actions taken as initial response, initial abatement measures and site check, initial site characterization, and free product removal.

(v) "Responsibility for" means either the right or authority to close an UST or maintain and repair an UST or take action for compliance with all or part of the requirements of GUSTA and these Rules.

(w) "Terminal" means a bulk storage facility for storing petroleum products supplied by pipeline or marine vessel.

(x) "Third party liability" insofar as GUST Trust Fund usage is concerned means liability for bodily injury or property damage caused directly by a release of petroleum products from an underground storage tank; however, it does not include or mean any liability for bodily injury or property damage to the person or property of the owner of the real property on which the USTs are located.

1. As to bodily injury, specific physical bodily injury proximately resulting from exposure, explosion, or fire caused by the presence of a release from a regulated underground
storage tank and which is incurred by a person other than the owner or operator, the landlord of the owner or operator, employees or agent of an owner or operator, or employees or agents of the landlord of an owner or operator; and

2. As to property damage, actual physical damage or damage due to specific loss of normal use of property owned by a person other than either the owner or operator of an underground storage tank from which a release has occurred or the landlord of an owner or operator of the underground storage tank from which a release has occurred.

(y) "Trustee" means the Director of the Environmental Protection Division of the Department of Natural Resources.

(z) "Underground storage tank" or "UST" means any one or combination of tanks, including underground pipes connected thereto, which is used to contain an accumulation of regulated substances and the volume of which, including the volume of the underground pipes connected thereto, is 10 percent or more beneath the surface of the ground.

(aa) "UST system" or "Tank System" means an underground storage tank and its associated ancillary equipment and containment system, if any.

(2) UST Exclusions. The term "underground storage tank" or "UST" does not include any:

(a) Farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;

(b) Tank used for storing heating oil for consumptive use on the premises where stored;

(c) Septic tank;

(d) Pipeline facility (including gathering lines) which is regulated under:

1. the Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. App. 1671 et seq.), or

2. the Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. App. 2001 et seq.), or

3. which is an intrastate pipeline facility regulated under State laws comparable to the provisions of the law referred to in subparagraph (d)1. or (d)2. of this definition;

(e) Surface impoundment, pit, pond, or lagoon;

(f) Storm water or wastewater collection system;

(g) Flow-through process tank;
(h) Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations;

(i) Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor;

(j) 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;

(k) Wastewater treatment tank system that is part of a wastewater treatment facility regulated under section 402 or 307 (b) of the Clean Water Act;

(l) Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tank and electrical equipment tank;

(m) UST system whose capacity is 110 gallons or less;

(n) UST system that contains a "de minimis" concentration of regulated substances;

(o) Emergency spill or overflow containment UST system that is expeditiously emptied after use; or

(p) Pipes connected to any tank which is described in subparagraphs (a) through (o) of this definition.

(3) UST Deferrals. 40 CFR §280.10 (c) and (d) (2000) are hereby incorporated by reference.


Authority O.C.G.A. Section 12-13-1 et seq. as amended.

391-3-15-.03 Confidentiality of Information. Amended.

(1) Any records, reports, or information obtained from any person by the Director under these Rules shall be available to the public for inspection and copying at the expense of the person requesting copies, except that upon a showing satisfactory to the Director by any person that any records, reports, or information or any particular part thereof, to which the Director has access under these rules would, if made public, divulge information entitled to protection or confidentiality under GUSTA, the Director shall consider confidential such information or any particular portion thereof in accordance with the purposes of GUSTA. However, such records, reports, documents, or information may be disclosed to officers, employees or authorized representatives of the United States government or the State of
Georgia concerned with carrying out the terms of the Federal Act, or when required by any

court in any proceedings under the Federal Act or under GUSTA.

(2) Any claim of confidentiality filed pursuant to this section must be asserted at the time

of initial submission of the record, report, or information in question, or it shall be deemed

waived.

(3) Any claim of confidentiality filed pursuant to this section must be accompanied by a

statement of the legal basis supporting the claim of confidentiality.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.

391-3-15-.04 Interim Prohibition for Deferred UST Systems. Amended. 40 CFR

§280.11 (2000) is hereby incorporated by reference.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.


Amended.


(2) For purposes of performance standards for new UST systems, as required in 40

CFR §280.20(d) (2000), any tank previously installed and subsequently removed must be

re-certified by the manufacturer or by an authorized representative of the manufacturer or

by a Georgia-registered Professional Engineer prior to installation as an UST.

(3) For purposes of notification of USTs, as required in 40 CFR §280.22 (2000), owners

shall use forms as prescribed by the Director.

(4) Annual Registration of USTs.

(a) Initially on or before May 1, 1995, and annually thereafter on or before September 1,

beginning September 1, 1996, the owner or operator of an UST for which notification

should have previously been submitted pursuant to O.C.G.A. 12-13-13 and which has not

been properly closed in accordance with 391-3-15-.11, but is in use or capable of being

used, shall submit to EPD an annual UST notification.

(b) The annual UST notification shall be submitted by the UST owner for all USTs at all

UST facilities on forms furnished by EPD and shall provide such information as may

reasonably be required by EPD which, at a minimum, shall include:

1. Name and address of facility at which USTs are located;

2. Name and address of owner and current operator of USTs at the facility location in 1.

above;
3. Size and identification of USTs at the facility location indicated in 1. above;

4. (i) Certification that the financial responsibility requirements of Rule 391-3-15-.12 have been met and the mechanism utilized to provide such financial responsibility; and

(ii) If the mechanism is the Georgia Underground Storage Tank Trust Fund, the financial assurance mechanism used for the $10,000 deductible.

5. Changes in owners, operators, upgrades, replacement of UST systems and changes in service from either the initial notification form filed or from the last annual notification filed, whichever is later; and

6. Method of annual leak detection for lines and USTs.

(c) If an UST is brought into service during the year, a confirmation of annual UST notification for the facility for the year in which the UST was brought into service shall be issued by EPD after the receipt of the initial notification of USTs, as required under paragraph 391-3-15-.05(1).

(d) The confirmation of annual UST notification form, as provided by EPD, for each underground storage tank facility shall be conspicuously posted and displayed at each UST facility, an alternate location approved by EPD or a copy of such form shall be provided by the facility to each person placing regulated substances into the UST. It shall be a violation of O.C.G.A. 12-13-5 and these Rules to either fail to file an annual UST notification or to fail to conspicuously post and display the confirmation of the annual UST notification at an UST facility or provide a copy such that any person placing regulated substances in an UST can determine that the confirmation of annual UST notification is current.

(e) Beginning 180 days from the effective date of these Rules, no person may place a regulated substance in a regulated UST unless they have verified that the facility has a valid confirmation of annual UST notification form. Such verification shall be performed on or after September 1, 1995, and annually thereafter beginning on January 1 of each year.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.


Authority O.C.G.A. Section 12-13-1 et seq., as amended.

391-3-15-.07 Release Detection. Amended.


(2) Any owner or operator shall, upon request from EPD, certify on forms prescribed by the Director that the UST facility of the owner or operator is in compliance with release

Authority O.C.G.A. Section 12-13-1 et seq., as amended.


Authority O.C.G.A. Section 12-13-1 et seq., as amended.


(2) Corrective action plans (CAPs), Part A for reporting completed release response activities and for summarizing the proposed site investigation, including a schedule for submittal of a CAP - Part B, and Part B for reporting the results of the site investigation and for summarizing the proposed soil and groundwater corrective action objectives and the activities required to meet those objectives, shall be submitted to the Division on such forms as provided by the Environmental Protection Division, Georgia Department of Natural Resources. The plans must include certifications by the UST owner or operator, in the format specified, that the plans are factual and meet all the criteria and requirements of these Rules and other environmental laws and regulations of the State of Georgia. The plans must also be stamped or sealed by a Georgia-registered Professional Engineer or Professional Geologist. The Corrective Action Plan - Part A shall be submitted in lieu of the initial abatement report, the initial site characterization report, and the free product removal report, as referenced by 40 CFR §§280.62(b), 280.63(b), and 280.64(d) (2000), respectively, and must be submitted to EPD within 60 days after release confirmation.

(3) A Corrective Action Plan - Part B must be submitted when one or more of the conditions listed in subparagraphs (a) through (e) below are encountered:

(a) Free product exceeds one-eighth inch (1/8") thickness or an alternate thickness, as required by EPD;

(b) Groundwater or surface water contamination exceeds federal and state in-stream water quality standards, as established by the Georgia Rules for Water Quality Control (Chapter 391-3-6, as amended);

(c) Groundwater contamination exceeds federal and state Maximum Contaminant Levels for Safe Drinking Water, and either;

(i) The plume is located in an area of average or higher groundwater pollution susceptibility, as defined by the Ground-Water Pollution Susceptibility Map of Georgia (Georgia Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey, 1992), within two (2) miles of a point of withdrawal for a public water
system, as defined in the Georgia Rules for Safe Drinking Water (Chapter 391-3-5, as amended), and/or within one-half (1/2) mile of a point of withdrawal for a non-public water system; or

(ii) The plume is located in an area of lower groundwater pollution susceptibility within one (1) mile of a point of withdrawal for a public water system and/or within one-quarter (1/4) mile of a point of withdrawal for a non-public water system.

(d) Concentrations of volatile organic compounds and/or polynuclear aromatic hydrocarbons, as appropriate, in soil exceed:

(i) Threshold levels listed in Table A; or

(ii) Threshold levels listed in Table B; or

(iii) Alternate threshold levels, as approved by EPD.

Table A
Petroleum Constituents and Soil Threshold Levels

At UST corrective action sites where withdrawal points for public and non-public water supplies exist within distances defined in GUST Rule 391-3-15-.09(3):

<table>
<thead>
<tr>
<th>CONSTITUENT</th>
<th>AVERAGE OR HIGHER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA(^b) (Where public water supplies exist within 2.0 miles and/or non-public supplies exist within 0.5 miles)</th>
<th>LOWER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA(^c) (Where public water supplies exist within 1.0 mile and/or non-public supplies exist within 0.25 mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS</td>
<td>.500 feet to withdrawal point &gt;500 feet to withdrawal point</td>
<td>500 feet to withdrawal point &gt;500 feet to withdrawal point</td>
</tr>
<tr>
<td>Benzene(^a)</td>
<td>0.005 mg/kg(^d) 0.008 mg/kg</td>
<td>0.005 mg/kg(^d) 0.71 mg/kg</td>
</tr>
<tr>
<td>Toluene</td>
<td>0.400 mg/kg 6.00 mg/kg</td>
<td>0.400 mg/kg 500.00 mg/kg</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>0.370 mg/kg 10.00 mg/kg</td>
<td>0.500 mg/kg 140.00 mg/kg</td>
</tr>
<tr>
<td>Xylenes (total)</td>
<td>20.00 mg/kg 700.00 mg/kg</td>
<td>27.00 mg/kg 700.00 mg/kg</td>
</tr>
<tr>
<td>POLYNUCLEAR AROMATIC HYDROCARBONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>N/A(^e) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
<tr>
<td>Anthracene</td>
<td>N/A(^e) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
<tr>
<td>Benz(a)anthracene</td>
<td>N/A(^e) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>0.660 mg/kg(^d) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
<tr>
<td>Benzo(b)fluoranthen</td>
<td>0.820 mg/kg(^f) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>N/A(^e) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
<tr>
<td>Benzo(k)fluoranthen</td>
<td>1.60 mg/kg(^f) N/A(^e)</td>
<td>N/A(^e) N/A(^e)</td>
</tr>
</tbody>
</table>

\(^a\) Concentrations for sites receiving groundwater withdrawal are listed as average or higher. 

\(^b\) Public water supplies are limited to 2.0 miles, and non-public water supplies are limited to 0.5 miles.

\(^c\) Public water supplies are limited to 1.0 mile, and non-public water supplies are limited to 0.25 mile.

\(^d\) Lower threshold concentrations are listed.

\(^e\) N/A = Not Applicable.

\(^f\) Determined at time of sampling.
<table>
<thead>
<tr>
<th>Chrysene</th>
<th>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</th>
<th>N/A&lt;sup&gt;e&lt;/sup&gt;</th>
<th>N/A&lt;sup&gt;e&lt;/sup&gt;</th>
<th>N/A&lt;sup&gt;e&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dibenzo(a,h)anthracene</td>
<td>1.50 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluorene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Indeno(1,2,3-c,d)pyrene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pyrene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

a. Based on worst-case assumptions for one-dimensional vadose zone and groundwater contaminant fate and transport models.
b. Based on assumed distance of 0.5 feet between contaminated soils and the water table.
c. Based on assumed distance of 5.0 feet between contaminated soils and the water table.
d. Estimated Quantitation Limit. The health-based threshold level is less than the laboratory method limit of detection.
e. Not applicable. The health-based threshold level exceeds the expected soil concentration under free product condition.
f. In order to protect surface waters, the soil threshold level in Table B may supersede that found in Table A.
g. In the presence of other petroleum contaminants in concentrations exceeding 1.0 mg/kg, the Estimated Quantitation Limit, and hence the soil threshold level, may be substantially greater, as approved by EPD.

**Table B**

**Petroleum Constituents and Soil Threshold<sup>a</sup> Levels**

At other UST corrective action sites where withdrawal points for public and non-public water supplies do not exist within distances defined in GUST Rule 391-3-15-.09(3):

<table>
<thead>
<tr>
<th>CONSTITUENT</th>
<th>AVERAGE OR HIGHER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA&lt;sup&gt;b&lt;/sup&gt;</th>
<th>LOWER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS</td>
<td>.500 feet to surface water body &gt;500 feet to surface water body</td>
<td>.500 feet to surface water body &gt;500 feet to surface water body</td>
</tr>
<tr>
<td>Benzene&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.017 mg/kg 0.120 mg/kg</td>
<td>0.020 mg/kg 11.30 mg/kg</td>
</tr>
<tr>
<td>Toluene</td>
<td>115.00 mg/kg 500.00 mg/kg</td>
<td>135.00 mg/kg 500.00 mg/kg</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>18.00 mg/kg 140.00 mg/kg</td>
<td>28.00 mg/kg 140.00 mg/kg</td>
</tr>
<tr>
<td>Xylenes (total)</td>
<td>700.00 mg/kg 700.00 mg/kg</td>
<td>700.00 mg/kg 700.00 mg/kg</td>
</tr>
<tr>
<td>POLYNUCLEAR AROMATIC HYDROCARBONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Anthracene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benz(a)anthracene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Substance</td>
<td>Level 1</td>
<td>Level 2</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chrysene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Dibenz[a,h]anthracene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluorene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Indeno(1,2,3-c,d)pyrene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pyrene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

a. Based on worst-case assumptions for one-dimensional vadose zone and groundwater contaminant fate and transport models.

b. Based on an assumed distance of 0.5 feet between contaminated soils and the water table.

c. Based on an assumed distance of 5.0 feet between contaminated soils and the water table.

d. Estimated Quantitation Limit. The health-based threshold level is less than the laboratory method limit of detection.

e. Not applicable. The health-based threshold level exceeds the expected soil concentration under free product condition.

f. In the presence of other petroleum contaminants in concentrations exceeding 1.0 mg/kg, the Estimated Quantitation Limit, and hence the soil threshold level, may be substantially greater, as approved by EPD.

(e) EPD has determined that, because of unique geologic, hydrologic or other site-specific conditions, a Corrective Action Plan - Part B is necessary to adequately protect human health and the environment.

(4) If a Corrective Action Plan - Part B must be proposed in compliance with paragraph 391-3-15-.09(3) above, the full extent of groundwater and surface water contamination must be delineated and one or more of the following corrective action objectives for contaminated soil, surface water, and groundwater, as applicable, in subparagraphs (a) through (d) below must be proposed and implemented upon approval by EPD:

(a) Remediate soil contamination that exceeds the threshold levels listed in Table A or Table B or exceeds alternate threshold levels approved by EPD, as applicable;

(b) Remediate free product that exceeds one-eighth inch (1/8") thickness or an alternate thickness, as approved by EPD;

(c) Remediate groundwater contamination that exceeds federal and state Maximum Contaminant Levels where drinking water supplies exist within the distances defined in subparagraph (3)(c)(i) or (ii) above, as applicable, or that exceeds in-stream water quality standards, as applicable, or alternate concentration limits as required by EPD;

(d) Determine alternate concentration limits for soil and groundwater corrective action through the use of an appropriate risk assessment, as determined by EPD, that demonstrates that the objectives in (a) and (c) above are not necessary to protect human health and the environment. The request for alternate concentration limits must explain clearly and concisely how these alternate concentration limits will adequately protect
human health, safety, and the environment and shall not be utilized unless approved by EPD. Upon approval of proposed alternate concentration limits by EPD, the owner or operator must either:

1. Remediate contaminated soils and/or groundwater to approved alternate concentration limits and monitor the soils and/or the plume to validate and verify predictions of the risk assessment, including the natural degradation of petroleum contaminants, unless such monitoring is deemed unnecessary by EPD; or

2. If remediation of contaminated soils and/or groundwater is not necessary, monitor the soils and/or the plume to validate and verify predictions of the risk assessment, including the natural degradation of petroleum contaminants, unless such monitoring is deemed unnecessary by EPD;

(5) An owner or operator may transport or provide for transportation of petroleum contaminated soil only to storage, treatment or disposal facilities which have all applicable local, state and federal permits and such facility or facilities shall be designated in the applicable corrective action plan.

(6) Upon completion of corrective action, the UST owner or operator must certify in the completion report, in the format specified, that the CAP was implemented completely and correctly and that the objectives of the corrective action have been achieved.

(7) An owner or operator conducting a corrective action with funds from a source other than the Georgia Underground Storage Tank Trust Fund, may remediate contaminated soil or groundwater to more stringent objectives than those of paragraph 391-3-15-.09 (4) at the owner or operator’s discretion.

(8) All determinations of petroleum contaminants in soil or groundwater must be performed in conformity with Test Methods for Evaluating Solid Waste (United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, SW-846, Third Edition, as revised) or with an alternate method, as approved by EPD.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.


The provisions of Rule 391-3-15-.09 shall apply, except that cleanup concentrations for leaked hazardous substances shall be equal to or less than the background level of that constituent in the soil or water immediately prior to the release of that constituent, as measured immediately upgradient of the UST and unaffected by the release, or an alternate concentration limit as established by EPD, or if a hazardous waste when leaked, in accordance with O.C.G.A. 12-8-60, the Georgia Hazardous Waste Management Act, as amended.
Authority O.C.G.A. Section 12-13-1 et seq., as amended.


(2) The owner or operator, or past owner or operator, of an UST system, in service on or after January 1, 1974, but taken out of service or abandoned before December 22, 1988, must close the UST system, as required by EPD, in accordance with 40 CFR Part 280, Subpart G (2000).

(3) For all UST systems permanently closed after the effective date of these rules, a closure report, prepared on such forms as provided by EPD, must be submitted to EPD by the owner within 45 days of completion of closure.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.

391-3-15-.12 Underground Storage Tanks Containing Petroleum; Financial Responsibility Requirements. Amended.


(2) An owner or operator may satisfy the requirements of financial responsibility, as described in 40 CFR §280.93 (2000), for underground storage tanks located in Georgia by participating in the liability limitations and reimbursement benefits of the Georgia Underground Storage Tank (GUST) Trust Fund, in accordance with Rule 391-3-15-.13.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.

391-3-15-.13 Georgia Underground Storage Tank (GUST) Trust Fund. Amended.

(1) Administration.

(a) Funding the GUST Trust Fund.

1. Environmental Assurance Fee (EAF). In order to participate in the liability limitations and reimbursement benefits of the GUST Trust Fund, commencing on July 1, 1988, an UST owner or operator shall pay to EPD an EAF on each gallon of petroleum products imported into Georgia. The EAF was 0.1¢ per gallon from July 1, 1988, through September 30, 1991, and the EAF is 0.2¢ per gallon from October 1, 1991, through September 30, 1996, and the EAF is 0.5¢ per gallon effective October 1, 1996. This fee is established to assure the funding of emergency, preventive, or corrective actions necessary when public health or safety is, or potentially may be, threatened from a release of regulated substances from an UST and to provide compensation for third-party liability.

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(i) **Point of EAF Collection.** This fee shall be collected by the terminal operator or jobber upon request of the UST owner or operator when the petroleum product is removed from a terminal, or if the petroleum product will never be stored in a terminal in Georgia, then by the importer thereof and paid to EPD. Proof of such payment shall be provided the UST owner or operator by the terminal operator or jobber. Exchanges of petroleum products on a gallon-for-gallon basis within a terminal shall be exempt from this fee. Petroleum product which is subsequently exported from Georgia is exempt from this fee. An UST owner or operator purchasing petroleum products from an out-of-state terminal operator or jobber must remit the EAF directly to EPD, unless the terminal operator or jobber agrees to remit the EAF for the owner or operator.

(ii) **Timetable for Remittance.** EAFs shall be remitted to EPD quarterly. Terminal operators remitting collected EAFs may be required to provide EPD with a list(s) of owners or operators who elected or declined payment of EAFs. Fees are due to EPD on the 20th day of each October, January, April, and July for the previous three-month period. The EAF payment shall be accompanied by such forms as may be prescribed by the Director. If a terminal operator, direct importer or direct pay owner or operator has good cause for an extension of time, he may apply to the Director for additional time to file his EAF payment. Such application must be made to the Director before the payment becomes delinquent and must state all facts giving rise to the necessity for additional time. If the Director grants an extension, such extension may not exceed 30 days.

2. **Civil Penalties.** All civil penalties recovered by the Director as provided in O.C.G.A. §12-13-19 shall be paid into the GUST Trust Fund.

(b) **Establishing GUST Trust Fund Eligibility.**

1. **Notification Requirements for UST Systems.** In order to participate in the GUST Trust Fund as a financial assurance mechanism, each owner or operator of an UST currently in use must have submitted notification forms as required in Rule 391-3-15-.05(3).

2. **Eligibility For Existing UST Systems.**

   (i) **Initial Election.** All owners or operators of existing USTs who elect to participate in the GUST Trust Fund as a financial assurance mechanism under Rule 391-3-15-.12, as of July 1, 1988, must:

   (I) pay the EAF on each gallon of petroleum product purchased after July 1, 1988; or

   (II) the owner or operator purchasing petroleum product from an out-of-state terminal operator or jobber must remit the EAF for each gallon thus purchased after July 1, 1988 directly to EPD unless the terminal operator or jobber agrees to remit the EAF to EPD for the owner or operator; and
(iii) report any known or suspected leaks from an existing UST.

Meeting these conditions automatically makes a tank owner or operator a participant in the GUST Trust Fund, and no specific notice to EPD is required to confirm such participation. Any tank owner or operator who elects not to participate in the GUST Trust Fund must make a written declaration of that election to the Director and to the terminal operator or jobber.

(ii) Subsequent Election. All owners or operators of existing USTs who elect to participate in the GUST Trust Fund as a financial assurance mechanism under Rule 391-3-15-.12, ninety (90) or more days after July 1, 1988, or who elect to participate in the GUST Trust Fund as a financial assurance mechanism under Rule 391-3-15-.12 after there has been an interruption in GUST Trust Fund participation subsequent to the initial or subsequent election to participate either by the current owner or operator or the current owner or operator’s predecessor in title, must:

(I) perform and pass a tank system precision tightness test, the results of which must be acceptable to EPD;

(II) perform a site check of the UST site in accordance with 40 CFR §280.52(b) (2000), the results of which must be acceptable to EPD;

(III) remit to EPD all EAFs which would have been collected under the provisions of Rule 391-3-15-.13 (1)(b)2.(i), including an amount equal to any interest which would have accrued to those monies had they been remitted from July 1, 1988, or from the date of the interruption of participation in the GUST Trust Fund, as determined by EPD, provided there has not been a release of petroleum that has not been remediated in accordance with these Rules; and

(IV) comply with (b)2.(i) of this paragraph.

(iii) Subsequent Election for New Owners or Operators. Notwithstanding the foregoing, in subsection (ii) above, all owners or operators who acquire a new interest or ownership in existing USTs through purchase or other transfer of title which are not covered by the GUST Trust Fund as a financial assurance mechanism as provided under Rule 391-3-15-.12 at the time of the acquisition may elect to participate in the GUST Trust Fund as a financial assurance mechanism under Rule 391-3-15-.12 for those USTs so acquired. The new owner or operator, in order to participate in the GUST Trust Fund as a financial assurance mechanism under Rule 391-3-15-.12, must, within one (1) year from the date of acquisition:

(I) perform and pass a tank system precision tightness test, the results of which must be acceptable to EPD;

(II) perform a site check of the UST site in accordance with 40 CFR §280.52(b) (2000), the results of which must be acceptable to EPD;
(III) remit to EPD all EAFs from the date of the acquisition of the USTs by the new owner or operator under the provision of Rule 391-3-15-.13(1)(b)2.(i), provided that prior to the initial EAF payment herein there has not been a release of petroleum that has not been remediated in accordance with these Rules;

(IV) submit a sworn statement by the new owner that the owner from whom the USTs are being or were acquired has no controlling interest in the new owner; and

(V) comply with (b)2.(i) of this paragraph.

3. Eligibility For New USTs Installed After July 1, 1988. All owners or operators of new USTs who elect to participate in the GUST Trust Fund as a financial assurance mechanism under Rule 391-3-15-.12 must:

(i) comply with all requirements of Rule 391-3-15-.05; and

(ii) comply with all requirements under the provision of Rule 391-3-15-.13 (1)(b)2.(i).

(c) Maintaining GUST Trust Fund Eligibility. In order to maintain eligibility for GUST Trust Fund disbursements, all participating owners or operators of UST systems must satisfy the following requirements:

1. Reporting Changes in UST Status. The participating owner or operator shall notify EPD in writing of any of the following changes in UST status:

(i) change in ownership; or

(ii) closure.

2. Payment of EAF. Payment of EAFs must be made for each UST until such time as closure requirements are satisfied.

3. Recordkeeping. The participating owner or operator shall maintain the following records for each UST and make them available to EPD:

(i) records of any tank system tightness tests as required in 391-3-15-.13 (1)(b);

(ii) receipts for any and all EAF payments, whether remitted directly or indirectly to EPD;

(iii) records of compliance with release detection requirements per Rule 391-3-15-.07; and

(iv) proof of payment of EAFs as required by O.C.G.A. §12-13-18(a) for the time period prior to September, 2000, is presumed from the filing of the Annual Tank Registration form for 2001, in accordance with Rule 391-3-15-.05(4), indicating that the method of Financial Responsibility for the USTs at the time of filing was participation in the GUST Trust Fund as
provided in Rule 391-3-15-.12, if payment of the most recent EAF for the registered tank has been made. This presumption shall be overcome and no longer effective if payment of such fees cannot be verified by records of EPD, the station owner, the UST owner or operator, or the terminal operator, maintained in accordance with Rule 391-3-15-.13(1)(c)4.(i) or any other relevant provision of law.

(v) any records as may be required by EPD.

4. Retention of Records.

(i) All records identified in (c)3. above shall be retained for a period of thirty-six (36) months or until one of the following is accomplished, whichever comes first:

(I) ownership of an UST, and all records pertaining thereto, are transferred to a new owner for retention; or

(II) owner or operator is instructed otherwise by EPD.

5. Reporting of Suspected Leaks or Spills. The participating owner or operator shall report to EPD any suspected leak or spill of petroleum product.

6. Loss of GUST Trust Fund Coverage. Whenever the Director has reason to believe that a participating owner or operator has failed to maintain GUST Trust Fund eligibility pursuant to these Rules, the Director shall issue a notice of violation. The participating owner or operator shall have 30 days from receipt of such notice to provide evidence of compliance with all GUST Trust Fund eligibility requirements or take all necessary steps to correct such violation. If after 30 days, the participating owner or operator fails to resolve the notice of violation, the Director shall issue a notice of termination of GUST Trust Fund eligibility. Within 60 days of such notice of termination, the owner or operator must provide an alternate financial assurance mechanism.

(d) Amount and Scope of GUST Trust Fund Coverage.

1. The GUST Trust Fund will provide, to participating owners or operators, coverage for release response and corrective action, as identified in 40 CFR Part 280, Subpart F (2000), and for compensation of third parties for bodily injury and property damage caused by accidental releases arising from operating regulated petroleum product USTs not to exceed $1 million per occurrence cumulatively. For purposes of Rule 391-3-15-.13, the term "occurrence" shall mean any unexpected or unintended sudden or nonsudden release of petroleum product arising from operating an UST that results in a need for corrective action, bodily injury, or property damage.

(i) Any property owner shall not be considered a third-party claimant if the property was transferred to that property owner by the owner or operator of an underground storage tank after a release where damages could be reasonably anticipated;
(ii) Third-party liability property damage shall be reimbursed from the GUST Trust Fund based on the rental costs of comparable property during the period of loss of use up to a maximum amount equal to the fair market value. In the case of property that is actually destroyed as a result of a petroleum release, reimbursement shall be an amount necessary to replace or repair the destroyed property, whichever is less; and

(iii) Payments for third-party liability damages, as defined in these Rules, shall never exceed the amount of the GUST Trust Fund coverage as provided in these Rules for any owner or operator and shall not include payments for any claims for attorney's fees for third-party claimants or claims for punitive damages or mental anguish.

2. The GUST Trust Fund will provide, to participating owners or operators, annual aggregate coverage for release response and corrective action and for compensation of third parties for bodily injury and property damage caused by accidental releases arising from operating petroleum product USTs not to exceed cumulatively the following amounts:

(i) for participating owners or operators of one to 100 petroleum product USTs, $1 million; and

(ii) for participating owners or operators of 101 or more petroleum product USTs, $2 million.

3. The participating owner or operator shall be liable for the first $10,000 of release response and corrective action costs and third party liability claims per occurrence and be totally responsible for any replacement or retrofitting or both of affected tanks and associated piping. The participating owner or operator must demonstrate financial responsibility for the first $10,000 of release response and corrective action costs and third party liability claims per occurrence by an allowable financial assurance mechanism as described in 40 CFR §§280.95 - 280.99, 280.102, and 280.103 (2000).

4. The State of Georgia and the GUST Trust Fund shall have no liability for loss of business, damages, or taking of property associated with any release response or corrective action.

5. Whenever the trustee of the GUST Trust Fund determines that all costs eligible for payment, both release response and corrective action costs and third-party liability claims, may exceed the per-occurrence or aggregate coverages, the first priority for payment shall be the corrective action costs necessary to protect human health and the environment. The trustee shall pay third-party liability claims in the order in which the trustee received valid court orders under Rule 391-3-15-.13 (1)(h)2.

6. If a corrective action is to be conducted using funds from the Georgia Underground Storage Tank Trust Fund, the corrective action will not extend substantially beyond the target objectives of Rule 391-3-15-.09(4). If a participating owner or operator desires to have the corrective action scope go beyond these objectives, the owner or operator must
pay the difference in cost between those objectives and the owner or operator's alternative objectives.

(e) Principal Disbursements.

1. The principal of the monies deposited in such fund pursuant to O.C.G.A. §12-13-10 may be expended by the Director for the following purposes:

   (i) to take whatever emergency action is necessary or appropriate to assure that the public health or safety is not threatened whenever there is a release or substantial threat of a release of regulated substances from an UST;

   (ii) to take preventive or corrective actions where the release of the regulated substances presents an actual or potential threat to human health or the environment where the owner or operator has not been identified or where the owner or operator is unable, as determined by the Director, to perform corrective action, including, but not limited to, provisions for providing alternative water supplies;

   (iii) to provide compensation for third-party liability;

   (iv) to pay for any portion of the administrative cost of administering the GUST Trust Fund which exceeds the amount of interest earned on the corpus of such fund; provided, however, that no more than 10 percent of the fees collected annually pursuant to Subsection (a) of O.C.G.A. 12-13-10 shall be used for such purpose;

   (v) to provide reimbursement to eligible, participating owners and operators who have conducted release response and corrective action; and

   (vi) to provide payments to state contractors for eligible, participating owners and operators who are unable, as determined by the Director, to conduct corrective action for petroleum releases from USTs.

2. To encourage voluntary release response and corrective action, a participating owner or operator conducting such activities under these regulations, either through his own personnel or through response action contractors or subcontractors, is entitled to reimbursement of reasonable costs from the GUST Trust Fund, subject to the following provisions:

   (i) subsequent to release response and prior to initiating additional corrective action, the participating owner or operator must submit to EPD a proposed Corrective Action Plan - Part A for release response activities completed and for proposal of site investigation activities, together with incurred and projected costs of the activities completed and proposed, respectively, and upon receipt of approval by EPD, shall promptly continue corrective action. Upon implementation and completion of the approved Corrective Action Plan - Part A and prior to initiating additional corrective action for soil and groundwater, the participating owner or operator must submit to EPD a proposed Corrective Action Plan -
Part B for site investigation reporting and for proposal of additional site activities, together with projected costs of those activities, and upon receipt of approval by EPD, shall promptly continue corrective action;

(ii) the participating owner or operator or his agents shall keep and preserve detailed records demonstrating compliance with the approved corrective action plans and all invoices and financial records associated with costs for which reimbursement will be requested;

(iii) upon receipt of a complete Corrective Action Plan - Part A, EPD shall make a determination and provide written notice as to whether the participating owner or operator responsible for corrective action is eligible or ineligible for reimbursement of costs. Should EPD determine the participating owner or operator is ineligible, it shall include in its written notice an explanation setting forth in detail the reasons for the determination;

(iv) the participating owner or operator shall submit to the Director, within 30 days of completing all corrective action, a completion report that corrective action has been completed;

(v) no later than 30 days from the submission of the completion report, the participating owner or operator must submit an application for reimbursement of costs in accordance with criteria established by EPD. The application for reimbursement must include the total cost of the corrective action and the amount of reimbursement sought;

(vi) the first $10,000 of approved corrective action costs incurred by the participating owner or operator are not eligible for reimbursement from the GUST Trust Fund nor are costs for replacement or retrofitting of affected tanks and associated piping;

(vii) no costs may be reimbursed to the participating owner or operator until such time as corrective action has been completed in accordance with a plan approved by EPD. However, provisions for interim payments may be made if the corrective action is being conducted in accordance with a plan approved by EPD which allows interim payments; and

(viii) reimbursement of reasonable costs from the GUST Trust Fund shall be limited as provided in Rule 391-3-15-.13 (1)(d).

(f) Cost Recovery.

1. The participating owner or operator of an UST shall be liable for all costs of preventive, corrective, and enforcement actions incurred by the State of Georgia as a result of a release or a substantial threat of release of a petroleum product from an UST unless the participating owner or operator enters into a consent agreement as directed in O.C.G.A. §12-13-11(c). The provisions for cost recovery from owners or operators participating in the GUST Trust Fund are as follows:

(i) whenever costs have been incurred by EPD pursuant to Subsection (f) of O.C.G.A.
§12-13-9 or Subsection (b) of O.C.G.A. §12-13-11, for corrective action, the participating owner or operator shall be liable for the first $10,000 per occurrence for corrective action; such funds to be paid into the GUST Trust Fund within 90 days of notice by the Director;

(ii) notwithstanding the provisions of Subsections (b) and (c) of O.C.G.A. §12-13-11, the participating owner or operator shall be liable for 100 percent of costs associated with preventive, corrective or enforcement actions necessary to protect human health or the environment, or for compensation of third-party liability claims, should EPD find that any of the following situations exist:

(I) the release was due to willful or negligent actions by the participating owner or operator;

(II) the participating owner or operator is in arrears for monies owed to the GUST Trust Fund;

(III) the participating owner or operator moves in any way to obstruct the efforts of EPD or its contractors to effectuate corrective action;

(IV) the participating owner or operator of a petroleum product UST has stored any petroleum product in such UST which has not been subjected to, nor paid any, EAF imposed in Subsection (a) of O.C.G.A. §12-13-10.

(iii) notwithstanding the provisions of Subsections (b) and (c) of O.C.G.A. §12-13-11, the participating owner or operator may be liable for up to 100 percent of costs associated with preventive, corrective or enforcement actions necessary to protect human health or the environment, or for compensation of third-party liability claims, should EPD find that any of the following situations exist:

(I) the release is from an UST not registered in accordance with O.C.G.A. §12-13-13;

(II) the participating owner or operator fails to comply with any provision of the consent agreement required by Subsection (c) of O.C.G.A. §12-13-11;

(III) the participating owner or operator has failed to comply with any provisions of GUSTA or these Rules and such failure has caused, contributed to or otherwise adversely affected the release, or when non-compliance has not directly contributed to or otherwise adversely affected a release and such non-compliance was not or has not been corrected in a timely fashion when directed to do so by the Director.

(iv) notwithstanding subparagraph (ii) or (iii) above, the participating owner or operator may not be liable for costs associated with preventive, corrective, or enforcement actions necessary to protect human health or the environment, or for compensation of third-party liability claims, should EPD find that the following exist:
(I) the source of the release is an UST system that was removed or abandoned prior to July 1, 1988, and is within close proximity, but not more than 200 feet, of an existing UST system owned or operated by a participant in the GUST Trust Fund, and the existing UST system is a replacement for the removed or abandoned UST system; or

(II) the current contamination from an existing UST system owned and operated by a participant in the GUST Trust Fund and another source cannot be differentiated, as determined by the Director.

2. Except as otherwise provided for in Subsection (c) of O.C.G.A. §12-13-11, in the event of any discharge or threatened discharge of a regulated substance, the State or any of its agencies may recover in a civil action from any owner, operator, or other responsible person all costs incurred by the State or any of its agencies or monies from the Federal Leaking Underground Storage Tank (LUST) Trust Fund in the assessment and the cleanup of any release of a regulated substance and all costs incurred in the prevention, abatement, or removal of any threatened discharge of a regulated substance, including reasonable attorney’s fees and any other necessary costs of response incurred by the State or any of its agencies. All such monies recovered shall be deposited into the GUST Trust Fund. The State shall have a lien on the property of owners or operators until funds are paid.

(g) Bankruptcy of GUST Trust Fund Participant. Following the commencement of a voluntary or involuntary proceeding under the U. S. Bankruptcy Code, 11 U.S.C. §101 et seq., naming a participating owner or operator as debtor, EPD may file a claim against the participating owner or operator for the following, as necessary:

1. satisfaction of closure requirements; or

2. corrective action.

(h) Third-Party Compensation Claims. Subject to all other provisions of these Rules, the trustee of the GUST Trust Fund shall provide compensation for third-party liability claims only when:

1. the trustee has received notice of potential third-party liability from the participating owner or operator within sixty (60) days of the date the participating owner or operator is made aware of a claim or claimant, which notice shall contain particulars sufficient to identify the UST covered by the GUST Trust Fund financial assurance mechanism and other information with respect to the time, place and circumstances of the occurrence, as well as the names and addresses of the persons alleged to be injured and all available witnesses. Failure to timely give a notice in compliance herewith shall forfeit all rights of a participating owner or operator to have third-party compensation claims paid from the GUST Trust Fund; and

2. the trustee has received a valid final court order establishing a judgment against the participating owner or operator for bodily injury or property damage caused by an accidental release of petroleum products from an underground storage tank covered by the
GUST Trust Fund financial assurance mechanism and the trustee of the GUST Trust Fund determines that the participating owner or operator has not satisfied the judgment. However, there shall be no liability on the part of the GUST Trust Fund and the trustee thereof unless the trustee shall have been given timely notice by a participating owner or operator of any lawsuit filed by a potential third-party liability claimant, and the trustee has an opportunity to intervene in said lawsuit and defend on behalf of the participating owner or operator with the full cooperation and assistance of the participating owner or operator against any claim which might be asserted by a potential third-party liability claimant for bodily injury or property damage allegedly caused by an accidental release of petroleum products from an underground storage tank covered by the GUST Trust Fund financial assurance mechanism. There shall be no liability for the GUST Trust Fund under this provision should the participating owner or operator fail to provide notice to the trustee within fifteen (15) days of the service of a law suit against the participating owner or operator or fail to cooperate with the trustee in the defense against the claim or should the final judgment presented to the trustee be a default judgment.

(2) Corrective Action.

(a) GUST Trust Fund Corrective Action for Participating Owners or Operators.

1. Reporting. The participating owner or operator shall report to EPD any suspected leak or spill of petroleum product as required in 40 CFR §280.50 (2000), and the participating owner or operator must inform EPD in writing within sixty (60) days of the date of the confirmation of the release of an intent to file a claim for reimbursement against the GUST Trust Fund or an intent to obtain corrective action through the State contractor.

2. Corrective Action by Participating Owner or Operator.

(i) Corrective Action Plan - Part A. Subsequent to release response and prior to initiating additional corrective action, the participating owner or operator must submit to and receive approval from EPD for the proposed Corrective Action Plan - Part A, in accordance with the provisions of Rules 391-3-15-.09(2) and 391-3-15-.13(1)(e)2. Such corrective action plan shall, at a minimum:

(I) provide documentation of participation in the GUST Trust Fund, if not submitted previously;

(II) report completed release response activities;

(III) summarize the proposed site investigation including a projected schedule for submittal of a Corrective Action Plan - Part B; and

(IV) provide cost projections and a schedule of reimbursements for the proposed site investigation activities.
(ii) Corrective Action Agreement. Following approval by EPD of the Corrective Action Plan - Part A, the participating owner or operator will enter into a corrective action agreement with EPD, which shall, at a minimum:

(I) provide approval, if not granted previously to protect human health and the environment, for continuation of corrective action;

(II) confirm eligibility under the GUST Trust Fund;

(III) approve an estimated schedule of reimbursement; and

(IV) require submittal of a Corrective Action Plan - Part B, unless directed by EPD not to submit such plan.

(iii) Corrective Action Plan - Part B. Subsequent to completion of the site investigation proposed in the Corrective Action Plan - Part A and prior to initiating additional corrective action, the participating owner or operator must submit to and receive approval from EPD for the proposed Corrective Action Plan - Part B, in accordance with the provisions of Rules 391-3-15-.09(2) and 391-3-15-.13(1)(e)2. Such corrective action plan shall, at a minimum:

(I) report the results of the site investigation;

(II) summarize the proposed corrective action including projected schedules and corrective action objectives; and

(III) provide cost projections and a schedule of reimbursement for proposed corrective action activities.

(iv) The proposed scopes of work, schedules and cost projections submitted under the Corrective Action Plan - Part A and the Corrective Action Plan - Part B may be modified, and, if approved by EPD in writing, said approval shall amend the Corrective Action Agreement.

3. Corrective Action by State. If the participating owner or operator is unable, as determined by EPD, to perform corrective action, the participating owner or operator of an UST shall be liable for all costs incurred by the State of Georgia as a result of a release of a petroleum product from an UST unless the participating owner or operator enters into a consent agreement with the State as provided for in O.C.G.A. §12-13-11(c).

(b) Other GUST Trust Fund Corrective Action. Whenever the Director has reason to believe that there is or has been a release of a regulated substance into the environment from an UST, regardless of the time at which storage of such material occurred, and has reason to believe that such release poses a danger to human health or the environment, the Director may obtain corrective action for such release, utilizing funds from the GUST
Trust Fund, provided however, that corrective action for regulated substances other than petroleum products shall not be obtained by utilizing funds generated from EAFs.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.

**391-3-15-.14 Enforcement.** The enforcement of these Rules and Regulations shall be in accordance with the Georgia Underground Storage Tank Act and the Georgia Administrative Procedure Act. Such enforcement measures include, but are not limited to, administrative orders, court orders, injunctive relief, and civil penalties pursuant to these Acts.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.

**391-3-15-.15 Variances.** A variance may be granted by the Director only if it is consistent with the requirements of GUSTA and these Rules and consistent with the Federal Act and Regulations promulgated thereunder.

Authority O.C.G.A. Section 12-13-1 et seq., as amended.
391-3-15-.16 Operator Responsibilities, Training and Examination.

(1) Responsibilities

(a) Each UST facility must have a Class A, Class B and Class C Operator designated for each UST system or group of UST systems and shall not operate without a designated operator for each class as herein defined. Should an operator in any class as herein defined either resign or be terminated for any reason, the UST facility must replace the vacated operator with another one in the same class within sixty (60) days or cease operations until such a replacement is designated. The Class A, Class B and Class C Operator may be the same person or multiple persons, provided the person designated to more than one operator class must be trained or meet the responsibilities for each operator class for which that person is designated. The Class A or B Operator does not have to be present at each UST facility at all times. For unmanned UST locations not open to the public where no attendant is present and each dispenser is either key or card controlled, each key or card holder shall be trained to the standards of a Class C Operator; provided however, the operators and owners of that facility are still responsible for the compliance requirements of the UST facility.

(b) In addition to those responsibilities for Class A Operators required by these Rules, the Class A Operator must ensure that appropriately trained individuals operate and maintain the UST systems; maintain appropriate records; conduct required emergency response activities and provide required financial responsibility documentation to EPD as required under these Rules. A Class A Operator must demonstrate to the satisfaction of the Director by passing an EPD authorized test that he or she has sufficient general knowledge of UST system requirements to be able to make informed decisions regarding UST compliance and be able to recognize if Class B or C operators are fulfilling the UST operation, maintenance, notification and record keeping requirements of these Rules and GUSTA, including, but not limited to, spill prevention, overfill prevention, release detection, corrosion protection, emergency response, product compatibility, release and suspected release reporting, temporary and permanent closure requirements, financial responsibility requirements, notification requirements and operator training requirements, for UST facilities as required by these Rules.

(c) In addition to those responsibilities for Class B Operators required by these Rules, the Class B Operator must demonstrate to the satisfaction of the Director through passing an appropriate test as established by EPD a sufficient knowledge of all UST system requirements indicating that he or she can make informed decisions and implement the UST operational, maintenance, notification and reporting requirements of these Rules and GUSTA, including, but not limited to UST system components, UST system component construction, methods of release detection and prevention, corrosion protection, emergency response requirements, product compatibility, reporting and record keeping requirements, delivery prohibition requirements and Class C Operator training requirements, as required by these Rules.

(d) In addition to those responsibilities for Class C Operators as are required by these Rules, the Class C Operator must demonstrate to the satisfaction of the Director, through passing appropriate examination as established by EPD, a sufficient knowledge of all
UST system requirements indicating that he or she can make informed decisions and take
appropriate actions in response to emergencies or alarms caused by spills or releases from
an UST system.

(2) Training

(a) No later than August 8, 2012, all Class A and Class B Operators of all UST systems
regulated under these Rules are required to pass a written examination corresponding to
their respective operator classification known as the Georgia UST Operator Examination,
as authorized and amended periodically by the Director, which shall determine that the
person being tested has the knowledge and skills necessary to be considered as competen
to operate UST systems at the operator level for which they have been designated and
tested. The Director shall periodically publish the name of the test administrator, contact
information, testing locations, testing frequency and a list of the guidance documents and
training materials on which the test will be based. The Director shall approve the content
of any tests administered by the approved test administrator and the curriculum of any
UST operator training courses. This testing of Class A and B Operators must be
accomplished for all Class A and B Operators for any UST facility as identified on the
Annual Tank Registration as required under Rule 391-3-15-.05 (4) (b) 2.

(b) Should any Class A or Class B Operator take the Georgia UST Operator
Examination and fail to pass the same as certified to the EPD by the test administrator,
the operator shall attend and successfully complete an UST Operator training course of
the operator’s choice; provided, the curriculum of which is based on the list of the
guidance documents and training materials as periodically identified by the Director.
After successful completion of an UST operator training course, evidenced by
appropriate documentation presented to the Georgia UST Operator Test administrator,
the operator will be required to retake and pass the Georgia UST Operator Examination.

(c) Fees for the initial and retake of the Georgia UST Operator Examination shall be as
set by the test administrator and shall be payable to the test administrator. Fees for
training courses shall be set by the training course providers and shall be payable to the
training provider.

(d) After August 8, 2012, all new Class A and Class B operators, if not already certified
as trained, or subject to the reciprocity provisions hereof, shall be required to pass the
Georgia UST Operators Examination within 30 days of taking responsibility of a UST
system. After satisfactorily passing the Georgia Underground Storage Tank Operators
Exam, the Class A or Class B Operator shall be issued a Certificate from the approved
test administrator indicating the name of the test applicant, operator category of the test
and the date of the test, which certificate shall expire seven (7) years from the date of
issue.

(e) By no later than August 8, 2012, Class C Operators shall receive training in the
responsibilities of that class prior to assuming responsibilities of that position. Class C
operators shall be trained in the responsibilities of that class by either the Class A or
Class B Operators for that facility. The method and curriculum used to train the Class C
operator shall be kept onsite at the UST facility and shall specifically identify which
employees are considered Class C operators and which have received the Class C
operator training. After August 8, 2012 any Class C operator if not already certified as trained shall be trained as required herein before taking responsibility for a UST system.

(3) Retraining.

(a) All Class (A) and Class (B) operators shall be required to retake and pass the Georgia UST Operator Examination once every seven (7) years.

(b) Should EPD determine that a UST facility is out of compliance with significant operational compliance requirements for release detection and release prevention requirements, or financial assurance responsibility requirements as provide in these Rules, the EPD shall require the Class A or Class B operator be trained and re-tested at a minimum for the criteria in which the UST facility was determined to be out of significant operational compliance.

(c) A Certificate of Training may be granted at the discretion of the Director to operators who have received certification from other States whose UST rules are compatible with these Rules and have an approved EPA operator training program and provide reciprocity to Georgia operators in that State.

(4) Revocation of Certification

The Director may investigate the actions of any operator and may revoke or suspend the certificate of an operator when it is found by the Director that in obtaining such certificate the operator has practiced fraud or deception; or that reasonable care, judgment, or the application of knowledge or ability was not used in the performance of the operator’s duties; or that the operator is incompetent or unable to perform his duties properly.

(5) Violations

It shall be a violation of these Rules for any UST owner to operate or allow to be operated any UST facility owned by that owner without a Class A, Class B or Class C operator being designated and existing for said UST facility as prescribed by these Rules. If any UST owner operates or allows to be operated any UST facility in violation of this Rule, 391-3-15-.16, the current Annual Tank Registration Certificate issued by EPD as required by Rule 391-3-15-.05 may be revoked by the Director.

GEORGIA UNDERGROUND STORAGE TANK ACT
(Official Code of Georgia Annotated Section 12-13-1 et seq.) ©

CHAPTER 13
UNDERGROUND STORAGE TANKS

Sec.
12-13-4. Exceptions to chapter.
12-13-5. Rules and regulations; enforcement powers.
12-13-10. Environmental assurance fees; late participation fee.
12-13-12. Recovery in event of discharge or threat of discharge of regulated substance; lien.
12-13-14. Corrective action for violations of chapter, rules and regulations, or orders and for release of regulated substance into environment.
12-13-17. Judgment in accordance with division's order.
12-13-18. Required compliance with chapter; proof that petroleum subjected to environmental fee; violations of chapter; access to property.


This chapter shall be known as and may be cited as the "Georgia Underground Storage Tank Act."


(a) It is declared to be the public policy of the State of Georgia, in furtherance of its responsibility to protect the public health, safety, and well-being of its citizens and to protect and enhance the quality of its environments, to institute and maintain a comprehensive state-wide program for the management of regulated substances stored in underground tanks.

b) It is the intent of the General Assembly that the Environmental Protection Division of the Department of Natural Resources shall be designated as the state agency to administer the provisions of this chapter. The director of the Environmental Protection Division of the Department of Natural Resources shall be the official charged with the primary responsibility for the enforcement of this chapter. In exercising any authority or power granted by this chapter and in fulfilling duties under this chapter, the director shall conform to and implement the policies outlined in this chapter.

c) It is the intent of the General Assembly to create an environmental assurance fund which, in addition to those purposes set forth in subsections (f) and (g) of Code Section 12-13-9, may also be used by owners and operators as an alternate to insurance purchased from insurance companies for purposes of evidencing financial responsibility for taking corrective action and compensation of third parties for bodily injury and property damage caused by sudden and nonsudden accidental releases arising from operating underground storage tanks.


As used in this chapter, the term:

(1) "Board" means the Board of Natural Resources of the State of Georgia.

(2) "Corrective action" means those activities required for response to and cleanup of releases of regulated substances from underground storage tanks, including, but not limited to, initial response, initial abatement measures and site check, initial site characterization, free product removal, investigations for soil and ground-water cleanup, and preparation and implementation of a corrective action plan.

(3) "Department" means the Department of Natural Resources of the State of Georgia.

(4) "Director" means the director of the Environmental Protection Division of the Department of Natural Resources.
(5) "Division" means the Environmental Protection Division of the Department of Natural Resources of the State of Georgia.


(7) "Guarantor" means any person, other than the owner or operator, who provides evidence of financial responsibility for an owner or operator.

(8) "Nonoperational storage tank" means any underground storage tank in which regulated substances will not be deposited or from which regulated substances will not be dispensed after November 8, 1984.

(9) "Operator" means any person in control of or having daily responsibility for the operation of the underground storage tank.

(10) "Owner" means, in the case of an underground storage tank in use on November 8, 1984, or brought into use or capable of being used after that date, any person who owns an underground storage tank used for or capable of being used for the storage or dispensing of regulated substances and, in the case of any underground storage tank in use before November 8, 1984, but no longer in use or capable of being used on November 8, 1984, any person who owned such tank immediately before the discontinuation of its use; provided, however, such term shall not include any person who, without participating in the management of an underground storage tank and otherwise not engaged in petroleum production, refining, and marketing, holds indicia of ownership primarily to protect that person's security interest in the underground storage tank.

(11) "Person" means an individual, trust, firm, joint-stock company, corporation, including a government corporation, partnership, association, municipality, commission, political subdivision, or any agency, board, department, or bureau of this state or of any other state or of the federal government.

(12) "Petroleum" means petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

(13) "Petroleum product" means petroleum, including gasoline, gasohol, diesel fuel, fuel oils including #2 fuel oil, and kerosene, including jet turbine fuel.

(14) "Regulated substance" means any substance defined in Section 101 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. Section 9601, as amended by P.L. 99-499, 1986, et seq., and petroleum, including crude oil or any fraction thereof which is liquid at the standard conditions of temperature and pressure of 60 degrees Fahrenheit and 14.7 pounds per square inch absolute, but not including any substance regulated as a hazardous waste under Part 1 of Article 3 of Chapter 8 of this title, the "Georgia Hazardous Waste Management Act," as amended.

(15) "Release" means any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an underground storage tank into ground water, surface water, or subsurface soils.

(16) "Terminal" means a bulk storage facility for storing petroleum products supplied by pipeline or marine vessel.
(17) "Third-party liability" means:
(A) As to bodily injury, specific physical bodily injury proximately resulting from exposure, explosion, or fire caused by the presence of a release from a regulated underground storage tank and which is incurred by a person other than the owner or operator, the landlord of the owner or operator, employees or agents of an owner or operator, or employees or agents of the landlord of an owner or operator; and
(B) As to property damage, actual physical damage or damage due to specific loss of normal use of property owned by a person other than either the owner or operator of an underground storage tank from which a release has occurred or the landlord of an owner or operator of the underground storage tank from which a release has occurred.

(18) "Underground storage tank" means any one or combination of tanks, including underground pipes connected thereto, which is used to contain an accumulation of regulated substances and the volume of which, including the volume of the underground pipes connected thereto, is 10 percent or more beneath the surface of the ground.


12-13-4. Exceptions to chapter.

This chapter shall not apply to the following:

(1) Any farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
(2) Any tank used for storing heating oil for consumptive use on the premises where stored;
(3) Any septic tank;
(4) Any pipeline facility, including gathering lines:
   (A) Regulated under the Natural Gas Pipeline Safety Act of 1968, 49 U.S.C. Section 1671, et seq.;
   (B) Regulated under the Hazardous Liquid Pipeline Safety Act of 1979, 49 U.S.C. Section 2001, et seq.; or
   (C) Which is an intrastate pipeline facility regulated under state law comparable to the provisions of law referred to in subparagraph (A) or (B) of this paragraph;
(5) Any surface impoundment, pit, pond, or lagoon;
(6) Any storm-water or waste-water collection system;
(7) Any flow-through process tank;
(8) Any liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or
(9) 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.

12-13-5. Rules and regulations; enforcement powers.

In the performance of its duties, the board shall have and may exercise the power to:

(1) Adopt, promulgate, modify, amend, and repeal rules and regulations to implement and enforce the provisions of this chapter as the board may deem necessary to provide for the management of regulated substances stored in underground tanks to protect the environment and health of humans. Such rules and regulations may be applicable to the state as a whole or may vary from area to area, as may be appropriate to facilitate the accomplishment of the provisions, purposes, and policies of this chapter. The rules and regulations shall include all requirements necessary for consistency with applicable federal law and federal regulations and shall include, but shall not be limited to, the following:

(A) Standards and control measures applicable to underground storage tanks and owners or operators of underground storage tanks. These standards and control measures may include, but are not limited to:

(i) Requirements for maintaining a leak detection system, an inventory control system together with tank testing, or a comparable system or method designed to identify releases in a manner consistent with the protection of human health and the environment;

(ii) Requirements for maintaining records of any monitoring or leak detection system or inventory controls or inventory control system or tank testing or comparable system;

(iii) Requirements for reporting of any releases and corrective actions taken in response to a release from an underground storage tank; and

(iv) Requirements for notification regarding the existence of operational or nonoperational underground storage tanks;

(B) Requirements for maintaining evidence of financial responsibility consistent with applicable federal law and federal regulation; and

(C) Performance standards for underground storage tanks brought into use on or after the effective date of such standards. The performance standards for new underground storage tanks shall include, but are not limited to, design, construction, installation, release detection, and compatibility standards; and

(2) Take all necessary steps to ensure the effective enforcement of this chapter.


(a) The director shall have and may exercise the following powers and duties:

(1) To exercise general supervision over the administration and enforcement of this chapter and all rules, regulations, and orders issued under this chapter;

(2) To encourage, participate in, or conduct studies, reviews, investigations, research, and demonstrations relating to underground tank storage of regulated substances in this state as he deems advisable and necessary;

(3) To make investigations, analyses, and inspections to determine and ensure
compliance with this chapter, the rules and regulations promulgated under this chapter, and any orders which the director may issue;

(4) To enter into such contracts as may be convenient, required, or necessary to effectuate the provisions of this chapter or the rules and regulations promulgated under this chapter, including the administration of the state underground storage tank program;

(5) To prepare, develop, amend, modify, submit, and enforce any comprehensive plan or program sufficient to comply with this chapter and the federal act for the control, regulation, and monitoring of underground tank storage of regulated substances in this state;

(6) To conduct such public hearings as are required by this chapter or as he deems necessary for the proper administration of this chapter and to control and manage the conduct procedure for such public hearings;

(7) To advise, consult, cooperate, and contract on underground tank storage of regulated substance matters with other agencies of this state, political subdivisions thereof, and other designated organizations or entities; and, with the approval of the Governor, to negotiate and enter into agreements with the governments of other states and the United States and their several agencies, subdivisions, or designated organizations or entities;

(8) To collect and disseminate information and to provide for public notification in matters relating to underground tank storage of regulated substances;

(9) To issue, amend, modify, or revoke orders as may be necessary to ensure and enforce compliance with the provisions of this chapter and all rules and regulations promulgated under this chapter;

(10) To institute, in the name of the division, proceedings of mandamus, injunction, or other proper administrative and civil proceedings to enforce the provisions of this chapter, the rules and regulations promulgated under this chapter, or any orders issued under this chapter;

(11) To accept, receive, administer, or disperse funds or grants from public or private sources for the purpose of proper administration of this chapter or for carrying out any of the duties, powers, or responsibilities under this chapter;

(12) To grant variances in accordance with the provisions of this chapter and the rules and regulations promulgated under this chapter, provided such variances are not inconsistent with the federal act and rules or regulations promulgated under such act;

(13) To encourage voluntary cooperation by persons and affected groups to achieve the purposes of this chapter;

(14) To assure that the State of Georgia complies with the federal act and retains maximum control under such act and receives all desired federal grants, aid, and other benefits;

(15) To require any person who is an owner or operator of an underground storage tank to notify the division in writing as provided by this chapter;

(16) To require any person who is an owner of an underground storage tank taken out of operation after January 1, 1974, to notify the division in writing as provided by this chapter;

(17) To maintain an inventory of underground tanks within the state, including such information as location, identity, quantity, method of storage, owners and operators, and
any other information which the director may deem necessary to administer and enforce this chapter;

(18) To adopt, promulgate, modify, amend, and repeal criteria for the identification of regulated substances and the determination of whether any substance or combination of substances is regulated for the purposes of this chapter;

(19) To establish underground storage tank technical standards for the state provided they are in all cases consistent with those provided by the federal act;

(20) To take all necessary steps to ensure that the administration of this chapter is consistent with and equivalent to the provisions of the federal act and any standards, rules, or regulations, promulgated under such act; and

(21) To exercise all incidental powers necessary to carry out the purposes of this chapter.

(b) The powers and duties provided for in subsection (a) of this Code section may be exercised and performed by the director through such duly authorized employees of the department as the director deems necessary and proper.


Until the effective date of rules and regulations adopted by the board pursuant to Code Section 12-13-5, no person may install an underground storage tank for the purpose of storing regulated substances unless such tank meets the performance standards established pursuant to the federal act.


(a) The director, an authorized employee of the department, or an authorized contractor or agent of the department, upon presentation of his or her credentials, shall have a right to enter upon, to, or through premises of persons subject to this chapter, or premises whereon a violation of this chapter or the rules and regulations adopted pursuant to this chapter is reasonably believed to be occurring or is reasonably believed to be about to occur, to investigate, take samples of, and copy all records relating to the storage of regulated substances in underground tanks, and to inspect for compliance with the requirements imposed under this chapter or the rules and regulations adopted pursuant to this chapter, or to determine whether such a violation or threatened violation exists.

(b) In the event any person does not consent to an inspection or investigation, the director or an authorized employee of the department shall have the power to seek a warrant authorizing the inspection or investigation.

(c) The director, an authorized employee of the department, or an authorized contractor or agent of the department, upon presentation of his or her credentials, shall have a right to enter upon, to, or through premises of persons subject to this chapter or
premises whereon a release of a regulated substance in violation of this chapter or the rules and regulations adopted pursuant to this chapter is reasonably believed to be occurring or is reasonably believed to have previously occurred to investigate, take samples, copy all records relating to storage of regulated substances in underground storage tanks, and inspect for compliance with the requirements imposed under this chapter or the rules and regulations adopted pursuant to this chapter in order to determine whether such a current release or past release exists and to conduct appropriate corrective action for any release which may currently exist or may have existed.


(a) The board shall promulgate regulations containing requirements for maintaining evidence of financial responsibility as deemed necessary and desirable for taking corrective action and for compensation of third parties for bodily injury and property damage caused by sudden and nonsudden accidental releases arising from operating an underground storage tank.

(b) Financial responsibility required by this Code section may be established in accordance with regulations promulgated by the board by any one or combination of the following: insurance, guarantee, surety bond, letter of credit, qualification as a self-insurer, or any other method satisfactory to the board. In promulgating requirements under this Code section, the board is authorized to specify policy or other contractual terms, conditions, or defenses which are necessary or are acceptable in establishing such evidence of financial responsibility in order to effectuate the purposes of this chapter and comply with financial responsibility requirements.

(c) Financial responsibility programs established pursuant to this chapter and administered by the division may be submitted as evidence of financial responsibility required under this chapter.

(d) In any case where the owner or operator is in bankruptcy, reorganization, or arrangement pursuant to the federal Bankruptcy Code or where, with reasonable diligence, jurisdiction in any state court or the federal courts cannot be obtained over an owner or operator likely to be solvent at the time of judgment, any claim arising from conduct for which evidence of financial responsibility must be provided under this Code section may be asserted directly against the guarantor providing such evidence of financial responsibility. In the case of any action pursuant to this subsection, such guarantor shall be entitled to invoke all rights and defenses which would have been available to the owner or operator if any action had been brought against the owner or operator by the claimant and which would have been available to the guarantor if any action had been brought against the owner or operator by the claimant and which would have been available to the guarantor if an action had been brought against the guarantor by the owner or operator.
(e) The total liability of any guarantor shall be limited to the aggregate amount which the guarantor has provided as evidence of financial responsibility to the owner or operator under this Code section. Nothing in this Code section shall be construed to limit any other state or federal statutory, contractual, or common law liability of a guarantor to its owner or operator including, but not limited to, the liability of such guarantor for bad faith either in negotiating or in failing to negotiate the settlement of any claim. Nothing in this Code section shall be construed to diminish the liability of any person under Sections 107 and 111 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. Section 9601, et seq., as amended by P.L. 99-499, 1986.

(f) There is hereby established the Underground Storage Tank Trust Fund. The director shall serve as trustee of this fund. The principal of the moneys deposited in such fund pursuant to Code Section 12-13-10 may be expended by the director for the following purposes:

(1) To take whatever emergency action is necessary or appropriate to assure that the public health or safety is not threatened whenever there is a release or substantial threat of a release of regulated substances from an underground storage tank;

(2) To take preventive or corrective actions where the release of the regulated substances presents an actual or potential threat to human health or the environment where the owner or operator has not been identified or is unable, as determined by the director, to perform corrective action, including but not limited to, provisions for providing alternative water supplies;

(3) To provide compensation for third-party liabilities; provided, however, that any such expenditure shall be subject to the following limitations:

(A) A property owner shall not be considered a third party if the property was transferred by the owner or operator of an underground storage tank in anticipation of damage due to a release;

(B) Third-party liability property damage shall be reimbursed from the Underground Storage Tank Trust Fund based on the rental costs of comparable property during the period of loss of use up to a maximum amount equal to the fair market value. In the case of property that is actually destroyed as a result of a petroleum release, reimbursement shall be an amount necessary to replace or repair the destroyed property, whichever is less; and

(C) Payments for third-party liability damages, as defined in this chapter, shall never exceed the amount of the Underground Storage Tank Trust Fund coverage as provided in this chapter for any owner or operator and shall not include payments for any claims for attorney’s fees for third-party claimants or punitive damages or mental anguish;

(4) To pay for any portion of the administrative cost of administering the Underground Storage Tank Trust Fund which exceeds the amount of interest earned on the corpus of such fund; provided, however, that no more than 10 percent of the fees collected annually pursuant to subsection (a) of Code Section 12-13-10 shall be used for such purpose;

(5) To provide reimbursements to eligible participating owners and operators who have conducted corrective action; and

(6) To provide payments to state contractors for eligible participating owners and operators who are unable, as determined by the director, to conduct corrective action for
petroleum releases from underground storage tanks.

(g) Any interest earned upon the corpus of the Underground Storage Tank Trust Fund shall not become a part thereof but shall be paid over to the division to be utilized by the division for administration of the state Underground Storage Tank Program. Any such funds not expended for this purpose in the fiscal year in which they are generated shall be deposited in the state treasury, provided that nothing in this Code section shall be construed so as to allow the division to retain any funds required by the Constitution of Georgia to be paid into the state treasury; provided, further, that the division shall comply with all provisions of Part 1 of Article 4 of Chapter 12 of Title 45, known as the "Budget Act," except Code Section 45-12-92, prior to expending any such funds.

(h) If any person chooses to make a claim against the fund and accepts payment from the fund, then the state shall be subrogated to any cause of action that the claimant may have to the extent of such payment or judgment. In any such action, the amount of damages shall be proved by the division by submitting to the court a written report of the amounts paid or owed from the fund to claimants. Such written report shall be admissible in evidence and the amounts paid from or owed by the fund to the claimants stated therein shall be presumed to be the amount of the damages.

(i) Notwithstanding any other provisions of law to the contrary, the Underground Storage Tank Trust Fund shall not be considered an insurance company or insurer under the laws of this state.


12-13-10. Environmental assurance fees; late participation fee.

(a) In order to participate in the liability limitations and reimbursement benefits of the Underground Storage Tank Trust Fund, a potential claimant shall pay to the division his or her share of an environmental assurance fee on each gallon of petroleum products imported into this state. Such fees shall be established by the board in such amount as is sufficient to assure the funding of emergency, preventive, or corrective actions necessary when public health or safety is, or potentially may be, threatened from a release of regulated substances from an underground storage tank, at a rate not to exceed 1.0¢ per gallon. This fee shall be collected by the terminal operator upon request of the owner or operator when the petroleum is removed from a terminal by the person who sells the petroleum, or if the petroleum product will never be stored in a terminal in this state then by the importer thereof, and paid to the department. Proof of such payment shall be provided the owner or operator. Exchanges of petroleum products on a gallon-for-gallon basis within a terminal shall be exempt from this fee. Petroleum product which is subsequently exported from this state is exempt from this fee.

(b) Environmental assurance fees as specified in subsection (a) of this Code section shall be paid into the trust fund until the unobligated principal balance of the trust fund equals or exceeds $50 million, at which time no environmental assurance fees shall be levied unless the balance in the trust fund is less than or equal to an unobligated balance of $30 million, in which case the collection of the environmental assurance fee
will resume within 180 days following the end of the month in which such unobligated balance occurs.

(c) If an underground storage tank was in use for the storage of jet turbine fuel prior to the owner's or operator's participation in the Underground Storage Tank Trust Fund, the director shall require, as a condition for beginning participation in the fund, the owner or operator to pay into the fund a late participation fee which shall be an amount equal to the environmental assurance fee provided for in subsection (a) of this Code section which would have been paid by the owner or operator, as if the owner or operator had been a participant in the fund, during a period beginning on July 1, 1988, and ending on the beginning date of participation in the fund or beginning on the date the jet turbine fuel underground storage tank was first used, if after July 1, 1988, and ending on the beginning date of participation in the fund.


(a) Whenever the director has reason to believe that there is or has been a release of a petroleum product into the environment from an underground tank, regardless of the time at which storage of such material occurred, and has reason to believe that such release poses a danger to health or the environment, the director shall obtain corrective action for such release from any current owner or operator or from any past owner or operator who has contributed to such release, either individually or jointly. Such corrective action shall be performed in accordance with a plan approved by the director.

(b) If the tank owner or operator is unable, as determined by the director, to perform corrective action as provided for in subsection (a) of this Code section, the director may undertake preventive or corrective actions utilizing funds from the Underground Storage Tank Trust Fund.

(b.1) The owner or operator of an underground storage tank shall be liable for all costs of preventive, corrective, and enforcement actions incurred by the State of Georgia as a result of a release or a substantial threat of release of a petroleum product from an underground storage tank unless the owner or operator, or both, are participants in the Underground Storage Tank Trust Fund and enter into a consent agreement with the state. In such consent agreement, at a minimum, the owner or operator, or both, must agree that:

(1) Whenever costs have been incurred by the director pursuant to this subsection for taking corrective or enforcement action, the owner or operator shall be liable for the first $10,000.00 per occurrence for corrective action, such funds to be paid into the Underground Storage Tank Trust Fund within 90 days of notice by the director;

(2) The State of Georgia and the Underground Storage Tank Trust Fund are relieved of all liability for loss of business, damages, and taking of property associated with the corrective action;
(3) The division or its contractors may enter upon the property of the owner or operator or the real property where the underground storage tank of the owner or operator is located if the real property owner and the underground storage tank owner or operator are not the same person, at such time and in such manner as deemed necessary to effectuate corrective action to protect health and the environment, such right-of-entry by the division or its contractors being implied by the willingness of the real property owner to allow the underground storage tank of the owner or operator to be placed on the real property of the real property owner;

(4) The owner or operator shall be fully responsible for replacement or retrofitting or both of leaking tanks and associated piping or shall allow division contractors to refill excavated areas resulting from removal of leaking tanks and associated piping with clean earth to its original elevation;

(5) The liability of the state and the state Underground Storage Tank Trust Fund shall not exceed $1 million per occurrence; and

(6) Such other provisions as are deemed appropriate by the board to ensure adequate protection of health and the environment.

(c) To encourage voluntary corrective action, an owner or operator conducting corrective action under this chapter and participating in the Underground Storage Tank Trust Fund, either through the owner's or operator's own personnel or through response action contractors or subcontractors, is entitled, as evidenced by an executed corrective action agreement with the division, to reimbursement of reasonable cost from the trust fund, subject to the following provisions:

(1) Prior to initiating such corrective action, the owner or operator must submit to and receive approval from the division of the proposed corrective action plan, together with projected costs of the corrective action, and once approved the owner or operator shall not substantially deviate from the approved costs and corrective actions without the prior approval of the division;

(2) The owner or operator or the owner's or operator's agents shall keep and preserve suitable records demonstrating compliance with the approved corrective action plan and all invoices and financial records associated with costs for which reimbursement will be requested;

(3) Upon receipt of a complete corrective action plan, the director shall make a determination and provide written notice as to whether the owner or operator responsible for corrective action is eligible or ineligible for reimbursement of costs. Should the director determine the owner or operator is ineligible, he or she shall include in his or her written notice an explanation setting forth in detail the reasons for the determination;

(4) The owner or operator shall submit to the director a written notice that corrective action has been completed within 30 days of completing corrective action;

(5) No later than 30 days from the submission of the notice as required by paragraph (4) of this subsection, the owner or operator must submit an application for reimbursement of costs in accordance with criteria established by the director. The application for reimbursement must include the total amount of the corrective action and the amount of reimbursement sought;

(6) The first $10,000.00 of eligible costs incurred by the owner or operator are not eligible for reimbursement from the trust fund nor are costs for replacement or retrofitting
of leaking tanks and associated piping; and

(7) No costs may be reimbursed to the owner or operator until such time as corrective action has been completed in accordance with the plan approved by the division; provided, however, that interim payments may be made if the corrective action is being conducted in accordance with a plan approved by the division which allows interim payments.

(d) Notwithstanding the provisions of subsections (b), (b.1), and (c) of this Code section, should the division find that any of the following situations exist, the owner or operator, or both, shall be liable for 100 percent of costs associated with preventive, corrective, or enforcement actions necessary to protect health or the environment:

(1) The release was due to willful or negligent actions by the owner or operator;

(2) The owner or operator is in arrears for moneys owed to the Underground Storage Tank Trust Fund;

(3) The owner or operator moves in any way to obstruct the efforts of the division or its contractors to effectuate corrective action; or

(4) The owner or operator of a petroleum product underground tank has stored a petroleum product, after July 1, 1988, in such tank which has not been subjected to the environmental assurance fee imposed in subsection (a) of Code Section 12-13-10 and the late participation fee provided for in subsection (c) of Code Section 12-13-10.

(e) Notwithstanding the provisions of subsections (b), (b.1), and (c) of this Code section, should the division find, based upon rules promulgated by the board, that any of the following situations exist, the owner or operator, or both, may be liable for up to 100 percent of costs associated with preventive, corrective, or enforcement actions necessary to protect health or the environment:

(1) The release is from a tank not registered in accordance with Code Section 12-13-13;

(2) The owner or operator fails to comply with any provision of the agreement required by subsection (b), (b.1), or (c) of this Code section; or

(3) The owner or operator has failed to comply with any provisions of this chapter or rules promulgated under this chapter.

(f) If no underground storage tank owner or operator can be found, the director may undertake preventive or corrective actions utilizing funds from the Underground Storage Tank Trust Fund or any appropriate federal funds as provided by the federal act, and any real property owner by virtue of the fact that he or she has allowed these underground storage tanks to exist or be placed on his or her real property shall be deemed to have granted permission to the division or its contractors or agents to enter its real property to investigate and take samples and, when deemed necessary by the director, to effectuate the necessary corrective action to protect health and the environment.

12-13-12. Recovery in event of discharge or threat of discharge of regulated substance; lien.

(a) Except as otherwise provided for in subsections (b), (b.1), and (c) of Code Section 12-13-11, in the event of any discharge or threatened discharge of a regulated substance, the state or any of its agencies may recover in a civil action from any owner, operator, or other responsible person all costs incurred by the state or any of its agencies or moneys from the federal Leaking Underground Storage Tank Trust Fund in the assessment and the cleanup of any release of a regulated substance and all costs incurred in the prevention, abatement, or removal of any threatened discharge of a regulated substance, including reasonable attorney's fees and any other necessary costs of response incurred by the state or any of its agencies. All moneys recovered for costs incurred under the Underground Storage Tank Trust Fund shall be deposited into the principal of the Underground Storage Tank Trust Fund. The state shall have a lien on the real property on which the underground storage tanks which caused the discharge are located, even if owned by a person other than the owner or operator, provided the owner or operator is in privy with the real property owner.

(b) The lien provided for above shall be perfected by filing a certified copy of any judgment obtained against the owner or operator with the Clerk of Superior Court for entry on the general execution docket in the county in which any real property of the owner or operator is located or where the real property on which the leaking underground storage tanks were operated is located.


(a) Unless such notification has been previously provided to the division or to the U.S. Environmental Protection Agency in accordance with the federal act, any person who owns an underground storage tank shall notify the division, on forms provided by the division, within a reasonable number of days which the director shall specify, indicating the age, size, type, location, and uses of such tanks, identifying the regulated substances stored, and providing any other information which may be deemed relevant under such conditions as the director may prescribe.

(b) Unless such notification has been previously provided to the division or to the U.S. Environmental Protection Agency in accordance with the federal act, any person who owns an underground storage tank taken out of service after January 1, 1974, shall notify the division in writing, on forms provided by the division, within a reasonable number of days which the director shall specify, indicating the date the tank was taken out of operation, the age of the tank at the date taken out of operation, the size, type, and location of the tank, and the type and quantity of substances left stored in such tank on the date taken out of operation and shall provide any other information which may be deemed relevant under such conditions as the director may prescribe.

(c) Any owner who brings into use an underground storage tank after July 1, 1988, shall notify the division, on forms provided by the division, within 30 days of the existence
of such tank, specifying the age, size, type, location, and uses of such tank.
(d) Beginning 30 days after the board issues new tank performance standard rules and regulations pursuant to Code Section 12-13-5, any person who sells a tank intended to be used as an underground storage tank shall notify the purchaser of such tank of the owner's notification requirements pursuant to this Code section.

(e) (1) The owner or operator of an underground storage tank in use or capable of being used shall provide to the division an annual underground storage tank notification for all underground storage tanks for which an initial notification has previously been given or should have been given pursuant to this Code section. Such notification shall be provided on forms as prescribed by the division and shall be submitted in accordance with rules and regulations promulgated by the board. It shall be a violation of this Code section for an owner or operator of an underground storage tank to fail to file an annual notification for an underground storage tank in accordance with such rules and regulations. The division shall issue confirmation of notification to the owner or operator for each facility with regulated underground storage tanks for which annual underground storage tank notifications have been submitted.

(2) Beginning 180 days after rules and regulations are promulgated by the board establishing the requirements for annual tank notification and confirmation of notification as provided in paragraph (1) of this subsection, it shall be a violation of this Code section for any person to place or cause to be placed regulated substances in an underground storage tank for which the tank owner or operator has failed to provide the annual tank notification to the division as required in this subsection.


12-13-14. Corrective action for violations of chapter, rules and regulations, or orders and for release of regulated substance into environment.

(a) Whenever the director has reason to believe that a violation of any provision of this chapter, any rule or regulation of the board, or any order of the director has occurred, he shall attempt to remedy the same by conference, conciliation, or persuasion. In case of failure of such conference, conciliation, or persuasion to correct or remedy any violation, the director may issue an order directed to such violator or violators. The order shall specify the provisions of the chapter or rules or regulations or order alleged to have been violated and may order that necessary corrective action be taken within a reasonable time to be prescribed in the order. An order issued by the director under this Code section shall be signed by the director. Any such order shall become final unless the person or persons named therein request in writing a hearing pursuant to Code Section 12-13-16.

(b) Whenever the director has reason to believe that there is or has been a release of a regulated substance into the environment from an underground tank, regardless of the time at which storage of such material occurred, and has reason to believe that such release poses a danger to health or the environment, the director shall attempt to obtain corrective action for such release by conference, conciliation, or persuasion. In the case
of failure of such conference, conciliation, or persuasion to obtain corrective action, the
director may issue an order directed to any person, including any current owner or
operator or any past owner or operator who has contributed to such release. The order
may direct that necessary corrective action may be taken within a reasonable time to be
prescribed in the order.


Whenever, in the judgment of the director, any person has engaged in or is about
to engage in any act or practice which constitutes or would constitute a violation of this
chapter, the rules and regulations, or any order or permit conditions, he may make
application to the superior court of the county in which the violative act or practice has
been or is about to be engaged in or in which the owner or operator resides for an order
enjoining such act or practice or for an order requiring compliance with this chapter, the
rules and regulations, or the order; and upon a showing by the director that such person
has engaged in or is about to engage in any such violative act or practice, a permanent
or temporary injunction, restraining order, or other order shall be granted without the
necessity of showing the lack of an adequate remedy at law.


All hearings on and review of contested matters and orders and all hearings on
and review of any other enforcement actions or orders under this chapter shall be
provided and conducted in accordance with subsection (c) of Code Section 12-2-2. The
hearing and review procedure provided in such Code section is to the exclusion of all
other means of hearing or review.


12-13-17. Judgment in accordance with division's order.

Any order of a hearing officer issued after a hearing as provided in Code Section
12-13-16 or any order of the director issued pursuant to Code Section 12-13-14, either
unappealed from as provided in those Code sections or affirmed or modified on any
review or appeal pursuant to Code Section 12-13-16, from which no further review is
taken or allowed under Code Section 12-13-16 may be filed, as unappealed from or as
affirmed or modified, if reviewed or appealed, by certified copy from the director in
superior court of the county wherein the person under order resides or, if said person is
a corporation, in the county wherein the corporation maintains its principal place of
business or in the county wherein the violation occurred. The superior court shall then
render judgment in accordance therewith and notify the parties. Such judgment shall have

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the same effect and all proceedings in relation thereto shall be the same as though said
judgment had been rendered in an action duly heard and determined by such court.


12-13-18. Required compliance with chapter; proof that petroleum subjected to
environmental fee; violations of chapter; access to property.

(a) It shall be unlawful for any person to engage in the storage of regulated
substances in underground tanks except in such a manner so as to conform to and
comply with any provisions of this chapter or any of the rules, regulations, and orders
established under this chapter. The owner or operator of any underground storage tank
for petroleum shall maintain proof that all petroleum stored in such tank after July 1, 1988,
was subjected to the environmental fee imposed in subsection (a) of Code Section
12-13-10.

(b) Notwithstanding the provisions of subsection (a) of this Code section, it shall
be a violation of this chapter to:

1. Cause or permit the release of a regulated substance from an underground
storage tank into the environment; or

2. Install an underground storage tank that does not meet the minimum standards
pursuant to this chapter or the rules promulgated pursuant to this chapter.

(c) Any real property owner adjoining a leaking underground storage tank site who
refuses to allow either the owner or operator or the division, through its agents or
contractors, access for purposes of providing corrective action for any pollution that may
have migrated onto the adjoining real property from the leaking underground storage tank
site shall be responsible for the remediation and cleanup of that pollution plume should
it migrate off that real property onto the real property of another.


(a) If a person fails to comply with an order under Code Section 12-13-14 within
the time specified in the order, he shall be liable for a civil penalty of not more than
$25,000.00 for each day of continued noncompliance.

(b) Any person who fails to notify or submits false information pursuant to any
provision of this chapter shall be subject to a civil penalty not to exceed $10,000.00 for
each tank for which notification is not given or for each time false information is submitted.

(c) Any person who violates any provision of this chapter or any requirement,
standard, rule, or regulation promulgated by the board pursuant to this chapter shall be
subject to a civil penalty not to exceed $10,000.00 for each day of violation for each
underground storage tank in violation thereof.

(d) Any person not subject to the provisions of 18 U.S.C. Section 1905 who
knowingly and willfully divulges or discloses any information entitled to protection under
Code Section 12-13-21 shall, upon conviction, be subject to a fine of not more than

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$5,000.00 or to imprisonment not to exceed one year, or both.

(e) Whenever the director has reason to believe that any person has violated any provision of this chapter or any rule or regulation effective under this chapter or has failed or refused to comply with any final order or emergency order of the director, he may upon written request cause a hearing to be conducted before a hearing officer appointed by the board. Upon finding that said person has violated any provision of this chapter or any rule or regulation effective under this chapter or has failed or refused to comply with any final order or emergency order of the director, said hearing officer shall issue his decision imposing civil penalties as provided in this Code section. Such hearing and any administrative or judicial review thereof shall be conducted in accordance with Code Section 12-13-16.

(f) In rendering a decision under this Code section imposing civil penalties, the hearing officer shall consider all factors which are relevant including, but not limited to, the following:

(1) The amount of civil penalty necessary to ensure immediate and continued compliance and the extent to which the violator may have profited by failing or delaying to comply;

(2) The character and degree of impact of the violation or failure on the natural resources of the state, especially any rare or unique natural phenomena;

(3) The conduct of the person incurring the civil penalty in promptly taking all feasible steps or procedures necessary or appropriate to comply or to correct the violation or failure;

(4) Any prior violations or failures to comply by such person with statutes, rules, regulations, or orders administered, adopted, or issued by the director;

(5) The character and degree of injury to or interference with public health or safety which is caused or threatened to be caused by such violation or failure; and

(6) The character and degree of injury to or interference with reasonable use of property which is caused or threatened to be caused by such violation or failure.

(g) All civil penalties recovered by the director as provided in this Code section shall be paid into the Underground Storage Tank Trust Fund established pursuant to the provisions of Code Section 12-13-9.


Whenever the director finds that an emergency exists requiring immediate action to protect the public health, safety, or well-being, the director may issue an order declaring the existence of such an emergency and requiring that such action be taken to meet the emergency as the director specifies. Such order shall be effective immediately. Any person to whom such order is directed shall comply therewith immediately but an application to the director shall be afforded a hearing within 48 hours. On the basis of such hearing, the director may continue such order in effect, revoke it, or modify it.

(a) Any records, reports, or information obtained from any person pursuant to this chapter shall be available to the public, except that upon a showing satisfactory to the director by any person that such records, reports, or information or a particular part thereof to which the director or any officer, employee, or representative thereof has access pursuant to this chapter, if made public, would divulge information entitled to protection under 18 U.S.C. Section 1905, such information or particular portion thereof shall be considered confidential in accordance with the purposes of that statute. However, such confidential record, report, document, or information may be disclosed to other officers, employees, or authorized representatives of the State of Georgia or the United States concerned with carrying out this chapter or the federal act or, when relevant, in any proceedings under this chapter or the federal act.

(b) In submitting information pursuant to this chapter, a person required to provide such information may:

1. Designate the information which such person believes is entitled to protection under this Code section; and

2. Submit such designated information separately from other data submitted under this Code section.


It shall be the duty of the Attorney General or his representative to represent the director in all actions in connection with this chapter.


the requirements of parts 257 and 258 of this chapter.

§ 279.82  Use as a dust suppressant.

(a) The use of used oil as a dust suppressant is prohibited, except when such activity takes place in one of the states listed in paragraph (c) of this section.

(b) A State may petition (e.g., as part of its authorization petition submitted to EPA under §271.5 of this chapter or by a separate submission) EPA to allow the use of used oil (that is not mixed with hazardous waste and does not exhibit a characteristic other than ignitability) as a dust suppressant. The State must show that it has a program in place to prevent the use of used oil/hazardous waste mixtures or used oil exhibiting a characteristic other than ignitability as a dust suppressant. In addition, such programs must minimize the impacts of use as a dust suppressant on the environment.

(c) List of States. [Reserved]

PART 280—TECHNICAL STANDARDS AND CORRECTIVE ACTION REQUIREMENTS FOR OWNERS AND OPERATORS OF UNDERGROUND STORAGE TANKS (UST)

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APPENDIX I TO PART 280—NOTIFICATION FOR UNDERGROUND STORAGE TANKS (FORM)

APPENDIX II TO PART 280—LIST OF AGENCIES DESIGNATED TO RECEIVE NOTIFICATIONS

APPENDIX III TO PART 280—STATEMENT FOR SHIPPING TICKETS AND INVOICES

AUTHORITY: 42 U.S.C. 6912, 6991, 6991a, 6991b, 6991c, 6991d, 6991e, 6991f, 6991g, 6991h.

SOURCE: 53 FR 37194, Sept. 23, 1988, unless otherwise noted.

Subpart A—Program Scope and Interim Prohibition

§ 280.10 Applicability.

(a) The requirements of this part apply to all owners and operators of an UST system as defined in §280.12 except as otherwise provided in paragraphs (b), (c), and (d) of this section. Any UST system listed in paragraph (c) of this section must meet the requirements of §280.11.

(b) The following UST systems are excluded from the requirements of this part:

(1) 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.

(2) Any wastewater treatment tank system that is part of a wastewater treatment facility regulated under section 402 or 307(b) of the Clean Water Act.

(3) Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks.

(4) Any UST system whose capacity is 110 gallons or less.

(5) Any UST system that contains a de minimis concentration of regulated substances.

(6) Any emergency spill or overflow containment UST system that is expeditiously emptied after use.

(c) Deferrals. Subparts B, C, D, E, and G do not apply to any of the following types of UST systems:

(1) Wastewater treatment tank systems;

(2) Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 U.S.C. 2011 and following);

(3) Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR part 50, appendix A;

(4) Airport hydrant fuel distribution systems; and

(5) UST systems with field-constructed tanks.

(d) Deferrals. Subpart D does not apply to any UST system that stores fuel solely for use by emergency power generators.

§ 280.11 Interim prohibition for deferred UST systems.

(a) No person may install an UST system listed in §280.10(c) for the purpose of storing regulated substances unless the UST system (whether of single- or double-wall construction):

(1) Will prevent releases due to corrosion or structural failure for the operational life of the UST system;

(2) Is cathodically protected against corrosion, constructed of noncorroding material, steel clad with a noncorroding material, or designed in a manner
§ 280.12 Definitions.

Aboveground release means 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 an UST system and aboveground releases associated with overfills and transfer operations as the regulated substance moves to or from an UST system.

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

Belowground release means any release to the subsurface of the land and to ground water. 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.

Beneath the surface of the ground means beneath the ground surface or otherwise covered with earthen materials.

Cathodic protection is a technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.

Cathodic protection tester means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems. CERCLA means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

Compatible means the 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.

Consumptive use with respect to heating oil means consumed on the premises.

Corrosion expert means a 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. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers or be 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. Dielectric material means a material that does not conduct direct electrical current. Dielectric coatings are used to electrically isolate UST systems from
Dielectric bushings are used to electrically isolate portions of the UST system (e.g., tank from piping).

Electrical equipment means underground equipment that contains dielectric fluid that is necessary for the operation of equipment such as transformers and buried electrical cable.

Excavation zone means the 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.

Existing tank system means a tank system used to contain an accumulation of regulated substances or for which installation has commenced on or before December 22, 1988. Installation is considered to have commenced if:

(a) The owner or operator has obtained all federal, state, and local approvals or permits necessary to begin physical construction of the site or installation of the tank system; and if,

(b)(1) Either a continuous on-site physical construction or installation program has begun; or,

(2) The owner or operator has entered into contractual obligations—which cannot be cancelled or modified without substantial loss—for physical construction at the site or installation of the tank system to be completed within a reasonable time.

Farm tank is a tank located on a tract of land devoted to the production of crops or raising animals, including fish, and associated residences and improvements. A farm tank must be located on the farm property. “Farm” includes fish hatcheries, rangeland and nurseries with growing operations.

Flow-through process tank is a 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 refers to a regulated substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water.)

Gathering lines means any pipeline, equipment, facility, or building used in the transportation of oil or gas during oil or gas production or gathering operations.

Hazardous substance UST system means an underground storage tank system that contains a hazardous substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (but not including any substance regulated as a hazardous waste under subtitle C) or any mixture of such substances and petroleum, and which is not a petroleum UST system.

Heating oil means petroleum that is No. 1, No. 2, No. 4—light, No. 4—heavy, No. 5—light, No. 5—heavy, and No. 6 technical grades of fuel oil; other residual fuel oils (including Navy Special Fuel Oil and Bunker C); and other fuels when used as substitutes for one of these fuel oils. Heating oil is typically used in the operation of heating equipment, boilers, or furnaces.

Hydraulic lift tank means a tank holding hydraulic fluid for a closed-loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

Implementing agency means EPA, or, in the case of a state with a program approved under section 9004 (or pursuant to a memorandum of agreement with EPA), the designated state or local agency responsible for carrying out an approved UST program.

Liquid trap means sumps, well cellars, and other traps used in association with oil and gas production, gathering, and extraction operations (including gas production plants), for the purpose of collecting oil, water, and other liquids. These liquid traps may temporarily collect liquids for subsequent disposition or reinjection into a production or pipeline stream, or may collect and separate liquids from a gas stream.

Maintenance means the normal operational upkeep to prevent an underground storage tank system from leaking product.

Motor fuel means petroleum or a petroleum-based substance that is motor
gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of a motor engine.

New tank system means a tank system that will be used to contain an accumulation of regulated substances and for which installation has commenced after December 22, 1988. (See also “Existing Tank System.”)

Noncommercial purposes with respect to motor fuel means not for resale.

On the premises where stored with respect to heating oil means UST systems located on the same property where the stored heating oil is used.

Operational life refers to the period beginning when installation of the tank system has commenced until the time the tank system is properly closed under Subpart G.

Operator means any person in control of, or having responsibility for, the daily operation of the UST system.

Overfill release is a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.

Owner means:

(a) In the case of an UST system in use on November 8, 1984, or brought into use after that date, any person who owns an UST system used for storage, use, or dispensing of regulated substances; and

(b) In the case of any UST system in use before November 8, 1984, but no longer in use on that date, any person who owned such UST immediately before the discontinuation of its use.

Person means an individual, trust, firm, joint stock company, Federal agency, corporation, state, municipality, commission, political subdivision of a state, or any interstate body. “Person” also includes a consortium, a joint venture, a commercial entity, and the United States Government.

Petroleum UST system means an underground storage tank system that contains petroleum or a mixture of petroleum with de minimis quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Pipe or Piping means a hollow cylinder or tubular conduit that is constructed of non-earthens materials. Pipeline facilities (including gathering lines) are new and existing pipe rights-of-way and any associated equipment, facilities, or buildings.

Regulated substance means:

(a) Any substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (but not including any substance regulated as a hazardous waste under subtitle C), and

(b) Petroleum, including crude oil and any fraction thereof that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

The term “regulated substance” includes but is not limited to petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil though processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

Release means any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an UST into ground water, surface water or subsurface soils.

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

Repair means to restore a tank or UST system component that has caused a release of product from the UST system.

Residential tank is a tank located on property used primarily for dwelling purposes.


Septic tank is a water-tight covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building 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.

Storm-water or wastewater collection system means piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

Surface impoundment is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is not an injection well.

Tank is a stationary device designed to contain an accumulation of regulated substances and constructed of non-earthen materials (e.g., concrete, steel, plastic) that provide structural support.

Underground area means an underground room, such as a basement, cellar, shaft, or vault, providing enough space for physical inspection of the exterior of the tank situated on or above the surface of the floor.

Underground release means any below-ground release.

Underground storage tank or UST means any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground. This term does not include any:

(a) Farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
(b) Tank used for storing heating oil for consumptive use on the premises where stored;
(c) Septic tank;
(d) Pipeline facility (including gathering lines) regulated under:
(1) The Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. App. 1671, et seq.), or
(3) Which is an intrastate pipeline facility regulated under state laws comparable to the provisions of the law referred to in paragraph (d)(1) or (d)(2) of this definition;
(e) Surface impoundment, pit, pond, or lagoon;
(f) Storm-water or wastewater collection system;
(g) Flow-through process tank;
(h) Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or
(i) Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor. The term “underground storage tank” or “UST” does not include any pipes connected to any tank which is described in paragraphs (a) through (i) of this definition.

Upgrade means the 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.

UST system or Tank system means an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

Wastewater treatment tank means a tank that is designed to receive and treat an influent wastewater through physical, chemical, or biological methods.
portion underground that routinely contains product must be protected from corrosion, in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified below:

(1) The tank is constructed of fiberglass-reinforced plastic; or


(2) The tank is constructed of steel and cathodically protected in the following manner:

(i) The tank is coated with a suitable dielectric material;

(ii) Field-installed cathodic protection systems are designed by a corrosion expert;

(iii) Impressed current systems are designed to allow determination of current operating status as required in §280.31(c); and

(iv) Cathodic protection systems are operated and maintained in accordance with §280.31 or according to guidelines established by the implementing agency; or

**NOTE:** The following codes and standards may be used to comply with paragraph (a)(2) of this section:

(A) Steel Tank Institute “Specification for STI-P 3 System of External Corrosion Protection of Underground Steel Storage Tanks”;

(B) Underwriters Laboratories Standard 1746, “Corrosion Protection Systems for Underground Storage Tanks”;

(C) Underwriters Laboratories of Canada CAN4-S603-M85, “Standard for Steel Under-ground Tanks for Flammable and Combustible Liquids,” and CAN4-G03.1-M85, “Pipe Connectors for Flammable and Combustible Liquids,” and CAN4-S631-M84, “Isolating Bushings for Steel Underground Tanks Protected with Coatings and Galvanized Systems”; or


(3) The tank is constructed of a steel-fiberglass-reinforced-plastic composite; or

**NOTE:** The following industry codes may be used to comply with paragraph (a)(3) of this section: Underwriters Laboratories Standard 1746, “Corrosion Protection Systems for Underground Storage Tanks,” or the Association for Composite Tanks ACT–100, “Specification for the Fabrication of FRP Clad Underground Storage Tanks.”

(4) The tank is constructed of metal without additional corrosion protection measures provided that:

(i) The tank is installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release due to corrosion during its operating life; and

(ii) Owners and operators maintain records that demonstrate compliance with the requirements of paragraphs (a)(4)(i) for the remaining life of the tank; or

(5) The tank construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than paragraphs (a) (1) through (4) of this section.

(b) Piping. The piping that routinely contains regulated substances and is in contact with the ground must be properly designed, constructed, and protected from corrosion in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified below:

(1) The piping is constructed of fiberglass-reinforced plastic; or

**NOTE:** The following codes and standards may be used to comply with paragraph (b)(1) of this section:

(A) Underwriters Laboratories Subject 971, “UL Listed Non-Metal Pipe”;

(B) Underwriters Laboratories Standard 567, “Pipe Connectors for Flammable and Combustible and LP Gas”;

(C) Underwriters Laboratories of Canada Guide ULC–107, “Glass Fiber Reinforced Plastic Pipe and Fittings for Flammable Liquids”; and

(D) Underwriters Laboratories of Canada Standard CAN 4-S633-M81, “Flexible Underground Hose Connectors.”
(2) The piping is constructed of steel and cathodically protected in the following manner:
   (i) The piping is coated with a suitable dielectric material;
   (ii) Field-installed cathodic protection systems are designed by a corrosion expert;
   (iii) Impressed current systems are designed to allow determination of current operating status as required in §280.31(c); and
   (iv) Cathodic protection systems are operated and maintained in accordance with §280.31 or guidelines established by the implementing agency; or
   NOTE: The following codes and standards may be used to comply with paragraph (b)(2) of this section:
   (A) National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code”;
   (B) American Petroleum Institute Publication 1615, “Installation of Underground Petroleum Storage Systems”;
   (C) American Petroleum Institute Publication 1632, “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”;

(3) The piping is constructed of metal without additional corrosion protection measures provided that:
   (i) The piping is installed at a site that is determined by a corrosion expert to not be corrosive enough to cause it to have a release due to corrosion during its operating life; and
   (ii) Owners and operators maintain records that demonstrate compliance with the requirements of paragraph (b)(3)(i) of this section for the remaining life of the piping; or
   NOTE: National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code”; and National Association of Corrosion Engineers Standard RP–01–69, “Control of External Corrosion on Submerged Metallic Piping Systems,” may be used to comply with paragraph (b)(3) of this section.

(4) The piping construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than the requirements in paragraphs (b)(1) through (3) of this section.

(c) Spill and overfill prevention equipment. (1) Except as provided in paragraph (c)(2) of this section, to prevent spilling and overfilling associated with product transfer to the UST system, owners and operators must use the following spill and overfill prevention equipment:
   (i) Spill prevention equipment that will prevent release of product to the environment when the transfer hose is detached from the fill pipe (for example, a spill catchment basin); and
   (ii) Overfill prevention equipment that will:
       (A) Automatically shut off flow into the tank when the tank is no more than 95 percent full; or
       (B) Alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high-level alarm; or
       (C) Restrict flow 30 minutes prior to overfilling, alert the operator with a high level alarm one minute before overfilling, or automatically shut off flow into the tank so that none of the fittings located on top of the tank are exposed to product due to overfilling.

(2) Owners and operators are not required to use the spill and overfill prevention equipment specified in paragraph (c)(1) of this section if:
   (i) Alternative equipment is used that is determined by the implementing agency to be no less protective of human health and the environment than the equipment specified in paragraph (c)(1)(i) or (ii) of this section; or
   (ii) The UST system is filled by transfers of no more than 25 gallons at one time.

(d) Installation. All tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer’s instructions.

   NOTE: Tank and piping system installation practices and procedures described in the following codes may be used to comply with the requirements of paragraph (d) of this section:
   (i) American Petroleum Institute Publication 1615, “Installation of Underground Petroleum Storage System”; or
§ 280.21 Upgrading of existing UST systems.

(a) Alternatives allowed. Not later than December 22, 1998, all existing UST systems must comply with one of the following requirements:

1. New UST system performance standards under §280.20;
2. The upgrading requirements in paragraphs (b) through (d) of this section; or
3. Closure requirements under subpart G of this part, including applicable requirements for corrective action under subpart F.

(b) Tank upgrading requirements. Steel tanks must be upgraded to meet one of the following requirements in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory:

1. Interior lining. A tank may be upgraded by internal lining if:
   (i) The lining is installed in accordance with the requirements of §280.33, and
   (ii) Within 10 years after lining, and every 5 years thereafter, the lined tank is internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications.
2. Cathodic protection. A tank may be upgraded by cathodic protection if the cathodic protection system meets the requirements of §280.20(a)(2) (ii), (iii), and (iv) and the integrity of the tank is ensured using one of the following methods:
   (i) The tank is internally inspected and assessed to ensure that the tank is structurally sound and free of corrosion holes prior to installing the cathodic protection system; or
   (ii) The tank has been installed for less than 10 years and is monitored monthly for releases in accordance with §280.43 (d) through (h); or
   (iii) The tank has been installed for less than 10 years and is assessed for corrosion holes by conducting two (2) tightness tests that meet the requirements of §280.43(c). The first tightness test must be conducted prior to installing the cathodic protection system. The second tightness test must be conducted between three (3) and six (6) months following the first operation of the cathodic protection system; or
   (iv) The tank is assessed for corrosion holes by a method that is determined by the implementing agency to prevent releases in a manner that is no less protective of human health and the environment than paragraphs (b)(2) (i) through (iii) of this section.
3. Internal lining combined with cathodic protection. A tank may be upgraded by both internal lining and cathodic protection if:
   (i) The lining is installed in accordance with the requirements of §280.33, and
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(ii) The cathodic protection system meets the requirements of §280.20(a)(2) (ii), (iii), and (iv).

NOTE: The following codes and standards may be used to comply with this section:
(A) American Petroleum Institute Publication 1631, “Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks”;
(B) National Leak Prevention Association Standard 631, “Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection”;
(C) National Association of Corrosion Engineers Standard RP-02-85, “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems”; and

(c) Piping upgrading requirements. Metal piping that routinely contains regulated substances and is in contact with the ground must be cathodically protected in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and must meet the requirements of §280.20(b)(2) (ii), (iii), and (iv).

NOTE: The codes and standards listed in the note following §280.20(b)(2) may be used to comply with this requirement.

(d) Spill and overfill prevention equipment. To prevent spilling and overfilling associated with product transfer to the UST system, all existing UST systems must comply with new UST system spill and overfill prevention equipment requirements specified in §280.20(c).

§280.22 Notification requirements.

(a) Any owner who brings an underground storage tank system into use after May 8, 1986, must within 30 days of bringing such tank into use, submit, in the form prescribed in appendix I of this part, a notice of existence of such tank system to the state or local agency or department designated in appendix II of this part to receive such notice.

NOTE: Owners and operators of UST systems that were in the ground on or after May 8, 1986, unless taken out of operation on or before January 1, 1974, were required to notify the designated state or local agency in accordance with the Hazardous and Solid Waste Amendments of 1984, Pub. L. 98–616, on a form published by EPA on November 8, 1985 (50 FR 46602) unless notice was given pursuant to section 103(c) of CERCLA. Owners and operators who have not complied with the notification requirements may use portions I through VI of the notification form contained in appendix I of this part.

(b) In states where state law, regulations, or procedures require owners to use forms that differ from those set forth in appendix I of this part to fulfill the requirements of this section, the state forms may be submitted in lieu of the forms set forth in Appendix I of this part. If a state requires that its form be used in lieu of the form presented in this regulation, such form must meet the requirements of section 9002.

(c) Owners required to submit notices under paragraph (a) of this section must provide notices to the appropriate agencies or departments identified in appendix II of this part for each tank they own. Owners may provide notice for several tanks using one notification form, but owners who own tanks located at more than one place of operation must file a separate notification form for each separate place of operation.

(d) Notices required to be submitted under paragraph (a) of this section must provide all of the information in sections I through VI of the prescribed form (or appropriate state form) for each tank for which notice must be given. Notices for tanks installed after December 22, 1988 must also provide all of the information in section VII of the prescribed form (or appropriate state form) for each tank for which notice must be given.

(e) All owners and operators of new UST systems must certify in the notification form compliance with the following requirements:

(1) Installation of tanks and piping under §280.20(e);
(2) Cathodic protection of steel tanks and piping under §280.20(a) and (b);
(3) Financial responsibility under subpart H of this part; and
(4) Release detection under §§280.41 and 280.42.

(f) All owners and operators of new UST systems must ensure that the installer certifies in the notification form that the methods used to install
§ 280.30 Spill and overfill control.

(a) Owners and operators must ensure that releases due to spilling or overfilling do not occur. The owner and operator must ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made and that the transfer operation is monitored constantly to prevent overfilling and spilling.

NOTE: The transfer procedures described in National Fire Protection Association Publication 385 may be used to comply with paragraph (a) of this section. Further guidance on spill and overfill prevention appears in American Petroleum Institute Publication 1621, “Recommended Practice for Bulk Liquid Stock Control at Retail Outlets,” and National Fire Protection Association Standard 30, “Flammable and Combustible Liquids Code.”

(b) The owner and operator must report, investigate, and clean up any spills and overfills in accordance with §280.33.

§ 280.31 Operation and maintenance of corrosion protection.

All owners and operators of steel UST systems with corrosion protection must comply with the following requirements to ensure that releases due to corrosion are prevented for as long as the UST system is used to store regulated substances:

(a) All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.

(b) All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements:

(1) Frequency. All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter or according to another reasonable time frame established by the implementing agency; and

(2) Inspection criteria. The criteria that are used to determine that cathodic protection is adequate as required by this section must be in accordance with a code of practice developed by a nationally recognized association.

NOTE: National Association of Corrosion Engineers Standard RP–02–85, “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems,” may be used to comply with paragraph (b)(2) of this section.

(c) UST systems with impressed current cathodic protection systems must also be inspected every 60 days to ensure the equipment is running properly.

(d) For UST systems using cathodic protection, records of the operation of the cathodic protection must be maintained (in accordance with §280.34) to demonstrate compliance with the performance standards in this section. These records must provide the following:

(1) The results of the last three inspections required in paragraph (c) of this section; and

(2) The results of testing from the last two inspections required in paragraph (b) of this section.

§ 280.32 Compatibility.

Owners and operators must use an UST system made of or lined with materials that are compatible with the substance stored in the UST system.

NOTE: Owners and operators storing alcohol blends may use the following codes to comply with the requirements of this section:

(a) American Petroleum Institute Publication 1626, “Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations”; and

(b) American Petroleum Institute Publication 1627, “Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations.”
§ 280.33 Repairs allowed.

Owners and operators of UST systems must ensure that repairs will prevent releases due to structural failure or corrosion as long as the UST system is used to store regulated substances. The repairs must meet the following requirements:

(a) Repairs to UST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

NOTE: The following codes and standards may be used to comply with paragraph (a) of this section: National Fire Protection Association Standard 30, "Flammable and Combustible Liquids Code"; American Petroleum Institute Publication 2200, "Repairing Crude Oil, Liquefied Petroleum Gas, and Product Pipelines"; American Petroleum Institute Publication 1631, "Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks"; and National Leak Prevention Association Standard 631, "Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection."

(b) Repairs to fiberglass-reinforced plastic tanks may be made by the manufacturer's authorized representatives or in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

(c) Metal pipe sections and fittings that have released product as a result of corrosion or other damage must be replaced. fiberglass pipes and fittings may be repaired in accordance with the manufacturer's specifications.

(d) Repaired tanks and piping must be tightness tested in accordance with § 280.43(c) and § 280.44(b) within 30 days following the date of the completion of the repair except as provided in paragraphs (d) (1) through (3), of this section:

(1) The repaired tank is internally inspected in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory; or

(2) The repaired portion of the UST system is monitored monthly for releases in accordance with a method specified in § 280.43(d) through (h); or

(3) Another test method is used that is determined by the implementing agency to be no less protective of human health and the environment than those listed above.

(e) Within 6 months following the repair of any cathodically protected UST system, the cathodic protection system must be tested in accordance with § 280.31(b) and (c) to ensure that it is operating properly.

(f) UST system owners and operators must maintain records of each repair for the remaining operating life of the UST system that demonstrate compliance with the requirements of this section.

§ 280.34 Reporting and recordkeeping.

Owners and operators of UST systems must cooperate fully with inspections, monitoring and testing conducted by the implementing agency, as well as requests for document submission, testing, and monitoring by the owner or operator pursuant to section 9005 of Subtitle I of the Resource Conservation and Recovery Act, as amended.

(a) Reporting. Owners and operators must submit the following information to the implementing agency:

(1) Notification for all UST systems (§ 280.22), which includes certification of installation for new UST systems (§ 280.20(e)).

(2) Reports of all releases including suspected releases (§ 280.50), spills and overfills (§ 280.53), and confirmed releases (§ 280.61);

(3) Corrective actions planned or taken including initial abatement measures (§ 280.62), initial site characterization (§ 280.63), free product removal (§ 280.64), investigation of soil and ground-water cleanup (§ 280.65), and corrective action plan (§ 280.66); and

(4) A notification before permanent closure or change-in-service (§ 280.71).

(b) Recordkeeping. Owners and operators must maintain the following information:

(1) A corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used (§ 280.20(a)(4); § 280.20(b)(3)).

(2) Documentation of operation of corrosion protection equipment (§ 280.33);

(3) Documentation of UST system repairs (§ 280.33(f));
§ 280.40  General requirements for all UST systems.

(a) Owners and operators of new and existing UST systems must provide a method, or combination of methods, of release detection that:

(1) Can detect a release from any portion of the tank and the connected underground piping that routinely contains product;

(2) Is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition; and

(3) Meets the performance requirements in §280.43 or 280.44, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer. In addition, methods used after the date shown in the following table corresponding with the specified methods except for methods permanently installed prior to that date, must be capable of detecting the leak rate or quantity specified for that method in the corresponding section of the rule (also shown in the table) with a probability of detection (Pd) of 0.95 and a probability of false alarm (Pfa) of 0.05.

(b) When a release detection method operated in accordance with the performance standards in §280.43 and §280.44 indicates a release may have occurred, owners and operators must notify the implementing agency in accordance with subpart E.

(c) Owners and operators of all UST systems must comply with the release detection requirements of this subpart by December 22 of the year listed in the following table:

<table>
<thead>
<tr>
<th>Year system was installed</th>
<th>1989</th>
<th>1990</th>
<th>1991</th>
<th>1992</th>
<th>1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1965 or date unknown</td>
<td>RD</td>
<td>P</td>
<td>P</td>
<td>RD</td>
<td>RD</td>
</tr>
<tr>
<td>1965–69</td>
<td>P/</td>
<td>P/</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>1970–74</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>1975–79</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>1980–88</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td></td>
</tr>
</tbody>
</table>

New tanks (after December 22) immediately upon installation.

P=Must begin release detection for all pressurized piping as defined in §280.41(b)(1).
RD=Must begin release detection for tanks and suction piping in accordance with §280.41(a), §280.41(b)(2), and §280.42.

(d) Any existing UST system that cannot apply a method of release detection that complies with the requirements of this subpart must complete the closure procedures in subpart G by the date on which release detection is required for that UST system under paragraph (c) of this section.

§ 280.41 Requirements for petroleum UST systems.

Owners and operators of petroleum UST systems must provide release detection for tanks and piping as follows:

(a) Tanks. Tanks must be monitored at least every 30 days for releases using one of the methods listed in §280.43 (d) through (h) except that:

(1) UST systems that meet the performance standards in §280.20 or §280.21, and the monthly inventory control requirements in §280.43 (a) or (b), may use tank tightness testing (conducted in accordance with §280.43(c)) at least every 5 years until December 22, 1998, or until 10 years after the tank is installed or upgraded under §280.21(b), whichever is later;

(2) UST systems that do not meet the performance standards in §280.20 or §280.21 may use monthly inventory controls (conducted in accordance with §280.43(a) or (b)) and annual tank tightness testing (conducted in accordance with §280.43(c)) until December 22, 1998 when the tank must be upgraded under §280.21 or permanently closed under §280.71; and

(3) Tanks with capacity of 550 gallons or less may use weekly tank gauging (conducted in accordance with §280.43(b)).

(b) Piping. Underground piping that routinely contains regulated substances must be monitored for releases in a manner that meets one of the following requirements:

(1) Pressurized piping. Underground piping that conveys regulated substances under pressure must:
   (i) Be equipped with an automatic line leak detector conducted in accordance with §280.44(a); and
   (ii) Have an annual line tightness test conducted in accordance with §280.44(b) or have monthly monitoring conducted in accordance with §280.44(c).

(2) Suction piping. Underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every 3 years and in accordance with §280.44(b), or use a monthly monitoring method conduct in accordance with §280.44(c). No release detection is required for suction piping that is designed and constructed to meet the following standards:
   (i) The below-grade piping operates at less than atmospheric pressure;
   (ii) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released;
   (iii) Only one check valve is included in each suction line;
   (iv) The check valve is located directly below and as close as practical to the suction pump; and
   (v) A method is provided that allows compliance with paragraphs (b)(2)(ii)–(iv) of this section to be readily determined.

§ 280.42 Requirements for hazardous substance UST systems.

Owners and operators of hazardous substance UST systems must provide release detection that meets the following requirements:

(a) Release detection at existing UST systems must meet the requirements for petroleum UST systems in §280.41. By December 22, 1998 all existing hazardous substance UST systems must meet the release detection requirements for new systems in paragraph (b) of this section.

(b) Release detection at new hazardous substance UST systems must meet the following requirements:

(1) Secondary containment systems must be designed, constructed and installed to:
   (i) Contain regulated substances released from the tank system until they are detected and removed;
   (ii) Prevent the release of regulated substances to the environment at any time during the operational life of the UST system; and
   (iii) Be checked for evidence of a release at least every 30 days.

   NOTE. The provisions of 40 CFR 265.193, Containment and Detection of Releases, may be used to comply with these requirements.

(2) Double-walled tanks must be designed, constructed, and installed to:
   (i) Contain a release from any portion of the inner tank within the outer wall; and
   (ii) Detect the failure of the inner wall.

(3) External liners (including vaults) must be designed, constructed, and installed to:
§ 280.43 Methods of release detection for tanks.

Each method of release detection for tanks used to meet the requirements of §280.41 must be conducted in accordance with the following:

(a) Inventory control. Product inventory control (or another test of equivalent performance) must be conducted monthly to detect a release of at least 1.0 percent of flow-through plus 130 gallons on a monthly basis in the following manner:

(1) Inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank are recorded each operating day;

(2) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(3) The regulated substance inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;

(4) Deliveries are made through a drop tube that extends to within one foot of the tank bottom;

(5) Product dispensing is metered and recorded within the local standards for meter calibration or an accuracy of 6 cubic inches for every 5 gallons of product withdrawn; and

(6) The measurement of any water level in the bottom of the tank is made to the nearest one-eighth of an inch at least once a month.

NOTE: Practices described in the American Petroleum Institute Publication 1621, "Recommended Practice for Bulk Liquid Stock Control at Retail Outlets," may be used, where applicable, as guidance in meeting the requirements of this paragraph.

(b) Manual tank gauging. Manual tank gauging must meet the following requirements:

(1) Tank liquid level measurements are taken at the beginning and ending of a period of at least 36 hours during which no liquid is added to or removed from the tank;

(2) Level measurements are based on an average of two consecutive stick readings at both the beginning and ending of the period;

(3) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(4) A leak is suspected and subject to the requirements of subpart E if the variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table:

<table>
<thead>
<tr>
<th>Nominal tank capacity</th>
<th>Weekly standard (one test)</th>
<th>Monthly standard (average of four tests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>550 gallons or less.</td>
<td>10 gallons ...............</td>
<td>5 gallons.</td>
</tr>
<tr>
<td>551–1,000 gallons.</td>
<td>13 gallons ...............</td>
<td>7 gallons.</td>
</tr>
<tr>
<td>1,001–2,000 gallons.</td>
<td>26 gallons ...............</td>
<td>13 gallons.</td>
</tr>
</tbody>
</table>
(5) Only tanks of 550 gallons or less nominal capacity may use this as the sole method of release detection. Tanks of 551 to 2,000 gallons may use the method in place of manual inventory control in §280.43(a). Tanks of greater than 2,000 gallons nominal capacity may not use this method to meet the requirements of this subpart.

(c) Tank tightness testing. Tank tightness testing (or another test of equivalent performance) must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

(d) Automatic tank gauging. Equipment for automatic tank gauging that tests for the loss of product and conducts inventory control must meet the following requirements:

(1) The automatic product level monitor test can detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product; and

(2) Inventory control (or another test of equivalent performance) is conducted in accordance with the requirements of §280.43(a).

(e) Vapor monitoring. Testing or monitoring for vapors within the soil gas of the excavation zone must meet the following requirements:

(1) The materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area;

(2) The stored regulated substance, or a tracer compound placed in the tank system, is sufficiently volatile (e.g., gasoline) to result in a vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank;

(3) The measurement of vapors by the monitoring device is not rendered inoperative by the ground water, rainfall, or soil moisture or other known interferences so that a release could go undetected for more than 30 days;

(4) The level of background contamination in the excavation zone will not interfere with the method used to detect releases from the tank;

(5) The vapor monitors are designed and operated to detect any significant increase in concentration above background of the regulated substance stored in the tank system, a component or components of that substance, or a tracer compound placed in the tank system;

(6) In the UST excavation zone, the site is assessed to ensure compliance with the requirements in paragraphs (e)(1) through (4) of this section and to establish the number and positioning of monitoring wells that will detect releases within the excavation zone from any portion of the tank that routinely contains product; and

(7) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(f) Ground-water monitoring. Testing or monitoring for liquids on the ground water must meet the following requirements:

(1) The regulated substance stored is immiscible in water and has a specific gravity of less than one;

(2) Ground water is never more than 20 feet from the ground surface and the hydraulic conductivity of the soil(s) between the UST system and the monitoring wells or devices is not less than 0.01 cm/sec (e.g., the soil should consist of gravels, coarse to medium sands, coarse silts or other permeable materials);

(3) The slotted portion of the monitoring well casing must be designed to prevent migration of natural soils or filter pack into the well and to allow entry of regulated substance on the water table into the well under both high and low ground-water conditions;

(4) Monitoring wells shall be sealed from the ground surface to the top of the filter pack;

(5) Monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible;

(6) The continuous monitoring devices or manual methods used can detect the presence of at least one-eighth of an inch of free product on top of the ground water in the monitoring wells;

(7) Within and immediately below the UST system excavation zone, the site is assessed to ensure compliance with
the requirements in paragraphs (f) (1) through (5) of this section and to establish the number and positioning of monitoring wells or devices that will detect releases from any portion of the tank that routinely contains product; and

(8) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(g) Interstitial monitoring. Interstitial monitoring between the UST system and a secondary barrier immediately around or beneath it may be used, but only if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains product and also meets one of the following requirements:

(1) For double-walled UST systems, the sampling or testing method can detect a release through the inner wall in any portion of the tank that routinely contains product;

NOTE: The provisions outlined in the Steel Tank Institute’s “Standard for Dual Wall Underground Storage Tanks” may be used as guidance for aspects of the design and construction of underground steel double-walled tanks.

(2) For UST systems with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the UST system and the secondary barrier;

(i) The secondary barrier around or beneath the UST system consists of artificially constructed material that is sufficiently thick and impermeable (at least 10⁻⁶ cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection;

(ii) The barrier is compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier allowing a release to pass through undetected;

(iii) For cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system;

(iv) The ground water, soil moisture, or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days;

(v) The site is assessed to ensure that the secondary barrier is always above the ground water and not in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions; and,

(vi) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(3) For tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.

(h) Other methods. Any other type of release detection method, or combination of methods, can be used if:

(1) It can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or

(2) The implementing agency may approve another method if the owner and operator can demonstrate that the method can detect a release as effectively as any of the methods allowed in paragraphs (c) through (h) of this section. In comparing methods, the implementing agency shall consider the size of release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner and operator must comply with any conditions imposed by the implementing agency on its use to ensure the protection of human health and the environment.

§ 280.44 Methods of release detection for piping.

Each method of release detection for piping used to meet the requirements of §280.41 must be conducted in accordance with the following:

(a) Automatic line leak detectors. Methods which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering an audible or visual alarm may be used only if they detect leaks of 3 gallons per hour at 10 pounds per square inch line pressure within 1 hour. An annual test of the operation of the leak detector must be conducted in accordance with the manufacturer’s requirements.
Environmental Protection Agency

§ 280.51 Release detection record-keeping.

All UST system owners and operators must maintain records in accordance with §280.34 demonstrating compliance with all applicable requirements of this subpart. These records must include the following:

(a) All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be maintained for 5 years, or for another reasonable period of time determined by the implementing agency, from the date of installation;

(b) The results of any sampling, testing, or monitoring must be maintained for at least 1 year, or for another reasonable period of time determined by the implementing agency, from the date of installation; and

(c) Written documentation of all calibration, maintenance, and repair of release detection equipment permanently located on-site must be maintained for at least one year after the servicing work is completed, or for another reasonable period determined by the implementing agency. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for 5 years from the date of installation.

Subpart E—Release Reporting, Investigation, and Confirmation

§ 280.50 Reporting of suspected releases.

Owners and operators of UST systems must report to the implementing agency within 24 hours, or another reasonable time period specified by the implementing agency, and follow the procedures in §280.52 for any of the following conditions:

(a) The discovery by owners and operators or others of released regulated substances at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface water).

(b) Unusual operating conditions observed by owners and operators (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST system, or an unexplained presence of water in the tank), unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced; and,

(c) Monitoring results from a release detection method required under §280.41 and §280.42 that indicate a release may have occurred unless:

(1) The monitoring device is found to be defective, and is immediately repaired, recalibrated or replaced, and additional monitoring does not confirm the initial result; or

(2) In the case of inventory control, a second month of data does not confirm the initial result.

§ 280.51 Investigation due to off-site impacts.

When required by the implementing agency, owners and operators of UST systems must follow the procedures in §280.52 to determine if the UST system is the source of off-site impacts. These impacts include the discovery of regulated substances (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface and drinking waters) that has been observed by the implementing agency or brought to its attention by another party.
§ 280.52 Release investigation and confirmation steps.

Unless corrective action is initiated in accordance with subpart F, owners and operators must immediately investigate and confirm all suspected releases of regulated substances requiring reporting under § 280.50 within 7 days, or another reasonable time period specified by the implementing agency, using either the following steps or another procedure approved by the implementing agency:

(a) System test. Owners and operators must conduct tests (according to the requirements for tightness testing in §280.43(c) and §280.44(b)) that determine whether a leak exists in that portion of the tank that routinely contains product, or the attached delivery piping, or both.

(1) Owners and operators must repair, replace or upgrade the UST system, and begin corrective action in accordance with subpart F if the test results for the system, tank, or delivery piping indicate that a leak exists.

(2) Further investigation is not required if the test results for the system, tank, and delivery piping do not indicate that a leak exists and if environmental contamination is not the basis for suspecting a release.

(3) Owners and operators must conduct a site check as described in paragraph (b) of this section if the test results for the system, tank, and delivery piping do not indicate that a leak exists but environmental contamination is the basis for suspecting a release.

(b) Site check. Owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth of ground water, and other factors appropriate for identifying the presence and source of the release.

(1) If the test results for the excavation zone or the UST site indicate that a release has occurred, owners and operators must begin corrective action in accordance with subpart F;

(2) If the test results for the excavation zone or the UST site do not indicate that a release has occurred, further investigation is not required.

§ 280.53 Reporting and cleanup of spills and overfills.

(a) Owners and operators of UST systems must contain and immediately clean up a spill or overfill and report to the implementing agency within 24 hours, or another reasonable time period specified by the implementing agency, and begin corrective action in accordance with subpart F in the following cases:

(1) Spill or overfill of petroleum that results in a release to the environment that exceeds 25 gallons or another reasonable amount specified by the implementing agency, or that causes a sheen on nearby surface water; and

(2) Spill or overfill of a hazardous substance that results in a release to the environment that equals or exceeds its reportable quantity under CERCLA (40 CFR part 302).

(b) Owners and operators of UST systems must contain and immediately clean up a spill or overfill of petroleum that is less than 25 gallons or another reasonable amount specified by the implementing agency, and a spill or overfill of a hazardous substance that is less than the reportable quantity. If cleanup cannot be accomplished within 24 hours, or another reasonable time period established by the implementing agency, owners and operators must immediately notify the implementing agency.

NOTE: Pursuant to §§ 302.6 and 355.40, a release of a hazardous substance equal to or in excess of its reportable quantity must also be reported immediately (rather than within 24 hours) to the National Response Center under sections 102 and 103 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and to appropriate state and local authorities under Title III of the Superfund Amendments and Reauthorization Act of 1986.
Environmental Protection Agency

Subpart F—Release Response and Corrective Action for UST Systems Containing Petroleum or Hazardous Substances

§ 280.60 General.
Owners and operators of petroleum or hazardous substance UST systems must, in response to a confirmed release from the UST system, comply with the requirements of this subpart except for USTs excluded under § 280.10(b) and UST systems subject to RCRA Subtitle C corrective action requirements under section 3004(u) of the Resource Conservation and Recovery Act, as amended.

§ 280.61 Initial response.
Upon confirmation of a release in accordance with § 280.52 or after a release from the UST system is identified in any other manner, owners and operators must perform the following initial response actions within 24 hours of a release or within another reasonable period of time determined by the implementing agency:
(a) Report the release to the implementing agency (e.g., by telephone or electronic mail);
(b) Take immediate action to prevent any further release of the regulated substance into the environment; and
(c) Identify and mitigate fire, explosion, and vapor hazards.

§ 280.62 Initial abatement measures and site check.
(a) Unless directed to do otherwise by the implementing agency, owners and operators must perform the following abatement measures:
(1) Remove as much of the regulated substance from the UST system as is necessary to prevent further release to the environment;
(2) Visually inspect any aboveground releases or exposed belowground releases and prevent further migration of the released substance into surrounding soils and ground water;
(3) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers or basements);
(4) Remedy hazards posed by contaminated soils that are excavated or exposed as a result of release confirmation, site investigation, abatement, or corrective action activities. If these remedies include treatment or disposal of soils, the owner and operator must comply with applicable State and local requirements;
(5) Measure for the presence of a release where contamination is most likely to be present at the UST site, unless the presence and source of the release have been confirmed in accordance with the site check required by § 280.52(b) or the closure site assessment of § 280.72(a). In selecting sample types, sample locations, and measurement methods, the owner and operator must consider the nature of the stored substance, the type of backfill, depth to ground water and other factors as appropriate for identifying the presence and source of the release; and
(6) Investigate to determine the possible presence of free product, and begin free product removal as soon as practicable and in accordance with § 280.64.
(b) Within 20 days after release confirmation, or within another reasonable period of time determined by the implementing agency, owners and operators must submit a report to the implementing agency summarizing the initial abatement steps taken under paragraph (a) of this section and any resulting information or data.

§ 280.63 Initial site characterization.
(a) Unless directed to do otherwise by the implementing agency, owners and operators must assemble information about the site and the nature of the release, including information gained while confirming the release or completing the initial abatement measures in §§ 280.60 and 280.61. This information must include, but is not necessarily limited to the following:
(1) Data on the nature and estimated quantity of release;
(2) Data from available sources and/or site investigations concerning the...
§ 280.64 Free product removal.

At sites where investigations under § 280.62(a)(6) indicate the presence of free product, owners and operators must remove free product to the maximum extent practicable as determined by the implementing agency while continuing, as necessary, any actions initiated under §§ 280.61 through 280.63, or preparing for actions required under §§ 280.65 through 280.66. In meeting the requirements of this section, owners and operators must:

(a) Conduct free product removal in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges or disposes of recovery by-products in compliance with applicable local, State and Federal regulations;

(b) Use abatement of free product migration as a minimum objective for the design of the free product removal system;

(c) Handle any flammable products in a safe and competent manner to prevent fires or explosions; and

(d) Unless directed to do otherwise by the implementing agency, prepare and submit to the implementing agency, within 45 days after confirming a release, a free product removal report that provides at least the following information:

(1) The name of the person(s) responsible for implementing the free product removal measures;

(2) The estimated quantity, type, and thickness of free product observed or measured in wells, boreholes, and excavations;

(3) The type of free product recovery system used;

(4) Whether any discharge will take place on-site or off-site during the recovery operation and where this discharge will be located;

(5) The type of treatment applied to, and the effluent quality expected from, any discharge;

(6) The steps that have been or are being taken to obtain necessary permits for any discharge; and

(7) The disposition of the recovered free product.

§ 280.65 Investigations for soil and ground-water cleanup.

(a) In order to determine the full extent and location of soils contaminated by the release and the presence and concentrations of dissolved product contamination in the ground water, owners and operators must conduct investigations of the release, the release site, and the surrounding area possibly affected by the release if any of the following conditions exist:

(1) There is evidence that groundwater wells have been affected by the release (e.g., as found during release confirmation or previous corrective action measures);

(2) Free product is found to need recovery in compliance with § 280.64;

(3) There is evidence that contaminated soils may be in contact with ground water (e.g., as found during conduct of the initial response measures or investigations required under §§ 280.60 through 280.64); and

(4) The implementing agency requests an investigation, based on the potential effects of contaminated soil or ground water on nearby surface water and ground-water resources.

(b) Owners and operators must submit the information collected under
paragraph (a) of this section as soon as practicable or in accordance with a schedule established by the implementing agency.

§ 280.66 Corrective action plan.

(a) At any point after reviewing the information submitted in compliance with §§ 280.61 through 280.63, the implementing agency may require owners and operators to submit additional information or to develop and submit a corrective action plan for responding to contaminated soils and ground water. If a plan is required, owners and operators must submit the plan according to a schedule and format established by the implementing agency. Alternatively, owners and operators may, after fulfilling the requirements of §§ 280.61 through 280.63, choose to submit a corrective action plan for responding to contaminated soil and ground water. In either case, owners and operators are responsible for submitting a plan that provides for adequate protection of human health and the environment as determined by the implementing agency, and must modify their plan as necessary to meet this standard.

(b) The implementing agency will approve the corrective action plan only after ensuring that implementation of the plan will adequately protect human health, safety, and the environment. In making this determination, the implementing agency should consider the following factors as appropriate:

1. The physical and chemical characteristics of the regulated substance, including its toxicity, persistence, and potential for migration;
2. The hydrogeologic characteristics of the facility and the surrounding area;
3. The proximity, quality, and current and future uses of nearby surface water and ground water;
4. The potential effects of residual contamination on nearby surface water and ground water;
5. An exposure assessment; and
6. Any information assembled in compliance with this subpart.

(c) Upon approval of the corrective action plan or as directed by the implementing agency, owners and operators must implement the plan, including modifications to the plan made by the implementing agency. They must monitor, evaluate, and report the results of implementing the plan in accordance with a schedule and in a format established by the implementing agency.

(d) Owners and operators may, in the interest of minimizing environmental contamination and promoting more effective cleanup, begin cleanup of soil and ground water before the corrective action plan is approved provided that they:

1. Notify the implementing agency of their intention to begin cleanup;
2. Comply with any conditions imposed by the implementing agency, including halting cleanup or mitigating adverse consequences from cleanup activities; and
3. Incorporate these self-initiated cleanup measures in the corrective action plan that is submitted to the implementing agency for approval.

§ 280.67 Public participation.

(a) For each confirmed release that requires a corrective action plan, the implementing agency must provide notice to the public by means designed to reach those members of the public directly affected by the release and the planned corrective action. This notice may include, but is not limited to, public notice in local newspapers, block advertisements, public service announcements, publication in a state register, letters to individual households, or personal contacts by field staff.

(b) The implementing agency will ensure that site release information and decisions concerning the corrective action plan are made available to the public for inspection upon request.

(c) Before approving a corrective action plan, the implementing agency may hold a public meeting to consider comments on the proposed corrective action plan if there is sufficient public interest, or for any other reason.

(d) The implementing agency must give public notice that complies with paragraph (a) of this section if implementation of an approved corrective action plan does not achieve the established cleanup levels in the plan and
termination of that plan is under consideration by the implementing agency.

Subpart G—Out-of-Service UST Systems and Closure

§ 280.70 Temporary closure.

(a) When an UST system is temporarily closed, owners and operators must continue operation and maintenance of corrosion protection in accordance with §280.31, and any release detection in accordance with subpart D, Subparts E and F must be complied with if a release is suspected or confirmed. However, release detection is not required as long as the UST system is empty. The UST system is empty when all materials have been removed using commonly employed practices so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remain in the system.

(b) When an UST system is temporarily closed for 3 months or more, owners and operators must also comply with the following requirements:
   (1) Leave vent lines open and functioning; and
   (2) Cap and secure all other lines, pumps, manways, and ancillary equipment.

(c) When an UST system is temporarily closed for more than 12 months, owners and operators must permanently close the UST system if it does not meet either performance standards in §280.20 for new UST systems or the upgrading requirements in §280.21, except that the spill and overfill equipment requirements do not have to be met. Owners and operators must permanently close the substandard UST systems at the end of this 12-month period in accordance with §280.71-280.74, unless the implementing agency provides an extension of the 12-month temporary closure period. Owners and operators must complete a site assessment in accordance with §280.72 before such an extension can be applied for.

§ 280.71 Permanent closure and changes-in-service.

(a) At least 30 days before beginning either permanent closure or a change-in-service under paragraphs (b) and (c) of this section, or within another reasonable time period determined by the implementing agency, owners and operators must notify the implementing agency of their intent to permanently close or make the change-in-service, unless such action is in response to corrective action. The required assessment of the excavation zone under §280.72 must be performed after notifying the implementing agency before completion of the permanent closure or a change-in-service.

(b) To permanently close a tank, owners and operators must empty and clean it by removing all liquids and accumulated sludges. All tanks taken out of service permanently must also be either removed from the ground or filled with an inert solid material.

(c) Continued use of an UST system to store a non-regulated substance is considered a change-in-service. Before a change-in-service, owners and operators must empty and clean the tank by removing all liquid and accumulated sludge and conduct a site assessment in accordance with §280.72.

NOTE: The following cleaning and closure procedures may be used to comply with this section:

(A) American Petroleum Institute Recommended Practice 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks";

(B) American Petroleum Institute Publication 2015, "Cleaning Petroleum Storage Tanks";

(C) American Petroleum Institute Recommended Practice 1631, "Interior Lining of Underground Storage Tanks," may be used as guidance for compliance with this section;

and

(D) The National Institute for Occupational Safety and Health "Criteria for a Recommended Standard * * Working in Confined Space" may be used as guidance for conducting safe closure procedures at some hazardous substance tanks.

§ 280.72 Assessing the site at closure or change-in-service.

(a) Before permanent closure or a change-in-service is completed, owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must
consider the method of closure, the nature of the stored substance, the type of backfill, the depth to ground water, and other factors appropriate for identifying the presence of a release. The requirements of this section are satisfied if one of the external release detection methods allowed in §280.43(e) and (f) is operating in accordance with the requirements in §280.43 at the time of closure, and indicates no release has occurred.

(b) If contaminated soils, contaminated ground water, or free product as a liquid or vapor is discovered under paragraph (a) of this section, or by any other manner, owners and operators must begin corrective action in accordance with subpart F.

§ 280.73 Applicability to previously closed UST systems.

When directed by the implementing agency, the owner and operator of an UST system permanently closed before December 22, 1988 must assess the excavation zone and close the UST system in accordance with this subpart if releases from the UST may, in the judgment of the implementing agency, pose a current or potential threat to human health and the environment.

§ 280.74 Closure records.

Owners and operators must maintain records in accordance with §280.34 that are capable of demonstrating compliance with closure requirements under this subpart. The results of the excavation zone assessment required in §280.72 must be maintained for at least 3 years after completion of permanent closure or change-in-service in one of the following ways:

(a) By the owners and operators who took the UST system out of service;

(b) By the current owners and operators of the UST system site; or

(c) By mailing these records to the implementing agency if they cannot be maintained at the closed facility.

Subpart H—Financial Responsibility

§ 280.90 Applicability.

(a) This subpart applies to owners and operators of all petroleum underground storage tank (UST) systems except as otherwise provided in this section.

(b) Owners and operators of petroleum UST systems are subject to these requirements if they are in operation on or after the date for compliance established in §280.91.

(c) State and Federal government entities whose debts and liabilities are the debts and liabilities of a state or the United States are exempt from the requirements of this subpart.

(d) The requirements of this subpart do not apply to owners and operators of any UST system described in §280.10(b) or (c).

(e) If the owner and operator of a petroleum underground storage tank are separate persons, only one person is required to demonstrate financial responsibility; however, both parties are liable in event of noncompliance. Regardless of which party complies, the date set for compliance at a particular facility is determined by the characteristics of the owner as set forth in §280.91.

§ 280.91 Compliance dates.

Owners of petroleum underground storage tanks are required to comply with the requirements of this subpart by the following dates:

(a) All petroleum marketing firms owning 1,000 or more USTs and all other UST owners that report a tangible net worth of $20 million or more to the U.S. Securities and Exchange Commission (SEC), Dun and Bradstreet, the Energy Information Administration, or the Rural Electrification Administration; January 24, 1989, except that compliance with §280.94(b) is required by July 24, 1989.

(b) All petroleum marketing firms owning 100–999 USTs; October 26, 1989.

(c) All petroleum marketing firms owning 13–99 USTs at more than one facility; April 26, 1991.

(d) All local government entities (including Indian tribes) not included in
paragraph (f) of this section; February 18, 1994.

(f) Indian tribes that own USTs on Indian lands which meet the applicable technical requirements of this part; December 31, 1998.


§ 280.92 Definition of terms.

When used in this subpart, the following terms shall have the meanings given below:

Accidental release means any sudden or nonsudden release of petroleum from an underground storage tank that results in a need for corrective action and/or compensation for bodily injury or property damage neither expected nor intended by the tank owner or operator.

Bodily injury shall have the meaning given to this term by applicable state law; however, this term shall not include those liabilities which, consistent with standard insurance industry practices, are excluded from coverage in liability insurance policies for bodily injury.

Chief Financial Officer, in the case of local government owners and operators, means the individual with the overall authority and responsibility for the collection, disbursement, and use of funds by the local government.

Controlling interest means direct ownership of at least 50 percent of the voting stock of another entity.

Director of the Implementing Agency means the EPA Regional Administrator, or, in the case of a state with a program approved under section 9004, the Director of the designated state or local agency responsible for carrying out an approved UST program.

Financial reporting year means the latest consecutive twelve-month period for which any of the following reports used to support a financial test is prepared:

(1) a 10-K report submitted to the SEC;

(2) an annual report of tangible net worth submitted to Dun and Bradstreet; or

(3) annual reports submitted to the Energy Information Administration or the Rural Electrification Administration.

Financial reporting year may thus comprise a fiscal or a calendar year period.

Legal defense cost is any expense that an owner or operator or provider of financial assurance incurs in defending against claims or actions brought:

(1) By EPA or a state to require corrective action or to recover the costs of corrective action;

(2) By or on behalf of a third party for bodily injury or property damage caused by an accidental release; or

(3) By any person to enforce the terms of a financial assurance mechanism.

Local government shall have the meaning given this term by applicable state law and includes Indian tribes. The term is generally intended to include:

(1) Counties, municipalities, townships, separately chartered and operated special districts (including local government public transit systems and redevelopment authorities), and independent school districts authorized as governmental bodies by state charter or constitution; and

(2) Special districts and independent school districts established by counties, municipalities, townships, and other general purpose governments to provide essential services.

Occurrence means an accident, including continuous or repeated exposure to conditions, which results in a release from an underground storage tank.

NOTE: This definition is intended to assist in the understanding of these regulations and is not intended either to limit the meaning of “occurrence” in a way that conflicts with standard insurance usage or to prevent the use of other standard insurance terms in place of “occurrence.”

Owner or operator, when the owner or operator are separate parties, refers to the party that is obtaining or has obtained financial assurances.

Petroleum marketing facilities include all facilities at which petroleum is produced or refined and all facilities from which petroleum is sold or transferred to other petroleum marketers or to the public.

Petroleum marketing firms are all firms owning petroleum marketing facilities. Firms owning other types of facilities
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with USTs as well as petroleum marketing facilities are considered to be petroleum marketing firms.

Property damage shall have the meaning given this term by applicable state law. This term shall not include those liabilities which, consistent with standard insurance industry practices, are excluded from coverage in liability insurance policies for property damage. However, such exclusions for property damage shall not include corrective action associated with releases from tanks which are covered by the policy.

Provider of financial assurance means an entity that provides financial assurance to an owner or operator of an underground storage tank through one of the mechanisms listed in §§ 280.95–280.103, including a guarantor, insurer, risk retention group, surety, issuer of a letter of credit, issuer of a state-required mechanism, or a state.

Substantial business relationship means the extent of a business relationship necessary under applicable state law to make a guarantee contract issued incident to that relationship valid and enforceable. A guarantee contract is issued “incident to that relationship” if it arises from and depends on existing economic transactions between the guarantor and the owner or operator.

Substantial governmental relationship means the extent of a governmental relationship necessary under applicable state law to make an added guarantee contract issued incident to that relationship valid and enforceable. A guarantee contract is issued “incident to that relationship” if it arises from a clear commonality of interest in the event of an UST release such as coterminous boundaries, overlapping constituencies, common ground-water aquifer, or other relationship other than monetary compensation that provides a motivation for the guarantor to provide a guarantee.

Tangible net worth means the tangible assets that remain after deducting liabilities; such assets do not include intangibles such as goodwill and rights to patents or royalties. For purposes of this definition, “assets” means all existing and all probable future economic benefits obtained or controlled by a particular entity as a result of past transactions.

Termination under § 280.97(b)(1) and § 280.97(b)(2) means only those changes that could result in a gap in coverage as where the insured has not obtained substitute coverage or has obtained substitute coverage with a different retroactive date than the retroactive date of the original policy.

§ 280.93 Amount and scope of required financial responsibility.

(a) Owners or operators of petroleum underground storage tanks must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks in at least the following per-occurrence amounts:

(1) For owners or operators of petroleum underground storage tanks that are located at petroleum marketing facilities, or that handle an average of more than 10,000 gallons of petroleum per month based on annual throughput for the previous calendar year; $1 million.

(2) For all other owners or operators of petroleum underground storage tanks; $500,000.

(b) Owners or operators of petroleum underground storage tanks must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks in at least the following annual aggregate amounts:

(1) For owners or operators of 1 to 100 petroleum underground storage tanks, $1 million; and

(2) For owners or operators of 101 or more petroleum underground storage tanks, $2 million.

(c) For the purposes of paragraphs (b) and (f) of this section, only, “a petroleum underground storage tank” means a single containment unit and does not mean combinations of single containment units.
(d) Except as provided in paragraph (e) of this section, if the owner or operator uses separate mechanisms or separate combinations of mechanisms to demonstrate financial responsibility for:

(1) Taking corrective action;
(2) Compensating third parties for bodily injury and property damage caused by sudden accidental releases; or
(3) Compensating third parties for bodily injury and property damage caused by nonsudden accidental releases, the amount of assurance provided by each mechanism or combination of mechanisms must be in the full amount specified in paragraphs (a) and (b) of this section.

(e) If an owner or operator uses separate mechanisms or separate combinations of mechanisms to demonstrate financial responsibility for different petroleum underground storage tanks, the annual aggregate required shall be based on the number of tanks covered by each such separate mechanism or combination of mechanisms.

(f) Owners or operators shall review the amount of aggregate assurance provided whenever additional petroleum underground storage tanks are acquired or installed. If the number of petroleum underground storage tanks for which assurance must be provided exceeds 100, the owner or operator shall demonstrate financial responsibility in the amount of at least $2 million of annual aggregate assurance by the anniversary of the date on which the mechanism demonstrating financial responsibility became effective. If assurance is being demonstrated by a combination of mechanisms, the owner or operator shall demonstrate financial responsibility in the amount of at least $2 million of annual aggregate assurance by the first-occurring effective date anniversary of any one of the mechanisms combined (other than a financial test or guarantee) to provide assurance.

(g) The amounts of assurance required under this section exclude legal defense costs.

(h) The required per-occurrence and annual aggregate coverage amounts do not in any way limit the liability of the owner or operator.
§280.95 Financial responsibility: tanks for which a financial test is used to demonstrate financial responsibility to EPA under this section or to a state implementing agency under a state program approved by EPA under 40 CFR part 281;

(ii) The sum of the corrective action cost estimates, the current closure and post-closure care cost estimates, and amount of liability coverage for which a financial test is used to demonstrate financial responsibility to EPA under 40 CFR 264.101, 264.143, 264.145, 265.143, 165.145, 264.147, and 265.147 or to a state implementing agency under a state program authorized by EPA under 40 CFR part 271; and

(iii) The sum of current plugging and abandonment cost estimates for which a financial test is used to demonstrate financial responsibility to EPA under 40 CFR 144.63 or to a state implementing agency under a state program authorized by EPA under 40 CFR part 145.

(2) The owner or operator, and/or guarantor, must have a tangible net worth of at least $10 million.

(3) The owner or operator, and/or guarantor, must have a letter signed by the chief financial officer worded as specified in paragraph (d) of this section.

(4) The owner or operator, and/or guarantor, must either:

(i) File financial statements annually with the U.S. Securities and Exchange Commission, the Energy Information Administration, or the Rural Electrification Administration; or

(ii) Report annually the firm's tangible net worth to Dun and Bradstreet, and Dun and Bradstreet must have assigned the firm a financial strength rating of 4A or 5A.

(5) The firm's year-end financial statements, if independently audited, cannot include an adverse auditor's opinion, a disclaimer of opinion, or a "going concern" qualification.

(c)(1) The owner or operator, and/or guarantor, must meet the financial test requirements of 40 CFR 264.147(f)(1), substituting the appropriate amounts specified in §280.93 (b)(1) and (b)(2) for the "amount of liability coverage" each time specified in that section.

(2) The fiscal year-end financial statements of the owner or operator, and/or guarantor, must be examined by an independent certified public accountant and be accompanied by the accountant's report of the examination.

(3) The firm's year-end financial statements cannot include an adverse auditor's opinion, a disclaimer of opinion, or a "going concern" qualification.

(4) The owner or operator, and/or guarantor, must have a letter signed by the chief financial officer, worded as specified in paragraph (d) of this section.

(5) If the financial statements of the owner or operator, and/or guarantor, are not submitted annually to the U.S. Securities and Exchange Commission, the Energy Information Administration or the Rural Electrification Administration, the owner or operator, and/or guarantor, must obtain a special report by an independent certified public accountant stating that:

(i) He has compared the data that the letter form the chief financial officer specifies as having been derived from the latest year-end financial statements of the owner or operator, and/or guarantor, with the amounts in such financial statements; and

(ii) In connection with that comparison, no matters came to his attention which caused him to believe that the specified data should be adjusted.

(d) To demonstrate that it meets the financial test under paragraph (b) or (c) of this section, the chief financial officer of the owner or operator, or guarantor, must sign, within 120 days of the close of each financial reporting year, as defined by the twelve-month period for which financial statements used to support the financial test are prepared, a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

LETTER FROM CHIEF FINANCIAL OFFICER

I am the chief financial officer of [insert: name and address of the owner or operator, or guarantor]. This letter is in support of the use of [insert: "the financial test of self-insurance," and/or "guarantee"] to demonstrate financial responsibility for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage"] caused by [insert:
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(40 CFR Ch. I (7–1–05 Edition))

“sudden accident releases” and/or “non-sudden accident releases” in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s).

Underground storage tanks at the following facilities are assured by this financial test or a financial test under an authorized State program by this [insert: “owner or operator,” and/or “guarantor”]: [List for each facility: the name and address of the facility where tanks assured by this financial test are located, and whether tanks are assured by this financial test or a financial test under a State program approved under 40 CFR part 281. If separate mechanisms or combinations of mechanisms are being used to assure any of the tanks at this facility, list each tank assured by this financial test or a financial test under a State program authorized under 40 CFR part 281 by the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22 or the corresponding State requirements.]

A [insert: “financial test,” and/or “guarantee”] is also used by this [insert: “owner or operator,” or ”guarantor”] to demonstrate evidence of financial responsibility in the following amounts under other EPA regulations or state programs authorized by EPA under 40 CFR parts 271 and 281:

<table>
<thead>
<tr>
<th>EPA Regulations</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Closure (§§ 264.143 and 265.143)</td>
<td>$</td>
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<tr>
<td>Post-Closure Care (§§ 264.145 and 265.145)</td>
<td>$</td>
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<tr>
<td>Liability Coverage (§§ 264.147 and 265.147)</td>
<td>$</td>
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<tr>
<td>Corrective Action (§§ 264.101(b))</td>
<td>$</td>
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<tr>
<td>Plugging and Abandonment (§ 144.63)</td>
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<tr>
<td>Closure</td>
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<tr>
<td>Post-Closure Care</td>
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<td>Liability Coverage</td>
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<td>Corrective Action</td>
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<td>Plugging and Abandonment</td>
<td>$</td>
</tr>
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<td>Total</td>
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</table>

This [insert: “owner or operator,” or “guarantor”] has not received an adverse opinion, a disclaimer of opinion, or a “going concern” qualification from an independent auditor on his financial statements for the latest completed fiscal year.

[Fill in the information for Alternative I if the criteria of paragraph (b) of §280.95 are being used to demonstrate compliance with the financial test requirements. Fill in the information for Alternative II if the criteria of paragraph (c) of §280.95 are being used to demonstrate compliance with the financial test requirements.]

Alternative I

1. Amount of annual UST aggregate coverage being assured by a financial test, and/or guarantee
2. Amount of corrective action, closure and post-closure care costs, liability coverage, and plugging and abandonment costs covered by a financial test, and/or guarantee
3. Sum of lines 1 and 2
4. Total tangible assets
5. Total liabilities [if any of the amount reported on line 3 is included in total liabilities, you may deduct that amount from this line and add that amount to line 6]
6. Tangible net worth [subtract line 5 from line 4]

Yes No

7. Is line 6 at least $10 million?
8. Is line 6 at least 10 times line 3?
9. Have financial statements for the latest fiscal year been filed with the Securities and Exchange Commission?
10. Have financial statements for the latest fiscal year been filed with the Energy Information Administration?
11. Have financial statements for the latest fiscal year been filed with the Rural Electrification Administration?
12. Has financial information been provided to Dun and Bradstreet, and has Dun and Bradstreet provided a financial strength rating of 4A or 5A? [Answer “Yes” only if both criteria have been met.]

Alternative II

1. Amount of annual UST aggregate coverage being assured by a test, and/or guarantee
2. Amount of corrective action, closure and post-closure care costs, liability coverage, and plugging and abandonment costs covered by a financial test, and/or guarantee
3. Sum of lines 1 and 2
4. Total tangible assets
Environmental Protection Agency

**Alternative II—Continued**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Total liabilities (if any of the amount reported on line 3 is included in total liabilities, you may deduct that amount from this line and add that amount to line 6) $</td>
</tr>
<tr>
<td>6.</td>
<td>Tangible net worth (subtract line 5 from line 4) $</td>
</tr>
<tr>
<td>7.</td>
<td>Total assets in the U.S. (required only if less than 90 percent of assets are located in the U.S.) $</td>
</tr>
<tr>
<td>8.</td>
<td>Is line 6 at least $10 million? Yes No</td>
</tr>
<tr>
<td>9.</td>
<td>Is line 6 at least 6 times line 3?</td>
</tr>
<tr>
<td>10.</td>
<td>Are at least 90 percent of assets located in the U.S.? (If &quot;No,&quot; complete line 11.)</td>
</tr>
<tr>
<td>11.</td>
<td>Is line 7 at least 6 times line 3?</td>
</tr>
<tr>
<td>12.</td>
<td>Current assets $</td>
</tr>
<tr>
<td>13.</td>
<td>Current liabilities</td>
</tr>
<tr>
<td>14.</td>
<td>Net working capital (subtract line 13 from line 12) $</td>
</tr>
<tr>
<td>15.</td>
<td>Is line 14 at least 6 times line 3?</td>
</tr>
<tr>
<td>16.</td>
<td>Current bond rating of most recent bond issue</td>
</tr>
<tr>
<td>17.</td>
<td>Name of rating service</td>
</tr>
<tr>
<td>18.</td>
<td>Date of maturity of bond</td>
</tr>
<tr>
<td>19.</td>
<td>Have financial statements for the latest fiscal year been filed with the SEC, the Energy Information Administration, or the Rural Electrification Administration?</td>
</tr>
</tbody>
</table>

(If "No," please attach a report from an independent certified public accountant certifying that there are no material differences between the data as reported in lines 4-18 above and the financial statements for the latest fiscal year.)

For both Alternative I and Alternative II, complete the certification with this statement:

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR part 280.95(d) as such regulations were constituted on the date shown immediately below.

[Signature] [Name] [Title] [Date]

(e) If an owner or operator using the test to provide financial assurance finds that he or she no longer meets the requirements of the financial test based on the year-end financial statements, the owner or operator must obtain alternative coverage within 30 days after notification of such a finding.

(g) If the owner or operator fails to obtain alternate assurance within 150 days of finding that he or she no longer meets the requirements of the financial test based on the year-end financial statements, or within 30 days of notification by the Director of the implementing agency that he or she no longer meets the requirements of the financial test, the owner or operator must notify the Director of such failure within 10 days.

§ 280.96 Guarantee.

(a) An owner or operator may satisfy the requirements of §280.93 by obtaining a guarantee that conforms to the requirements of this section. The guarantor must be:

1. A firm that (i) possesses a controlling interest in the owner or operator; (ii) possesses a controlling interest in a firm described under paragraph (a)(1)(i) of this section; or, (iii) is controlled through stock ownership by a common parent firm that possesses a controlling interest in the owner or operator; or,

2. A firm engaged in a substantial business relationship with the owner or operator and issuing the guarantee as an act incident to that business relationship.
§ 280.96  

(b) Within 120 days of the close of each financial reporting year the guarantor must demonstrate that it meets the financial test criteria of §280.95 based on year-end financial statements for the latest completed financial reporting year by completing the letter from the chief financial officer described in §280.95(d) and must deliver the letter to the owner or operator. If the guarantor fails to meet the requirements of the financial test at the end of any financial reporting year, within 120 days of the end of that financial reporting year the guarantor shall send by certified mail, before cancellation or nonrenewal of the guarantee, notice to the owner or operator. If the Director of the implementing agency notifies the guarantor that he no longer meets the requirements of the financial test of §280.95 (b) or (c) and (d), the guarantor must notify the owner or operator within 10 days of receiving such notification from the Director. In both cases, the guarantee will terminate no less than 120 days after the date the owner or operator receives the notification, as evidenced by the return receipt. The owner or operator must obtain alternative coverage as specified in §280.110(c).

(c) The guarantee must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

Guarantee

Guarantee made this [date] by [name of guaranteeing entity], a business entity organized under the laws of the state of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obligees, on behalf of [owner or operator] of [business address].

Recitals.

(1) Guarantor meets or exceeds the financial test criteria of 40 CFR 280.95 (b) or (c) and (d) and agrees to comply with the requirements for guarantors as specified in 40 CFR 280.96(b).

(2) [Owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and addresses of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.112 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H, requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location arising from operating the above-identified underground storage tank(s) in the amount of [insert dollar amount] per occurrence and [insert dollar amount] annual aggregate.

(3) [Insert appropriate phrase: “On behalf of our subsidiary” (if guarantor is corporate parent of the owner or operator), “On behalf of our affiliate” (if guarantor is a related firm of the owner or operator); or “Incident to our business relationship with” (if guarantor is providing the guarantee as an incident to a substantial business relationship with owner or operator)] (owner or operator), guarantor guarantees to [implementing agency] and to any and all third parties that:

In the event that [owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director] determines that [owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in the amount of [insert dollar amount] annual aggregate.

In the event that [owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director] determines that [owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in the amount of [insert dollar amount] per occurrence and [insert dollar amount] annual aggregate.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [“sudden” and/or “nonsudden”] accidental releases arising from the operation of the above-identified tank(s), or fails to pay [insert dollar amount] agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall fund a standby trust fund in accordance with the provisions of 40 CFR 280.108, in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in the amount of [insert dollar amount] annual aggregate.
(4) Guarantor agrees that if, at the end of any fiscal year before cancellation of this guarantee, the guarantor fails to meet the financial test criteria of 40 CFR 280.95 (b) or (c) and (d), guarantor shall send within 120 days of such failure, by certified mail, notice to [owner or operator]. The guarantee will terminate 120 days from the date of receipt of the notice by [owner or operator], as evidenced by the return receipt.

(5) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(6) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(7) Guarantor agrees to remain bound under this guarantee for so long as [owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above-identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt.

(8) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [insert owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaded to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

(9) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR 280.96(c) as such regulations were constituted on the effective date shown immediately below.

Effective date:
[Name of guarantor]
[Authorized signature for guarantor]
[Name of person signing]
[Title of person signing]
Signature of witness or notary:

(d) An owner or operator who uses a guarantee to satisfy the requirements of §280.93 must establish a standby trust fund when the guarantee is obtained. Under the terms of the guarantee, all amounts paid by the guarantor under the guarantee will be deposited directly into the standby trust fund in accordance with instructions from the Director of the implementing agency under §280.108. This standby trust fund must meet the requirements specified in §280.103.

§280.97 Insurance and risk retention group coverage.

(a) An owner or operator may satisfy the requirements of §290.93 by obtaining liability insurance that conforms to the requirements of this section from a qualified insurer or risk retention group. Such insurance may be in the form of a separate insurance policy or an endorsement to an existing insurance policy.

(b) Each insurance policy must be amended by an endorsement worded as specified in paragraph (b)(1) of this section, or evidenced by a certificate of insurance worded as specified in paragraph (b)(2) of this section, except that instructions in brackets must be replaced with the relevant information and the brackets deleted:

(1) Endorsement
Name: [name of each covered location]
Address: [address of each covered location]
Policy Number:
Period of Coverage: [current policy period]

Name of [Insurer or Risk Retention Group]:
Address of [Insurer or Risk Retention Group]:

Name of Insured:
§ 280.97 40 CFR Ch. I (7–1–05 Edition)

Address of Insured: __________________________

Endorsement:

1. This endorsement certifies that the policy to which this endorsement is attached provides liability insurance covering the following underground storage tanks:

   [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.] for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases”; in accordance with and subject to the limits of liability, exclusions, conditions, and other terms of the policy; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the underground storage tank(s) identified above.

   The limits of liability are [insert the dollar amount of the “each occurrence” and “annual aggregate” limits of the Insurer’s or Group’s liability; if the amount of coverage is different for different types of coverage or for different underground storage tanks or locations, indicate the amount of coverage for each type of coverage and for each underground storage tank or location, exclusive of legal defense costs, which are subject to a separate limit under the policy. This coverage is provided under [policy number]. The effective date of said policy is [date].

2. The insurance afforded with respect to such occurrences is subject to all of the terms and conditions of the policy; provided, however, that any provisions inconsistent with subsections (a) through (e) of this Paragraph 2 are hereby amended to conform with subsections (a) through (e):

   a. Bankruptcy or insolvency of the insured shall not relieve the [“Insurer” or “Group”] of its obligations under the policy to which this endorsement is attached.

   b. The [“Insurer” or “Group”] is liable for the payment of amounts within any deductible applicable to the policy to the provider of corrective action or a damaged third-party, with a right of reimbursement by the insured for any such payment made by the [“Insurer” or “Group”]. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated under another mechanism or combination of mechanisms as specified in 40 CFR 290.95–290.102.

   c. Whenever requested by [a Director of an implementing agency], the [“Insurer” or “Group”] agrees to furnish to [the Director] a signed duplicate original of the policy and all endorsements.

   d. Cancellation or any other termination of the insurance by the [“Insurer” or “Group”], except for non-payment of premium or misrepresentation by the insured, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the insured. Cancellation for non-payment of premium or misrepresentation by the insured will be effective only upon written notice and only after expiration of a minimum of 10 days after a copy of such written notice is received by the insured.

   [Insert for claims-made policies:

   e. The insurance covers claims otherwise covered by the policy that are reported to the [“Insurer” or “Group”] within six months of the effective date of cancellation or non-renewal of the policy except where the new or renewed policy has the same retroactive date or a retroactive date earlier than that of the prior policy, and which arise out of any covered occurrence that commenced after the policy retroactive date, if applicable, and prior to such policy renewal or termination date. Claims reported during such extended reporting period are subject to the terms, conditions, limits, including limits of liability, and exclusions of the policy.]

I hereby certify that the wording of this instrument is identical to the wording in 40 CFR 280.97(b)(1) and that the [“Insurer” or “Group”] is [“licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more states”].

[Signature of authorized representative of Insurer or Risk Retention Group]

[Name of person signing]

[Title of person signing], Authorized Representative of [name of Insurer or Risk Retention Group]

[Address of Representative]

[2 Certificate of Insurance]

Name: [name of each covered location]

Address: [address of each covered location]

Policy Number: ____________________________

Endorsement (if applicable): __________________________

Period of Coverage: [current policy period]

Name of [Insurer or Risk Retention Group]: __________________________

Address of [Insurer or Risk Retention Group]: __________________________

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Name of Insured:
Address of Insured:

Certification:

1. [Name of Insurer or Risk Retention Group], [the "Insurer" or "Group"], as identified above, hereby certifies that it has issued liability insurance covering the following underground storage tank(s):

[List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number and the expiration date of the instrument in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.]

for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental releases"; in accordance with and subject to the limits of liability, exclusions, conditions, and other terms of the policy; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the underground storage tank(s) identified above.

The limits of liability are [insert the dollar amount of the "each occurrence" and "annual aggregate" limits of the Insurer’s or Group’s liability; if the amount of coverage is different for different types of coverage or for different underground storage tanks or locations, indicate the amount of coverage for each type of coverage and/or for each underground storage tank or location, exclusive of legal defense costs, which are subject to a separate limit under the policy. This coverage is provided under [policy number]. The effective date of said policy is [date].]

2. The ["Insurer" or "Group"] further certifies the following with respect to the insurance described in Paragraph 1:

a. Bankruptcy or insolvency of the insured shall not relieve the ["Insurer" or "Group"] of its obligations under the policy to which this certificate applies.

b. The ["Insurer" or "Group"] is liable for the payment of amounts within any deductible applicable to the policy to the provider of corrective action or a damaged third-party, with a right of reimbursement by the insured for any such payment made by the ["Insurer" or "Group"]. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated under another mechanism or combination of mechanisms as specified in 40 CFR 280.95–280.102.

c. Whenever requested by [a Director of an implementing agency], the ["Insurer" or "Group"] agrees to furnish to [the Director] a signed duplicate original of the policy and all endorsements.

d. Cancellation or any other termination of the insurance by the ["Insurer" or "Group"], except for non-payment of premium or misrepresentation by the insured, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the insured. Cancellation for non-payment of premium or misrepresentation by the insured will be effective only upon written notice and only after expiration of a minimum of 10 days after a copy of such written notice is received by the insured.

[Insert for claims-made policies:

e. The insurance covers claims otherwise covered by the policy that are reported to the ["Insurer" or "Group"], within six months of the effective date of cancellation or non-renewal of the policy except where the new or renewed policy has the same retroactive date or a retroactive date earlier than that of the prior policy, and which arise out of any covered occurrence that commenced after the policy retroactive date, if applicable, and prior to such policy renewal or termination date. Claims reported during such extended reporting period are subject to the terms, conditions, limits, including limits of liability, and exclusions of the policy.]

I hereby certify that the wording of this instrument is identical to the wording in 40 CFR 280.97(b)(2) and that the ["Insurer" or "Group"] is ["licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more states"][Signature of authorized representative of Insurer]

[Type name]
[Title], Authorized Representative of [name of Insurer or Risk Retention Group]
[Address of Representative]

(c) Each insurance policy must be issued by an insurer or a risk retention group that, at a minimum, is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer in one or more states.

[53 FR 43370, Oct. 26, 1988, as amended at 54 FR 47081, Nov. 9, 1989]

§ 280.98 Surety bond.

(a) An owner or operator may satisfy the requirements of §280.93 by obtaining a surety bond that conforms to the
§ 280.98

Performance Bond

Date bond executed: ____________________________

Period of coverage: ____________________________

Principal: [legal name and business address of owner or operator]

Type of organization: [insert “individual,” “joint venture,” “partnership,” or “corporation”]

State of incorporation (if applicable):

Surety(ies): [name(s) and business address(es)]

Scope of Coverage: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility. List the coverage guaranteed by the bond. “Taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases” “arising from operating the underground storage tank”.

Penal sums of bond:

Per occurrence $ ____________________________

Annual aggregate $ ____________________________

Surety’s bond number: ____________________________

Now, therefore, the conditions of the obligation are such that if the Principal shall faithfully [“take corrective action, in accordance with 40 CFR part 280, subpart F and the Director of the state implementing agency’s instructions for,” and/or “compensate injured third parties for bodily injury and property damage caused by” either “sudden” or “nonsudden” or “sudden and nonsudden” accidental releases arising from operating the tank(s) indentified above, or if the Principal shall provide alternate financial assurance, as specified in 40 CFR part 280, subpart H, within 120 days after the date the notice of cancellation is received by the Principal from the Surety(ies), then this obligation shall be null and void; otherwise it is to remain in full force and effect.

Such obligation does not apply to any of the following:

(a) Any obligation of [insert owner or operator] under a workers’ compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily injury or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

The Surety(ies) shall become liable on this bond obligation only when the Principal has
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failed to fulfill the conditions described above.

Upon notification by [the Director of the implementing agency] that the Principal has failed to take corrective action, in accordance with 40 CFR part 280, subpart F and the Director’s instructions, and/or “compensate injured third parties” as guaranteed by this bond, the Surety(ies) shall either perform (“corrective action in accordance with 40 CFR part 280 and the Director’s instructions,” and/or “third-party liability compensation”) or place funds in an amount up to the annual aggregate penal sum into the standby trust fund as directed by [the Regional Administrator or the Director] under 40 CFR 280.108.

Upon notification by [the Director] that the Principal has failed to provide alternate financial assurance within 60 days after the date the notice of cancellation is received by the Principal from the Surety(ies) and that [the Director] has determined or suspects that a release has occurred, the Surety(ies) shall place funds in an amount not exceeding the annual aggregate penal sum into the standby trust fund as directed by [the Director] under 40 CFR 280.108.

The Surety(ies) hereby waive(s) notification of amendments to applicable laws, statutes, rules, and regulations and agrees that no such amendment shall in any way alleviate its (their) obligation on this bond.

The liability of the Surety(ies) shall not be discharged by any payment or succession of payments hereunder, unless and until such payment or payments shall amount in the annual aggregate to the penal sum shown on the face of the bond, but in no event shall the obligation of the Surety(ies) hereunder exceed the amount of said annual aggregate penal sum.

The Surety(ies) may cancel the bond by sending notice of cancellation by certified mail to the Principal, provided, however, that cancellation shall not occur during the 120 days beginning on the date of receipt of the notice of cancellation by the Principal, as evidenced by the return receipt.

The Principal may terminate this bond by sending written notice to the Surety(ies).

In Witness Thereof, the Principal and Surety(ies) have executed this Bond and have affixed their seals on the date set forth above. The persons whose signatures appear below hereby certify that they are authorized to execute this surety bond on behalf of the Principal and Surety(ies) and that the wording of this surety bond is identical to the wording specified in 40 CFR 280.98(b) as such regulations were constituted on the date this bond was executed.

[Principal]

[Signature(s)]
[Names(s)]
[Title(s)]
The letter of credit may be drawn on to cover insert: “taking corrective action” and/or compensating third parties for bodily injury and property damage caused by either “sudden accidental releases” or “non-sudden accidental releases” or “accidental releases” arising from operating the underground storage tank(s) identified below in the amount of [in words] $[insert dollar amount] per occurrence and [in words] $[insert dollar amount] annual aggregate.

List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.

The letter of credit may not be drawn on to cover any of the following:

(a) Any obligation of [insert owner or operator] under a workers’ compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert owner or operator] arising from, and in the course of, employment by [insert owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily injury or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR 280.93.

This letter of credit is effective as of [date] and shall expire on [date], but such expiration date shall be automatically extended for a period of [at least the length of the original term] on [expiration date] and on each successive expiration date, unless, at least 120 days before the current expiration date, we notify [owner or operator] by certified mail that we have decided not to extend this letter of credit beyond the current expiration date. In the event that [owner or operator] is so notified, any unused portion of the credit shall be available upon presentation of your sight draft for 120 days after the date of receipt by [owner or operator], as shown on the signed return receipt.

Whenever this letter of credit is drawn on under and in compliance with the terms of this credit, we shall duly honor such draft upon presentation to us, and we shall deposit the amount of the draft directly into the standby trust fund of [owner or operator] in accordance with your instructions.

We certify that the wording of this letter of credit is identical to the wording specified in 40 CFR 290.99(b) as such regulations were constituted on the date shown immediately below.

[Signature(s) and title(s) of official(s) of issuing institution]

[Date]

This credit is subject to [insert “the most recent edition of the Uniform Customs and Practice for Documentary Credits, published and copyrighted by the International Chamber of Commerce,” or “the Uniform Commercial Code”].

(c) An owner or operator who uses a letter of credit to satisfy the requirements of §280.93 must also establish a standby trust fund when the letter of credit is acquired. Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Director of the implementing agency will be deposited by the issuing institution directly into the standby trust fund in accordance with instructions from the Director under §280.108. This standby trust fund must meet the requirements specified in §280.103.

(d) The letter of credit must be irrevocable with a term specified by the issuing institution. The letter of credit must provide that credit be automatically renewed for the same term as the original term, unless, at least 120 days before the current expiration date, the issuing institution notifies the owner or operator by certified mail of its decision not to renew the letter of credit. Under the terms of the letter of credit, the 120 days will begin on the date when the owner or operator receives

[Date]
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the notice, as evidenced by the return receipt.
[53 FR 37194, Sept. 23, 1988, as amended at 59 FR 29660, June 10, 1994]

§ 280.100 Use of state-required mechanism.

(a) For underground storage tanks located in a state that does not have an approved program, and where the state requires owners or operators of underground storage tanks to demonstrate financial responsibility for taking corrective action and/or for compensating third parties for bodily injury and property damage, an owner or operator may use a state-required financial mechanism to meet the requirements of §280.93 if the Regional Administrator determines that the state mechanism is at least equivalent to the financial mechanisms specified in this subpart.

(b) The Regional Administrator will evaluate the equivalency of a state-required mechanism principally in terms of: certainty of the availability of funds for taking corrective action and/or for compensating third parties; the amount of funds that will be made available; and the types of costs covered. The Regional Administrator may also consider other factors as is necessary.

(c) The state, an owner or operator, or any other interested party may submit to the Regional Administrator a written petition requesting that one or more of the state-required mechanisms be considered acceptable for meeting the requirements of §280.93. The submission must include copies of the appropriate state statutory and regulatory requirements and must show the amount of funds for corrective action and/or for compensating third parties assured by the mechanism(s). The Regional Administrator may require the petitioner to submit additional information as is deemed necessary to make this determination.

(d) Any petition under this section may be submitted on behalf of all of the state's underground storage tank owners and operators.

(e) The Regional Administrator will notify the petitioner of his determination regarding the mechanism's acceptability in lieu of financial mechanisms specified in this subpart. Pending this determination, the owners and operators using such mechanisms will be deemed to be in compliance with the requirements of §280.93 for underground storage tanks located in the state for the amounts and types of costs covered by such mechanisms.

§ 280.101 State fund or other state assurance.

(a) An owner or operator may satisfy the requirements of §280.93 for underground storage tanks located in a state, where EPA is administering the requirements of this subpart, which assures that monies will be available from a state fund or state assurance program to cover costs up to the limits specified in §280.93 or otherwise assures that such costs will be paid if the Regional Administrator determines that the state's assurance is at least equivalent to the financial mechanisms specified in this subpart.

(b) The Regional Administrator will evaluate the equivalency of a state fund or other state assurance principally in terms of: certainty of the availability of funds for taking corrective action and/or for compensating third parties; the amount of funds that will be made available; and the types of costs covered. The Regional Administrator may also consider other factors as is necessary.

(c) The state must submit to the Regional Administrator a description of the state fund or other state assurance to be supplied as financial assurance, along with a list of the classes of underground storage tanks to which the funds may be applied. The Regional Administrator may require the state to submit additional information as is deemed necessary to make a determination regarding the acceptability of the state fund or other state assurance. Pending the determination by the Regional Administrator, the owner or operator of a covered class of USTs will be deemed to be in compliance with the requirements of §280.93 for the amounts and types of costs covered by the state fund or other state assurance.

(d) The Regional Administrator will notify the state of his determination regarding the acceptability of the
§ 280.102 Trust fund.

(a) An owner or operator may satisfy the requirements of § 280.93 by establishing a trust fund that conforms to the requirements of this section. The trustee must be an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal agency or an agency of the state in which the fund is established.

(b) The wording of the trust agreement must be identical to the wording specified in § 280.103(b)(1), and must be accompanied by a formal certification of acknowledgement as specified in § 280.107(b)(5).

(c) The trust fund, when established, must be funded for the full required amount of coverage, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining required coverage.

(d) If the value of the trust fund is greater than the required amount of coverage, the owner or operator may submit a written request to the Director of the implementing agency for release of the excess.

(e) If other financial assurance as specified in this subpart is substituted for all or part of the trust fund, the owner or operator may submit a written request to the Director of the implementing agency for release of the excess.

(f) Within 60 days after receiving a request from the owner or operator for release of funds as specified in paragraph (d) or (e) of this section, the Director of the implementing agency will instruct the trustee to release to the owner or operator such funds as the Director specifies in writing.

§ 280.103 Standby trust fund.

(a) An owner or operator using any one of the mechanisms authorized by §§ 280.96, 280.98, or 280.99 must establish a standby trust fund when the mechanism is acquired. The trustee of the standby trust fund must be an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal agency or an agency of the state in which the fund is established.

(b) The standby trust agreement, or trust agreement, must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

TRUST AGREEMENT

Trust agreement, the "Agreement," entered into as of [date] by and between [name of the owner or operator], a [name of state] [insert "corporation," "partnership," "association," or "proprietorship"], the "Grantor," and [name of corporate trustee], [insert "Incorporated in the state of ___" or "a national bank"], the "Trustee."

Whereas, the United States Environmental Protection Agency, "EPA," an agency of the United States Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of an underground storage tank shall provide assurance that funds will be available when needed for corrective action and third-party compensation for bodily injury and property damage caused by sudden and nonsudden accidental releases arising from the operation of the underground storage tank. The attached Schedule A lists the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located that are covered by the standby trust agreement.

Whereas, the Grantor has elected to establish [insert either a "guarantee," a "surety bond," or a "letter of credit"] to provide all or part of such financial assurance for the underground storage tanks identified herein and is required to establish a standby trust fund able to accept payments from the instrument [This paragraph is only applicable to the standby trust agreement].
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Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this agreement, and the Trustee is willing to act as trustee;

Now, therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions

As used in this Agreement:
(a) The term “Grantor” means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.
(b) The term “Trustee” means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of the Financial Assurance Mechanism

This Agreement pertains to the financial assurance mechanism, either a guarantee, surety bond, or letter of credit, from which the standby trust fund is established to receive payments (This paragraph is only applicable to the standby trust agreement).

Section 3. Establishment of Fund

The Grantor and the Trustee hereby establish a trust fund, the “Fund,” for the benefit of the Grantor, acting through its duly authorized officers, and the Trustee. The Trustee shall invest and reinvest the money in the Fund as provided in this Section.

Section 4. Payment for (“Corrective Action” and/or “Third-Party Liability Claims”)

The Trustee shall make payments from the Fund as provided in this Section to the Grantor for corrective action expenses and/or third-party liability claims.

Section 5. Payments Comprising the Fund

Payments made to the Trustee for the Fund shall consist of cash and securities acceptable to the Trustee.

Section 6. Trustee Management

The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiaries and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:
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(i) Securities or other obligations of the Grantor, or any other owner or operator of the tanks, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a–2(a), shall not be acquired or held, unless they are securities or other obligations of the federal or a state government;

(ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the federal or state government; and

(iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment

The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a–1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee

Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the federal or state government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses

All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Advice of Counsel

The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any questions arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 11. Trustee Compensation

The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 12. Successor Trustee

The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply
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to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in writing sent to the Grantor and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 13. Instructions to the Trustee

All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Schedule B or such other designees as the Grantor may designate by amendment to Schedule B. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor’s orders, requests, and instructions. All orders, requests, and instructions by [the Director of the implementing agency] to the Trustee shall be in writing, signed by [the Director], and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or [the Director] hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or [the Director], except as provided for herein.

Section 14. Amendment of Agreement

This Agreement may be amended by an instrument in writing executed by the Grantor and the Trustee, or by the Trustee and [the Director of the implementing agency] if the Grantor ceases to exist.

Section 15. Irrevocability and Termination

Subject to the right of the parties to amend this Agreement as provided in Section 14, this Trust shall be irrevocable and shall continue until terminated at the written direction of the Grantor and the Trustee, or by the Trustee and [the Director of the implementing agency], if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 16. Immunity and Indemnification

The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or [the Director of the implementing agency] issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 17. Choice of Law

This Agreement shall be administered, construed, and enforced according to the laws of the state of [insert name of state], or the Comptroller of the Currency in the case of National Association banks.

Section 18. Interpretation

As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

In Witness whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals (if applicable) to be hereunto affixed and attested as of the date first above written. The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 280.103(b)(1) as such regulations were constituted on the date written above.

[Signature of Grantor]
[Name of the Grantor]
[Title]

[Signature of Trustee]
[Name of the Trustee]
[Title]
[Seal]

[Signature of Witness]
[Name of the Witness]
[Title]
[Seal]

(2) The standby trust agreement, or trust agreement must be accompanied by a formal certification of acknowledgment similar to the following. State requirements may differ on the proper content of this acknowledgment.

State of
County of

On this [date], before me personally came [owner or operator] to me known, who, being by me duly sworn, did depose and say that she/he resides at [address], that she/he is [title] of [corporation], the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was
§ 280.104 Local government bond rating test.

(a) A general purpose local government owner or operator and/or local government serving as a guarantor may satisfy the requirements of § 280.93 by having a currently outstanding issue or issues of general obligation bonds of $1 million or more, excluding refunded obligations, with a Moody's rating of Aaa, Aa, A, or Baa, or a Standard & Poor's rating of AAA, AA, A, or BBB. Where a local government has multiple outstanding issues, or where a local government's bonds are rated by both Moody's and Standard and Poor's, the lowest rating must be used to determine eligibility. Bonds that are backed by credit enhancement other than municipal bond insurance may not be considered in determining the amount of applicable bonds outstanding.

(b) A local government owner or operator or local government serving as a guarantor that is not a general-purpose local government and does not have the legal authority to issue general obligation bonds may satisfy the requirements of § 280.93 by having a currently outstanding issue or issues of revenue bonds of $1 million or more, excluding refunded issues and by also having a Moody's rating of Aaa, Aa, A, or Baa, or a Standard & Poor's rating of AAA, AA, A, or BBB as the lowest rating for any rated revenue bond issued by the local government. Where bonds are rated by both Moody's and Standard & Poor's, the lower rating for each bond must be used to determine eligibility. Bonds that are backed by credit enhancement may not be considered in determining the amount of applicable bonds outstanding.

(c) The local government owner or operator and/or guarantor must maintain a copy of its bond rating published within the last 12 months by Moody's or Standard & Poor's.

(d) To demonstrate that it meets the local government bond rating test, the chief financial officer of a general purpose local government owner or operator and/or guarantor must sign a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

**LETTER FROM CHIEF FINANCIAL OFFICER**

I am the chief financial officer of [insert: name and address of local government owner or operator, or guarantor]. This letter is in support of the use of the bond rating test to demonstrate financial responsibility for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage"] caused by [insert: "sudden accidental releases" and/or "nonsudden accidental releases"] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s). Underground storage tanks at the following facilities are assured by this bond rating test: [List for each facility: the name and address of the facility where tanks are assured by the bond rating test].

The details of the issue date, maturity, outstanding amount, bond rating, and bond rating agency of all outstanding bond issues that are being used by [name of local government owner or operator, or guarantor] to demonstrate financial responsibility are as follows: [complete table]

<table>
<thead>
<tr>
<th>Issue date</th>
<th>Maturity date</th>
<th>Outstanding amount</th>
<th>Bond rating</th>
<th>Rating agency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[Moody's or Standard &amp; Poor's]</td>
</tr>
</tbody>
</table>
The total outstanding obligation of [insert amount], excluding refunded bond issues, exceeds the minimum amount of $1 million. All outstanding general obligation bonds issued by this government that have been rated by Moody’s or Standard & Poor’s are rated at least investment grade (Moody’s Baa or Standard & Poor’s BBB) based on the most recent ratings published within the last 12 months. Neither rating service has provided notification within the last 12 months of downgrading of bond ratings below investment grade or of withdrawal of bond rating other than for repayment of outstanding bond issues.

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR Part 280.104(d) as such regulations were constituted on the date shown immediately below.

[Date]  
[Signature]  
[Name]  
[Title]

(e) To demonstrate that it meets the local government bond rating test, the chief financial officer of local government owner or operator and/or guarantor other than a general purpose government must sign a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

LETTER FROM CHIEF FINANCIAL OFFICIAL

I am the chief financial officer of [insert: name and address of local government owner or operator, or guarantor]. This letter is in support of the use of the bond rating test to demonstrate financial responsibility for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage"] caused by [insert: "sudden accidental releases" and/or "nonsudden accidental releases"] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s). This local government is not organized to provide general governmental services and does not have the legal authority under state law or constitutional provisions to issue general obligation debt.

Underground storage tanks at the following facilities are assured by this bond rating test: [List for each facility: the name and address of the facility where tanks are assured by the bond rating test].

The details of the issue date, maturity, outstanding amount, bond rating, and bond rating agency of all outstanding revenue bond issues that are being used by [name of local government owner or operator, or guarantor] to demonstrate financial responsibility are as follows: [complete table]

<table>
<thead>
<tr>
<th>Issue date</th>
<th>Maturity date</th>
<th>Outstanding amount</th>
<th>Bond rating</th>
<th>Rating agency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>[Moody’s or Standard &amp; Poor’s]</td>
</tr>
</tbody>
</table>

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR part 280.104(e) as such regulations were constituted on the date shown immediately below.

[Date]  
[Signature]  
[Name]  
[Title]

(f) The Director of the implementing agency may require reports of financial condition at any time from the local government owner or operator, and/or local government guarantor. If the Director finds, on the basis of such reports or other information, that the local government owner or operator, and/or guarantor, no longer meets the local government bond rating test requirements of §280.104, the local government owner or operator must obtain alternative coverage within 30 days after notification of such a finding.

(g) If a local government owner or operator using the bond rating test to provide financial assurance finds that
§ 280.105 Local government financial test.

(a) A local government owner or operator may satisfy the requirements of §280.93 by passing the financial test specified in this section. To be eligible to use the financial test, the local government owner or operator must have the ability and authority to assess and levy taxes or to freely establish fees and charges. To pass the local government financial test, the owner or operator must meet the criteria of paragraphs (b)(2) and (b)(3) of this section based on year-end financial statements for the latest completed fiscal year.

(b)(1) The local government owner or operator must have the following information available, as shown in the year-end financial statements for the latest completed fiscal year:

(i) Total revenues: Consists of the sum of general fund operating and non-operating revenues including net local taxes, licenses and permits, fines and forfeitures, revenues from use of money and property, charges for services, investment earnings, sales (property, publications, etc.), intergovernmental revenues (restricted and unrestricted), and total revenues from all other governmental funds including enterprise, debt service, capital projects, and special revenues, but excluding revenues to funds held in a trust or agency capacity. For purposes of this test, the calculation of total revenues shall exclude all transfers between funds under the direct control of the local government using the financial test (interfund transfers).

(ii) Total expenditures: Consists of the sum of general fund operating and non-operating expenditures including public safety, public utilities, transportation, public works, environmental protection, cultural and recreational, community development, revenue sharing, employee benefits and compensation, office management, planning and zoning, capital projects, interest payments on debt, payments for retirement of debt principal, and total expenditures from all other governmental funds including enterprise, debt service, capital projects, and special revenues. For purposes of this test, the calculation of total expenditures shall exclude all transfers between funds under the direct control of the local government using the financial test (interfund transfers).

(iii) Local revenues: Consists of total revenues (as defined in paragraph (b)(1)(i) of this section) minus the sum of all transfers from other governmental entities, including all monies received from Federal, state, or local government sources.

(iv) Debt service: Consists of the sum of all interest and principal payments on all long-term credit obligations and all interest-bearing short-term credit obligations. Includes interest and principal payments on general obligation bonds, revenue bonds, notes, mortgages, judgments, and interest bearing warrants. Excludes payments on non-interest-bearing short-term obligations, interfund obligations, amounts owed in a trust or agency capacity, and advances and contingent loans from other governments.

(v) Total funds: Consists of the sum of cash and investment securities from all funds, including general, enterprise, debt service, capital projects, and special revenue funds, but excluding employee retirement funds, at the end of the local government’s financial reporting year. Includes Federal securities, Federal agency securities, state and local government securities, and other securities such as bonds, notes and mortgages. For purposes of this test, the calculation of total funds shall exclude agency funds, private trust funds, accounts receivable, value of real property, and other non-security assets.

(vi) Population consists of the number of people in the area served by the local government.

(2) The local government’s year-end financial statements, if independently audited, cannot include an adverse auditor’s opinion or a disclaimer of opinion. The local government cannot
have outstanding issues of general obligation or revenue bonds that are rated as less than investment grade.

(3) The local government owner or operator must have a letter signed by the chief financial officer worded as specified in paragraph (c) of this section.

(c) To demonstrate that it meets the financial test under paragraph (b) of this section, the chief financial officer of the local government owner or operator, must sign, within 120 days of the close of each financial reporting year, as defined by the twelve-month period for which financial statements used to support the financial test are prepared, a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

LETTER FROM CHIEF FINANCIAL OFFICER

I am the chief financial officer of [insert name and address of the owner or operator]. This letter is in support of the use of the local government financial test to demonstrate financial responsibility for [insert “taking corrective action” and/or “compensating third parties for bodily injury and property damage”] caused by [insert “sudden accidental releases” and/or “nonsudden accidental releases”] in the amount of at least [insert dollar amount] per occurrence and [insert dollar amount] annual aggregate arising from operating [an] underground storage tank[s].

Underground storage tanks at the following facilities are assured by this financial test [List for each facility: the name and address of the facility where tanks assured by this financial test are located. If separate mechanisms or combinations of mechanisms are being used to assure any of the tanks at this facility, list each tank assured by this financial test by the tank identification number provided in the notification submitted pursuant to 40 CFR Part 280.22 or the corresponding state requirements.]

This owner or operator has not received an adverse opinion, or a disclaimer of opinion from an independent auditor on its financial statements for the latest completed fiscal year. Any outstanding issues of general obligation or revenue bonds, if rated, have a Moody’s rating of Aaa, Aa, A, or Baa or a Standard and Poor’s rating of AAA, AA, A, or BBB; if rated by both firms, the bonds have a Moody’s rating of Aaa, Aa, A, or Baa and a Standard and Poor’s rating of AAA, AA, A, or BBB.

WORKSHEET FOR MUNICIPAL FINANCIAL TEST

Part I: Basic Information

1. Total Revenues
   a. Revenues (dollars) ______
   Value of revenues excludes liquidation of investments and issuance of debt. Value includes all general fund operating and non-operating revenues, as well as all revenues from all other governmental funds including enterprise, debt service, capital projects, and special revenues, but excluding revenues to funds held in a trust or agency capacity.
   b. Subtract interfund transfers (dollars) ______
   c. Total Revenues (dollars) ______

2. Total Expenditures
   a. Expenditures (dollars) ______
   Value consists of the sum of general fund operating and non-operating expenditures including interest payments on debt, payments for retirement of debt principal, and total expenditures from all other governmental funds including enterprise, debt service, capital projects, and special revenues.
   b. Subtract interfund transfers (dollars) ______
   c. Total Expenditures (dollars) ______

3. Local Revenues
   a. Total Revenues (from 1c) (dollars) ______
   b. Subtract total intergovernmental transfers (dollars) ______
   c. Local Revenues (dollars) ______

4. Debt Service
   a. Interest and fiscal charges (dollars) ______
   b. Add debt retirement (dollars) ______
   c. Total Debt Service (dollars) ______

5. Total Funds (dollars)
   (Sum of amounts held as cash and investment securities from all funds, excluding amounts held for employee retirement funds, agency funds, and trust funds)

6. Population (Persons) ______

Part II: Application of Test

7. Total Revenues to Population
   a. Total Revenues (from 1c) ______
   b. Population (from 6) ______
   c. Divide 7a by 7b ______
   d. Subtract 417 ______
   e. Divide by 5,212 ______
   f. Multiply by 4.095 ______

8. Total Expenses to Population
   a. Total Expenses (from 2c) ______
§ 280.106

b. Population (from 6)
c. Divide 8a by 8b
d. Subtract 524
e. Divide by 5,401
f. Multiply by 4.095

9. Local Revenues to Total Revenues
a. Local Revenues (from 3c)
b. Total Revenues (from 1c)
c. Divide 9a by 9b
d. Subtract .695
e. Divide by .205
f. Multiply by 2.840

10. Debt Service to Population
a. Debt Service (from 4d)
b. Population (from 6)
c. Divide 10a by 10b
d. Subtract 51
e. Divide by 1,038
f. Multiply by ¥ 1.866

11. Debt Service to Total Revenues
a. Debt Service (from 4d)
b. Total Revenues (from 1c)
c. Divide 11a by 11b
d. Subtract .068
e. Divide by .259
f. Multiply by ¥ 3.533

12. Total Revenues to Total Expenses
a. Total Revenues (from 1c)
b. Total Expenses (from 2c)
c. Divide 12a by 12b
d. Subtract .910
e. Divide by .899
f. Multiply by 3.458

13. Funds Balance to Total Revenues
a. Total Funds (from 5)
b. Total Revenues (from 1c)
c. Divide 13a by 13b
d. Subtract .891
e. Divide by 9.156
f. Multiply by 3.270

14. Funds Balance to Total Expenses
a. Total Funds (from 5)
b. Total Expenses (from 2c)
c. Divide 14a by 14b
d. Subtract .866
e. Divide by 6.409
f. Multiply by 3.270

15. Total Funds to Population
a. Total Funds (from 5)
b. Population (from 6)
c. Divide 15a by 15b
d. Subtract 270
e. Divide by 4,548
f. Multiply by 1.866

16. Add 7f + 8f + 9f + 10f + 11f + 12f + 13f + 14f + 15f + 4.937

I hereby certify that the financial index shown on line 16 of the worksheet is greater than zero and that the wording of this letter is identical to the wording specified in 40 CFR part 280.105(c) as such regulations were constituted on the date shown immediately below.

[Date]
[Signature]
[Name]
[Title]

(d) If a local government owner or operator using the test to provide financial assurance finds that it no longer meets the requirements of the financial test based on the year-end financial statements, the owner or operator must obtain alternative coverage within 150 days of the end of the year for which financial statements have been prepared.

(e) The Director of the implementing agency may require reports of financial condition at any time from the local government owner or operator. If the Director finds, on the basis of such reports or other information, that the local government owner or operator no longer meets the financial test requirements of §280.105 (b) and (c), the owner or operator must obtain alternate coverage within 30 days after notification of such a finding.

(f) If the local government owner or operator fails to obtain alternate assurance within 150 days of finding that it no longer meets the requirements of the financial test based on the year-end financial statements or within 30 days of notification by the Director of the implementing agency that it no longer meets the requirements of the financial test, the owner or operator must notify the Director of such failure within 10 days.

[58 FR 9054, Feb. 18, 1993]

§ 280.106 Local government guarantee.

(a) A local government owner or operator may satisfy the requirements of §280.93 by obtaining a guarantee that conforms to the requirements of this section. The guarantor must be either the state in which the local government owner or operator is located or a local government having a “substantial governmental relationship” with
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(d) If the guarantor is a state, the local government guarantee with standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

Local Government Guarantee With Standby Trust Made by a State

Guarantee made this [date] by [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals

(1) Guarantor is a state.

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement and, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases” or “accidental releases”: if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the above-identified underground storage tank(s) in the amount of [insert dollar amount] per occurrence and [insert dollar amount] annual aggregate.

(3) Guarantor guarantees to [implementing agency] and to any and all third parties that: [in the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon instructions from the [Director] shall fund a standby trust fund in accordance with the provisions of 40 CFR part 280.112, in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the
§ 280.106 Petroleum underground storage tank; 40 CFR Ch. I (7–1–05 Edition)

above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall fund a standby trust fund in accordance with the provisions of 40 CFR part 280.112, in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by ["sudden" and/or "nonsudden"] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall fund a standby trust in accordance with the provisions of 40 CFR part 280.112 to satisfy such judgment(s), award(s), or settlement agreement(s) up to the limits of coverage specified above.

(4) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(5) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(6) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt.

(7) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert: local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, leased to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(8) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106(d) as such regulations were constituted on the effective date shown immediately below.

Effective date:
[Name of guarantor]
[Authorized signature for guarantor]
[Name of person signing]
[TITLE of person signing]
Signature of witness or notary:
[Signature of witness or notary]

Local Government Guarantee With Standby Trust Made by a Local Government

Guarantee made this [date] by [name of guaranteeing entity], a local government organized under the laws of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator], which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280 or the corresponding state requirements of 40 CFR part 280.93, to fund a standby trust fund in accordance with the provisions of 40 CFR part 280.106(d) as such regulations were constituted on the effective date shown immediately below.

Local Government Guarantee With Standby Trust Made by a Local Government

Guarantee made this [date] by [name of guaranteeing entity], a local government organized under the laws of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator], which [insert owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for any injury or property damage caused by [either "sudden accidental releases" or]

Recitals

(1) Guarantor meets or exceeds [select one: the local government bond rating test requirements of 40 CFR part 280.104, the local government financial test requirements of 40 CFR part 280.105, or the local government bond guarantee under 40 CFR part 280.107(a), 280.107(b), or 280.107(c)].

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by"

"either "sudden accidental releases" or]
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"nonsudden accidental releases" or "accidental releases"; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location. At the time of issuance of this guarantee, the above-identified underground storage tank(s) in the amount of [insert dollar amount] per occurrence and [insert: dollar amount] annual aggregate.

(3) Incident to our substantial governmental relationship with [local government owner or operator], guarantor guarantees to [implementing agency] and to any and all third parties that:

In the event that [local government owner or operator] fails to provide alternative coverage to the amount shown immediately below, except that instructions in paragraph (1), guarantor shall send within 120 days of such failure, by certified mail, to [local government owner or operator], notice to [local government owner or operator], as evidenced by the return receipt.

(5) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(6) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(7) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt.

(8) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers' compensation, disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert: local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaned to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;

(e) Bodily damage or property damage for which [insert: owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(9) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106(d) as such regulations were constituted on the effective date shown immediately below.

Effective date:

[Name of guarantor]
[Authorized signature for guarantor]
[Name of person signing]
[Title of person signing]

Signature of witness or notary:

(e) If the guarantor is a state, the local government guarantee without standby trust must be worded exactly as follows, except that instructions in
§ 280.106  40 CFR Ch. I (7–1–05 Edition)

brackets are to be replaced with relevant information and the brackets deleted:

LOCAL GOVERNMENT GUARANTEE WITHOUT STANDBY TRUST MADE BY A STATE

Guarantor made this [date] by [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator],

Recitals

(1) Guarantor is a state.

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee:

[List the number of tanks at each facility and the name(s) and addresses of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280, subpart H requirements for assuring funding for [insert: “taking corrective action” and/or “compensating third parties for bodily injury and property damage caused by” either “sudden accidental releases” or “nonsudden accidental releases”]: if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location arising from operating the above-identified underground storage tank(s) in the amount of [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate.

(3) Guarantor guarantees to [implementing agency] and to any and all third parties and obliges that:

In the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon written instructions from the [Director], shall make funds available to pay for corrective actions and compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall make funds available to pay for corrective actions in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by [“sudden” and/or “nonsudden”] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall make funds available to compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

(4) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as debtor, within 10 days after commencement of the proceeding.

(5) Guarantor agrees to remain bound under this guarantee notwithstanding any modification or alteration of any obligation of [owner or operator] pursuant to 40 CFR part 280.

(6) Guarantor agrees to remain bound under this guarantee for so long as [local government owner or operator] must comply with the applicable financial responsibility requirements of 40 CFR part 280, subpart H for the above-identified tank(s), except that guarantor may cancel this guarantee by sending notice by certified mail to [owner or operator], such cancellation to become effective no earlier than 120 days after receipt of such notice by [owner or operator], as evidenced by the return receipt. If notified of a probable release, the guarantor agrees to remain bound to the terms of this guarantee for all charges arising from the release, up to the coverage limits specified above, notwithstanding the cancellation of the guarantee with respect to future releases.

(7) The guarantor's obligation does not apply to any of the following:

(a) Any obligation of [local government owner or operator] under a workers’ compensation disability benefits, or unemployment compensation law or other similar law;

(b) Bodily injury to an employee of [insert local government owner or operator] arising from, and in the course of, employment by [insert: local government owner or operator];

(c) Bodily injury or property damage arising from the ownership, maintenance, use, or entrustment to others of any aircraft, motor vehicle, or watercraft;

(d) Property damage to any property owned, rented, loaded to, in the care, custody, or control of, or occupied by [insert: local government owner or operator] that is not the direct result of a release from a petroleum underground storage tank;
(e) Bodily damage or property damage for which [insert: owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(8) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106 as such regulations were constituted on the effective date shown immediately below.

Effective date:
Name of guarantor
[Authorized signature for guarantor]
[Name of person signing]
[Title of person signing]
Signature of witness or notary:

If the guarantor is a local government, the local government guarantee without standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

LOCAL GOVERNMENT GUARANTEE WITHOUT STANDBY TRUST MADE BY A LOCAL GOVERNMENT

Guarantee made this [date] by [name of guaranteeing entity], a local government organized under the laws of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals
(1) Guarantor meets or exceeds [select one: the local government bond rating test requirements of 40 CFR part 280.104, the local government financial test requirements of 40 part CFR 280.105, the local government fund under 40 CFR part 280.107(a), 280.107(b), or 280.107(c)].

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280 subpart H requirements for assuring funding for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases"].

(9) Bodily damage or property damage for which [insert: owner or operator] is obligated to pay damages by reason of the assumption of liability in a contract or agreement other than a contract or agreement entered into to meet the requirements of 40 CFR part 280.93.

(8) Guarantor expressly waives notice of acceptance of this guarantee by [the implementing agency], by any or all third parties, or by [local government owner or operator].

I hereby certify that the wording of this guarantee is identical to the wording specified in 40 CFR part 280.106 as such regulations were constituted on the effective date shown immediately below.

Effective date:
Name of guarantor
[Authorized signature for guarantor]
[Name of person signing]
[Title of person signing]
Signature of witness or notary:

If the guarantor is a local government, the local government guarantee without standby trust must be worded exactly as follows, except that instructions in brackets are to be replaced with relevant information and the brackets deleted:

LOCAL GOVERNMENT GUARANTEE WITHOUT STANDBY TRUST MADE BY A LOCAL GOVERNMENT

Guarantee made this [date] by [name of guaranteeing entity], a local government organized under the laws of [name of state], herein referred to as guarantor, to [the state implementing agency] and to any and all third parties, and obliges, on behalf of [local government owner or operator].

Recitals
(1) Guarantor meets or exceeds [select one: the local government bond rating test requirements of 40 CFR part 280.104, the local government financial test requirements of 40 part CFR 280.105, the local government fund under 40 CFR part 280.107(a), 280.107(b), or 280.107(c)].

(2) [Local government owner or operator] owns or operates the following underground storage tank(s) covered by this guarantee: [List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR part 280 or the corresponding state requirement, and the name and address of the facility.] This guarantee satisfies 40 CFR part 280 subpart H requirements for assuring funding for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases"]. If coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location arising from operating the above-identified underground storage tank(s) in the amount of [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate.

(3) Incident to our substantial governmental relationship with [local government owner or operator], guarantor guarantees to [implementing agency] and to any and all third parties and obliges that:

In the event that [local government owner or operator] fails to provide alternative coverage within 60 days after receipt of a notice of cancellation of this guarantee and the [Director of the implementing agency] has determined or suspects that a release has occurred at an underground storage tank covered by this guarantee, the guarantor, upon written instructions from the [Director] shall make funds available to pay for corrective actions and compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

In the event that the [Director] determines that [local government owner or operator] has failed to perform corrective action for releases arising out of the operation of the above-identified tank(s) in accordance with 40 CFR part 280, subpart F, the guarantor upon written instructions from the [Director] shall make funds available to pay for corrective actions in an amount not to exceed the coverage limits specified above.

If [owner or operator] fails to satisfy a judgment or award based on a determination of liability for bodily injury or property damage to third parties caused by ["sudden" and/or "nonsudden"] accidental releases arising from the operation of the above-identified tank(s), or fails to pay an amount agreed to in settlement of a claim arising from or alleged to arise from such injury or damage, the guarantor, upon written instructions from the [Director], shall make funds available to compensate third parties for bodily injury and property damage in an amount not to exceed the coverage limits specified above.

(4) Guarantor agrees that if at the end of any fiscal year before cancellation of this guarantee, the guarantor fails to meet or exceed the requirements of the financial responsibility mechanism specified in paragraph (1), guarantor shall send within 120 days of such failure, by certified mail, notice to [local government owner or operator], as evidenced by the return receipt.

(5) Guarantor agrees to notify [owner or operator] by certified mail of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code naming guarantor as
§ 280.107 Local government fund.

A local government owner or operator may satisfy the requirements of §280.93 by establishing a dedicated fund account that conforms to the requirements of this section. Except as specified in paragraph (b), a dedicated fund may not be commingled with other funds or otherwise used in normal operations. A dedicated fund will be considered eligible if it meets one of the following requirements:

(a) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order as a contingency fund for general emergencies, including taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks and is funded for the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage; or

(b) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order as a contingency fund for general emergencies, including taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, and is funded for five times the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage; or

(c) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order to pay for taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, and is funded for less than five times the amount of coverage required under §280.93.

§ 280.107 Local government fund.

A local government owner or operator may satisfy the requirements of §280.93 by establishing a dedicated fund account that conforms to the requirements of this section. Except as specified in paragraph (b), a dedicated fund may not be commingled with other funds or otherwise used in normal operations. A dedicated fund will be considered eligible if it meets one of the following requirements:

(a) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order as a contingency fund for general emergencies, including taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks and is funded for the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage; or

(b) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order as a contingency fund for general emergencies, including taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, and is funded for five times the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage; or

(c) The fund is dedicated by state constitutional provision, or local government statute, charter, ordinance, or order to pay for taking corrective action and compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, and is funded for less than five times the amount of coverage required under §280.93.
from the operation of petroleum underground storage tanks. A payment is made to the fund once every year for seven years until the fund is fully-funded. This seven year period is hereafter referred to as the "pay-in-period." The amount of each payment must be determined by this formula:

\[ TF - CF \]

\[ Y \]

Where TF is the total required financial assurance for the owner or operator, CF is the current amount in the fund, and Y is the number of years remaining in the pay-in-period, and:

(1) The local government owner or operator has available bonding authority, approved through voter referendum (if such approval is necessary prior to the issuance of bonds), for an amount equal to the difference between the required amount of coverage and the amount held in the dedicated fund. This bonding authority shall be available for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks, or

(2) The local government owner or operator has a letter signed by the appropriate state attorney general stating that (1) the use of the bonding authority will not increase the local government's debt beyond the legal debt ceilings established by the relevant state laws. The letter must also state that prior voter approval is not necessary before use of the bonding authority.

(d) To demonstrate that it meets the requirements of the local government fund mechanism, the chief financial officer of the local government owner or operator and/or guarantor must sign a letter worded exactly as follows, except that the instructions in brackets are to be replaced by the relevant information and the brackets deleted:

LETTER FROM CHIEF FINANCIAL OFFICER

I am the chief financial officer of [insert: name and address of local government owner or operator, or guarantor]. This letter is in support of the use of the local government fund mechanism to demonstrate financial responsibility for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage"] caused by [insert: "sudden accidental releases" and/or "nonsudden accidental releases"] in the amount of at least [insert: dollar amount] per occurrence and [insert: dollar amount] annual aggregate arising from operating (an) underground storage tank(s).

Underground storage tanks at the following facilities are assured by this local government fund mechanism: [List for each facility: the name and address of the facility where tanks are assured by the local government fund].

[Insert: "The local government fund is funded for the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage." or "The local government fund is funded for ten times the full amount of coverage required under §280.93, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining coverage," or "A payment is made to the fund once every year for seven years until the fund is fully-funded and [name of local government owner or operator] has available bonding authority, approved through voter referendum, of an amount equal to the difference between the required amount of coverage and the amount held in the dedicated fund" or "A payment is made to the fund once every year for seven years until the fund is fully-funded and I have attached a letter signed by the State Attorney General stating that (1) the use of the bonding authority will not increase the local government's debt beyond the legal debt ceilings established by the relevant state laws and (2) that prior voter approval is not necessary before use of the bonding authority"].

The details of the local government fund are as follows:

Amount in Fund (market value of fund at close of last fiscal year):

[If fund balance is incrementally funded as specified in §280.107(c), insert: Amount added to fund in the most recently completed fiscal year: Number of years remaining in the pay-in-period:]

A copy of the state constitutional provision, or local government statute, charter, ordinance or order dedicating the fund is attached.

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 280.107(d) as such regulations were constituted on the date shown immediately below.

[Date]

[Signature]

[Name]
§ 280.108 Substitution of financial assurance mechanisms by owner or operator.

(a) An owner or operator may substitute any alternate financial assurance mechanisms as specified in this subpart, provided that at all times he maintains an effective financial assurance mechanism or combination of mechanisms that satisfies the requirements of § 280.93.

(b) After obtaining alternate financial assurance as specified in this subpart, an owner or operator may cancel a financial assurance mechanism by providing notice to the provider of financial assurance.


§ 280.109 Cancellation or nonrenewal by a provider of financial assurance.

(a) Except as otherwise provided, a provider of financial assurance may cancel or fail to renew an assurance mechanism by sending a notice of termination by certified mail to the owner or operator.

(1) Termination of a local government guarantee, a guarantee, a surety bond, or a letter of credit may not occur until 120 days after the date on which the owner or operator receives the notice of termination, as evidenced by the return receipt.

(2) Termination of insurance or risk retention coverage, except for non-payment or misrepresentation by the insured, or state-funded assurance may not occur until 60 days after the date on which the owner or operator receives the notice of termination, as evidenced by the return receipt.

(b) If a provider of financial responsibility cancels or fails to renew for reasons other than incapacity of the provider as specified in § 280.114, the owner or operator must obtain alternate coverage as specified in this section within 60 days after receipt of the notice of termination. If the owner or operator fails to obtain alternate coverage within 60 days after receipt of the notice of termination, the owner or operator must notify the Director of the implementing agency of such failure and submit:

(1) The name and address of the provider of financial assurance;

(2) The effective date of termination; and

(3) The evidence of the financial assistance mechanism subject to the termination maintained in accordance with § 280.107(b).

[58 FR 9051, Feb. 18, 1993]

§ 280.110 Reporting by owner or operator.

(a) An owner or operator must submit the appropriate forms listed in § 280.111(b) documenting current evidence of financial responsibility to the Director of the implementing agency:

(1) Within 30 days after the owner or operator identifies a release from an underground storage tank required to be reported under § 280.53 or § 280.61;

(2) If the owner or operator fails to obtain alternate coverage as required by this subpart, within 30 days after the owner or operator receives notice of:

(i) Commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a provider of financial assurance as a debtor;

(ii) Suspension or revocation of the authority of a provider of financial assurance to issue a financial assurance mechanism;

(iii) Failure of a guarantor to meet the requirements of the financial test;

(iv) Other incapacity of a provider of financial assurance;

(3) As required by § 280.95(g) and § 280.109(b).

(b) An owner or operator must certify compliance with the financial responsibility requirements of this part as specified in the new tank notification form when notifying the appropriate state or local agency of the installation of a new underground storage tank under § 280.22.
(c) The Director of the Implementing Agency may require an owner or operator to submit evidence of financial assurance as described in §280.111(b) or other information relevant to compliance with this subpart at any time.

[58 FR 9051, Feb. 18, 1993]

§ 280.111 Recordkeeping.

(a) Owners or operators must maintain evidence of all financial assurance mechanisms used to demonstrate financial responsibility under this subpart for an underground storage tank until released from the requirements of this subpart under §280.113. An owner or operator must maintain such evidence at the underground storage tank site or the owner’s or operator’s place of work. Records maintained off-site must be made available upon request of the implementing agency.

(b) An owner or operator must maintain the following types of evidence of financial responsibility:

1. An owner or operator using an assurance mechanism specified in §§280.95 through 280.100 or §280.102 or §§280.104 through 280.107 must maintain a copy of the instrument worded as specified.

2. An owner or operator using a financial test or guarantee, or a local government financial test or a local government guarantee supported by the local government financial test must maintain a copy of the chief financial officer’s letter based on year-end financial statements for the most recent completed financial reporting year. Such evidence must be on file no later than 120 days after the close of the financial reporting year.

3. An owner or operator using a guarantee, surety bond, or letter of credit must maintain a copy of the signed standby trust fund agreement and copies of any amendments to the agreement.

4. A local government owner or operator using a local government guarantee under §280.106(d) must maintain a copy of the signed standby trust fund agreement and copies of any amendments to the agreement.

5. A local government owner or operator using the local government bond rating test under §280.104 must maintain a copy of its bond rating published within the last twelve months by Moody’s or Standard & Poor’s.

6. A local government owner or operator using the local government guarantee under §280.106, where the guarantor’s demonstration of financial responsibility relies on the bond rating test under §280.104 must maintain a copy of the guarantor’s bond rating published within the last twelve months by Moody’s or Standard & Poor’s.

7. An owner or operator using an insurance policy or risk retention group coverage must maintain a copy of the signed insurance policy or risk retention group coverage policy, with the endorsement or certificate of insurance and any amendments to the agreement.

8. An owner or operator covered by a state fund or other state assurance must maintain on file a copy of any evidence of coverage supplied by or required by the state under §280.101(d).

9. An owner or operator using a local government fund under §280.107 must maintain the following documents:

(i) A copy of the state constitutional provision or local government statute, charter, ordinance, or order dedicating the fund, and

(ii) Year-end financial statements for the most recent completed financial reporting year showing the amount in the fund. If the fund is established under §280.107(a)(3) using incremental funding backed by bonding authority, the financial statements must show the previous year’s balance, the amount of funding during the year, and the closing balance in the fund.

(iii) If the fund is established under §280.107(a)(3) using incremental funding backed by bonding authority, the owner or operator must also maintain documentation of the required bonding authority, including either the results of a voter referendum (under §280.107(a)(3)), or attestation by the State Attorney General as specified under §280.107(a)(3)(ii).
§ 280.112 Drawing on financial assurance mechanisms.

(a) Except as specified in paragraph (d) of this section, the Director of the implementing agency shall require the guarantor, surety, or institution issuing a letter of credit to place the amount of funds stipulated by the Director, up to the limit of funds provided by the financial assurance mechanism, into the standby trust if:

(1)(i) The owner or operator fails to establish alternate financial assurance within 60 days after receiving notice of cancellation of the guarantee, surety bond, letter of credit, or, as applicable, other financial assurance mechanism; and

(ii) The Director determines or suspects that a release from an underground storage tank covered by the mechanism has occurred and so notifies the owner or operator or the owner or operator has notified the Director pursuant to subparts E or F of a release from an underground storage tank covered by the mechanism; or

(2) The conditions of paragraph (b)(1) or (b)(2) (i) or (ii) of this section are satisfied.

(b) The Director of the implementing agency may draw on a standby trust fund when:

(1) The Director makes a final determination that a release has occurred and immediate or long-term corrective action for the release is needed, and the owner or operator, after appropriate notice and opportunity to comply, has not conducted corrective action as required under 40 CFR part 280, subpart F; or

(2) The Director has received either:

(i) Certification from the owner or operator and the third-party liability claimant(s) and from attorneys representing the owner or operator and the third-party liability claimant(s) that a third-party liability claim should be paid. The certification must be worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

CERTIFICATION OF VALID CLAIM

The undersigned, as principals and as legal representatives of [insert: owner or operator] and [insert: name and address of third-party claimant], hereby certify that the claim of bodily injury [and/or] property damage caused by an accidental release from operating [owner’s or operator’s] underground storage tank should be paid in the amount of $[llllll].

[Signatures]
Owner or Operator
Attorney for Owner or Operator
(Notary)
Date
[Signatures]
Claimant(s)
Attorney(s) for Claimant(s)
(Notary)
Date
or (ii) A valid final court order establishing a judgment against the owner or operator for bodily injury or property damage caused by an accidental release from an underground storage tank covered by financial assurance mechanisms for the most recent completed financial reporting year showing the amount of the fund.

(11)(i) An owner or operator using an assurance mechanism specified in §§ 280.95 through 280.107 must maintain an updated copy of a certification of financial responsibility worded as follows, except that instructions in brackets are to be replaced with the relevant information and the brackets deleted:

CERTIFICATION OF FINANCIAL RESPONSIBILITY

[Owner or operator] hereby certifies that it is in compliance with the requirements of subpart H of 40 CFR part 280.

The financial assurance mechanism(s) used to demonstrate financial responsibility under subpart H of 40 CFR part 280 is (are) as follows:

[For each mechanism, list the type of mechanism, name of issuer, mechanism number (if applicable), amount of coverage, effective period of coverage and whether the mechanism covers "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental releases"].

[Signature of owner or operator]
[Name of owner or operator]
[Title]
[Date]

[Signature of witness or notary]
[Name of witness or notary]
[Date]

(ii) The owner or operator must update this certification whenever the financial assurance mechanism(s) used to demonstrate financial responsibility change(s).

[58 FR 9051, Feb. 18, 1993]
under this subpart and the Director determines that the owner or operator has not satisfied the judgment.

(c) If the Director of the implementing agency determines that the amount of corrective action costs and third-party liability claims eligible for payment under paragraph (b) of this section may exceed the balance of the standby trust fund and the obligation of the provider of financial assurance, the first priority for payment shall be corrective action costs necessary to protect human health and the environment. The Director shall pay third-party liability claims in the order in which the Director receives certifications under paragraph (b)(2)(i) of this section, and valid court orders under paragraph (b)(2)(ii) of this section.

(d) A governmental entity acting as guarantor under §280.106(e), the local government guarantee without standby trust, shall make payments as directed by the Director under the circumstances described in §280.112 (a), (b), and (c).

[58 FR 9052, Feb. 18, 1993]

§ 280.113 Release from the requirements.

An owner or operator is no longer required to maintain financial responsibility under this subpart for an underground storage tank after the tank has been properly closed or, if corrective action is required, after corrective action has been completed and the tank has been properly closed as required by 40 CFR part 280, subpart G.


§ 280.114 Bankruptcy or other incapacity of owner or operator or provider of financial assurance.

(a) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming an owner or operator as debtor, the owner or operator must notify the Director of the implementing agency by certified mail of such commencement and submit the appropriate forms listed in §280.111(b) documenting current financial responsibility.

(b) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a guarantor providing financial assurance as debtor, such guarantor must notify the owner or operator by certified mail of such commencement as required under the terms of the guarantee specified in §280.96.

(c) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a local government owner or operator as debtor, the local government owner or operator must notify the Director of the implementing agency by certified mail of such commencement and submit the appropriate forms listed in §280.111(b) documenting current financial responsibility.

(d) Within 10 days after commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming a guarantor providing a local government financial assurance as debtor, such guarantor must notify the local government owner or operator by certified mail of such commencement as required under the terms of the guarantee specified in §280.106.

(e) An owner or operator who obtains financial assurance by a mechanism other than the financial test of self-insurance will be deemed to be without the required financial assurance in the event of a bankruptcy or incapacity of its provider of financial assurance, or a suspension or revocation of the authority of the provider of financial assurance to issue a guarantee, insurance policy, risk retention group coverage policy, surety bond, letter of credit, or state-required mechanism. The owner or operator must obtain alternate financial assurance as specified in this subpart within 30 days after receiving notice of such an event. If the owner or operator does not obtain alternate coverage within 30 days after such notification, he must notify the Director of the implementing agency.

(f) Within 30 days after receipt of notification that a state fund or other state assurance has become incapable of paying for assured corrective action or third-party compensation costs, the
§ 280.115 Replenishment of guarantees, letters of credit, or surety bonds.

(a) If at any time after a standby trust is funded upon the instruction of the Director of the implementing agency with funds drawn from a guarantee, local government guarantee with standby trust, letter of credit, or surety bond, and the amount in the standby trust is reduced below the full amount of coverage required, the owner or operator shall by the anniversary date of the financial mechanism from which the funds were drawn:

(1) Replenish the value of financial assurance to equal the full amount of coverage required, or

(2) Acquire another financial assurance mechanism for the amount by which funds in the standby trust have been reduced.

(b) For purposes of this section, the full amount of coverage required is the amount of coverage to be provided by § 280.93 of this subpart. If a combination of mechanisms was used to provide the assurance funds which were drawn upon, replenishment shall occur by the earliest anniversary date among the mechanisms.

[58 FR 9053, Feb. 18, 1993]

§ 280.116 Suspension of enforcement.

[Reserved]

Subpart I—Lender Liability

Source: 60 FR 46711, Sept. 7, 1995, unless otherwise noted.

§ 280.200 Definitions.

(a) UST technical standards, as used in this subpart, refers to the UST preventative and operating requirements under 40 CFR part 280, subparts B, C, D, G, and § 280.50 of subpart E.

(b) Petroleum production, refining, and marketing.

(1) Petroleum production means the production of crude oil or other forms of petroleum (as defined in § 280.12) as well as the production of petroleum products from purchased materials.

(2) Petroleum refining means the cracking, distillation, separation, conversion, upgrading, and finishing of refined petroleum or petroleum products.

(3) Petroleum marketing means the distribution, transfer, or sale of petroleum or petroleum products for wholesale or retail purposes.

(c) Indicia of ownership means evidence of a secured interest, evidence of an interest in a security interest, or evidence of an interest in real or personal property securing a loan or other obligation, including any legal or equitable title or deed to real or personal property acquired through or incident to foreclosure. Evidence of such interests include, but are not limited to, mortgages, deeds of trust, liens, surety bonds and guarantees of obligations, title held pursuant to a lease financing transaction in which the lessor does not select initially the leased property (hereinafter “lease financing transaction”), and legal or equitable title obtained pursuant to foreclosure. Evidence of such interests also includes assignments, pledges, or other rights to or other forms of encumbrance against property that are held primarily to protect a security interest. A person is not required to hold title or a security interest in order to maintain indicia of ownership.

(d) A holder is a person who, upon the effective date of this regulation or in the future, maintains indicia of ownership (as defined in § 280.200(c)) primarily to protect a security interest (as defined in § 280.200(f)(1)) in a petroleum UST or UST system or facility or property on which a petroleum UST or UST system is located. A holder includes the initial holder (such as a loan originator); any subsequent holder (such as a successor-in-interest or subsequent purchaser of the security interest on the secondary market); a guarantor of an obligation, surety, or any other person who holds ownership indicia primarily to protect a security interest; or a receiver or other person who acts on behalf or for the benefit of a holder.

(e) A borrower, debtor, or obligor is a person whose UST or UST system or facility or property on which the UST
or UST system is located is encumbered by a security interest. These terms may be used interchangeably.

(f) Primarily to protect a security interest means that the holder's indicia of ownership are held primarily for the purpose of securing payment or performance of an obligation.

(1) Security interest means an interest in a petroleum UST or UST system or in the facility or property on which a petroleum UST or UST system is located, created or established for the purpose of securing a loan or other obligation. Security interests include but are not limited to mortgages, deeds of trusts, liens, and title pursuant to lease financing transactions. Security interests may also arise from transactions such as sale and leasebacks, conditional sales, installment sales, trust receipt transactions, certain assignments, factoring agreements, accounts receivable financing arrangements, and consignments, if the transaction creates or establishes an interest in an UST or UST system or in the facility or property on which the UST or UST system is located, for the purpose of securing a loan or other obligation.

(2) Primarily to protect a security interest, as used in this subpart, does not include indicia of ownership held primarily for investment purposes, nor ownership indicia held primarily for purposes other than as protection for a security interest. A holder may have other, secondary reasons for maintaining indicia of ownership, but the primary reason why any ownership indicia are held must be as protection for a security interest.

(g) Operation means, for purposes of this subpart, the use, storage, filling, or dispensing of petroleum contained in an UST or UST system.

§ 280.210 Participation in management.

The term “participating in the management of an UST or UST system” means that, subsequent to the effective date of this subpart, December 6, 1995, the holder is engaging in decision-making control of, or activities related to, operation of the UST or UST system, as defined herein.

(a) Actions that are participation in management.

(1) Participation in the management of an UST or UST system means, for purposes of this subpart, actual participation by the holder in the management or control of decisionmaking related to the operation of an UST or UST system. Participation in management does not include the mere capacity or ability to influence or the unexercised right to control UST or UST system operations. A holder is participating in the management of the UST or UST system only if the holder either:

(i) Exercises decisionmaking control over the operational (as opposed to financial or administrative) aspects of the UST or UST system, such that the holder has undertaken responsibility for all or substantially all of the management of the UST or UST system; or

(ii) Exercises control at a level comparable to that of a manager of the borrower's enterprise, such that the holder has assumed or manifested responsibility for the overall management of the enterprise encompassing the day-to-day decisionmaking of the enterprise with respect to all, or substantially all, of the operational (as opposed to financial or administrative) aspects of the enterprise.

(2) Operational aspects of the enterprise relate to the use, storage, filling, or dispensing of petroleum contained in an UST or UST system, and include functions such as that of a facility or plant manager, operations manager, chief operating officer, or similar functions. Operational aspects of the enterprise do not include the financial or administrative aspects of the enterprise, or actions associated with environmental compliance, or actions undertaken voluntarily to protect the environment in accordance with applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 USC 6991c and 40 CFR part 281.
§ 280.210 40 CFR Ch. I (7–1–05 Edition)

(b) Actions that are not participation in management pre-foreclosure.

(1) Actions at the inception of the loan or other transaction. No act or omission prior to the time that indicia of ownership are held primarily to protect a security interest constitutes evidence of participation in management within the meaning of this subpart. A prospective holder who undertakes or requires an environmental investigation (which could include a site assessment, inspection, and/or audit) of the UST or UST system or facility or property on which the UST or UST system is located (in which indicia of ownership are to be held), or requires a prospective borrower to clean up contamination from the UST or UST system or to comply or come into compliance (whether prior or subsequent to the time that indicia of ownership are held primarily to protect a security interest) with any applicable law or regulation, is not by such action considered to be participating in the management of the UST or UST system or facility or property on which the UST or UST system is located.

(2) Loan policing and work out. Actions that are consistent with holding ownership indicia primarily to protect a security interest do not constitute participation in management for purposes of this subpart. The authority for the holder to take such actions may, but need not, be contained in contractual or other documents specifying requirements for financial, environmental, and other warranties, covenants, conditions, representations or promises from the borrower. Loan policing and work out activities cover and include all such activities up to foreclosure, exclusive of any activities that constitute participation in management.

(i) Policing the security interest or loan.

(A) A holder who engages in policing activities prior to foreclosure will remain within the exemption provided that the holder does not together with other actions participate in the management of the UST or UST system as provided in §280.210(a). Such policing activities include, but are not limited to, requiring the borrower to clean up contamination from the UST or UST system during the term of the security interest; requiring the borrower to comply or come into compliance with applicable federal, state, and local environmental and other laws, rules, and regulations during the term of the security interest; securing or exercising authority to monitor or inspect the UST or UST system or facility or property on which the UST or UST system is located (including on-site inspections) in which indicia of ownership are maintained, or the borrower’s business or financial condition during the term of the security interest; or taking other actions to adequately police the loan or security interest (such as requiring a borrower to comply with any warranties, covenants, conditions, representations, or promises from the borrower).

(B) Policing activities also include undertaking by the holder of UST environmental compliance actions and voluntary environmental actions taken in compliance with 40 CFR part 280, provided that the holder does not otherwise participate in the management or daily operation of the UST or UST system as provided in §280.210(a) and §280.230. Such allowable actions include, but are not limited to, release detection and release reporting, release response and corrective action, temporary or permanent closure of an UST or UST system, UST upgrading or replacement, and maintenance of corrosion protection. A holder who undertakes these actions must do so in compliance with the applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281. A holder may directly oversee these environmental compliance actions and voluntary environmental actions, and directly hire contractors to perform the work, and is not by such action considered to be participating in the management of the UST or UST system.

(ii) Loan work out. A holder who engages in work out activities prior to foreclosure will remain within the exemption provided that the holder does not together with other actions participate in the management of the UST
or UST system as provided in §280.210(a). For purposes of this rule, "work out" refers to those actions by which a holder, at any time prior to foreclosure, seeks to prevent, cure, or mitigate a default by the borrower or obligor; or to preserve, or prevent the diminution of, the value of the security. Work out activities include, but are not limited to, restructuring or renegotiating the terms of the security interest; requiring payment of additional rent or interest; exercising forbearance; requiring or exercising rights pursuant to an assignment of accounts or other amounts owing to an obligor; requiring or exercising rights pursuant to an escrow agreement pertaining to amounts owing to an obligor; providing specific or general financial or other advice, suggestions, counseling, or guidance; and exercising any right or remedy the holder is entitled to by law or under any warranties, covenants, conditions, representations, or promises from the borrower.

(c) Foreclosure on an UST or UST system or facility or property on which an UST or UST system is located, and participation in management activities post-foreclosure.

(1) Foreclosure. (i) Indicia of ownership that are held primarily to protect a security interest include legal or equitable title or deed to real or personal property acquired through or incident to foreclosure. For purposes of this subpart, the term "foreclosure" means that legal, marketable or equitable title or deed has been issued, approved, and recorded, and that the holder has obtained access to the UST, UST system, UST facility, and property on which the UST or UST system is located. Provided that the holder acted diligently to acquire marketable title or deed and to gain access to the UST, UST system, UST facility, and property on which the UST or UST system is located. The indicia of ownership held after foreclosure continue to be maintained primarily as protection for a security interest provided that the holder undertakes to sell, re-lease an UST or UST system or facility or property on which the UST or UST system is located, held pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), or otherwise divest itself of the UST or UST system or facility or property on which the UST or UST system is located, in a reasonably expeditious manner, using whatever commercially reasonable means are relevant or appropriate with respect to the UST or UST system or facility or property on which the UST or UST system is located, taking all facts and circumstances into consideration, and provided that the holder does not participate in management (as defined in §280.210(a)) prior to or after foreclosure.

(ii) For purposes of establishing that a holder is seeking to sell, re-lease pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), or divest in a reasonably expeditious manner an UST or UST system or facility or property on which the UST or UST system is located, the holder may use whatever commercially reasonable means as are relevant or appropriate with respect to the UST or UST system or facility or property on which the UST or UST system is located, or may employ the means specified in §280.210(c)(2). A holder that outbids, rejects, or fails to act upon a written bona fide, firm offer of fair consideration for the UST or UST system or facility or property on which the UST or UST system is located, as provided in §280.210(c)(2), is not considered to hold indicia of ownership primarily to protect a security interest.

(2) Holding foreclosed property for disposition and liquidation. A holder, who does not participate in management prior to or after foreclosure, may sell, re-lease, pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), an UST or UST system or facility or property on which the UST or UST system is located, liquidate, wind up operations, and take measures, prior to sale or other disposition, to preserve, protect, or prepare the secured UST or UST system or facility or property on which the UST or UST system is located. A holder may also arrange for an existing or new operator to continue or initiate operation of the UST or UST system.
The holder may conduct these activities without voiding the security interest exemption, subject to the requirements of this subpart.

(i) A holder establishes that the ownership indicia maintained after foreclosure continue to be held primarily to protect a security interest by, within 12 months following foreclosure, listing the UST or UST system or the facility or property on which the UST or UST system is located, with a broker, dealer, or agent who deals with the type of property in question, or by advertising the UST or UST system or facility or property on which the UST or UST system is located, as being for sale or disposition on at least a monthly basis in either a real estate publication or a trade or other publication suitable for the UST or UST system or facility or property on which the UST or UST system is located, or a newspaper of general circulation (defined as one with a circulation over 10,000, or one suitable under any applicable federal, state, or local rules of court for publication required by court order or rules of civil procedure) covering the location of the UST or UST system or facility or property on which the UST or UST system is located. For purposes of this provision, the 12-month period begins to run from December 6, 1995 or from the date that the marketable title or deed has been issued, approved and recorded, and the holder has obtained access to the UST, UST system, UST facility and property on which the UST or UST system is located, whichever is later, provided that the holder acted diligently to acquire marketable title or deed and to obtain access to the UST, UST system, UST facility and property on which the UST or UST system is located. If the holder fails to act diligently to acquire marketable title or deed or to gain access to the UST or UST system, the 12-month period begins to run from December 6, 1995 or from the date on which the holder first acquires either title to or possession of the secured UST or UST system, or facility or property on which the UST or UST system is located, whichever is later.

(ii) A holder that outbids, rejects, or fails to act upon an offer of fair consideration for the UST or UST system or the facility or property on which the UST or UST system is located, establishes by such outbidding, rejection, or failure to act, that the ownership indicia in the secured UST or UST system or facility or property on which the UST or UST system is located are not held primarily to protect the security interest, unless the holder is required, in order to avoid liability under federal or state law, to make a higher bid, to obtain a higher offer, or to seek or obtain an offer in a different manner.

(A) Fair consideration, in the case of a holder maintaining indicia of ownership primarily to protect a senior security interest in the UST or UST system or facility or property on which the UST or UST system is located, is the value of the security interest as defined in this section. The value of the security interest includes all debt and costs incurred by the security interest holder, and is calculated as an amount equal to or in excess of the sum of the outstanding principal (or comparable amount in the case of a lease that constitutes a security interest) owed to the holder immediately preceding the acquisition of full title (or possession in the case of a lease financing transaction) pursuant to foreclosure, plus any unpaid interest, rent, or penalties (whether arising before or after foreclosure). The value of the security interest also includes all reasonable and necessary costs, fees, or other charges incurred by the holder incident to work out, foreclosure, retention, preserving, protecting, and preparing, prior to sale, the UST or UST system or facility or property on which the UST or UST system is located, re-lease, pursuant to a lease financing transaction (whether by a new lease financing transaction or substitution of the lessee), of an UST or UST system or facility or property on which the UST or UST system is located, or other disposition. The value of the security interest also includes environmental investigation costs (which could include a site assessment, inspection, and/or audit of the UST or UST system or facility or property on which the UST or UST system is located), and corrective action costs incurred under §§ 280.51 through 280.67 or any other costs incurred as a result of reasonable efforts to comply with any
§ 280.220 Ownership of an underground storage tank or underground storage tank system or facility or property on which an underground storage tank or underground storage tank system is located.

Ownership of an UST or UST system or facility or property on which an UST or UST system is located. A holder is not an “owner” of a petroleum UST or UST system or facility or property on which a petroleum UST or UST system is located for purposes of compliance with the UST technical standards as defined in §280.200(a), the UST corrective action requirements under §§280.51 through 280.67, and the UST financial responsibility requirements under §§280.90 through 280.111, provided the person:

other applicable federal, state or local law or regulation; less any amounts received by the holder in connection with any partial disposition of the property and any amounts paid by the borrower (if not already applied to the borrower’s obligations) subsequent to the acquisition of full title (or possession in the case of a lease financing transaction) pursuant to foreclosure. In the case of a holder maintaining indicia of ownership primarily to protect a junior security interest, fair consideration is the value of all outstanding higher priority security interests plus the value of the security interest held by the junior holder, each calculated as set forth in this paragraph.

(B) Outbids, rejects, or fails to act upon an offer of fair consideration means that the holder outbids, rejects, or fails to act upon within 90 days of receipt, a written, bona fide, firm offer of fair consideration for the UST or UST system or facility or property on which the UST or UST system is located received at any time after six months following foreclosure, as defined in §280.210(c). A “written, bona fide, firm offer” means a legally enforceable, commercially reasonable, cash offer solely for the foreclosed UST or UST system or facility or property on which the UST or UST system is located, including all material terms of the transaction, from a ready, willing, and able purchaser who demonstrates to the holder’s satisfaction the ability to perform. For purposes of this provision, the six-month period begins to run from December 6, 1995 or from the date that marketable title or deed has been issued, approved and recorded to the holder, and the holder has obtained access to the UST, UST system, UST facility and property on which the UST or UST system is located, whichever is later, provided that the holder was acting diligently to acquire marketable title or deed and to obtain access to the UST or UST system, UST facility and property on which the UST or UST system is located. If the holder fails to act diligently to acquire marketable title or deed or to gain access to the UST or UST system, the six-month period begins to run from December 6, 1995 or from the date on which the holder first acquires either title to or possession of the secured UST or UST system, or facility or property on which the UST or UST system is located, whichever is later.

(3) Actions that are not participation in management post-foreclosure. A holder is not considered to be participating in the management of an UST or UST system or facility or property on which the UST or UST system is located when undertaking actions under 40 CFR part 280, provided that the holder does not otherwise participate in the management or daily operation of the UST or UST system as provided in §280.210(a) and §280.230. Such allowable actions include, but are not limited to, release detection and release reporting, release response and corrective action, temporary or permanent closure of an UST or UST system, UST upgrading or replacement, and maintenance of corrosion protection. A holder who undertakes these actions must do so in compliance with the applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281. A holder may directly oversee these environmental compliance actions and voluntary environmental actions, and directly hire contractors to perform the work, and is not by such action considered to be participating in the management of the UST or UST system.
§ 280.230 Operating an underground storage tank or underground storage tank system.

(a) Operating an UST or UST system prior to foreclosure. A holder, prior to foreclosure, as defined in §280.210(c), is not an "operator" of a petroleum UST or UST system for purposes of compliance with the UST technical standards as defined in §280.200(a), the UST corrective action requirements under §§280.51 through 280.67, and the UST financial responsibility requirements under §§280.90 through 280.111, provided that, after December 6, 1995, the holder is not in control of or does not have responsibility for the daily operation of the UST or UST system.

(b) Operating an UST or UST system after foreclosure. The following provisions apply to a holder who, through foreclosure, as defined in §280.210(c), acquires a petroleum UST or UST system or facility or property on which a petroleum UST or UST system is located.

(1) A holder is not an "operator" of a petroleum UST or UST system for purposes of compliance with 40 CFR part 280 if there is an operator, other than the holder, who is in control of or has responsibility for the daily operation of the UST or UST system, and who can be held responsible for compliance with applicable requirements of 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281.

(2) If another operator does not exist, as provided for under paragraph (b)(1) of this section, a holder is not an "operator" of the UST or UST system, for purposes of compliance with the UST technical standards as defined in §280.200(a), the UST corrective action requirements under §§280.51 through 280.67, and the UST financial responsibility requirements under §§280.90 through 280.111, provided that the holder:

(i) Empties all of its known USTs and UST systems within 60 calendar days after foreclosure or within 60 calendar days after December 6, 1995, whichever is later, or another reasonable time period specified by the implementing agency, so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remains in the system; leaves vent lines open and functioning; and caps and secures all other lines, pumps, manways, and ancillary equipment; and

(ii) Empties those USTs and UST systems that are discovered after foreclosure within 60 calendar days after discovery or within 60 calendar days after December 6, 1995, whichever is later, or another reasonable time period specified by the implementing agency, so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remains in the system; leaves vent lines open and functioning; and caps and secures all other lines, pumps, manways, and ancillary equipment.

(iii) If another operator does not exist, as provided for under paragraph (b)(1) of this section, in addition to satisfying the conditions under paragraph (b)(2) of this section, the holder must either:

(A) Permanently close the UST or UST system in accordance with §§280.71 through 280.74, except §280.72(b); or

(B) Temporarily close the UST or UST system in accordance with the following applicable provisions of §280.70:

(ii) Temporarily close the UST or UST system in accordance with the following applicable provisions of §280.70:

(A) Continue operation and maintenance of corrosion protection in accordance with §280.31;

(B) Report suspected releases to the implementing agency; and

(C) Conduct a site assessment in accordance with §280.72(a) if the UST system is temporarily closed for more than 12 months and the UST system does not meet either the performance standards in §280.20 for new UST systems or the upgrading requirements in §280.21, except that the spill and overfill equipment requirements do not have to be met. The holder must report any suspected releases to the implementing agency. For purposes of this provision, the 12-month period begins...
to run from December 6, 1995 or from the date on which the UST system is emptied and secured under paragraph (b)(2) of this section, whichever is later.

(4) The UST system can remain in temporary closure until a subsequent purchaser has acquired marketable title to the UST or UST system or facility or property on which the UST or UST system is located. Once a subsequent purchaser acquires marketable title to the UST or UST system or facility or property on which the UST or UST system is located, the purchaser must decide whether to operate or close the UST or UST system in accordance with applicable requirements in 40 CFR part 280 or applicable state requirements in those states that have been delegated authority by EPA to administer the UST program pursuant to 42 U.S.C. 6991c and 40 CFR part 281.
APPENDIX I TO PART 280—NOTIFICATION FOR UNDERGROUND STORAGE TANKS (FORM)

Notification for Underground Storage Tanks

## GENERAL INFORMATION

<table>
<thead>
<tr>
<th>I.D. Number</th>
<th>STATE USE ONLY</th>
</tr>
</thead>
</table>

**NOTIFICATION IS REQUIRED BY FEDERAL LAW FOR ALL UNDERGROUND STORAGE TANKS THAT HAVE BEEN USED TO STORE REGULATED SUBSTANCES SINCE JANUARY 1, 1976, OR ARE IN THE GROUND AS OF MAY 8, 1988, OR THAT ARE BUILT AFTER MAY 8, 1988. THE INFORMATION REQUIRED IS DEFINED IN SECTION 802 OF THE Resource Conservation and Recovery Act (RCRA), AS AMENDED.**

The primary purpose of this notification program is to locate and evaluate underground storage tanks that contain regulated substances. It is essential that the information you provide is retained on these forms and made available within 30 days of the occurrence of such spills, leaks, breaks, breaks, breaks, or leaks.

### WHO MUST NOTIFY?

Section 902 of RCRA, as amended, requires that, unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks. Owners mean:

1. In the case of an underground storage tank in use on November 8, 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage, use, or dispensing of regulated substances, and
2. In the case of underground storage tanks in use before November 8, 1984, but in use on that date, any person who owned such tank immediately before the discontinuance of its use.

### WHAT TANKS ARE INCLUDED?

Underground storage tanks are defined as any one or combination of tanks that:

1. Are installed underground or in the ground;
2. Store petroleum, natural gas, or liquefied petroleum gases;
3. Are closed pressure systems;
4. Serve more than one customer.

### WHAT TANKS ARE EXCLUDED?

Tanks excluded from the definition above are:

1. A tank under 55 gallons or less capacity used for residential purposes;
2. Tanks used for storing heating oil or consumer use on the premises where stored;
3. Septic tanks.

### INSTRUCTIONS

Please type or print in all ink all items except “signature” in Section V. This form must be completed for each location containing underground storage tanks. If more than one tank is owned at this location, photocopy the reverse side, and staple continuation sheets to this form.

## I. OWNERSHIP OF TANK(S)

<table>
<thead>
<tr>
<th>Area Code</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### I.1. LOCATION OF TANK(S)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Facility Code</th>
<th>City (nearest)</th>
<th>State</th>
<th>ZIP Code</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### I.2. CONTACT PERSON AT TANK LOCATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Job Title</th>
<th>Area Code</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

### I.3. TYPE OF NOTIFICATION

<table>
<thead>
<tr>
<th>Mark box here only if this is an amended or subsequent notification for this location</th>
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</thead>
<tbody>
<tr>
<td>Mark box here only if this is an amended or subsequent notification for this location</td>
</tr>
</tbody>
</table>

### I.4. CERTIFICATION (Read and sign after completing Section III.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Name: ____________________________
Signature: ________________________
Date: ____________________________

CONTINUE ON REVERSE SIDE

EPA Form 7330-1 (Revised 9-94)
<table>
<thead>
<tr>
<th>Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential Number (e.g., 1,2,3...)</th>
<th>Tank No.</th>
<th>Tank No.</th>
<th>Tank No.</th>
<th>Tank No.</th>
<th>Tank No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Status of Tank (Mark all that apply &gt;)</td>
<td>Currently in Use</td>
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<tr>
<td></td>
<td>Temporarily Out of Use</td>
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<td>Permanently Out of Use</td>
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<td></td>
<td>Brought into Use after 5/8/96</td>
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<td>2. Estimated Age (Years)</td>
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<td>3. Estimated Total Capacity (Gallons)</td>
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<td>4. Material of Construction (Mark one &gt;)</td>
<td>Steel</td>
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<td></td>
<td>Concrete</td>
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<td></td>
<td>Fiberglass Reinforced Plastic</td>
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<td></td>
<td>Unknown</td>
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<td>Other, Please Specify</td>
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<td>5. Internal Protection (Mark all that apply &gt;)</td>
<td>Cathodic Protection</td>
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<td></td>
<td>Interior Lining (e.g., epoxy resins)</td>
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<td></td>
<td>None</td>
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<td></td>
<td>Unknown</td>
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<td>Other, Please Specify</td>
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<td>6. External Protection (Mark all that apply &gt;)</td>
<td>Cathodic Protection</td>
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<td></td>
<td>Painted (e.g., asphaltic)</td>
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<td></td>
<td>Fiberglass Reinforced Plastic Coated</td>
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<td>None</td>
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<td>Other, Please Specify</td>
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<td>7. Piping (Mark all that apply &gt;)</td>
<td>Bare Steel</td>
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<td>Galvanized Steel</td>
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<td>Fiberglass Reinforced Plastic</td>
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<td>Cathodically Protected</td>
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<td>Unknown</td>
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<td>Other, Please Specify</td>
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<tr>
<td>8. Substance Currently or Last Stored in Greatest Quantity by Volume (Mark all that apply &gt;)</td>
<td>a. Empty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Petroleum</td>
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<td></td>
<td></td>
<td>Diesel</td>
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<td></td>
<td></td>
<td>Kerosene</td>
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<td>Gasoline (including alcohol blends)</td>
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<td></td>
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<td>Used Oil</td>
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<td>Other, Please Specify</td>
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<td>c. Hazardous Substance</td>
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<td></td>
<td>Please Indicate Name of Principal CERCLA Substance or Chemical Abstract Service (CAS) No.</td>
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<td>Mark box if tank stores a mixture of substances</td>
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<tr>
<td></td>
<td>d. Unknown</td>
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<tr>
<td>9. Additional Information (for tanks permanently taken out of service)</td>
<td>a. Estimated date last used (mo/yr)</td>
<td></td>
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<td></td>
<td>b. Estimated quantity of substance remaining (gal.)</td>
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<tr>
<td></td>
<td>c. Mark box if tank was filled with inert material (e.g., sand, concrete)</td>
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</tr>
</tbody>
</table>
APPENDIX II TO PART 280—LIST OF AGENCIES DESIGNATED TO RECEIVE NOTIFICATIONS

Alabama (EPA Form), Alabama Department of Environmental Management, Ground Water Section/Water Division, 1751 Congresswoman W.L. Dickinson Drive, Montgomery, Alabama 36130, 205/271-7823

Alaska (EPA Form), Department of Environmental Conservation, Box 0, Juneau, Alaska 99811-1800, 907/465-2653
Environmental Protection Agency

American Samoa (EPA Form), Executive Secretary, Environmental Quality Commission, Office of the Governor, American Samoa Government, Pago Pago, American Samoa 96799; Attention: UST Notification

Arizona (EPA Form), Attention: UST Coordinator, Arizona Department of Environmental Quality, Environmental Health Services, 2005 N. Central, Phoenix, Arizona 85004

Arkansas (EPA Form), Arkansas Department of Pollution Control and Ecology, P.O. Box 9583, Little Rock, Arkansas 72219, 501/562-7444

California (State Form), Executive Director, State Water Resources Control Board, P.O. Box 100, Sacramento, California 95801, 916/445-1533

Colorado (EPA Form), Section Chief, Colorado Department of Health, Waste Management Division, Underground Tank Program, 4210 East 11th Avenue, Denver, Colorado 80220, 303/893-8333

Connecticut (State Form), Hazardous Materials Management Unit, Department of Environmental Protection, State Office Building, 165 Capitol Avenue, Hartford, Connecticut 06106

Delaware (State Form), Division of Air and Waste Management, Department of Natural Resources and Environmental Control, P.O. Box 1403, 89 Kings Highway, Dover, Delaware 19903, 302/726-5409

District of Columbia (EPA Form), Attention: UST Notification Form, Department of Consumer and Regulatory Affairs, Pesticides and Hazardous Waste Management Branch, Room 114, 9010 Overlook Avenue SW., Washington, DC 20032

Florida (State Form), Florida Department of Environmental Regulation, Solid Waste Section, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399, 904/487-4398

Georgia (EPA Form), Georgia Department of Natural Resources, Environmental Protection Division, Underground Storage Tank Program, 3420 Norman Berry Drive, 7th Floor, Hapeville, Georgia 30354, 404/656-7404

Guam (State Form), Administrator, Guam Environmental Protection Agency, P.O. Box 2999, Agana, Guam 96910, Overseas Operator (Commercial call 646-8863)

Hawaii (EPA Form), Administrator, Hazardous Waste Program, 645 Hailekauwila Street, Honolulu, Hawaii 96813, 808/586-2270

Idaho (EPA Form), Underground Storage Tank Coordinator, Water Quality Bureau, Division of Environmental Quality, Idaho Department of Health and Welfare, 450 W. State Street, Boise, Idaho 83720, 208/334-4251

Illinois (EPA Form), Underground Storage Tank Coordinator, Division of Fire Prevention, Office of State Fire Marshal, 3150 Executive Park Drive, Springfield, Illinois 62703-4599

Indiana (EPA Form), Underground Storage Tank Program, Office of Environmental Response, Indiana Department of Environmental Management, 105 South Meridian Street, Indianapolis, Indiana 46225

Iowa (State Form), UST Coordinator, Iowa Department of Natural Resources, Henry A. Wallace Building, 900 East Grand, Des Moines, Iowa 50219, 512/281-8135

Kansas (EPA Form), Kansas Department of Health and Environment, Forbes Field, Building 740, Topeka, Kansas 66620, 913/296-1904

Kentucky (State Form), Department of Environmental Protection, Hazardous Waste Branch, Fort Boone Plaza, Building # 2, 18 Reilly Road, Frankfort, Kentucky 40601, 502/564-6716

Louisiana (State Form), Secretary, Louisiana Department of Environmental Quality, P.O. Box 4406, Baton Rouge, Louisiana 70004, 504/342-1265

Maine (State Form), Attention: Underground Tanks Program, Bureau of Oil and Hazardous Material Control, Department of Environmental Protection, State House—Station 17, Augusta, Maine 04333

Maryland (EPA Form), Science and Health Advisory Group, Office of Environmental Programs, 201 West Preston Street, Baltimore, Maryland 21201

Massachusetts (EPA Form), UST Registry, Department of Public Safety, 1010 Commonwealth Avenue, Boston, Massachusetts 02215, 617/566-4500

Michigan (EPA Form), Michigan Department of State Police, Fire Marshal Division, General Office Building, 7150 Harris Drive, Lansing, Michigan 48913

Minnesota (State Form), Underground Storage Tank Program, Bureau of Oil and Hazardous Wastes, Minnesota Pollution Control Agency, 520 West Lafayette Road, St. Paul, Minnesota 55155

Mississippi (State Form), Department of Natural Resources, Bureau of Pollution Control, Underground Storage Tank Section, P.O. Box 10385, Jackson, Mississippi 39209, 601/962-5171

Missouri (EPA Form), UST Coordinator, Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, Missouri 65102, 314/751-7428

Montana (EPA Form), Solid and Hazardous Waste Bureau, Department of Health and Environmental Science, Cogswell Bldg., Room B-203, Helena, Montana 59620

Nebraska (EPA Form), Nebraska State Fire Marshal, P.O. Box 94677, Lincoln, Nebraska 68509-4677, 402/471-9405

Nevada (EPA Form), Attention: UST Coordinator, Division of Environmental Protection, Department of Conservation and Natural Resources, Capitol Complex 201 S. Fall Street, Carson City, Nevada 89710, 809/992-0900, Ext. 4670, 702/885-4670

533
New Hampshire (EPA Form), NH Dept. of Environmental Services, Water Supply and Pollution Control Division, Hazen Drive, P.O. Box 95, Concord, New Hampshire 03301, Attention: UST Registration

New Jersey (State Form), Underground Storage Tank Coordinator, Department of Environmental Protection, Water Quality Branch, Division of Water Resources (CN-020), Trenton, New Jersey 08625, 609/292–0424

New Mexico (EPA Form), New Mexico Environmental Improvement Division, Ground-water Hazardous Waste Bureau, P.O. Box 968, Santa Fe, New Mexico 87504, 505/827–2933

New York (EPA Form), Bulk Storage Section, Division of Water, Department of Environmental Conservation, 50 Wolf Road, Room 336, Albany, New York 12233–0001, 518/477–4351

North Carolina (EPA Form), Division of Environmental Management, Ground-Water Operations Branch, Department of Natural Resources and Community Development, P.O. Box 27687, Raleigh, North Carolina 27611, 919/733–3271

North Dakota (EPA Form), Division of Hazardous Management and Special Studies, North Dakota Department of Health, Box 5520, Bismarck, North Dakota 58502–5520

Northern Mariana Islands (EPA Form), Chief, Division of Environmental Quality, P.O. Box 1304, Commonwealth of Northern Mariana Islands, Saipan, CN 96950. Cable Address: Gov. NMI Saipan, Overseas Operator: 6984

Ohio (State Form), State Fire Marshal's Office, Department of Commerce, 8895 E. Main Street, Reynoldsburg, Ohio 43068, State Hotline: 800/382–1927

Oklahoma (EPA Form), Underground Storage Tank Program, Oklahoma Corporation Comm., Jim Thorpe Building, Oklahoma City, Oklahoma 73105

Oregon (State Form), Underground Storage Tank Program, Hazardous and Solid Waste Division, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon 97204, 503/229–5788

Pennsylvania (EPA Form), PA Department of Environmental Resources, Bureau of Water Quality Management, Ground Water Unit, 9th Floor Fulton Building, P.O. Box 2063, Harrisburg, Pennsylvania 17120

Puerto Rico (EPA Form), Director, Water Quality Control Area, Environmental Quality Board, Commonwealth of Puerto Rico, Santurce, Puerto Rico, 809/725–0717

Rhode Island (EPA Form), UST Registration, Department of Environmental Management, 83 Park Street, Providence, Rhode Island 02903, 401/277–2294

South Carolina (State Form), Ground-Water Protection Division, South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201, 803/758–5213

South Dakota (EPA Form), Office of Water Quality, Department of Water and Natural Resources, Joe Foss Building, Pierre, South Dakota 57501

Tennessee (EPA Form), Tennessee Department of Health and Environment, Division of Superfund Underground Storage Tank Section, 150 Ninth Avenue, North, Nashville, Tennessee 37219–5404, 615/741–0860

Texas (EPA Form), Underground Storage Tank Program, Texas Water Commission, P.O. Box 13067, Austin, Texas 78711

Utah (EPA Form), Division of Environmental Health, P.O. Box 45500, Salt Lake City, Utah 84104–0500

Vermont (State Form), Underground Storage Tank Program, Vermont AEC/Waste Management Division, State Office Building, Montpelier, Vermont 05602, 802/382–3325

Virginia (EPA Form), Virginia Water Control Board, P.O. Box 11143, Richmond, Virginia 23230–1143, 804/257–6685

Virgin Islands (EPA Form), 205J Coordinator, Division of Natural Resources Management, 14 F Building 111, Watergut Homes, Christiansted, St. Croix, Virgin Islands 00820


West Virginia (EPA Form), Attention: UST Notification, Solid and Hazardous Waste, Ground Water Branch, West Virginia Department of Natural Resources, 1201 Greenbriar Street, Charleston, West Virginia 25311

Wisconsin (State Form), Bureau of Petroleum Inspection, P.O. Box 7069, Madison, Wisconsin 53707, 608/266–7605

Wyoming (EPA Form), Water Quality Division, Department of Environmental Quality, Herschler Building, 4th Floor West, 122 West 25th Street, Cheyenne, Wyoming 82002, 307/777–7781

APPENDIX III TO PART 280—STATEMENT FOR SHIPPING TICKETS AND INVOICES

NOTE. A Federal law (the Resource Conservation and Recovery Act (RCRA), as amended (Pub. L. 96–516)) requires owners of certain underground storage tanks to notify designated State or local agencies by May 8, 1986, of the existence of their tanks. Notifications for tanks brought into use after May 8, 1986, must be made within 30 days. Consult EPA's regulations, issued on November 8, 1985 (40 CFR part 280) to determine if you are affected by this law.
(C) identifiable environmental impacts of each project included in the study, including to fish and wildlife, water quality, and recreation;
(D) projected water yield from each such project;
(E) beneficiaries of each such project;
(F) the amount authorized and expended;
(G) projected funding needs and timelines for completing the study (if applicable);
(H) anticipated costs of each such project; and
(I) other factors that might interfere with construction of any such project.
(4) An identification of potential hydroelectric facilities that might be developed pursuant to each study identified under paragraph (1).
(5) Applicable costs and benefits associated with potential hydroelectric production pursuant to each study.

Approved August 8, 2005.
Musts For USTs

A Summary Of Federal Regulations For Underground Storage Tank Systems
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WHAT ARE THESE REGULATIONS ABOUT?

Over one million underground storage tank systems (USTs) in the United States contain petroleum or hazardous substances regulated by the U.S. Environmental Protection Agency (EPA). Many of these USTs have leaked or are currently leaking. More USTs will leak unless owners and operators make sure their USTs meet the requirements described in this booklet.

Releases from USTs--from spills, overfills, or leaking tanks and piping--can cause fires or explosions that threaten human safety. Releases from USTs can also contaminate the groundwater that many of us depend on for the water we drink.

Properly managed, USTs will not threaten our health or environment. Federal legislation, therefore, directed EPA to develop the UST regulations described in this booklet. Regulations require owners and operators of USTs to:

# **Prevent** releases from USTs (see pages 7, 12-17, and 19-21);

# **Detect** releases from USTs (see pages 8-11 and 19); and

# **Correct** the problems created by releases from USTs (see pages 22-24).

In addition, the regulations require owners and operators of USTs to demonstrate their ability to pay for correcting the problems created if their USTs do leak (see pages 2 and 5).
How Will These Regulations Affect You?

The regulations describe the steps you, as an UST owner or operator, need to take to help protect our health and environment. These steps will also help you avoid the high cost of cleaning up the environment and involving yourself in legal actions that can result if your tank or its piping leaks.

You must take these steps:

# If you install an UST after December 22, 1988, it must meet the requirements for new USTs concerning correct installation, leak detection, and spill, overfill, and corrosion protection (see pages 6-17).

# If you have an UST that was installed before December 22, 1988, it must meet two major requirements:

1) By December 1993, your UST must have leak detection (see pages 8-11 and 19).

2) By December 1998, your UST must have spill, overfill, and corrosion protection (see pages 12-17 and 19-21).

# You must take corrective action in response to leaks (see pages 22-24).

# You must follow closure requirements for tanks you temporarily or permanently close (see page 25).

# You must demonstrate your financial responsibility for the cost of cleaning up a leak and compensating other people for bodily injury and property damage. The financial responsibility requirements appear in the Code of Federal Regulations, 40 CFR Part 280. These requirements are briefly summarized in a free EPA booklet, Dollars And Sense, which you can order by calling EPA’s toll-free Hotline at 800 424-9346.

Basically, as an owner or operator of USTs storing petroleum, you must be able to demonstrate your ability to pay for damage costs that could occur if your USTs leaked. You need either $500,000 or $1 million in "per occurrence" coverage and either $1 million or $2 million in "aggregate" coverage, depending on your ownership category. Compliance deadlines were phased in according to categories of UST owners, but by February 1994 virtually every UST owner should have met the financial responsibility requirements. The table on page 5 displays UST categories, coverage amounts, and deadlines. See Dollars And Sense for details.
Who Is The "Regulatory Authority"?

This booklet describes EPA's basic requirements for USTs, but your state or local regulatory authority may have requirements that are somewhat different or more stringent. Contact your regulatory authority for its specific UST requirements. If you are not sure who your regulatory authority is, see the list of state UST contacts starting on page 35.

What's An “UST”?

An UST is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. The federal regulations apply only to USTs storing either petroleum or certain hazardous substances.

The "For Hazardous Substance USTs Only" section starting on page 28 identifies hazardous substances and special requirements for USTs storing them. Generally, the requirements for both petroleum and hazardous substance USTs are very similar.

Some kinds of tanks are not covered by these regulations:

# Farm and residential tanks of 1,100 gallons or less capacity holding motor fuel used for noncommercial purposes.

# Tanks storing heating oil used on the premises where it is stored.

# Tanks on or above the floor of underground areas, such as basements or tunnels.

# Septic tanks and systems for collecting storm water and wastewater.

# Flow-through process tanks.

# Emergency spill and overfill tanks.

Other storage sites, such as surface impoundments, are not covered by the federal requirements. Some tanks, such as field-constructed tanks, have been deferred from most of the regulations. (For details see the Code of Federal Regulations, 40 CFR Part 280.)

The tables on the next two pages display basic UST requirements and deadlines...
# When Do You Have To Act?

<table>
<thead>
<tr>
<th>TYPE OF TANK &amp; PIPING</th>
<th>LEAK DETECTION</th>
<th>SPILL &amp; OVERFILL PROTECTION</th>
<th>CORROSION PROTECTION</th>
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<tbody>
<tr>
<td>New Tanks &amp; Piping (installed after December 22, 1988)</td>
<td>At installation</td>
<td>At installation (Does not apply to piping)</td>
<td>At installation</td>
</tr>
<tr>
<td>Existing Tanks &amp; Piping (installed before December 22, 1988)</td>
<td>No later than December 1993</td>
<td>No later than December 22, 1998 (Does not apply to piping)</td>
<td>No later than December 22, 1998</td>
</tr>
</tbody>
</table>

# What Do You Have To Do?

## LEAK DETECTION *(see pages 8-11 and 19)*

**NEW TANKS**
- Monthly Monitoring*; or
- Inventory Control Plus Tank Tightness Testing** (only for 10 years after installation)

**EXISTING TANKS**
- Monthly Monitoring*; or
- Inventory Control Plus Tank Tightness Testing** (only for 10 years after adding spill, overfill, and corrosion protection); or
- Inventory Control Plus Annual Tank Tightness Testing (only until December 1998)

**NEW & EXISTING PRESSURIZED PIPING**
- Automatic Shutoff Device or Flow Restrictor or Continuous Alarm System; AND
- Annual Line Tightness Test or Monthly Monitoring* [except Automatic Tank Gauging]

**NEW & EXISTING SUCTION PIPING**
- Monthly Monitoring*; or
- Line Tightness Testing (every 3 years); or
- No Requirements (if the system has the characteristics described on page 11)

## SPILL & OVERFILL PROTECTION *(see pages 12-15)*

**ALL TANKS**
- Catchment Basins; AND
- Automatic Shutoff Devices or Overfill Alarms or Ball Float Valves

## CORROSION PROTECTION *(see pages 16-17 and 20-21)*

**NEW TANKS & PIPING**
- Coated and Cathodically Protected Steel; or
- Fiberglass Reinforced Plastic (FRP); or
- Steel Tank Clad With FRP (does not apply to piping)

**EXISTING TANKS & PIPING**
- Same Options As For New Tanks & Piping; or
- Cathodically Protected Steel; or
- Tank Interior Lining; or
- Tank Interior Lining AND Cathodic Protection

* Monthly Monitoring includes: Interstitial Monitoring; Automatic Tank Gauging; Vapor Monitoring; Groundwater Monitoring; Statistical Inventory Reconciliation; and other methods approved by the regulatory authority.

** Tanks 2,000 gallons and smaller may be able to use manual tank gauging (see page 9).
## How Does Financial Responsibility Work?

<table>
<thead>
<tr>
<th>GROUP OF UST OWNERS AND OPERATORS</th>
<th>COMPLIANCE DEADLINE</th>
<th>PER OCCURRENCE COVERAGE</th>
<th>AGGREGATE COVERAGE</th>
</tr>
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</table>
| **GROUP 1:** Petroleum marketers with 1,000 or more tanks  
OR Nonmarketers with net worth of $20 million or more  
(for nonmarketers, the "per occurrence" amount is the same as Group 4-B below) | January 1989 | $1 million | $1 million if you have 100 or fewer tanks |
| **GROUP 2:** Petroleum marketers with 100-999 tanks | October 1989 | $2 million | OR |
| **GROUP 3:** Petroleum marketers with 13-99 tanks | April 1991 | | $1 million if throughput is more than 10,000 gallons monthly |
| **GROUP 4-A:** Petroleum marketers with 1-12 tanks | December 1993 | | $500,000 if throughput is 10,000 gallons monthly or less |
| **GROUP 4-B:** Nonmarketers with net worth of less than $20 million | December 1993 | | OR |
| **GROUP 4-C:** Local governments (including Indian tribes not part of Group 5) | February 1994 | | $1 million |
| **GROUP 5:** Indian tribes owning USTs on Indian lands (USTs must be in compliance with UST technical requirements) | December 1998 | | |

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**Musts For USTs**  5
WHAT DO NEW PETROLEUM USTs NEED?

New UST systems are those installed after December 22, 1988.

You must meet four requirements when you install a new UST system:

- You must certify that the tank and piping are installed according to industry codes. See page 7.
- Your UST must have leak detection. See pages 8-11.
- Your UST must have devices that provide spill and overfill protection. Also, you must follow correct tank filling practices. See pages 12-15.
- Your UST must have corrosion protection. See pages 16 and 17.

The table on page 4 displays basic UST requirements and deadlines.

The following pages provide information on these requirements...
What you must do for installation:

# Make sure your UST is installed correctly by using qualified installers who follow industry codes. (See pages 31 and 34 for information on industry codes and installation practices.)

# Certify on a notification form (see page 26) that you have used a qualified installer who can assure you that your UST has been installed correctly.

Installation problems result from careless installation practices that do not follow standard industry codes and procedures. Improper installation is a significant cause of fiberglass-reinforced plastic (FRP) and steel UST failures, particularly piping failures. Installation includes excavation, tank system siting, burial depth, tank system assembly, backfilling around the tank system, and surface grading.

Many mistakes can be made during installation. For example, mishandling of the tank during installation can cause structural failure of FRP tanks or damage to steel tank coatings and cathodic protection. Improper layout of piping runs, incomplete tightening of joints, inadequate cover pad construction, and construction accidents can lead to failure of delivery piping.

You need to make sure that installers carefully follow the correct installation procedures called for by industry codes.
What you must do for leak detection:

You must provide your UST system with leak detection that allows you to meet three basic requirements:

# You can detect a leak from any portion of the tank or its piping that **routinely** contains petroleum;

# Your leak detection is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions; and

# Your leak detection meets the performance requirements described in the federal regulations (sections 280.43 and 280.44).

The **monthly monitoring methods** that you may use to meet the federal leak detection requirements are listed on the next page. As a **temporary** method, you may also use one of the two methods described on page 10. Please **note the additional leak detection requirements for piping on page 11**.

For a detailed booklet that focuses only on leak detection methods and requirements, order EPA's free booklet, **Straight Talk On Tanks**, by calling EPA's toll-free Hotline at 800 424-9346. Also, see page 32 and after for additional sources of information on leak detection.

**Some Leak Detection Methods**
Monthly Monitoring Methods

**Interstitial Monitoring:** This method detects leaks in the space between the UST and a second barrier. The regulations describe general performance requirements for interstitial monitoring with double-walled USTs, USTs fitted with internal liners, and USTs using interception barriers.

**Automatic Tank Gauging Systems:** This method uses automated processes to monitor product level and inventory control.

**Monitoring For Vapors In The Soil:** This method samples vapors in the soil gas surrounding the UST. Leaked petroleum produces vapors that can be detected in the soil gas. The regulations describe several requirements for using this leak detection method. For example, this method requires using porous soils in the backfill and locating the monitoring devices in these porous soils near the UST system.

**Monitoring For Liquids On The Groundwater:** This method monitors the groundwater table near an UST for the presence of released free product on the water table. Monitoring wells near the UST are checked frequently to see if petroleum can be detected. The regulations describe several requirements for the use of this method. For example, this method cannot be used if the water table is more than 20 feet below the surface of the ground.

**Statistical Inventory Reconciliation:** In this method, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data, which you must supply regularly.

**Other Methods Approved By The Regulatory Authority:** If other methods can be shown to work as effectively as the methods described above for leak detection, these alternative methods can be approved by the regulatory authority.
Alternate Leak Detection Method Good For 10 Years

Instead of using one of the monthly monitoring methods noted above, you can combine inventory control with tank tightness testing, **but only for 10 years after you install a new UST**. Inventory control involves taking daily measurements of tank contents and recording deliveries and amount pumped. Based upon some daily and monthly calculations, you can discover if your tank may be leaking. Tank tightness testing usually requires taking the UST out of service while changes in level or volume over time are measured. Your UST will need a tank tightness test every 5 years. **After 10 years, you must use one of the monthly monitoring methods.**

The success of this temporary combined method depends on your performing inventory control correctly. EPA has a booklet available, **Doing Inventory Control Right**, that clearly explains how to do inventory control with simple step-by-step directions. The booklet also includes standard forms used to record inventory data. You can order this free booklet by calling EPA's toll-free Hotline at 800 424-9346 and asking for **Doing Inventory Control Right**.

One Additional Leak Detection Method For Small Tanks

Tanks of 2,000 gallons capacity or less may be able to use **manual tank gauging** as a leak detection method, either by itself or in combination with tank tightness testing. This method involves keeping the tank undisturbed for at least 36 hours each week, during which the tank's contents are measured, twice at the beginning and twice at the end of the test period. Manual tank gauging can be used as the sole method of leak detection for the life of the tank **only** for tanks up to 1,000 gallons. Tanks between 1,001 and 2,000 gallons can use this method only in combination with tank tightness testing. This combined method, however, can be used only during the first 10 years following tank installation.

EPA has a booklet available, **Manual Tank Gauging: For Small Underground Storage Tanks**, that clearly explains how to do manual tank gauging with simple step-by-step directions. The booklet also includes standard forms used to record inventory data. You can order this free booklet by calling EPA's toll-free Hotline at 800 424-9346 and asking for **Manual Tank Gauging**.
Additional Leak Detection For Piping

Pressurized piping must meet the following requirements:

# The piping must have devices that automatically shut off or restrict flow or have an alarm that indicates a leak.

# You must either conduct an annual tightness test of the piping or use one of the following monthly methods noted above for tanks: interstitial monitoring, vapor monitoring, groundwater monitoring, statistical inventory reconciliation, or other approved monthly methods.

If your UST has suction piping, your leak detection requirements will depend on which type of suction piping you have.

# One type of suction piping does not require leak detection if it has the following characteristics:

  ▶ Below-grade piping operating at less than atmospheric pressure is sloped so that the piping's contents will drain back into the storage tank if the suction is released.

  ▶ Only one check valve is included in each suction line and is located directly below the suction pump.

# Suction piping that does not exactly match the characteristics noted above must have leak detection, either monthly monitoring (using one of the monthly methods noted above for use on pressurized piping) or tightness testing of the piping every 3 years.
**Spill Protection**

You and your fuel deliverer should watch "Keeping It Clean," a video that shows how deliveries can be made safely with no spills (see page 34 for ordering information).

**What you must do for spill protection:**

# Your USTs must have catchment basins to contain spills. Catchment basins are described below and on the next page. New USTs must have catchment basins when they are installed.

# You and your fuel deliverer must follow industry standards for correct filling practices.

Many releases at UST sites come from spills. Spills often occur at the fill pipe when the delivery truck’s hose is disconnected. Although these spills are usually small, repeated small releases can cause big environmental problems.

**Human error causes most spills.** These mistakes can be avoided by following standard tank filling practices. For example, you must make sure there is room in the UST for the delivery, and the delivery driver must watch the delivery at all times. If you and the delivery driver follow standard practices, nearly all spills can be prevented. For this reason, federal UST regulations require that you follow standard filling practices.

If an UST never receives more than 25 gallons at a time, the UST does not have to meet the spill protection requirements. Many small used oil tanks fall in this category.

**What Are Catchment Basins?**

Catchment basins are also called "spill containment manholes" or "spill buckets." Basically, a catchment basin is a bucket sealed around the fill pipe (see illustration below).

---

**Catchment Basin**

**Pump**

**Fill Pipe**
To protect against spills, the basin should be large enough to contain what may spill when the delivery hose is uncoupled from the fill pipe. Basins range in size from those capable of holding only a few gallons to those that are much larger—the larger the catchment basin, the more spill protection it provides.

You need a way to remove liquid from catchment basins. Manufacturers equip catchment basins with either pumps or drains to remove liquid. The illustration on the previous page shows a catchment basin with a pump; the illustration below shows a catchment basin with a drain.

You should try to keep water out of catchment basins. Some catchment basins can collect enough water and sediment, along with spilled product, to make draining this mixture into the tank unwise. If this happens, you may pump out the catchment basin and dispose of the liquid properly. If the liquid contains fuel or chemicals, it could be considered a hazardous waste. Contact your state agency responsible for hazardous waste for information on testing and handling requirements.
What you must do for overfill protection:

# Your UST must have overfill protection. New USTs must have overfill protection devices when they are installed. The three main types of overfill protection devices (automatic shutoff devices, overfill alarms, and ball float valves) are described below and on the next page.

# You and your fuel deliverer must follow industry standards for correct filling practices.

Overfills usually release much larger volumes than spills. When a tank is overfilled, large volumes can be released at the fill pipe and through loose fittings on the top of the tank or a loose vent pipe. The tightness of these fittings normally would not be a problem if the tank were not filled beyond its capacity.

You can solve overfill problems by:

# Making sure there is enough room in the tank for the delivery BEFORE the delivery is made;

# Watching the entire delivery to prevent overfilling or spilling; and

# Using overfill protection devices.

If an UST never receives more than 25 gallons at a time, the UST does not have to meet the overfill protection requirements. Many small used oil tanks fall in this category.

NOTE: If you have "pumped delivery" where fuel is delivered under pressure, you must make sure your overfill protection device works compatibly with pumped deliveries. Also, remember that overfill protection devices are effective only when combined with careful filling practices (as noted on page 12).

What Are Automatic Shutoff Devices?

An automatic shutoff device installed in an UST’s fill pipe can slow down and then stop the delivery when the product has reached a certain level in the tank. This device—sometimes simply called a "fill pipe device"—has one or two valves that are operated by a float mechanism (the illustration on the left shows one kind of automatic shutoff device).
Some automatic shutoff devices work in two stages. The first stage drastically reduces the flow of product to alert the driver that the tank is nearly full. The driver can then close the delivery valve and still have room in the tank for the product left in the delivery hose.

If the driver does not pay attention and the liquid level rises higher, the valve closes completely and no more liquid can be delivered into the tank, leaving the driver with a delivery hose full of product.

What Are Overfill Alarms?

Overfill alarms use probes installed in the tank (see illustration on the right) to activate an alarm when the tank is either 90 percent full or within 1 minute of being overfilled. Either way, the alarm should provide enough time for the driver to close the truck’s shutoff valve before an overfill happens. Alarms must be located where the driver can see or hear them easily. (Overfill alarms are often a part of automatic tank gauging systems.)

Overfill alarms work only if they alert the driver at the right time and the driver responds quickly. Remember to put the alarm on an electrical circuit that is active all the time so that the alarm will always work. Many deliveries are made at night when the facility is closed. You don’t want to turn off your alarm when you turn off the office lights.

What Are Ball Float Valves?

Ball float valves (see illustration on the right) are placed at the bottom of the vent line several inches below the top of the UST. The ball floats on the product and rises with product level during delivery until it restricts vapor flowing out the vent line BEFORE the tank is full. If all tank fittings are tight, the ball float valve can create enough back pressure to restrict product flow into the tank—which can notify the driver to close the truck’s shutoff valve. However, if the UST has loose fittings, sufficient back pressure may not develop and will result in an overfill. 

Note: Manufacturers do not recommend using ball float valves with suction piping, pressurized delivery, or coaxial Stage I vapor recovery.
What you must do for corrosion protection:

Your new USTs need to match one of the following performance standards:

- **Tank and piping completely made of noncorrodible material, such as fiberglass.** Corrosion protection is also provided if tank and piping are completely isolated from contact with the surrounding soil by being enclosed in or "jacketed" in noncorrodible material.

- **Tank and piping made of steel having a corrosion-resistant coating AND having cathodic protection** (such as an sti-P® tank with appropriate piping). A corrosion-resistant coating electrically isolates the coated metal from the surrounding environment to help protect against corrosion. *Asphaltic coating does NOT qualify as a corrosion-resistant coating.* Methods of cathodic protection are briefly explained on the next page.

- **Tank made of steel clad with a thick layer of noncorrodible material** (such as an ACT-100® tank). This option does not apply to piping. *Galvanized steel is NOT a noncorrodible material.*

Federal rules require corrosion protection for USTs because unprotected steel USTs corrode and release product through corrosion holes.
What Are Cathodic Protection Methods?

# Sacrificial Anode System: Sacrificial anodes can be attached to the UST for corrosion protection (as illustrated below). Sacrificial anodes are pieces of metal more electrically active than the steel UST. Because these anodes are more active, the corrosive current will exit from them rather than the UST. Thus, the UST is protected while the attached anode is "sacrificed."

# Impressed Current System: An impressed current system uses a rectifier to convert alternating current to direct current (see illustration below). This current is sent through an insulated wire to the anodes, which are special metal bars buried in the soil near the UST. The current then flows through the soil to the UST system, and returns to the rectifier through an insulated wire attached to the UST. The UST system is protected because the current going to the UST system overcomes the corrosion-causing current normally flowing away from it.
WHAT DO EXISTING PETROLEUM USTs NEED?

Existing UST systems are those installed before December 22, 1988.

Your existing USTs must meet the following requirements:

- **Leak Detection**: Have leak detection no later than December 1993 (see page 19).
- **Spill And Overfill Protection**: Have spill and overfill protection by December 22, 1998 (see page 19).
- **Corrosion Protection**: Have corrosion protection by December 22, 1998 (see pages 20-21).

The table on page 4 displays basic UST requirements and deadlines.

Although the regulatory deadline for spill, overfill, and corrosion protection is in 1998, you should make these improvements as soon as possible. Early action reduces your costs and reduces the chance that you will be liable for damages caused by releases from unimproved USTs.

*The following pages provide information on these requirements...*
All USTs must now have leak detection. USTs installed before December 22, 1988 had compliance deadlines that varied with the age of the USTs. By December 22, 1993, all of these "older" USTs had to be in compliance with leak detection requirements.

The leak detection requirements for existing USTs are similar to those for new tanks and piping, so please refer to pages 8-11.

# You can use any of the monthly monitoring methods listed for new USTs on page 9.

# You can use the combined method described on page 10 that combines inventory control and tank tightness testing. However, you can use this combined method only for 10 years after upgrading the UST with spill, overfill, and corrosion protection. After 10 years, you must use one of the monthly monitoring methods noted above. USTs that have not been upgraded can combine inventory control and annual tank tightness testing, but only until December 1998.

# Tanks of 2,000 gallons capacity or less may use manual tank gauging (see page 10). However, USTs between 1,001 and 2,000 gallons using the combination of manual tank gauging and tank tightness testing can only do so for 10 years after upgrading with spill, overfill, and corrosion protection. After 10 years, you must use one of the monthly monitoring methods noted above. USTs that have not been upgraded can combine manual tank gauging and annual tank tightness testing, but only until December 1998.

Other types of leak detection methods may be used if they have been approved by the regulatory authority.

All existing USTs must be upgraded with spill and overfill protection by December 1998. Otherwise, these USTs must be replaced with new USTs or permanently closed. EPA has a booklet available, Don't Wait Until 1998, that explains the requirements to upgrade, replace, or close USTs by 1998. You can order this free booklet by calling EPA's toll-free Hotline at 800 424-9346 and asking for Don't Wait Until 1998.

The requirements for spill and overfill are exactly the same for existing and new USTs, so please refer to pages 12-15 for information on spill and overfill requirements. However, you should already be following industry standards for tank filling procedures that will prevent spills and overfills (see pages 12 and 14).
All existing USTs must have corrosion protection by December 1998. Otherwise, these USTs must be replaced with new USTs or permanently closed. EPA has a booklet available, Don’t Wait Until 1998, that explains the requirements to upgrade, replace, or close USTs by 1998. You can order this free booklet by calling EPA’s toll-free Hotline at 800 424-9346 and asking for Don’t Wait Until 1998.

Your USTs already meet the requirements for corrosion protection if they match one of the performance standards for new USTs described on page 16:

- Tank and piping completely made of noncorrodible material, such as fiberglass.
- Tank and piping made of steel having a corrosion-resistant coating AND having cathodic protection. (Methods of cathodic protection are briefly explained on page 17.)
- Tank made of steel clad with a thick layer of noncorrodible material (such as an ACT-100® tank). This option does not apply to piping.

How Can You Add Corrosion Protection To Existing Steel USTs?

It is not practical to add coatings or claddings to existing steel USTs that have no corrosion protection. Instead, you must choose ONE of the following THREE methods to add corrosion protection to existing steel tanks:

1. Add cathodic protection. If you are adding ONLY cathodic protection, you must do the following:

   - First, assess tank integrity. Satisfy ONE of the following methods to make sure that the tank is structurally sound:
     - If the tank is LESS THAN 10 YEARS OLD, you can use results from one of the monthly leak detection methods to show the UST is not leaking (interstitial monitoring, automatic tank gauging, vapor monitoring, groundwater monitoring, statistical inventory reconciliation, or other approved methods).
     - If the tank is LESS THAN 10 YEARS OLD, you can use results from two tank tightness tests to show the UST is not leaking. The first test takes place before you install cathodic protection, and the second test takes place between 3 and 6 months after installation.
Musts For USTs

Page 17 describes cathodic protection methods. Impressed current systems work best with existing USTs.

Only tanks proven to be structurally sound can be lined.

! If the tank is 10 YEARS OLD OR MORE, it can be internally inspected, tested, and assessed to make sure that the tank is structurally sound and free of corrosion holes (see page 31 for industry codes).

! You can assess the tank for corrosion holes by a method that the regulatory authority determines is no less protective than those above.

0 Second, install cathodic protection. Regulations require a qualified corrosion expert to design cathodic protection systems installed at the UST site. The system must be tested by a qualified cathodic protection tester within 6 months of installation and at least every 3 years thereafter. You will need to keep the results of the last two tests to prove that the cathodic protection is working. In addition, you must inspect an impressed current system every 60 days to verify that the system is operating. Keep results of your last three inspections to prove that the impressed current system is operating properly.

2. Add interior lining to the tank. The interior of a tank can be lined with a thick layer of noncorrodible material (see page 31 for industry codes). Tanks using only an interior lining for corrosion protection must pass an internal reinspection in 10 years and every 5 years after that to make sure that the lining is sound. Keep records of the inspection results.

3. Combine cathodic protection and interior lining. You can add both cathodic protection and interior lining. The advantages for you of this combined method are simple: your USTs receive more protection; and you are not required to have the interior lining periodically inspected (which saves you the cost of these inspections). You will still need to have the cathodic protection system periodically tested and inspected and to keep records (as explained above).

And what about piping?

Existing steel piping must have cathodic protection. Note that cathodic protection needs to be designed by a qualified corrosion expert, tested and inspected periodically, and records kept (as explained above).

Piping entirely made of (or enclosed in) noncorrodible material, such as fiberglass, does not need cathodic protection.
WHAT DO YOU DO ABOUT UST RELEASES?

Warning signals indicate that your UST may be leaking and creating problems for the environment and your business. You can minimize these problems by paying careful attention to early warning signals and reacting to them quickly before major problems develop.

You should suspect a leak when you discover the following warning signals:

# **Unusual operating conditions** (such as erratic behavior of the dispensing pump). Check first to see if this problem results from equipment failure that can be repaired.

# **Results from leak detection monitoring and testing that indicate a leak.** What at first appears to be a leak may be the result of faulty equipment that is part of your UST system or its leak detection. Double check this equipment carefully for failures.

You need to call your regulatory authority and report suspected leaks. Then find out quickly if these *suspected leaks* are *actual leaks* using the following investigative steps:

# Conduct tightness testing of the entire UST system.

# Check the site for additional information on the presence and source of contamination.

If these system tests and site checks confirm a leaking UST, follow the actions for responding to *confirmed* leaks described on the next page.

You must also respond quickly to any evidence of leaked petroleum that appears at or near your site. For example, neighbors might tell you they smell petroleum vapors in their basements or taste petroleum in their drinking water. If evidence of this type is discovered, you must report this discovery *immediately* to the regulatory authority and take the investigative steps and follow-up actions noted above.
Your response to **confirmed** releases comes in two stages: **short-term** and **long-term**.

**Short-Term Actions**

# Take immediate action to stop and contain the release.

# Report the release to the regulatory authority within 24 hours. However, petroleum spills and overfills of less than 25 gallons do not have to be reported if you immediately contain and clean up these releases.

# Make sure the release poses no immediate hazard to human health and safety by removing explosive vapors and fire hazards. Your fire department should be able to help or advise you with this task. You must also make sure you handle contaminated soil properly so that it poses no hazard (for example, from vapors or direct contact).

# Remove petroleum from the UST system to prevent further release into the environment.

# Find out how far the petroleum has moved and begin to recover the leaked petroleum (such as product floating on the water table). Report your progress and any information you have collected to the regulatory authority no later than 20 days after confirming a release.

# Investigate to determine if the release has damaged or might damage the environment. This investigation must determine the extent of contamination both in soils and groundwater. You must report to the regulatory authority what you have learned from an investigation of your site according to the schedule established by the regulatory authority. At the same time, you must also submit a report explaining how you plan to clean up the site. Additional site studies may be required.

**Long-Term Actions**

Based on the information you have provided, the regulatory authority will decide if you must take further action at your site. You may need to take two more actions:

# Develop and submit a Corrective Action Plan that shows how you will meet requirements established for your site by the regulatory authority.

# Make sure you implement the steps approved by the regulatory authority for your site.
Can Leaking Tanks Be Repaired?

You can repair a leaking tank if the person who does the repair carefully follows standard industry codes that establish the correct way to conduct repairs. (See page 31 for industry codes and standards.)

Within 30 days of the repair, you must prove that the tank repair has worked by doing one of the following:

# Have the tank inspected internally or tightness tested following standard industry codes; or

# Use one of the monthly leak detection monitoring methods (see page 9); or

# Use other methods approved by the regulatory authority.

Within 6 months of repair, USTs with cathodic protection must be tested to show that the cathodic protection is working properly.

You must keep records for each repair as long as you keep the UST in service.

Can Leaking Piping Be Repaired?

Damaged metal piping cannot be repaired and must be replaced. Loose fittings can be tightened, and in some cases that may solve the problem.

Piping made of fiberglass-reinforced plastic can be repaired, but only in accordance with the manufacturer’s instructions or national codes of practice. Within 30 days of the repair, piping must be tested in the same ways noted above for testing tank repairs (except for internal inspection).
HOW DO YOU CLOSE USTs?

You can close your UST temporarily or permanently.

Closing Temporarily

You may temporarily close your UST for up to 12 months by following these requirements for temporary closure:

# Continue to monitor for leaks by maintaining the UST’s leak detection. (If your UST is empty, however, you do not need to maintain leak detection.) Also, continue to monitor and maintain any corrosion protection systems. If a release is discovered, respond as you would for a release from an active UST, as described on page 23.

# If the UST remains temporarily closed for more than 3 months, you must leave vent lines open, but cap and secure all other lines, pumps, manways, and ancillary equipment.

After 12 months of temporary closure, you must permanently close your UST. Your UST, however, can remain "temporarily" closed indefinitely if it meets the requirements for new or upgraded USTs and the requirements above for temporarily closed USTs.

Closing Permanently

If your UST does not meet the requirements for corrosion protection and it remains closed for more than 12 months, you must close it permanently. If you decide for any reason to close your UST permanently, follow these requirements for permanent closure:

# You must notify the regulatory authority 30 days before you close your UST.

# You must determine if contamination from your UST is present in the surrounding environment. If there is contamination, you will have to take the corrective actions described on page 23.

# You can either remove the UST from the ground or leave it in the ground. In both cases, the tank must be emptied and cleaned by removing all liquids, dangerous vapor levels, and accumulated sludge. These potentially very hazardous actions need to be carried out carefully by following standard safety practices. (See pages 31 and 34 for sources of information on good closure practices.) If you leave the UST in the ground, you must also fill it with a harmless, chemically inactive solid, like sand. The regulatory authority can help you decide how best to close your UST so that it meets local requirements for closure.
WHAT DO YOU NEED TO REPORT?

You need to report to the regulatory authority on the following occasions:

# When you install an UST, you have to fill out a **notification form** available from your state. This form provides information about your UST, including a certification of correct installation. (You should have already used this form to identify your existing USTs. If you haven't done that yet, be sure you do so now.)

# You must report suspected releases to the regulatory authority (see page 22). If a release is confirmed, you must also report follow-up actions you plan or have taken to correct the damage caused by your UST (see page 23).

# You must notify the regulatory authority 30 days before you permanently close your UST (see page 25).

You should check with your regulatory authority about the particular reporting requirements in your area, including any additional or more stringent requirements than those noted above.

If you are not sure who your regulatory authority is, see the list of state UST contacts starting on page 35.

**REPORTING**

- **Installation**
  - Notify

- **Suspected Release**
  - Report

- **Corrective Action**
  - Plan

- **Closure**
WHAT RECORDS MUST YOU KEEP?

You will have to keep records that can be provided to an inspector during an on-site visit that prove your facility meets certain requirements. These records must be kept long enough to show your facility's recent compliance status in four major areas:

# You will have to keep records of leak detection performance and maintenance:
  - The last year's monitoring results, and the most recent tightness test.
  - Copies of performance claims provided by leak detection manufacturers.
  - Records of recent maintenance, repair, and calibration of on-site leak detection equipment.

# You will have to keep records showing the required inspections and tests of your corrosion protection system.

# You must keep records showing that a repaired or upgraded UST system was properly repaired or upgraded.

# For at least 3 years after closing an UST, you must keep records of the site assessment results required for permanent closure. (These results show what impact your UST has had on the surrounding area.)

# You must keep records that document your financial responsibility, as explained in EPA's booklet, Dollars And Sense (to order this booklet, see page 33).

You should check with your regulatory authority about the particular recordkeeping requirements in your area. Generally, you should follow this useful rule of thumb for recordkeeping: When in doubt, keep it.
FOR HAZARDOUS SUBSTANCE USTs ONLY

Several hundred substances were designated as "hazardous" in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

The UST regulations apply to the same hazardous substances identified by CERCLA, except for those listed as hazardous wastes. These hazardous wastes are already regulated under Subtitle C of the Resource Conservation and Recovery Act and are not covered by the UST regulations. (See 40 CFR Parts 260-270 for the hazardous waste regulations.) Information on the CERCLA hazardous substances is available from EPA through the RCRA/CERCLA Hotline at 800 424-9346.

What Requirements Apply To New Hazardous Substance USTs?

New hazardous substance USTs are those installed after December 22, 1988. These USTs have to meet the same requirements described earlier for new petroleum USTs concerning correct installation, spill, overfill and corrosion protection, corrective action, and closure. (See pages 7 and 12-17.)

In addition, new hazardous substance USTs must have secondary containment and interstitial monitoring for leak detection, as described below.

Secondary Containment

All new hazardous substance USTs must have "secondary containment." A single-walled tank is the first or "primary" containment. Using only primary containment, a leak can escape into the environment. But by enclosing an UST within a second wall, leaks can be contained and detected quickly before harming the environment.

There are several ways to construct secondary containment:

# Placing one tank inside another tank or one pipe inside another pipe (making them double-walled systems).

# Placing the UST system inside a concrete vault.

# Lining the excavation zone around the UST system with a liner that cannot be penetrated by the hazardous substance.
**Interstitial Monitoring**

The hazardous substance UST must have a leak detection system that can indicate the presence of a leak in the confined space between the first and the second wall. Several devices are available to monitor this confined "interstitial" space. ("Interstitial" simply means "between the walls.") The UST regulations describe these various methods and the requirements for their proper use.

You can apply for an exception, called a **variance**, from the requirement for secondary containment and interstitial monitoring. To obtain a variance you must demonstrate to the regulatory authority that your alternative leak detection method will work effectively by providing detailed studies of your site, proposed leak detection method, and available methods for corrective action.

**What About Existing Hazardous Substance USTs?**

**Existing UST systems are those installed before December 22, 1988.** In addition to immediately starting tank filling procedures that prevent spills and overfills, you will need to meet the following requirements for existing USTs.

**Leak Detection**

Deadlines for compliance with leak detection requirements were phased in according to the age of the UST. **By December 22, 1993, all existing USTs were required to have leak detection.** Pressurized piping must meet the requirements for **new pressurized piping** (described on page 11).

You can meet the leak detection requirements in one of the following three ways:

# Until December 1998, you can use any of the leak detection methods described on page 19 **but only if** the method you choose can effectively detect releases of the hazardous substance stored in the UST.

# After December 22, 1998, your UST must meet the same requirements for secondary containment and interstitial monitoring that apply to new hazardous substance USTs.

# After December 22, 1988, a **variance** can be granted if you meet the same requirements described above for receiving a variance for a new hazardous substance UST.
Spill, Overfill, and Corrosion Protection

By December 22, 1998, you must improve your USTs:

# By using devices that **prevent spills and overfills**.

# By adding **corrosion protection** to steel tanks and piping.

Although the regulatory deadline is in 1998, you should make these improvements as soon as you can to reduce the chance that you will be liable for damages caused by your unimproved UST.

What If You Have A Hazardous Substance Release?

You must follow the same short-term and long-term actions described earlier for petroleum releases on page 23, with two exceptions.

First, you must immediately report hazardous substance spills or overfills that meet or exceed their "reportable quantities" to the National Response Center at 800 424-8802 or 202 267-2675.

Second, you must also report hazardous substance spills or overfills that meet or exceed their "reportable quantities" to the regulatory authority within 24 hours. However, if these spills or overfills are smaller than their "reportable quantities" and are immediately contained and cleaned up, they do not need to be reported. You can get information on the "reportable quantities" by calling the EPA RCRA/CERCLA Hotline at 800 424-9346.
### Industry Codes And Standards

**Installation**

- API Recommended Practice 1615 (1987), "Installation of Underground Petroleum Storage Systems"

**Tank Filling Practices**

- NFPA 385 (1985), "Standard for Tank Vehicles for Flammable and Combustible Liquids"

**Closure**

- API Recommended Practice 1604 (1987), "Removal and Disposal of Used Underground Petroleum Storage Tanks"

**Assessing Tank Integrity, Repairing Tanks, and Interior Lining Of Tank**

- API Recommended Practice 1631 (1992), "Interior Lining of Underground Storage Tanks"
- NLPA Standard 631 (1991), "Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks"

**Corrosion Protection**

- API Recommended Practice 1632 (1987), "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems"
- NACE RP-0169-92 (1992), "Standard Recommended Practice: Control of Corrosion on Underground or Submerged Metallic Piping Systems"
- NACE RP-0285-85 (1985), "Standard Recommended Practice: Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems"
- STI R892-91 (1991), "Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems"

**General (Repair, Spill and Overfill, Installation, Compatibility)**

- API Recommended Practice 1621 (1993), "Bulk Liquid Stock Control at Retail Outlets"
- API Recommended Practice 1626 (1985), "Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations"
- API Recommended Practice 1627 (1986), "Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations"
- API Recommended Practice 1635 (1987), "Management of Underground Petroleum Storage Systems at Marketing and Distribution Facilities"
- NFPA 30 (1993), "Flammable and Combustible Liquids Code"
- NFPA 30A (1993), "Automotive and Marine Service Station Code"

*Organizations are identified on the next page.
## Organizations To Contact For UST Information

<table>
<thead>
<tr>
<th>Organization</th>
<th>Address</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>API -- American Petroleum Institute</td>
<td>1220 L Street, N.W. Washington, DC 20005</td>
<td>(202) 682-8000</td>
</tr>
<tr>
<td>Fiberglass Petroleum Tank and Pipe Institute</td>
<td>9801 Westheimer; Suite 606 Houston, TX 77042-3951</td>
<td>(713) 465-3310</td>
</tr>
<tr>
<td>NACE International (formerly the National Association of Corrosion Engineers)</td>
<td>Box 218340 Houston, TX 77218-8340</td>
<td>(713) 492-0535</td>
</tr>
<tr>
<td>DLPA -- National Leak Prevention Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NLPA -- National Leak Prevention Association</td>
<td>Box 1643 Boise, ID 83701</td>
<td>(208) 336-6941</td>
</tr>
<tr>
<td>PEI -- Petroleum Equipment Institute</td>
<td>Box 2380 Tulsa, OK 74101-2380</td>
<td>(918) 494-9696</td>
</tr>
<tr>
<td>Steel Tank Institute</td>
<td>570 Oakwood Road Lake Zurich, IL 60047</td>
<td>(708) 438-TANK [8265]</td>
</tr>
<tr>
<td>NFPA -- National Fire Protection Association</td>
<td>1 Batterymarch Park Box 9101 Quincy, MA 02269-9101</td>
<td>(617) 770-3000</td>
</tr>
</tbody>
</table>
### PUBLICATIONS

<table>
<thead>
<tr>
<th>TITLE</th>
<th>AVAILABLE FREE FROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight Talk On Tanks: Leak Detection Methods For Petroleum Underground Storage Tanks</td>
<td>Booklet explains federal regulatory requirements for leak detection and briefly describes allowable leak detection methods. (About 30 pages.)</td>
</tr>
<tr>
<td>Doing Inventory Control Right: For Underground Storage Tanks</td>
<td>Booklet describes how owners and operators of USTs can use inventory control and periodic tightness testing to meet federal leak detection requirements. Contains reporting forms. (About 16 pages.)</td>
</tr>
<tr>
<td>Don't Wait Until 1998: Spill, Overfill, And Corrosion Protection For Underground Storage Tanks</td>
<td>Information to help owners and operators of USTs meet the 1998 deadline for compliance with requirements to upgrade, replace, or close USTs installed before December 1988. (About 16 pages.)</td>
</tr>
<tr>
<td>Dollars And Sense: Financial Responsibility Requirements For Underground Storage Tanks</td>
<td>Booklet clearly summarizes the &quot;financial responsibility&quot; required of UST owners and operators by federal UST regulations. (About 16 pages.)</td>
</tr>
<tr>
<td>An Overview Of Underground Storage Tank Remediation Options</td>
<td>Fact sheets provide information about technologies that can be used to remediate petroleum contamination in soil and groundwater. (About 26 pages.)</td>
</tr>
<tr>
<td>Controlling UST Cleanup Costs</td>
<td>Fact sheet series on the cleanup process includes: Hiring a Contractor, Negotiating the Contract, Interpreting the Bill, Managing the Process, and Understanding Contractor Code Words. (About 10 pages.)</td>
</tr>
<tr>
<td>Federal Register Reprints</td>
<td>Not simple summaries, these reprints are extensive records of the rulemaking process including technical information, explanatory preambles, and the rules as they appear in the Code of Federal Regulations. Reprints dated 9/23/88; 10/26/88; 11/9/89; 5/2/90; and 2/18/93. Over 300 pages.</td>
</tr>
</tbody>
</table>

You can call EPA's toll-free RCRA/Superfund Hotline at 800 424-9346 and order free copies. Just identify the titles you want. Or you can write and ask for titles by addressing your requests to:

**NCEPI**  
Box 42419  
Cincinnati, OH 45242

Or you can fax your order to NCEPI at 513 891-6685.
## Publications And Videos About USTs

### VIDEOS

<table>
<thead>
<tr>
<th>TITLE/COST</th>
<th>AVAILABLE FROM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doing It Right</strong></td>
<td>Environmental Media Center</td>
</tr>
<tr>
<td>Illustrates proper installation of underground tanks and piping for installation crews. Part 1: Tanks (24 minutes); Part 2: Piping (16 minutes). Cost: $25</td>
<td>Box 30212  Bethesda, MD 20814  301 654-7141  800 522-0362  Visa and MasterCard accepted</td>
</tr>
<tr>
<td><strong>Doing It Right II: Installing Required UST Equipment</strong></td>
<td></td>
</tr>
<tr>
<td>Illustrates installation of spill and overfill equipment, observation wells, and piping leak detection (23 minutes). Cost: $60</td>
<td><strong>Doing It Right</strong> and <strong>Doing it Right II</strong> Set Cost: $75</td>
</tr>
<tr>
<td><strong>Keeping It Clean: Making Safe And Spill-Free Motor Fuel Deliveries</strong></td>
<td></td>
</tr>
<tr>
<td>Making pollution-free deliveries to USTs. Includes Stage 1 vapor recovery, overfill prevention and spill containment. For fuel tanker drivers and UST owner/operators (25 minutes). Cost: $60</td>
<td><strong>Petroleum Leaks Underground</strong></td>
</tr>
<tr>
<td>How liquids and vapors move in the subsurface and why early response to leaked petroleum is so important. Part 1: How Liquids Move (14 minutes); Part 2: How Vapors Move (15 minutes). Cost: $75</td>
<td><strong>Straight Talk On Leak Detection</strong></td>
</tr>
<tr>
<td>Overview of the leak detection methods available for complying with federal regulations. Part 1: Straight Talk From Tank Owners (owners address the problems of UST compliance [5 minutes]); Part 2: Straight Talk On Leak Detection (30 minutes). Cost: $40</td>
<td></td>
</tr>
<tr>
<td><strong>Tank Closure Without Tears: An Inspector’s Safety Guide</strong></td>
<td>New England Interstate Training Center</td>
</tr>
<tr>
<td>Focuses on explosive vapors and safe tank removal (30 minutes). Video and Booklet Cost: $35; Booklet: $5</td>
<td>ATTN:VIDEOS  2 Fort Road  South Portland, ME 04106  207 767-2539</td>
</tr>
<tr>
<td><strong>What Do We Have Here?: An Inspector’s Guide To Site Assessment At Tank Closure</strong></td>
<td></td>
</tr>
<tr>
<td>Inspecting sites for contamination where tanks have been removed. Part 1: Site Assessment Overview (30 minutes); Part 2: Field Testing Instruments At A Glance (14 minutes); Part 3: Soil And Water Sampling At A Glance (7 minutes). Video and Booklet Cost: $45; Booklet: $5</td>
<td><strong>Searching For The Honest Tank: A Guide To UST Facility Compliance Inspection</strong></td>
</tr>
<tr>
<td>Covers major steps of UST inspections from protocols and equipment to enforcement and followup; from cathodic protection to leak detection. Directed at inspectors, yet also helpful to owners and operators (30 minutes). Video and Booklet Cost: $40; Booklet: $5</td>
<td></td>
</tr>
</tbody>
</table>

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Visa and MasterCard accepted

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Visa and MasterCard accepted
State Contacts For UST Information

[LUST contacts focus on leaking underground storage tanks.]

Alabama Dept. of Env. Management
Groundwater Section/ Water Division
Box 301463
Montgomery, AL 36130-1463
UST phone: 334 271-7986
LUST phone: 334 271-7834

Alaska Dept. of Env. Conservation
410 Willoughby Ave.
Juneau, AK 99801-1795
phone: 907 465-5203

Arizona Dept. of Env. Quality
3033 N. Central Ave.
Phoenix, AZ 85012
phone: 602 207-4324

Arkansas Dept. of Pollution Control & Ecology
Regulated Storage Tank Division
8001 National Dr.
Little Rock, AR 72209
phone: 501 570-2801

California State Water Resources Control Board
Div. of Clean Water Program
Box 944212
Sacramento, CA 94244-2120
phone: 916 227-4313

[UST contact]
Colorado Dept. of Health
UST Program
4300 Cherry Creek Dr. S.
Denver, CO 80220
phone: 303 692-3453

Connecticut Dept. of Env. Protection
UST Program
State Office Bldg.
79 Elm Street
Hartford, CT 06106
phone: 203 424-3374

DC Env. Regulatory Administration
Pesticides, Hazardous Waste & UST Div.
2100 Martin Luther King Ave. S.E., Suite 203
Washington, D.C. 20020
phone: 202 645-6080

Delaware Dept. of Natural Resources & Env. Control
UST Branch
715 Grantham Lane
New Castle, DE 19720
phone: 302 323-4588

Florida Dept. of Env. Regulation
Tank Section
Twin Towers Office Bldg., Rm. 403
2600 Blair Stone Road
Tallahassee, FL 32399-2400
phone: 904 488-3935

Georgia Dept. of Natural Resources
UST Mgmt. Program
4244 Int'l. Parkway, Suite 100
Atlanta, GA 30354
phone: 404 362-2687

Hawaii Dept. of Health
Solid and Hazardous Waste Branch
919 Ala Moana Blvd., Suite 212
Honolulu, HI 96814
phone: 808 586-4226

Idaho Dept. of Health & Welfare
Div. of Env. Quality
1410 North Hilton Boise, ID 83706
phone: 208 334-0542

[UST contact]
Illinois Office of State Fire Marshall
Div. of Petroleum & Chem. Safety
1035 Stevenson Dr.
Springfield, IL 62703
phone: 217 785-5878

[UST contact]
Illinois EPA
Div. of Remediation Mgmt.
LUST Section
Box 19276
Springfield, IL 62796
phone: 217 782-6760

Indiana Dept. of Env. Mgmt.
Office of Env. Response
Box 7015
Indianapolis, IN 46206
phone: 317 233-6418

Iowa Dept. of Natural Resources
UST Section
Wallace State Office Bldg.
900 East Grand
Des Moines, IA 50319
phone: 515 281-8135

Kansas Dept. of Health & Env.
Bureau of Env. Remediation
Storage Tank Section
Forbes Field, Bldg. 740
Topeka, KS 66620
phone: 913 296-1678

Kentucky Div. of Waste Mgmt.
UST Branch
14 Reilly Road
Frankfort, KY 40601
phone: 502 564-6716

Louisiana Dept. of Env. Quality
UST Division
Box 82178
Baton Rouge, LA 70810
phone: 504 765-0243

Maine Dept. of Env. Protection
State House, Station 17
Hospital St., Ray Bldg.
Augusta, ME 04333
phone: 207 287-2651

Maryland Dept. of Env. Waste Mgmt. Adm.
Oil Control Program
2500 Broening Highway
Baltimore, MD 21224
phone: 410 631-3442

Massachusetts Dept. of Public Safety
UST Program
1010 Commonwealth Ave.
Boston, MA 02215
phone: 617-351-6000

[UST contact]
Massachusetts Dept. of Env. Protection
Bureau of Waste Site Cleanup
One Winter St.
Boston, MA 02108
phone: 617 556-1044
<table>
<thead>
<tr>
<th>State</th>
<th>Division/Program</th>
<th>Contact Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>Dept. of Natural Resources</td>
<td>UST Division Box 30157, Lansing, MI 48909 UST phone: 517 373-8168 MUSTFA (state fund): 517 373-6247</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Pollution Control Agency</td>
<td>Tanks and Spills Section 520 Lafayette Road North St. Paul, MN 55155-3898 phone: 612 297-8609</td>
</tr>
<tr>
<td>Mississippi</td>
<td>Dept. of Env. Quality</td>
<td>Bureau of Pollution Control, UST Section Box 10385 Jackson, MS 39289-0385 phone: 601 961-5171</td>
</tr>
<tr>
<td>Missouri</td>
<td>Dept. of Natural Resources</td>
<td>Water Pollution Control Program (UST) Environmental Services Program (LUST) Box 176 Jefferson City, MO 65102-0176 UST phone: 314 751-7428 LUST phone: 314 526-3384</td>
</tr>
<tr>
<td>Montana</td>
<td>Dept. of Health &amp; Env. Sciences</td>
<td>Solid &amp; Hazardous Waste Bureau UST Program Cogswell Bldg. Helena, MT 59620 phone: 406 444-5970 [UST contact]</td>
</tr>
<tr>
<td>Nebraska</td>
<td>State Fire Marshal</td>
<td>Flammable Liquid Storage 246 South 14th St. Lincoln, NE 68508 phone: 402 471-9465 [UST contact]</td>
</tr>
<tr>
<td>Nevada</td>
<td>Dept. of Conserv. &amp; Natural Resources</td>
<td>Div. of Env. Protection Capitol Complex 333 W. Nye Lane Carson City, NV 89710 phone: 702 687-5872</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>Dept. of Env. Services</td>
<td>Oil Compliance Section Groundwater Protection Bureau Box 95 Concord, NH 03301 phone: 603 271-3644</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Dept. of Env. Protection</td>
<td>Responsible Party Site Remediation 401 E. State (CN-028) Trenton, NJ 08625-0028 phone: 609 984-3156</td>
</tr>
<tr>
<td>New Mexico</td>
<td>Env. Dept.</td>
<td>UST Bureau Box 26110 Santa Fe, NM 87502 phone: 505 827-0188</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Pollution Control Branch</td>
<td>Div. of Env. Mgt. Dept. of Env. Health &amp; Natural Resources 441 N. Harrington St. Raleigh, NC 27603-1923 phone: 919 733-8486</td>
</tr>
<tr>
<td>Oregon</td>
<td>Dept. of Env. Quality</td>
<td>UST Compliance Section 811 S.W. Sixth Ave., 7th Floor Portland, OR 97204 phone: 503 229-5774 [UST contact]</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Dept. of Env. Resources</td>
<td>Cleanup Program 811 S.W. Sixth Ave., 9th Floor Portland, OR 97204 phone: 503 229-6642</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Dept. of Health and Env. Control</td>
<td>Department of Health and Consolidated Lab. Box 5520 Bismarck, ND 58502-5520 phone: 701 328-5166</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Dept. of Env. &amp; Conservation</td>
<td>Div. of USTs 4th Floor, L&amp;C Tower 401 Church St. Nashville, TN 37243-1541 phone: 615 532-0945</td>
</tr>
<tr>
<td>Utah</td>
<td>Dept. of Env. Quality</td>
<td>Div. of Env. Response and Remediation UST Branch 168 North 1950 West, 1st Floor Salt Lake City, UT 84116 phone: 801 536-4100</td>
</tr>
<tr>
<td>Vermont</td>
<td>Dept. of Natural Resources</td>
<td>UST Program 103 South Main St., West Bldg. Waterbury, VT 05676 phone: 802 244-8702 [UST contact]</td>
</tr>
<tr>
<td>Virginia</td>
<td>Dept. Env. Quality</td>
<td>Response Program 4951 Cox Road Glen Allen, VA 23060 phone: 804 527-5189</td>
</tr>
</tbody>
</table>
State Contacts For UST Information

[U.S. TERRITORIES]

American Samoa Env. Protection Agency
Office of the Governor
American Samoa Government
ATTN: UST Program
Pago Pago, American Samoa 96799
phone: 684 633-2304

Commonwealth of Northern Mariana Islands
Div. of Env. Quality
Box 1304
Dr. Torres Hospital
Saipan, MP 96950
phone: 607 234-6984

Guam Env. Protection Agency
IT&E
Harmon Plaza,
Complex Unit D-107
130 Rojas St.
Harmon, Guam 96911
phone: 671 646-8863

Puerto Rico Env. Quality Board
Box 11488
Commonwealth of Puerto Rico
Santurce, Puerto Rico 00910
phone: 809 767-8109

Virgin Islands Div. of Env. Protection
Dept. of Planning and Natural Resources
Nisky Center 231
45A Estate Nisky
Charlotte Amalie
St. Thomas, Virgin Islands 00802
phone: 809 774-3320

[U.S. TERRITORIES]

Washington Dept. of Ecology
Box 47655
Olympia, WA 98504-7655
UST phone: 206 407-7211
LUST phone: 206 407-7218

West Virginia Div. of Env. Protection
Office of Waste Mgmt.
UST Section
1356 Hansford St.
Charleston, WV 25301
phone: 304 558-6371

[UST contact]
Wisconsin Dept. of Industry, Labor & Human Relations
Division of Safety and Buildings
Box 7969
Madison, WI 53707
phone: 608 267-7605

[UST contact]
Wisconsin Dept. of Natural Resources
Bureau of Solid and Hazardous Waste Mgmt.
Box 7921
Madison, WI 53707-7921
phone: 608 267-7560

Wyoming Dept. of Env. Quality
Water Quality Div.
Herschler Bldg., 4th Floor
122 West 25th St.
Cheyenne, WY 82002
phone: 307 777-7096

[U.S. TERRITORIES]

American Samoa Env. Protection Agency
Office of the Governor
American Samoa Government
ATTN: UST Program
Pago Pago, American Samoa 96799
phone: 684 633-2304

Commonwealth of Northern Mariana Islands
Div. of Env. Quality
Box 1304
Dr. Torres Hospital
Saipan, MP 96950
phone: 607 234-6984

Guam Env. Protection Agency
IT&E
Harmon Plaza,
Complex Unit D-107
130 Rojas St.
Harmon, Guam 96911
phone: 671 646-8863

Puerto Rico Env. Quality Board
Box 11488
Commonwealth of Puerto Rico
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Nisky Center 231
45A Estate Nisky
Charlotte Amalie
St. Thomas, Virgin Islands 00802
phone: 809 774-3320
Dollars And Sense

Financial Responsibility Requirements For Underground Storage Tanks
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**Why are there financial responsibility requirements?**

When Congress amended Subtitle I of the Resource Conservation and Recovery Act in 1986, it directed the U.S. Environmental Protection Agency (EPA) to develop financial responsibility regulations for owners and operators of underground storage tanks (USTs) storing petroleum.

EPA estimates that there are about 1.2 million federally regulated petroleum USTs buried at over 500,000 sites nationwide. These sites are owned by marketers who sell gasoline to the public (such as service stations and convenience stores) and nonmarketers who use USTs solely for their own needs (such as fleet service operators and local governments).

Many of these USTs have released or will release petroleum into the environment through spills, overfills, or failures in the tank and piping system. EPA estimates that the total number of confirmed releases could reach 400,000 in the next several years. After this peak, EPA expects fewer releases as owners of USTs comply with federal and state requirements for new USTs and upgrade older USTs with spill, overfill, and corrosion protection.

Cleaning up these leaks can be costly. Congress wanted owners and operators of USTs to demonstrate that they have the financial resources—through insurance or other means explained below—to pay for the costs of corrective action and third-party liability that can result from leaking USTs.

The financial responsibility requirements are designed to make sure that someone can pay the costs of cleaning up leaks and compensating third-parties for bodily injury and property damage caused by leaking USTs.

If you need an overview of all the federal requirements for USTs, please refer to EPA’s free booklet, *Musts For USTs*. Ordering information for *Musts For USTs* and several other publications and videos about USTs appears on pages 13-14.
Why should your USTs meet these requirements?

It is particularly important that someone be prepared to pay cleanup costs so that cleanup activities can begin as quickly as possible. Without fast action at contaminated sites, contamination can spread and increase significantly the chance of damaging the environment and human health.

Complying with the financial responsibility requirements also protects you, as an owner or operator of USTs. If your UST leaks, you may be faced with high cleanup costs or with lawsuits brought by third parties. You will be able to pay these costs if you have met the financial responsibility requirements.

Also, if you cannot demonstrate financial responsibility by the compliance deadline that applies to your UST facility, you can be cited for violations and fined.

Who needs to demonstrate financial responsibility?

Either the owner or the operator of the UST must demonstrate financial responsibility, if the owner and operator are different individuals or firms. It is the responsibility of the owner and operator to decide which one will demonstrate financial responsibility.

Federal and state governments and their agencies that own USTs are not required to demonstrate financial responsibility. Local governments, however, must comply with the financial responsibility requirements.
What kinds of USTs need to meet these requirements?

An underground storage tank system (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. The federal UST regulations for financial responsibility apply only to underground tanks and piping storing petroleum.

The financial responsibility requirements apply to all USTs holding petroleum, with the following exceptions. These tanks are NOT covered by the financial responsibility requirements:

- Farm and residential tanks of 1,100 gallons or less capacity holding motor fuel used for noncommercial purposes;
- Tanks storing heating oil used on the premises where it is stored;
- Tanks on or above the floor of underground areas, such as basements or tunnels;
- Septic tanks and systems for collecting storm water and wastewater;
- Flow-through process tanks;
- Tanks of 110 gallons or less capacity, and tanks holding a minimal concentration of petroleum; and
- Emergency spill and overfill tanks.

Other storage sites not covered by the federal financial responsibility requirements (such as surface impoundments and field-constructed tanks) are identified in the Code of Federal Regulations, 40 CFR Part 280.
How much financial responsibility coverage is required? When do you need it?

Both the amount of financial responsibility coverage you need and the date by which you need it are determined by the type of business you operate, the amount of throughput of your tank, and the number of tanks you have. On the next page you will find a table that displays five groups of UST owners and operators, compliance deadlines for each group, and required coverage amounts.

Basically, your financial responsibility amount falls into two types: **per occurrence** and **annual aggregate**.

- **Per occurrence.** "Per occurrence" means the amount of money that must be available to pay the costs from one occurrence of a leaking UST. If your tank is used in petroleum production, refining or marketing (such as service stations and truck stops), you must be able to demonstrate that you have $1 million of per occurrence coverage. The per occurrence amount may be less if your tanks are located at a facility NOT engaged in petroleum production, refining or marketing. In this case, if your facility has a monthly throughput of 10,000 gallons or less, you need $500,000 of per occurrence coverage.

- **Annual aggregate.** You must also have coverage for an annual aggregate amount. The annual aggregate amount is the total amount of financial responsibility that you must have to cover all leaks that might occur in one year. The amount of aggregate coverage that you need depends on the number of tanks that you own or operate: $1 million annual aggregate for 100 or fewer tanks; $2 million annual aggregate for more than 100 tanks.
## Financial Responsibility Requirements

<table>
<thead>
<tr>
<th>Group Of UST Owners And Operators</th>
<th>Compliance Deadline</th>
<th>Per Occurrence Coverage</th>
<th>Aggregate Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GROUP 1:</strong> Petroleum marketers with 1,000 or more tanks <strong>OR</strong> Nonmarketers with net worth of $20 million or more (for nonmarketers, the &quot;per occurrence&quot; amount is the same as Group 4-B below)</td>
<td>January 1989</td>
<td>$1 million</td>
<td>$1 million if you have 100 or fewer tanks</td>
</tr>
<tr>
<td><strong>GROUP 2:</strong> Petroleum marketers with 100-999 tanks</td>
<td>October 1989</td>
<td></td>
<td></td>
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<tr>
<td><strong>GROUP 3:</strong> Petroleum marketers with 13-99 tanks</td>
<td>April 1991</td>
<td></td>
<td>$2 million if you have more than 100 tanks</td>
</tr>
<tr>
<td><strong>GROUP 4-A:</strong> Petroleum marketers with 1-12 tanks</td>
<td>December 1993</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GROUP 4-B:</strong> Nonmarketers with net worth of less than $20 million</td>
<td>December 1993</td>
<td>$500,000 if throughput is 10,000 gallons monthly or less</td>
<td></td>
</tr>
<tr>
<td><strong>GROUP 4-C:</strong> Local governments (including Indian tribes not part of Group 5)</td>
<td>February 1994</td>
<td></td>
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<tr>
<td><strong>GROUP 5:</strong> Indian tribes owning USTs on Indian lands (USTs must be in compliance with UST technical requirements)</td>
<td>December 1998</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Dollars And Sense 5*
How can you demonstrate financial responsibility?

There are several options for demonstrating financial responsibility (each option is described fully in the Code of Federal Regulations, 40 CFR Part 280):

- **Use state financial assurance funds.** Your state may pay for some cleanup and third-party liability costs (see page 7).

- **Obtain insurance coverage.** Insurance may be available from a private insurer or a risk retention group (see page 7).

- **Obtain a guarantee.** You may secure a guarantee for the coverage amount from another firm with whom you have a substantial business relationship. The provider of the guarantee has to pass one of the financial tests described on page 9.

- **Obtain a surety bond.** A surety bond is a guarantee by a surety company that it will meet your financial responsibility obligations.

- **Obtain a letter of credit.** A letter of credit is a contract involving you, an issuer (usually a bank), and a third party (such as the implementing agency) that obligates the issuer to help you demonstrate your financial responsibility.

- **Pass a financial test.** If your firm has a tangible net worth of at least $10 million, you can prove your financial responsibility by passing one of the two financial tests described on page 9.

- **Set up a trust fund.** You may set up a fully-funded trust fund administered by a third party to demonstrate financial responsibility.

- **Use other state methods.** You may also use any additional methods of coverage approved by your state.

Local governments have four additional compliance methods tailored to their special characteristics: a bond rating test, a financial test, a guarantee, and a dedicated fund (all fully described in 40 CFR Part 280).
What about state financial assurance funds?

Most states have established programs that can help pay for cleanup and third-party liability costs resulting from leaking petroleum USTs. Owners and operators of USTs may use these state financial assurance funds to demonstrate financial responsibility.

Many state funds, however, pay only part of the cleanup costs or require that you pay a deductible amount. Some state funds do not pay for third-party liability costs. State assurance funds often have eligibility requirements, such as proof that the UST facility is in compliance with requirements for leak detection and recordkeeping.

You should contact your state agency to determine if the state has a fund that you may use to demonstrate financial responsibility. Find out what the state will pay for and what additional amount of financial responsibility, if any, you must obtain. See the list of state UST/LUST contacts starting on page 15. (LUST means "leaking underground storage tanks.")

What about insurance coverage?

To make sure your insurance policy meets the financial responsibility requirements, have your insurer fill out one of the two following forms. If your UST insurance coverage is an expansion of a policy you already have, your insurer should give you an "Endorsement" document that completes and reproduces the model form shown on page 10. If you get a new policy, your insurer should give you a "Certificate of Insurance" document that completes and reproduces the model form shown on page 11. Keep the completed form in your records, as explained on page 8.

You should be aware that insurers may require you to meet certain conditions for coverage. For example, your insurer may require you to test your tank for tightness or make improvements in your tank system, such as adding corrosion protection.

You may also be able to get insurance coverage through a risk retention group. A risk retention group is an insurance company formed by businesses or individuals with similar risks to provide insurance coverage for those risks.
What happens if your coverage is cancelled?

Your financial responsibility method must specify that the provider may cancel your coverage only after sending you advance written notice. Insurance, risk retention group, and state fund coverage can be cancelled only 60 days after you receive the cancellation notice. Guarantees, surety bonds, and letters of credit can be cancelled only 120 days after you receive the cancellation notice. You must find replacement coverage within 60 days after you receive the notice of cancellation. If you cannot get replacement coverage, you must notify your implementing agency.

What records must you keep or report to others?

You must keep at your UST site or your place of business the following records of financial responsibility coverage:

- A current "Certification of Financial Responsibility" (see page 12 for a model of this form that you must complete and reproduce); and

- Any additional documentation that shows your financial responsibility method is valid and provides details on the method's coverage, such as signed copies of official letters, policies, and state fund agreements.

Keep these records until your UST site is properly closed.

Keeping clear records makes good business sense. If asked by UST inspectors or regulatory officials to demonstrate your financial responsibility, you can use these records to demonstrate quickly your compliance with the financial responsibility requirements.

Many states require you to file copies of your financial responsibility records with the state agency, so check with your state to see what you need to do. You do not need to report financial responsibility records to the federal EPA unless you have been requested to do so.
Two Financial Tests

Test 1

- Your firm must have a tangible net worth of at least $10 million; and
- Your firm must have a tangible net worth of at least 10 times the amount of aggregate coverage that you are required to demonstrate plus any other liability coverage for which your firm is using the test to demonstrate financial responsibility to EPA; and
- Your firm must file the firm's annual financial statements with the Securities and Exchange Commission (SEC), or annually report the firm's tangible net worth to Dun and Bradstreet and receive a rating of 4A or 5A. Utilities may file financial statements with the Energy Information Administration, or the Rural Electrification Administration instead of the SEC; and
- Your firm must have audited financial statements that do not include an adverse auditor's opinion or disclaimer of opinion.

Test 2

- Your firm must have a tangible net worth of at least $10 million; and
- Your firm must have a tangible net worth of at least 6 times the amount of aggregate coverage that you are required to demonstrate; and
- Have U.S. assets that are at least 90 percent of total assets or at least 6 times the required aggregate amount; and
- Have net working capital at least 6 times the required aggregate amount, or a bond rating AAA, AA, A, or BBB from Standard and Poor's, or Aaa, Aa, A, or Baa from Moody's; and
- Your firm must have audited financial statements that do not include an adverse auditor's opinion or disclaimer of opinion.
Model Of "Endorsement"

Name: [name of each covered location]
Address: [address of each covered location]
Policy Number:
Period of Coverage [current policy period]:
Name of [Insurer or Risk Retention Group]:
Address of [Insurer or Risk Retention Group]:
Name of Insured:
Address of Insured:

1. This endorsement certifies that the policy to which the endorsement is attached provides liability insurance covering the following underground storage tank(s):

[List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.]

for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental release"; in accordance with any state requirement, and the name and address of the facility.]

The limits of liability are [insert the dollar amount of the "per occurrence" and "annual aggregate" limits of the Insurer's or Group's liability; if the amount of coverage is different for different types of coverage or for different underground storage tanks or locations, indicate the amount of coverage for each type of coverage and/or for each underground storage tank or location], exclusive of legal defense costs, which are subject to a separate limit under the policy. This coverage is provided under [policy number]. The effective date of said policy is [date].

2. The insurance afforded with respect to such occurrences is subject to all of the terms and conditions of the policy; provided, however, that any provisions inconsistent with subsections (a) through (e) of this Paragraph 2 are hereby amended to conform with subsection (a) through (e):

a. Bankruptcy or insolvency of the insured shall not relieve the ["Insurer" or "Group"] of its obligations under the policy to which this endorsement is attached.

b. The ["Insurer" or "Group"] is liable for the payment of amounts within any deductible applicable to the policy to the provider of corrective action or a damaged third party, with a right of reimbursement by the insured for any such payment made by the ["Insurer" or "Group"]. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated under another mechanism or combination of mechanisms as specified in 40 CFR 280.95-280.102.

c. Whenever requested by [a Director of an Implementing Agency], the ["Insurer" or "Group"] agrees to furnish to [the Director] a signed duplicate original of the policy and all endorsements.

d. Cancellation or any other termination of the insurance by the ["Insurer" or "Group"], except for non-payment of premium or misrepresentation by the insured, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the insured. Cancellation for non-payment of premium or misrepresentation by the insured will be effective only upon written notice and only after expiration of a minimum of 10 days after a copy of such written notice is received by the insured.

[Insert for claims-made policies:

e. The insurance covers claims otherwise covered by the policy that are reported to the ["Insurer" or "Group"] within six months of the effective date of the cancellation or non-renewal of the policy except where the new or renewed policy has the same retroactive date or a retroactive date earlier than that of the prior policy, and which arise out of any covered occurrence that commenced after the policy retroactive date, if applicable, and prior to such policy renewal or termination date. Claims reported during such extended reporting period are subject to the terms, conditions, limits, including limits of liability, and exclusions of the policy.]

I hereby certify that the wording of this instrument is identical to the wording in 40 CFR 280.97(b)(1) and that the ["Insurer" or "Group"] is [licensed to transact the business of insurance in one or more states].

[Signature of authorized representative of Insurer or Risk Retention Group]

[Printed name of person signing]

[Title of person signing], Authorized Representative of [name of Insurer of Risk Retention Group]

[Address of Representative]
Model Of "Certificate Of Insurance"

Name: [name of each covered location]
Address: [address of each covered location]
Policy Number:
Period of Coverage [current policy period]:
Name of [Insurer or Risk Retention Group]:
Address of [Insurer or Risk Retention Group]:
Name of Insured:
Address of Insured:

1. [Name of Insurer or Risk Retention Group], [the "Insurer" or "Group"], as identified above, hereby certifies that it has issued liability insurance covering the following underground storage tank(s):

[List the number of tanks at each facility and the name(s) and address(es) of the facility(ies) where the tanks are located. If more than one instrument is used to assure different tanks at any one facility, for each tank covered by this instrument, list the tank identification number provided in the notification submitted pursuant to 40 CFR 280.22, or the corresponding state requirement, and the name and address of the facility.] for [insert: "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "nonsudden accidental releases" or "accidental releases"; in accordance with and subject to the limits of liability, exclusions, conditions, and other terms of the policy; if coverage is different for different tanks or locations, indicate the type of coverage applicable to each tank or location] arising from operating the underground storage tank(s) identified above.

The limits of liability are [insert the dollar amount of the "per occurrence" and "annual aggregate" limits of the Insurer's or Group's liability; if the amount of coverage is different for different types of coverage or for different underground storage tanks or locations, indicate the amount of coverage for each type of coverage and/or for each underground storage tank or location], exclusive of legal defense costs, which are subject to a separate limit under the policy. This coverage is provided under [policy number]. The effective date of said policy is [date].

2. The ["Insurer" or "Group"] further certifies the following with respect to the insurance described in Paragraph 1:

a. Bankruptcy or insolvency of the insured shall not relieve the ["Insurer" or "Group"] of its obligations under the policy to which this certificate applies.

b. The ["Insurer" or "Group"] is liable for the payment of amounts within any deductible applicable to the policy to the provider of corrective action or a damaged third party, with a right of reimbursement by the insured for any such payment made by the ["Insurer" or "Group"]. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated under another mechanism or combination of mechanisms as specified in 40 CFR 280.95-280.102.

c. Whenever requested by [a Director of an Implementing Agency], the ["Insurer" or "Group"] agrees to furnish to [the Director] a signed duplicate original of the policy and all endorsements.

d. Cancellation or any other termination of the insurance by the ["Insurer" or "Group"], except for non-payment of premium or misrepresentation of insured, will be effective only upon written notice and only after the expiration of 60 days after a copy of such written notice is received by the insured.

Cancellation for non-renewal of premium or misrepresentation by the insured will be effective only upon written notice and only after expiration of a minimum of 10 days after a copy of such written notice is received by the insured.

[Insert for claims-made policies:

e. The insurance covers claims otherwise covered by the policy that are reported to the ["Insurer" or "Group"] within six months of the effective date of cancellation or non-renewal of the policy except where the new or renewed policy has the same retroactive date or a retroactive date earlier than that of the prior policy, and which arises out of any covered occurrence that commenced after the policy retroactive date, if applicable, and prior to such policy renewal or termination date. Claims reported during such extended reporting periods are subject to the terms, conditions, limits, including limits of liability, and exclusions of the policy.] I hereby certify that the wording of this instrument is identical to the wording in 40 CFR 280.97(b)(1) and that the ["Insurer" or "Group"] is ["licensed to transact the business of insurance or eligible to provide insurance as an excess or surplus lines insurer in one or more states"].

[Signature of authorized representative of Insurer or Risk Retention Group]

[Printed name of person signing]

[Title of person signing], Authorized Representative of [name of Insurer or Risk Retention Group]

[Address of Representative]
Model Of "Certification Of Financial Responsibility"

[Owner or operator] hereby certifies that it is in compliance with the requirements of Subpart H of 40 CFR Part 280.

The financial assurance mechanism(s) used to demonstrate financial responsibility under Subpart H of 40 CFR Part 280 is (are) as follows:

[For each mechanism, list the type of mechanism, name of issuer, mechanism number (if applicable), amount of coverage, effective period of coverage and whether the mechanism covers "taking corrective action" and/or "compensating third parties for bodily injury and property damage caused by" either "sudden accidental releases" or "non-sudden accidental releases" or "accidental releases."]

[Signature of owner or operator]

[Printed name of owner or operator]

[Title]

[Date]

[Signature of witness or notary]

[Printed name of witness or notary]

[Date]

The owner or operator must update this certification whenever the financial insurance mechanism(s) used to demonstrate financial responsibility change(s).
# Publications And Videos About USTs

## Publications

<table>
<thead>
<tr>
<th>Title</th>
<th>Available Free From</th>
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<tr>
<td><strong>Musts For USTs: A Summary Of The Federal Regulations For</strong></td>
<td>You can call EPA's toll-free RCRA/Superfund Hotline at 800 424-9346 and order free copies. Just identify the titles you want. Or you can write and ask for titles by addressing your requests to:</td>
</tr>
<tr>
<td><strong>Underground Storage Tank Systems</strong></td>
<td>NCEPI</td>
</tr>
<tr>
<td>Booklet clearly summarizes federal UST requirements for installation, release detection, spill, overfill, and corrosion protection, corrective action, closure, reporting and recordkeeping. (About 40 pages.)</td>
<td>Box 42419&lt;br&gt;Cincinnati, OH 45242</td>
</tr>
<tr>
<td><strong>Normas Y Procedimientos Para T.S.A.</strong></td>
<td>Or you can fax your order to NCEPI at 513 891-6685.</td>
</tr>
<tr>
<td>Spanish translation of <strong>Musts For USTs.</strong> (About 40 pages.)</td>
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<tr>
<td><strong>Straight Talk On Tanks: Leak Detection Methods For Petroleum</strong></td>
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<tr>
<td><strong>Underground Storage Tanks</strong></td>
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<tr>
<td>Booklet explains federal regulatory requirements for leak detection and briefly describes allowable leak detection methods. (About 30 pages.)</td>
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<tr>
<td><strong>Doing Inventory Control Right: For Underground Storage Tanks</strong></td>
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<tr>
<td>Booklet describes how owners and operators of USTs can use inventory control and periodic tightness testing to meet federal leak detection requirements. Contains reporting forms. (About 16 pages.)</td>
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<tr>
<td><strong>Manual Tank Gauging: For Small Underground Storage Tanks</strong></td>
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<td>Booklet provides simple, step-by-step directions for conducting manual tank gauging for tanks 2,000 gallons or smaller. Contains reporting forms. (About 12 pages.)</td>
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<td><strong>Don't Wait Until 1998: Spill, Overfill, And Corrosion Protection For</strong></td>
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<td><strong>Underground Storage Tanks</strong></td>
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<td>Information to help owners and operators of USTs meet the 1998 deadline for compliance with requirements to upgrade, replace, or close USTs installed before December 1988. (About 16 pages.)</td>
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<tr>
<td><strong>An Overview Of Underground Storage Tank Remediation Options</strong></td>
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<tr>
<td>Fact sheets provide information about technologies that can be used to remediate petroleum contamination in soil and groundwater. (About 26 pages.)</td>
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<td><strong>Controlling UST Cleanup Costs</strong></td>
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<td>Fact sheet series on the cleanup process includes: <em>Hiring a Contractor, Negotiating the Contract, Interpreting the Bill, Managing the Process, and Understanding Contractor Code Words.</em> (About 10 pages.)</td>
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<td><strong>Federal Register Reprints</strong></td>
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<td>Not simple summaries; these reprints are extensive records of the rulemaking process including technical information, explanatory preambles, and the rules as they appear in the Code of Federal Regulations. Reprints dated 9/23/88; 10/26/88; 11/9/89; 5/2/90; and 2/18/93. Over 300 pages.</td>
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#### VIDEOS

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<td>Environmental Media Center</td>
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<td>Searching For The Honest Tank: A Guide To UST Facility Compliance Inspection</td>
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Straight Talk on Tanks
Leak Detection Methods For Petroleum Underground Storage Tanks And Piping
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Free Publications About UST Requirements

You can go to EPA’s UST web site at http://www.epa.gov/OUST/ to order, download, or read documents online. You can write and ask for titles by addressing your request to NSCEP, EPA’s publication distributor: NSCEP, Box 42419, Cincinnati, OH 45242. Or you can make your request by calling NSCEP’s toll-free number at (800) 490-9198. Or you can fax your order to NSCEP at (513) 489-8695.
Do You Have Questions About Leak Detection?

As an owner or operator of underground storage tanks (USTs) storing petroleum:

- Do you understand the basic leak detection requirements for USTs?
- Do you need help choosing the best leak detection method for your USTs?

These are important questions, because your UST and its underground piping must have leak detection in order to comply with federal law.

This booklet begins with an overview of the federal regulatory requirements for leak detection. Each following section focuses on one leak detection method or the special requirements for piping.

You will find answers in this booklet to many basic questions about how leak detection methods work and which methods are best for your UST site.

**Why is leak detection so important?**

As of March 2005, almost 450,000 UST leaks had been confirmed. At sites without leak detection, leaks were discovered late, after contamination had spread, requiring difficult and costly cleanups.

By contrast, if you have effective leak detection, you can respond quickly to signs of leaks. You can minimize the extent of environmental damage and the threat to human health and safety. Early action on your part also protects you from the high costs that can result from cleaning up extensive leaks and responding to third-party liability claims.

If you need an overview of all the federal requirements for USTs, please refer to **Musts For USTs**, a booklet developed by the U.S. Environmental Protection Agency (EPA). You can order a free copy of this booklet by calling EPA’s publication distributor at (800) 490-9198 (see inside the front cover for additional information) or downloading it from EPA’s website at [http://www.epa.gov/oust/](http://www.epa.gov/oust/).
An Overview Of Leak Detection Requirements

All USTs installed after December 1988 must have leak detection when installed.

USTs installed before December 1988 had to meet leak detection compliance deadlines that were phased in over 5 years. By December 1993, all of these USTs had to have leak detection.

EPA has identified the following methods that owners and operators may use to meet the federal leak detection requirements:

- Secondary Containment With Interstitial Monitoring
- Automatic Tank Gauging Systems (including continuous ATG systems)
- Vapor Monitoring (including tracer compound analysis)
- Groundwater Monitoring
- Statistical Inventory Reconciliation
- Other Methods Meeting Performance Standards

The leak detection methods noted above are all monthly monitoring methods and eventually everyone must use at least one of them. However, as a temporary method, you can combine tank tightness testing with inventory control (or with manual tank gauging if you have a small tank), as explained on page 4.

Underground piping connected to your USTs must also have leak detection. See pages 22-25 for descriptions of the requirements for piping.

Brief descriptions of leak detection methods appear on the next two pages. More complete descriptions appear in the following sections.
■ **Secondary Containment With Interstitial Monitoring** (see pages 6-7)

Secondary containment often uses a barrier, an outer wall, a vault, or a liner around the UST or piping. Tanks can be equipped with inner bladders that provide secondary containment. Leaked product from the inner tank or piping is directed towards an interstitial monitor located between the inner tank or piping and the outer barrier.

There are a number of interstitial monitoring methods. These methods include the use of a simple dipstick or a continuous, automated vapor or liquid sensor permanently installed in the system to monitor interstitial spaces. Interstitial spaces can also be filled with brine or glycol solutions and their levels monitored. Also, sophisticated pressure/vacuum monitoring systems may be used to indicate pressure changes within these spaces.

■ **Automatic Tank Gauging Systems (including continuous ATG systems)** (see pages 8-9)

A probe permanently installed in the tank is wired to a monitor to provide information on product level and temperature. These systems automatically calculate the changes in product volume that can indicate a leaking tank.

■ **Vapor Monitoring (including tracer compound analysis)** (see pages 10-11)

Vapor monitoring measures either product fumes in the soil around the UST or special tracer chemicals added to the UST which escape in order to check for a leak. This method requires installation of carefully placed monitoring wells. Vapor monitoring can be performed manually on a periodic basis or continuously using permanently installed equipment.

■ **Groundwater Monitoring** (see pages 12-13)

Groundwater monitoring senses the presence of liquid product floating on the groundwater. This method requires installation of monitoring wells at strategic locations in the ground near the tank and along the piping runs. To discover if leaked product has reached groundwater, these wells can be checked periodically by hand or continuously with permanently installed equipment. This method cannot be used at sites where groundwater is more than 20 feet below the surface.

■ **Statistical Inventory Reconciliation** (see pages 14-15)

In this method, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data, which you must supply regularly. Also, the owner can purchase software and enter data into his own computer, which statistically analyzes the data.

■ **Other Methods Meeting Performance Standards**

Any technology can be used if it meets a performance standard of detecting a leak of 0.2 gallons per hour with a probability of detection of at least 95 percent and a probability of false alarm of no more than 5 percent. Regulatory authorities can approve another method if you demonstrate that it works as well as one of the methods above and you comply with any condition the authority imposes.
- **Tank Tightness Testing With Inventory Control** (see pages 16-19)

  This method combines periodic tank tightness testing with monthly inventory control. Inventory control involves taking measurements of tank contents and recording amount pumped each operating day, as well as reconciling all this data at least once a month. This combined method must also include tightness tests, which are sophisticated tests performed by trained professionals. *This combined method can be used only temporarily* (usually for 10 years or less)—see page 19 for time restrictions.

- **Manual Tank Gauging** (see pages 20-21)

  Manual tank gauging can be used only for tanks of 2,000 gallons or less capacity. This method requires keeping the tank undisturbed for at least 36 hours each week, during which the contents of the tank are measured twice at the beginning and twice at the end of the test period. At the end of each week you compare the results to the standards shown on page 21 to see if your tank may be leaking. This method can be used by itself only for tanks up to 1,000 gallons. Tanks between 1,001 and 2,000 gallons can use this method only in combination with periodic tank tightness testing. *This combined method can be used only temporarily* (usually for 10 years or less)—see page 21 for time restrictions.

**Look For The Proof Of A Third-Party Evaluation**

An evaluation performed by a third party (someone who is independent of the manufacturer or vendor of the leak detection system) shows that a leak detection system can work as designed. The evaluation follows required evaluation procedures and often takes place in a laboratory. EPA and third parties have developed evaluation procedures for all leak detection systems.

Although an evaluation and its resulting documentation are technical, you should be familiar with the evaluation's report and its results form. You should obtain this documentation from the leak detection vendor and keep it on file. The report also contains a signed certification that the system performed as described, as well as documenting any limitations of the system. This information is important to your compliance with the UST requirements. For example, if a tank tightness test was evaluated and certified only for tests taking 2 hours or more, then your UST must be tested for at least 2 hours or it would fail to meet the leak detection requirements.
**Required Probabilities For Some Leak Detection**

The regulations require not only that leak detection methods be able to detect certain leak rates, but that they also give the correct answer consistently. In general, methods must detect the specified leak rate with a probability of detection of at least 95 percent and a probability of false alarm of no more than 5 percent. Simply stated, this means that, of 100 tests of USTs leaking at the specified rate, at least 95 of them must be correctly detected. It also means that, of 100 tests of non-leaking USTs, no more than 5 can be incorrectly called leaking. This is what is meant by the probabilities noted in this booklet.

**Which leak detection method is best for you?**

There is no one leak detection system that is best for all sites, nor is there a particular type of leak detection that is consistently the least expensive. Each leak detection method has unique characteristics. For example, vapor detection devices work rapidly and most effectively in porous soils, while liquid detectors are only appropriate for areas with a high water table.

Identifying the best leak detection choice for your UST depends on a number of factors including cost (both initial installation cost and long-term operation and maintenance cost), facility configuration (such as complexity of piping runs and manifolded tanks), groundwater depth, soil type, seasonal rainfall and temperature ranges, availability of experienced installers, and other variables.

You should look around extensively for experienced, professional vendors and installers of leak detection. Ask questions that help you find the most reliable, cost-effective leak detection for your type of facility. Some possible information sources are: references from fellow UST owners, oil marketers, equipment suppliers, trade journals, trade associations, state and local trade associations (especially those for petroleum marketers and UST owners), and state and local regulatory authorities. (See state UST contact information on page 28.) Your state may also have an assistance fund that may be able to help you pay for your UST’s leak detection.

The National Work Group on Leak Detection Evaluations (NWGLDE) – an independent group – also maintains a list of leak detection equipment whose third-party conducted documentation has been reviewed by the group. The list contains a detailed summary of specifications for over 325 leak detection systems. Although the list can be used to help select systems and determine their compliance or acceptability, the publication is not a list of approved leak detection systems. Approval or acceptance of leak detection systems rests with the implementing agency, in most cases the state environmental agency. The list can be accessed via the Internet at www.nwglde.org.

For additional information about federal UST requirements, visit EPA's website at www.epa.gov/OUST/.
Secondary Containment With Interstitial Monitoring

Will you be in compliance?

When installed and operated according to the manufacturer's specifications, secondary containment with interstitial monitoring meets the federal leak detection requirements for USTs. Operation of the monitoring device at least once each month fulfills the requirements for the life of the tank. Secondary containment with interstitial monitoring can also be used to detect leaks from piping (see the section on leak detection for piping starting on page 22).

How does the leak detection method work?

Secondary containment

- Secondary containment provides a barrier between the tank and the environment. The barrier holds the leak between the tank and the barrier so that the leak is detected. The barrier is shaped so that a leak will be directed towards the interstitial monitor.

- Barriers include:
  - Double-walled or jacketed tanks, in which an outer wall partially or completely surrounds the primary tank;
  - Internally fitted liners (i.e., bladders); and
  - Leakproof excavation liners that partially or completely surround the tank.

- Clay and other earthen materials cannot be used as barriers.

Interstitial monitors

- Monitors are used to check the area between the tank and the barrier for leaks and alert the operator if a leak is suspected.

- Some monitors indicate the physical presence of the leaked product, either liquid or gaseous. Other monitors check for a change in condition that indicates a hole in the tank (such as a loss of vacuum or pressure) or a change in the level of a monitoring liquid (such as a brine or glycol solution) between the walls of a double-walled tank.

- Monitors can be as simple as a dipstick used at the lowest point of the containment to see if liquid product has leaked and pooled there. Monitors can also be sophisticated automated systems that continuously check for leaks.
What are the regulatory requirements?

- The barrier must be immediately around or beneath the tank.
- The interstitial monitor must be checked at least once every 30 days.
- A double-walled system must be able to detect a release through the inner wall.
- An excavation liner must:
  - Direct a leak towards the monitor;
  - Not allow the specific product being stored to pass through it any faster than $10^{-6}$ cm/sec;
  - Be compatible with the product stored in the tank;
  - Not interfere with the UST's cathodic protection;
  - Not be disabled by moisture;
  - Always be above the groundwater and the 25-year flood plain; and
  - Have clearly marked and secured monitoring wells, if they are used.
- A bladder must be compatible with the product stored and must be equipped with an automatic monitoring device.

Will it work at your site?

- In areas with high groundwater or a lot of rainfall, it may be necessary to select a secondary containment system that completely surrounds the tank to prevent moisture from interfering with the monitor.

Anything else you should consider?

- This method works effectively only if the barrier and the interstitial monitor are installed correctly. Therefore, trained and experienced installers are necessary.
Automatic Tank Gauging Systems

Will you be in compliance?

When installed and operated according to the manufacturer's specifications, automatic tank gauging systems (ATGS) meet the federal leak detection requirements for tanks (this method does not detect piping leaks). A test performed each month fulfills the requirements for the life of the tank. (For additional requirements for piping, see the section on leak detection for piping starting on page 22.)

How does the leak detection method work?

- The product level and temperature in a tank are measured continuously and automatically analyzed and recorded by a computer.

- In the inventory mode, the ATGS replaces the use of the gauge stick to measure product level and perform inventory control. This mode records the activities of an in-service tank, including deliveries.

- In the test mode, the tank is taken out of service and the product level and temperature are measured for at least one hour. Some systems, known as continuous ATGS, do not require the tank to be taken out of service to perform a test. This is because these systems can gather and analyze data during many short periods when no product is being added to or taken from the tank.

- Some methods combine aspects of automatic tank gauges with statistical inventory reconciliation. See pages 14-15 for more information about these methods.

What are the regulatory requirements?

- The ATGS must be able to detect a leak of 0.2 gallons per hour with certain probabilities of detection and of false alarm. Some ATGS can also detect a leak of 0.1 gallons per hour with the required probabilities.

Will it work at your site?

- ATGS have been used primarily on tanks containing gasoline or diesel. Some systems have been evaluated for use on tank capacities of up to 75,000 gallons. If considering using an ATGS for products other than gasoline or diesel, discuss its applicability with the manufacturer's representative. Check the method's evaluation to confirm that it will meet regulatory requirements and your needs.

- Water around a tank may hide a leak by temporarily preventing the product from leaving the tank. To detect a leak in this situation, the ATGS should be capable of detecting water in the bottom of a tank.
Anything else you should consider?

- The ATGS probe is permanently installed through an opening (not the fill pipe) on the top of the tank.

- With the exception of some continuous ATGS evaluated to perform on manifolded tanks, each tank at a site must be equipped with a separate probe. Check the method’s evaluation to determine if the ATGS can be used with manifolded tanks.

- The ATGS probe is connected to a console that displays ongoing product level information and the results of the monthly test. Printers can be connected to the console to record this information.

- ATGS are often equipped with alarms for high and low product level, high water level, and theft.

- ATGS can be linked with computers at other locations, from which the system can be programmed or read.

- For ATGS that are not of the continuous type, no product should be delivered to the tank or withdrawn from it for at least 6 hours before the monthly test or during the test (which generally takes 1 to 6 hours).

- An ATGS can be programmed to perform a test more often than once per month (a recommended practice).

- Some ATGS may be evaluated to test at relatively low capacities (e.g., 25% or 30%). Although the product level at such capacities may be valid for the test equipment, it may not appropriately test all portions of the tank that routinely contain product. The ATGS test needs to be run to test the tank at the capacity to which it is routinely filled.

Find out if there are state or local requirements on the use of ATGS that differ from those described here.
Vapor Monitoring (Including Tracer Compound Analysis)

Will you be in compliance?

When installed and operated according to the manufacturer's instructions, vapor monitoring meets the federal leak detection requirements for USTs. Vapor monitoring denotes sampling for petroleum hydrocarbons (e.g., gasoline) that are sufficiently volatile to be picked up in the monitoring well/sampling point. However, the federal regulations also recognize sampling for tracer compounds introduced in the UST system. Operation of a vapor monitoring system at least once each month fulfills the requirements for the life of the tank. Vapor monitoring can also be installed to detect leaks from piping (see the section on leak detection for piping starting on page 22).

How does the leak detection method work?

- Vapor monitoring senses or measures fumes from leaked product in the soil around the tank to determine if the tank is leaking.

- Tracer compound analysis samples for the presence of a tracer compound outside the UST system that was introduced in the tank or underground piping.

- Fully automated vapor monitoring systems have permanently installed equipment to continuously or periodically gather and analyze vapor samples and respond to a release with a visual or audible alarm.

- Tracer compound analysis requires the installation of monitoring wells/sampling points strategically placed in the tank backfill or along pipe runs to intercept special chemicals that, in the event of a leak, are picked up in the sampling points.

- Manually operated vapor monitoring systems range from equipment that immediately analyzes a gathered vapor sample to devices that gather a sample that must be sent to a laboratory for analysis. Manual systems must be used at least once a month to monitor a site. Tracer compound analysis may be performed on a monthly or less frequent basis by qualified technicians.

- All vapor monitoring devices should be periodically calibrated according to the manufacturer's instructions to ensure that they are properly responding.

- Before installation of a vapor monitoring system for release detection, a site assessment is necessary to determine the soil type, groundwater depth and flow direction, and the general geology of the site. This can only be done by a trained professional.

- The number of wells and their placement is very important. Only an experienced contractor can properly design and construct an effective monitoring well system. Vapor monitoring requires the installation of monitoring wells within the tank backfill. A minimum of two wells is recommended for a single tank excavation. Three or more wells are recommended for an excavation with two or more tanks. Some state and local agencies have developed regulations for monitoring well placement.
What are the regulatory requirements?

- The UST backfill must be sand, gravel or another material that will allow the petroleum vapors or tracer compound to easily move to the monitor.

- The backfill should be clean enough that previous contamination does not interfere with the detection of a current leak.

- The substance stored in the UST must vaporize easily so that the vapor monitor can detect a release. Some vapor monitoring systems do not work well with diesel fuel.

- High groundwater, excessive rain, or other sources of moisture must not interfere with the operation of vapor monitoring for more than 30 consecutive days.

- Monitoring wells must be secured and clearly marked.

Will it work at your site?

- Before installing a vapor monitoring system, a site assessment must be done to determine whether vapor monitoring is appropriate at the site. A site assessment usually includes at least a determination of the groundwater level, background contamination, stored product type, and soil type. This assessment can only be done by a trained professional.
Groundwater Monitoring

Will you be in compliance?

When installed and operated according to the manufacturer's instructions, a groundwater monitoring system meets the federal leak detection requirements for USTs. Operation of a groundwater monitoring system at least once each month fulfills the requirements for the life of a tank. Groundwater monitoring can also be used to detect leaks in piping (see the section on leak detection for piping starting on page 22).

How does the leak detection method work?

- Groundwater monitoring involves the use of permanent monitoring wells placed close to the UST. The wells are checked at least monthly for the presence of product that has leaked from the UST and is floating on the groundwater surface.

- The two main components of a groundwater monitoring system are the monitoring well (typically a well of 2-4 inches in diameter) and the monitoring device.

- Detection devices may be permanently installed in the well for automatic, continuous measurements for leaked product.

- Detection devices are also available in manual form. Manual devices range from a bailer (used to collect a liquid sample for visual inspection) to a device that can be inserted into the well to electronically indicate the presence of leaked product. Manual devices must be used at least once a month.

- Before installation, a site assessment is necessary to determine the soil type, groundwater depth and flow direction, and the general geology of the site. This assessment can only be done by a trained professional.

- The number of wells and their placement is very important. Only an experienced contractor can properly design and construct an effective monitoring well system. A minimum of two wells is recommended for a single tank excavation. Three or more wells are recommended for an excavation with two or more tanks. Some state and local agencies have developed regulations for monitoring well placement.
What are the regulatory requirements?

- Groundwater monitoring can only be used if the stored substance does not easily mix with water and floats on top of water.

- If groundwater monitoring is to be the sole method of leak detection, the groundwater must not be more than 20 feet below the surface, and the soil between the well and the UST must be sand, gravel or other coarse materials.

- Product detection devices must be able to detect one-eighth inch or less of leaked product on top of the groundwater.

- Monitoring wells must be properly designed and sealed to keep them from becoming contaminated from outside sources. The wells must also be clearly marked and secured.

- Wells should be placed in the UST backfill so that they can detect a leak as quickly as possible.

Will it work at your site?

- In general, groundwater monitoring works best at UST sites where:
  - Monitoring wells are installed in the tank backfill; and
  - There are no previous releases of product that would falsely indicate a current release.

- A professionally conducted site assessment is critical for determining these site-specific conditions.

Find out if there are state or local requirements on the use of groundwater monitoring that differ from those described here.
Statistical Inventory Reconciliation

Will you be in compliance?

Statistical inventory reconciliation (SIR), when performed according to the vendor's specifications, meets federal leak detection requirements for USTs as follows. SIR with a 0.2 gallon per hour leak detection capability meets the federal requirements for monthly monitoring for the life of the tank and piping. SIR with a 0.1 gallon per hour leak detection capability meets the federal requirements as an equivalent to tank tightness testing. SIR can, if it has the capability of detecting even smaller leaks, meet the federal requirements for line tightness testing as well. (For additional requirements for piping, see the section on leak detection for piping starting on page 22.)

How does the leak detection method work?

- SIR analyzes inventory, delivery, and dispensing data collected over a period of time to determine whether or not a tank system is leaking.
- Each operating day, the product level is measured using a gauge stick or other tank level monitor. You also keep complete records of all withdrawals from the UST and all deliveries to the UST. After data have been collected for the period of time required by the SIR vendor, you provide the data to the SIR vendor.
- The SIR vendor uses sophisticated computer software to conduct a statistical analysis of the data to determine whether or not your UST system may be leaking. The SIR vendor provides you with a test report of the analysis. Also, you can purchase SIR software which performs this same analysis and provides a test report from your own computer.
- Some methods combine aspects of automatic tank gauges with statistical inventory reconciliation. In these methods, sometimes called hybrid methods, a gauge provides liquid level and temperature data to a computer running SIR software, which performs the analysis to detect leaks.

What are the regulatory requirements?

- To be allowable as monthly monitoring, a SIR method must be able to detect a leak at least as small as 0.2 gallons per hour and meet the federal regulatory requirements regarding probabilities of detection and of false alarm. Data must be submitted at least monthly.
- To be allowable as an equivalent to tank tightness testing, a SIR method must be able to detect a leak at least as small 0.1 gallons per hour and meet the federal regulatory requirements regarding probabilities of detection and of false alarm.
The individual SIR method must have been evaluated with a test procedure to certify that it can detect leaks at the required level and with the appropriate probabilities of detection and of false alarm.

The method’s evaluation must reflect the way the method is used in the field. If a SIR method is not performed by the SIR vendor, then the method’s evaluation must be done without the involvement of the SIR vendor. Examples of this situation are SIR methods licensed to owners and hybrid ATGS/SIR methods.

If the test report is not conclusive, you must take the steps necessary to find out conclusively whether your tank is leaking. Because SIR requires multiple days of data, you will probably have to use another method.

You must keep on file both the test reports and the documentation that the SIR method used is certified as valid for your UST system.

**Will it work at your site?**

Some SIR methods have been evaluated for use on tanks up to 60,000 gallons in capacity. If you are considering using a SIR method, check the method’s evaluation to confirm that it will meet regulatory requirements and your specific UST system needs.

A SIR method's ability to detect leaks declines as throughput increases. If you are considering using a SIR method for high throughput UST systems, check the method’s evaluation to confirm that it will meet regulatory requirements and your needs.

Water around a tank may hide a hole in the tank or distort the data to be analyzed by temporarily preventing a leak. To detect a leak in this situation, you should check for water at least once a month.

**Anything else you should consider?**

Data, including product level measurements, dispensing data, and delivery data, should all be carefully collected according to the SIR vendor's specifications. Poor data collection produces inconclusive results and noncompliance.

The SIR vendor will generally provide forms for recording data, a calibrated chart converting liquid level to volume, and detailed instructions on conducting measurements.

SIR should not be confused with other release detection methods that also rely on periodic reconciliation of inventory, withdrawal, and delivery data. Unlike manual tank gauging or inventory control, SIR uses a sophisticated statistical analysis of data to detect releases.
Tank Tightness Testing With Inventory Control

*Will you be in compliance?*

When performed according to the manufacturer's specifications, periodic tank tightness testing combined with monthly inventory control can *temporarily* meet the federal leak detection requirements for *tanks* (this method does not detect piping leaks). See page 19 for time restrictions.

These two leak detection methods must be used together because neither method alone meets the federal requirements for leak detection for tanks. Tightness testing is also an option for underground piping, as described in the section on leak detection for piping starting on page 22.

Because they must be used together, both tank tightness testing and inventory control are discussed in this section. Tank tightness testing is discussed first, followed by inventory control.

**Tank Tightness Testing**

*How does the leak detection method work?*

Tightness tests include a wide variety of methods. These methods can be divided into two categories: volumetric and nonvolumetric. Tightness test methods are also referred to as precision tank tests.

- **Volumetric test methods** generally involve measuring very precisely (in milliliters or thousandths of an inch) the change in product level in a tank over time. Additional characteristics of this category of tank tightness testing include:
  - Changes in product temperature also must be measured very precisely (thousandths of a degree) at the same time as level measurements, because temperature changes cause volume changes that interfere with finding a leak.
  - The product in the tank is required to be at a certain level before testing. This often requires adding product from another tank on-site or purchasing additional product.
  - A net decrease in product volume (subtracting out volume changes caused by temperature) over the time of the test indicates a leak.
  - A few of these methods measure properties of product that are independent of temperature, such as mass and so do not need to measure product temperature.

- **Nonvolumetric methods** use acoustics or vacuum or pressure decay to determine the presence of a hole in the tank.
  - Various nonvolumetric methods are used to test either the wetted portion of the tank (that part containing product) or the ullage (unfilled portion of the tank that does not contain product) of the UST.
  - Nonvolumetric testing involving acoustics interprets an ultrasonic signal.
  - Tracer chemicals can also be circulated through the UST system and tested in strategically placed sampling ports.
For both volumetric and nonvolumetric (except tracer compounds) test methods, the following generally apply:

- The testing equipment is temporarily installed in the tank, usually through the fill pipe.
- The tank must be taken out of service for the test.
- Some tightness test methods require all of the measurements and calculations be made by hand by the tester. Other tightness test methods are highly automated. After the tester sets up the equipment, a computer controls the measurements and analysis.

Some automatic tank gauging systems are capable of meeting the regulatory requirements for tank tightness testing and may be considered an equivalent method. Check with your implementing agency.

**What are the regulatory requirements?**

- The tightness test method must be able to detect a leak at least as small as 0.1 gallon per hour with certain probabilities of detection and of false alarm. To meet leak detection requirements, tank tightness testing must be combined with either inventory control or manual tank gauging, as described on pages 18 and 20.

- UST systems must have the combined method using tank tightness testing every 5 years for no more than 10 years following corrosion protection, spill, and overfill upgrade of tanks (no later than December 1998) or installation of new tanks. For some USTs which had corrosion protection before the entire UST system met upgrade standards, the combined method using tank tightness testing every 5 years may be valid for less than 10 years.

- Ten years after upgrade or installation of a new UST system, you must have a monitoring method that can be performed at least once per month. See the other sections of this booklet for allowable monthly monitoring options.

**Anything else you should consider?**

- For most methods, the test is performed by a testing company. You just observe the test.

- Depending on the method, tank tightness testing can be used on tanks of varying capacity containing gasoline and diesel. Many test methods have limitations on the capacity of the tank or the amount of ullage (unwetted portion of the tank not filled with product) that should not be exceeded. Methods that use tracer chemical analysis do not have limitations on tank capacity. If you are considering using tightness testing for products other than gasoline or diesel, discuss the method's applicability with the manufacturer's representative. Check the method's evaluation to confirm that it will meet regulatory requirements and your specific UST system needs.

- Manifolded tanks generally should be disconnected and tested separately.

- Procedure and personnel, not equipment, are usually the most important factors in a successful tightness test. Therefore, well-trained and experienced testers are very important. Some states and local authorities have tester certification programs.
Inventory Control

*How does the leak detection method work?*

Inventory control requires frequent measurements of tank contents and math calculations that let you compare your stick inventory (what you've measured) to your book inventory (what your recordkeeping indicates you should have). Some people call this process inventory reconciliation. If the difference between your stick and book inventory is too large, your tank may be leaking.

EPA has a booklet, *Doing Inventory Control Right*, that fully explains how to do inventory control. The booklet also contains standard recordkeeping forms. You can order this free booklet by calling EPA's publication distributor at (800) 490-9198 or downloading it from EPA's web site at http://www.epa.gov/OUST/. See inside the front cover for full ordering information.

- UST inventories are determined each operating day by using a gauge stick and recording the data on a form. The level on the gauge stick is converted to a volume of product in the tank using a calibration chart, which is often furnished by the UST manufacturer.

- The amounts of product delivered to and withdrawn from the UST each operating day are also recorded. At least once each month, the gauge stick data and the sales and delivery data are reconciled and the month's overage or shortage is determined. If the overage or shortage is greater than or equal to 1.0 percent of the tank's flow-through volume plus 130 gallons of product, the UST may be leaking.

*What are the regulatory requirements?*

- Inventory control must be used in combination with periodic tank tightness tests.

- The gauge stick should reach the bottom of the tank and be marked so that the product level can be determined to the nearest one-eighth of an inch. A monthly measurement should be taken to identify any water at the bottom of the tank.

- Product dispensers must be calibrated to the local weights and measures standards.

*Anything else you should consider?*

- Inventory control is a practical, commonly used management tool that does not require closing down the tank operation for long periods.

- The accuracy of tank gauging can be greatly increased by spreading product-finding paste on the gauge stick before taking measurements (or by using in-tank product level monitoring devices).

- If your tank is not level, inventory control may need to be modified. You will need to get a corrected tank chart.
**Time restrictions on the use of this combined method...**

The combined method using tank tightness testing every 5 years is valid only after the entire UST system has met spill, overfill, and corrosion protection standards. Following entire UST system upgrade, this combined method may be used for 10 years after the date the tank was installed or upgraded with corrosion protection. Note that the end date is based on the compliance status of the **tank only**, not the entire UST system. As a result, some USTs may not be able to use this combined method for as long as 10 years (see discussion below). At the end of the valid time period, you must use one of the monthly monitoring leak detection choices described in this booklet.

**Unique time restriction for some USTs...**

For some USTs which had corrosion protection **before** the entire UST system met upgrade standards—this combined method of inventory control and tightness testing every 5 years may be valid for less than 10 years.

Federal regulations state that the combined method can be used: 1) 10 years after the tank is protected from corrosion, and 2) the period of validity cannot begin until the entire UST system meets upgrade standards. Therefore, in those cases where the tank had corrosion protection before the UST system met upgrade standards, the period of validity is less than 10 years. The effect of this restriction will be clear in the following example: a bare steel tank upgraded with corrosion protection in 1986 (or the tank was made of noncorrodible material and installed in 1986), but the piping, spill, and overfill upgrades were not added until 1995. The UST system in this example could start using the combined method only in 1995 (when the full system met upgrade standards) and could use the combined method only until 1998 (the date which is the later of either 1998 or 10 years after the tank has corrosion protection). In this example, the UST may use the combined method to meet federal leak detection requirements only for three years (from 1995 to 1998).

Correspondingly, when the period of validity is less than 10 years, fewer periodic tightness tests may be required.

**Check with your implementing agency for guidance.**
Manual Tank Gauging

Will you be in compliance?

NOTE: Manual tank gauging can be used only on tanks 2,000 gallons or less capacity. Tanks 1,000 gallons or less can use this method alone. Tanks from 1,001-2,000 gallons can temporarily use manual tank gauging only when it is combined with tank tightness testing. Manual tank gauging cannot be used on tanks over 2,000 gallons. When performed according to recommended practices, manual tank gauging meets the federal leak detection requirements for USTs with a capacity of 1,000 gallons or less for the life of the tank. Manual tank gauging detects leaks only from tanks (this method does not detect piping leaks). For requirements for piping, see the section on leak detection for piping starting on page 22.

How does the leak detection method work?

EPA has a booklet, Manual Tank Gauging, that fully explains how to do manual tank gauging correctly. The booklet also contains standard recordkeeping forms. You can order this free booklet by calling EPA’s publication distributor at (800) 490-9198 or downloading it from the EPA web site at http://www.epa.gov/OUST/. See inside the front cover for complete ordering information.

- Four measurements of the tank’s contents must be taken weekly, two at the beginning and two at the end of at least a 36-hour period during which nothing is added to or removed from the tank. See the table on the next page.
- The average of the two consecutive ending measurements are subtracted from the average of the two beginning measurements to indicate the change in product volume.
- Every week, the calculated change in tank volume is compared to the standards shown in the table on the next page. If the calculated change exceeds the weekly standard, the UST may be leaking. Also, monthly averages of the four weekly test results must be compared to the monthly standard in the same way. See the table on the next page.

What are the regulatory requirements?

- Liquid level measurements must be taken with a gauge stick that is marked to measure the liquid to the nearest one-eighth of an inch.
- Manual tank gauging may be used as the sole method of leak detection for tanks with a capacity of 1,000 gallons or less for the life of the tank. Tanks between 551 and 1,000 gallons have testing standards based on their diameter or their additional use of tightness testing (see table). These tanks may temporarily use a combination of manual tank gauging and periodic tank tightness (see next bullet on page 21).
### Table of Test Standards for Manual Tank Gauging

<table>
<thead>
<tr>
<th>Tank Size</th>
<th>Minimum Duration Of Test</th>
<th>Weekly Standard (1 test)</th>
<th>Monthly Standard (4-test average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 550 gallons</td>
<td>36 hours</td>
<td>10 gallons</td>
<td>5 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 64&quot;)</td>
<td>44 hours</td>
<td>9 gallons</td>
<td>4 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 48&quot;)</td>
<td>58 hours</td>
<td>12 gallons</td>
<td>6 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>13 gallons</td>
<td>7 gallons</td>
</tr>
<tr>
<td>1,001-2,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>26 gallons</td>
<td>13 gallons</td>
</tr>
</tbody>
</table>

- For tanks with a capacity of 1,001-2,000 gallons, manual tank gauging must be combined with periodic tightness testing. This combined method will meet the federal requirements only *temporarily*. See page 19 for an explanation of time restrictions that also applies to the combination of manual tank gauging and tank tightness testing. You must eventually have another monitoring method that can be performed at least once a month. See the other sections of this booklet for allowable monthly monitoring options. Also, see pages 16-17 on tank tightness testing for details on this method.

- Tanks greater than 2,000 gallons in capacity may not use this method of leak detection to meet these regulatory requirements.

**Anything else you should consider?**

- You can perform manual tank gauging yourself. Correct gauging, recording, and math are the most important factors for successful tank gauging. The accuracy of tank gauging can be greatly increased by spreading product-finding paste on the gauge stick before taking measurements.
Leak Detection For Underground Piping

Will you be in compliance?

When installed and operated according to the manufacturer's specifications, the leak detection methods discussed here meet the federal regulatory requirements for the life of underground piping systems. Your UST may have suction or pressurized piping, which are discussed below.

What are the regulatory requirements for suction piping?

- No leak detection is required if the suction piping has (1) enough slope so that the product in the pipe can drain back into the tank when suction is released and (2) has only one check valve, which is as close as possible beneath the pump in the dispensing unit. If a suction line is to be considered exempt based on these design elements, there must be some way to check that the line was actually installed according to these plans.

- If a suction line does not meet all of the design criteria noted above, one of the following leak detection methods must be used:
  - A line tightness test at least every 3 years; or
  - Monthly interstitial monitoring; or
  - Monthly vapor monitoring (including tracer compound analysis); or
  - Monthly groundwater monitoring; or
  - Monthly statistical inventory reconciliation; or
  - Other monthly monitoring that meets performance standards.

The line tightness test must be able to detect a leak at least as small as 0.1 gallon per hour at 1.5 times normal operating pressure with certain probabilities of detection and of false alarm.

Interstitial monitoring, vapor monitoring (including tracer compound analysis), groundwater monitoring, and statistical inventory reconciliation have the same regulatory requirements for piping as they do for tanks. See the earlier sections of this booklet on those methods.
What are the regulatory requirements for pressurized piping?

Each pressurized piping run must have one leak detection method from each set below:

An automatic line leak detector:
- Automatic flow restrictor; or
- Automatic flow shutoff; or
- Continuous alarm system.

And one other method:
- Annual line tightness test; or
- Monthly interstitial monitoring; or
- Monthly vapor monitoring (including tracer compound analysis); or
- Monthly groundwater monitoring; or
- Monthly statistical inventory reconciliation; or
- Other monthly monitoring that meets performance standards.

The automatic line leak detector (LLD) must be designed to detect a leak at least as small as 3 gallons per hour at a line pressure of 10 pounds per square inch within 1 hour by shutting off the product flow, restricting the product flow, or triggering an audible or visual alarm.

The line tightness test must be able to detect a leak at least as small as 0.1 gallon per hour when the line pressure is 1.5 times its normal operating pressure. The test must be conducted each year. If the test is performed at pressures lower than 1.5 times operating pressure, the leak rate to be detected must be correspondingly lower.

Automatic LLDs and line tightness tests must also be able to meet the federal regulatory requirements regarding probabilities of detection and false alarm.

Interstitial monitoring, vapor monitoring (including tracer compound analysis), groundwater monitoring, and statistical inventory reconciliation have the same regulatory requirements for piping as they do for tanks. See the earlier sections of this booklet on those methods.

How do the leak detection methods work?

Automatic line leak detectors (LLDs)

Flow restrictors and flow shutoffs can monitor the pressure within the line in a variety of ways: whether the pressure decreases over time; how long it takes for a line to reach operating pressure; and combinations of increases and decreases in pressure.
If a suspected leak is detected, a flow restrictor keeps the product flow through the line well below the usual flow rate. If a suspected leak is detected, a flow shutoff completely cuts off product flow in the line or shuts down the pump.

A continuous alarm system constantly monitors line conditions and immediately triggers an audible or visual alarm if a leak is suspected. Automated internal, vapor, or interstitial line monitoring systems can also be set up to operate continuously and sound an alarm, flash a signal on the console, or even ring a telephone in a manager's office when a leak is suspected.

Both automatic flow restrictors and shutoffs are permanently installed directly into the pipe or the pump housing.

Vapor, interstitial, or other monitoring systems can be installed to shut off flow, restrict flow, or trigger an alarm whenever a leak is detected. If it meets the applicable standards, such a setup meets the monthly monitoring requirement as well as the LLD requirement.

**Line tightness testing**

The line is taken out of service and pressurized, usually above the normal operating pressure. A drop in pressure over time, usually an hour or more, suggests a possible leak.

Suction lines are not pressurized very much during a tightness test (about 7 to 15 pounds per square inch).

Most line tightness tests are performed by a testing company. You just observe the test.

Some tank tightness test methods can be performed to include a tightness test of the connected piping.

For most line tightness tests, no permanent equipment is installed.

In the event of trapped vapor pockets, it may not be possible to conduct a valid line tightness test. There is no way to tell definitely before the test begins if this will be a problem, but long complicated piping runs with many risers and dead ends are more likely to have vapor pockets.

Some permanently installed electronic systems (which often include ATGS) can meet the requirements of monthly monitoring or a line tightness test.
Secondary containment with interstitial monitoring

- A barrier is placed between the piping and the environment. Double-walled piping or a leakproof liner in the piping trench can be used.

- A monitor is placed between the piping and the barrier to sense a leak if it occurs. Monitors range from a simple stick that can be put in a sump to see if a liquid is present, to continuous automated systems that monitor for the presence of liquid product or vapors.

- Proper installation of secondary containment is the most important and the most difficult aspect of this leak detection method. Trained and experienced installers are necessary.

- See the section on secondary containment for additional information. Secondary containment for piping is similar to that for tanks.

Vapor (including tracer compound analysis) or groundwater monitoring

- Vapor monitoring detects product that leaks into the soil and evaporates.

- Tracer compound analysis uses a tracer chemical to determine if there is a hole in the line.

- Groundwater monitoring checks for leaked product floating on the groundwater near the piping.

- A site assessment must be used to determine monitoring well placement and spacing.

- UST systems using vapor (including tracer compound analysis) or groundwater monitoring for the tanks are well suited to use the same monitoring method for the piping.

- See the earlier sections on vapor (including tracer compound analysis) and groundwater monitoring. Use of these methods with piping is similar to that for tanks.
Available Free...You can go to our web site at http://www.epa.gov/oust/pubs/index.htm to order or download documents online. You can write and ask for titles by addressing your request to NSCEP, our publication distributor: NSCEP, Box 42419, Cincinnati, OH 45242. Or you can make your request by calling NSCEP’s toll-free number at (800) 490-9198. Or you can fax your order to NSCEP at (513) 489-8695.

Titles

Musts For USTs: A Summary Of Federal Regulations For Underground Storage Tank Systems

Manual helps state and EPA UST inspectors evaluate how well owners and operators are using their automatic tank gauging (ATG) systems to comply with release detection requirements. Contains a summary of specifications, based on third-party evaluations, for ATG systems that detect leaks from USTs and their piping (140 pages).

Operating and Maintaining Underground Storage Tank Systems: Practical Help and Checklists
Manual provides brief summaries of federal UST requirements for operation and maintenance (O&M), as well as practical help that goes beyond the requirements. Contains checklists, recordkeeping forms, and information to help owners and operators properly operate and maintain their USTs (50 pages).

Model Underground Storage Tank Environmental Results Program Workbook
Workbook, which states can modify to reflect their laws, helps improve owner and operator compliance with UST regulations. Contains general information about ERP; instructions on how to use the workbook; regulatory requirements, best management practices, and compliance checklists for USTs; and draft forms and worksheets in the appendices (164 pages).

UST Systems: Inspecting and Maintaining Sumps and Spill Buckets – Practical Help and Checklist
Manual presents recommended inspection guidelines and best management practices for UST system sumps and spill buckets. Includes safety considerations; a general introduction to the kinds of sumps; basic maintenance procedures for sumps and spill buckets; and a sump and spill bucket inspection checklist (16 pages).

Doing Inventory Control Right: For Underground Storage Tanks
Booklet describes how owners and operators of USTs can use inventory control and periodic tightness testing to meet federal leak detection requirements. Contains reporting forms (16 pages).

Manual Tank Gauging: For Small Underground Storage Tanks
Booklet provides simple, step-by-step directions for conducting manual tank gauging for tanks 2,000 gallons or smaller. Contains reporting forms (12 pages).

Introduction To Statistical Inventory Reconciliation: For Underground Storage Tanks
Booklet describes how Statistical Inventory Reconciliation (SIR) can meet federal leak detection requirements (12 pages).

Closing Underground Storage Tanks: Brief Facts
Trifold leaflet presents “brief facts” on properly closing USTs in order to comply with federal closure requirements.

Dollars And Sense: Financial Responsibility Requirements For Underground Storage Tanks
Booklet summarizes the "financial responsibility" required of UST owners and operators (16 pages).

Financing Underground Storage Tank Work: Federal And State Assistance Programs
Booklet identifies potential sources of financial assistance to cover the costs of upgrading, replacing, or closing an UST, or of cleaning up an UST release (30 pages).
There are several helpful videos you can order as explained below. Contacts can provide information about availability and cost.

<table>
<thead>
<tr>
<th>Video Title</th>
<th>Contact</th>
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<tbody>
<tr>
<td><strong>Tank Closure Without Tears: An Inspector’s Safety Guide</strong></td>
<td>New England Interstate Water Pollution Control Commission</td>
</tr>
<tr>
<td>Focuses on explosive vapors and safe tank removal (30 minutes).</td>
<td>Attn: Videos</td>
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<tr>
<td></td>
<td>116 John Street</td>
</tr>
<tr>
<td></td>
<td>Lowell, MA 01852</td>
</tr>
<tr>
<td></td>
<td>(978) 323-7929</td>
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<tr>
<td><strong>What Do We Have Here?: An Inspector’s Guide To Site Assessment At Tank Closure</strong></td>
<td></td>
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<tr>
<td>Inspecting sites for contamination where tanks have been removed.</td>
<td>Scene Three, Inc.</td>
</tr>
<tr>
<td>Part 1: Site Assessment Overview (30 minutes); Part 2: Field Testing Instruments At A Glance (14 minutes); Part 3: Soil And Water Sampling At A Glance (7 minutes).</td>
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<tr>
<td><strong>Searching For The Honest Tank: A Guide To UST Facility Compliance Inspection</strong></td>
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<tr>
<td>Covers major aspects of UST inspections, including protocols, equipment,</td>
<td>EPA’s Office of Underground Storage Tanks</td>
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<tr>
<td>cathodic protection, and leak detection. Directed at inspectors, yet also</td>
<td>(703) 603-9900 or visit EPA’s web site at</td>
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<tr>
<td>helpful to owners and operators (30 minutes).</td>
<td><a href="http://www.epa.gov/oust/oustcont.htm">www.epa.gov/oust/oustcont.htm</a> (see videos)</td>
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<tr>
<td><strong>Tank Time</strong></td>
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<tr>
<td>Humorous presentation explains what UST owners and operators must do to</td>
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<tr>
<td>comply with the December 1998 deadline to upgrade, replace, or close</td>
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<td>tanks installed before December 1988 (18 minutes).</td>
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<tr>
<td><strong>Doing It Right</strong></td>
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<tr>
<td>Illustrates proper installation of underground tanks and piping for</td>
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<tr>
<td>installation crews. Part 1: Tanks (24 minutes); Part 2: Piping (16 minutes).</td>
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<tr>
<td><strong>Doing It Right II: Installing Required UST Equipment</strong></td>
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<tr>
<td>Illustrates installation of spill and overfill equipment, observation</td>
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<tr>
<td>wells, and piping leak detection (23 minutes).</td>
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<tr>
<td><strong>Keeping It Clean: Making Safe And Spill-Free Motor Fuel Deliveries</strong></td>
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<tr>
<td>Making pollution-free deliveries to USTs. Includes Stage 1 vapor recovery,</td>
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<tr>
<td>overfill prevention and spill containment. For fuel tanker drivers and UST</td>
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<tr>
<td>owner/operators (25 minutes).</td>
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<td><strong>Petroleum Leaks Underground</strong></td>
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<td>How liquids and vapors move in the subsurface and why early response to</td>
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<td>leaked petroleum is so important. Part 1: How Liquids Move (14 minutes);</td>
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<tr>
<td>Part 2: How Vapors Move (15 minutes).</td>
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<tr>
<td><strong>Straight Talk on Leak Detection</strong></td>
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<tr>
<td>Overview of the leak detection methods available for complying with</td>
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<td>federal regulations (30 minutes).</td>
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<tr>
<td><strong>RBCA: Initial Site Assessment</strong></td>
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<tr>
<td>Overview of risk-based corrective action process produced by Shell Oil</td>
<td></td>
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<tr>
<td>Company (25 minutes).</td>
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</table>
State Contacts for UST Information

State Regulatory Agency Contacts

See EPA's web site at http://www.epa.gov/oust/states/statcon1.htm for state underground storage tank program contact information.
Doing Inventory Control Right
For Underground Storage Tanks
# CONTENTS

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Step 5 — Calculate Monthly Changes In Inventory ............... 12
Why You Should Read This Booklet If You Use Inventory Control

Federal and state laws require underground storage tanks (USTs) to have leak detection.

If your USTs do not have leak detection, you can be cited for violations and fined. Leak detection violations can also keep you from getting legally required insurance coverage and reimbursement for cleanup costs. Without leak detection, you constantly risk discovering a leak only after it becomes a major financial burden for yourself and an environmental problem for everyone.

If inventory control is part of your leak detection, then this booklet can help you make sure you do inventory control correctly.

Inspections conducted nationwide indicate that most people who think they are doing inventory control are not doing it in a way that is likely to find leaks and meet the law's requirements for leak detection. So even if you are SURE you are doing inventory control right, read this booklet carefully—it could save you a lot of grief and money.

If you need information on federal leak detection requirements and the various methods of leak detection available to you, see "Straight Talk On Tanks." Call EPA's toll-free Hotline at 800 424-9346 and order this free publication by number: EPA 530/UST-90/012.
How Does Inventory Control Work?

This booklet helps you use inventory control to meet federal regulatory leak detection requirements by showing you how to do three important tasks:

- Good sticking
- Good math
- Good recordkeeping

Without these three, you may fail to meet the leak detection requirements. To do inventory control right, you have to spend time to make sure that you consistently measure the tank's contents correctly, that you don't let math errors creep into your daily and monthly calculations, and that you keep complete, easy-to-read records on file for at least a year.

Basically, inventory control requires daily measurements of tank contents and math calculations that let you compare your "stick" inventory (what you've measured) to your "book" inventory (what your recordkeeping indicates you should have). Some people call this process "inventory reconciliation." If the difference between your "stick" and "book" inventory is too large, your tank may be leaking.

Be sure you read about several important restrictions on the use of inventory control that are described on the next page.

To use INVENTORY CONTROL correctly,

follow Steps 1—5 starting on page 6.
Please note these important restrictions on the use of inventory control as leak detection:

! **Inventory control can never be used alone.** Inventory control must always be used in combination with tank tightness testing. Tanks must be tightness tested every 12 months if they do not have corrosion protection and spill/overfill devices. Tanks with corrosion protection and spill/overfill devices must be tested every 5 years.

! **Inventory control is a TEMPORARY leak detection method.** You can use inventory control only for 10 years after installing a new tank that has corrosion protection and spill/overfill devices or for 10 years after upgrading an old tank with corrosion protection and spill/overfill devices. After the 10-year period, you must use a monthly monitoring method, such as groundwater monitoring or interstitial monitoring.

Tanks without corrosion protection and spill/overfill devices can use inventory control only until December 1998, when these tanks must be upgraded or closed. (See "Straight Talk On Tanks.")

! **The combined use of inventory control and tank tightness testing does not meet your tank system's leak detection requirements for piping.** Pressurized and some suction piping must use other methods of leak detection, such as interstitial monitoring. (See "Straight Talk On Tanks.")

If you don't pay careful attention to these restrictions, you will fail to meet the leak detection requirements.
Do You Have The Right Equipment?

Gauge Stick Or Other Gauges
The gauge stick used to measure the depth of liquid in an underground tank must be marked or notched to the \( \frac{1}{8} \) inch, starting with zero at the bottom end. Check your stick to be sure the end has not been worn or cut off and that the stick is not warped. The stick should be made of non-sparking material, such as wood, and varnished to minimize the creeping of fuel above the actual fuel level in the tank. Instead of using a gauge stick, you may use a mechanical or electronic tank level monitor. Whatever measuring device you use must be capable of measuring the level of product over the full range of the tank's height to the nearest \( \frac{1}{8} \) inch.

Pastes For Finding Water Or Fuel
You must check for water in the bottom of the tank at least once each month by smearing a water-finding paste along the bottom of the gauge stick. The paste changes color when it comes in contact with water. Many operators improve their stick readings by smearing a fuel-finding paste on about 6 inches of the stick where they expect the fuel level to be. Fuel-finding paste changes color when it comes in contact with fuel.

Forms
The instructions in this booklet are keyed to two forms: the "DAILY INVENTORY WORKSHEET" and the "MONTHLY INVENTORY RECORD." You will find filled-in sample copies of these forms on the last two pages of this booklet. These samples are on perforated pages, so tear them out and refer to them while you read through the directions that are keyed alphabetically to the sample forms. Also, near the back of the booklet, you will find "masters" you can copy repeatedly to provide forms for use in your recordkeeping. If these forms are filled out according to the instructions in this booklet, you will be in compliance with federal regulations for inventory control. You should find out if state or local requirements have limitations on the use of inventory control or have requirements that are different from those presented in this booklet. You can use other standard recordkeeping forms, as long as they are clear, consistent, and contain all the information required by the federal and state leak detection regulations.
Tank Chart
A tank chart is a table that converts the number of inches of liquid in the tank into the number of gallons. You need a tank chart that exactly matches your storage tank (tank manufacturers usually provide charts for their tanks). If you have more than one tank, you will need a chart for each tank unless the tanks are identical. The tank chart must show conversion to gallons for each inch stick reading. If your tank chart does not convert each inch reading into gallons, contact the tank manufacturer, or, if you have a steel tank, the Steel Tank Association (708 438-8265) to get an appropriate chart.

You always need to convert inches into gallons in order to fill out the forms correctly and to do the necessary math. To convert inches into gallons, find your stick’s reading to the nearest inch on the tank chart, then simply read across to the gallons column to find the number of gallons. If you cannot get a tank chart showing conversion to gallons for each inch reading, you must do the additional math explained on page 9.

Drop Tube
The fill pipe through which the fuel is delivered into the tank must have a drop tube extending to within 1 foot of the bottom of the tank. Stick measurements should be made through a drop tube in the fill pipe or gauging port. If your fill pipe does not have a drop tube, call your petroleum equipment supplier to have one installed.

Calibrated Dispensing Meters
Meters must be calibrated according to local standards.

Manifolded Tanks
If you have manifolded tanks or dispensers that blend fuel, consider these tanks as one tank system if they share a common inventory of stored fuel. As you follow the directions on the following pages, you will need to combine your measurements and calculations for all the tanks manifolded into one system.
Step 1—Measure The Tank’s Contents

You must measure the tank every day that fuel is added or removed. You may take measurements using a gauge stick or a mechanical or electronic tank level monitor.

No fuel can be added or removed from the tank while you are performing Step 1 or Step 2.

Every day you measure the tank, you should fill out a "DAILY INVENTORY WORKSHEET." As you go through the following directions, refer to the sample DAILY INVENTORY WORKSHEET you will find on the last pages of this booklet. For easy reference, the sample is on a perforated page so you can tear it out and keep it handy as you read through the directions. Also, near the back of the booklet is a "master copy" on a perforated page you can tear out to make copies of the DAILY INVENTORY WORKSHEET for your recordkeeping.

A Fill in the identifying information at the top of the worksheet.

B Next to the "TANK IDENTIFICATION" box are empty vertical columns. Each column represents one tank—consistently enter all information on that one tank in the same vertical column. NOTE: Once you have filled in the tank identification boxes, make copies of the worksheet so you won’t have to repeatedly enter the same information.

USE GOOD STICKING PRACTICES: Slowly lower the gauge stick to the tank’s bottom. Let the stick gently touch the bottom, then quickly bring it back up. Read the depth of fuel indicated by the wet mark to the closest 1/8 inch division on the stick. Use of fuel-finding paste will make your stick readings more accurate.

C Write your measurement in the box labeled "END STICK INCHES" for the tank you measured.

NOTE: If your tank is equipped with an automatic tank gauge (ATG), you may record the inches of product and gallons of product directly from the ATG’s printed tape or simply staple the tape with this information to the worksheet.
Step 2—Record The Amount Pumped

At the same time you measure the tank contents (Step 1), you must record on the DAILY INVENTORY WORKSHEET the amount of fuel pumped. No fuel can be added or removed from the tank while you are sticking the tank and recording the amount pumped.

D Locate the box labeled "AMOUNT PUMPED" on the left side of the worksheet. Copy the numbers from each dispenser's totalizer onto the worksheet. Be very careful that you write all the meter readings for a tank in the same column. You may have several dispensers and totalizers for one tank, so the worksheet provides boxes in which you can enter several readings in any order.

E Add up the totalizer meter readings in each column and write the result in the box labeled "TODAY'S SUM OF TOTALIZERS."

F Find the last DAILY INVENTORY WORKSHEET you completed. Copy "TODAY'S SUM OF TOTALIZERS" from that worksheet into the "Previous Day's Sum of Totalizers" box of the worksheet you are working on today.

G On today’s worksheet, subtract "Previous Day's Sum of Totalizers" from "TODAY'S SUM OF TOTALIZERS" and write the result in the box labeled "AMOUNT PUMPED TODAY."

You may have an alternative to reading totalizers. If you have a self-service fueling operation where the cashier can authorize fuel sales from inside the facility, you can probably print out a daily report that gives you the total sales for each type of fuel. NOTE: You can use the sales volumes from this report instead of reading your totalizer meters only if no fuel sales are made between the time you print the report from the cash register and the time you measure your tanks (Step 1).

H If you are using cash register reports to record the amount pumped, enter the amount of each type of fuel pumped in the box labeled "AMOUNT PUMPED TODAY" or staple the printout to the worksheet.
Step 3—Record Fuel Deliveries

You must check how much fuel has been delivered every time any amount of fuel is delivered to your tank. **NOTE: You should not pump any fuel during the time it takes to do items "I" and "J" below.**

Before the delivery begins, the liquid level in the tank must be measured. Always use good sticking practices: slowly lower the gauge stick, gently touch the stick to the bottom of the tank, then quickly bring the stick back up. Read the depth of fuel indicated by the wet mark to the nearest \( \text{c} \) inch division on the stick.

**I** Write your measurement in the box labeled "Inches of Fuel Before Delivery" for each tank you measured.

The delivery person can now deliver fuel into the tank. After the delivery, wait at least 5 minutes for the fuel level in the tank to stabilize, and then measure again as described above.

**J** Record fuel level in the box labeled "Inches of Fuel After Delivery."

**K** Using your tank chart with \( \text{c} \) inch readings, convert both delivery readings to the correct number of gallons. Record these numbers in the boxes labeled "Gallons of Fuel Before Delivery" and "Gallons of Fuel After Delivery." (If necessary, see page 9 on converting inches into gallons.)

**L** Subtract "Gallons of Fuel Before Delivery" from "Gallons of Fuel After Delivery." Record the result in the box labeled "GALLONS DELIVERED (STICK)."

Now look at the delivery receipt and find the volume of each type of product that was delivered. If two volumes are given, one labeled "net" and the other "gross," use the gross gallons as the volume of product delivered.

**M** For each type of fuel delivered, copy the gross gallons delivered from the delivery receipt onto the worksheet in the box labeled "GROSS GALLONS DELIVERED (RECEIPT)." The gallons in items "L" and "M" should roughly match. If they don't, contact your supplier.
Using Tank Charts Without c Inch Conversions

If your tank chart does not list direct conversions from inches to gallons for every c inch, then you must do the additional math described below every time you stick your tank.

The easiest way to explain this procedure is with an example. Let’s say you have a stick reading of 43d inches and you need to figure how many gallons are in your tank.

1. Look on your tank chart and find the inch measurements that are just above and below your stick reading and write down the number of gallons for these inch readings. Subtract the gallon readings to find the difference between the two readings:

| Chart reading at 44 inches: | 3,585 gallons |
| Chart reading at 43 inches: | 3,480 gallons |
| Difference: | 105 gallons |

2. Dividing 105 by 8 will give you the number of gallons per c inch, which in this example is 13. (More exactly it is 13.125, but do round off the number to the nearest whole number.) Because your fraction is d, multiply 13 gallons by 3, which gives you 39 gallons as the volume represented by d inch.

CAUTION: The gallons represented by each c inch will vary from top to bottom of the tank and must be calculated for each conversion.

3. Take the number of gallons you have just calculated and add it to the inch reading just below your actual stick reading:

| Chart reading at 43 inches: | 3,480 gallons |
| Gallons at d inch: | + 39 gallons |
| Sum: | 3,519 gallons |

Thus, your stick reading of 43d inches converts to 3,519 gallons.

NOTE: If your tank chart is in half or quarter inches, you must still use this procedure so that your gallon readings are accurate to c inch.

After all of this math, you can see why it pays to have the correct tank chart that indicates gallons for each c inch.
Step 4—Calculate Daily Changes In Inventory

In this step, you will copy information from the DAILY INVENTORY WORKSHEET onto the MONTHLY INVENTORY RECORD. You will then do some math to determine your daily inventory. You need one MONTHLY INVENTORY RECORD for each tank that you have.

As you go through the following directions, refer to the sample MONTHLY INVENTORY RECORD you will find on the reverse side of the DAILY INVENTORY WORKSHEET sample you have already been using. For easy reference, the sample is on a perforated page so you can tear it out and keep it handy as you read through the directions. Also, near the back of the booklet is a "master copy" on a perforated page you can tear out to make copies of the MONTHLY INVENTORY RECORD for your recordkeeping.

N Fill in the identifying information at the top of the MONTHLY INVENTORY RECORD.

If this is the very first day of your inventory recordkeeping, convert the "END STICK INCHES" from the DAILY WORKSHEET into gallons and enter on the MONTHLY RECORD under "END STICK INVENTORY (GALLONS)" for that starting date. (If necessary, see page 9 on converting inches into gallons.) This is all you can do today. Starting tomorrow, follow all of the instructions listed below.

C Find the line in the left column on the MONTHLY RECORD with today's date listed. Copy the previous day's "END STICK INVENTORY (GALLONS)" number into the box for today's "START STICK INVENTORY (GALLONS)."

P Enter the amount of fuel delivered from the DAILY INVENTORY WORKSHEET. If you were NOT pumping fuel during the time when the delivery was taking place, then use the "GALLONS DELIVERED (STICK)" number. However, if you had to pump fuel while the delivery was taking place, then use the "GROSS GALLONS DELIVERED (RECEIPT)" number as your delivery amount.

Q Copy the "AMOUNT PUMPED TODAY" number from the DAILY INVENTORY WORKSHEET into the "GALLONS PUMPED" column of the MONTHLY INVENTORY RECORD.
Add the "START STICK INVENTORY (GALLONS)" and the "GALLONS DELIVERED" columns; then subtract the "GALLONS PUMPED" column. Enter the result in the column labeled "BOOK INVENTORY (GALLONS)."

Copy the "END STICK INCHES" number from the DAILY WORKSHEET into the column labeled "END STICK INVENTORY (INCHES)" on the MONTHLY RECORD. Convert inches into gallons and enter the result in the column on the MONTHLY RECORD labeled "END STICK INVENTORY (GALLONS)." (If necessary, see page 9 on converting inches into gallons.)

Subtract the "BOOK INVENTORY (GALLONS)" from the "END STICK INVENTORY (GALLONS)." Enter the difference into today's "DAILY OVER OR SHORT" box. This number will usually be a positive or negative number (only rarely will it be zero).

Enter your initials to show who entered today's information.

At least once each month, you must also measure for water in the tank. Smear water-finding paste on the bottom few inches of the gauge stick. Open the fill pipe and slowly lower the stick to the tank's bottom. Hold the stick on the bottom for 10 seconds for gasoline (30 seconds for diesel). Then remove the stick. If there is water in the bottom of the tank, the water-finding paste will change color. Read the depth of water indicated by the line where the water-finding paste has changed color to the closest inch division on the stick. Do not use this stick reading to measure the amount of fuel in the tank, because the fuel will creep up the stick and will give you an inaccurate reading.

If you checked the tank for water today, enter the number of inches of water in the tank on the line under "Facility Name" at the top of the monthly record. If there is no water present, enter a zero to indicate that you in fact checked for water but found none. If you find more than 1 inch of water, you should arrange for its immediate removal, notify the product supplier, and conduct further tests to ensure that the tank is not leaking.
Step 5—Calculate Monthly Changes In Inventory

At the end of each month, follow the directions below to see if the difference between "stick" and "book" inventory indicates a possible leak.

W Add all of the month's "GALLONS PUMPED" numbers and write this total at the bottom of the column in the box labeled "TOTAL GALLONS PUMPED."

X Add all the month's "DAILY OVER OR SHORT" numbers: pay careful attention to positive and negative numbers to get an accurate total. For example, adding +4 and +3 and -2 should equal +5. Enter the total at the bottom of the column in the box labeled "TOTAL GALLONS OVER OR SHORT."

Y Fill out the "LEAK CHECK" line at the bottom of the MONTHLY INVENTORY RECORD as follows:

1. Take the "TOTAL GALLONS PUMPED" number and drop the last two digits to get 1% (for example: 6594 becomes 65).

2. Add 130 (for example: 65 + 130 = 195).

Enter the result of this calculation at the end of the "LEAK CHECK" line. This number is the maximum change in inventory allowed by federal regulations (1% of throughput plus 130 gallons).

Z At the bottom of the MONTHLY INVENTORY RECORD, circle "YES" or "NO" to show whether your "TOTAL GALLONS OVER OR SHORT" number is LARGER than the "LEAK CHECK" number you identified in the previous item. Even if your "TOTAL GALLONS OVER OR SHORT" is a negative number, treat it as a positive number for the purpose of this comparison. For example, -74 would become +74.

If you circle "YES" for 2 months in a row, you must notify your regulatory agency as soon as possible (usually within 24 hours) that your tank may be leaking.

NOTE: Keep your inventory control records on file for at least 1 year. Your state, however, may have different rules about when you have to report a leak or how long you must keep the inventory records. Be sure you know the rules that apply to you.
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MONTHLY INVENTORY RECORD

TANK IDENTIFICATION & TYPE OF FUEL: ____________________________________

MONTH/YEAR :_______/______

FACILITY NAME: ___________________________________________________________

DATE OF WATER CHECK: ___________     LEVEL OF WATER (INCHES):_________

START STICK BOOK END STICK

INVENTORY DAILY OVER (+) (-)

INVENTORY GALLONS GALLONS

(INCHES) (GALLONS) "End" "Book"

INITIALS

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TOTAL GALLONS PUMPED > __________________________ TOTAL GALLONS OVER OR SHORT > __________________________

DROP THE LAST 2 DIGITS from the Pumped number and enter on the line below the TOTAL GALLONS LEAK CHECK:

numbers Compare these

LEAK CHECK: __________ + 130 = __________ 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 regulatory agency as soon as possible.

KEEP THIS PIECE OF PAPER ON FILE FOR AT LEAST 1 YEAR
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| E DELIVERY RECORD     |         |         |         |         |
| Inches of Fuel Before Delivery | 13 3/8  |         | 49 3/8  |
| Gallons of Fuel Before Delivery (from tank chart) | 537  | 5246  |
| Inches of Fuel After Delivery | 41 4/4  | 86 1/2 |
| Gallons of Fuel After Delivery (from tank chart) | 2672 | 9423  |
| GALLONS DELIVERED (STICK) (Gallons "After" - Gallons "Before") | 2135 | 4177  |
| GROSS GALLONS DELIVERED (RECEIPT) | 2100 | 4200  |
MONTHLY INVENTORY RECORD

TANK IDENTIFICATION & TYPE OF FUEL: 4 MIDGRADE UNL

MONTH/YEAR: 9/93

FACILITY NAME: LAST CHANCE #2

DATE OF WATER CHECK: 9/1

LEVEL OF WATER (INCHES): 0

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<th>GALLONS PUMPED</th>
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<td>77 1/2</td>
<td>8591</td>
<td>+15</td>
</tr>
<tr>
<td>10</td>
<td>8591 (+)</td>
<td>(-) 205 (=)</td>
<td>8386</td>
<td>75 1/2</td>
<td>8329</td>
<td>-7</td>
</tr>
<tr>
<td>11</td>
<td>8329 (+)</td>
<td>(-) 204 (=)</td>
<td>8195</td>
<td>73 5/8</td>
<td>8173</td>
<td>-2</td>
</tr>
<tr>
<td>12</td>
<td>8173 (+)</td>
<td>(-) 166 (=)</td>
<td>6507</td>
<td>72</td>
<td>7991</td>
<td>-16</td>
</tr>
<tr>
<td>13</td>
<td>7991 (+)</td>
<td>(-) 350 (=)</td>
<td>7641</td>
<td>69 3/4</td>
<td>7780</td>
<td>-159</td>
</tr>
<tr>
<td>14</td>
<td>7780 (+)</td>
<td>(-) 307 (=)</td>
<td>4743</td>
<td>67</td>
<td>4920</td>
<td>-21</td>
</tr>
<tr>
<td>15</td>
<td>4920 (+)</td>
<td>(-) 76 (=)</td>
<td>7326</td>
<td>66 1/2</td>
<td>7342</td>
<td>+16</td>
</tr>
<tr>
<td>16</td>
<td>7342 (+)</td>
<td>(-) 224 (=)</td>
<td>7168</td>
<td>64 1/8</td>
<td>7090</td>
<td>-68</td>
</tr>
<tr>
<td>17</td>
<td>7090 (+)</td>
<td>(-) 390 (=)</td>
<td>6660</td>
<td>61</td>
<td>6657</td>
<td>-3</td>
</tr>
<tr>
<td>18</td>
<td>6657 (+)</td>
<td>(-) 296 (=)</td>
<td>6361</td>
<td>58 5/8</td>
<td>6354</td>
<td>-7</td>
</tr>
<tr>
<td>19</td>
<td>6354 (+)</td>
<td>(-) 38 (=)</td>
<td>6276</td>
<td>58 1/8</td>
<td>6290</td>
<td>+14</td>
</tr>
<tr>
<td>20</td>
<td>6290 (+)</td>
<td>(-) 424 (=)</td>
<td>5866</td>
<td>54 3/8</td>
<td>5869</td>
<td>+3</td>
</tr>
<tr>
<td>21</td>
<td>5869 (+)</td>
<td>(-) 205 (=)</td>
<td>5694</td>
<td>53 3/8</td>
<td>5639</td>
<td>-25</td>
</tr>
<tr>
<td>22</td>
<td>5639 (+)</td>
<td>4177 (=)</td>
<td>9413</td>
<td>86 1/2</td>
<td>9423</td>
<td>+10</td>
</tr>
<tr>
<td>23</td>
<td>9423 (+)</td>
<td>(-) 87 (=)</td>
<td>9336</td>
<td>85 1/2</td>
<td>9343</td>
<td>+7</td>
</tr>
<tr>
<td>24</td>
<td>9343 (+)</td>
<td>(-) 311 (=)</td>
<td>9032</td>
<td>82</td>
<td>9036</td>
<td>+4</td>
</tr>
<tr>
<td>25</td>
<td>9036 (+)</td>
<td>(-) 259 (=)</td>
<td>8779</td>
<td>79 1/2</td>
<td>8757</td>
<td>-40</td>
</tr>
<tr>
<td>26</td>
<td>8757 (+)</td>
<td>(-) 256 (=)</td>
<td>8501</td>
<td>76 3/8</td>
<td>8526</td>
<td>-25</td>
</tr>
<tr>
<td>27</td>
<td>8526 (+)</td>
<td>(-) 264 (=)</td>
<td>8262</td>
<td>74 3/8</td>
<td>8270</td>
<td>+8</td>
</tr>
<tr>
<td>28</td>
<td>8270 (+)</td>
<td>(-) 263 (=)</td>
<td>8007</td>
<td>72</td>
<td>7991</td>
<td>-16</td>
</tr>
<tr>
<td>29</td>
<td>7991 (+)</td>
<td>(-) 185 (=)</td>
<td>7806</td>
<td>69</td>
<td>7811</td>
<td>-1</td>
</tr>
<tr>
<td>30</td>
<td>7811 (+)</td>
<td>(-) 116 (=)</td>
<td>7695</td>
<td>68</td>
<td>7690</td>
<td>-5</td>
</tr>
<tr>
<td>31</td>
<td>(-) (-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL GALLONS PUMPED > 6594
TOTAL GALLONS OVER OR SHORT > -74

DROP THE LAST 2 DIGITS from the PUMPED number and enter on the TOTAL GALLONS line below

LEAK CHECK: 65 + 130 = 195 gallons

Is "TOTAL GALLONS OVER OR SHORT" LARGER than "LEAK CHECK" result? Yes \(\bigcirc\) No (circle one)

If answer is "YES" for 2 MONTHS IN A ROW, notify regulatory agency as soon as possible.

**KEEP THIS PIECE OF PAPER ON FILE FOR AT LEAST 1 YEAR**
GET GOOD INVENTORY CONTROL MEASUREMENTS!

! Measure each tank every operating day

! Use gauge sticks that are
  ✓ marked to the c inch
  ✓ not cut off or worn off at the "0" end
  ✓ varnished and not warped

! Measure through the same drop tube each time

! Use good sticking practices
  ✓ SLOWLY lower stick
  ✓ GENTLY touch stick on tank bottom
  ✓ QUICKLY pull stick out

! Measure just before each delivery

! Wait at least 5 minutes after delivery, then measure again

! Read and record totalizer meters carefully

! Check for water at least once a month using water-finding paste
Developed in cooperation with...

Fiberglass
Petroleum Tank & Pipe Institute

International Association of Tank Testing Professionals

PEI
Petroleum Equipment Institute

PMAA
Petroleum Marketers Association of America

SSDA
Service Station Dealers of America

SICMA
Society of Independent Gasoline Marketers of America

Steel Tank Institute
Manual Tank Gauging
For Small Underground Storage Tanks
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Why You Should Read This Booklet

Federal and state laws require underground storage tanks (USTs) to have leak detection. A lot of attention has been focused on large gasoline tanks, but it is also important to detect leaks from tanks 2,000 gallons or smaller, which often contain used oil.

If your USTs do not have leak detection, you can be cited for violations and fined. Leak detection violations can also keep you from getting legally required insurance coverage and reimbursement for cleanup costs. Without leak detection, you constantly risk discovering a leak only after it becomes a major financial burden for yourself and an environmental problem for everyone.

Manual tank gauging is a unique leak detection method that can be used only on tanks 2,000 gallons or smaller. If this method is appropriate for any of your USTs, this booklet can help you make sure you do manual tank gauging correctly.

If you need information on federal leak detection requirements and the various methods of leak detection available to you, see "Straight Talk On Tanks." Call EPA's toll-free Hotline at 800 424-9346 and order this free publication by number: EPA 530/UST-90/012.
How Does Manual Tank Gauging Work?

This booklet helps you use manual tank gauging to meet federal regulatory leak detection requirements by showing you how to do three important tasks:

- Good sticking
- Good math
- Good recordkeeping

Without these three, you may fail to meet the leak detection requirements. Steps 1 through 5 on the following pages show you how to perform manual tank gauging correctly.

Basically, manual tank gauging involves taking the tank out of service every week for 36 hours or more while you measure the tank's contents to see if changes in the tank's volume indicate a possible leak.

Manual tank gauging can be used only on tanks 2,000 gallons or smaller. Be sure you read about several important restrictions on the use of manual tank gauging that are described on the next page.

To use MANUAL TANK GAUGING correctly, follow Steps 1—5 starting on page 5.
Please note these important restrictions on the use of manual tank gauging:

- Manual tank gauging can be used only on tanks 2,000 gallons or smaller.

- Tanks 1,000 gallons or smaller can use this method alone.

- Tanks from 1,001 to 2,000 gallons can use manual tank gauging only when it is combined with periodic tank tightness testing. The combined method of manual tank gauging and tank tightness testing is a TEMPORARY leak detection method. You can use the combined method only for 10 years after installing a new tank that has corrosion protection and spill/overfill devices or for 10 years after upgrading an old tank with corrosion protection and spill/overfill devices. (However, tanks that are filled by transfers of no more than 25 gallons at one time are not required to have spill/overfill devices.) During this 10-year period, tanks need tightness testing every 5 years. After the 10-year period, you must use a monthly monitoring method, such as groundwater monitoring or interstitial monitoring.

- Tanks without corrosion protection and spill/overfill devices cannot use this combined method after December 1998, when these tanks must be upgraded or closed. Before December 1998, these tanks need tightness testing every year. (See "Straight Talk On Tanks.")

- The use of manual tank gauging does not meet your tank system's leak detection requirements for piping. Pressurized and some suction piping must use other methods of leak detection, such as interstitial monitoring. (See "Straight Talk On Tanks.")

- If you don’t pay careful attention to these restrictions, you will fail to meet the leak detection requirements.
Do You Have The Right Equipment?

Gauge Stick Or Other Gauges
The gauge stick used to measure the depth of liquid in an underground tank must be marked or notched to the 1/8" inch, starting with zero at the bottom end. Check your stick to be sure the end has not been worn or cut off and that the stick is not warped. The stick should be made of non-sparking material, such as wood, and varnished to minimize the creeping of fuel above the actual fuel level in the tank. Instead of using a gauge stick, you may use a mechanical or electronic tank level monitor. Whatever measuring device you use must be capable of measuring the level of product over the full range of the tank's height to the nearest 1/8" inch.

Forms
The instructions in this booklet are keyed to the "MANUAL TANK GAUGING RECORD" form. You will find a filled-in sample of this form on the last page of this booklet. This sample is on a perforated page, so tear it out and refer to it while you read through the directions that are keyed alphabetically to it. Also, near the back of the booklet, you will find blank "masters" you can copy repeatedly to provide forms for use in your recordkeeping. If the "MANUAL TANK GAUGING RECORD" is filled out according to the instructions in this booklet, you will be in compliance with federal regulations for manual tank gauging.

Tank Chart
A tank chart is a table that converts the number of inches of liquid in the tank into the number of gallons. You need a tank chart that exactly matches your storage tank (tank manufacturers usually provide charts for their tanks). If you have more than one tank, you will need a chart for each tank unless the tanks are identical. The tank chart must show conversion to gallons for each 1/8" inch stick reading. If your tank chart does not convert each 1/8" inch reading into gallons, contact the tank manufacturer, or, if you have a steel tank, the Steel Tank Association (708 438-8265) to get an appropriate chart.

You always need to convert inches into gallons in order to fill out the form correctly and to do the necessary math. To convert inches into gallons, find your stick’s reading to the nearest 1/8" inch on the tank chart, then simply read across to the gallons column to find the number of gallons. If you cannot get a tank chart showing conversion to gallons for each 1/8" inch reading, you must do the additional math explained on page 8.
Step 1—Find The Right Testing Period

Once each week you must take your tank out of service for a testing period. The length of the testing period depends on the size of your tank and whether you are using manual tank gauging alone or in combination with tank tightness testing.

A  Circle your tank size and test duration in the table so you will know which you are using. To identify the appropriate testing period, use the sample form found on the last page of this booklet and locate your tank on the table in the upper left corner of the sample form (see the section labeled “A”). You know which testing period you need to use every week by looking at the number in the "Minimum Duration Of Test" column next to the box that matches a description of your tank. With tanks of 551 to 1,000 gallons, you can choose a shorter test time (36 hours) with tightness testing or a longer test time (44 or 58 hours, depending on tank diameter) without tightness testing.

During the test period the tank must remain out of service so that nothing is put into the tank and nothing is taken out of it.

Step 2—Measure The Tank’s Contents

Every week, you must take liquid level measurements twice before and twice after each out-of-service testing period.

B  Fill in the identifying information at the top of the "MANUAL TANK GAUGING RECORD" form. You need a separate form for each tank using manual tank gauging.

C  Take your first stick reading using "good sticking practices" noted in the box on the right. Enter your reading in the column labeled "First Initial Stick Reading."

D  Wipe the stick dry with a rag and take a second stick reading as you did before. Enter the second reading in the column labeled "Second Initial Stick Reading."

After the readings are taken, the tank opening should be closed so that no liquid can be added or removed from the tank.

E  When the out-of-service testing period is over, take two more stick readings in the same way you took the first two readings. Enter the ending readings in the columns labeled "First and Second End Stick Reading."
Step 3—Do Some Math

Every week at the end of the test period, you must record some math calculations.

F. Average the two initial stick readings to the nearest \( \text{cm} \) inch. Enter the result in the "Average Initial Reading" column.

G. The average stick reading of the tank's contents will be in inches. You always need to convert inches into gallons in order to fill out the form completely and to calculate the change in the tank volume. Find your stick's reading on the tank chart to the nearest \( \text{cm} \) inch, then read across to the gallons column to find the number of gallons. Enter the result in the "Initial Gallons" column.

Your tank chart should have direct conversions from \( \text{cm} \) inch stick readings to gallons. If you cannot get a tank chart with \( \text{cm} \) inch conversions, do the additional math explained on page 8.

H. Average the two end stick readings to the nearest \( \text{cm} \) inch. Enter the result in the "Average End Reading" column.

I. Convert the average stick reading from inches into gallons (as you did in item "G" above) and enter the result in the "End Gallons" column.

J. Subtract the "End Gallons" column from the "Initial Gallons" column. Enter the result in the column labeled "Change In Tank Volume."

Step 4—Find The Right Test Standards

K. The weekly and monthly test standards depend on tank size and whether you are using manual tank gauging alone or in combination with tank tightness testing. To find your tank's weekly and monthly test standards, locate your tank on the table in the upper left corner of the sample MANUAL TANK GAUGING RECORD (see the section labeled "K"). You know which test standards apply to your tank by looking at the gallon numbers in the "Weekly Standard" and "Monthly Standard" columns next to your tank.

Circle the weekly and monthly test standards in the table that apply to your tank so you will know which standards your tank must meet.
Step 5—Compare Your Measurements With Test Standards

You must compare your calculation of "Change In Tank Volume" to the weekly and monthly test standards for your tank.

- **Every week**, compare your "Change In Tank Volume" number to the weekly test standard. For the purpose of this comparison, consider all numbers to be positive (for example, a -16 would become a +16). If your "Change In Tank Volume" number is not larger than the weekly test standard, circle YES in the "Tank Passes Test" column. If your "Change In Tank Volume" number is larger than the weekly test standard, circle NO. **If you circle NO, you must also call your regulatory agency to report a suspected leak as soon as possible.**

- **Once a month**, add up the 4 weekly "Change In Tank Volume" numbers: this time pay careful attention to positive and negative numbers to get an accurate total. For example, adding +4 and +3 and -2 and -1 should equal +4. After you have the sum of the 4 weekly tests, divide by 4 to get the monthly test average. **Enter the result at the bottom of the "Change In Tank Volume" column.**

  Compare your monthly test average to the monthly test standard for your tank. For the purpose of this comparison, again consider all numbers to be positive (for example, a -16 would become a +16). If your "Change In Tank Volume" number is not larger than the monthly test standard, circle YES in the "Tank Passes Test" column. If your monthly average "Change In Tank Volume" is larger than the monthly test standard, circle NO. **If you circle NO, you must also call your regulatory agency to report a suspected leak as soon as possible.**

---

Keep your manual tank gauging records on file for at least 1 year. Also, keep a record of the last tank tightness test, if you use the method that combines manual tank gauging with periodic tank tightness testing.
Using Tank Charts Without \( \text{c} \) Inch Conversions

If your tank chart does not list direct conversions from inches to gallons for every \( \text{c} \) inch, then you must do the additional math described below every time you stick your tank.

The easiest way to explain this procedure is with an example. Let's say you have a stick reading of 23\( \text{d} \) inches and you need to figure how many gallons are in your tank.

1. Look on your tank chart and find the inch measurements that are just above and below your stick reading and write down the number of gallons for these inch readings. Subtract the gallon readings to find the difference between the two readings:

<table>
<thead>
<tr>
<th>STICK READING</th>
<th>GALLONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>22''</td>
<td>265</td>
</tr>
<tr>
<td>23''</td>
<td>293</td>
</tr>
<tr>
<td>24''</td>
<td>325</td>
</tr>
<tr>
<td>25''</td>
<td>360</td>
</tr>
<tr>
<td>26''</td>
<td>407</td>
</tr>
<tr>
<td>27''</td>
<td>444</td>
</tr>
</tbody>
</table>

Chart reading at 24 inches: 325 gallons
Chart reading at 23 inches: 293 gallons

Difference: 32 gallons

2. Dividing 32 by 8 will give you the number of gallons for each \( \text{c} \) inch, which is 4 gallons. (Round off the number to the nearest whole number.) Because your fraction is \( \text{d} \), multiply 4 gallons by 3, which gives you 12 gallons as the volume represented by \( \text{d} \) inch.

CAUTION: The gallons represented by each \( \text{c} \) inch will vary from top to bottom of the tank and must be calculated for each conversion.

3. Take the number of gallons you have just calculated and add it to the inch reading just below your actual stick reading:

<table>
<thead>
<tr>
<th>STICK READING</th>
<th>GALLONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>22''</td>
<td>265</td>
</tr>
<tr>
<td>23''</td>
<td>293</td>
</tr>
<tr>
<td>24''</td>
<td>325</td>
</tr>
<tr>
<td>25''</td>
<td>360</td>
</tr>
<tr>
<td>26''</td>
<td>407</td>
</tr>
<tr>
<td>27''</td>
<td>444</td>
</tr>
</tbody>
</table>

Chart reading at 23 inches: 293 gallons
Gallons at \( \text{d} \) inch: + 12 gallons

Sum: 305 gallons

Thus, your stick reading of 23\( \text{d} \) inches converts to 305 gallons.

NOTE: If your tank chart is in half or quarter inches, you must still use this procedure so that your gallon readings are accurate to \( \text{c} \) inch.

After all of this math, you can see why it pays to have the correct tank chart that indicates gallons for each \( \text{c} \) inch.
## MANUAL TANK GAUGING RECORD

Circle your tank size, test duration, and weekly/monthly standards in the table below:

<table>
<thead>
<tr>
<th>Tank Size</th>
<th>Minimum Duration Of Test</th>
<th>Weekly Standard (1 test)</th>
<th>Monthly Standard (4-test average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 550 gallons</td>
<td>36 hours</td>
<td>10 gallons</td>
<td>5 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 64&quot;)</td>
<td>44 hours</td>
<td>9 gallons</td>
<td>4 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 48&quot;)</td>
<td>58 hours</td>
<td>12 gallons</td>
<td>6 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>13 gallons</td>
<td>7 gallons</td>
</tr>
<tr>
<td>1,001-2,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>26 gallons</td>
<td>13 gallons</td>
</tr>
</tbody>
</table>

Compare your weekly readings and the monthly average of the 4 weekly readings with the standards shown in the table on the left.

If the calculated change exceeds the weekly standard, the UST may be leaking. Also, the monthly average of the 4 weekly test results must be compared to the monthly standard in the same way.

If either the weekly or monthly standards have been exceeded, the UST may be leaking. As soon as possible, call your implementing agency to report the suspected leak and get further instructions.

### Start Test (month, day, and time)

<table>
<thead>
<tr>
<th>First Initial Stick Reading</th>
<th>Second Initial Stick Reading</th>
<th>Average Initial Reading</th>
<th>Initial Gallons (convert inches to gallons) [a]</th>
<th>End Test (month, day, and time)</th>
<th>First End Stick Reading</th>
<th>Second End Stick Reading</th>
<th>Average End Reading</th>
<th>End Gallons (convert inches to gallons) [b]</th>
<th>Change In Tank Volume In Gallons + or (—) [a—b]</th>
<th>Tank Passes Test (circle YES or NO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Y N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
<tr>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Y N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
<tr>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Y N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
<tr>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Date:</td>
<td>Time: AM/PM</td>
<td>Y N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y N</td>
</tr>
</tbody>
</table>

To see how close you are to the monthly standard, divide the sum of the 4 weekly readings by 4 and enter result here >

---

KEEP THIS PIECE OF PAPER ON FILE FOR AT LEAST 1 YEAR
Circle your tank size, test duration, and weekly/monthly standards in the table below:

<table>
<thead>
<tr>
<th>Tank Size</th>
<th>Minimum Duration Of Test</th>
<th>Weekly Standard (1 test)</th>
<th>Monthly Standard (4-test average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 550 gallons</td>
<td>36 hours</td>
<td>10 gallons</td>
<td>5 gallons</td>
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<tr>
<td>551-1,000 gallons (when tank diameter is 64&quot;)</td>
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<td>9 gallons</td>
<td>4 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 48&quot;)</td>
<td>58 hours</td>
<td>12 gallons</td>
<td>6 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (also requires periodic tank tightness testing)</td>
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<td>13 gallons</td>
<td>7 gallons</td>
</tr>
<tr>
<td>1,001-2,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>26 gallons</td>
<td>13 gallons</td>
</tr>
</tbody>
</table>

Start Test (month, day, and time) | First Initial Stick Reading | Second Initial Stick Reading | Average Initial Reading | Initial Gallons (convert inches to gallons) [a] | End Test (month, day, and time) | First End Stick Reading | Second End Stick Reading | Average End Reading | End Gallons (convert inches to gallons) [b] | Change In Tank Volume In Gallons + or (—) [a—b] | Tank Passes Test (circle YES or NO) | Y N | Y N | Y N | Y N | Y N |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Time: AM/PM</td>
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<td></td>
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</tr>
</tbody>
</table>

Keep this piece of paper on file for at least 1 year.

To see how close you are to the monthly standard, divide the sum of the 4 weekly readings by 4 and enter result here.

If the calculated change exceeds the weekly standard, the UST may be leaking. Also, the monthly average of the 4 weekly test results must be compared to the monthly standard in the same way.

If either the weekly or monthly standards have been exceeded, the UST may be leaking. As soon as possible, call your implementing agency to report the suspected leak and get further instructions.
Circle your tank size, test duration, and weekly/monthly standards in the table below:

<table>
<thead>
<tr>
<th>Tank Size</th>
<th>Minimum Duration Of Test</th>
<th>Weekly Standard (1 test)</th>
<th>Monthly Standard (4-test average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 550 gallons</td>
<td>36 hours</td>
<td>10 gallons</td>
<td>5 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 64&quot;)</td>
<td>44 hours</td>
<td>9 gallons</td>
<td>4 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (when tank diameter is 48&quot;)</td>
<td>58 hours</td>
<td>12 gallons</td>
<td>6 gallons</td>
</tr>
<tr>
<td>551-1,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>13 gallons</td>
<td>7 gallons</td>
</tr>
<tr>
<td>1,001-2,000 gallons (also requires periodic tank tightness testing)</td>
<td>36 hours</td>
<td>26 gallons</td>
<td>13 gallons</td>
</tr>
</tbody>
</table>

Compare your weekly readings and the monthly average of the 4 weekly readings with the standards shown in the table on the left.

If the calculated change exceeds the weekly standard, the UST may be leaking. Also, the monthly average of the 4 weekly test results must be compared to the monthly standard in the same way.

If either the weekly or monthly standards have been exceeded, the UST may be leaking. As soon as possible, call your implementing agency to report the suspected leak and get further instructions.

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## MANUAL TANK GAUGING RECORD

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If either the weekly or monthly standards have been exceeded, the UST may be leaking. As soon as possible, call your implementing agency to report the suspected leak and get further instructions.

## SAMPLE

<table>
<thead>
<tr>
<th>Start Test (month, day, and time)</th>
<th>First Initial Stick Reading</th>
<th>Second Initial Stick Reading</th>
<th>Average Initial Reading</th>
<th>Initial Gallons (convert inches to gallons)</th>
<th>End Test (month, day, and time)</th>
<th>First End Stick Reading</th>
<th>Second End Stick Reading</th>
<th>Average End Reading</th>
<th>End Gallons (convert inches to gallons) + or (–)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: 9/4 Time: 6 AM PM</td>
<td>44 3/8</td>
<td>45 1/8</td>
<td>45</td>
<td>1101</td>
<td>Date: 9/6 Time: 6 AM PM</td>
<td>45 3/8</td>
<td>45 1/2</td>
<td>45 1/2</td>
<td>1119</td>
</tr>
<tr>
<td>Date: 9/11 Time: 6 AM PM</td>
<td>7 1/8</td>
<td>7</td>
<td>7 1/8</td>
<td>89</td>
<td>Date: 9/13 Time: 6 AM PM</td>
<td>6 1/2</td>
<td>6 1/2</td>
<td>6 1/2</td>
<td>75</td>
</tr>
<tr>
<td>Date: 9/18 Time: 6 AM PM</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>150</td>
<td>Date: 9/20 Time: 6 AM PM</td>
<td>9 3/8</td>
<td>10 1/2</td>
<td>10</td>
<td>150</td>
</tr>
</tbody>
</table>

To see how close you are to the monthly standard, divide the sum of the 4 weekly readings by 4 and enter result here >

Keep this piece of paper on file for at least 1 year.
Developed in cooperation with...

Fiberglass
Petroleum Tank & Pipe Institute

IATP
INTERNATIONAL ASSOCIATION OF TANK TESTING PROFESSIONALS

PEI
PETROLEUM EQUIPMENT INSTITUTE

PMAA
PETROLEUM MARKETERS ASSOCIATION OF AMERICA

SSDA
SERVICE STATION DEALERS OF AMERICA

SIGMA
SOCIETY OF INDEPENDENT GASOLINE MARKETERS OF AMERICA

STI
Steel Tank Institute
Introduction To Statistical Inventory Reconciliation
For Underground Storage Tanks
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Why You Should Read This Booklet

Federal and state laws require underground storage tank systems (USTs) to have leak detection. One of the available leak detection methods is Statistical Inventory Reconciliation (SIR). In this method, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data.

SIR can allow the owner or operator of an UST facility to meet leak detection requirements without an extensive outlay of capital, using only the equipment that most facilities have readily at hand—a tank stick and a tank chart used for inventory control. The SIR analysis itself is usually provided as a service by vendors who charge a monthly fee based on the number of tanks.

This booklet provides basic information on the method—what it is, how it works, factors that impact data quality—to assist you in determining if SIR is appropriate to your needs.

If you need information on federal leak detection requirements and the various methods of leak detection available to you, see Straight Talk on Tanks. For a free copy, call the U.S. Environmental Protection Agency’s (EPA’s) toll-free Hotline at 800 424-9346 and ask for publication EPA 510-K-95-003.
How Does SIR Work?

On the face of it, SIR looks very similar to old-fashioned inventory control—the owner or operator, using simple equipment, tracks tank volumes, deliveries, and sales. However, the similarity ends there. Simple inventory control is relatively imprecise. Depending on your system throughput, you could be losing hundreds of gallons every month without realizing anything is wrong!

By contrast, SIR analysis can be very sensitive and accurate. A SIR vendor can take the same inventory data and analyze them for releases so small that many would go unnoticed with inventory control. By using a month’s worth of good tank data, it is possible for SIR methods to detect a release of just over 1½ pints per hour (that’s about 145 gallons per month) from a tank or its product lines 95 times out of a hundred.

The mechanics of how SIR works are beyond the scope of this booklet. SIR vendors actually use a variety of statistical tools to evaluate inventory data, and no two vendors’ methods are exactly alike—the information they collect and the results they provide can vary. Still, for fundamental release detection purposes, there are only three possible bottom-line responses for any SIR test: PASS, FAIL, or INCONCLUSIVE. These bottom-line responses are described below and on the following pages.

PASS—According to the analyzed data, the UST system tests tight.

FAIL—Analyzed data indicate a loss of product from the system or an influx of groundwater. However, a FAIL does not necessarily indicate that your system is leaking. A FAIL may indicate miscalibrated dispensers, inaccurately metered deliveries, or stolen product. There is also a chance that a FAIL is a false alarm. If you receive a FAIL, you must first notify your local UST regulatory agency. Then, you should explore possible reasons for the FAIL (see page 7). Keep your local UST agency informed as to your findings.

INCONCLUSIVE—Analyzed data cannot make the call. There is a chance that the information provided to the SIR vendor is so bad that it is not possible to make a determination. This often can be traced back to poor tank sticking or bookkeeping practices (for example, a new hire who has received inadequate training). Whatever the reason, an INCONCLUSIVE result means, in effect, that you have failed to perform leak detection on the UST in question for that month. You are in violation of federal leak detection requirements. Contact your state UST program office to find out local policy on how INCONCLUSIVE results are handled. See page 7 for additional information.
Necessary Equipment

One of the major attractions of SIR for UST owners and operators is that it does not require a large, up-front investment of capital—the primary cost is subscribing to the SIR vendor’s services. The equipment needed to use the method is usually already found on-site at most UST facilities.

Gauge Stick Or Other Gauges

A gauge stick, made of wood or other non-sparking material, is used to measure the depth of liquid in the UST. Typically, such sticks are marked or notched in 1/8-inch increments starting with the bottom of the stick. It is important that the stick be in good condition. Sticks that have worn ends, cut-off ends, worn-off numbers, or worn-off varnish coatings are not acceptable and should be replaced.

Other forms of gauges can also be used if they are available and in good operating condition. Automatic tank gauges, for instance, can simplify measuring tank volumes. (Keep in mind, of course, that some automatic tank gauging systems can serve as acceptable monthly tank leak detection methods by themselves.)

Whatever form of gauge you choose to use, you must follow the SIR vendor’s instructions carefully to gather useful data. For instance, many providers of SIR services require that the tank measurements are made to the nearest 1/8-inch. If you fail to follow the vendor’s instructions, you may end up with inconclusive test results.

Pastes For Finding Fuel Or Water

If you use a gauge stick, you can improve the quality of your readings if you use a fuel-sensitive paste smeared over about six inches of the stick where you expect the fuel level to be. The paste changes color where it comes into contact with the fuel.

Similarly, you can use a water-sensitive paste on the end of the stick to monitor for the presence of water in the bottom of the tank. While water in the tank can come with your deliveries or as a result of condensation of moisture inside the tank, it can also come from groundwater leaking in through holes or through loose fittings high in your tank.

Tank Chart

The strapping chart used to convert stick measurements into gallons must be the right one for the tank. The chart should have stick measurements listed to 1/8 of an inch to minimize math errors that occur when using charts marked off to the nearest inch. SIR vendors can quickly determine if the chart is inappropriate to your tank, and will often generate a proper one for your tank.
Calibrated Dispensing Meters
A poorly calibrated totalizer can produce bad data that may be mistaken for some types of releases. While many SIR vendors can identify this pattern as a possible cause of a FAIL, it is wise to avoid the problem entirely. Keep your dispensers in good operating condition and have them periodically recalibrated as recommended by your equipment manufacturer and as required by state and local weights and measures agencies.

Forms
The SIR vendor typically provides forms on which daily stick readings, sales, and deliveries are recorded. These forms often resemble the inventory sheets usually maintained at UST facilities. In some instances, SIR vendors may allow submission of the data on a facility’s own inventory sheets. Some vendors may also permit submission of data in electronic format, such as computer spreadsheets.

SIR Reporting And Recordkeeping
What You Should Provide To The Vendor
Although SIR vendors may ask for a variety of information, some of the more common elements include:

- Tank size (capacity, diameter, and length).
- Tank type, material of construction, and manufacturer.
- Product type.
- Date each stick measurement was taken.
- Daily opening stick measurement and volume.
- Daily closing stick measurement and volume.
- Daily sales volume.
- Gross deliveries over the course of the month.
- Thirty days of observations.

What The Vendor Should Provide To You
Vendors supply different levels of service to their clients. You will need to consult with individual vendors to find the collection of features you desire. However, there is a core of reporting elements that should be common to all SIR analyses (see sample on page 6). These include:
Clear and timely reporting of results in terms of *PASS, FAIL, or INCONCLUSIVE*.

Complete and annotated copies of inventory records used in the analysis, showing such problems as errors in delivery records or bad measurements tossed out by the test.

Suggestions as to the likely cause of any test failure or inconclusive result.

Instructions on follow-up actions to be taken in the event of a *FAIL* or *INCONCLUSIVE* (for example: “Notify your local UST agency of a failed test result within 24 hours”).

Also, in the case of quantitative testing methods, the form should report the calculated leak rate in gallons per hour and the leak threshold at which a leak would be declared based on the data provided for each tank. The minimum detectable leak rate (MDL) for your data may also be provided by some vendors. (See page 9.)

Your SIR vendor may also supply you with other useful information and services beyond the basics itemized above. SIR vendors may further provide:

- Off-site storage of leak detection records.
- Potential reasons for a *FAIL* other than a release of product:
  - Apparent product theft
  - Missed product delivery entry
  - Suspected totalizer miscalibration
- Potential reasons and possible solutions for any *INCONCLUSIVE* results.
- Possible location of leak within the system.
- Assessment of tank sticking practices.
- Special tank-specific strapping charts for those tanks needing them (such as tilted tanks and odd-sized tanks).

**What You Should Keep On File**

The minimal recordkeeping requirements for facilities using SIR are the same as for other release detection methods:

- All written performance claims pertaining to the SIR method used and the manner in which those claims were justified or tested by the vendor (such as a third-party evaluation of the method) must be kept on file for five years from the date you started using the method at the facility.

- The monthly SIR reports, along with the results of any other sampling, testing, or monitoring, must be kept for at least one year.
## Monthly Statistical Inventory Reconciliation Report

**Sammy's SIR Services**  
12739 N. South St.  
Nowhere, USA

For the Period of: October 1-31, 1995  
Facility: Joe's Gas & Grill  
123 E. West Street  
Anytown, XX

### October 1995

<table>
<thead>
<tr>
<th>Tank ID</th>
<th>Product</th>
<th>System Status</th>
<th>Measured Leak Rate</th>
<th>Threshold</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Premium Unleaded</td>
<td>PASS</td>
<td>0.037</td>
<td>0.09</td>
<td>0.18</td>
</tr>
<tr>
<td>002&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Regular Unleaded</td>
<td>FAIL!</td>
<td>0.735</td>
<td>0.13</td>
<td>0.26</td>
</tr>
<tr>
<td>003&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Diesel</td>
<td>INCONCLUSIVE!</td>
<td>0.120</td>
<td>0.17</td>
<td>0.34</td>
</tr>
</tbody>
</table>

(All rates are in gallons per hour)

<sup>1</sup>Tank number 002 has an unexplained loss of product. You must notify your local underground storage tank agency of the failed test within 24 hours and take appropriate steps to confirm or refute.

<sup>2</sup>Tank number 003 could not be analyzed to the necessary performance levels. The tank has failed to meet federal leak detection requirements for the period in question. Improved tank sticking methods may help. See report detail for more information.

---

**What to do if problems are discovered.**

**Detailed copies of inventory records included.**

Copies of your analyzed inventory records accompany this report.

**Keep this report on file for at least one year.**

**Questions? Call xxx-xxx-xxxx.**

**Number to call for help.**
Records of equipment calibration and maintenance must be kept for at least one year. Any schedules of required calibration and maintenance provided by the SIR vendor must be kept for five years from the date you began using the method at the facility.

You should check with your local UST agency to determine if there are any additional recordkeeping requirements.

**What To Do When You Get A ‘Fail’**

When your UST system fails a SIR monthly analysis, you must report the incident to your local UST program agency within 24 hours or whatever time period your local agency requires.

At the same time, you need to begin to investigate the cause of the failed test. Within seven days, you must determine the cause of the *Fail* and report back to your local agency. Your SIR vendor may, on the basis of the test results, be able to provide you with areas to examine, such as a miscalibrated totalizer. You must have any defective equipment repaired or replaced immediately.

If the *Fail* cannot be linked to equipment problems, you must have the system tightness tested or the site checked for evidence of a release (such as sampling in the excavation zone). You must report the results to the local agency. If a release is confirmed, the agency will provide instructions for any necessary cleanup action.

**What To Do When You Get An ‘Inconclusive’**

An *Inconclusive* means you have failed to meet leak detection requirements. However, the steps you must take upon getting an *Inconclusive* depend on the requirements of your local UST agency. In some instances, you may be required to perform a system tightness test to be sure the UST is not leaking. In others, you may be given an additional month to come into compliance. Be sure to know what is required locally. A list of UST agency phone numbers can be found in the back of this booklet.

An *Inconclusive* should in no way be taken as demonstrating the failings of a given vendor’s method—it is inherent to all methods. Even if vendors use terms other than “inconclusive,” they represent the same condition.

In all cases, you will want to double check your operating procedures to see what caused the *Inconclusive* and prevent its recurrence. Your SIR vendor will provide assistance in locating the problem and offer suggestions to improve your data collection.
Answers To Frequently Asked Questions

“Can SIR be used on manifolded tanks?”

SIR methods can be used on tank systems that have multiple tanks linked together by siphon bars. This generally requires that each tank in the manifolded system be individually stuck for inventory measurements. As with single tank systems, no product deliveries or sales should be made during the time the sticking and totalizer readings are taking place.

Check with your local UST agency to determine if it permits use of SIR on manifolded systems or has additional requirements.

“Can SIR be used as an annual tightness test?”

For facilities that are still using inventory control with tightness testing as their means of leak detection, it is possible to use SIR in place of more traditional tightness tests such as an overfill test. The performance requirements for a tightness test are more stringent than for monthly monitoring methods, however, so be sure to check that your SIR vendor can meet those requirements. Tanks must be tested for releases of 0.1 gph with a probability of detection ($P_D$) of 95% and a probability of false alarm ($P_{FA}$) of 5%. To act as a replacement for piping tightness testing, the requirements are even more rigorous—the SIR method must be able to detect releases of 0.08 gph with a $P_D$ of 95% and a $P_{FA}$ of 5%. To find releases of this magnitude, SIR vendors often need several months of good data.

Be sure to contact your local UST agency to see if it allows use of SIR as an annual test. Also, remember that inventory control with tightness testing can only be used for a limited time. You may want to consider moving now to an approved method of monthly monitoring, such as automatic tank gauge systems, monitoring wells, or monthly SIR analyses.

“Why did a SIR vendor fail my tank for a leak under 0.2 gph?”

First of all, it is a misconception that any leakage into the environment is acceptable. Even small leaks over long periods of time can result in extensive contamination that can cost you substantial time and money for soil and groundwater clean up.

Secondly, the performance standard by which leak detection methods (including SIR) are measured says that leaks of 0.2 gph must be detected in 95 out of 100 times. Further, false alarms should not happen more than five times in a hundred. What this means is that the SIR vendor looks at the estimated leak rate determined for a tank—say 0.15 gph—and asks the question “What is the likelihood that the true leak rate is actually 0.2 gph?” On the basis of a statistical analysis of the data you provide the vendor, the SIR vendor can make the call as to whether your system tests tight or not.

---

There is no such thing as an “acceptable” leak. Any leak will cost you in the long run and should be fixed.
Typically, a *Fail* will be called for apparent releases of around 0.1 gph. See the question on page 10 on ‘estimated leak,’ ‘threshold,’ and ‘MDL’ for additional information.

“What is the difference between ‘qualitative’ and ‘quantitative’ SIR methods?”

Although there are many methods that are employed by vendors performing SIR analyses, they break down into two major classifications: *qualitative* and *quantitative*.

**Qualitative** methods do not provide estimated leak rates. When a vendor’s qualitative method is evaluated to demonstrate its capability of meeting the EPA performance standard, it simply reports results in terms of *PASS*, *FAIL*, or *INCONCLUSIVE*. These results are compared with the evaluator’s knowledge of which tanks are leaking in a test set of tank records.

**Quantitative** methods also categorize results in terms of *PASS*, *FAIL*, or *INCONCLUSIVE*, but they go further by actually providing a numerical estimate of the leak rate, typically in gallons per hour. In evaluating the performance of the method, the evaluator compares the method’s estimates with the actual leak rates imposed on the test set of tank records.

“What is this ‘estimated leak rate,’ ‘threshold,’ and ‘MDL’ stuff all about?”

These are rather technical statistical terms often used by quantitative SIR vendors to provide their clients with more detailed information on their analyses. They provide insight beyond the simple *PASS*, *FAIL*, and *INCONCLUSIVE*, including just how bad a leak appears to be (estimated leak rate) and how good the data are that you have been providing to the vendor for analysis (MDL).

The **estimated leak rate** is the number a quantitative SIR method comes up with for the amount of product your tank appears to be losing. The number is usually expressed in gallons per hour since the EPA regulations use those units.

This estimated leak rate is rarely, if ever, zero. All tanks, whether leaking or tight, will generally show a leak rate. The question is, is this leak rate significant? This is where the threshold comes in.

The **threshold** is basically an action level leak rate. That is, if the estimated leak rate exceeds the threshold leak rate, the SIR vendor declares a *Fail*. It is important to note that the threshold is *not* a fixed number, such as 0.1 gph. Instead, it is typically the value associated with a fixed percentage set to the probability of false alarms (that is, declaring a leak on a system that is actually tight) the SIR vendor is willing to accept. EPA’s regulations allow no more than 5% of analyses to turn out to be false alarms. However, many SIR vendors consider one failure in twenty analyses to be too high and set their thresholds to a 1% probability of false alarm.
Finally, the MDL is the *Minimum Detectable Leak*. The MDL is the smallest leak rate the vendor can determine for the data provided with a $P_D$ of 95% or better. The MDL is tied to the threshold and is usually twice the threshold leak rate. The MDL must be less than or equal to the EPA performance standard rate of 0.2 gph at a $P_D$ of 95% and a $P_{FA}$ of 5% in order to make a *PASS/FAIL* call. If the MDL exceeds the performance standard, your system cannot be given a *PASS*—an *INCONCLUSIVE* is the best you can get.

Fortunately, most vendors who provide this level of detail often provide a “plain English” translation as well.

**“Can SIR be used as a monthly test of my piping, too?”**

Yes. SIR is a test of the entire UST system. Losses are reported regardless of their origins. So, whether you are losing product as a result of a tank leak, a line leak, miscalibrated equipment, or theft, a *FAIL* will result if the estimated leak rate exceeds the threshold for calling a leak. Remember, though, that if you are using pressurized lines, you will also need to have an automatic flow restrictor, shutoff device, or continuous alarm in place to fully meet piping leak detection requirements.

**“How much does SIR cost?”**

Unlike most other methods, SIR has no installation costs and equipment costs are minimal—a well-calibrated dispensing meter and a good stick are about all you need. While vendor costs will vary, monthly monitoring for a facility with three USTs costs about $800 to $1200 per year. SIR used as an annual tightness test costs about $200 to $600. (These figures are based on estimates in 1995.)

**“There are so many vendors. How do I choose?”**

Whether you have decided to invest in SIR services or other leak detection methods, the basic steps are similar:

- Request information from the vendors you are interested in. Compare their services, option packages, and prices to see which vendors best meet your needs. Ask for references and check them.

- Contact your local UST agency to see if it has a certification program for leak detection vendors. Consult the agency’s list of certified service providers.

- Contact the Better Business Bureau to see if there have been any complaints lodged against the vendor.

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**NOTE:** State programs may require a different form of testing for lines. Check with your local UST agency.
**PUBLICATIONS**

<table>
<thead>
<tr>
<th>Title</th>
<th>Available Free From</th>
</tr>
</thead>
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<tr>
<td>Musts For USTs: A Summary Of The Federal Regulations For Underground Storage Tank Systems</td>
<td>You can call EPA’s toll-free RCRA/Superfund Hotline at 800 424-9346 and order free copies. Just identify the titles you want. Or you can write and ask for titles by addressing your requests to: NCEPI Box 42419 Cincinnati, OH 45242</td>
</tr>
<tr>
<td>Normas Y Procedimientos Para T.S.A.</td>
<td></td>
</tr>
<tr>
<td>Straight Talk On Tanks: Leak Detection Methods For Petroleum Underground Storage Tanks</td>
<td>Or you can fax your order to NCEPI at 513 891-6685.</td>
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<tr>
<td>Doing Inventory Control Right: For Underground Storage Tanks</td>
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<tr>
<td>Manual Tank Gauging: For Small Underground Storage Tanks</td>
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<tr>
<td>Don’t Wait Until 1998: Spill, Overfill, And Corrosion Protection For Underground Storage Tanks</td>
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<td>Dollars And Sense: Financial Responsibility Requirements For Underground Storage Tanks</td>
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<tr>
<td>An Overview Of Underground Storage Tank Remediation Options</td>
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<tr>
<td>Controlling UST Cleanup Costs</td>
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<tr>
<td>Federal Register Reprints</td>
<td>Not simple summaries, these reprints are extensive records of the rulemaking process including technical information, explanatory preambles, and the rules as they appear in the Code of Federal Regulations. Reprints dated 9/23/88; 10/26/88; 11/9/89; 5/2/90; and 2/18/93. Over 300 pages.</td>
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# Publications and Videos about USTs

## Publications

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<tr>
<td>Doing It Right</td>
<td>Environmental Media Center</td>
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<tr>
<td>Illustrates proper installation of underground tanks and piping for installation crews. Part 1: Tanks (24 minutes); Part 2: Piping (16 minutes). Cost: $25</td>
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<tr>
<td>Doing It Right II: Installing Required UST Equipment</td>
<td>New England Interstate Environmental Training Center</td>
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| Illustrates installation of spill and overfill equipment, observation wells, and piping leak detection (23 minutes). Cost: $60 | ATTN: VIDEOS
| Doing It Right and Doing It Right II Set Cost: $75                  | 2 Fort Road
| Keeping It Clean: Making Safe And Spill-Free Motor Fuel Deliveries | South Portland, ME 04106
<p>| Making pollution-free deliveries to USTs. Includes Stage 1 vapor recovery, overfill prevention and spill containment. For fuel tanker drivers and UST owner/operators (25 minutes). Cost: $60 |
| Petroleum Leaks Underground                                         | 207 767-2539                                                                  |
| How liquids and vapors move in the subsurface and why early response to leaked petroleum is so important. Part 1: How Liquids Move (14 minutes); Part 2: How Vapors Move (15 minutes). Cost: $75 |
| Straight Talk On Leak Detection                                    |                                                                                |
| Overview of the leak detection methods available for complying with federal regulations. Part 1: Straight Talk From Tank Owners (owners address the problems of UST compliance [5 minutes]); Part 2: Straight Talk On Leak Detection (30 minutes). Cost: $40 |
| Tank Closure Without Tears: An Inspector’s Safety Guide             |                                                                                |
| Focuses on explosive vapors and safe tank removal (30 minutes). Video and Booklet Cost: $35; Booklet: $5 |
| What Do We Have Here?: An Inspector’s Guide To Site Assessment At Tank Closure |                                                                                |
| Inspecting sites for contamination where tanks have been removed. Part 1: Site Assessment Overview (30 minutes); Part 2: Field Testing Instruments At A Glance (14 minutes); Part 3: Soil And Water Sampling At A Glance (7 minutes). Video and Booklet Cost: $45; Booklet: $5 |
| Searching For The Honest Tank: A Guide To UST Facility Compliance Inspection |                                                                                |
| Covers major steps of UST inspections from protocols and equipment to enforcement and followup; from cathodic protection to leak detection. Directed at inspectors, yet also helpful to owners and operators (30 minutes). Video and Booklet Cost: $40; Booklet: $5 |</p>
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<td>334 271-7986</td>
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<tr>
<td>907 465-5203</td>
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<tr>
<td>Arizona Dept. of Env. Quality</td>
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<td>602 207-4324</td>
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<td>Arkansas Dept. of Pollution Control &amp; Ecology</td>
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<tr>
<td>501 570-2801</td>
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<tr>
<td>California State Water Resources Control Board</td>
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<td>916 227-4313</td>
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<tr>
<td>Colorado State Oil Inspection Office</td>
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<tr>
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<tr>
<td>Connecticut Dept. of Env. Protection</td>
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<td>203 424-3374</td>
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<td>DC Env. Regulatory Administration</td>
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<td>202 645-6080</td>
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<td>Delaware Dept. of Natural Resources &amp; Env. Control</td>
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<td>302 323-4588</td>
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<td>904 468-3935</td>
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<td>Georgia Dept. of Natural Resources</td>
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<td>404 362-2687</td>
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<td>Hawaii Dept. of Health</td>
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<td>808 586-4226</td>
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<td>Idaho Dept. of Health &amp; Welfare</td>
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<td>208 334-0542</td>
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<tr>
<td>Illinois Office of State Fire Marshall</td>
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<tr>
<td>217 785-5878</td>
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<tr>
<td>Indiana Dept. of Env. Mgt.</td>
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<td>Vermont Dept. of Natural Resources</td>
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<td>802 244-8702</td>
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<td>804 527-5189</td>
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<td>Washington Dept. of Ecology</td>
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<td>206 407-7211</td>
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<td>West Virginia Div. of Env. Protection</td>
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<td>304 558-6371</td>
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<tr>
<td>Wisconsin Dept. of Industry, Labor &amp; Human Relations</td>
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<td>608 267-7605</td>
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<td>Wisconsin Dept. of Natural Resources</td>
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<td>608 267-7560</td>
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<td>Wyoming Dept. of Env. Quality</td>
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# ENVIRONMENTAL PROTECTION DIVISION
# COMPLIANCE GUIDANCE FOR
# STATISTICAL INVENTORY RECONCILIATION (SIR)

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ENVIRONMENTAL PROTECTION DIVISION
COMPLIANCE GUIDANCE FOR
STATISTICAL INVENTORY RECONCILIATION (SIR)

AUTHORITY

The purpose of this guidance document is to assist the regulated community, SIR vendors, and other interested parties in understanding Georgia’s policies for satisfactory utilization of SIR as a monthly monitoring method. Georgia recognizes SIR as one of the “other methods” of monthly monitoring allowed under Georgia’s Rules for Underground Storage Tank Management, Chapter 391-3-15-.07, which incorporates §40 CFR 280.43(h). This Rule states that “any other type of release detection method, or combination of methods, can be used if the following performance standard can be met:

It can detect a 0.20 gallon per hour (GPH) leak rate or a release of 150 gallons within a month with a “PROBABILITY OF DETECTION of at least 0.95 and a PROBABILITY OF FALSE ALARM of no more than 0.05.”

Probability of detection means that if 100 UST systems are tested, all of which are leaking at exactly 0.2 GPH, the test will correctly identify at least 95 of them as leakers. Probability of false alarm means that if 100 UST systems are tested, none of which are leaking (0.00 GPH), no more than 5 of them will incorrectly fail the test.

For any SIR method to be an acceptable stand alone monthly monitoring method for leak detection it must have received a third party evaluation and subsequent certification that the method can meet the performance standard stated above. The O/O must maintain a copy of the third party evaluation above.

INTRODUCTION

Statistical inventory reconciliation analyzes inventory, delivery, and dispensing data collected over a period of time to determine if the UST system (tank and associated product lines) is leaking. Each operating day the UST owner/operator (O/O) measures the product level using a gauge stick or other tank level monitor. The O/O also keeps complete records of all withdrawals and all deliveries to the UST. After data has been collected for a specified period of time (not to exceed thirty days), the O/O provides the data to the SIR vendor for processing. The SIR vendor processes the data and provides the O/O with monthly results showing the status of the UST system. Computer software is used to conduct a statistical analysis of the data to determine if the UST system is leaking. Some SIR methods can report if dispensers are out of calibration, theft is occurring, or product deliveries are inaccurate.

“Stand-Alone” SIR software systems are available whereby the O/O gathers the data, analyzes the data once per month and maintains the results in their leak detection records. These SIR software systems must also have an independent third party evaluation/certification indicating the system is capable of meeting the requirements of §40 CFR 280.43(h). The O/O must maintain a copy of the third party evaluation.
DEFINITIONS

**Performance Standard (PS):** To qualify as a leak detection method, SIR must be able to meet the performance standards of being able to detect a 0.2 GPH leak rate. The method must be able to detect a 0.20 GPH leak rate or a release of 150 gallons within a month with a **PROBABILITY OF DETECTION** of at least 0.95 and a **PROBABILITY OF FALSE ALARM** of no more than 0.05.

**Threshold for Declaring a Leak (TH):** The TH is the leak rate that defines the boundary between pass and fail results. When the calculated leak rate is greater than the TH, the test result is “fail.” The TH for a SIR vendor is determined by the third party evaluation and is most often equal to 0.1 GPH. The TH must be smaller than the performance standard (0.1 GPH) in order to be 95% sure of detecting 0.2 GPH leaks.

**Minimum Detectable Leak Rate (MDL):** MDL is the smallest leak that can be reliably detected in a given set of data. To be in compliance with leak detection regulations, the MDL must be less than or equal to the performance standard for a SIR analysis to provide conclusive results. In other words, if the quality of a set of data is so poor that a leak of 0.2 GPH cannot be detected with at least 95% accuracy, then the performance standard has not been met and the test result must be inconclusive or fail.

**Calculated Leak Rate (CLR):** CLR is the estimated leak value, always expressed in GPH, for a given set of data. To obtain the most accurate calculated leak rate, the SIR analysis must account for conversion errors caused by tank tilt and/or deformation, mechanical problems and temperature fluctuations prior to analysis. Once all discrepancies are taken into account the residual cumulative over/short becomes the estimated leak rate for a given data set.

**Pass:** If the CLR does not exceed the TH and the MDL is less than or equal to the PS (0.2 GPH), the test result will be a **“PASS”**.

<table>
<thead>
<tr>
<th>CLR</th>
<th>TH</th>
<th>MDL</th>
<th>PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05 gph</td>
<td>0.1 gph</td>
<td>0.15 gph</td>
<td>0.2 gph</td>
</tr>
</tbody>
</table>

**CLR<TH AND MDL<PS = PASS**

**Fail:** If the CLR is greater than the leak TH value of 0.1 gph, the test result will be a **“FAIL”**.

<table>
<thead>
<tr>
<th>TH</th>
<th>CLR</th>
<th>PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 gph</td>
<td>0.15 gph</td>
<td>0.2 gph</td>
</tr>
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</table>

**CLR>TH = FAIL**

NOTE: A loss or gain of product in excess of the threshold is a fail.
**Inconclusive:** A SIR test result is inconclusive when it produces a MDL that exceeds the certified performance standard of 0.2 GPH, and a CLR that is less than the TH.

An inconclusive generally indicates that the inventory records are too poor, have too much variability, or are of insufficient length such that the data could not be analyzed with reliable results.

An inconclusive result has been interpreted by EPD as noncompliance with the leak detection requirements for the period of time on which the inconclusive was based. What an O/O must do to resolve an inconclusive is discussed under EPD REQUIREMENTS No. 9, below.

<table>
<thead>
<tr>
<th>EXAMPLE:</th>
<th>CLR</th>
<th>TH</th>
<th>PS</th>
<th>MDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>.08 gph</td>
<td>0.1 gph</td>
<td>0.2 gph</td>
<td>0.25 gph</td>
<td></td>
</tr>
</tbody>
</table>

CLR<\(\text{TH and MDL}\)>PS = INCONCLUSIVE

**NOTE:** In determining whether a result is inconclusive, the absolute value of the MDL should be compared to the PS.

**ENSURING QUALITY DATA**

Conclusive SIR analysis results are contingent upon proper and sound inventory practices. An owner/operator must ensure that the following practices are employed:

- Measure the product level accurately to the nearest one-eighth inch (1/8") at the same time every day the site operates. When measuring the product level, take the average of two stick readings prior to converting inches to gallons.

- The equipment used must be capable of measuring the level of product over the full range of the tank’s height.

- No dispensing can occur between product level readings and meter readings.

- Record all sales on a daily basis. All figures must be rounded to the nearest one gallon.

- Record all delivery information accurately and as it appears on the bills of lading. Whether gross or net delivery figures should be submitted for SIR analysis is determined by your SIR vendor.

- Check for water in the USTs at least once a month. Measurements must be made to the nearest one-eighth inch and must be taken into consideration in the SIR determination of tank status.

- Calculate and evaluate overages and shortages daily. If any inaccuracy is detected, verify all records for that day and the day before for any computation or measurement errors.

- Keep all inventory records independently for each tank. If the site operates a manifolded tank system, sales and delivery information may be combined. Separate tank product level readings must be maintained for every tank in the manifold set.
EPD REQUIREMENTS:

1) The procedures specified in §40 CFR 280.43 (a) for inventory control can be used to gather data for SIR. Drop tubes which extend to within one foot of the tank bottom are required for inventory control and are likewise required for gathering data for SIR.

2) Monthly SIR results must be reported on Georgia Form, GUST-126, “Monthly Statistical Inventory Reconciliation Report” (copy attached) or on an equivalent form. The Georgia form is consistent with the form developed through a joint effort between EPA Region IV States and EPD.

3) The results reported must contain the language: “pass, fail, or inconclusive” in accordance with the definitions presented above.

4) In addition to all the information listed on Georgia Form, GUST-126 (noted in No. 2 above), all results reported MUST state the threshold level, calculated leak rate, minimum detectable leak rate, tank capacity, the number of data points analyzed for a given month, number of days submitted by the owner or operator and the final system results for the month.

5) SIR reports should be received by the O/O no later than twenty (20) business days after the end of the reporting period.

6) The threshold leak rate must be in accordance with the third party certification.

7) Monthly reports consisting of raw inventory data, plus the resulting SIR determination must be maintained by the owner/operator. The last three years of SIR results must be maintained for EPD review if the facility is a participant to the GUST Trust Fund. If the facility is not participating in the GUST Trust Fund, the last twelve months of SIR results must be maintained.

8) SIR may not be used as a substitute for tightness testing.

9) If the result of a SIR monthly analysis is inconclusive, the O/O must conduct a release investigation within seven (7) days from the date of receipt of the vendor’s report or their own report if they are utilizing a stand alone SIR system. The O/O should use the vendor’s standard investigation procedures to review inventory records and calculations to determine if there are any errors. If the problem is determined not to be a data problem, the O/O must check for physical problems such as meter miscalibration and inspect all accessible portions of the UST system for evidence of leakage.

If the first monthly report after completion of the investigation into the cause of the previous months’ inconclusive is again inconclusive, unusable or anything other than a definite conclusion, the O/O must:

a) report a suspected release to EPD within twenty-four hours of receipt of the vendor’s report or their own report if a stand alone system is used;

b) perform a tightness test within seven (7) days, to determine whether or not a leak exists in the tank or piping and submit the results within thirty (30) days to EPD.
c) Any time two (2) consecutive months of SIR monthly analyses yield reports of inconclusive, the O/O must consider another method of release detection until a determination of the problem is made and resolved.

10) If the result of a SIR monthly analysis indicates a failure, the O/O must:

   A) report a suspected release to EPD within (24) hours of receipt of the vendor’s report or their own report if a stand alone system is used, and

   B) conduct a release investigation within seven (7) days of obtaining the report. The O/O should use the vendor’s standard investigation procedures in conducting the investigation. After completing the investigation, the O/O should proceed as follows:

   1) If the investigation does not reveal a cause for the failed test result, a tightness test must be performed within seven (7) days to check on whether a leak exists in the tank and or piping, and the test results must be submitted to the EPD immediately.

   2) If the investigation indicates that factors accounting for the loss trend are not related to a release, these factors must be immediately corrected, and no tightness test is required. However, if the first monthly report after completion of the investigation into the cause of the previous month’s loss trend again indicates a loss or is inconclusive, the O/O must

      i) report a suspected release to EPD within twenty-four (24) hours of receipt of the vendor’s report or their own report if a stand alone system is used; and

      ii) perform a tightness test within seven (7) days to determine whether or not a leak exists in the tank or piping and submit the results to EPD.

11) If the result of a SIR monthly analysis is a fail and the leak rate is negative, the O/O must check the tank immediately and daily thereafter for at least seven days for the presence of water. This means that you are gaining product. Increase in product can be due to water entering the tank or miscallibrated meters. The following procedures must be followed:

   A) Calibrate meters;
   B) Check for water for seven days.

   • If there is no water in the tank, or if the water level is one inch or less and does not change from day to day, the O/O must document the results of the water checks and follow the vendor’s standard investigation procedures to determine the reason for the gain trend and correct the problem.

   • If the daily water checks show more than 1 inch of water in the tank the O/O must have the water pumped out of the tank. If subsequent daily water checks show no water in the tank, the O/O must document the results of the water checks and follow the vendor’s standard investigation procedures to determine the reason for the gain trend and correct the problem.
If the water has been pumped out of the tank and subsequent daily water checks show that there is again water in the tank, or if the water level in the tank changes from day to day, the O/O must:

A) report a suspected release to EPD within 24 hours; and

B) perform a tightness test within seven (7) days to determine whether or not a leak exists in the tank or piping and submit the results to EPD immediately.

12) O/O’s using a Stand Alone SIR System should establish their reporting period based on the first and last date of each month (monthly basis). If a loss trend occurs during any part of the month, it is acceptable to report it immediately as a suspected release. EPD will not penalize an O/O for waiting until the end of the month to report.

13) If the result of a SIR monthly analysis is pass, retain records for three years.
1. The tank owner is required to have an SIR report for each month.
2. Monthly reports must be submitted to the Georgia EPD upon request.
3. The tank owner is required to have the completed report by the 20th business day of the following month.
4. If, for any reason, the test is neither "pass" or "fail," the "inconclusive" column must be marked.
5. The UST system owner/operator must notify EPD within twenty-four (24) hours at (404) 362-2687 of a suspected release and conduct a tank and piping tightness test within seven (7) days of the occurrence of one of the following:
   • The monthly analysis indicates a “fail,”
   • The monthly analysis produces an unexplained loss/gain of product, or
   • The second consecutive monthly analysis is inconclusive, or fail.
6. All SIR Methods:
   a. A leak threshold, minimum detectable leak rate, and calculated leak rate must be provided for each tank. If not, the report is incomplete and will not be accepted by EPD.
   b. If the calculated leak rate for a tank is greater than the leak threshold, the tank failed the SIR test. (leak threshold = one half of the required performance standard of 0.2 gph)
   c. If the minimum detectable leak rate for a tank is greater than the required performance standard, the test is inconclusive for that month.
7. A conclusive result of "pass" or "fail" is required to meet the monthly leak detection requirements.
8. The results of monthly measurements for water in each tank, must be recorded in inches on the following lines:
   1) __________; 2) __________; 3) __________; 4) __________; 5) __________

Person conducting evaluation

Signature (optional)  Date
ENVIRONMENTAL PROTECTION DIVISION
COMPLIANCE GUIDANCE
FOR
STATISTICAL INVENTORY RECONCILIATION (SIR)

The Underground Storage Tank Management Program (USTMP) has completed a guidance document for Statistical Inventory Reconciliation (SIR) use and reporting. This document is the result of a coordinated effort between the USTMP, seventeen (17) SRI vendors and several UST owners.

The purpose of this guidance is to assist the regulated community, SIR vendors, and other interested parties in understanding Georgia’s policies for properly utilizing SIR as a monthly monitoring method. Georgia recognizes SIR as one of the “other methods” of monthly monitoring allowed under Georgia’s Rules for Underground Storage Tank Management, Chapter 391-3-15-.07, which incorporates 40 CFR 280.43(h).

This guidance ensures reporting language consistency by establishing “pass”, “Fail”, and “inconclusive” as the only terms for use in reporting results. In addition, the guidance provides clarification concerning reporting of suspected releases and inconclusive results. This guidance will also facilitate the review process of SIR results by USTMP staff.

If you use SIR, Please ask your vendor if they are aware of this guidance and whether or not they have a copy. A copy of this guidance can be obtained by contacting Shaheer Muhanna at (404) 632-2687.

The USTMP is requesting that this guidance be implemented in March of 1998.
Don’t Wait Until ‘98
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DISCLAIMER: Any reference to or depiction of commercial products in this booklet is solely for explanatory purposes and is not intended as an endorsement of these products.
Why Should You Read This Booklet?

This booklet contains information to help you meet requirements for underground storage tank systems (USTs) installed before December 22, 1988. We call these older tank systems "existing USTs."

Federal rules and state law require you to make sure your existing USTs have the following by December 22, 1998:

- Spill protection
- Overfill protection
- Corrosion protection

Leak detection is also required, but is not addressed in this booklet. For more information, refer to EPA's publication "Straight Talk on Tanks" (ordering information on page 16), or contact DEP at (609) 984-3156.

You must choose one of the following actions for an existing UST:

- Add spill, overfill, and corrosion protection by December 22, 1998
- Close the existing UST by December 22, 1998
- Replace the closed existing UST with a new UST

You should act as soon as possible. Without the protection provided by upgrading or replacing, your UST is more likely to leak, damage the environment, and leave you with costly cleanups. The next page lists several advantages of acting early.

This booklet focuses on how you can meet upgrade requirements. The basic upgrade requirements are listed on page 3. Some information on properly closing an UST appears on page 12. You can find more information on the requirements for new UST systems (those installed after December 22, 1988) in EPA's publication "Musts for USTs" (ordering information on page 16).
Why Should You Upgrade Or Replace Early?

- Early upgrading or replacing prevents leaks that would otherwise occur between now and December 1998. Avoiding leaks benefits the environment and your business. If your UST does not leak, you will not face costly mandatory cleanups or potential criminal suits or civil suits for damage claims.

- As December 1998 nears, increased customer demand to upgrade, close, or replace USTs may result in higher charges for these services. Also, you may have trouble finding available contractors and supplies needed to meet the deadline.

- It can take several months to upgrade, close, or replace your system. Bad weather or contractor delays are not unusual. Before work can start, local construction and regulatory permits may be necessary. The sooner you get started, the better the chance you'll meet or beat the 1998 deadline.

- The State Legislature has extended the upgrade deadline to be consistent with federal law and to allow tank owners and operators to comply with the 1998 deadline. The USEPA has consistently maintained the position that the federal upgrade deadline will not be extended.

- If you miss the 1998 deadline for any of the reasons noted above, you can be cited for violations and fined. Failure to be in compliance may reduce or eliminate coverage provided by insurance policies just when you may need these financial resources.

- Your insurance company may offer financial incentives to upgrade or replace earlier than required by law, such as lower deductibles or premiums.

- If you discover a leak during upgrading or closing and need financial assistance with remediation costs, the Hazardous Discharge Site Remediation Fund (HDSRF) may be able to help. If you make your claim early, you may be able to avoid possible processing delays that may occur as the deadline approaches. (For more information concerning the HDSRF, please call (609) 633-7141.)
What Are The Basic Upgrade Requirements For Existing USTs?

<table>
<thead>
<tr>
<th><strong>Spill Protection</strong> (see pages 4-5)</th>
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<tbody>
<tr>
<td>Existing tanks must have <strong>catchment basins</strong> to contain spills from delivery hoses.</td>
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<table>
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<tr>
<th><strong>Overfill Protection</strong> (see pages 6-7)</th>
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<tr>
<td>Existing tanks must use <strong>ONE</strong> of the following:</td>
</tr>
<tr>
<td>- Automatic shutoff devices</td>
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<tr>
<td>- Overfill alarms</td>
</tr>
<tr>
<td>- Ball float valves (restrictive flow devices)</td>
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<table>
<thead>
<tr>
<th><strong>Corrosion Protection</strong> (see pages 8-11)</th>
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<tbody>
<tr>
<td>Existing tanks must match <strong>ONE</strong> of the following:</td>
</tr>
<tr>
<td>- Steel tank has corrosion-resistant coating <strong>AND</strong> cathodic protection (such as an sti-P3 tank)</td>
</tr>
<tr>
<td>- Tank made of noncorrodible material (such as fiberglass)</td>
</tr>
<tr>
<td>- Steel tank clad with noncorrodible material (such as an ACT-100 tank) or tank enclosed in noncorrodible material</td>
</tr>
<tr>
<td>- Uncoated steel tank has cathodic protection system</td>
</tr>
<tr>
<td>- Uncoated steel tank has interior lined with noncorrodible material</td>
</tr>
<tr>
<td>- Uncoated steel tank has cathodic protection <strong>AND</strong> interior lined with noncorrodible material</td>
</tr>
</tbody>
</table>

Existing piping must match **ONE** of the following:
- Uncoated steel piping has cathodic protection
- Steel piping has a corrosion-resistant coating **AND** cathodic protection
- Piping made of (or enclosed in) noncorrodible material (such as fiberglass)

1998 Deadline: Existing USTs must be protected from spills, overfills, and corrosion by December 1998.

MOST tanks and piping must already have leak detection. See EPA's "Straight Talk on Tanks" (ordering information on page 16).

When new USTs are installed, they must have leak detection and protection from spills, overfills, and corrosion. See EPA's "Musts for USTs" (ordering information on page 16).
How Can You Protect Against Spills?

Many releases at UST sites come from spills. Spills often occur at the fill pipe when the delivery truck’s hose is disconnected. Although these spills are usually small, repeated small releases can cause big environmental problems.

Human error causes most spills. These mistakes can be avoided by following standard tank filling practices. For example, you must make sure there is room in the UST for the delivery, and the delivery driver must watch the delivery at all times. If you and the delivery driver follow standard practices, nearly all spills can be prevented. For this reason, federal and state UST regulations require that you follow standard filling practices now.

In addition, USTs must have catchment basins to contain spills. New USTs must have catchment basins when they are installed.

Federal and state rules require that existing USTs must have catchment basins by December 1998.

What Are Catchment Basins?

Catchment basins are also called “spill containment manholes” or “spill buckets.” Basically, a catchment basin is a bucket sealed around the fill pipe (see illustration below).

If an UST never receives more than 25 gallons at a time, the UST does not have to meet the spill protection requirements. For example, many small used oil tanks fall in this category.
To protect against spills, the basin should be large enough to contain what may spill when the delivery hose is uncoupled from the fill pipe. Basins range in size from those capable of holding only a few gallons to those that are much larger - the larger the catchment basin, the more spill protection it provides.

You need a way to remove liquid from catchment basins. Manufacturers equip catchment basins with either pumps or drains to remove liquid. The illustration on the previous page shows a catchment basin with a pump; the illustration below shows a catchment basin with a drain.

Your equipment supplier can help you choose the size and type of catchment basin that meets your needs.

You should try to keep water out of catchment basins. Some catchment basins can collect enough water and sediment, along with spilled product, to make draining this mixture into the tank unwise. If this happens, you may pump out the catchment basin and dispose of the liquid properly. If the liquid contains fuel or chemicals, it could be considered a hazardous waste. Contact the Bureau of Advisement and Manifest at (609) 292-8341 for information on testing and handling requirements.

Having the surrounding surface slope away from the top of catchment basins helps keep water out of them.
How Can You Protect Against Overfills?

Overfills usually release much larger volumes than spills. When a tank is overfilled, large volumes can be released at the fill pipe and through loose fittings on the top of the tank or a loose vent pipe. The tightness of these fittings normally would not be a problem if the tank were not filled beyond its capacity.

You can solve overfill problems by:

- Making sure there is enough room in the tank for the delivery BEFORE the delivery is made;
- Watching the entire delivery to prevent overfilling or spilling; and
- Using equipment that protects against overfills.

Federal and state rules require that existing USTs must have overfill protection devices by December 1998.

New USTs must have overfill protection devices when they are installed. The three main types of overfill protection devices (automatic shutoff devices, overfill alarms, and ball float valves) are described below and on the next page.

NOTE: If you have "pumped delivery" where fuel is delivered under pressure, you must make sure your overfill protection device works compatibly with pumped deliveries. Also, remember that overfill protection devices are effective only when combined with careful filling practices.

1. What Are Automatic Shutoff Devices?

An automatic shutoff device installed in an UST’s fill pipe can slow down and then stop the delivery when the product has reached a certain level in the tank. This device, sometimes simply called a “fill pipe device,” has one or two valves that are operated by a float mechanism (the illustration on the left shows one kind of automatic shutoff device).
Some automatic shutoff devices work in two stages. The first stage drastically reduces the flow of product to alert the driver that the tank is nearly full. The driver can then close the delivery valve and still have room in the tank for the product left in the delivery hose.

If the driver does not pay attention and the liquid level rises higher, the valve closes completely and no more liquid can be delivered into the tank, leaving the driver with a delivery hose full of product.

2. What Are Overfill Alarms?

Overfill alarms use probes installed in the tank (see illustration on the right) to activate an alarm when the tank is either 90 percent full or within 1 minute of being overfilled. Either way, the alarm should provide enough time for the driver to close the truck’s shutoff valve before an overfill happens. Alarms must be located where the driver can see or hear them easily. (Overfill alarms are often a part of automatic tank gauging systems.)

Overfill alarms work only if they alert the driver at the right time and the driver responds quickly. Remember to put the alarm on an electrical circuit that is active all the time so that the alarm will always work. Many deliveries are made at night when the facility is closed. You don’t want to turn off your alarm when you turn off the office lights.

3. What Are Ball Float Valves?

Ball float valves (see illustration on the right) are placed at the bottom of the vent line several inches below the top of the UST. The ball floats on the product and rises with product level during delivery until it restricts vapor flowing out the vent line before the tank is full. If all tank fittings are tight, the ball float valve can create enough back pressure to restrict product flow into the tank which can notify the driver to close the truck’s shutoff valve. However, if the UST has loose fittings, sufficient back pressure may not develop and will result in an overfill. Note: Manufacturers do not recommend using ball float valves with suction piping, pressurized delivery, or coaxial Stage I vapor recovery.
How Can You Protect Against Corrosion?

Federal and state rules require corrosion protection for USTs because unprotected steel USTs corrode and release product through corrosion holes.

You already meet the requirements for corrosion protection if your UST system matches one of the following performance standards for new USTs:

- Tank and piping completely made of noncorrodible material, such as fiberglass. Corrosion protection is also provided if tank and piping are completely isolated from contact with the surrounding soil by being enclosed in noncorrodible material (sometimes called “jacketed” with noncorrodible material).

- Tank and piping made of steel having a corrosion-resistant coating AND having cathodic protection (such as an sti-P tank with appropriate piping). A corrosion-resistant coating electrically isolates the coated metal from the surrounding environment to help protect against corrosion. Asphallic coating does not qualify as a corrosion-resistant coating. Methods of cathodic protection are briefly explained on page 11.

- Tank made of steel clad with a thick layer of noncorrodible material (such as an ACT-100 tank clad with fiberglass reinforced plastic). This option does not apply to piping. Galvanized steel is not a noncorrodible material.

It is not practical to add coatings or claddings to existing steel USTs that have no corrosion protection. Instead, you must choose one of the following three methods to add corrosion protection to existing steel tanks:

1. Add cathodic protection or
2. Add interior lining to tank or
3. Combine cathodic protection and interior lining.

These methods are described on the following pages.
1. **Add cathodic protection.** If you are adding only cathodic protection, you must do the following:

   ■ **First, assess tank integrity.** Satisfy **ONE** of the following methods to make sure that the tank is structurally sound:

     If the tank is LESS THAN 10 YEARS OLD, you can use results from one of the monthly leak detection methods to show the UST is not leaking (groundwater monitoring, vapor monitoring, interstitial monitoring, automatic tank gauging, statistical inventory reconciliation, or other approved methods).

     If the tank is LESS THAN 10 YEARS OLD, you can use results from two tank tightness tests to show the UST is not leaking. The first test takes place before you install cathodic protection, and the second test takes place between 3 and 6 months after installation.

     If the tank is 10 YEARS OLD OR MORE, it must be internally inspected, tested, and assessed to make sure that the tank is structurally sound and free of corrosion holes (see page 15 for industry codes).

   ■ **Second, install cathodic protection.** Regulations require a certified cathodic protection specialist to design, supervise installation, and inspect cathodic protection systems installed at the UST site. The system must be tested by a certified cathodic protection tester within 6 months of installation and at least every 3 years thereafter. You will need to keep the results of all tests to verify that the cathodic protection is working. In addition, you must inspect an impressed current system every 60 days to verify that the system is operating. Keep results of all of your inspections to prove that the impressed current system is operating properly.

Only tanks proven to be structurally sound can have cathodic protection added to them.

Using cathodic protection requires periodic tests and inspections, as well as consistent recordkeeping (see page 15 for industry codes).
2. **Add interior lining to the tank.** The interior of a tank can be lined with a thick layer of noncorrodible material (see page 15 for industry codes). Tanks using only an interior lining for corrosion protection must pass an internal reinspection in 10 years and every 5 years after that to make sure that the lining is sound. Keep records of the inspection results.

3. **Combine cathodic protection and interior lining.** You can add both cathodic protection and interior lining. The advantages for you of this combined method are simple: your USTs receive more cathodic protection; and you are not required to have the interior lining periodically inspected (which saves you the cost of these inspections). You will still need to have the cathodic protection system periodically tested and inspected and to keep records (as explained on page 9).

**And what about piping?**

Existing steel piping must have cathodic protection. Note that cathodic protection needs to be tested and inspected periodically and records kept as described on page 9.

Piping entirely made of (or enclosed in) noncorrodible material, such as fiberglass, does not need cathodic protection.
What Are Cathodic Protection Methods?

**IMPRESSED CURRENT SYSTEM**

An impressed current system uses a rectifier to convert alternating current to direct current (see illustration below). This current is sent through an insulated wire to the "anodes," which are special metal bars buried in the soil near the UST. The current then flows through the soil to the UST system, and returns to the rectifier through an insulated wire attached to the UST. The UST system is protected because the current going to the UST system overcomes the corrosion-causing current normally flowing away from it.

**SACRIFICIAL ANODE SYSTEM**

Another type of cathodic protection (not illustrated here) is called a sacrificial anode or galvanic system. Although sacrificial anode systems work with new USTs, corrosion protection experts generally agree that sacrificial anodes do not work effectively or economically with most existing steel USTs. Only a certified cathodic protection specialist can determine what kind of cathodic protection will work at your UST site.

For more information on corrosion and how USTs can be protected from it, contact NACE International (formerly the National Association of Corrosion Engineers) or other professionals in this field (see page 15).
What If You Close Or Replace The UST?

If you do not upgrade your existing UST, then you must properly close it. After closing the UST, you may replace it by installing a new UST. Basically, state rules require the following when closing or replacing an UST:

- Submit a Closure Plan Approval Application to the DEP at least 60 days before you take an UST out of service for closure or replacement. (For application forms and information contact the Bureau of Field Operations at (609) 633-7141.) Tanks may not be closed until a Closure Approval from DEP and a demolition permit from your local construction official have been obtained.

- Determine if releases from your UST have contaminated the surrounding environment. You will need to do a site investigation, typically consisting of soil sampling, unless tanks and distribution systems are secondarily contained with approved leak detection and no discharge history. Precision tests may be used in lieu of soil sampling for inaccessible tanks or for original piping with no history of discharge or repair. If you find contamination, you must call DEP’s Environmental Action Hot Line at (609) 292-7172 to report the contamination. After making your report, you must arrange to clean up the contamination. To perform a proper cleanup (also called “corrective action”), you must follow the Technical Requirements for Site Remediation (N.J.A.C. 7:26E). Copies of N.J.A.C. 7:26E can be ordered from the Office of Administrative Law at (609) 588-6606. Within 120 days of reporting the contamination, you must also submit a remedial investigation report to the DEP, describing all activities conducted and results found (see page 16 for ordering EPA’s booklet on taking corrective action).

- Have the tank emptied of liquids, dangerous vapor levels, and accumulated sludge. These wastes must be disposed of properly. These potentially very hazardous actions need to be carried out by trained personnel who carefully follow standard safety practices. After the tank has been properly emptied, you can have it removed. All tanks must be removed except when located under a permanent structure or if inaccessible as certified by a New Jersey professional engineer and approved by DEP. If you have obtained DEP approval to leave the UST in the ground, you must fill it with a harmless and chemically inactive solid, such as sand or cement.

What About Hazardous Substance USTs?

Several hundred substances, excluding motor fuel and petroleum products, are designated as "hazardous". These include the hazardous wastes designated pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580 (42 U.S.C. 6921) and N.J.A.C. 7:26-8; hazardous substances designated pursuant to Section 311 of the Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500 (33 U.S.C. 1321). Section 101 (14) of the Comprehensive Environmental Response, Compensation and...

If your hazardous substance UST was installed before December 22, 1988, you have until December 22, 1998 to add spill, overfill, and corrosion protection (see pages 4-11). Otherwise, you must properly close the UST (see page 12). By this same date, hazardous substance USTs must also have leak detection systems that include secondary containment with interstitial monitoring. The leak detection system must be able to detect a leak in the interstitial space within 30 days of occurrence.

Secondary containment is created by placing a barrier inside or outside the tank and piping so that any leaks are contained within the space between the barrier and the tank and piping. This containment space is called the "interstitial space" and must be monitored for leaks. Methods that create an interstitial space for existing systems are currently limited in number and not available everywhere.

For more information on hazardous substance USTs, see "Musts for USTs" (ordering information on page 16).

NOTE: You may find the "Quick Compliance Checklist" on page 17 to be helpful.

Permits, Registration and Fees

1. Permitting Requirements

Before you upgrade your UST system, you must first obtain a substantial modification permit from DEP, and a construction permit from your local construction official. If you decide to replace your UST by installing a new UST system, you must first obtain an installation permit from DEP unless the entire UST system to be installed (tank and piping) is secondarily contained with interstitial monitoring, corrosion protection and spill and overfill protection. Before installing a new UST system you must also obtain a construction permit from your local construction official, whether or not the new UST system is secondarily contained.

2. Registration Requirements

If you decide to replace your UST by installing a new UST, you must register your new UST with DEP at least 30 days prior to the use of the UST. The old UST being replaced can be deregistered at the same time.

3. Fees

Since New Jersey public money is not used to fund the New Jersey UST program, fee collection allows program activities to continue. The authority to collect fees is provided by N.J. S.A. 58:10A-21 et seq. and by N.J. A.C. 7:14B-3.
Following is a listing of various activities outlined in this booklet together with the fees associated with these activities. You should submit a separate fee for each activity at a facility which requires a permit or approval at the time the application or report is submitted.

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<td>1. Permit for the installation or substantial modification of an UST system.</td>
<td>$300.00</td>
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<tr>
<td>2. Review of the closure plan for an UST system.</td>
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<tr>
<td>3. Review of the site investigation report of soil sampling following closure.</td>
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<td>4. Review of the remedial investigation report.</td>
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ORGANIZATIONS TO CONTACT FOR TANK INFORMATION

- **API (American Petroleum Institute)**
  1220 L Street, N.W.
  Washington, DC 20005
  202 682-8000

- **ASTM (American Society for Testing and Materials)**
  1916 Race Street
  Philadelphia, PA 19103
  215 299-5585

- **Fiberglass Petroleum Tank and Pipe Institute**
  9801 Westheimer, Suite 606
  Houston, TX 77042-3951
  713 465-3310

- **NACE International (formerly the National Association of Corrosion Engineers)**
  Box 218340
  Houston, TX 77218-8340
  713 492-0535

- **National Fire Protection Association**
  1 Batterymarch Park
  Box 9109
  Quincy, MA 02269-9101
  617 770-3000

- **NLPA (National Leak Prevention Association)**
  Box 1643
  Boise, ID 83701
  208 389-2074

- **PEI (Petroleum Equipment Institute)**
  Box 2380
  Tulsa, OK 74101-2380
  918 494-9696

- **STI (Steel Tank Institute)**
  570 Oakwood Road
  Lake Zurich, IL 60047
  708 438-8265

INDUSTRY CODES AND STANDARDS

- **Assessing Tank Integrity and Interior Lining of Tank**
  API Recommended Practice 1631 (1992), “Interior Lining of Underground Storage Tanks”

An ASTM consensus code may be published to standardize alternatives to internal inspections that assess tank integrity.

Cathodic Protection

API Recommended Practice 1632 (1987), "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems"

NACE RP-0169-92 (1992), "Recommended Practice: Control of Corrosion on External Underground or Submerged Metallic Piping Systems"

NACE RP-0285-85 (1985), "Recommended Practice: Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems"

STI R892-91 (1991), "Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems"

Closing USTs

API Recommended Practice 1604 (1987), "Removal and Disposal of Used Underground Petroleum Storage Tanks"

General

API Recommended Practice 1615 (1987), "Installation of Underground Petroleum Storage Systems"

PEI RP100-94 (1994), "Recommended Practice for Installation of Underground Liquid Storage Systems"

DEP FORMS & APPLICATIONS

Hazardous Discharge Site Remediation Fund Application Package

UST Upgrade Package (Permit)

UST Closure Approval Application

UST Registration Package

- the above can be obtained by calling (609) 633-7141

DEP PUBLICATIONS

"Guidance Document for the Remediation
EPA PUBLICATIONS

Leak Detection Requirements

"Straight Talk On Tanks: A Summary of Leak Detection Methods for Petroleum Underground Storage Tanks." To order this free publication, call EPA's toll-free RCRA/Superfund Hotline at 800 424-9346 and ask for EPA 530/UST-90/012.

Installing New USTs and General Information


Taking Corrective Action

"Oh No! Petroleum Leaks and Spills: What Do You Do?" To order this free publication, call EPA's toll-free RCRA/Superfund Hotline at 800 424-9346 and ask for EPA 530/UST-88/004.

Tank Filling

"Keeping It Clean: Making Safe and Spill-Free Motor Fuel Deliveries." For ordering information call EPA's toll-free RCRA/Superfund Hotline at 800 424-9346 (video costs about $60).

Closure

"Tank Closure Without Tears" and "What Do We Have Here?" Videos and companion booklets available ($20 to $45) from New England Interstate Water Pollution Control Commission, ATTN: VIDEOS, 84 Merrimac St., Boston, MA 02114
Quick Compliance Checklist

You should be in compliance with the “upgrade” requirements if you can check off the major items below for each of your existing UST systems by December 1998 (this list does not include leak detection requirements):

- Spill protection provided by a catchment basin
- Overfill protection provided by an automatic shutoff device, overfill alarm, or ball float valve
- Corrosion protection for the tank provided by one of the following:
  - Steel tank has corrosion-resistant coating AND cathodic protection
  - Tank made of noncorrodible material (such as fiberglass)
  - Steel tank clad with (or enclosed in) noncorrodible material
  - Uncoated steel tank has cathodic protection system
  - Uncoated steel tank has interior lined with noncorrodible material
  - Uncoated steel tank has cathodic protection AND interior lined with noncorrodible material steel tank
- Corrosion protection for piping provided by one of the following:
  - Uncoated steel piping has cathodic protection
  - Steel piping has a corrosion-resistant coating AND cathodic protection
  - Piping made of (or enclosed in) noncorrodible material

You have decided not to upgrade your existing UST system with the items above, and you have properly closed the UST system. If you subsequently install a new UST system, the new installation meets all the regulatory requirements for installations after December 22, 1988.
Applicability and Summary of Regulated Underground Storage Tanks 
(N.J. S.A. 58:10A-21 et seq.)

HEATING OIL (Petroleum products used for on-site consumption; #2, #4, and #6 fuel oil, kerosene, etc.)

COMMERCIAL: (fuel oil dealers)
Any quantity stored for sale, distribution, processing or other commercial use must comply with all requirements of the State UST Law.

NON-RESIDENTIAL: (business, industry)
2,001 gallons or more for on-site consumptive use must comply with all requirements of the State UST Law. Tank facilities with capacities of 2,000 gallons or less are exempt.

MOTOR FUEL (Petroleum products used in the operation of a motor: gasoline, diesel, aviation, kerosene, gasohol, etc.)

COMMERCIAL:
Any quantity of motor fuel stored for commercial use must comply with all requirements of the State UST Law.

NON-COMMERCIAL:
Farm or residential tanks of 1,101 gallons or more storing motor fuel for non-commercial purposes must comply with all requirements of the State UST Law. Tank facilities with capacities of 1,100 gallons or less are exempt.

HAZARDOUS SUBSTANCES (Non-petroleum substances as defined in the State UST Law)

Any quantity stored must comply with all requirements of the State UST Law. The list of substances regulated is available from the Bureau.

HAZARDOUS WASTE (Substances as defined in the State Solid Waste Management Act, N.J. S.A. 13:1E-1 et seq.)

Any quantity stored must comply with all requirements of the State UST Law. Hazardous wastes include WASTE OIL. Many hazardous waste tanks are also regulated under the New Jersey Hazardous Waste Regulations (N.J.A.C. 7:26-1). For hazardous waste classification and technical assistance, contact the Bureau of Advisement and Manifest at (609)292-8341.

All gallonage totals are aggregate for the substance category at the specific site.

*NOTE: Owners or operators of FARM TANKS should contact the Bureau of Applicability and Compliance *

All gallonage figures are based upon the manufacturer's nominal tank capacity ONLY.
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SECTION 1 – GENERAL

1.1 Introduction

The purpose of this document is to establish the policy of this office regarding the evaluation of cathodic protection systems operating on underground storage tank (UST) systems in the State of Georgia. While conducting structure-to-soil potential surveys is the primary means of testing cathodic protection systems, other aspects related to the evaluation, installation, operation and repair of cathodic protection systems are also addressed in this document where necessary.

Evaluation of cathodic protection systems to ensure they are functioning as intended has proven to be one of the more problematic areas that has led to a great deal of confusion and various practices among individuals engaged in the field of cathodic protection. Because the applicable regulations contain no specific criteria and instead defer to industry standards, a large degree of latitude has historically been provided for interpretation of what constitutes an acceptable evaluation.

Since there are many factors that can affect cathodic protection, there is understandably no standard test method or “cookie-cutter” approach that will work at every site that has a cathodic protection system in operation. Therefore, the primary intent of this policy is to create a level playing field in which everyone engaged in the field of UST system cathodic protection in the State of Georgia understands what is expected. To this end, forms that must be utilized when evaluating cathodic protection are included in Appendix K and L of this document.

It is further necessary to understand that the creation of this policy has necessitated a compromise to some degree. Every effort has been made so as not to place an unduly harsh burden on the tank owners and contractors who operate in the State of Georgia. At the same time, it is necessary to be protective of human health and the environment to the degree required to achieve the charge of the Georgia Environmental Protection Division (EPD). This document represents the best efforts of EPD to assure that cathodic protection systems operate as intended and effectively mitigate corrosion while being mindful of the economic constraints that must be considered.

Some of the more important points established with this guidance document are:

- Access to the soil directly over the structure that is being tested must be provided.
- “Instant off” potentials must be obtained on all impressed current systems.
- Continuity/isolation must be established whenever a cathodic protection survey is conducted.
- Under certain conditions a “corrosion expert” must evaluate the cathodic protection survey.
- A person must meet certain minimum qualifications in order to conduct an effective evaluation.

Simply conducting a structure-to-soil potential survey does not adequately evaluate a cathodic protection system. Other considerations that may need to be addressed are outlined in the text of this document and include: continuity measurements; evaluation of rectifier operation; current distribution among an impressed current anode ground bed; consideration of voltage drops; assurance of wiring integrity; continuity bonds; as built drawings and others.

This policy is not intended to replace any statute or regulatory requirement concerning the installation, repair, operation or testing of cathodic protection systems. Rather, it is intended to state the interpretation of EPD with regard to the implementation of those rules and regulations applicable to UST cathodic protection systems.
SECTION 2 – TECHNICAL STANDARDS

2.1 Rules

Federal and state laws require that any component of a UST system that routinely contains product and is in contact with the soil must be protected from corrosion. If the UST component in question is constructed of metal and in contact with the soil and/or water, it must be cathodically protected.

The rules also require that all cathodic protection systems must be evaluated within six months of installation/repair and once every three years thereafter. Consideration should be given to evaluating impressed current systems on an annual basis since these types of systems are more susceptible to failure or may be in need of adjustment on a more frequent basis in order to provide adequate cathodic protection.

The EPD adopted by reference the federal UST rules established under Subtitle I of the Resource Conservation and Recovery Act. The rules are published in Title 40 of the Code of Federal Regulation Part 280 (40 CFR 280) also known as the Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tank Systems. The regulations reference several industry codes and practices and a listing of these may be found in Appendix A of this document. Following are the pertinent paragraphs of 40 CFR 280 that are related to cathodic protection:

280.12 Definitions

“Cathodic Protection” is a technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.

“Cathodic protection tester” means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

“Corrosion expert” means a 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. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers (NACE) or be 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.

280.20 Performance Standards for New UST Systems

(a) (2) The tank is constructed of steel and cathodically protected in the following manner:

(i) The tank is coated with a suitable dielectric material;
(ii) Field-installed cathodic protection systems are designed by a corrosion expert;

(iii) Impressed current systems are designed to allow a determination of current operating status as required in 280.31 (c); and

(iv) Cathodic protection systems are operated and maintained in accordance with 280.31 or according to guidelines established by the implementing agency; or (various industry codes and standards are referenced here – see Appendix A).

280.31 Operation and Maintenance of Corrosion Protection

(a) All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.

(b) All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements:

(1) *Frequency.* All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter.

(2) *Inspection Criteria.* The criteria that are used to determine that cathodic protection is adequate as required by this section must be in accordance with a code of practice developed by a nationally recognized association.

(c) UST systems with impressed current cathodic protection systems must also be inspected every 60 days to ensure the equipment is running properly.

(d) For UST systems using cathodic protection, records of the operation of the cathodic protection must be maintained (in accordance with 280.34) to demonstrate compliance with the performance standards in this section. These records must provide the following:

(1) The results of the last three inspections required in paragraph (c) above;

(2) The results of testing from the last two inspections required in paragraph (b) above.

280.31 Repairs Allowed

(e) Within 6 months following the repair of any cathodically protected UST system, the cathodic protection system must be tested in accordance with 280.31 (b) and (c) to ensure that it is operating properly.
SECTION 3 - TYPES OF CATHODIC PROTECTION

3.1 General

The two types of cathodic protection that are typically installed on UST systems are galvanic (sacrificial anode) and impressed current systems. An attempt to explain the principles involved in the theory of cathodic protection is beyond the scope of this document and it is assumed the reader has a basic understanding of the subject. However, stated in the simplest terms, both of these types of cathodic protection attempt to reverse the flow of electric current away from the metal that is intended to be protected from corrosion. Both types of cathodic protection prevent electric current from leaving the protected structure by supplying an electrical charge in the form of DC power sufficient to overcome any current that would otherwise leave the structure. The way in which the required electrical current is provided is what distinguishes the two types of cathodic protection.

3.2 Galvanic Systems

Galvanic systems are also known as sacrificial anode systems because an anode (usually zinc or magnesium) corrodes instead of the protected metal. Because the anode corrodes instead of the metal that it is protecting, the anode is said to sacrifice itself. Sacrificial anodes are connected directly to the structure to be protected by either cadwelding or mechanical connection of lead wires.

Galvanic systems are generally limited to those tank components that are well coated with a dielectric material (sti-P³ tanks or fusion bonded epoxy coated steel piping) because the available current output of these systems is low. Attempts to galvanically protect long runs of uncoated piping or uncoated tanks is generally not practical because the useful life of the anodes is too short or the number of anodes needed is too great.

3.3 Impressed Current Systems

Impressed current systems are sometimes called rectifier systems because they utilize a device (a rectifier) to convert an external AC power source to the required DC power source. In this type of system, anodes are installed in the soil around the structure to be protected and the DC power is supplied to the anodes through buried wires. The power to the rectifier cannot be interrupted except when conducting maintenance or testing activities. Normally, a dedicated and protected circuit is provided for the impressed current system so that the power cannot be inadvertently cut off.

In impressed current systems the protected structure is bonded to the DC power system to complete the electrical circuit. It is critical that the anodes are connected to the positive terminal and the protected structure to the negative terminal of the rectifier. Reversal of the lead wires will make the components of the tank system anodic and can cause a rapid failure of the tank system due to corrosion. In addition, it is critical that all wire connections and splices are well insulated. Any breaks in the wiring insulation will allow current to leave the wire at that point and a rapid failure of the wire can occur due to corrosion.

Impressed current systems are generally installed on those tank systems that were installed prior to the effective date of the UST regulations since these tanks usually do not have a good dielectric coating. The level of cathodic protection provided by an impressed current system can be adjusted since the voltage produced by the rectifier can be changed. Because conditions that affect the level of cathodic protection needed are likely to change over time, adjustment of the rectifier is frequently necessary.
SECTION 4 – QUALIFICATIONS TO TEST CATHODIC PROTECTION SYSTEMS

4.1 Qualifications

In order to test cathodic protection systems in the State of Georgia, an individual must meet certain minimum qualifications. It is the intent of EPD that those individuals who meet the minimum qualifications perform testing in a manner that is consistent with the policies of this guidance document. Should an individual who meets the minimum qualifications as described below not possess the knowledge and expertise needed to properly evaluate a cathodic protection system, that individual should not attempt to undertake such an evaluation.

While it is not necessary to be an “expert” to test cathodic protection systems in most cases, it should be recognized that the proper evaluation of the two types of cathodic protection systems may require differing levels of expertise. Impressed current systems are inherently more involved and require a higher level of understanding than galvanic systems. In addition, certain circumstances and conditions may exist that would preclude an individual from making an effective evaluation of a cathodic protection system without the assistance of someone who is more qualified.

Because the testing of impressed current systems is inherently more complicated, someone who is only minimally qualified as a “tester” should recognize that he or she may or may not be able to properly evaluate all such systems. Galvanic cathodic protection systems that are operating as designed are normally straightforward and a lesser degree of expertise is needed to properly evaluate such systems. However, troubleshooting and/or repair of such systems may require someone who has a higher level of expertise than a person who is only minimally qualified as a tester.

Scenarios that require an expert to either conduct or evaluate the cathodic protection survey are listed in Section 7.2 of this document. It should be recognized that there might be other circumstances that require an expert although they may not be specifically listed. A listing of those individuals who meet the qualifications of an expert (certified as either as a “corrosion specialist” or a “cathodic protection specialist”) can be found at the web site of NACE International (www.nace.org).

Listed below are the minimum qualifications necessary to test cathodic protection:

- Anyone who meets the definition of “cathodic protection tester” as found in 40 CFR 280.10 is recognized as qualified to test cathodic protection.

- Anyone who holds a certification from NACE International which that organization recognizes at a minimum as qualifying that person as a cathodic protection tester.

SECTION 5 - INSTALLATION/REPAIR OF CATHODIC PROTECTION SYSTEMS

5.1 Galvanic Systems
5.1.1 sti-P3® Tanks

The design requirements for the installation of additional sacrificial anodes to a sti-P3® tank may be met with the need for a corrosion expert to design such, provided the provisions of the Steel Tank Institute “Recommended Practice for the Installation of Supplemental Anodes for sti-P3® UST’s R-972-01” are followed. An evaluation of the cathodic protection system must be conducted within six months of the installation/repair in accordance with the requirements of this document.

5.1.2 Factory Coated Metallic Piping

Installation of sacrificial anodes to factory coated (fusion bonded epoxy) metallic piping may be accomplished with the design of a corrosion expert provided the provisions of the Steel Tank Institute “Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems R892-91” are followed. As an alternative, the practices as described in the Petroleum Equipment Institute “RP 100–2000 Recommended Practices for the Installation of Underground Liquid Storage Systems” may also be followed when installing sacrificial anodes on factory coated piping. Repairs of this type are only allowed on systems which have already demonstrated cathodic protection in the previously performed cathodic protection surveys.

5.1.3 Non-factory Coated Metallic Piping- New Installations

The design of the galvanic cathodic protection system must be accomplished by a corrosion expert. In addition, an evaluation of the cathodic protection system must be conducted within six months of the installation/repair in accordance with the requirements of this document.

5.1.4 Metallic Piping Repair/Installation

Provided below are some general observations that are commonly applicable to questions that arise when attempting to meet the corrosion protection requirements on metallic piping and other metallic components of a typical UST system.

Protected Components - Any metallic component of the piping system, including all metallic nipples, ells, tees, couplings, unions, ball valves, etc. must be protected from corrosion if they are in contact with the soil and/or water. Corrosion protection may be accomplished by either a) isolating the component in question from contact with the soil and/or water or b) coating/wrapping with a suitable dielectric material and cathodic protection. Any isolation boot or containment sump designed to isolate the metallic component from contact with the soil must also prevent water from contacting the component in question in order to eliminate the need for cathodic protection.

Unprotected Components - Metallic components of the UST system that do not require corrosion protection include: tank vent lines; any type of tank riser pipe; tank hold down straps; remote tank fill lines and submersible turbine pump (STP) heads. Although the pump head “routinely contains product”, it is not required to meet the corrosion protection requirements and may be in contact with the soil or submerged in water without the need for cathodic protection. However, the pump head should remain visible (not buried) so that any obvious corrosion problems or leaks that may be present can be observed and appropriate action taken to prevent or repair any leaks.

Repair - Some confusion exists over whether or not metallic piping that has failed can be repaired or must be replaced. “Repaired” as related to steel pipe involves the replacement of the section of pipe that has failed. The entire run of steel piping does not have to be replaced but the repair must
consist of replacement of the section of pipe that has failed. Only steel pipe that is factory coated with a dielectric material (fusion bonded epoxy) can be used to replace the failed section of pipe. Under no circumstances is it allowable to install galvanized piping when it is intended to serve as a product transfer line. Because of the complexities that may be involved in the cathodic protection of galvanized steel piping, a corrosion expert must evaluate and/or conduct the cathodic protection survey after the repair.

Electrical Continuity - Dielectric unions are normally not installed if the piping is protected by an impressed current system. It is essential that all metallic piping that is part of the UST system is bonded to the negative circuit of the impressed current system if it is buried. It is normally desirable to electrically isolate any metallic portion of the UST system that is not buried or submerged in water from that portion that is buried/submerged.

Electrical Isolation - If metallic piping is galvanically protected, it is critical that effective electrical isolation is provided. Failure to isolate the protected piping will result in premature failure of the sacrificial anodes. Isolation can be difficult to achieve where cathodically protected piping is present under dispensers that have shear valves present. This is due to the requirement that the shear valve must be properly anchored to the island form. Particular care should be exercised in these instances to assure proper isolation. If possible, the dielectric union should be installed below the shear valve so that anchoring does not cause a continuity problem.

Screw Joints - Particular care should be taken when dealing with metallic piping that is mechanically coupled with threaded screw joints. Any threaded joint in a metallic piping material can serve as a break in the electrical continuity of the piping system. It has been established that threaded couple pipe joints can develop enough electrical resistivity over time to effectively isolate each section of a piping system. For obvious reasons, this is highly undesirable in a cathodic protection system and you should ensure that electrical continuity is present between any sections of piping that are intended to be protected. Jumper wires or welding may be necessary across each pipe couple in order to assure electrical continuity between each section of piping.

Flex Connectors - Any metallic flexible connector (including stainless steel) that is utilized on a piping system must be protected from corrosion. The flex connector may be isolated from contact with soil/water or cathodically protected.

Containment Sumps - If metallic components of a piping system are installed in a containment sump, the sump must be maintained dry. If a sump contains water and you are unable to keep the water out, the metallic components must be protected from corrosion. The metallic components may be protected by installing appropriate isolation boots (in the case of flex connectors) or sacrificial anodes. If cathodic protection is necessary, the sump may or may not be filled with clean sand to a depth adequate to bury the anode. Burial of the anode may help prevent an oxidation film from forming on the anode (and causing passivation) in the event that standing water is not always present in the sump. In either case, it is critical that the anode be installed within the containment sump. Do not place the anode outside of the sump.

“Mixed” Piping - In those instances where fiberglass reinforced plastic or flexible piping is connected to an existing metallic pipe (e.g. to extend a fueling island), a cathodic protection test station or access to the soil where the two dissimilar materials are joined must be provided. This is necessary to effectively test the adequacy of cathodic protection operating on the metallic piping.

5.2 Impressed Current Systems
The design of an impressed current system must be accomplished by a corrosion expert. If the repair of an impressed current cathodic protection system results in the reconfiguration of any of the components of the system, then the reconfiguration must also be designed by a corrosion expert.

If the repair only involves the replacement of existing components, a corrosion expert does not need to “sign-off” on such work. However, after any repair/alteration of the impressed current system is made, an evaluation of the cathodic protection system must be conducted within six months of the repair. If the repair/alteration results in any of the conditions that are beyond the capabilities of a cathodic protection tester, such as the examples in Section 7.2 of this document, then the cathodic protection survey must be conducted/evaluated by a corrosion expert. The retest must be conducted by a qualified tester, and any repairs must be documented in a drawing. The retest must include continuity and local potentials.

5.2.1 Rectifier Adjustment

Anyone who is considered qualified as a cathodic protection tester may adjust the rectifier output/voltage of an impressed current cathodic protection system. An evaluation of the cathodic protection system must be conducted whenever an adjustment to the rectifier is made. Before making any adjustments to the rectifier, the power must be turned off. Open both the AC and the DC circuit breakers.

It should be recognized that increasing the rectifier output could cause an increase in the potential for stray current to be generated that may have a detrimental effect on other buried metallic structures at the facility. Excessive rectifier output can also significantly shorten the life of the anode ground bed since the anodes will be consumed more quickly than necessary. In addition, care should also be taken to ensure that components of the rectifier do not become overheated (causing a potential fire hazard) as a result of increasing the output.

When evaluating the operation and output of a rectifier, it is important to make all measurements with a good quality multimeter. Do not rely on the output indicated by the voltmeter and/or ammeter that may be installed on the rectifier. Most rectifier gauges are adjustable and adjustments made should be based on measurements that are indicated by the portable multimeter.

The gauges that are commonly built into rectifiers are usually not accurate and may even be frozen in position. If the indicator needle is frozen on the rectifier voltmeter/ammeter and cannot be freed, the gauge should be replaced. If replacement is not accomplished, document that the gauge is not functioning so that an observer will be able to discern that the gauge is inoperable.

For the reasons given above and other considerations, a person qualified as a corrosion expert should be consulted whenever the output is adjusted or repairs are made to the rectifier.

SECTION 6 - CATHODIC PROTECTION TESTING

6.1 Equipment

Although the equipment required to test cathodic protection systems is relatively simple, the equipment must be maintained in good working order and free of corrosion and contamination. The basic equipment includes a voltmeter/ammeter (multimeter), reference electrode, wires, clips and test probes.
It may also be necessary to have a current interrupter for impressed current systems when the power cannot be easily cut on and off at the rectifier. A clamp-on type ammeter can be useful when troubleshooting impressed current systems. Wire locators can help determine the location of buried anode lead wires and header cables. Hand tools to clean corrosion or dielectric coatings from the surface of the structure you are testing at the point of contact with lead wires/probes may also be necessary.

6.1.1 Voltmeter/Ammeter

A good quality voltmeter/ammeter (multimeter) that has an adequate degree of accuracy is essential for testing cathodic protection due to the low voltage/current involved. Most “low end” voltmeters/ammeters are not capable of achieving results accurate enough to ensure reliable results and should therefore not be used.

All testing of cathodic protection systems must be accomplished with a high internal resistance (impedance of 10 meg-ohms or greater) voltmeter that is properly maintained and periodically calibrated in accordance with the manufacturer’s recommendations. The voltmeter should be calibrated at least on an annual basis. It is important that the voltmeter has a high internal resistance in order to avoid introducing a large error when measuring structure-to-soil potentials.

The voltmeter must have a high degree of sensitivity and must be placed in as low a scale as possible (normally the 2 volt DC scale works well) in order to accurately measure the small voltages associated with cathodic protection systems. All voltage measurements obtained should be recorded as millivolts (mV). For example, a reading of -1.23 volts should be recorded as -1230 mV; a reading of -.85 volts should be recorded as -850 mV.

Voltmeters that have a variable input resistance can be utilized to ensure that contact resistance between the reference electrode and the electrolyte has been evaluated as a source of error (voltage drop) in the observed structure-to-soil potential. This is accomplished by changing the input resistance and noting whether or not the voltage observed changes significantly. If no voltage change is observed when the input resistance is changed, it can be assumed that contact resistance is not causing an error in the structure-to-soil potential measurement.

An ammeter that has a very low internal resistance is necessary when testing impressed current systems in order to accurately determine the current output of the rectifier and/or individual circuits in the system. Generally, amperage should only be measured where calibrated measurement shunts are present. Alternatively, a “clamp-on” type ammeter may be utilized in those cases where shunts are not present.

The batteries in the portable multimeter must also be in good condition. Batteries that are in poor condition can cause unintended errors. If there is any question about the condition of the batteries in the multimeter, they must be replaced.

6.1.2 Reference Electrode

A standard copper/copper sulfate reference electrode (also known as a half cell or reference cell) must be utilized in order to obtain structure-to-soil potentials. The reference electrode must be maintained in good working condition and must be placed in the soil in a vertical position when conducting a test.
On those sti-P3® tanks that have a PP4® test station, a reference electrode is permanently buried in the tank pit. Since it is generally not possible to determine where the permanent reference electrode was installed on these types of systems, it is also necessary to conduct structure-to-soil potential measurements in the conventional manner (i.e. with a portable reference electrode in the soil directly over the tank and at a remote placement). A tank may not be passed on the basis of a structure-to-soil potential obtained with a PP4® test station. The local potential obtained in the conventional manner must indicate that adequate cathodic protection has been provided regardless of what the PP4® test station indicates.

Maintenance of the reference electrode is important for accurate results and includes:

a. The copper-sulfate solution inside the reference electrode should be clear. If the solution appears cloudy, this may indicate that the solution has become contaminated and the reference electrode should be compared with the known standard as described in paragraph e below. Should it be necessary to replace the solution, only distilled water and new copper-sulfate crystals should be used. Excess copper-sulfate crystals must be present in order to assure a saturated solution. Under average conditions, it is usually a good idea to empty and replace the solution every 2 or 3 months.

b. The porous ceramic tip must be maintained moist at all times. If the tip is allowed to dry out, it may lose its porosity and a good low resistivity contact with the soil will not be possible. Periodic replacement of the tip may be necessary.

c. The copper rod inside the reference electrode should periodically be cleaned with non-metallic sandpaper. Do not use black metal oxide sandpaper, steel wool or any other metallic abrasive as this can cause the copper rod to become contaminated. If the copper rod becomes contaminated, it is best to replace the reference electrode.

d. The copper-sulfate solution must be free of contamination or errors will be introduced in the readings you observe. If the reference electrode is submerged in water or placed in moist soils that are contaminated, it is likely that the solution will become contaminated.

e. The reference electrode that is used in the field must be periodically calibrated. How often the reference electrode needs to be calibrated depends upon several different factors. Among the more important factors that should be considered are the frequency of use and the exposure of the reference electrode to contaminants. As a general rule, calibration should be checked once every week if the reference electrode is used daily. If the reference electrode is only periodically used, calibration should be checked prior to each use.

Calibration of the reference electrode is accomplished by comparing it with another reference electrode that has never been used. The unused reference electrode that is to act as the calibration standard should be properly set up (ready for use) and must not have ever been used in the field so that no chance of contamination exists. Consideration should be given to obtaining a reference electrode that is certified by the manufacturer to be properly calibrated for periodic calibration of the field electrode.

To calibrate the field electrode:
1. Place the voltmeter on the 2 volt DC scale (or lower) and connect the leads to the reference electrodes as shown in the illustration below.

2. Place both the field electrode and the standard electrode in a shallow nonmetallic container that has one to two inches of tap water in the bottom of it. Do not use distilled water. The reference electrodes must be placed vertically in the container with the ceramic tip of each submerged in the water.

3. Observe the potential measurement displayed on the voltmeter. If more than 10 mV potential exists between the two reference electrodes, the field reference electrode should be properly cleaned and refilled with new solution until the potential difference is 10 mV or less. If you are unable to achieve a 10 mV or less potential difference after cleaning/reconditioning, the field electrode must be discarded and a new one obtained.

4. In order to lessen the chance of cross contaminating the calibration electrode, you should leave the calibration electrode in the water for the shortest time necessary to complete the test.

6.1.3 Lead Wires/Test Probes/Miscellaneous

You should ensure that the insulation material of any lead wires is in good condition. Any clips or probes used to make contact with the structure to be tested must be clean and free of corrosion. A spool of suitable wire of sufficient length is necessary to conduct continuity and/or “remote earth” testing. It is usually necessary to have a probe that can be attached to the end of a tank gauging stick in order to contact the tank bottom since it is not uncommon for the test lead on sti-P³® tanks to either be missing or discontinuous with the tank shell. A pair of locking pliers can sometimes be useful when attempting to get a solid connection.

6.2 Test Criteria
There are three test criteria that can be utilized to indicate if adequate cathodic protection is being provided to the structure being evaluated:

**850 On** - A structure-to-soil potential of –850 mV or more negative with the protective current applied. This is commonly referred to as “850 on” or the “on potential”. This criterion is normally the only one available for galvanic systems since the protective current usually cannot be interrupted.

Voltage drops (see Section 6.3) other than those across the structure to electrolyte boundary must be taken into consideration whenever this criterion is applied. Voltage drops may have a significant impact on the potentials observed when testing impressed current systems with the protective current applied. Therefore, the 850 on criterion is not applicable to impressed current systems.

**850 Off** - A structure-to-soil potential of –850 mV or more negative with the protective current temporarily interrupted. This is commonly referred to as “850 off”, “polarized potential” or “instant off potential”. This criterion is applicable to impressed current and galvanic systems where the protective current can be interrupted. Caution must be exercised when testing impressed current systems to ensure that no active sacrificial anodes are also installed near the protected structure. If there are active anodes influencing the observed potential, the 850 off criterion is not applicable.

The instant off potential is the 2nd value that is observed on a digital voltmeter the instant the power is interrupted. The first number that appears immediately after power interruption must be disregarded. After the second number appears, a rapid decay (depolarization) of the structure will normally occur. In order to obtain instant off potentials, a current interrupter or a 2nd person is necessary. If a current interrupter is not available, have the second person throw the power switch at the rectifier off for 3 seconds and then back on for 15 seconds. Repeat this procedure until you are sure an accurate instant off reading has been obtained.

This criterion is considered by most to be the best indicator that adequate cathodic protection has been provided. Therefore, consideration should be given to adjusting the rectifier output upward until the 850 off criterion has been met if this is feasible.

**100 mV Polarization** - A polarization voltage shift of at least 100 mV. Commonly referred to as “100 mV polarization” or “100 mV shift”. This criterion is applicable to galvanic and impressed current systems where the protective current can be temporarily interrupted. Either the formation or the decay of at least 100 mV polarization may be used to evaluate adequate cathodic protection.

The “true” polarized potential may take a considerable length of time to effectively form on a structure that has had cathodic protection newly applied. If the protective current is interrupted on a metallic structure that has been under cathodic protection, the polarization will begin to decay nearly instantaneously. For this reason, it is important that the protective current not be interrupted for any significant length of time. Generally, not more than 24 hours should be allowed for the 100 mV depolarization to occur. On a well-coated structure complete depolarization may take as long as 60-90 days. Complete depolarization of uncoated structures will usually occur within 48 hours although it could take as long as 30 days.

The base reading from which to begin the measurement of the voltage shift is the instant off potential. For example, a structure exhibits an on voltage of –835 mV. The instant off voltage is -720mV. In order to meet the 100 mV polarization criteria, the structure-to-soil potential must decay to at least –620 mV (final voltage).
The use of native potentials to demonstrate the formation of 100 mV polarization is generally only applicable when a system is initially energized or is re-energized after a complete depolarization has occurred. This is because it is necessary to leave the reference electrode undisturbed (or returned to the exact position) between the time the native and the final voltage are obtained.

It is only necessary to conduct a 100 mV polarization test on that component of the UST system where the lowest (most positive) instant off structure-to-soil potential exists in order to demonstrate that the UST system meets this criterion. If the criterion is met at the test point where the potential is most positive, it can be assumed that it will be met at all other test locations.

6.3 Voltage (IR) Drops

The effect voltage drops have must be considered whenever structure-to-soil potentials are obtained during the survey of a cathodic protection system. The concept of voltage drops is a difficult and controversial subject and a full discussion is beyond the scope of this document. However, stated in the simplest terms, a voltage drop may be thought of as any component of the total voltage measurement (potential) that causes an error.

The term IR drop is sometimes used and it is equivalent to voltage drop. IR drop is derived from Ohm’s Law which states that \( V = I \times R \). In this equation, \( V \) stands for voltage, \( I \) represents current (amperage) and \( R \) stands for resistance. Because the observed voltage is equal to the amperage \( I \) multiplied by the resistance \( R \), a voltage drop is commonly referred to as an IR drop. There are various sources of voltage drops and two of the more common are discussed below.

**Current Flow** - Whenever a current flows through a resistance, a voltage drop is necessarily created and will be included whenever a measurement of the electrical circuit is conducted. In order to effectively eliminate this voltage drop when testing impressed current systems, it is necessary to interrupt the protective current. The magnitude of the voltage drop obtained on impressed current systems is evaluated by conducting both on and instant off potential measurements.

To illustrate how this type of voltage drop contributes to the potential observed when measuring impressed current systems consider the following example. A potential of -950 mV is observed when the rectifier is on. A potential of -700 mV is observed when the power is interrupted. Taking the absolute values (negative is dropped), the voltage drop component of the on potential is 250 mV (950 - 700 = 250). Figure 2 is a graphical representation of this voltage drop and also shows how the instant off potential will degrade over time until the native potential is reached.

![Figure 2 - Graphic Representation of Voltage Drop in “On” Potential](image-url)
Raised Earth - All active anodes will have a voltage gradient present in the soil around them producing a “raised earth effect”. An abnormally high (more negative) potential will be observed if the reference electrode is within the voltage gradient of an active anode. The magnitude or area of influence of the voltage gradient is dependent predominantly on the voltage output of the anode and the resistance of the soil. Unfortunately, there is no “rule of thumb” guidance that can be given to determine how far away you must be from an anode in order to be outside the voltage gradient. If you suspect the potential you obtain may be affected by raised earth, you should take a remote reading and compare the two.

Because of the raised earth effect, it is necessary to place the reference electrode as far away from any active anode (and still be directly over the structure) when obtaining local potentials on galvanic systems. Since the protective current can not typically be interrupted in galvanic systems, any effect this type of voltage drop may have can be evaluated by placing the reference electrode remotely. Placement of the reference electrode remotely ensures that the reference electrode is not within the voltage gradient of an active anode. Any effect raised earth may have when testing impressed current systems is eliminated by temporarily interrupting the power.

6.4 Stray Current

An unintended current that is affecting the structure you are trying to protect is referred to as a stray current. Stray currents can cause rapid corrosion failure of a buried metallic structure and are caused by an electric current flowing through the earth in an unintended path. If the metallic object you are trying to cathodically protect is buried near the path of the stray current, the current may “jump-on” the protected structure because it offers a lower resistance path for the current to flow. The affected structure will be cathodic where the stray current enters but will be highly anodic where the stray current returns to the earth. At the point where the current discharges, rapid corrosion of the structure intended to be protected will occur.

Although stray currents are relatively rare on UST systems, common sources include: a) Railroad crossing signals (powered by batteries); b) Traffic signals that have induction type sensors buried in the pavement; c) Portable or fixed emergency power generators; d) Electrical railway systems such as streetcars or subways in urban areas; e) DC welding operations and other types of industrial machinery or processes that utilize DC power; f) and other corrosion protection systems.

If unsteady readings are observed on the protected structure and you have determined that it is not because of a bad electrical connection, you should suspect that stray current is affecting the protected structure. In some cases, a pattern can be seen in the potential whereby it alternates between two relatively stable readings. These patterns can sometimes help to identify the source of the stray current. If you suspect that stray current may be affecting the UST system, a thorough investigation must be conducted as soon as possible by a qualified corrosion expert since stray current can cause a rapid failure of the affected structure.

Cathodic Interference - When the impressed current cathodic protection system operating on the structure you are trying to protect causes an unintended current on some other nearby structure, this type of stray current is referred to as “cathodic interference”. Cathodic interference can cause a rapid failure of the water lines and other buried metallic structures at the facility where the cathodic protection system is operating. If you observe what you believe to be an abnormally high (more
negative) potential on a buried metallic structure, you should suspect that the impressed current system operating on the UST system is causing cathodic interference. Instances where cathodic interference may be present include: a) copper water lines that are not bonded to the impressed current system and have a polarized potential of greater than -200 mV; b) metallic flex connectors associated with fiberglass reinforced plastic piping that have abnormally high (more negative) potentials and are not bonded to the impressed current system; c) sti-P3® tanks are buried at a facility where there is an impressed current system operating and are not bonded to the negative circuit. When the sti-P3® tanks have zinc anodes and a potential more negative than -1100 mV (more negative than -1600 mV in the case of magnesium anodes) is observed, it is likely that cathodic interference is occurring. Because of the potential for stray current to impact sti-P3® tanks, it is normally necessary to bond them into the impressed current system.

A corrosion expert must be consulted whenever cathodic interference is suspected in order to properly investigate and make any repairs/modifications that may be necessary.

6.5 Dissimilar Metals/Bimetallic Couples

The effect bimetallic couples may have must also be considered whenever structure-to-soil potentials are obtained during the survey of a cathodic protection system. The concept of dissimilar metals/bimetallic couples and the impact they can have on the proper evaluation of cathodic protection systems is a difficult and controversial subject and a full discussion is beyond the scope of this document. However, you should be aware that bimetallic couples may substantially influence the structure-to-soil potentials of a tank system to the extent that the 100 mV polarization criterion is not applicable. Because the validity of the 100 mV criterion may be suspect, consideration should be given to only utilizing the -850 mV instant off criterion when evaluating impressed current systems. A brief discussion follows.

Caution must be exercised when evaluating steel UST systems that have metals of lower electrochemical potential electrically connected to them. Typically, bimetallic couples are only of concern on impressed current systems since those steel components protected by galvanic systems are electrically isolated from other metallic structures. Copper is the metal of lower potential that is commonly of concern. Sources of copper at UST facilities include the water service lines and the grounding system of the electrical power grid. Since the AC power supply to the submersible turbine pump should be continuous with the electrical service grounding system, which may in turn be continuous with the water lines, a significant amount of copper may be coupled to the steel UST system.

The effect this type of bimetallic couple has on the impressed current system can sometimes be clearly seen on those UST systems that store fuel for emergency power generators. Commonly these generator tank systems are installed with copper supply and return lines. When these tanks were retrofitted with an impressed current system, the copper lines were bonded into the cathodic protection system. In these instances, it is not uncommon to observe native structure-to-soil potentials on the UST system of -450 mV or more positive.

If the native structure-to-soil potential of the UST system is substantially lower than what you would normally expect, it is likely that a significant amount of copper is electrically bonded to the UST system. Typically, the expected native potential of a steel UST system should not be more positive than -500 mV.

To illustrate the effect of the copper-steel couple, consider the following example: A steel UST system that is coupled to copper has a native structure-to-soil potential of -300 mV with the
bimetallic couple intact. If the copper couple is broken the UST system native potential is -600 mV. With the copper couple intact, the polarized (off) potential of the UST system -450 mV. Although the voltage shift satisfies the 100 mV polarization criterion (from -300 mV to -450 mV), it is likely that the steel UST system is not adequately protected. This is because the UST system is not polarized at least 100 mV beyond the native potential of the steel. Since the true native potential of the steel UST system in this example is -600 mV, you would need to reach a polarized (instant off) potential of -700 mV or more negative.

Because the unaffected native potential of steel UST systems is generally not known, the application of the 100 mV polarization criterion would be inappropriate when there is a significant amount of copper (or other more noble metal) electrically continuous. For this reason, it is always desirable to demonstrate that the UST system satisfies the 850 off criterion when evaluating a cathodic protection system.

6.6 Other Test Considerations

Various other factors can affect the accuracy of structure-to-soil potentials. Listed below are some of the more common factors:

Contact Resistance – In order to obtain an accurate structure-to-soil potential, a good (low resistivity) contact between the reference electrode and the soil must be made. Sometimes, the soil at the surface is too dry and water needs to be added in order to lower the resistance between the reference electrode and the soil. In addition, if the porous ceramic tip of the reference electrode becomes clogged or contaminated it should be replaced since this in itself can cause a high contact resistance.

Contaminated Soil – You should ensure that the soil the reference electrode is placed in is free of contamination. Hydrocarbon contamination can cause a high resistance between the reference electrode and the soil.

Current Requirement Testing – When a current requirement test is conducted on galvanically protected tanks (refer to STI R972-01 for a description of this test), the affected structure can exhibit an elevated (more negative) structure-to-soil potential during the test and for a period of time after the test is completed. This is due to a temporary polarization of the tested structure which will dissipate over a period of time ranging from a few minutes to perhaps a few days depending on several different factors. Therefore, time sufficient for the temporary polarization of the affected structure to “drain-off” after a current requirement test is conducted must be allowed before an accurate structure-to-soil potential can be obtained. In addition, any potential measured with the battery connected should be disregarded as this measurement contains a large voltage drop. Only instant off voltages are meaningful when the battery is connected.

Drought Conditions – On occasion, it has been observed that structure-to-soil potentials are lowered during drought conditions due to dry soils being less conductive. Cathodic protection should be accomplished 365 day of the year not just during optimal conditions. Therefore the –850 mV criteria should always be met for a system to pass regardless of weather conditions.

Electrical Shorts – When a substandard reading is observed on a galvanically protected system, it is common to find that some other metallic object is electrically connected to the protected structure. For instance, on sti-P3® tanks, the nylon bushings installed in the tank bungs were sometimes removed when the various risers and other tank system components were installed or an electrical conduit was buried in contact with the tank shell.
**Electromagnetic Interference** – Overhead high voltage power lines, railroad crossing signals, airport radar systems and radio frequency transmitters (CB radios, cellular phones, etc.) can all cause an interference that will result in an inaccurate voltage reading.

**Galvanized Metals** - Buried metals that have a high electrochemical potential can also influence the voltage observed if the reference electrode is placed in close proximity to such metals. For instance, the steel of some of the manways that are installed to provide access to the tank appurtenances may be galvanized. If the reference electrode is placed in the soil of such a manway, an artificially high (more negative) potential may be observed. This is actually a raised earth effect although the galvanized metal is not acting to cathodically protect the buried structure of concern.

**Parallel Circuits** – Care should be taken to ensure that the person conducting the structure-to-soil testing does not allow their person to come into contact with the electrical components of the testing equipment. If the person touches the electrical connections, an error may be introduced due to the creation of a parallel circuit.

**Pea Gravel** – Because pea gravel or crushed stone typically has a very high electrical resistivity, it is necessary to ensure that it is saturated with water when attempting to measure structure-to-soil potentials with the reference electrode placed in the pea gravel. Evaluate any effect high contact resistance may have by changing the input resistance of the voltmeter as described in Section 6.1.1. As an alternative way to evaluate the effect contact resistance may have, place the reference electrode remotely. If the remote reading is substantially more negative than the local, high resistance is indicated. Placement of a saturated sponge on the surface of the pea gravel may help overcome high contact resistance.

**Photovoltaic Effect** – It is known that sunlight striking the viewing window of a reference electrode can have an effect (as much as 50 mV) on the voltages observed when conducting testing. You should ensure that the viewing window of the reference electrode is kept out of direct sunlight. As an alternative, the viewing window can be covered with black electrical tape in order to prevent any sunlight from reaching the copper-copper sulfate solution.

**Poor Connection** – If the observed structure-to-soil potentials are unsteady and the voltmeter will not stabilize, you should suspect a bad connection somewhere. Ensure that all electrical connections are clean and tight and good contact is made between the test lead and the structure.

**Shielding** – Sometimes, a buried metallic structure that is between the reference electrode and the structure you are attempting to test will cause the reference electrode to be unable to “see” the structure you are testing. Shielding is commonly cited when low potentials are observed with the reference electrode placed locally over sti-P3® tanks due to the various tank risers, pump heads, piping, electrical conduits and metallic manways that are typically located over the tank.

**Temperature** – The temperature of the reference electrode affects the voltages that are observed when conducting cathodic protection testing. You may need to make a correction to the observed potential in some extreme and/or marginal cases. The “standard” temperature is considered to be 77°F. For every degree less than 77 add 0.5 mV from the observed voltage. For every degree above 77 subtract 0.5 mV from the observed voltage. To illustrate this, consider the following (in order to simplify the calculation, the negative sign is dropped from the structure-to-soil potential): A voltage of 845 mV is observed when the temperature is 57°F. In this case the corrected voltage would then be 855 mV (20° X 0.5 mV = 10 mV. Therefore: 845 mV + 10 mV = 855 mV).
6.7 Continuity Testing

When conducting an evaluation of a cathodic protection system, it is normally necessary to establish that the cathodically protected components of a UST system are either electrically isolated or electrically continuous depending on the type of cathodic protection system. Ohmmeters (continuity testers) such as those utilized to test automotive wiring circuits are not acceptable for use on buried metallic structures and should never be used for testing continuity of UST system components. The “fixed cell-moving ground” method is the commonly utilized way to test continuity and are discussed in more detail below.

**Fixed Cell - Moving Ground Method** - The most commonly accepted method of conducting a continuity survey is referred to as fixed cell – moving ground. In this method, the reference electrode is placed at a location remote from any of the cathodically protected structures. Potentials of all the metallic structures present at the site are then measured without moving the reference electrode (refer to Appendix E for a more complete description). Because the conditions found at the reference electrode/electrolyte interface can change over a short period of time (causing the observed potential to change), it is important to conduct this type of testing as quickly as possible.

When determining whether electrical continuity or isolation is provided, the following guidelines are generally accepted for fixed cell – moving ground surveys:

- If two or more structures exhibit potentials that vary by 8 mV or less, the structures are considered to be electrically continuous.
- If two or more structures exhibit potentials that vary by 12 mV or greater, the structures are considered to be electrically isolated.
- If two or more structures exhibit potentials that vary by more than 8 mV but less than 12 mV, the result may be inconclusive and should be reviewed by a corrosion expert and their decision should be documented on the form.

6.7.1 Continuity Testing of Galvanic Systems

In order for sacrificial anodes to function efficiently, the protected component must be electrically isolated from any other metallic structures that may be connected to or in contact with the protected structure. This is generally accomplished through the use of dielectric bushings and unions and by making sure that no additional metallic structures come into contact with the protected structure.

On those systems where adequate cathodic protection has not been achieved, it is common to find that some unintended metallic structure is electrically continuous with the protected structure. Frequently, an electrical conduit is in contact with a sti-P3® tank or the tank bung nylon bushings are missing or damaged. If metallic tank hold down straps were improperly installed, they will wear through the epoxy coating on the tank over time and cause premature anode failure. With metallic piping, the shear valve anchoring bracket usually provides an electrical bond with the dispenser cabinet and all of the other metal connected to it. When this is the case, the anodes are trying to protect much more metal than intended and the life of the anodes is shortened.

6.7.2 Continuity Testing of Impressed Current Systems
All protected components of the UST system must be electrically continuous in an impressed current cathodic protection system. Various bonds may be required in order to ensure that continuity has been provided. Failure to establish continuity in an impressed current system can result in accelerated corrosion of the electrically isolated components.

Carefully check all bonds when evaluating an impressed current system as these are of critical importance. Commonly, tanks are bonded into the negative circuit by attachment to the tank vent lines above ground. Because of this, it is easy for the integrity of the bonds to be compromised. It is equally important to ensure that the positive lead wire(s) have continuity. Any break in the insulation or dielectric coating of the positive circuit will allow current to discharge from the break and cause rapid corrosion failure of the wire. This is why it is absolutely critical that all buried positive circuit splices are properly coated and insulated.

6.8 Reference Electrode Placement

6.8.1 General

Where you place the reference electrode when taking structure-to-soil potential measurements is of critical importance. It is also essential that the exact location of the reference electrode placement is documented so that anyone could come back at a later date and reasonably duplicate the test. Reference electrode placement must be indicated by both written description and visually shown on a drawing of the tank system. The forms in Appendix K and L of this guidance document provide for both written and visual description of reference electrode placement.

6.8.2 Local Placement

Placement of the reference electrode is considered local when it is in the soil directly over the structure that is being tested. As discussed in Section 6.3, consideration of any effect active anodes have (raised earth) must be considered when selecting the appropriate location for local placement.

In addition, shielding of the reference electrode by other buried metallic components may also need to be considered. For instance, it is necessary to ensure that the tip of the reference electrode is below the metallic skirting found on most man ways. If the tip of the reference electrode is not below the metal skirt, it may be shielded from “seeing” the cathodic protection current. Ideally, the tip of the reference electrode should be as close to the structure-to-soil interface as is practical in order to minimize the voltage drop present in the soil due to resistivity. In practice, about 6 inches of soil between the tip of the reference electrode and the structure being tested works well.

6.8.3 Remote Placement

The remote potential represents the average potential of the entire surface of the protected structure. The purpose of remote placement is to eliminate any effect that raised earth may be contributing to the measurement of the structure-to-soil potential and to overcome any effects shielding may have, and to prove for sti-P3 tanks for continuity measurements.

Placement of the reference electrode is considered remote when it is placed in the soil a certain distance away from the structure that is being tested. There are several different factors that determine the distance necessary in order to reach remote earth and a full discussion is beyond the
scope of this document. However, a remote condition can normally be achieved when the reference electrode is placed between 25 and 100 feet away from any protected structure.

Depending on the conditions specific to the particular location where the cathodically protected structure is, the minimum distance to remote earth may be considerably more than 25 feet. Therefore, it is important that you establish that the reference electrode is truly remote when obtaining a structure-to-soil potential. In order to ensure that remote earth has been achieved, place the reference electrode at least 25 feet away from the protected structure and observe the potential. Move the reference electrode out away from the protected structure another 10 feet or so and observe the potential. If there is no significant difference in the two potentials, it can be assumed that remote earth has been achieved. If there is a significant difference, continue moving the reference electrode out away from the protected structure until no significant difference is observed.

When selecting a location to place the reference electrode to establish remote earth, it is essential that there are no other cathodically protected structures (e.g. natural gas lines) in proximity to the reference electrode. Foreign cathodically protected structures can cause an abnormally high (more negative) potential that is not indicative of the remote potential of the structure you are measuring. It is also important that there are no other buried metallic structures in the vicinity of the reference electrode. Any metallic structure that is buried near the reference electrode could possibly affect the structure-to-soil potential that is observed on the protected structure.

In addition to the above considerations, you should attempt to select the remote placement such that the reference electrode can “see” the structure you are testing. This means that there should not be any buried metallic structure between the remote reference electrode placement and the protected structure. If you suspect that shielding may be affecting the observed potential, place the reference electrode away from the protected structure in a different direction.

### 6.8.4 Galvanic Placement

All galvanic cathodic protection systems must be tested with the reference electrode placed both local and remote. In order to pass the structure-to-soil survey, the local potentials must indicate that adequate cathodic protection has been provided.

### 6.8.5 Impressed Current Placement

In order to pass the survey, the potential obtained with the reference electrode placed locally must satisfy either the 850 off or the 100 mV polarization criteria. While only one test point is required, the tester should obtain structure to soil potentials from as many soil access points along the structure as is practical. If any of the potentials indicate that adequate cathodic protection has not been provided, the structure should be failed.

Although not required by this guidance, it may be useful to place the reference electrode remotely when testing an impressed current system. The remote potential may provide additional information by which to evaluate the cathodic protection system. However, the structure may not be passed based on the remote potential itself. In all circumstances, the potential obtained with the reference electrode placed locally must indicate that adequate cathodic protection has been provided.

Additionally, special circumstances may require that a remote potential be obtained when testing impressed current systems. For instance, if there are active sacrificial anodes buried in close proximity to the structure being tested, the local potential may be influenced by raised earth. The voltage drop caused by the sacrificial anodes would preclude the accurate measurement of the local
structure-to-soil potential. If it is known that sacrificial anodes are impacting the potentials obtained locally, remote potentials must be obtained.

The remote potential obtained under these special circumstances must meet either the 850 off or the 100 mV polarization criteria in order for the tested structure to pass the survey. An explanation must be given in the “comments” of Section XVI of the EPD impressed current cathodic protection evaluation form as to why the remote potential must be considered. The remote potentials should be indicated on the form by designating remote in the location code column of Section XVI.

6.9 Soil Access

All structure-to-soil potentials that are intended to satisfy one of the three acceptable criteria found in Section 6.2 must be obtained with the reference electrode placed in the soil. Therefore, the person conducting the evaluation must either confirm that soil access is available or make prior arrangements with the owner of the UST system to secure access.

Under no circumstances is it allowable to place the reference electrode on concrete, asphalt, or any other paving material to achieve satisfactory structure-to-soil potentials. Likewise, the practice of placing the reference electrode on a crack or expansion joint of a concrete or asphalt paving is not recognized as an acceptable method of obtaining satisfactory structure-to-soil potentials.

Placement of the reference electrode in an observation (monitoring) well to obtain a passing reading is also not allowed. While it may be useful to obtain data by placing the reference electrode on a crack in the pavement or in an observation well, the structure-to-soil potentials obtained by such placement are not in themselves acceptable to demonstrate adequate cathodic protection.

Access may be provided by drilling holes through the pavement or the installation of proper cathodic protection test stations. A practical way to provide soil access is to drill a ½ inch diameter hole in the pavement so that a “pencil” type reference electrode (3/8 inch diameter) can be inserted through the pavement and into the soil. Upon completion of the survey, the hole should be filled with a fuel resistant caulking material so that easy access can be provided at a later date. As an alternative, a two inch hole could be drilled to allow use of a standard reference electrode. A short length of PVC pipe could be epoxied in the hole and plugged with a threaded cap. Various cathodic protection test stations/man ways are available for installation. Whenever, a new tank system is installed or the pavement is reworked around an existing system, provisions for access to the soil should be made so that adequate cathodic protection testing may be accomplished.

6.10 Cathodic Protection Test Locations

Because there are many different possible tank and cathodic protection system configurations that may occur, it is not feasible to attempt to illustrate every situation that may exist and the examples given in the following sections are offered as representative of some typical scenarios to illustrate the general principles. It may sometimes be necessary for you to utilize judgement to apply the intent of this guidance document when circumstances arise that are not specifically addressed in this guidance document.

6.10.1 Galvanically Protected (sti-P3®) Tanks

The measurement of both local and remote structure-to-soil potentials is necessary when evaluating sti-P3® tanks. The appropriate location to place the reference electrode locally would be in the soil at the middle of the tank (see Figure 3). However, if access to the soil is not available at
the middle of the tank, the reference electrode may be placed at any point along the centerline of the tank but not directly over the anodes at each end of the tank.

Caution should be exercised to ensure that there are no sacrificial anodes installed in the soil around the submersible pump manway to protect any steel piping that may be associated with the tank. If anodes are installed at the pump manway, the reference electrode must be placed in the soil near the opposite end of the tank.

In addition to the local potential described above, a remote potential must also be obtained for continuity measurements. Remote generally means the reference electrode is placed in the soil at least 25 feet away and not more than 100 feet away from the tank you are measuring (See Figure 4). Refer to Section 6.8.3 for a more complete discussion of remote reference electrode placement. Care must be taken that the remote location is not in proximity to any other cathodically protected structure (e.g. natural gas lines) or directly over any other kind of buried metallic structure. The remote placement should be such that the reference electrode is aligned with the longitudinal axis of the tanks and can “see” the anodes. This orientation is desirable in order to prevent shielding.

In addition to the local potential described above, a remote potential must also be obtained for continuity measurements. Remote generally means the reference electrode is placed in the soil at least 25 feet away and not more than 100 feet away from the tank you are measuring (See Figure 4). Refer to Section 6.8.3 for a more complete discussion of remote reference electrode placement. Care must be taken that the remote location is not in proximity to any other cathodically protected structure (e.g. natural gas lines) or directly over any other kind of buried metallic structure. The remote placement should be such that the reference electrode is aligned with the longitudinal axis of the tanks and can “see” the anodes. This orientation is desirable in order to prevent shielding.
6.10.2 Galvanically Protected Metallic Piping

Both local and remote potentials are required on all galvanically protected metallic piping. When metallic piping is protected by sacrificial anodes, several different possibilities exist as to where would be the appropriate location to place the reference electrode to obtain local potentials. Knowing where the anodes that are protecting the piping are installed is of critical importance. When obtaining local potentials, the reference electrode must be placed in the soil directly over the pipe to be evaluated at a point that is the most distant from any anode that may be along the pipe.

Because it is a common practice to bury piping anodes at the submersible pump manway of a tank, the appropriate location to place the reference electrode to obtain local potentials is at the dispensers (See Figure 5).

![Figure 5: Local Reference Electrode Placement for Galvanically Protected Piping When Piping Anodes Are at Tanks](image)

When the piping anodes are installed at the dispensers, the appropriate local reference electrode placement would be at the piping nearest the tanks (usually the submersible turbine pump manway) as shown in Figure 6.

![Figure 6: Local Reference Electrode Placement for Galvanically Protected Piping When Piping Anodes Are at Dispensers](image)
When the piping anodes are located at both the tanks and the dispensers, the reference electrode must be placed at the approximate center of the piping run to obtain local potentials (See Figure 7).

![Figure 7 - Local Reference Electrode Placement for Galvanically Protected Piping When Piping Anodes are at Both Ends of the Piping](image)

When the anodes are installed at the center of the piping, or it is not known where the anodes are installed, the reference electrode must be placed at both the tank and the dispenser end of the piping to obtain local potentials (See Figure 8).

![Figure 8 - Local Reference Electrode Placement for Galvanically Protected Piping When Anodes are Installed at Center of Piping or Location is Unknown](image)

6.10.3 Tanks Protected by Impressed Current
With impressed current cathodic protection systems, tank potentials are required to be measured with the reference electrode placed locally. Where the location of the anodes is known and they are relatively evenly distributed about the tank bed, the appropriate location to place the reference electrode would be in the soil at the middle of the tank (See Figure 9). However, if access to the soil is not available at the middle of the tank, the reference electrode may be placed in the soil at any point along the centerline of the tank similar to that described in Section 6.10.1.

As with the evaluation of any cathodic protection system, the location of the anodes in relation to reference electrode placement can be of critical importance. When selecting the appropriate local placement, it is necessary to place the reference electrode at the point over the structure that is the most distant from any active anode due to the effects of attenuation. Attenuation of the cathodic protection current may occur whereby effective protection is not achieved at some point along a UST system. For instance, if all of the active anodes are along one side of a tank bed, current distribution and attenuation may prevent sufficient protective current from reaching the side of the tanks away from the anodes. The preferred placement of the reference electrode would be along the centerline of the tanks at the end opposite to that where the anodes are installed (See Figure 10).
If it is not known where the anodes are installed, at least one measurement is required along the centerline of the tank. Testing should be conducted at as many locations along the centerline of the tank as are available. If soil access is available at each end of the tank and in the middle, all three structure-to-soil potentials should be recorded. **If any one of the measured potentials does not meet one of the acceptable criteria, the structure should be failed.**

In addition, if it is possible to measure the individual circuits in an impressed current system, a determination can be made as to which anodes are functional and how the current is distributed throughout the groundbed. How the current is distributed should be considered when choosing reference electrode placement when conducting a structure-to-soil potential survey. If for instance it is known that the majority of the rectifier output current is directed to only those anodes along one end of a tank bed, the reference electrode should be placed at the opposite end of the tank bed.

### 6.10.4 Piping Protected by Impressed Current

With impressed current cathodic protection systems, pipe potentials are required to be measured with the reference electrode placed locally. Just as with any other type of cathodic protection system, knowing where the anodes that are protecting the piping are installed is of critical importance. Due to the high degree of variability that exists in anode placement and piping configurations, structure-to-soil potentials must be obtained by placing the reference electrode at both the tank and dispenser end of any piping that is protected by impressed current (See Figure 11).

![FIGURE 11 – REFERENCE ELECTRODE PLACEMENT FOR METALLIC PIPING PROTECTED BY IMPRESSED CURRENT SYSTEM](image)

### 6.10.5 “100 Foot Rule” for Piping

For both galvanic and impressed current systems, if more than 100 feet of piping exists between any two anodes, the reference electrode must also be placed at the midpoint between the two anodes that are separated by more than 100 feet (see Figure 12). In addition, if it is not known...
where the piping anodes are located, there can be no more than 100 feet of piping between any two test points. This midpoint placement is in addition to any other reference electrode placement that may be required as noted above in Sections 6.10.1 through 6.10.4.

**SECTION 7 - DOCUMENTATION OF EVALUATION**

7.1  **Documentation**

As with any kind of testing or work that is being performed at a UST facility, it is critical that proper documentation be made of all activities and test procedures. Without proper documentation, the evaluation of a cathodic protection system through the application of a structure-to-soil potential survey is of little value.

Although it has been previously stated, the exact location where the reference electrode was placed in order to obtain a passing structure-to-soil potential is of critical importance and cannot be overemphasized. For this reason, an exact description of where the reference electrode was placed for each structure-to-soil potential obtained during the survey is an absolute necessity. Failure to properly document reference electrode placement will result in the survey being deemed invalid.

Additionally, in order to effectively evaluate the survey of a cathodic protection system it is essential to be able to clearly understand how the survey was conducted. Likewise, when a re-survey of an existing system is being conducted it is important that the tester understands how the previous survey was conducted. Various forms of documentation may be necessary in order to clearly convey the procedures and survey results. In the sections that follow, some of the more critical aspects of documentation are discussed in more detail.

7.1.1  **As Built Drawings**

If any modification to the construction of the cathodic protection system is made (e.g. supplemental anodes) it is necessary to show the modification on the “as built” drawings. If no as built drawing is available, you must indicate the location of any anode addition on the site drawing that is prepared as part of the evaluation. As built drawings are required whenever a cathodic protection system is
installed or substantially modified. The drawings should include: a) how many anodes were installed; b) what type of anodes were installed; c) where were the anodes installed; d) how deep were the anodes installed; e) what type of wire was used; f) how were the wires bonded; g) weight of the anodes, etc.

7.1.2 Site Drawing

Whenever a cathodic protection survey is conducted, a site drawing depicting the UST system, the cathodic protection system and any related features of the facility must be constructed. In addition, you must indicate on the drawing where the reference electrode was placed for each of the structure-to-soil potentials utilized to obtain a pass. Figure 13 is an example of a site drawing that shows the type of information that is necessary to properly complete the evaluation.

While it is understood that you will not always know where all of the pertinent components of the cathodic protection system may be buried, all that is known must be indicated. It is very important to show where the anodes are located on the site drawing. If you do not know where the anodes are buried, voltage gradients in the soil may help you determine the approximate location as described in the raised earth discussion of Section 6.3.

Should any modifications to the cathodic protection system be made, it is very important that such modifications be both visually indicated on the site drawing and a written narrative made that describes the work conducted. If as built drawings are available, it is acceptable to utilize these drawings for the purposes of meeting the requirements of this section. Any modifications or changes to the UST and/or cathodic protection systems that have been made since the construction of the as built drawings must be included.
7.1.3 EPD UST Cathodic Protection Evaluation Forms

Whenever a cathodic protection survey is conducted in the State of Georgia, the appropriate form(s) prescribed by EPD (Appendix K and/or L) must be utilized to document the survey. However, use of the prescribed form(s) is not intended to limit other kinds of documentation that may be desirable in order to complete the evaluation. For instance, it may be necessary to provide a written narrative.
describing various aspects of the evaluation or a repair/modification that are not captured by completion of the form(s) themselves.

7.1.4 Pass/Fail/Inconclusive

In order to assure uniformity in the manner in which cathodic protection evaluations are documented, it is necessary to “make a call” as prescribed in the EPD cathodic protection evaluation form found in Appendix K and L of this document. The terms “pass”, “fail” and “inconclusive” are utilized for this purpose. Therefore, it is necessary to clarify what these terms mean and their applicability as related to the evaluation of cathodic protection systems utilizing the EPD forms.

An evaluation conducted by an individual who is only qualified as a cathodic protection tester must result in one of three conclusions, pass, fail or inconclusive. If the person conducting the evaluation is qualified as a corrosion expert, the evaluation must result in either pass or fail.

**Pass** - The term “pass” as related to Section VI and VII (tester’s/corrosion expert’s evaluation) of the EPD galvanic/impressed current cathodic protection system evaluation forms is taken to mean that the structure-to-soil potential survey indicates all of the protected structures at a facility meet at least one of the three accepted criteria.

Pass as related to Section XIV and XVI (potential survey) of the respective EPD galvanic/impressed current cathodic protection system evaluation forms means that the individual structure that is being tested meets at least one of the accepted criteria.

**Fail** - The term “fail” as related to Section VI and VII (tester’s/corrosion expert’s evaluation) of the EPD galvanic/impressed current cathodic protection system evaluation forms means that the structure-to-soil potential survey indicates that there are one or more protected structures at a facility that do not meet any of the accepted criteria.

Fail as related to Section XIV and XVI (potential survey) of the respective EPD galvanic/impressed current cathodic protection system evaluation forms means that the individual structure that is being tested does not meet any of the accepted criteria.

**Inconclusive** - The term “inconclusive” as related to Section VI (tester’s evaluation) of the EPD galvanic/impressed current cathodic protection system evaluation forms means that a person qualified only as a tester is unable to conclusively evaluate the cathodic protection system and a corrosion expert must “make the call”. A cathodic protection tester must indicate inconclusive whenever one or more of the conditions listed in Section 7.2 of this document are applicable.

Inconclusive as related to Section XII and XV (continuity testing) of the respective EPD galvanic/impressed current cathodic protection system evaluation forms means that it cannot be determined if the individual structure that is being tested is either electrically isolated in the case of galvanic systems or is electrically continuous in the case of impressed current systems.

7.2 Corrosion Expert’s Evaluation

Because the EPD has allowed those individuals who may only have minimal training in the principles of cathodic protection to conduct testing of such systems, it must be recognized that there will be instances where the expertise of someone who is more qualified and better understands the principles involved will be necessary.
Some of the more obvious scenarios where a person with a level of expertise equivalent to a “corrosion expert” {as defined in Section 2.1 of this document} are necessary are given below. If any of the conditions given below are met, a corrosion expert must evaluate the survey results obtained by a tester and/or conduct further testing and complete Section VII of the EPD cathodic protection system evaluation form(s). If the structure-to-soil potential survey is conducted by a person who is qualified as a corrosion expert, completion of Section VII of the EPD form(s) is all that is necessary.

A corrosion expert is required to evaluate and/or conduct the survey when:

1. Supplemental anodes are added to a galvanic cathodic protection system and an accepted industry standard is not followed and/or properly documented.

2. Supplemental anodes or other changes in the construction of an impressed current system are made.

3. It is known or suspected that stray current may be affecting the protected structure.

4. The repair and/or addition of supplemental anodes to bare steel/galvanized piping that is galvanically protected is required (see Section 5.1.3).

Although not specifically listed above, it should be recognized that there might be additional circumstances that may arise that will require evaluation, and/or design by a corrosion expert.

7.3 What if the Evaluation Result is Fail?

It is important to properly notify the tank owner if an evaluation of the cathodic protection system fails. Necessary repairs should be accomplished within 60 days of receipt of the “failed” evaluation. The tank owner is responsible for ensuring that the cathodic protection system is maintained in a manner that will provide adequate corrosion protection to the UST system.

Therefore, a 60-day re-testing period is allowed whenever a fail is obtained during which no action is necessary to repair or modify the cathodic protection system. This applies only to those galvanic and impressed current systems that appear to be in good working condition. If there are obvious problems with a system or the system did not pass within the 60-day window, the tank owner must make any repairs and/or modifications that are necessary to achieve a pass. Repairs and/or modifications must be completed as soon as practical but no more than an additional 60 days should be allowed.

SECTION 8 – Handling Corrosion Protection System Outages

8.1 Background

Problems are being continuously documented with UST facilities for which the cathodic protection systems (galvanic and/or impressed current) are inoperative or have failed. The Federal Technical Standards in 40 CFR 280.31(a) requires that, “All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated
substances and are in contact with the ground.” Furthermore, Section 280.31(c) specifies, “UST systems with impressed current cathodic protection systems must also be inspected every 60 days to ensure that the equipment is running properly.”

These requirements establish that UST facilities that do not maintain operating impressed current cathodic protection systems or that do not repair and maintain galvanic systems are not in compliance with the rule. Violations of the requirements by impressed current systems, that are operated in noncompliance should typically be identified within 60 days due to the periodic rectifier inspection requirements. However, the circumstances of bankruptcy, fire, ownership changes, operator/owner error, and remodeling activities have resulted in impressed current cathodic protection systems that were inoperative for over 60 days.

Additionally, there is no regulatory guidance or industry standard for restoration of the impressed current system following a period of non-operation. Similarly, there is no guidance about how long the impressed current cathodic protection system on a UST system could be inoperative before the integrity of the USTs is compromised.

In the case of galvanic systems, there are industry standards for repair, but no guidance on how long a UST system should operate after a galvanic system failure and still be allowed to be repaired to the industry standard. Input has been obtained from reputable corrosion engineers/NACE Cathodic Protection Specialists and other state regulatory agencies to establish criteria for returning to service UST systems with impressed current cathodic protection systems that had a prolonged out of operation period. The project also addressed criteria for restoration of galvanic systems.

8.2 Discussion:

Responses to the question of “how long is too long” for an inoperative cathodic protection system were varied. However, the responses from the corrosion engineers/NACE Cathodic Protection Specialists had several common points. There was consensus that resulting impacts from non-operation vary from site to site and that the potential effect on the system must be assessed and sufficient repairs made before returning the UST system to service.

The responses recommended examining the length of time the cathodic protection system was inoperative, the potential amount of corrosion damage to the tank system(s) (i.e. metal thickness loss), and the reason for non-operation (turned off or system failure). Responses from the various state regulatory agencies indicate that few states have developed a policy or rule for dealing with this situation.

From the common elements of the responses, a multi-phase approach to restoring cathodic protection systems to service has been developed. The process is based on the amount of time the system has been inoperative and uses various levels of expertise and testing to validate system performance when the system has been restored.

According to the federal rule, “All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester…. a person who can
demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.” Tasks a cathodic protection tester would accomplish to restore an inoperative impressed current cathodic protection system include determining the cause of system failure and a resurvey of the system to validate system performance when power has been restored. The cathodic protection tester could also validate galvanic system performance after repairs had been made.

When the out of service condition has existed for an extended period or when system damage requires repairs, a “corrosion expert” will be required to complete the work. A corrosion expert is accredited or certified as being qualified by NACE or a registered professional engineer with certification or licensing that includes education and experience in corrosion control. Tasks for a corrosion expert include calculating appropriate replacement anode size and attachment points for a galvanic system, estimating the potential corrosion damage to the tank system(s), calculating current requirements for impressed current systems, and determining the reason for the inoperative condition in addition to re-commissioning an impressed current system. Re-commissioning includes testing the system for electrical continuity, energizing the rectifier, and making necessary adjustments so that the site complies with NACE RP 0285-95 criteria for effective corrosion control.

Precision testing of the UST system being protected will also be required at certain points along the timeline to insure the integrity of the tank and/or piping after an extended time without corrosion protection—the longer the CP system was inoperative, the greater the potential for corrosion damage. Similarly, the longer the CP system was inoperative, the more expertise needed to direct/conduct repair, startup, and testing of the system.

8.3 USTMP Policy:

The following procedures are intended to insure proper management of UST systems with inoperative or failed corrosion protection systems:

A. Impressed Current Cathodic Protection – Tanks Not Lined:

1.) CP System inoperative 120 days or less with no obvious damage to the CP system equipment:
   a.) Power restored.
   b.) CP system test by a qualified cathodic protection tester.

2.) CP System inoperative for 121 – 180 days with no obvious damage to the CP system equipment:
   a.) Precision test of the UST system.
   b.) Power restored.
   c.) CP system test by a qualified cathodic protection tester.

3.) CP System inoperative for 181 – 365 days or CP system equipment damaged or failed:
   a.) Corrosion expert repair/re-survey/re-commission the CP system.
   b.) Precision test of the UST system.

4.) CP System inoperative for more than 365 days and the UST system currently in use:
a.) Corrosion expert repair/re-survey/re-commission the CP system.
b.) Precision test of the UST system at 95% full.

5.) UST system has been out of service for 365 days or more and the CP system has been inoperative for 365 days or more, the UST system must be permanently closed (280.70).

B. Impressed Current Cathodic Protection, Tank Internally Lined within 10 Years:

1.) CP System inoperative 120 days or less with no obvious damage to the CP system equipment:
   a.) Power restored.
   b.) CP system test by a qualified cathodic protection tester.

2.) CP System inoperative for 121 – 180 days with no obvious damage to the CP system equipment:
   a.) Precision test of the UST system.
   b.) Power restored.
   c.) CP system test by a qualified cathodic protection tester.

3.) CP System inoperative for 181 – 365 days or CP system equipment damaged or failed:
   a.) Precision test of the UST system.
   b.) Corrosion expert re-survey and re-commission CP system.

4.) CP system inoperative more than 365 days:
   a.) Third party certified invasive inspection. If lining fails internal inspection, owner has to permanently close the tank.
   b.) Corrosion expert re-survey and re-commission CP system.
   c.) Precision test of the UST system.

C. Impressed Current Cathodic Protection, Tank Internally Lined Over 10 Years

1.) CP system inoperative 120-365 days with no damage to the CP system equipment.
   a.) Third party certified invasive inspection. If lining fails internal inspection, owner has option of repair or permanent closure.
   b.) Restore power to the CP system.
   c.) CP system test by a qualified cathodic protection tester.
   d.) Precision test of UST system prior to resuming operation.

2.) CP system inoperative more than 365 days or CP system equipment failed or damaged.
   a.) Third party certified invasive inspection. If lining fails internal inspection, owner has to permanently close the tank.
   b.) Corrosion expert direct repair/re-survey/re-commissioning of impressed current system.
   c.) Precision test of UST system prior to resuming operation.
APPENDIX A - INDUSTRY CODES/STANDARDS, REFERENCES and REGULATIONS

INDUSTRY CODES/STANDARDS


National Association of Corrosion Engineers (NACE International) RP0169-96 “Control of External Corrosion on Underground or Submerged Metallic Piping Systems”.

National Association of Corrosion Engineers (NACE International) TM0101-2001 “Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Tank Systems”.

National Association of Corrosion Engineers (NACE International) RP0285-2002 “Corrosion Control of Underground Storage Tank Systems by Cathodic Protection”.


Steel Tank Institute (STI) R892-91 “Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems”.

Steel Tank Institute (STI) R972-01 “Recommended Practice for the Installation of Supplemental Anodes for sti-P3® UST’s”.

REFERENCES

Department of Defense MIL-HDBK-1136 “Maintenance and Operation of Cathodic Protection Systems”.

Department of Defense MIL-HDBK-1136/1 “Cathodic Protection Field Testing”.

REGULATIONS


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APPENDIX B – GLOSSARY

100 mV POLARIZATION – One of the three criteria that are commonly accepted as indicating adequate cathodic protection has been achieved. It is typically measured by interrupting the protective current on an impressed current system. When the current is interrupted, an “instant off” potential is recorded and the structure under cathodic protection is then allowed to depolarize until a change of at least 100 mV in potential is observed. Not more than 24 hours should be allowed for the depolarization to occur when conducting this test.

850 ON – One of the three criteria that are commonly accepted as indicating adequate cathodic protection has been achieved. It is measured with the protective current applied and is typically the only measurement possible with galvanic systems since the anodes cannot be disconnected. This criterion is not applicable to impressed current systems since a large portion of the “on” measurement can be comprised of a voltage drop when the protective current is applied.

850 OFF – One of the three criteria that are commonly accepted as indicating adequate cathodic protection has been achieved. It is measured with the protective current interrupted (either the power is cut off to the rectifier or the sacrificial anodes are disconnected). This criterion is considered by most to be the best indicator that adequate cathodic protection has been provided.

ANODE – The electrode of an electrochemical cell where oxidation (corrosion) occurs. With respect to cathodic protection, it can be thought of as the place where electrons leave the surface of a metal. Common galvanic anodes are zinc and magnesium.

AMPERE (AMP) – The basic unit of current flow in an electric circuit. Amperage can be thought of as “gallons per minute” in a water system.

AS BUILT DRAWINGS – Drawings that show how a system was actually installed in the field. Sometimes, unforeseen factors prevent the installation of a system as it was intended in the design drawings and this is why it is important to have detailed and accurate “as built” drawings.

ATTENUATION - The protective effects of cathodic protection current diminish as you move away from the source of the protective current. To illustrate this, on an impressed current system where the ground bed is installed only on one side of the tank bed, the end of the tanks away from the ground bed will receive less protective current than the side of the tanks closest to the anodes. Attenuation of protective current applies to galvanic systems as well.

CATHODE – The electrode of an electrochemical cell where reduction (and no corrosion) occurs. With respect to cathodic protection, it can be thought of as the place where current enters the surface of a metal.

CATHODIC PROTECTION – The technique of causing the entire surface of a metallic structure to become a cathode with respect to its external environment (soil). This is accomplished by supplying an electric current sufficient to overcome the tendency of naturally occurring electrical currents to leave the metallic structure.

CATHODIC PROTECTION EVALUATION – The interpretation of whether or not a cathodic protection system is providing sufficient corrosion protection. An evaluation incorporates all cathodic protection testing, surveys, rectifier operation/output measurements, consideration of voltage drops, condition of dielectric coatings, continuity, bond integrity, circuit integrity and any other factors or site specific conditions that may have an influence on the operation and effectiveness of a cathodic protection system.

CATHODIC PROTECTION SURVEY – Refers to the process whereby all of the structure-to-soil measurements necessary to contribute to the final evaluation of a system are obtained.

CATHODIC PROTECTION TEST – Refers to the process whereby only a single structure-to-soil measurement is obtained.

CONTINUITY – As related to cathodic protection, continuity means that two metallic structures are electrically continuous. With impressed current systems all protected structures must be continuous and this is normally accomplished through the use of wires referred to as continuity bonds.

CORROSION – The deterioration of a material (usually a metal) caused by an electro-chemical reaction with its environment. Corrosion of metals involves the flow of electrons (current) between an anode and a cathode. Corrosion will occur where the electrons leave the surface of a metal.

CURRENT TEST – A method of temporarily creating an impressed current cathodic protection system on a galvanically protected structure so that it can be determined how much protective current is necessary in order to achieve adequate cathodic protection. This is normally done by connecting a 12-volt battery to the structure to be tested and to a temporary anode.

DIELECTRIC MATERIAL – A coating that does not conduct electricity. Various coatings are utilized and some examples are the “fusion-bonded epoxy” found on factory coated steel piping and coal tar epoxies commonly found on sli-P3® tanks.
DISTRIBUTED GROUND BED – Used to describe an anode configuration in which the anodes are more or less equally distributed around the metallic structure that is intended to be protected.

ELECTROLYTE – As related to UST cathodic protection systems, electrolyte refers to the soil and/or water surrounding the metallic structure that is under cathodic protection.

ELECTROMAGNETIC INTERFERENCE – As related to corrosion protection, it is an external electrical current that causes an error in a voltmeter measurement. Sources are commonly associated with high voltage AC power lines, radio frequency transmitters and airport radar systems.

FAIL – See Section 7.1.4.

FIELD INSTALLED – Refers to any impressed current system or sacrificial anode cathodic protection system that is installed at a pre-existing UST location or when sacrificial anodes are installed on new metallic pipe in the field. Any cathodic protection system except for those associated with unmodified sti-P3® tanks may be thought of as “field installed”.

FINAL POTENTIAL (VOLTAGE) – The voltage that is observed at the end of the depolarization period associated with the measurement of “100 mV polarization”. The final voltage must be at least 100 mV less than the “instant off” voltage in order to meet the 100 mV polarization criterion for adequate cathodic protection.

“FIXED CELL – MOVING GROUND” – A technique for measuring continuity in a UST system whereby the reference electrode is placed in the soil at a location remote from the UST system and is left undisturbed (fixed cell) while potentials are measured on various parts of the UST system (moving ground).

GALVANIC (SACRIFICIAL) ANODE – A metal of high electro-potential (see Appendix J) that is used to protect another metal. Zinc and magnesium are two metals that are commonly utilized in the protection of UST systems.

GALVANIC CATHODIC PROTECTION – A cathodic protection system that utilizes sacrificial anodes to provide the protective current. The anode will corrode (sacrifice itself) instead of the metal it is intended to protect. The anode provides a protective current (reverses the electron flow) because it has a higher electrochemical potential than the metal it is intended to protect. Galvanic systems are normally limited to the protection of well coated structures because they have a very low driving potential.

IMPRESSED CURRENT ANODE – A metal that is utilized to deliver the current from a rectifier to the soil in order to protect the intended metallic structure. Impressed current anodes are commonly made of graphite, high silicon cast iron and “mixed-metal oxides” because the metal must be highly resistant to corrosion in order to have an acceptably long life span.

IMPRESSED CURRENT CATHODIC PROTECTION – A cathodic protection system in which the protective current is supplied by an external source (rectifier). The level of protective current that is delivered to the structure is adjustable and is much higher than that associated with galvanic anodes. For this reason, impressed current systems are utilized on those UST systems that are uncoated or require a high amount of protective current.

INCONCLUSIVE - See Section 7.1.4.

INSTANT OFF POTENTIAL (VOLTAGE) – The voltage that is observed momentarily after the power to an impressed current cathodic protection system is interrupted. It is used as the base line from which to begin calculating a “100 mV polarization”. The second number that appears after the current is interrupted is considered the proper value to represent the instant off potential.

ISOLATION – As related to cathodic protection, isolation means that two metallic structures are electrically discontinuous. With galvanic systems a protected structure must be electrically isolated and this is normally accomplished through the use of nylon bushings and dielectric unions.

LOCAL POTENTIAL (VOLTAGE) – The structure-to-soil potential of a metallic structure that is measured with the reference electrode placed in the soil immediately over the protected structure.

NACE INTERNATIONAL – Acronym for National Association of Corrosion Engineers International.

NATIVE POTENTIAL (VOLTAGE) – The structure-to-soil potential of a metallic structure exhibited before any cathodic protection is applied.

ON POTENTIAL (VOLTAGE) – The structure-to-soil potential of a metallic structure that is measured with the protective current applied.
**PARALLEL CIRCUIT** – Can be caused by the person conducting the test making contact with a metallic part of the test leads, or reference electrode when conducting structure-to-soil potential measurements. The creation of parallel paths must be avoided since inadvertent errors can be introduced.

**PASS** – See Section 7.1.4

**PASSIVATION** - When a metal undergoes passivation, an oxidation layer forms on the surface of the metal due to corrosion and can be defined as the loss of chemical reactivity. The oxidation layer acts as a coating and prevents or slows further corrosion of the metallic object since oxygen is prevented from reaching the underlying metal.

**PHOTOVOLTAIC EFFECT** – Sunlight striking the electrolyte solution in a copper-copper sulfate reference electrode can cause an error in the observed structure-to-soil potential and must be avoided.

**POLARIZATION** – The change in the structure-to-soil potential of a metallic structure due to the application of a protective current. In this guidance document, polarization is considered to mean cathodic polarization - that is, the potential of the metal is shifted in the negative direction.

**POLARIZED POTENTIAL** – The structure-to-soil potential of a metallic structure that is observed after the protective current is applied and sufficient time has elapsed for the structure to completely polarize.

**RAISED EARTH** – Term used to describe the high voltage gradient found in the soil around an active impressed current or sacrificial anode. Placement of the reference electrode in proximity to an active anode will cause an abnormally high (more negative) structure-to-soil potential than would be present if the anode were not in close proximity.

**RECTIFIER** – A device utilized in impressed current systems that changes AC power to DC power.

**REFERENCE ELECTRODE** – Also referred to as a reference cell or a half-cell. A device whose electrochemical potential is constant that is used to measure the structure-to-soil potential of buried metallic structures. The potential that is observed on the buried metallic structure is relative to the potential of the reference electrode. The potential of a buried metallic structure would be zero if it were of the exact same composition as the reference electrode if all sources of measurement error were eliminated.

**RESISTANCE** – A measurement of the tendency of a substance to inhibit the flow of electrical current. Resistance in UST cathodic protection systems is generally meant to refer to the electrical properties of the backfill materials (soil).

**REMOTE EARTH** – The structure-to-soil potential of a metallic structure that is measured with the reference electrode placed in the soil at a point well away (remote) from the protected structure. Remote earth is generally thought of as at least 25 feet and not more than 100 feet away. Remote earth is established when the observed structure-to-soil potential does not significantly change no matter how far away the reference electrode is from the protected structure.

**SACRIFICIAL ANODE** – See Galvanic Anode.

**SHIELDING** – A structure that prevents or diverts an electrical current from reaching the desired location. Normally thought of as something that stops a reference electrode from being able to “see” the metallic structure on which you are attempting to measure a structure-to-soil potential.

**sti-P3® TANK** – A steel tank manufactured to the standard created by the Steel Tank Institute that comes from the factory with a “pre-engineered” cathodic protection system. The “P3” means that the steel tank is protected in three ways: 1) A protective dielectric coating is factory applied; 2) Sacrificial anodes (normally zinc) are factory installed on the tanks and 3) dielectric bushings are installed to facilitate electrical isolation of the tank.

**STRAY CURRENT** – An electrical current that travels along an unintended path. Normally thought of as a current from some external source that enters a protected metallic structure at one point that then exits at another point. The point where the stray current exits the protected structure can be subject to intense corrosion and failure may rapidly occur.

**STRUCTURE-TO-SOIL POTENTIAL** – Also known as “pipe-to-soil potential” or “structure-to-electrolyte potential” – The difference in the potential of the surface of a buried metallic structure and the electrolyte (soil) that surrounds it with respect to a reference electrode in contact with the electrolyte (soil). Can be thought of as the voltage difference between a buried metallic structure and the soil that it is buried in.

**VOLTAGE** – The basic unit of force in an electric circuit. Voltage can be thought of as “pounds per square inch pressure” in a water system.

**VOLTAGE (IR) DROP** – With respect to UST cathodic protection systems, voltage drops may be thought of as any voltage that causes an error in the observed structure-to-soil potential. Whenever a current is flowing through a resistance, a voltage drop is present and is part of the voltage measurement obtained.
Listed in this table are some generalized observations that can be applied to the interpretation of structure-to-soil potentials. Depending on the specific site conditions and other factors, differing interpretations are possible.

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<thead>
<tr>
<th>VOLTAGE (mV) “ON”</th>
<th>GENERALIZED INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POSITIVE</strong></td>
<td>Test leads are reversed (negative should be connected to the reference electrode and the positive should contact the structure you are testing in order to observe negative voltages). Could indicate that stray current is affecting the structure (consult with a corrosion expert).</td>
</tr>
<tr>
<td>0 to -100</td>
<td>Usually occurs when you are attempting to measure a structure that has a test lead that is not continuous with the tank. Because you are measuring the potential of a copper wire with reference to the copper-copper sulfate half-cell, the potential is zero or very near it. Disregard test lead and make direct contact with the protected structure.</td>
</tr>
<tr>
<td>-101 to -399</td>
<td>Try again – A reading in this range is not normally seen on an underground steel structure. Could indicate that steel structure is electrically connected to a significant amount of a more noble metal (e.g. copper). Very corroded low carbon steel may also be indicated.</td>
</tr>
<tr>
<td>-400 to -599</td>
<td>Steel structure does not meet regulatory requirements. Usually means that the steel structure has no cathodic protection. Existing sacrificial anodes could be completely “burned-out” or were never there to begin with.</td>
</tr>
<tr>
<td>-600 to -849</td>
<td>Steel structure does not meet regulatory requirements. Usually means that the steel structure has anodes but for whatever reason, something is causing a low reading that may indicate adequate cathodic protection has not been provided. The anodes may be trying to protect a structure that requires more current than they can produce. The protected steel structure may not be electrically isolated from all other metallic structures (conduct continuity testing). The environmental conditions may not be favorable at the time you are attempting to obtain the reading. Retest during the next 90 days to see if an acceptable reading can be obtained.</td>
</tr>
<tr>
<td>-850 to -1100</td>
<td>Steel structure protected by zinc anodes meets regulatory requirements and cathodic protection is judged to be adequate. Readings in this range are what you would expect on most sti-P3® tanks that have not been modified and are reading “good” since nearly all come from the manufacturer with zinc anodes.</td>
</tr>
<tr>
<td>-850 to -1600</td>
<td>Steel structure protected by magnesium anodes meets regulatory requirements and cathodic protection is judged to be adequate. Readings in this range are what you would typically expect on steel piping that is reading “good” since magnesium anodes are generally installed on piping. You may also find readings up to -1600 mV on a sti-P3® tank that has been retrofitted or was supplied at the factory with magnesium anodes.</td>
</tr>
<tr>
<td><strong>MORE NEGATIVE THAN -1100 WITH ZINC ANODES ONLY</strong></td>
<td>Voltages more negative than -1100 mV are theoretically not possible if there are only zinc anodes installed. If you have a reading more negative than -1100 mV and you are sure magnesium anodes are not present, you should suspect that stray current may be affecting the cathodically protected structure. A corrosion expert should be contacted immediately since stray current can cause a corrosion failure in a relatively short period of time.</td>
</tr>
<tr>
<td><strong>MORE NEGATIVE THAN -1600</strong></td>
<td>Voltages more negative than -1600 mV are theoretically not possible with any sacrificial anode cathodic protection system. If you have a reading more negative than -1600 mV on any galvanic cathodic protection system, you should suspect that stray current may be affecting the cathodically protected structure. A corrosion expert should be contacted immediately since stray current can cause a corrosion failure in a relatively short period of time.</td>
</tr>
<tr>
<td>VARIABLE</td>
<td>If the voltmeter readings vary you should suspect that stray current may be affecting the cathodically protected structure. Sometimes, the stray current can cause a pattern to develop that is recognizable. An example would be the on/off pattern of a nearby DC powered welding operation. A corrosion expert should be contacted immediately since stray current can cause a corrosion failure in a relatively short period of time.</td>
</tr>
<tr>
<td>Rapidly fluctuating</td>
<td>If the voltmeter will not stabilize, it usually means that there is a high electrical resistance somewhere. Check all lead wires and connections and make sure that you are making a solid and clean metal to metal connection. Soil where the reference electrode is placed could be too dry. Add water to the soil or wait until a heavy rain occurs and try again. Petroleum contaminated soils may cause a high contact resistance. The tip of the reference electrode may need to be cleaned or replaced.</td>
</tr>
</tbody>
</table>
## APPENDIX D

### GENERALIZED INTERPRETATION OF STRUCTURE-TO-SOIL POTENTIAL MEASUREMENTS (VOLTAGES) OBTAINED ON IMPRESSED CURRENT CATHODIC PROTECTION SYSTEMS

Listed in this table are some generalized observations that can be applied to the interpretation of structure-to-soil potentials. Depending on the specific site conditions and other factors, differing interpretations are possible.

<table>
<thead>
<tr>
<th>VOLTAGE (mV)</th>
<th>GENERALIZED INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANY POSITIVE VOLTAGE OR 0 TO -100 “ON” or “OFF”</td>
<td>Can indicate that the structure you are attempting to measure is not bonded to the impressed current system (conduct continuity testing). Stray current could be affecting the protected structure (consult a corrosion expert). Positive and negative wires could be reversed (negative must be to protected structure and positive to anode). Test leads are reversed (positive lead should contact structure and negative lead should be connected to reference electrode). Could indicate that you are measuring the potential of a copper wire.</td>
</tr>
<tr>
<td>-101 to -399 “ON” or “OFF”</td>
<td>Try again – A reading in this range is not normally seen on an underground steel structure. Could indicate that steel structure is electrically connected to a significant amount of a more noble metal (e.g. copper). Very corroded low carbon steel may also be indicated.</td>
</tr>
<tr>
<td>-400 to -599 “ON” or “OFF”</td>
<td>Usually means that the steel structure has no cathodic protection. Existing impressed current anodes could be completely “burned-out”. Continuity of anode lead wires (positive circuit) could be broken. Negative bonds on the protected structures may be broken or non-existent.</td>
</tr>
<tr>
<td>-600 to -849 “ON” or “OFF”</td>
<td>Usually means that the steel structure has some protection but for whatever reason, something is causing a low reading that may indicate adequate cathodic protection has not been provided. The impressed current system may be trying to protect a structure that requires more current than it can produce (rectifier output too small). The impressed current system may not be capable of effectively distributing the required current to all parts of the structure you are trying to protect (not enough anodes, anodes improperly installed, soil resistivity too high). The steel structure that is intended to be protected may not be electrically continuous with the other metallic structures under protection (conduct continuity testing). The environmental conditions may not be favorable at the time you are attempting to obtain the reading. Retest during the next 90 days.</td>
</tr>
<tr>
<td>-850 or MORE NEGATIVE “ON”</td>
<td>Steel structure may or may not be adequately protected. Usually indicates that the impressed current system is providing current to the structure although the reading normally includes a large voltage (IR) drop. Because the flow of current through the soil causes a voltage drop, the on potential cannot be used to indicate that adequate cathodic protection has been provided. Instant off potentials must be utilized to demonstrate cathodic protection.</td>
</tr>
<tr>
<td>-850 or MORE NEGATIVE “OFF”</td>
<td>Steel structure protected by impressed current system meets regulatory requirements and cathodic protection is judged to be adequate. A potential measurement of -850 mV or more negative with the protective current temporarily interrupted (850 off) is considered to be the best indicator that adequate cathodic protection has been provided.</td>
</tr>
<tr>
<td>MORE NEGATIVE THAN -1220 mV “OFF”</td>
<td>Instant off potentials more negative than -1220 mV are theoretically not possible. If you observe an instant off potential more negative than -1220 mV, you should suspect stray current is affecting the protected structure. Consult a corrosion expert immediately since stray current can cause a rapid corrosion failure of the protected structure.</td>
</tr>
<tr>
<td>MORE NEGATIVE THAN -2000 “ON”</td>
<td>Usually means that a high resistance exists in the ground bed that is causing a large voltage drop. This condition is normally evident by checking the rectifier output since the voltage is very high but the amperage is relatively low. However, you should be cautious when abnormally high voltages are observed since this can have a detrimental effect on cathodically protected structures or the anodes may be rapidly depleted. Stray current may also be generated that can adversely affect other buried metallic structures such as water lines and other utilities. Consult a corrosion expert whenever it is suspected that too much voltage is being generated.</td>
</tr>
<tr>
<td>VARIABLE “ON” or “OFF”</td>
<td>If the voltmeter readings vary, you should suspect that stray current may be affecting the cathodically protected structure. Sometimes, the stray current can cause a pattern to develop that is recognizable. An example would be the on/off pattern of a nearby DC powered welding operation. A corrosion expert should be contacted immediately since stray current can cause a corrosion failure in a relatively short period of time.</td>
</tr>
<tr>
<td>RAPIDLY FLUCTUATING “ON” or “OFF”</td>
<td>If the voltmeter will not stabilize, it usually means that there is a high electrical resistance somewhere. Check all lead wires and connections and make sure that you are making a solid and clean metal to metal connection. Soil where the reference electrode is placed could be too dry. Add water to the soil or wait until a heavy rain occurs and try again. Petroleum contaminated soils may cause a high contact resistance. The tip of the reference electrode may need to be cleaned or replaced.</td>
</tr>
</tbody>
</table>
CONTINUITY TESTING PROCEDURE FOR GALVANIC/IMPRESSED CURRENT CATHODIC PROTECTION SYSTEMS

### Fixed Cell – Moving Ground Continuity Test Procedure

1. Place reference electrode in contact with the soil at a location remote (25 – 100 feet) from all cathodically protected structures. You must ensure that the remote reference electrode placement is not in proximity to any other cathodic protection systems (e.g. natural gas pipelines) or directly over any buried metallic structure in order to minimize the chances of unwanted interference.

2. Be sure that reference electrode is firmly placed in moist soil and is not in contact with any vegetation.

3. Connect reference electrode to the negative terminal of voltmeter using a long spool of suitable wire.

4. Connect positive lead wire to voltmeter. This lead wire should have a sharp test prod (scratch awl or similar) in order to assure good contact with the metallic structures under test.

5. Place voltmeter on 2 volt DC scale.

6. Contact each buried metallic structure with the positive test lead without moving the reference electrode. Typical items that would be tested during a continuity survey include: all tanks, tank risers, submersible pump heads, piping, flex connectors/swing joints, vent lines, electrical conduits, dispensers, utilities, etc.

7. Obtain voltage for each component and record on EPD continuity testing form.

8. Voltages for each component that is tested must be obtained as quickly as possible since the observed potential can change over time. This is because the conditions in the soil where the reference electrode is placed can change over a relatively short period of time.

### Fixed Cell – Moving Ground Data Interpretation

- If two or more structures exhibit potentials that vary by 8 mV or less, the structures are considered to be electrically continuous.

- If two or more structures exhibit potentials that vary by 12 mV or greater, the structures are considered to be electrically isolated.

- If two or more structures exhibit potentials that vary by more than 8 mV but less than 12 mV, the result is inconclusive and further testing is necessary.

### Point-to-Point Continuity Test Procedure

1. Turn off power to rectifier if testing an impressed current system. This is necessary to obtain accurate results.

2. Connect test leads to voltmeter. Both test leads should have a sharp test prod or suitable clip lead in order to make good contact with tested structures.

3. Place voltmeter on 2 volt (or lower) DC scale.

4. Connect one voltmeter test lead to one of the structures for which continuity is being tested and connect the other voltmeter test lead to the other structure that is being tested.

5. Record voltages observed on each of the two structures that are being compared and record on EPD continuity testing form.

Note: Testing with this method does not require a reference electrode. The two structures of interest are simply connected in parallel with the voltmeter and a determination made as to whether or not any potential difference exists between them.

### Point-to-Point Data Interpretation

- If the voltage difference observed between the two structures is 1 mV or less, this indicates that the two structures are considered to be electrically continuous with each other.

- If the voltage difference observed between the two structures is 10 mV or greater, this indicates that the two structures are considered to be electrically isolated from each other.

- If the voltage difference observed between the two structures is greater than 1 mV but less than 10 mV, the result is inconclusive and further testing beyond the scope of this document is necessary.
**APPENDIX F**

<table>
<thead>
<tr>
<th>STRUCTURE-TO-SOIL TEST PROCEDURE FOR GALVANIC CATHODIC PROTECTION SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place voltmeter on 2 volt DC scale.</td>
</tr>
<tr>
<td>2. Connect voltmeter negative lead to reference electrode.</td>
</tr>
<tr>
<td>3. Place reference electrode in clean soil directly over the structure that is being tested to obtain local potential. At least one local potential is required for each tank - the preferred test point is at the approximate midpoint along the centerline of the tank. Piping may require measurement at each end of the pipe and at the middle depending upon anode configuration (see Section 6.10.2 of EPD guidance document).</td>
</tr>
<tr>
<td>- The reference electrode may not be placed on concrete or other paving materials.</td>
</tr>
<tr>
<td>- Ensure that the reference electrode is placed in a vertical position (tip down).</td>
</tr>
<tr>
<td>- Ensure that the soil where the reference electrode is placed is moist – add tap water if necessary.</td>
</tr>
<tr>
<td>- Ensure that the soil where the reference electrode is placed is not contaminated with hydrocarbons.</td>
</tr>
<tr>
<td>- Ensure that the reference electrode window is not exposed to direct sunlight.</td>
</tr>
<tr>
<td>4. Connect voltmeter positive lead to structure that is to be tested.</td>
</tr>
<tr>
<td>- If a test lead wire is utilized to make contact with the tested structure you must ensure that continuity exists between the test lead wire and the structure. This may be accomplished by conducting a point-to-point continuity test as described in Appendix E.</td>
</tr>
<tr>
<td>- Ensure that good metal-to-metal contact is made between the test lead clip/probe and the structure.</td>
</tr>
<tr>
<td>- Ensure that no corrosion exists where the test lead makes contact with the structure.</td>
</tr>
<tr>
<td>- Ensure that your body does not come into contact with the electrical connections.</td>
</tr>
<tr>
<td>- Ensure that test leads are not submerged in any standing water.</td>
</tr>
<tr>
<td>- Ensure that test lead insulation is in good condition.</td>
</tr>
<tr>
<td>- sti-P3® tanks</td>
</tr>
<tr>
<td>- If the test lead wire is not continuous or is not present, contact with the inside bottom of the tank is necessary. This may be accomplished by connecting the voltmeter lead wire to a test prod mounted onto the bottom of a wooden gauging stick and lowering the stick into the tank fill riser. Be sure that firm contact is made with the tank bottom. Care should be taken to ensure that any drop tube that may be installed in the tank does not prohibit contact with the tank bottom. If a metallic probe bar is utilized to contact the tank bottom, ensure that the probe bar does not contact the fill riser or any other metallic component of the UST system.</td>
</tr>
<tr>
<td>- If a sti-P3® tank is equipped with a PP4® test station, the PP4® test station is disregarded and local potentials must be obtained with a portable reference electrode placed in the soil as described in Section 6.10.1 of the EPD guidance document.</td>
</tr>
<tr>
<td>5. Obtain voltage and record in the local column on the EPD galvanic survey form.</td>
</tr>
<tr>
<td>6. Obtain voltage and record in the remote column on the EPD galvanic cathodic protection form. (Note: if the fixed cell-moving ground method was used to conduct continuity survey, the potential obtained during the continuity survey for each corresponding structure may be transposed to the appropriate column.)</td>
</tr>
</tbody>
</table>

**Data Interpretation** (for a more complete discussion refer to Appendix C of this guidance document)

- If the local potentials are −850 mV or more negative, the −850 mV criterion is satisfied and it is judged that adequate cathodic protection has been provided.
- If the local potentials are more positive than −850 mV the test result is failed and further testing and/or repairs are necessary.
STRUCTURE-TO-SOIL TEST PROCEDURE FOR IMPRESSED CURRENT CATHODIC PROTECTION SYSTEMS

1. Inspect rectifier for proper operation and document necessary information. This includes measurement of output voltage/amperage with a multimeter (do not rely on rectifier gauges) and measurement of individual anode circuits (if installation allows such). Record all necessary information under Section XI and XII of EPD impressed current form.

2. Place voltmeter on 2 volt DC scale.

3. Connect voltmeter negative lead to reference electrode.

4. Place reference electrode in clean soil directly over the structure that is being tested. At least one measurement must be taken for each tank - the preferred test point is usually the center of the tank. Piping normally requires measurement at each end of the pipe (see Section 6.10.3 and 6.10.4 of EPD guidance document for further explanation).
   - Ensure that the reference electrode is placed in a vertical position (tip down).
   - Ensure that the soil where the reference electrode is placed is moist – add tap water if necessary.
   - Ensure that the soil where the reference electrode is placed is not contaminated with hydrocarbons.
   - Ensure that the reference electrode window is not exposed to direct sunlight.

5. Connect voltmeter positive lead to structure that is to be tested.
   - Ensure that good metal-to-metal contact is made between the test lead clip/probe and the structure.
   - Ensure that no corrosion exists where the test lead makes contact with the structure.
   - Ensure that your body does not come into contact with the electrical connections.
   - Ensure that test leads are not submerged in any standing water.
   - Ensure that test lead insulation is in good condition.

6. Obtain voltage potential with the protective current applied and record in the on column on the EPD impressed current cathodic protection evaluation form.

7. Without moving reference electrode from the position it was in during step 6 above, obtain voltage potential with the protective current temporarily interrupted and record in the instant off column on the impressed current cathodic protection form.
   - The instant off potential is the 2nd value that is observed on a digital voltmeter the instant the power is interrupted. The first number that appears immediately after power interruption must be disregarded. After the second number appears, a rapid decay (depolarization) of the structure will normally occur.
   - In order to obtain instant off potentials, a current interrupter or a 2nd person is necessary. If a current interrupter is not available, have the second person throw the power switch at the rectifier off for 3 seconds and then back on for 15 seconds. Repeat this procedure until you are sure an accurate instant off reading has been obtained.

8. Conduct 100 mV polarization decay if you are unable to obtain an instant off potential of -850 mV or more negative in step 7 above. (Note: While not a requirement of this guidance document, consideration should be given to adjusting the rectifier output until an instant off potential of -850 mV is achieved or the maximum safe output is reached.) It is only necessary to conduct 100 mV polarization where the lowest (most positive) instant off potential is observed on the UST system.
   - 100 mV of polarization is determined by leaving the power interrupted on the structure until a change of at least 100 mV in the structure-to-soil potential is observed. In calculating the 100 mV decay, the instant off potential obtained in Step 7 above is utilized as the starting point (e.g. if instant off = -800 mV, power must be left off until decayed to -700 mV).
   - Calculate voltage change by subtracting final (or ending) voltage from the instant off voltage and record these values in the appropriate columns on the EPD impressed current cathodic protection evaluation form.

Data Interpretation (for a more complete discussion refer to Appendix D of this guidance document)
   - If the instant off potential is -850 mV or more negative, the 850 off criterion is satisfied and it is judged that adequate cathodic protection has been provided.
   - If the instant off potential is more positive than -850 mV, the tank may or may not be adequately protected and a 100 mV polarization test is necessary.
   - If the structure exhibits more than 100 mV polarization, the 100 mV polarization criterion is met and it is judged that adequate cathodic protection has been provided.
   - If you are unable to meet either the 850 instant off or the 100 mV polarization criteria, it is judged that adequate cathodic protection has not been provided and repairs/modification are indicated. Alternatively, a person qualified as a corrosion expert could evaluate/conduct the survey and determine that cathodic protection is adequate based on their interpretation.
## CHECKLIST FOR GALVANIC CATHODIC PROTECTION SYSTEM SURVEY

- Identified UST owner, UST facility, CP tester, tester's qualifications and reason for survey (complete Sections I – V of EPD galvanic cathodic protection form).
- Described UST and cathodic protection system (complete Section X of EPD galvanic cathodic protection form).
- Constructed site drawing depicting all pertinent components of the UST and cathodic protection systems at the facility (complete Section XII of EPD galvanic cathodic protection form).
- Reviewed any previous cathodic protection design/repair/testing data that may be available.
- Ensured soil access was available directly over each cathodically protected component at the facility (see Section 6.9.2 of EPD cathodic protection guidance document for discussion).
- Conducted continuity testing of all pertinent metallic components at the UST facility by the fixed remote – moving ground. (complete Section XII of EPD galvanic cathodic protection form).
- Obtained local structure-to-soil potentials on every cathodically protected structure with the reference electrode placed in the soil directly over the structure under test (complete Section XIV of EPD galvanic cathodic protection form).
- Obtained remote potentials or transposed remote potentials obtained during continuity testing for every cathodically protected structure to appropriate column in Section XIV of EPD galvanic cathodic protection form.
- Indicated location (by code or other means) of reference electrode placement on site drawing for each structure-to-soil potential that was obtained during the survey.
- Described any repairs and/or modifications that were made to the cathodic protection system (complete Section XI of EPD galvanic cathodic protection form).
- Indicated whether or not each protected structure met the –850mV on criteria for the local reference electrode placement by indicating pass/fail in the appropriate column in Section XVI of the EPD galvanic cathodic protection form.
- If only qualified as a tester - indicated the results of the evaluation by marking either pass or fail in Section VI of EPD galvanic cathodic protection form.
- If only qualified as a tester - marked inconclusive if any of the conditions found in Section 7.2 of EPD cathodic protection guidance document were applicable to survey.
- Indicated criteria that were applied to the evaluation by completion of Section VIII of the EPD galvanic cathodic protection form.
- Indicated action required as a result of the survey by marking either none, retest or repair & retest in Section IX of EPD galvanic cathodic protection form.
- Provided UST owner with any other type(s) of documentation that may be necessary in order to adequately describe the cathodic protection evaluation including the operating status and any repairs or recommendations and attached same to the EPD galvanic cathodic protection form.
## Checklist for Impressed Current Cathodic Protection System Survey

- Identified UST owner, UST facility, CP tester, tester's qualifications and reason for survey (complete Sections I – V of EPD impressed current cathodic protection form).
- Described UST system and type of cathodic protection (complete Section X of EPD impressed current cathodic protection form).
- Constructed site drawing depicting all pertinent components of the UST and cathodic protection systems at the facility (complete Section XIV of EPD impressed current cathodic protection form).
- Reviewed any previous cathodic protection design/repair/testing data that may be available.
- Checked rectifier for proper operation and measured output voltage/amperage with portable multimeter and indicated all other pertinent information (complete Section XI of EPD impressed current form).
- Measured current output of all positive and negative circuits if the system was designed to allow for such (complete Section XII of the EPD impressed current cathodic protection form).
- Ensured soil access was available directly over each cathodically protected component at the facility.
- Conducted continuity testing of all pertinent metallic components at the UST facility by the fixed remote – moving ground method (complete Section XV of EPD impressed current form).
- Recorded native structure-to-soil potentials in appropriate column in Section XVI of EPD impressed current cathodic protection form if this data was available or the system had been down long enough for complete depolarization to occur.
- Obtained structure-to-soil potential on every cathodically protected structure with the reference electrode placed in the soil directly over the structure under test with the protective current applied (on) and recorded voltages in appropriate column in Section XVI of EPD impressed current cathodic protection form.
- Obtained structure-to-soil potential on every cathodically protected structure without moving reference electrode from placement utilized to obtain on potential with the protective current temporarily interrupted (instant off) and recorded voltages in appropriate column in Section XVI of EPD impressed current form.
- Conducted 100 mV polarization test if all protected structures did not meet the -850 mV instant off criterion.
- Obtaining a 100 mV decay is only required on that component of the UST system that displays the lowest (most positive) instant off potential in order to demonstrate the criterion has been satisfied.
- Indicated location (by code or other means) of reference electrode placement on site drawing for each structure-to-soil potential that was obtained.
- Described any repairs and/or modifications that were made to the cathodic protection system (complete Section XIII of EPD impressed current cathodic protection form).
- Indicated whether or not each protected structure met the -850mV instant off criteria and/or the 100 mV polarization criteria by indicating pass/fail in the appropriate column in Section XVI of the EPD form.
- If only qualified as a tester - indicated the results of the evaluation by marking either pass, fail or inconclusive in Section VI of EPD impressed current cathodic protection form.
- If only qualified as a tester - marked inconclusive if any of the conditions found in Section 7.2 of EPD cathodic protection guidance document were applicable to survey.
- If it was necessary for the tester to indicate inconclusive, a corrosion expert evaluated the data obtained by a tester and/or conducted his own testing and completed Section VII of EPD impressed current form.
- If a corrosion expert conducted evaluation – indicated the results by marking either pass or fail in Section VII of EPD impressed current cathodic protection form.
- Indicated criteria that were applied to the evaluation by completion of Section VIII of the EPD form.
- Indicated action required as a result of the survey by marking either none, retest or repair & retest in Section IX of EPD impressed current cathodic protection form.
- Provided UST owner with any other type(s) of documentation that may be necessary in order to adequately describe the cathodic protection evaluation including the operating status and any repairs or recommendations and attached same to the EPD impressed current cathodic protection form.
The table below lists some common metals and their observed electrical potentials as measured with respect to a copper/copper sulfate reference electrode.

<table>
<thead>
<tr>
<th>METAL</th>
<th>VOLTAGE (mV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium (commercially pure)</td>
<td>-1750</td>
</tr>
<tr>
<td>Magnesium (alloy found in typical cathodic protection anode)</td>
<td>-1600</td>
</tr>
<tr>
<td>Zinc (nearly 100% pure - as found in typical cathodic protection anode)</td>
<td>-1100</td>
</tr>
<tr>
<td>Aluminum (5% zinc alloy)</td>
<td>-1050</td>
</tr>
<tr>
<td>Aluminum (pure)</td>
<td>-800</td>
</tr>
<tr>
<td>Low Carbon Steel (new – clean &amp; shiny)</td>
<td>-600 to -750</td>
</tr>
<tr>
<td>Low Carbon Steel (old – rusty)</td>
<td>-500 to -600</td>
</tr>
<tr>
<td>Stainless Steel (active - unpasivated)</td>
<td>-450 to -600</td>
</tr>
<tr>
<td>Cast Iron (not graphitized)</td>
<td>-500</td>
</tr>
<tr>
<td>Lead</td>
<td>-500</td>
</tr>
<tr>
<td>Low Carbon Steel in Concrete</td>
<td>-200</td>
</tr>
<tr>
<td>Brass, Bronze</td>
<td>-200</td>
</tr>
<tr>
<td>Stainless Steel (passivated)</td>
<td>50 to -250</td>
</tr>
<tr>
<td>Copper</td>
<td>0 to -200</td>
</tr>
<tr>
<td>High Silicone Cast Iron</td>
<td>-200</td>
</tr>
<tr>
<td>Carbon, Graphite</td>
<td>+300</td>
</tr>
<tr>
<td>Silver</td>
<td>+500</td>
</tr>
<tr>
<td>Platinum</td>
<td>+900</td>
</tr>
<tr>
<td>Gold</td>
<td>+1200</td>
</tr>
</tbody>
</table>
APPENDIX K
STATE OF GEORGIA
GALVANIC CATHODIC PROTECTION SYSTEM EVALUATION

APPENDIX L
STATE OF GEORGIA
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM EVALUATION

APPENDIX M
STATE OF GEORGIA
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM
60 DAY RECORD OF OPERATION
STATE OF GEORGIA
GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM EVALUATION

- This form must be utilized to evaluate underground storage tank (UST) cathodic protection systems in the State of Georgia.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the UST cathodic protection system and all reference electrode placements must be completed.

I. UST OWNER

<table>
<thead>
<tr>
<th>NAME:</th>
<th>NAME:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS:</td>
<td>ADDRESS:</td>
</tr>
<tr>
<td>CITY:</td>
<td>STATE:</td>
</tr>
<tr>
<td>CITY:</td>
<td>COUNTY:</td>
</tr>
</tbody>
</table>

II. UST FACILITY

<table>
<thead>
<tr>
<th>ID #</th>
</tr>
</thead>
</table>

III. CP TESTER

<table>
<thead>
<tr>
<th>TESTER’S NAME:</th>
<th>NACE INTERNATIONAL CERTIFICATION NUMBER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPANY NAME:</td>
<td>CERTIFICATION DATE: TYPE OF CERTIFICATION:</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>SOURCE OF CERTIFICATION:</td>
</tr>
<tr>
<td>CITY:</td>
<td>STATE:</td>
</tr>
<tr>
<td>OTHER (EXPLAIN):</td>
<td>__________________________________________</td>
</tr>
</tbody>
</table>

IV. CP TESTER’S QUALIFICATIONS

V. REASON SURVEY WAS CONDUCTED (mark only one)

<table>
<thead>
<tr>
<th>Routine - 3 year</th>
<th>Routine – within 6 months of installation</th>
<th>60-day re-survey after fail</th>
<th>Re-survey after repair/modification</th>
</tr>
</thead>
</table>

Date next cathodic protection survey must be conducted by ___________________ (required within 6 months of installation/repair & every 3 years thereafter).

VI. CATHODIC PROTECTION TESTER’S EVALUATION (mark only one)

<table>
<thead>
<tr>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).</td>
<td></td>
</tr>
<tr>
<td>One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (complete Section IX).</td>
<td></td>
</tr>
</tbody>
</table>

CP TESTER’S SIGNATURE: DATE  CP SURVEY PERFORMED:

VII. CORROSION EXPERT’S EVALUATION (mark only one)

<table>
<thead>
<tr>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).</td>
<td></td>
</tr>
<tr>
<td>One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX).</td>
<td></td>
</tr>
</tbody>
</table>

CORROSION EXPERT’S NAME: COMPANY NAME:

<table>
<thead>
<tr>
<th>NACE INTERNATIONAL CERTIFICATION:</th>
<th>NACE INTERNATIONAL CERTIFICATION NUMBER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOURCE OF CERTIFICATION:</td>
<td>OTHER (EXPLAIN):</td>
</tr>
<tr>
<td>DATE:</td>
<td>____________________________________</td>
</tr>
</tbody>
</table>

VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)

| 850 ON |
| Structure-to-soil potential more negative than –850 mV with respect to a Cu/CuSO₄ reference electrode with the protective current applied (This criterion is applicable to any galvanically protected structure). |

IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark only one)

<table>
<thead>
<tr>
<th>NONE</th>
<th>REPAIR &amp; RETEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathodic protection is adequate. No further action is necessary at this time. Test again by no later than (see Section V).</td>
<td></td>
</tr>
<tr>
<td>Cathodic protection is not adequate. Repair/modification is necessary as soon as practical but within the next 60 days.</td>
<td></td>
</tr>
</tbody>
</table>

EPA, UST MANAGEMENT PROGRAM
4244 INTERNATIONAL PKWY, ATLANTA, GA 30354  PHONE 404) 362-2687  FAX (8404) 362-2654  www.dnr.state.ga.us/dnr/environment
### X. DESCRIPTION OF UST SYSTEM

<table>
<thead>
<tr>
<th>TANK #</th>
<th>PRODUCT</th>
<th>CAPACITY</th>
<th>TANKS</th>
<th>PIPING</th>
<th>FLEX CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<td>7</td>
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<tr>
<td>10</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### XI. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR MODIFICATION

Complete if any repairs or modifications to the cathodic protection system are made or are necessary. Certain repairs/modifications as explained in the text of the EPD cathodic protection guidance document are required to be designed and/or evaluated by a corrosion expert (completion of Section VII is required).

- [ ] Supplemental anodes for a stl-P3® tank (attach corrosion expert’s design or documentation industry standard was followed).
- [ ] Supplemental anodes for metallic pipe (attach corrosion expert’s design or documentation industry standard was followed).
- [ ] Galvanically protected tanks/piping not electrically isolated (explain in “Remarks/Other” below).

Remarks/Other: __________________________________________________________________________________________________________
_________________________________________________________________________________________________________________________
_________________________________________________________________________________________________________________________

### XII. UST FACILITY SITE DRAWING

Attach detailed drawing or use the space provided to draw a sketch of the UST and cathodic protection systems. Sufficient detail must be given in order to clearly indicate where the reference electrode was placed for each structure-to-soil potential that is recorded on the survey forms. Any pertinent data must also be included. At a minimum you should indicate the following: All tanks, piping and dispensers; All buildings and streets; All anodes and wires; Location of CP test stations; Each reference electrode placement must be indicated by a code (1, 2, T-1,) corresponding with the appropriate line number in Section XIV of this form.

**AN EVALUATION OF THE CATHODIC PROTECTION SYSTEM IS NOT COMPLETE WITHOUT AN ACCEPTABLE SITE DRAWING.**
XIII. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM CONTINUITY SURVEY

- This section may be utilized to conduct measurements of continuity on underground storage tank systems that are protected by cathodic protection systems.
- When conducting a fixed cell - moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
- For galvanic systems, the structure that is to be protected must be isolated from any other metallic structure in order to pass the continuity survey.

### FACILITY NAME:

NOTE: The survey is not complete unless all applicable parts of Sections I-XIV are also completed.

### DESCRIBE LOCATION OF “FIXED REMOTE” REFERENCE ELECTRODE PLACEMENT:

<table>
<thead>
<tr>
<th>Contact Points</th>
<th>Potential (mV)</th>
<th>Comments</th>
<th>ISOLATED/ CONTINUOUS/ INCONCLUSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Pipe Riser</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Submersible Pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Tank Monitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Piping at sub pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Vent Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tank 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Pipe Riser</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Submersible Pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Tank Monitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Piping at sub pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Vent Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tank 3</td>
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<td></td>
<td></td>
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<tr>
<td>A. Tank Bottom/Test Lead</td>
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<td></td>
</tr>
<tr>
<td>B. Fill Pipe Riser</td>
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<tr>
<td>C. Submersible Pump</td>
<td></td>
<td></td>
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<tr>
<td>D. Tank Monitor</td>
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<td></td>
<td></td>
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<tr>
<td>E. Piping at sub pump</td>
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<tr>
<td>F. Vent Line</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Dispensers</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No. 1</td>
<td>No. 5</td>
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<td>No. 2</td>
<td>No. 6</td>
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<td>No. 3</td>
<td>No. 7</td>
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<tr>
<td>No. 4</td>
<td>No. 8</td>
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<td></td>
</tr>
</tbody>
</table>

### COMMENTS:

EPD, UST MANAGEMENT PROGRAM
4244 INTERNATIONAL PKWY, ATLANTA, GA 30354 PHONE (404) 362-2687 FAX (404) 362-2654 www.dnr.state.ga.us/dnr/environ
XIV. GALVANIC (SACRIFICIAL ANODE) CATHODIC PROTECTION SYSTEM SURVEY

- This section may be utilized to conduct a survey of a galvanic cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly over the tested structure (local).

FACILITY NAME:  

NOTE: The survey is not complete unless all applicable parts of sections I – XIV are also completed

DESCRIBE LOCATION OF REMOTE REFERENCE ELECTRODE PLACEMENT:

<table>
<thead>
<tr>
<th>Reference Cell Location</th>
<th>Potential (mV)</th>
<th>Comments</th>
<th>PASS/FAIL/ INCONCLUSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tank 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Piper Riser</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Submersible Pump</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>D. Tank Monitor</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>E. Piping at sub pump</td>
<td></td>
<td></td>
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<tr>
<td>F. Vent Line</td>
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<td></td>
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<tr>
<td><strong>Tank 2</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Piper Riser</td>
<td></td>
<td></td>
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<tr>
<td>C. Submersible Pump</td>
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<tr>
<td>D. Tank Monitor</td>
<td></td>
<td></td>
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<tr>
<td>E. Piping at sub pump</td>
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<td></td>
<td></td>
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<tr>
<td>F. Vent Line</td>
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<td></td>
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</tr>
<tr>
<td><strong>Tank 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Piper Riser</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Submersible Pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Tank Monitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Piping at sub pump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Vent Line</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dispensers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No. 2</td>
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<td>No. 3</td>
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<tr>
<td>No. 4</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No. 5</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

COMMENTS:

Designate numerically or by code on the site drawing each “local” reference electrode placement (e.g. 1,2,3… T-1, T-2, P-1, P-2…etc.).

Describe the exact location where reference electrode is placed for each “local” measurement (e.g. soil @ plus tank STP; soil @ dispenser 5/6; etc.)

Record the structure-to-soil potential measured with the reference electrode placed “local” in millivolts (e.g. –865 mV, -920 mV, etc.).

Indicate whether the tested structure passed or failed the –850 mV “on” criterion based on your interpretation of the test data.
STATE OF GEORGIA
IMPRESSSED CURRENT CATHODIC PROTECTION SYSTEM EVALUATION

- This form must be utilized to evaluate underground storage tank (UST) cathodic protection systems in Georgia.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the UST cathodic protection system and all reference electrode placements must be completed.

<table>
<thead>
<tr>
<th>I. UST OWNER</th>
<th>II. UST FACILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME:</td>
<td>NAME:</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>ADDRESS:</td>
</tr>
<tr>
<td>CITY:</td>
<td>STATE:</td>
</tr>
<tr>
<td></td>
<td>CITY:</td>
</tr>
<tr>
<td></td>
<td>COUNTY:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. CP TESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TESTER’S NAME:</td>
</tr>
<tr>
<td>COMPANY NAME:</td>
</tr>
<tr>
<td>ADDRESS:</td>
</tr>
<tr>
<td>CITY:</td>
</tr>
<tr>
<td>STATE:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV. CP TESTER’S QUALIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NACE INTERNATIONAL CERTIFICATION NUMBER:</td>
</tr>
<tr>
<td>CERTIFICATION DATE:</td>
</tr>
<tr>
<td>TYPE OF CERTIFICATION:</td>
</tr>
<tr>
<td>SOURCE OF CERTIFICATION:</td>
</tr>
<tr>
<td>OTHER (EXPLAIN):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V. REASON SURVEY WAS CONDUCTED (mark only one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Routine - 3 year</td>
</tr>
<tr>
<td>□ Routine – within 6 months of installation</td>
</tr>
<tr>
<td>□ 60-day re-survey after fail</td>
</tr>
<tr>
<td>□ Re-survey after repair/modification</td>
</tr>
</tbody>
</table>

Date next cathodic protection survey must be conducted ________________ (required within 6 months of installation/repair & every 3 years thereafter).

<table>
<thead>
<tr>
<th>VI. CATHODIC PROTECTION TESTER’S EVALUATION (mark only one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ PASS All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).</td>
</tr>
<tr>
<td>□ FAIL One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (complete Section IX).</td>
</tr>
<tr>
<td>□ INCONCLUSIVE The cathodic protection survey of an impressed current system must be evaluated by a corrosion expert because one or more of the conditions listed in Section 7.1.5 of the EPD cathodic protection guidance document are applicable (complete Section VII).</td>
</tr>
</tbody>
</table>

CP TESTER’S SIGNATURE: DATE CP SURVEY PERFORMED:

<table>
<thead>
<tr>
<th>VII. CORROSION EXPERT’S EVALUATION (mark only one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ PASS All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).</td>
</tr>
<tr>
<td>□ FAIL One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX).</td>
</tr>
</tbody>
</table>

CORROSION EXPERT’S NAME: COMPANY NAME:|
| NACE INTERNATIONAL CERTIFICATION: |
| NACE INTERNATIONAL CERTIFICATION NUMBER: |

CORROSION EXPERT’S SIGNATURE: DATE:

<table>
<thead>
<tr>
<th>VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 850 OFF Structure-to-soil potential more negative than –850 mV with respect to a Cu/CuSO₄ reference electrode with protective current temporarily interrupted (instant-off).</td>
</tr>
<tr>
<td>□ 100 mV POLARIZATION Structure(s) exhibit at least 100 mV of cathodic polarization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark only one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ NONE Cathodic protection is adequate. No further action is necessary at this time. Test again by no later than (see Section V).</td>
</tr>
<tr>
<td>□ REPAIR &amp; RETEST Cathodic protection is not adequate. Repair/modification is necessary as soon as practical but within the next 60 days.</td>
</tr>
</tbody>
</table>
### X. DESCRIPTION OF UST SYSTEM

<table>
<thead>
<tr>
<th>TANK #</th>
<th>PRODUCT</th>
<th>CAPACITY</th>
<th>TANK MATERIAL</th>
<th>PIPING MATERIAL</th>
<th>FLEX CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

### XI. IMPRESSED CURRENT RECTIFIER DATA (complete all applicable)

In order to conduct an effective evaluation of the cathodic protection system, a complete evaluation of rectifier operation is necessary.

<table>
<thead>
<tr>
<th>RECTIFIER MANUFACTURER:</th>
<th>RATED DC OUTPUT:</th>
<th>VOLTS</th>
<th>AMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECTIFIER MODEL:</td>
<td>RECTIFIER SERIAL NUMBER:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RECTIFIER OUTPUT AS INITIALLY DESIGNED OR LASTLY RECOMMENDED (if available): VOLTS AMPS

<table>
<thead>
<tr>
<th>EVENT</th>
<th>DATE</th>
<th>TAP SETTINGS</th>
<th>DC OUTPUT</th>
<th>HOUR</th>
<th>METER</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>COARSE</td>
<td>FINE</td>
<td>VOLTS</td>
<td>AMPS</td>
<td></td>
</tr>
<tr>
<td>&quot;AS FOUND&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;AS LEFT&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### XII. IMPRESSED CURRENT POSITIVE & NEGATIVE CIRCUIT MEASUREMENTS (output amperage)

Complete if the system is designed to allow such measurements (i.e. individual lead wires for each anode are installed and measurement shunts are present).

<table>
<thead>
<tr>
<th>CIRCUIT</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANODE (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TANK (-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### XIII. DESCRIPTION OF CATHODIC PROTECTION SYSTEM REPAIRS AND/OR MODIFICATION

Complete if any repairs or modifications to the cathodic protection system are made OR are necessary. Certain repairs/modifications as explained in the text of the EPD cathodic protection guidance document are required to be designed and/or evaluated by a corrosion expert (completion of Section VII required).

- [ ] Additional anodes for an impressed current system (attach corrosion expert’s design).
- [ ] Repairs or replacement of rectifier (explain in “Remarks/Other” below).
- [ ] Anode header cables repaired and/or replaced(explain in “Remarks/Other” below).
- [ ] Impressed current protected tanks/piping not electrically continuous (explain in “Remarks/Other” below).

Remarks/Other: ____________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

### XIV. UST FACILITY SITE DRAWING

Attach detailed drawing of the UST and cathodic protection systems. Sufficient detail must be given in order to clearly indicate where the reference electrode was placed for each structure-to-soil potential that is recorded on the survey forms. Any pertinent data must also be included. At a minimum you should indicate the following: All tanks, piping and dispensers; All buildings and streets; All anodes and wires; Location of CP test stations; Each reference electrode placement must be indicated by a code (1,2,3 R-1, R-2, R-3,…etc.) corresponding with the appropriate line number in Section XVI of this form.

AN EVALUATION OF THE CATHODIC PROTECTION SYSTEM IS NOT COMPLETE WITHOUT AN ACCEPTABLE SITE DRAWING.
XV. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM CONTINUITY SURVEY

- This section may be utilized to conduct measurements of continuity on underground storage tank systems that are protected by cathodic protection systems.
- When conducting a fixed cell - moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
- For impressed current systems, the protected structure must be continuous with all other protected structures in order to pass the continuity survey.

FACILITY NAME: 

NOTE: The survey is not complete unless all applicable parts of sections I-XIV are also completed

DESCRIBE LOCATION OF “FIXED REMOTE” REFERENCE ELECTRODE PLACEMENT:

<table>
<thead>
<tr>
<th>CONTACT POINT</th>
<th>STRUCTURE “A” FIXED REMOTE INSTANT OFF VOLTAGE</th>
<th>STRUCTURE “B” FIXED REMOTE INSTANT OFF VOLTAGE</th>
<th>ISOLATED</th>
<th>CONTINUOUS</th>
<th>INCONCLUSIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TANK 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Pipe Riser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Submersible Pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Tank Monitor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Piping at sub pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Vent Line</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TANK 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>B. Fill Pipe Riser</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>C. Submersible Pump</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>D. Tank Monitor</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>E. Piping at sub pump</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Vent Line</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TANK 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Tank Bottom/Test Lead</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>B. Fill Pipe Riser</td>
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<td></td>
<td></td>
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<tr>
<td>C. Submersible Pump</td>
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<td>D. Tank Monitor</td>
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<td>E. Piping at sub pump</td>
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<tr>
<td>F. Vent Line</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Dispensers

No. 1
No. 2
No. 3

Comments:
**XVI. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SURVEY**

- This section may be utilized to conduct a survey of an impressed current cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly above the structure that is being tested and as far away from any active anode as practical to obtain a valid structure-to-soil potential (refer to the EPD cathodic protection evaluation guidance document for detailed discussion of electrode placement).
- Both on and instant off potentials must be measured for each structure that is intended to be under cathodic protection.
- The instant off potential must be -850 mV or more negative or the 100 mV polarization criterion must be satisfied in order to pass.

**FACILITY NAME:**

**NOTE:** This survey is not complete unless all applicable parts of sections I – XIV are also completed

<table>
<thead>
<tr>
<th>LOCATION CODE</th>
<th>Location of Cell Contact to Tank</th>
<th>ON VOLTAGE</th>
<th>INSTANT OFF VOLTAGE</th>
<th>100 mV POLARIZATION</th>
<th>PASS/FAIL 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ending Voltage</td>
<td>Voltage Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**COMMENTS:**

Designate numerically or by code on the site drawing each local reference electrode placement (e.g. 1,2,3… T-1, T-2, P-1, P-2…etc.).

Describe the exact location where the reference electrode is placed for each measurement (e.g. soil @ regular tank STP manway; soil @ dispenser 2, etc.)

(Applies to all tests) Record the structure-to-soil potential (voltage) observed with the current applied (e.g. –1070 mV).

(Applies to all tests) Record the structure to soil potential (voltage) observed when the current is interrupted (e.g. 680 mV).

(Applies to 100 mV polarization test only) Record the voltage observed at the end of the test period (e.g. 575 mV).

(Applies to 100 mV polarization test only) Subtract the final voltage from the instant off voltage (e.g. 680 mV – 575 mV = 105 mV).

Indicate if the tested structure passed or failed one of the two acceptable criteria (850 instant off or 100 mV polarization) based on your interpretation of data.
This form may be utilized to document that the cathodic protection system rectifier is checked for operation at least once every 60 days.

Checked for operation is taken to mean that it was confirmed the rectifier was receiving power and is “turned-on”.

If your rectifier is so equipped, you should also record the output voltage, amperage and the number of hours indicated on the meter.

Any significant variance should be reported to your corrosion professional so that any repairs and/or adjustments necessary can be made.

<table>
<thead>
<tr>
<th>UST OWNER</th>
<th>UST FACILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME:</td>
<td>NAME:</td>
</tr>
<tr>
<td>ADDRESS:</td>
<td>ADDRESS:</td>
</tr>
<tr>
<td>CITY:</td>
<td>STATE:</td>
</tr>
<tr>
<td></td>
<td>CITY:</td>
</tr>
<tr>
<td></td>
<td>COUNTY:</td>
</tr>
</tbody>
</table>

**IMPRESSED CURRENT RECTIFIER DATA**

- Rectifier Manufacturer: 
- Rated DC Output: __________ VOLTS __________ AMPS
- Rectifier Model: 
- Rectifier Serial Number: 
- What is the ‘as designed’ or lastly recommended rectifier output? __________ VOLTS __________ AMPS

**60-DAY LOG OF RECTIFIER OPERATION**

<table>
<thead>
<tr>
<th>DATE INSPECTED</th>
<th>RECTIFIER TURNED ON?</th>
<th>TAP SETTINGS</th>
<th>DC OUTPUT</th>
<th>HOUR METER</th>
<th>INSPECTOR INITIALS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>COARSE FINE</td>
<td>VOLTS AMPS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EPD, UST MANAGEMENT PROGRAM
4244 INTERNATIONAL PKWY, ATLANTA, GA 30354 PHONE 404) 362-2687 FAX (404) 362-2654 www.dnr.state.ga.us/dnr/environment
10-Year Inspection of Lined USTs

Department of Environmental Quality
Storage Tank Division
If you do not know the date the UST was lined and/or if you did not receive or do not have records from the lining company, including a complete report of the tank evaluation, as well as design, installation and operational requirements of the lining system, you will be required to conduct an early 10 year structural integrity inspection.
Business Decision

- If tank inspection indicates tank wall thickness is not 75% of the original wall thickness, the tank will have to be closed and removed.
Liner Requirements

- A UST may only be upgraded once by internal lining
Liner Requirements

- Tank linings that have bubbled, flaked, or disbonded from the tank surface, are not acceptable.
- These tanks must be closed and removed from the ground.
Liner Requirements

- If tank is ultrasonically tested and found to still have 75% of the original wall thickness, the O/O may install an impressed current cathodic protection system.
10-Year Inspection Requirements

- The O/O shall notify the STD of all inspections not less than 15 days before work begins.
- Liner inspection personnel shall be certified in Level I competence for nondestructive testing.
10-Year Inspection Requirements

- Ultrasonic thickness gauging shall be utilized, to assure average wall thickness is found to be not less than 75% of the original wall thickness specified in UL 58.
- The liner thickness shall be a minimum of 100-mil dry film thickness or greater.
10-Year Inspection Requirements

- A liner hardness test shall be performed using a Barcol Hardness Tester, or other acceptable instrument to determine that lining has maintained a hardness that meets liner manufacturer specifications.
10-Year Inspection Requirements

- An internal inspection surface continuity test of the tank interior shall be performed using a Holiday Detector with a silicon brush electrode.
10-Year Inspection
Requirements

- A tank tightness is performed as part of the final evaluation. The use of an ATG tightness test is not acceptable.
- The inspecting company shall provide the O/O with a complete report of the UST evaluation. The certified ultrasonic testing inspector must sign and date the internal inspection report.
Did Not Meet 10-Year Inspection

- A UST that fails to meet the inspection criteria for interior lining must be taken out of service immediately and either replaced or permanently closed within 6 months.
UNDERGROUND STORAGE TANK (UST) CLOSURE GUIDANCE DOCUMENT
--Petroleum Releases—

IT IS THE RESPONSIBILITY OF THE OWNER/OPERATOR TO SUBMIT THE CLOSURE REPORT.

REVIEW THIS GUIDANCE DOCUMENT PRIOR TO REMOVING USTS. For underground storage tanks (USTs) and/or associated piping that are removed or permanently closed in-place, a Closure Report or Corrective Action Plan (CAP)-Part A, as applicable, must be prepared. If the UST Closure Report is submitted alone or as part of a CAP-Part A, follow these guidelines for closure procedures, sampling, excavation, disposal, and reporting.

A CAP-Part A must be submitted within sixty days (60) of the date that free product is observed in the environment or that laboratory sample analysis results are received, unless it is demonstrated that groundwater has not been impacted above applicable water quality standards (through clean [below detection limits] soil samples or a groundwater sample) AND soil contamination does not exceed applicable threshold levels and the site is eligible for No Further Action Required. If a CAP-A is required, include a complete closure report form and supporting documentation in the CAP-A.

If the site is eligible for No Further Action status, a Closure Report (including the attached Closure Report Form) must be submitted to Environmental Protection Division (EPD) within forty-five (45) days after removal or in-place decommissioning of the USTs, and a copy must be retained by the owner or operator for at least three (3) years.

Consult this guidance document to determine which type of report must be prepared and submitted. Adhering to the following guidance will expedite the review of your file.

The original signature of the UST owner is required on the closure report form. Original chains-of-custody signed by the sampler and receiving laboratory and original laboratory data sheets signed by the laboratory chemist must be submitted.

CLOSURE ACTIVITIES ARE NOT REIMBURSABLE
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I. PERMANENT CLOSURE OF USTS

A. INTRODUCTION

USTs may be permanently closed by removing them from the ground or by filling the empty tanks with an inert solid material, such as sand, a mixture of sand and earth, foam, or concrete. The inert material must not react with the UST or its contents or allow leaching of residual petroleum from the UST. Permanent closure of product piping may be accomplished by emptying and removing the piping and capping the ends. If closed in-place, the piping must first be flushed into the UST prior to emptying the UST. In most cases, the EPD recommends removal of the entire UST system. It is recommended that in-place closure should be reserved for situations in which a structure, such as the foundation of a building or roadway, would be jeopardized by removal of the UST(s). (For additional guidance on UST closure, refer to 40 CFR Part 280.71.) Note: Water is not an inert solid material and cannot be used for in-place closure.

Because of the inherent dangers in handling tanks (for example, explosive vapors and potentially hazardous petroleum residuals) EPD recommends that only qualified and experienced personnel close UST systems. The Occupational Safety and Health Administration (OSHA) requires that when it is reasonably possible that personnel may encounter hazardous materials, such as petroleum, and if personnel are conducting corrective actions involving clean-up operations at sites covered by RCRA, such as UST sites, those personnel must complete forty hours of OSHA-approved health and safety training. Petroleum is considered by OSHA to be a hazardous material in regards to OSHA regulations. Knowledge of and experience with EPA sampling procedures, industry standards, and OSHA regulations (29 CFR Part 1910 and Part 1926) are essential. Fatalities have resulted from mistakes made during tank closures. In addition, improper handling of the material in the USTs and piping can result in releases that require costly cleanups. Mistakes in sample collection, handling and analysis can also result in costly re-sampling.

B. USTS AND EQUIPMENT REQUIRING PERMANENT CLOSURE

The Georgia Underground Storage Tank (GUST) Rules define an UST as any one or a combination of tanks, including underground pipes connected thereto. Therefore, all references to a "tank" or a "UST" in this document refer to both the UST and its associated piping, i.e., the UST system.

A tank must be permanently closed if:

- It has been temporarily closed for more than twelve months and does not meet standards for new UST systems or the upgrade requirements for existing systems;
- It has been abandoned and is substandard (not upgraded);

- It was in service on or after January 1, 1974, but taken out of service or abandoned before December 22, 1988 (whether there has been a release or not);

- Some local Fire Safety Codes may not permit an UST to remain in the ground if it is permanently out of service. Consult your local fire safety official about these rules.

C. FORMS TO SUBMIT TO THE EPD PRIOR TO CLOSURE

CLOSURE ACTIVITY FORM (GUST-29)

At least 30 days prior to closing the UST, complete and submit an original signed GUST-29 to the Underground Storage Tank Management Program (USTMP). The form is included in Appendix A.

D. ADDITIONAL AGENCIES TO NOTIFY PRIOR TO UST CLOSURE

Contact the local fire marshal and the Utilities Protection Center before beginning an UST closure. The fire marshal and sometimes other local governmental agencies have jurisdiction over USTs and may require their oversight during removal. State law requires you to notify the Utilities Protection Center at 1-(800)-282-7411 at least 72 hours before you start to dig.

Contact your local government agency about construction permit requirements.

II. SAMPLE COLLECTION AND ANALYSES REQUIREMENTS

The purpose of sampling soil during UST removal is twofold: 1) to determine if contamination has migrated to the water table and 2) to determine whether soil contamination requires remediation because it poses a future threat or continuing threat to the groundwater quality. In order to obtain representative samples of soil and (if required) groundwater, collect the samples no later than 24 hours after the UST removal. The following sections outline the requirements for sample collection and analysis.

A. REQUIRED ANALYTICAL METHODS

All analyses must be performed by a laboratory, using EPA-approved SW-846 methods (Test Methods for Evaluating Solid Waste, United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, SW-846, Third Edition, as revised). Approved EPA methods require the performance of certain sampling, analysis, and quality assurance and quality control procedures in the field and in the laboratory. Please refer to Appendix B and Section II.B.1. of this document for a brief overview of the requirements for BTEX soil samples.
Method 8260B is preferred for analysis of volatile organics instead of 8021B, since misidentification of compounds and “false positives” are reduced using Method 8260B. However, Method 8021B may be used, if proper SW-846 procedures are followed.

Laboratories must meet the estimated quantitation (detection) limits required by SW846 or provide a brief written explanation for any elevated limits. Since the EPD understands that Method Detection Limits (MDLs) and Estimated Quantitation Limits (EQLs), commonly referred to as “detection limits”, will vary from day to day within an acceptable range, according to the performance of the analytical equipment and the condition of the sample, an estimated quantitation limit range of 1-5 ug/kg will be accepted for EPA Laboratory Method 8021B for soil samples; however, if the analysis indicates that regulated compounds are present above the EQLs calculated for that day, they must be reported even when the concentrations are below 5 ug/kg. Detections of solitary compounds below 5 ug/kg will be considered as possible false positives. However, the presence of several compounds at concentrations of less than 5 ug/kg indicates that petroleum contamination is present in the soil and that groundwater may be contaminated. The laboratory estimated quantitation limits from SW-846 are provided in Table 2 for each compound.

If these laboratory estimated quantitation limits cannot be achieved because the laboratory diluted the sample, but no concentrations of the target compounds are reported above the elevated detection limits, include a brief written explanation from the laboratory for the dilution. If the analytical method used was either EPA Method 8260B or 8270C (GC/MS), include a tentative identification and estimated quantitation of any interfering constituent. If detection limits are elevated by a factor of more than 100 due to matrix interference using Method 8021B, but no target compounds are detected above the elevated detection limits, then identification of the interfering compound will be required by analysis of the sample duplicate using Method 8260B for volatile organics or 8270C for PAHs to identify the interfering compound. Other regulated compounds in addition to the usual target compounds may be present and require corrective action.

Identification of interfering compounds may not be necessary when the only substance stored at the release site was a heavier petroleum distillate, such as diesel, since diesel contains other unregulated hydrocarbons, which sometimes cause matrix interference in analysis of BTEX or PAHs, but does not typically contain other regulated compounds. However, for other more complex petroleum mixtures, such as mineral spirits, identification of any interfering compound will usually be necessary.

If the laboratory over-dilutes the sample in anticipation of high concentrations of organics, but no interfering contaminants detectable are identified and reported above the resulting elevated detection limits, the laboratory should run a duplicate sample at a lower dilution and report the results, in accordance with accepted laboratory procedure. If the EQLs are elevated above the limits cited in Table 2, the EPD may assume that target compounds are present in the sample(s) at the elevated detection limit, and
additional corrective action may be required as a result. Collection of duplicate samples in the field to enable the laboratory to run multiple dilutions is therefore advised. If the contractor is certain that the laboratory will attain the necessary detection limits without requiring multiple dilutions, and that no other problems will occur in transport or analysis of the sample, duplicate samples may be eliminated. Be advised however, that remobilization to resample is usually more costly than collection of duplicate samples. Analysis of all duplicate samples is not required.

Submit the original laboratory data sheets signed by the appropriate laboratory manager or QA/QC manager, and provide the following quality control information:

1) Laboratory quantitation limits for each sample and constituent
2) Laboratory blank analysis results
3) Recovery and precision results of analysis of the laboratory control sample and the matrix spike
4) Recovery results of analysis of the surrogate addition to the sample
5) A listing of the samples in the batch

In addition, submit an original chain-of-custody, signed by the sampler and the receiving laboratory, which notes the condition and temperature of the samples upon arrival at the laboratory. Also note the method of sample collection if 5035 is used for soil samples (Encore™ or 40 ml vial, for example) and list the type of preservative used for each soil sample if a 40 ml vial is used (i.e., sodium bicarbonate or methanol). The signed laboratory data sheets and chains-of-custody submitted to the EPD must not contain photocopied signatures and laboratory data sheets must be on laboratory letterhead.

All analytical laboratories performing analysis in accordance with SW-846 must have performed and documented a method detection limit (MDL) study within the previous 12-month period that submitted samples were analyzed. The laboratory must also have and be able to document a formal quality assurance program that includes instrument calibration, daily calibration verification, confirmation of analyte identification, formal demonstrations of operator capability, participation in annual performance evaluation by an NIST-approved provider, and comply with other measures as described in Chapter 1, SW-846.

Effective on or after July 1, 2001, laboratory data submitted to the EPD must be analyzed by an approved laboratory, in accordance with the Georgia Rules for Commercial Environmental Laboratories (391-3-26). According to the State of Georgia Code 12-2-9, “all commercial analytical laboratories submitting data for regulatory purposes shall be accredited or approved as specified in the Environmental Protection Division's rules and regulations.”
1.) SOIL SAMPLES

Soil analysis requirements depend on the type of product stored in the UST during its period of use. The appropriate analyses must be performed for any and all substances the UST has contained or may have contained. If any type of petroleum was stored (gasoline, diesel, aviation fuel, etc), analyze the soil samples for benzene, toluene, ethylbenzene, xylenes (BTEX) using EPA Method 5035-8021B or 5035-8260B; and Total Petroleum Hydrocarbons Gasoline Range Organics and/or Diesel Range Organics (TPH-GRO and/or TPH-DRO), as appropriate (see Table 1). Method 5035-8260B is preferred over Method 5035-8021B because it is less likely to result in misidentification of the compounds that initiate corrective action.

For closure assessments, PAH analysis is only required of soil and groundwater samples collected beneath UST system(s) which once contained a product other than gasoline. PAH analysis is not required of soil samples collected beneath gasoline USTs that were located in the same excavation as non-gasoline USTs. For example, if two gasoline and one diesel UST are contained in the same pit, PAHs are only required to be collected under the diesel UST. However, an affidavit will be necessary in such a case to verify that no other product besides gasoline was contained in the gasoline USTs during their use. For PAH analysis, use EPA Method 8270C or 8310. You may also use Method 8100 for PAHs, but if PAHs are detected using this method, you must use Method 8270C or 8310 to determine the concentrations of the individual PAHs.

Consult Table 1 of this document to determine which analytical methods are required for your site. If a substance other than petroleum was stored in the UST, analyze the soil for the substance or regulated constituent that was stored.

If soil from the prescribed sampling locations in the bottom of the UST, piping, and dispenser island excavations does not contain detectable quantities of BTEX or PAHs, analyze the soil for Total Petroleum Hydrocarbons (TPH). Continue vertical soil sampling, above the water table, until contamination is no longer detectable. If the water table is encountered before BTEX and TPH (and PAHs if applicable) is vertically delineated to non-detectable levels, collect a groundwater sample and analyze it for both BTEX (and PAHs if applicable), as described in the next section. Sampling of the groundwater for TPH is not necessary.

TPH analysis is used as an indicator of possible groundwater contamination in addition to BTEX and PAH analysis. TPH analysis is used as an additional indicator because BTEX constituents leach and volatilize more quickly than other components of TPH, and PAHs are present in lower concentrations than the other components of TPH. The absence of detectable concentrations of BTEX and PAHs in soil often does not provide an accurate indication of whether groundwater is contaminated. In many cases, only the heavier petroleum constituents of TPH can be identified in the soil because the BTEX and PAHs have either already migrated to the groundwater or have biodegraded. Therefore, even if BTEX and PAHs are not detectable in the
soil, you must vertically delineate TPH contamination (using the methods outlined in Table 1), or take a groundwater sample in the worst-case location(s). All constituents for which analysis is required (e.g., BTEX, PAHs, and TPH) must be non-detectable in the bottom-most confirmation soil samples in order to be vertically delineated, or a groundwater sample must be collected, as described in Section II.C.4.

**Note:** A vapor monitoring instrument, such as a photoionization detector (PID) or organic vapor analyzer (OVA), may be used ONLY for field screening. **Vapor monitoring (field instrument) readings and other non-SW-846 methods cannot be substituted for required laboratory analytical data.** (Be advised that some heavier petroleum products do not give off sufficient vapors to register on field instruments, and that other unregulated organic compounds and moisture can produce false-negative or false-positive readings on such instruments.)

2.) GROUNDWATER SAMPLES

If groundwater is encountered during excavation or if soil samples are contaminated with BTEX, PAHs or TPH down to the water table, groundwater samples must be collected. If analysis of soil samples from the bottom of the excavation indicate that soil is contaminated with BTEX, PAHs, or TPH, groundwater samples may be collected from boreholes or monitor wells advanced through the bottom of the excavation or within two (2) feet of the excavation, either before or after the excavation is backfilled, instead of attempting to vertically delineate soil contamination during the closure sampling. Typically one groundwater sample per contiguous UST pit should be collected in order to determine the highest groundwater contaminant concentrations beneath the contaminated area. However, groundwater samples should be collected no more than approximately 25 feet apart horizontally in order to adequately determine the highest groundwater contaminant concentrations beneath multiple contaminated soil samples. If a boring is extended to groundwater, the work must be directed and supervised by a Professional Geologist or Professional Engineer registered in the State of Georgia, in accordance with the Water Well Standards Act.

If petroleum was stored in the UST, analyze the water samples using EPA Method 8021B or 8260B for BTEX. If a substance other than gasoline was stored, also analyze the samples using EPA Method 8270C or 8310 for PAHs. As with soil samples, Method 8100 may be used to analyze for the presence of PAHs, but if PAHs are detected using this method, Method 8270C or 8310 must be used to determine the concentrations of the individual PAHs, in accordance with the EPA SW-846 requirements. Analysis of water samples for TPH is not necessary. Acceptable quantitation limits are provided in Table 2.
If a substance other than petroleum was stored in the UST system, analyze the groundwater for the substances or regulated constituents that were stored.

**Note:** Analysis of soil and groundwater samples for PAHs is not required if affidavits are signed by current and former owners of the facility (or authorized agent thereof) who are familiar with the complete history of the site's petroleum operations. They must certify that, to the best of their knowledge, only gasoline has been stored in the USTs addressed in the closure report. A sample affidavit is attached as Appendix C.
# TABLE 1
LABORATORY METHODS FOR SOIL AND GROUNDWATER ANALYSIS

Make sure your laboratory is familiar with the requirements of this table and this document

<table>
<thead>
<tr>
<th>SUBSTANCE STORED</th>
<th>CONSTITUENT</th>
<th>SOIL SAMPLING &amp; ANALYSIS METHODS</th>
<th>GROUNDWATER SAMPLING &amp; ANALYSIS METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline or Aviation Gas Only (Affidavit Required)</td>
<td>BTEX</td>
<td>5035-8021B¹ OR 5035-8260B¹; AND 5035-8015B-GRO</td>
<td>5030-8021B¹ OR 5030-8260B¹</td>
</tr>
<tr>
<td></td>
<td>TPH-GRO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jet Fuel A, Jet Fuel B, Mineral Spirits or Unknown Petroleum Contents, Kerosene, Used Oil</td>
<td>BTEX</td>
<td>5035-8021B¹ OR 5035-8260B¹; AND 8270C/8310/8100² AND 5035-8015B-GRO AND 8015B-DRO</td>
<td>5030-8021B¹ OR 5030-8260B¹ AND 8270C/8310/8100²</td>
</tr>
<tr>
<td></td>
<td>PAHs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TPH-GRO</td>
<td>5035-8015B-GRO AND 8015B-DRO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TPH-DRO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diesel, Fuel Oil (#2, #4, #5, or #6), Motor Oil, or Hydraulic Oil³</td>
<td>BTEX</td>
<td>5035-8021B¹ OR 5035-8260B¹; AND 8270C/8310/8100² AND 8015B-DRO</td>
<td>8270C/8310/8100²</td>
</tr>
<tr>
<td></td>
<td>PAHs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TPH-DRO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) For Methods 8021B, 8260B, and 8015B-GRO (i.e. methods used to test for organic volatiles), use preparation and sampling Method 5035 for soil samples. Consult your analytical laboratory for required field equipment and field procedures. **Method 8260B is usually preferred over Method 8021B because Method 8260B is better able to identify regulated and interfering compounds and Methyl tertiary butyl ether (MTBE), whereas Method 8021B may misidentify some compounds as being regulated when they are not, may not be able to identify interfering compounds, and may provide false-positive results for MTBE.** Please request your laboratory to provide MTBE data if Method 8260B is used.

2) Be aware that if PAHs are detected using Method 8100, you must use Method 8270C or 8310 to determine the concentrations of the individual PAHs.

3) For example, hydraulic oil stored in USTs not connected to hydraulic equipment. Refer to the GUST Rules for details (391-3-15-.02.2(l)).

4) TPH-GRO and TPH-DRO analysis of confirmation soil samples is not required if groundwater samples are collected at the worst-case locations (see Section II.A.1.)

5) **If 80 Octane Aviation Gasoline was stored, also analyze soil samples for Lead.**
TABLE 2
LABORATORY ESTIMATED QUANTITATION LIMITS FOR SOIL AND GROUNDWATER SAMPLES

Make sure your laboratory is familiar with the requirements of this table and this document

<table>
<thead>
<tr>
<th>METHOD</th>
<th>5035-8021B</th>
<th>5030-8021B</th>
<th>5035-8260B</th>
<th>5030-8260B</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAMPLE TYPE</td>
<td>Soil</td>
<td>Groundwater</td>
<td>Soil</td>
<td>Groundwater</td>
</tr>
<tr>
<td>Benzene</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>Toluene</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>Xylenes (for each isomer)</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD</th>
<th>8100¹, 8270C, or 8310</th>
<th>8100¹, 8270C, or 8310</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each PAH Constituent</td>
<td>660 ug/kg</td>
<td>10 ug/l</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD</th>
<th>8015B-GRO OR 8015B-DRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPH GRO &amp; DRO</td>
<td>10 mg/kg</td>
</tr>
</tbody>
</table>

1) Be aware that if PAHs are detected using Method 8100, you must use Method 8270C or 8310 to determine the concentrations of the individual PAHs.

2) See Section II.A. of these guidelines for a more detailed explanation of expected estimated quantitation limits.

Note: the above information was obtained from the EPA SW-846 analytical guidelines. Further information on estimated quantitation limits (EQLs), commonly reported as “detection limits” by laboratories, is available in SW-846 on EPA’s website at www.epa.gov/epaoswer/hazwaste/test/sw846.htm.
B. SOIL AND GROUNDWATER SAMPLE COLLECTION PROCEDURES

Failure to follow EPA-approved sampling procedures may cause laboratory results to be invalid. Proper sampling procedures are outlined in EPA's *Environmental Compliance Branch Standard Operating Procedures & Quality Assurance Manual* (Region IV, revised February 1, 1991), and in SW-846. Decontaminate equipment between samples and provide proper chain-of-custody documentation. Consult your laboratory for detailed sampling directions and required equipment.

1.) SOIL SAMPLES

Soil collection procedures for BTEX, TPH-GRO and other volatile organics were revised by the EPA in June, 1997 and were implemented by the State of Georgia EPD on July 1, 1998. These procedures apply to EPA Methods 8021B, 8015B-GRO, and 8260B. These revised sampling procedures provide more than one option for proper soil sample collection. The option you select is directly dependent on your laboratory's set-up and capabilities. You must contact your laboratory prior to collection of the samples to determine their required field sampling procedures. A brief description of the soil sampling options and holding times is outlined in Appendix B. The description in Appendix B cannot be used instead of consulting with your laboratory; it only provides an overview.

Never use the same portion of a sample for both screening with field instruments (OVA or PID) and laboratory analysis. Exposing the sample to air and/or allowing the sample to increase in temperature to obtain a representative OVA or PID measurement renders the sample unusable for laboratory analysis. If the sample is not put into an air-tight container and cooled to 4 degrees Celsius immediately after sampling, it will provide inaccurate results and the results will be invalid.

Sampling methods for PAHs and TPH-DRO were not changed substantially in the last update of SW-846 (December 1996). For PAHs and TPH-DRO, you must use clean, laboratory-grade jars with tight-fitting lids, follow proper decontamination procedures between sampling, and keep the samples on ice or refrigerated at all times after collection and during shipment to the laboratory. The maximum holding time for PAH and TPH-DRO samples is 14 days from the date of collection.

2.) GROUNDWATER SAMPLES

Collect groundwater samples for volatiles such as BTEX (Method 8260B or 8021B) in clean 40 ml glass vials with Teflon™-lined lids appropriate for
laboratory analysis. These vials may be obtained from scientific or laboratory suppliers. Follow the laboratory instructions and EPA guidelines for filling sample containers and preserving the samples during shipment. The maximum holding time for preserved groundwater samples analyzed with the methods outlined in this document is 14 days.

Sampling methods for PAHs and TPH-DRO are outlined in SW-846 (December 1996). As stated previously, clean, laboratory-grade bottles with tight-fitting lids must be used and proper decontamination procedures must be followed. The samples must be kept on ice or refrigerated at all times after collection and during shipment to the laboratory. The maximum holding time for PAH and TPH-DRO samples is 14 days from the date of collection.

C. NUMBER AND LOCATION OF SOIL AND GROUNDWATER SAMPLES

Follow the guidelines below to demonstrate compliance with the UST closure requirements. It is your responsibility to ensure that a sufficient quantity and quality of samples are taken to determine if a release has occurred.

1.) SOIL SAMPLES FROM UST EXCAVATION

Upon tank removal, collect at least the following number of soil samples, from native soil, approximately two feet below the estimated tank bottom:

- one sample per tank up to 1,050 gallons
- two samples per tank from 1,050 to 12,500 gallons
- additional sample per tank for every 10,000 gallons, or fraction thereof, in excess of 12,501 gallons
- One of the soil samples must be collected from the fill-port end of the UST(s).
- One sample per 200 cubic yards of stockpile of excavated soil, or fraction thereof, or one sample per 200 cubic yards of backfill material if backfill is not excavated.

To estimate the size of the stockpile, multiply the length of the excavation by the width and by the depth in feet, and divide by 27 to obtain a result in cubic yards. Then subtract .005 yards per gallon of capacity of the USTs removed. The formula is:

\[(L \times W \times D) - .005 \times C = \text{Volume of the stockpile in yards}\]

Where \(L\) = Length of excavation, \(W\) = Width of excavation, \(D\) = depth of excavation, \(C\) = The total number of gallons contained by the USTs removed
If groundwater is encountered during excavation, one groundwater sample per contiguous UST pit must be collected in order to determine the highest groundwater contaminant concentrations beneath the contaminated soil. See section on “Groundwater Samples” below.

If a tank is being closed in place, take a minimum of one soil sample from each end of each tank, but no less than the appropriate number listed above, at least two feet below the estimated tank bottom. The samples should be taken as close to the tank as possible. Analyze groundwater if encountered in the borings or monitor wells and report the results. See Section II.C.4. for a discussion of groundwater sampling from borings vs. monitor wells.

a) BEDROCK CONDITIONS

If bedrock is encountered during excavation or sampling, collect the required soil samples just above the top of bedrock. If contamination is present on top of the bedrock at the soil/bedrock interface, a well will be required in the bedrock at the location of the contaminated soil, to a depth of 20 feet into the bedrock or to the water table, whichever is encountered first. If groundwater is encountered in the bedrock, wells must be installed deeply enough to allow for an adequate screen length. Generally, if these monitor wells are extended to the same elevation (relative to a common datum) as the nearest surface water body, and they do not contain water, it is considered unlikely that the site serves as a recharge area for the nearby surface water body. Exceptions include sites in karst areas in which groundwater flow is much less predictable. Wells must be installed under the direction and oversight of a Professional Engineer or Professional Geologist registered in the State of Georgia.6

In cases where nearby water supply wells have been impacted by petroleum, additional investigation may be required on a case-by-case basis, in order to protect human health and the environment. The presence of groundwater contamination is one of the conditions under which a CAP-A is required (reference the Rules for UST Management 391-3-15.)

2.) IF OVER-EXCAVATION IS PERFORMED

This section only addresses the location of samples collected after over-excavation. Please refer to Section III “Over-Excavation” for more information on over-excavation.

Following tank removal and over-excavation collect the following confirmation samples:

- one sample every 30 linear feet along the base of the sides (within 1 foot of the bottom of the excavation or at the base of the former UST pit.)
- one sample per 200 square feet along the bottom of the excavated area.

Sample the backfill and excavated material and clearly identify the results as samples from the excavated material in the report. Sampling of excavated and stockpiled soils is discussed in more detail under Section IV. "Disposal of Excavated Material" later in this document. Separation of contaminated soil from relatively uncontaminated soil during excavation may reduce the volume of soil requiring treatment or off-site disposal and reduce costs.

Samples should be taken from the area(s) of worst-case contamination. These areas typically include locations under the UST at the fill neck end or where evidence of spillage or leakage has been observed. When two or more samples are taken from the bottom of the tank pit, they must not be taken from the same location; instead, they should be representative of the tank area. If initial sampling found no contamination in some areas of the UST pit and piping trench, and over-excavation is performed up to the specified dimensions in the remaining contaminated areas, then confirmatory sampling is necessary only in the over-excavated area. Additional confirmatory sampling is not required in areas where no detectable concentrations of BTEX, PAHs (if applicable), and TPH were found during the initial sampling. Composite sampling for BTEX and TPH-GRO is not acceptable since it does not comply with SW-846 Method 5035. Sample and handle stockpiled soil in accordance with Section IV, "Disposal of Contaminated Soil" and Section V, "Conditions for No Further Action Required (NFAR) Status."

3.) SOIL SAMPLES FROM BELOW PIPING TRENCH AND DISPENSERS

Following piping closure, collect soil samples along the piping trench for a total of at least one sample per 25 feet. In addition, collect at least one sample per 25 feet of contiguous dispenser island. Collect each sample from native soil, beneath a dispenser. If the dispenser is directly above the UST to which it is connected, sample collection beneath the dispenser is not necessary, since the soil above the UST will usually be excavated during closure. Samples should be collected from the worst-case locations, such as the elbows and other line fittings near the dispensers, as well as beneath sample locations where indicators of contamination such as petroleum odors or staining have been observed. Obtain the samples from the native soil underlying the backfill material, along the centerline of the trench. Also obtain samples from the backfill and other excavated material after stockpiling to determine the proper method of disposal and clearly identify the results as samples of excavated material in the report. Separation of contaminated soil from relatively uncontaminated soil is recommended to lower disposal costs. See Section IV, "Disposal of Contaminated Soil."

If soil in the piping trench is over-excavated, take the samples from the bottom of the excavation. If piping is less than twenty-five (25) feet from the UST excavation, a piping sample is not necessary, but take at least one sample per 25 feet of contiguous dispenser island, as discussed below. Vertically delineate
any soil contamination to non-detectable levels or obtain a groundwater sample from the piping/dispenser area. See the section below for details on groundwater sampling and Section III., “Over-Excavation” for more details on the limitations for over-excavation of piping trenches and dispenser islands.

Following closure of each dispenser and/or over-excavation of the dispenser island area, take at least one sample per 25 feet of contiguous dispenser island. Collect each sample from native soil beneath a dispenser. Sample any backfill and other excavated material removed from below the dispenser(s) in order to determine the proper method of disposal for the stockpile. Vertically delineate any soil contamination to non-detectable levels unless a groundwater sample is obtained from the piping/dispenser area, as outlined in the section below. In the report, clearly identify the samples as being collected from the excavated material in order to avoid confusion with confirmation samples collected from the bottom of the excavation. Excavated material may be stockpiled together and one sample collected for every 200 cubic yards or fraction thereof as described under section IV., “Disposal of Contaminated Soil.”

4.) GROUNDWATER SAMPLES

a) REQUIRED GROUNDWATER SAMPLING

If groundwater is encountered during closure, groundwater samples must be collected, whether the groundwater samples are obtained during removal of the UST system, or from borings or monitor wells advanced to the watertable in the areas of highest contamination. If bedrock is encountered before contaminated soil is vertically delineated, then refer to Section II.C.1.a. which discusses this situation. If more than one foot of groundwater covers more than fifty percent of the base of the excavation, a groundwater sample may be taken instead of soil samples from the base of the excavation. If a groundwater sample is taken instead of the soil samples from the base of the excavation because groundwater has entered the excavation, one soil sample per UST must be collected along the sides at the soil-water interface, immediately adjacent to the ends of the former USTs at the fill-port end. Sample groundwater where contamination is most likely to be found; i.e., from worst-case locations.

b) GROUNDWATER SAMPLING TO REDUCE SOIL SAMPLING

In lieu of vertical delineation of soil samples in the UST pit, a monitor well or boring to the water table may be installed within two feet of the UST pit, and a groundwater sample collected and analyzed. If groundwater sampling is performed, only one soil sample per UST will be deemed necessary to characterize the soil left in the excavation, in addition to the samples required to characterize the excavated materials, the remaining soils in the piping trench, and beneath the dispenser areas.
Be cautioned that samples collected from open borings instead of properly constructed monitor wells may cause contamination to be dragged from an upper contaminated soil layer above the water table into the groundwater, and lead to a false-positive result of groundwater contamination; therefore installation of properly constructed monitor wells is encouraged when possible. The collection of groundwater samples from borings or piezometers installed by direct-push methods is also discouraged unless previously installed groundwater monitor wells exist at the site to accurately locate the top of the water table. Because borings installed by direct-push methods tend to smear the clay in soils along the sides of the borehole, accurate water levels and water samples representative of the top of the water table are difficult to obtain. Water samples collected by this method without supporting water-level data from on-site groundwater monitor wells are not considered to be consistently representative of worst-case conditions.

If the piping extends more than 25 feet from the USTs to the dispensers, and groundwater sampling is to be performed in lieu of vertical delineation at the piping and dispensers, an additional monitor well at the dispenser island should be installed within two feet of the dispensers, in the estimated downgradient direction of groundwater flow. If more than one dispenser island exists and the direction of groundwater flow cannot be estimated from topography, the monitor well should be situated at a midpoint between the dispenser islands, within 25 feet of each dispenser. If the size of the dispenser area is so great that one monitor well cannot be located within 25 feet of each dispenser, then more monitor wells would be necessary to characterize the area if the direction of groundwater flow is not apparent from topography.

On the other hand, if the dispensers are within 25 feet of the monitor well installed to characterize the UST pit, only one well per contiguous UST pit would be required instead of vertical delineation of soil contamination at the USTs, piping and dispensers.

Please note that a Professional Geologist or Professional Engineer registered in the State of Georgia must direct and supervise the installation of any boring or monitor well advanced to the water table and the interpretation of geologic data. If a boring is advanced to the water table, include a boring log with the closure report, signed and sealed by the PG or PE who supervised and directed the installation and proper abandonment of the boring. If a groundwater monitor well was installed, include a boring log and a well construction diagram for each boring or well, signed and sealed by the PG or PE who supervised and directed its installation and proper abandonment (if abandoned). Field supervision may be conducted by a subordinate to a registered Professional Geologist or Professional Engineer, as outlined in the laws governing registered Professional Engineers and Geologists.8

c) ADVANTAGES OF GROUNDWATER SAMPLING
Groundwater sampling has the advantage of eliminating multiple vertical soil samples, remobilizations, and TPH sampling of confirmation samples. It usually results in speedier resolution of the closure. EPD conducted a review of soil and groundwater data from all closure reports, CAP-As and Phase II site assessments submitted for non-reimbursable sites between October, 1999 and May, 2000. The study found that more than half (55%) of all the closure sites required remobilization to determine whether groundwater was impacted.

The study also revealed that the absence of soil contamination above applicable Threshold Levels (see Appendix D for the Threshold Tables) is not a reliable indicator of the absence of groundwater contamination. Most of the closure sites with groundwater contamination (54%) reported all soil confirmation samples below applicable Threshold Levels.

Furthermore, even when confirmation soil samples are delineated to non-detectable concentrations, approximately 4% of assessments or closures at sites with impacted groundwater may fail to determine that groundwater contamination is present, unless groundwater samples are collected at the source areas. The study found that 4% of sites with impacted groundwater reported no detectable soil contamination in any confirmation sample (Appendix E).

The No Further Action Required (NFAR) status of sites is usually rescinded when groundwater contamination is discovered at a later date. The last owner/operator of the USTs that leaked is often considered the responsible party for corrective action in cases where the USTs have been removed prior to discovery of contamination. A thorough environmental assessment upon UST closure makes it more likely that adequate funds will be set aside for any required corrective action.

A survey performed by the EPD found that the cost of installing one to two groundwater monitor wells to a depth of 25 feet in unconsolidated soil was approximately equal to or less than the cost of re-mobilizing an excavator or drill rig to the site to further vertically delineate soil contamination. Further savings were realized in the elimination of all TPH analysis of confirmation samples and approximately half of the BTEX and PAH samples from the UST excavation, which is possible when a groundwater sample or samples are collected, as outlined above. The difference in cost ranged from a 40% savings (if one monitor well was installed, compared to mobilization of the cheapest excavator), to an 8% increase in cost (if two monitor wells were installed instead of mobilizing the least expensive excavator that responded to the survey).

If a CAP-A is required, the monitor wells may be used towards the three to four monitor wells required for a complete CAP-A and will be considered for reimbursement for GUST-Trust Fund eligible releases.

III. OVER-EXCAVATION

GUST - 9

16 November, 2006
Soil excavation is considered a method of remediation, and when it is performed, it is usually conducted as an interim corrective action during tank closures. Because this is a form of corrective action, the issue of reimbursement for these actions is addressed here as well.

A. DEFINITIONS

Any soil excavation beyond three (3) feet from the outermost sides and ends of any UST, beyond one (1) foot from the bottom of the deepest UST, or beyond one (1) foot from the piping or dispensers, will be considered “corrective action” and “over-excavation”. If more than one UST is present in the pit, and the USTs are laid side-by-side, measurement will extend from the sides of the outermost USTs and the ends of the USTs. If the USTs are laid end-to-end, measurement will extend from the ends of the outermost USTs and the sides of the USTs. However, if excavation exceeds these dimensions, the site may still receive NFAR status without preparation of a CAP if the conditions outlined in Section V are met. Over-excavation, as defined here in relation to a UST closure, will not be considered for reimbursement unless the scope, costs, and other pertinent information have been adequately detailed and proposed in a Corrective Action Plan (CAP), and subsequently approved by EPD. Soils or backfill excavated within the three (3) foot or one (1) foot limitations specified above are considered part of the UST closure and are not reimbursable under any circumstances.

B. REIMBURSEMENT

If you are trying to obtain a “clean closure”, over-excavation as a part of a UST closure is permitted, but will not be reimbursed. Reimbursement for such over-excavation WILL NOT be considered unless it has first been proposed in a CAP and subsequently approved by EPD. As stated previously, soils or backfill excavated within the three (3) foot or one (1) foot limitations specified above are considered part of the UST closure and are not reimbursable under any circumstances.

If soil contamination is present in the excavated material and has been delineated in the excavation to below detectable limits during closure, and the soil contamination is the only factor driving preparation of a CAP-A, off-site disposal is probably the most cost-effective solution instead of placing the soil back into the excavation and preparing a CAP-A and possible CAP-B. A CAP prepared only to address soils excavated within the three-foot/one-foot limitations described above will not be reimbursed, since remediation of such soils constitutes non-reimbursable closure activities only.

C. LIMITATIONS AND REQUIREMENTS

The following limitations and requirements apply when conducting non-reimbursable over-excavation for a “clean closure” without an approved CAP:
1) Because soil excavation is typically not a cost-effective method of remediating large amounts of contaminated soil, it is generally discouraged whenever possible. Therefore, more than six (6) feet below and beyond the ends of the UST, more than six (6) feet beyond the sides of the UST, and more than four (4) feet below and beyond the product piping or dispenser island should not be excavated. If more than one UST is located in the excavation, more than six (6) feet beyond the sides of the outermost USTs, and more than six (6) feet below and beyond the ends of the USTs should not be excavated. This limitation is separate from the definition of “over-excavation” for reimbursable sites. Please be advised that in-place remediation methods are usually more cost-effective than over-excavating in excess of these dimensions. In-place remediation requires the preparation of a CAP.

2) Because free product is often trapped below the water table, soil excavation is usually not an effective method of removing free product and will not be considered an approved method of corrective action for free product in most cases. Free product must be removed immediately when encountered and the methods detailed and justified in the CAP-Part A.

3) Whenever over-excavation is conducted, a site map showing the excavation with a detailed description of the tank pit, piping and dispensers must be provided to the USTMP. This figure must include the dimensions of the UST(s), locations of the UST(s) within the tank pit, the piping, dispensers, over-excavation areas, and the final excavation dimensions.

4) Soil excavated for the tank closure, including backfill or over-excavated native soil may be placed back into the excavation if laboratory analysis shows that the concentrations in the excavated soils are less than the applicable threshold levels for BTEX and PAHs and the soil does not contain free product (approximately 10,000 mg/kg TPH). If soils containing contamination above applicable BTEX or PAH Threshold Levels are placed back into the excavation, preparation and submittal of a CAP-A (calculating alternate threshold levels) and/or a CAP-B (detailing in-place remediation methods) is required. See “Disposal of Contaminated Soil” below.

5) Excavated contaminated soils cannot be stockpiled on the site for more than 90 days. See “Disposal of Contaminated Soil” below for more information.

IV. DISPOSAL OF CONTAMINATED SOIL

If the soil is to be temporarily stored on site, place the contaminated soil on plastic sheeting and cover it with plastic sheeting to prevent infiltration, runoff and contamination of surface waters during inclement weather. Soil may also be temporarily stored in 55-gallon drums on site.
of any drums is suggested to discourage other parties from adding unwanted drums from unknown sources during off-hours.) During excavation, contaminated soil may be separated from relatively uncontaminated soil to reduce the volume of material requiring treatment or off-site disposal. Do not store stockpiled soil on site for more than 90 days.

Collect one sample from each stockpile per every 200 cubic yards of excavated soil or fraction thereof (composite samples are not acceptable) and submit the laboratory analytical results in the closure report. Excavated material may be placed back into the excavation if:

- the analytical results of samples from the stockpiled soil (including the backfill) are less than the applicable Threshold Levels listed on Table A for BTEX and PAHs (see Appendix D or GUST Rule 391-3-15-.09(3)), and if no visible free product (approximately 10,000 mg/kg TPH) is present in the soil,

  OR

- the analytical results of samples from the stockpiled soil (including the backfill) are less than the applicable Threshold Levels listed on Table B for BTEX and PAHs (see Appendix D or GUST Rule 391-3-15-.09(3)), no visible free product (approximately 10,000 mg/kg TPH) is present in the soil, and it is documented that there are no points of withdrawal for public or non-public water systems within the prescribed radii in Rule 391-3-15-.09(3)(c)(1)&(ii). Refer to Appendix F for acceptable methods and documentation required for water supply surveys.

  OR

- a CAP-A is submitted which demonstrates that the excavated soil is below alternate threshold levels or if the method of in-place treatment of any contaminated soil is outlined and justified in a CAP-A and/or a CAP-B. However, be cautioned that disposing contaminated soil off-site at a permitted treatment or disposal facility is often more cost-effective than placing the soil back into the excavation and preparing a CAP-A and possible CAP-B, if the contaminated excavated material is the only factor driving preparation of a CAP-A. A CAP prepared only to address soils excavated within the three-foot/one-foot limitations described in Section II.A. will not be reimbursed since remediation of such soils constitutes non-reimbursable closure activities only.

Please note that stockpiled soil that does not have detectable levels of BTEX or PAHs, is classified as a recovered material, and may be handled as ordinary soil.

If the stockpiled soil is contaminated with free product (approximately 10,000 mg/kg TPH) it may not be placed back into the excavation. The contaminated soil may be taken to an EPD-permitted treatment or disposal facility, in accordance with the attached guidance document Petroleum Contaminated Soil Disposal/Treatment (GUST-39). Proper disposal of stockpiled contaminated soil should occur as soon as possible, but no later than 90 days after the tank closure. Provide copies of soil disposal manifests with either the Closure Report or CAP-Part A, as applicable.
For on-site soil treatment or in-place remediation, a CAP-Part A and CAP-Part B are required.

V. CONDITIONS FOR "NO FURTHER ACTION REQUIRED" (NFAR) STATUS

Under some conditions, NFAR status may be obtained through over-excavation of any soil contaminated above threshold levels if it is demonstrated that groundwater has not been impacted. This section and Section II, “Sample Collection and Analysis Requirements” outlines the acceptable methods for determining whether groundwater has been impacted.

If the soil is over-excavated, document satisfactory removal of contaminated soil and provide analytical results of confirmatory soil samples obtained from the bottom and sides of the excavation. As stated before, if soil is over-excavated, EPD recommends that a minimum of one grab sample be taken every thirty feet along the base of the excavation sides and one sample per 200 square feet along the bottom of the excavation. No Further Action Required (NFAR) status may be achieved if the guidelines are followed and the analytical results for samples collected beneath the tanks and piping either prior to or following any over-excavation indicate one of the following:

BTEX, PAHs (if applicable) and TPH are below estimated quantitation (detection) limits (BDL) in the soil in every sample.

OR

BTEX and PAHs (if applicable) are BDL in all soil samples and TPH in soil is vertically delineated to BDL above the groundwater table;

OR

BTEX or PAHs in the initial samples are above estimated quantitation (detection) limits in soil but below the applicable Table A Threshold Levels (listed in the GUST Rules) and confirmation soil samples collected beneath the contaminated soil samples are BDL for BTEX, PAHs (if applicable), and TPH; i.e., BTEX, PAHs, and TPH are vertically delineated to BDL above the groundwater table;

OR

BTEX or PAHs are above quantitation (detection) limits in initial samples, but below the applicable Table B Threshold Levels, listed in the GUST Rules, a water supply survey indicates that there are no potential receptors within the applicable radii, and soil samples collected underneath the contaminated soil are BDL for BTEX, PAHs (if applicable), and TPH; i.e., BTEX, PAHs, and TPH are vertically delineated to BDL above the groundwater table. See Appendix F for acceptable water-supply survey methods and documentation.

OR
BTEX and PAHs are less than the applicable Table A Threshold Levels, listed in the GUST Rules, and BTEX, PAHs (if applicable), and TPH is not vertically delineated to BDL above the water table because groundwater was encountered in the boring or the excavation, but the groundwater sample does not contain BTEX or PAHs above Federal or State Maximum Contaminant Levels (MCLs);

OR

BTEX and PAHs are less than the applicable Table B Threshold Levels, listed in the GUST Rules, and BTEX, PAHs (if applicable), and TPH are not vertically delineated to BDL above the groundwater table because groundwater is encountered in the boring or excavation, and the water samples do not contain BTEX or PAHs above In-stream Water Quality Standards, and the water supply survey indicates that there are no water supplies within the applicable radii. See Appendix F for acceptable water-supply survey methods and documentation. Samples must have been collected from acceptable worst-case (potential source) locations to ensure that soil and groundwater samples are representative of the center of the contaminant plume.

If one of the conditions for NFAR outlined above is not met, a CAP-Part A is required within 60 days of release confirmation and must include the closure information outlined in this guidance document.

VI. REPORT SUBMITTAL

Any time a tank or piping is closed in place or removed, you must inform EPD by submitting one of the following reports:

A. CLOSURE REPORT

When analytical results indicate that there are no detectable levels of contamination, i.e., a release has not occurred, a Closure Report (including the completed Closure Report Form) must be prepared and forwarded to the USTMP within forty-five (45) days after tank UST removal or in-place decommissioning. This brief report must address all pertinent information and attachments, as outlined in the attached Closure Report Form. This report must be retained by the tank owner/operator for at least three (3) years. A CAP-Part A should not be prepared in such a case.

If detectable levels of contaminants were present in the soil or groundwater, but the results and site conditions are identical to one of the scenarios for NFAR described above, a CAP-Part A is not required and a Closure Report must be submitted within 45 days of removal or in-place closure of the USTs.

All Closure Reports must meet the following requirements in addition to the other requirements discussed in this document:

1) The report must include a completed Closure Report Form (Appendix G) and other required attachments. An updated 7530-1 is not required, since the required
tank notification information and signature are to be submitted on the closure report form.

2) The report must be submitted to EPD within 45 days after completion of closure (i.e., UST removal or decommissioning).

3) The report must contain a site map constructed in accordance with the attached Closure Report Form. **The map must be to scale OR, as a minimum, distances between the tank pit area, piping trenches, dispenser islands, sewer, water, or other utility lines (or other preferential pathways), roads and main building must be accurately indicated.** It must also include a north (N) directional arrow. Tank IDs must correspond to most recent EPA Form 7530-1 that was submitted to register the USTs, and sample locations with sample numbers and depths must also be shown. Sample numbers must correspond to the attached laboratory analytical data. Although not mandatory, photos may be attached to help clarify the UST system layout in addition to the scaled map.

**B. CORRECTIVE ACTION PLAN (CAP) PART A**

If free product is encountered, recovery must begin immediately. If free product is present or if contaminant levels and site conditions do not meet the criteria for NFAR outlined above then a CAP-Part A **must** be prepared. If a CAP-Part A is prepared, then the closure information outlined in this document is required as part of the CAP-Part A. In that case, a closure report form should be completed and included in the CAP-A and not be submitted separately. **The CAP-Part A must be prepared in accordance with the GUST Rules and in the format outlined in the CAP-Part A guidance document.**

If a CAP-Part A must be prepared, it must be directed and supervised by a Professional Engineer (PE) or Professional Geologist (PG) registered in the State of Georgia. The professional registration status of an individual is available from the Boards of Registration at (912) 656-2281 or on the web at http://www.sos.state.ga.us. If a CAP-Part A is required, it must be submitted to EPD **within 60 days** after release confirmation.
VII. REQUIREMENTS FOR RELEASE NOTIFICATION

The GUST Rules define a release as any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an UST system into groundwater, surface water or subsurface soils. If contamination is detected in soil or groundwater samples or if a release is detected through other means, the owner/operator must notify EPD via telephone at (404) 362-2687 by the next business day explaining what has been found and what steps were taken to eliminate any hazardous conditions and prevent the spread of contamination.

This notification must be made whenever free product is encountered and/or analytical results indicate that BTEX, PAH, or TPH contamination is present in the soil and/or groundwater. If contaminated soil or groundwater is discovered, or if a release is discovered by other means, a CAP-Part A must be prepared in accordance with the GUST Rules and in the format outlined in the CAP-Part A Guidance Document unless contaminated soil is successfully excavated within the dimensions discussed in "Over-Excavation," the soil is properly disposed of off-site, and it is demonstrated that groundwater has not been impacted above the water quality standards. Demonstration of clean groundwater may be accomplished by either collection of a groundwater sample or by vertical delineation of soil contamination to non-detectable levels. Collect confirmatory samples in accordance with the Section II.C. "Number and Location of Soil and Groundwater Samples."

If a CAP-Part A must be prepared for the remediation of a soil stockpile only (not in-place remediation of impacted soils), and groundwater has not been impacted, collect the samples required by this guidance document, complete the Closure Report Form and include the attachments and form in the CAP-Part A. Include in the CAP-A a description of the method of soil remediation and what measures will be taken to prevent run-off and leaching of contaminated soil during treatment, in accordance with the CAP-A Guidelines. Installation of three additional monitor wells, collection of groundwater samples and determination of groundwater flow direction would not be required for a CAP-A prepared only to address soil contamination, if it has been determined that groundwater is not impacted through vertical delineation of soil contamination. For more information, please refer to Section IV, "Disposal of Contaminated Soil" and Section V, "Conditions for No Further Action Required (NFAR) Status," and Section VI, “Report Requirements”, and the CAP-A Guidelines.

VIII. UST CLEANING AND DISPOSAL

A. UST CLEANING

Petroleum residuals may accumulate in the bottom of the tank, particularly if it has been in use for a long period of time. The residuals may be hazardous because they may contain lead and volatile organic components. Any substances used to clean the tanks, if mixed with the sludge, may be classified as a hazardous waste. These sludges and hazardous wastes should only be handled by qualified personnel, trained and authorized to do this work. Any hazardous wastes must also be handled and
disposed of in accordance with the Georgia Rules for Hazardous Waste Management, which can be obtained by calling (404) 656-7802. Additional guidance for tank cleaning can be found in publications available from:

National Fire Protection Association (NFPA)
Batterymarch Park
Quincy, Massachusetts 02269
617/770-3500

American Petroleum Institute (API)
1220 L Street, N.W.
Washington, D.C. 20005
202/682-8372.

B. UST DISPOSAL

Before the tank is transported for reduction to scrap, it must be made vapor-safe (by inerting or purging) and prepared in accordance with recommended practices of API 1604. If it is transported off site prior to being reduced to scrap, it must be transported in accordance with Part 393.1 of the Federal Motor Carrier Safety Regulations. Because of the extreme danger involved in handling used petroleum tanks, EPD recommends that only qualified and experienced personnel perform this procedure. Every precaution should be taken to prevent a fire or explosion when the tank is handled and/or destroyed. When reducing the tank to scrap, it is recommended that methods be used which reduce the possibility of fire or explosion hazard as much as possible.

C. RE-USE OF UNDERGROUND STORAGE TANKS

Although the GUST Act and Rules do not disallow re-use of USTs, EPD discourages this practice. All tanks to be installed, or reinstalled, are subject to state and federal requirements for new UST systems. All used tanks must be recertified by the manufacturer, a manufacturer's representative, or Georgia registered Professional Engineer as meeting new tank requirements before the tank can be reused, in accordance with USTMP Rule 391-3-15-.05. API Publication 1604, Section 6.1, as referenced in 40 CFR Part 280, states that tanks which previously contained petroleum must not be used for storage of food or liquids intended for animal or human consumption.
NOTES


5 State of Georgia. Official Code of Georgia (OCG). *Water Well Standards Act of 1985.* OCG 12-5-125, “Except as provided in subsection (f) of Code Section 12-5-127, no person shall drill a water well without first having a water well contractor's license issued by the council. No person, including licensed water well contractors, shall drill any other kind of well, borehole, or corehole unless such person is acting under the direction of a professional geologist or a professional engineer.”

12-5-136..”All water well contractors or other persons drilling boreholes or coreholes are required to conduct their work in a manner that complies with the well construction standards established in this part and are required to be licensed or acting under the direction of a professional engineer or professional geologist as set forth in Code Section 12-5-125.”
12-5-122, "Monitoring well" means any well for which the primary purpose is to collect data for hydrologic, geohydrologic, or ground water quality or quantity evaluations. "Borehole" means a hole made into the earth's surface and extending at least 50 feet into the earth or at least ten feet below the water table. 

6 ibid.

7 ibid.

APPENDIX A

CLOSURE ACTIVITY FORM (GUST-29)
NOTICE DATE: _________________

GEORGIA UNDERGROUND STORAGE TANK (GUST) CLOSURE ACTIVITY FORM

For underground storage tanks (USTs), which will be permanently closed by removal or in-place, this form should be completed and submitted to the address above at least 30 days prior to the proposed closure. USTs should be closed within ninety (90) days after the proposed closure date as reported to EPD.

I. FACILITY INFORMATION:

Facility Name: _________________________________________________________________________
Contact Person: __________________________________________ Telephone: (____)______________
Address (location; P.O. Box not acceptable): _________________________________________________
City: _______________________________ County: ______________________ Zip Code: ____________
Facility ID: _________________________

II. UST INFORMATION:

<table>
<thead>
<tr>
<th>Tank ID</th>
<th>Tank Size (gallons)</th>
<th>Contents</th>
<th>Type of Closure (check one)</th>
<th>Date Last Used</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Removal</td>
<td>In-Place</td>
</tr>
</tbody>
</table>

III. UST OWNER:

UST Owner Name: _____________________________________________________________________
Mailing Address: ______________________ City: _______________ State: _____ Zip Code:__________

IV. CONTRACTOR:

Company or Organization Name: __________________________________________________________
Contractor Representative Name: _______________________________ Telephone: (____)______________
Address: ____________________________ City:________________ State:______Zip Code:___________

V. CLOSURE NOTIFICATION INFORMATION:

As UST owner, I certify that the information concerning permanent closure of the UST system referenced on this form is true to the best of my belief and knowledge, and that the requirements of Subpart G of Title 40 CFR Part 280 and the Georgia Environmental Protection Division Closure Guidance (GUST-9, as revised) will be met. (Not valid without owner signature.)

Name (Print): ______________________ Title: ____________________________
Organization Name: ______________________ Telephone: (____)______________
UST Owner Signature: ___________________________ Date: ________________________

GUST-29
APPENDIX B

SUMMARY OF METHOD 5035 SOIL SAMPLING PROCEDURES
SUMMARY OF METHOD 5035 SOIL SAMPLING PROCEDURES

Soil samples may be collected and shipped in one of two ways. One method requires the use of Encore™ samplers (as specified by SW-846), which must be sealed after sample collection, and immediately placed in a cooler in watertight containers on ice or on frozen ice packs. They must be shipped via overnight delivery to the laboratory for preservation and analysis. The Encore™ sample must arrive at the laboratory within 48 hours for preservation. At all times after collection and during shipment, the sample must be cooled to a minimum of 4 degrees Celsius and kept at or below that temperature. If the proper procedures are not followed, the results may not be valid and will not be accepted. (It is recommended if the samples are shipped that they be insured for the cost of re-sampling, since the samples will not be valid if they do not arrive at the laboratory in time to be preserved within 48 hours.) After the laboratory preserves the samples using this method, they may be held for a maximum of 14 days before being analyzed.

The second method requires the use of a small-diameter coring device (such as a 10 ml syringe with the tip removed) to collect the sample. This soil sample must be placed into pre-weighed 40 ml glass vials containing appropriate preservatives and cooled to 4 degrees Celsius immediately. SW-846 requires that the sample containers be “prepared in a fixed laboratory or other controlled environment, sealed, and shipped to the field location”, and that they must be “clean” if analyzed using Method 8021B. The introduction to SW-846 describes a very complex series of steps necessary to clean sampling containers, so cleaning by a laboratory is recommended. Approximately 5 g of sample must be placed in each vial for proper analysis. All sample vials must be laboratory-cleaned following the procedures outlined in SW-846, and weighed in the laboratory prior to sample collection.

Many laboratories have developed procedures to reduce the complexity of the field sampling, such as providing pre-weighed 40 ml vials with pre-measured preservative in each vial. According to a strict interpretation of Method 5035, the vials should be weighed in field again, immediately prior to placement of the sample into the vial. However, it is accepted by the EPD that it has become common practice to omit weighing the sample bottle in the field. The sampler should recognize, however, that not doing so is a modification of the method, and may affect the analytical results. If the laboratory provides pre-weighed vials with preservative in each vial, no preservative can be spilled from the vial during sample collection or the analytical results will not be accurate. Also, ensure that no soil has adhered to the exterior of the vial or its cap.

If the samples are preserved in the field at the time of sampling, the holding time is 14 days from the date of collection. If the samples are shipped to the laboratory before being preserved, the laboratory must preserve the samples within 48 hours, as with the Encore™ method. All samples must be preserved within 48 hours in order for the results to be valid whenever using any of the above methods and they must be kept on ice or frozen ice packs in water-tight containers in a cooler or kept in a refrigerator at or below 4 degrees Celsius at all times after collection. Do not allow water to enter the sample container.
When the samples are preserved in the laboratory or in the field, an adequate number of samples must be collected from each location to preserve the samples in two separate vials with two types of preservative: methanol and sodium bisulfate. Additional samples may be necessary for the laboratory to measure moisture content or to analyze the sample at a higher dilution. Consult your laboratory for the number of samples required at each sampling location. Methanol preservative is required in order to detect higher concentrations of BTEX and other volatiles and the sodium bisulfate preservative is required to detect lower concentrations of BTEX and other volatiles. Since the EPD needs to know the concentrations in both ranges, use of both preservatives in separate vials is required for closure sampling.

If the soil sample contains natural carbonates it may “fizz” or effervesce when it comes in contact with the sodium bisulfate. If the sample effervesces when placed into the vial containing sodium bisulfate, you cannot preserve soil samples from that location in sodium bisulfate. If this is the case, you must collect another sample in a 40 ml vial, add no preservative, ship it on ice or ice packs. The laboratory must receive it and analyze it within 48 hours of collection, or preserve the sample using an alternate and equally effective method.
APPENDIX C

SAMPLE AFFIDAVIT
--SAMPLE AFFIDAVIT--

(Re-type this form and omit the paragraph that does not apply.)

OWNER/OPERATOR AFFIDAVIT
STATE OF GEORGIA

(County)

Personally appeared before me, the undersigned attesting Authority in and for said State and County, the following deponent, who being first duly sworn, on oath deposes and says as follows:

1) That I am the (previous) owner/operator, or the _________ of ____________, the owner/operator of the following facility:

   Facility Name:
   Address:

   Facility ID:

--CHOOSE ONE--

2) That as the owner/operator, or authorized agent thereof, of the facility from _______ (month) of _______ (year), when the facility was constructed, until the present time, I have knowledge that only gasoline has been stored in and sold from the current or prior Underground Storage Tank(s) (USTs) on site. I also have knowledge that diesel fuel, fuel oil, used oil, or other petroleum hydrocarbons, other than gasoline have never been stored in or sold from the current or prior UST(s) on site.

OR

2) That as the previous owner/operator, or authorized agent thereof, of the facility from _______ (month) of _______ (year) when the facility was constructed until _______ (month) of _______ (year) when the facility was sold to ______________ (current owner), I have knowledge that, during that period, only gasoline has been stored in and sold from the Underground Storage Tank(s) (USTs) addressed on site. I also have knowledge that during that period diesel fuel, fuel oil, used oil or other petroleum hydrocarbons, other than gasoline, have never been stored in or sold from the UST(s) on site.

   Signature:
   Name (printed:__________________________

Sworn to and subscribed before me this

____day of ______ (Month), ________(Year).

Notary Public
APPENDIX D

TABLE A AND TABLE B SOIL THRESHOLD LEVELS

(FROM GEORGIA DEPARTMENT OF NATURAL RESOURCES RULE 391-3-15-.09)
Table A Soil Threshold Levels
Petroleum Constituents and Soil Threshold Levels\(^a\)

At UST corrective action sites where withdrawal points for public and non-public water supplies exist within distances defined in GUST Rule 391-3-15-.09(3)

<table>
<thead>
<tr>
<th>CONSTITUENT</th>
<th>AVERAGE OR HIGHER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA(^b)</th>
<th>LOWER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Where public water supplies exist within 2.0 miles or non-public supplies exist within 0.5 miles)</td>
<td>(Where public water supplies exist within 1.0 mile or non-public supplies exist within 0.25 miles)</td>
</tr>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS</td>
<td>(\leq 500) feet to withdrawal point</td>
<td>(&gt;500) feet to withdrawal</td>
</tr>
<tr>
<td>Benzene</td>
<td>(0.005) mg/kg(^d)</td>
<td>(0.008) mg/kg</td>
</tr>
<tr>
<td>Toluene</td>
<td>(0.400) mg/kg</td>
<td>(6.00) mg/kg</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>(0.370) mg/kg</td>
<td>(10.00) mg/kg</td>
</tr>
<tr>
<td>Xylenes</td>
<td>(20.00) mg/kg</td>
<td>(700.00) mg/kg</td>
</tr>
<tr>
<td>POLYNUCLEAR AROMATIC HYDROCARBONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Anthracene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Benz(a)anthracene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>(0.660) mg/kg(^d)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>(0.820) mg/kg(^d)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>(1.60) mg/kg</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Chrysene</td>
<td>(0.660) mg/kg(^d)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Dibenz(a,h)anthracene</td>
<td>(1.50) mg/kg(^d)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Fluorene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Indeno(1,2,3-c,d)pyrene</td>
<td>(0.660) mg/kg(^d)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
<tr>
<td>Pyrene</td>
<td>N/A(^e)</td>
<td>N/A(^e)</td>
</tr>
</tbody>
</table>

\(^a\) - Based on worst-case assumptions for one-dimensional vadose zone and groundwater contaminant fate and transport models.
\(^b\) - Based on an assumed distance of 0.5 feet between contaminated soils and the water table.
\(^c\) - Based on an assumed distance of 5.0 feet between contaminated soils and the water table.
\(^d\) - Estimated Quantitation Limit. The health-based threshold level is less than the laboratory method limit of detection.
\(^e\) - Not applicable. The health-based threshold level exceeds the expected soil concentration under free product conditions.
## Table B: Soil Threshold Levels

Petroleum Constituents and Soil Threshold Levels

At UST corrective action sites where withdrawal points for public and non-public water supplies do not exist within distances defined in GUST Rule 391-3-15-.09(3)

<table>
<thead>
<tr>
<th>CONSTITUENT</th>
<th>AVERAGE OR HIGHER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA&lt;sup&gt;b&lt;/sup&gt;</th>
<th>LOWER GROUNDWATER POLLUTION SUSCEPTIBILITY AREA&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLATILE ORGANIC COMPOUNDS</td>
<td>≤500 feet to surface water body</td>
<td>≤ 500 feet to surface water body</td>
</tr>
<tr>
<td></td>
<td>&gt;500 feet to surface water body</td>
<td>&gt;500 feet to surface water body</td>
</tr>
<tr>
<td></td>
<td>(Where public water supplies exist within 2.0 miles or non-public supplies exist within 0.5 miles)</td>
<td>(Where public water supplies exist within 1.0 mile or non-public supplies exist within 0.25 miles)</td>
</tr>
<tr>
<td>Benzene</td>
<td>0.017 mg/kg</td>
<td>0.020 mg/kg</td>
</tr>
<tr>
<td></td>
<td>0.120 mg/kg</td>
<td>11.30 mg/kg</td>
</tr>
<tr>
<td>Toluene</td>
<td>115.00 mg/kg</td>
<td>135.00 mg/kg</td>
</tr>
<tr>
<td></td>
<td>500.00 mg/kg</td>
<td>500.00 mg/kg</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>18.00 mg/kg</td>
<td>28.00 mg/kg</td>
</tr>
<tr>
<td></td>
<td>140.00 mg/kg</td>
<td>140.00 mg/kg</td>
</tr>
<tr>
<td>Xylenes</td>
<td>700.00 mg/kg</td>
<td>700.00 mg/kg</td>
</tr>
<tr>
<td></td>
<td>700.00 mg/kg</td>
<td>700.00 mg/kg</td>
</tr>
<tr>
<td>POLYNUCLEAR AROMATIC HYDROCARBONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Anthracene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(g.h.i)perylene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chrysene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Dibenz(a,h)anthracene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluorantherne</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluorene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Indeno(1,2,3-c,d)pyrene</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.660 mg/kg&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Phenanthrene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pyrene</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
<td>N/A&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> - Based on worst-case assumptions for one-dimensional vadose zone and groundwater contaminant fate and transport models.

<sup>b</sup> - Based on an assumed distance of 0.5 feet between contaminated soils and the water table.

<sup>c</sup> - Based on an assumed distance of 5.0 feet between contaminated soils and the water table.

<sup>d</sup> - Estimated Quantitation Limit. The health-based threshold level is less than the laboratory method limit of detection.

<sup>e</sup> - Not applicable. The health-based threshold level exceeds the expected soil concentration under free product conditions.
APPENDIX E

REPORT REVIEW STATISTICS
REPORT REVIEW STATISTICS

Results of Review of Closure Reports received after October 1, 1999:

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFAR</td>
<td>211</td>
<td>53%</td>
</tr>
<tr>
<td>CAP-A</td>
<td>44</td>
<td>11%</td>
</tr>
<tr>
<td>Unresolved deficiencies</td>
<td>144</td>
<td>36%</td>
</tr>
<tr>
<td>N/A (Haz. Waste)</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>400</td>
<td>100%</td>
</tr>
</tbody>
</table>

Closure Review Results Without Unresolved Deficiencies and Hazardous Waste Sites:

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFAR</td>
<td>211</td>
<td>83%</td>
</tr>
<tr>
<td>CAP-A</td>
<td>44</td>
<td>17%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>255</td>
<td>100%</td>
</tr>
</tbody>
</table>

For Non-Haz Waste Sites -

Closure sites receiving NFAR:

- Required remobilization prior to NFAR: 82 (38%)
- Did Not require remobilization: 129 (62%)
- **Total**: 211 (100%)

Unresolved Deficiency Sites:

- Need or needed vertical delineation: 105 (73%)
- Other deficiencies: 39 (27%)
- **Total**: 144 (100%)

Closures requiring CAP-A:

- Needed vertical delineation to determine whether CAP-A was needed: 33 (75%)
- Did not require remob. for vert. delineation: 11 (25%)
- **Total**: 44 (100%)

Number of Sites Requiring Remobilization Compared to Total Sites Reviewed:

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Closure Sites Reviewed</td>
<td>399</td>
</tr>
<tr>
<td>NFARs requiring remobilization</td>
<td>82</td>
</tr>
<tr>
<td>Sites going to CAP-A requiring remob.</td>
<td>33</td>
</tr>
<tr>
<td>Deficiencies requiring remob.</td>
<td>105</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>220</td>
</tr>
<tr>
<td><strong>Percentage of total sites requiring remob.</strong></td>
<td>((220/399) \times 100)</td>
</tr>
</tbody>
</table>
Number of sites where GW impact was found during closure    47   12%
Number of sites where GW was not investigated or ≤ 1ppb at closure 352  88%
Total                                      399  100%

Soil Contamination Below Practical Quantitation Limits (PQLs or "Detection Limits") at GW impact Sites:

| BTEX below PQLs; TPH above PQLs | 6   | 13% |
| TPH below PQLs; BTEX above PQLs       | 6   | 13% |
| Both BTEX & TPH below PQLs         | 2   | 4%  |
| No BTEX data reported (Haz. Waste site) | 1   | 2%  |
| No TPH data reported               | 4   | 8%  |
| Both BTEX & TPH above PQLs         | 29  | 60% |
| Total                               | 48  | 100%|

Incidence of Soil Contamination Above Threshold Levels at GW Impact Sites:

| BTEX above applicable Soil Threshold Levels | 21  | 44% |
| BTEX less than applicable Soil Threshold Levels | 26  | 54% |
| No BTEX data reported (Haz. Waste)        | 1   | 2%  |
| Total                                    | 48  | 100%|

Discussion

Of the closure reports reviewed for which the future outcome had been determined (i.e., deficiencies have been addressed), 83% resulted in No Further Action Required (NFAR) status and 17% required preparation of a CAP-A, including those sites with no soil contamination and no groundwater sampling. The study was limited to reviews of closure reports received between October 1, 1999 and May 1, 2000 by Corrective Action Unit II (CAU II), after the date that vertical delineation of confirmation soil samples to non-detectable levels was required by the staff of CAU II.

Of the sites that received NFAR after review of the closure report, 38% of all closure assessments required remobilization for sampling to obtain enough information necessary to determine whether a CAP-A was necessary. Of the sites eventually requiring a CAP-A, 75% required remobilization for sampling to determine whether groundwater was impacted and a CAP-A was required. Of the closure sites with currently unresolved deficiencies, 73% need vertical delineation of contamination soil.

The percentage of sites requiring remobilization totaled 55% of all the closure sites reviewed.

Of the closure sites with documented groundwater contamination, 4% reported no soil contamination in the confirmation samples above detection limits (PQLs) for both BTEX and TPH. Of the groundwater-impacted closure sites, 6 sites reported TPH below PQLs and BTEX above PQLs and 6 sites reported BTEX below PQLs and TPH above PQLs.
Of the groundwater-impacted closure sites, 54% reported no soil contamination in the confirmation samples above applicable Threshold Levels.

Conclusions

Remobilization (and re-submittal and re-review of closure reports) was necessary to determine whether groundwater was impacted in 55% of the closure assessments. This indicates that an opportunity exists for UST owner/operators to save time and money by making this determination during the first mobilization in the majority of the cases.

However, eventually 83% of sites received NFAR status from October 1, 1999 until May 1, 2000, either with no deficiencies or with deficiencies adequately addressed. These NFARs were issued after the date (October 1, 1999) that the project officers began requiring vertical delineation to non-detectable concentrations of BTEX and TPH.

The data indicates that vertical delineation of soil contamination to non-detectable levels (PQLs) is necessary. Of the sites with available subsequent groundwater sample results, 54% of the sites without soil contamination above Threshold Levels in confirmation samples reported groundwater contamination. The data also indicates that even when soil contamination is vertically delineated to below detectable levels, 4% of sites with groundwater contamination will not be identified unless future assessment is performed (e.g., for property transfer purposes).

The majority of the closure reports reviewed, for which the future outcome was determined, eventually received No Further Action Required (NFAR) status without preparation of a CAP-A (83%).

The rate of error of non-detection of groundwater contamination using BTEX analysis of soil samples (13%) equaled that of TPH analysis (13%). In other words, neither parameter alone appeared to be a perfect indicator, and use of both indicators together appear to have lowered the error rate to 4%.
APPENDIX F

LOCAL WATER SUPPLY SURVEY
LOCAL WATER SUPPLY SURVEY

This attachment serves to outline the methodology and documentation to be used to identify local water resources. Water resources that must be identified include surface water bodies that may receive groundwater flow and points of withdrawal for public and non-public water supply, such as drinking water wells. The water resources survey is used to determine the appropriate corrective action objectives, in accordance with GUST Rule 391-3-15-.09(4)(a)-(d). When soil contaminant concentrations are between the applicable Table A and the applicable Table B standards, or if groundwater contaminant concentrations are between drinking water standards and In-Stream Water Quality Standards (ISWQS), a water supply survey must be conducted and submitted in the Closure Report to determine whether additional corrective action is necessary.

Documentation of the water resources survey must include, but is not limited to, a United States Geological Survey (USGS) database search, communication logs (telephone or personal), and a field survey summary. It should be included as an attachment to the Closure Report. Include a figure constructed from a USGS 7.5 minute Topographic Quadrangle Map displaying the location(s) of all water resources within radii of concern. A legend must identify which points of withdrawal for water supply are public and non-public. The map must be to scale, have the scale displayed, and include a north arrow, and is preferred to be in color. Both water supply and surface water surveys should be verified by a field reconnaissance.

A public drinking water system, as defined by the Georgia Rules for Safe Drinking Water (Chapter 391-3-5, as amended), is one that provides piped water for human consumption to at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. The water system survey includes the identification of all water wells (domestic, commercial, industrial and irrigation), surface water withdrawal points and springs. Identify public/non-public drinking water systems by reviewing federal, state, county, and/or city records as well as conducting a field reconnaissance. Examples of public agencies that may have public and private well information include the USGS, Georgia Geologic Survey, local health departments, and local water and sewer authorities. All adjacent property owners should be contacted via telephone, personal visit, or certified mail. A detailed field reconnaissance should be conducted to verify the presence or absence of water wells within ½ mile of the site in a high or average susceptibility area and ¼ mile within a low groundwater pollution susceptibility area.
APPENDIX G

CLOSURE REPORT FORM
USTMP CLOSURE REPORT FORM

If a boring or monitor well was extended to groundwater, the Professional Engineer (PE) or Professional Geologist (PG), registered in the State of Georgia, that supervised the work must complete and sign the following statement:

“I have supervised and directed the installation of the boring or monitor well and the interpretation of groundwater data, in accordance with the Water Well Standards Act, the Professional Engineer Act and the Professional Geologist Act. This report complies with the standards of the USTMP Act, Rules, and guidelines and other applicable state and federal environmental regulations. The information presented herein is true and accurate.”

Name (print)___________________________________________

Signature____________________________  Date___________

PG/PE Certification Expiration Date____________________  Georgia Stamp or Seal

November, 2001
Facility ID #: ___________ USTMP CLOSURE REPORT FORM
Complete this form and provide documentation to substantiate information as outlined in the Underground Storage Tank (UST) Closure Guidance Document (GUST-9). Use a separate form for each tank excavation.

I. GENERAL

A. UST OWNER  Company Name (if applicable): __________________________________________
Mailing Address: __________________________ City: __________ State: _____ Zip: ________

Owner’s Name (printed): __________________________________________ Phone: __________
I hereby certify that the information in this Closure Report and in all the attachments is true, accurate, and complete, and the Closure Report satisfies all criteria and requirements of Rule 391-3-15-.09 of the Georgia Rules for Underground Storage Tank Management.

Signature (of owner listed under “Name” above): __________________________ Date: ______

B. REMOVAL CONTRACTOR (Prime Contractor/Prime consultant)
Company: ____________________________________________________________________
Mailing Address: __________________________ City: __________ State: _____ Zip: ________

Name of Company Representative (printed): __________________________ Phone: __________
I hereby certify that I have performed or supervised the work detailed in this report, and have examined and am familiar with the information submitted in this and all attached documents. The submitted information is, to the best of knowledge, true, accurate, complete, and in accordance with the Georgia Rules for Underground Storage Tank Management, revised February, 1995.

Signature (of same contractor listed under “Name”): __________________________ Date: ______

C. UST Site Facility Name: __________________________ County: __________ Fac. I.D.#: __________
Street Address: __________________________ City: __________ State: _____ Zip: ________

II. TANKS AND PIPING CLOSURE DATA

A. LIST USTs THAT HAVE BEEN CLOSED (Use the same tank ID # as on the 7530-1):

<table>
<thead>
<tr>
<th>TANK ID#</th>
<th>Product</th>
<th>Size (gals)</th>
<th>How Closed</th>
<th>Date Last Used</th>
<th>Date Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Removed</td>
<td>_____________</td>
<td>____________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In Place</td>
<td>_____________</td>
<td>____________</td>
</tr>
</tbody>
</table>

B. LIST ANY USTS STILL IN USE AT THE FACILITY (Use same tank ID # as on 7530-1):

<table>
<thead>
<tr>
<th>TANK ID#</th>
<th>Product</th>
<th>Size (gals)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. PIPING: How was Piping closed? _ Removed.  _ Emptied, capped, left in place.  _ Emptied, filled with inert material.
If only piping was closed, give date: _____________ (month, day, year)
III. SAMPLING AND ANALYTICAL

A. Soil/Groundwater Sampling: The quantity of samples taken should be in accordance with USTMP closure guideline (GUST-9) requirements and all samples must be collected in accordance with current EPA-approved sampling procedures.

B. Regulated Substance Released: Whenever free product is encountered and/or analytical results indicate that BTEX, PAH, or TPH contamination is present in the soil and/or groundwater, a release must be reported to EPD via telephone or fax by the next business day explaining what has been found and what steps were taken to eliminate any hazardous conditions and prevent the spread of contamination. Indicate here what substance, if any, was released:

   __ None __ Gasoline __ Diesel __ Kerosene __ Used Oil __ Other (Name):

   Date release reported to EPD:______________________________

C. Laboratory Analytical Methods Used (check all that were used):

   5035-8021B____ 5035-8015_____ 5035-8260_____ 8100_____ 8310______ 8270_____
   Other_____________________________________________________________________

   If Method 5035 was used to sample, which method was used to collect and contain the samples?
   Encore™_______ Syringe/corer and field-preserved in 40 ml vial________

IV. TANK EXCAVATION SAMPLES (see #5 for piping trench samples)

<table>
<thead>
<tr>
<th>Size (capacity in gallons) of UST</th>
<th># of samples required per UST</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1,050</td>
<td>1</td>
</tr>
<tr>
<td>1,050 - 12,500</td>
<td>2</td>
</tr>
<tr>
<td>&gt; of equal to 12,501</td>
<td>2 per UST + 1 per additional 10,000 gals</td>
</tr>
</tbody>
</table>

(Collect 1 sample per UST if a groundwater sample was collected within 2 feet of the excavation.)

A. Based on the total number of USTs closed as reported on this form, the total number of tank excavation samples taken for this site was:________________________

B. If over-excavation is performed, take one confirmation sample every 30 linear feet along the base of the sides (within 1 ft of the bottom of the excavation) and one sample per 200 sq ft along the bottom of the excavated area.

   1) Was over-excavation performed?  Yes_____  No _____
   2) If “yes”, what was the area of the excavation in square feet?____
   3) Enter total number of over-excavation samples for this site here:______________
C. Site-Specific Hydrogeology: 1.) Was Groundwater encountered? ____ Yes ____ No  
2.) If encountered, at what depth: ______________feet  
3.) If Table B Threshold Levels are being used, how far is the nearest drinking water well or point of withdrawal for drinking water? ______________ft.

D. Groundwater conditions: If more than one foot of groundwater covers more than 50% of the base of the excavation, a groundwater sample may be taken in lieu of soil samples from the base of the excavation. One soil sample per UST must still be collected at the fill-pipe end of each UST along the sidewalls at the soil-water interface. Enter total number of soil-water interface samples for this site here: ____________________

V. PIPING SYSTEM EXCAVATION SAMPLES

A. PIPING TRENCH

Distance from UST to nearest dispenser island: Less Than 25 ft * 25 feet or more

# of samples required for each trench: 0* 1 sample per 25 feet **

What was the distance from the USTs along each piping trench to the nearest dispenser island?  
________ (feet) [ __________ (feet) __________ (feet) (if more than one trench)]

How many confirmation samples were collected from each piping trench?  
________ (piping trench 1) [ __________ (piping trench 2) __________ (piping trench 3)]

B. DISPENSER ISLAND

Number of dispenser islands  X  Length of each Dispenser Island (ft) / 25(ft) = # of Samples  
(Rounded up to nearest whole number)

How many dispensers were present in the closed system(s)? ________

How long was each dispenser island (ft)? ______ ______ ______ ______ ______

How many dispenser samples were collected? ________

* Although no piping trench samples are required if the piping length is <25 ft., dispenser samples are required. Exception: If the dispenser is directly above the tank excavation, no piping samples and no dispenser samples would be required.

** This includes all fittings (couplings, elbows, flex hoses, etc.) between the tank and the dispenser island. Do not count fittings at the tank excavation and the islands. For straight piping runs, estimate 20 ft between couplings.

VI. EXCAVATED SOIL

A. Sampling:

How many cubic yards of material was excavated? ____________________

Based on one sample per 200 cubic yards of excavated soil or fraction thereof, the total number of excavated soil samples: ____________________
VII. CLOSURE SUMMARY

A. CONCLUSIONS

___ Soil or groundwater contamination exists in excess of the levels specified in the above situations and this closure report is being submitted within a certified CAP-Part A.

___ Clean Closure, No Further Action Required because analytical results indicate the condition marked below:

___ BTEX, PAHs and TPH are below detection limits (BDL) in the soil.

___ BTEX and PAHs are BDL in the soil and TPH (and BTEX) is vertically delineated to BDL above the groundwater table.

___ BTEX and PAHs are above detection limits in soil but below Table A Threshold Levels, and TPH, PAHs, and BTEX in soil is vertically delineated to BDL above the groundwater table.

___ BTEX and PAHs are above detection limits but below Table B Threshold Levels, a water supply survey indicates there are no potential receptors within the applicable radii, and BTEX, PAHs, and TPH in soil is vertically delineated to BDL above the groundwater table.

___ BTEX and PAHs are less than Table A Threshold Levels and BTEX, PAHs or TPH is not vertically delineated to BDL above the groundwater table because groundwater is encountered in the boring or the excavation, and the water sample does not contain BTEX or PAHs above Federal or State MCLs.

___ BTEX and PAHs are less than Table B Threshold Levels and BTEX, PAHs or TPH is not vertically delineated to BDL above the groundwater table because groundwater is encountered in the boring or excavation, and the water sample does not contain BTEX or PAHs above In-stream Water Quality Standards, and the water supply survey indicates that there are no water supplies within the applicable radii.

B. SITE MAP (Attach to report): The map must be to scale OR, as a minimum, distances between the tank pit area, piping trenches, dispenser islands, sewer, water, utility lines (or other preferential pathways), road and main buildings must be accurately indicated on the map. These listed features must be depicted on the map in order to accurately interpret the data. The map must also include a north (N) directional arrow. Tank ID’s must correspond to EPA Form 7530-1 and sample locations, sample identification numbers and depths must also be shown. Sample numbers must correspond to attached laboratory analytical data. Although not mandatory, photos may be attached to help clarify the UST system layout.
SOIL/GROUNDWATER ANALYTICAL RESULTS SUMMARY

(Use additional pages as necessary)

Facility Name:  
Facility ID #

Volatile Organic Compounds
(Indicate S for Soil and GW for Groundwater. GW results must be in ug/l and soil results in mg/kg)

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>S/GW</th>
<th>Depth</th>
<th>Benzene</th>
<th>Toluene</th>
<th>Ethylbenz.</th>
<th>Xylenes</th>
<th>Total BTEX</th>
<th>TPH</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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Polynuclear Aromatic Hydrocarbons (PAHs)
(Indicate S for Soil and GW for Groundwater. Report soil concentrations in mg/kg and groundwater in ug/L.)

<table>
<thead>
<tr>
<th>Sample ID#</th>
<th>S/GW</th>
<th>Depth</th>
<th>Detected PAH Compounds</th>
<th>Total PAHs</th>
<th>Units</th>
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LABORATORY ANALYTICAL REQUIREMENTS FOR UST CLOSURES

TABLE 1
LABORATORY METHODS FOR SOIL AND GROUNDWATER ANALYSIS

Make sure your laboratory is familiar with the requirements of this table and this document

<table>
<thead>
<tr>
<th>SUBSTANCE STORED</th>
<th>CONSTITUENT</th>
<th>SOIL SAMPLING &amp; ANALYSIS METHODS</th>
<th>GROUNDWATER SAMPLING &amp; ANALYSIS METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline or Aviation Gas Only (Affidavit Required)</td>
<td>BTEX, TPH-GRO</td>
<td>5035-8021B OR 5035-8260B&lt;sup&gt;1&lt;/sup&gt;; AND 5035-8015B-GRO</td>
<td>5030-8021B OR 5030-8260B&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Jet Fuel A, Jet Fuel B, Mineral Spirits or Unknown Petroleum Contents, Kerosene, or Used Oil,</td>
<td>BTEX, PAHs, TPH-GRO, TPH-DRO</td>
<td>5035-8021B OR 5035-8260B&lt;sup&gt;1&lt;/sup&gt;; AND 8270C/8310/8100&lt;sup&gt;2&lt;/sup&gt; AND 5035-8015B-GRO AND 8015B-DRO</td>
<td>5030-8021B OR 5030-8260B&lt;sup&gt;1&lt;/sup&gt; AND 8270C/8310/8100&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Diesel, Fuel Oil (#2, #4, #5, or #6), Motor Oil, or Hydraulic Oil&lt;sup&gt;3&lt;/sup&gt;</td>
<td>BTEX, PAHs, TPH-DRO</td>
<td>5035-8021B OR 5035-8260B&lt;sup&gt;1&lt;/sup&gt;; AND 8270C/8310/8100&lt;sup&gt;2&lt;/sup&gt; AND 8015B-DRO</td>
<td>5030-8021B OR 5030-8260B&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1) For Methods 8021B, 8260B, and 8015B-GRO (i.e. methods used to test for organic volatiles), use preparation and sampling Method 5035 for soil samples. Consult your analytical laboratory for required field equipment and field procedures. Method 8260B is usually preferred over Method 8021B because Method 8260B is better able to identify regulated and interfering compounds and MTBE, whereas Method 8021B may misidentify some compounds as being regulated when they are not, may not be able to identify interfering compounds, and may provide false-positive results for MTBE.

2) Be aware that if PAHs are detected using Method 8100, you must use Method 8270C or 8310 to determine the concentrations of the individual PAHs.

3) e.g., hydraulic oil stored in USTs not connected to hydraulic equipment. Refer to the GUST Rules for details (391-3-15-.02).

4) TPH-GRO and TPH-DRO analysis of confirmation soil samples is not required if groundwater samples are collected at the worst-case locations (Section II.A.1.)

5) If 80 Octane Aviation Gasoline was stored, also analyze soil samples for Lead.
# TABLE 2

**LABORATORY ESTIMATED QUANTITATION LIMITS FOR SOIL AND GROUNDWATER SAMPLES**

*Make sure your laboratory is familiar with the requirements of this table and this document*

<table>
<thead>
<tr>
<th>METHOD</th>
<th>5035-8021B</th>
<th>5030-8021B</th>
<th>5035-8260B</th>
<th>5030-8260B</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAMPLE TYPE</td>
<td>Soil</td>
<td>Groundwater</td>
<td>Soil</td>
<td>Groundwater</td>
</tr>
<tr>
<td>Benzene</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>Toluene</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>Xylenes (for each isomer)</td>
<td>1-5 ug/kg</td>
<td>1-5 ug/l</td>
<td>5 ug/kg</td>
<td>5 ug/l</td>
</tr>
<tr>
<td>METHOD</td>
<td>8100¹, 8270, or 8310</td>
<td>8100¹, 8270, or 8310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Each PAH Constituent</td>
<td>660 ug/kg</td>
<td>10 ug/l</td>
<td></td>
<td></td>
</tr>
<tr>
<td>METHOD</td>
<td>8015B-GRO OR 8015B-DRO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TPH GRO &amp; DRO</td>
<td>10 mg/kg</td>
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</tr>
</tbody>
</table>

1) Be aware that if PAHs are detected using Method 8100, you must use Method 8270C or 8310 to determine the concentrations of the individual PAHs.

2) See Section II.A. of these guidelines for a more detailed explanation of expected estimated quantitation limits.

Note: the above information was obtained from the EPA SW-846 analytical guidelines. Further information on estimated quantitation limits (EQLs), commonly reported as “detection limits” by laboratories, is available in SW-846 on EPA’s website at www.epa.gov/epaoswer/hazwaste/test/sw846.htm.
Technical Guidance Document #3

**Reporting Suspected Releases – ARM 17.56.502**

ARM 17.56.502 *et seq.* requires reporting of suspected petroleum releases by "owners, operators, any installer, any person who performs subsurface investigations for the presence of regulated substances, and any person who performs a tank tightness or line tightness test."

Consultants completing environmental and geotechnical site assessments must report petroleum contamination discovered during the assessment. This is interpreted broadly to include the following common scenarios:

- Petroleum-contaminated soil discovered through environmental sampling from borings, monitoring wells, or test pits, or completed as part of environmental site assessment work.
- Petroleum-contaminated soil discovered through geotechnical borings for building footing/foundation work.
- Visible petroleum staining on the ground surface.
- Odor and/or detectable vapor headspace readings on vapor monitoring equipment used for field screening of soil samples.
- Visible petroleum sheen on groundwater in excavations and groundwater samples.
- Any detectable analytical results which indicate the presence of petroleum hydrocarbons in soil or groundwater.
- Analytical results from soil samples that exceed 200 milligrams per kilogram for extractable petroleum hydrocarbons (EPH) screen.

Contamination discovered under these scenarios must be notified to the department as a suspected or confirmed release. Additional information from the consultant may verify that the soil contamination is related to a different source not directly attributable to a UST system which may fall under the jurisdiction of another State agency. Information provided by the caller and knowledge of other UST releases in the local area will be used by DEQ project managers to make that decision. All such cases will be referred to the appropriate State agency for follow-up.
Owners and operators of underground storage tanks (USTs) must also report a suspected release during any of the following conditions:

- The sudden or unexplained loss of product from the tank system
- A failed tightness test, performed in accordance with subchapter 4, unless the tank system is found to be defective but not leaking and is immediately repaired or replaced.
- Sampling, testing, or monitoring results from a release detection method, performed in accordance with subchapter 4, that indicate a release may have occurred, unless the release detection or monitoring device is found to be defective and is immediately repaired, recalibrated, or replaced, and subsequent monitoring, sampling, or testing indicates that the system is not leaking.
- The presence of product in the tank secondary containment system;
- Erratic behavior of product dispensing equipment or automatic release detection equipment unless the equipment is found to be defective but not leaking, and is immediately repaired or replaced.
- An unexplained presence of water in the tank or in the interstitial space between the tank and the tank secondary containment.
- Inconclusive results from a tank tightness test, performed in accordance with subchapter 4, unless the tank system is found to be defective but not leaking.
- Sampling, testing, or monitoring results from a release detection method, required under subchapter 4, that are inconclusive and cannot rule out the occurrence of a release, unless the monitoring device is found to be defective and is immediately repaired, recalibrated, or replaced, and subsequent monitoring, sampling, or testing indicates that the system is not leaking.

Failure to report releases within 24 hours is a violation of ARM 17.56.501. If the DEQ verifies that contamination was discovered (suspected or confirmed releases) or if the owner had knowledge of one of the previous conditions without reporting it to the DEQ within 24 hours, the owner and operator will be subject to substantial State and Federal civil penalties.
PEARSON VUE TESTING CENTERS IN GEORGIA

ALBANY 1125- Albany Pearson Professional Center
(229) 878-6265
2410 Westgate Drive, Suite 102
Albany, Georgia 31707
Directions
Test Site Schedule

ATLANTA SOUTH 1112- Atlanta South Pearson Professional Center
(404) 305-9220
Entrusted Building
3420 Norman Berry Drive, Suite 275
Atlanta, Georgia 30354
Directions
Test Site Schedule

AUGUSTA 1124- Augusta Pearson Professional Centers
(706) 724-2892
Augusta Riverfront Center
One 10th Street, Suite 640
Augusta, Georgia 30901
Directions
Test Site Schedule

MACON 1122 - Macon Pearson Professional Center
(478) 474-1400
4885 Riverside Drive
Riverside Corporate Center, Suite 101
Macon, Georgia 31210
Directions
Test Site Schedule

ATLANTA NORTH 1128- Marietta North Pearson VUE Test Center
(770) 795-9122
1279 Kennestone Circle, Suite 100
Marietta, Georgia 30066
Directions
Test Site Schedule

SAVANNAH 1123- Savannah Pearson Professional Center
(912) 921-5352
785 King George Boulevard
Georgetown Center Bldg 1, Suite C
Savannah, Georgia 31419
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