

**GUIDELINES FOR SITE CHECKS, TANK CLOSURE,  
AND INITIAL RESPONSE AND ABATEMENT  
FOR UST RELEASES**

UST Section

North Carolina

Department of Environment and Natural Resources

Division of Waste Management

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## Definitions

Action Level: the concentration of a contaminant that if exceeded may require further regulatory action such as cleanup or monitoring.

Aquifer: a permeable body of rock or sediment that stores and transmits groundwater in sufficient quantity to supply wells or springs.

Bedrock: any consolidated rock which is encountered in the place in which it was formed or deposited and which cannot be readily excavated without the use of explosives or heavy rock cutting equipment. Bedrock generally underlies soil or other unconsolidated, superficial material.

Cleanup Level: the concentration of a contaminant at which no further cleanup actions are required based on the risk of harm posed by the contaminant.

Closure: activities conducted during the permanent removal (or abandonment) of underground storage tank systems and not inclusive of corrective actions/remediation.

Confining Layer: a layer having very low hydraulic conductivity, in relationship to adjacent stratigraphic units, that restricts the movement of water into and out of an aquifer (e.g., dense, unfractured clay).

Confirmed Release: a release for which an analytical result for sampled media shows any contaminant level above the Method Detection Limit.

De Minimus Concentration: amount of a regulated substance which does not exceed one percent of the capacity of the tank, excluding piping and vent lines.

Department: the North Carolina Department of Environment and Natural Resources.

Discharge: a release (See also Release).

Division: the Division of Waste Management.

Ex Situ Soil: soil that has been excavated.

Free Product: any accumulation of a substance of greater than or equal to 1/8 inch (0.010417 foot) in contact with groundwater or perched on the water table, with a density less than or greater than water, and existing as a non-aqueous phase liquid (i.e., not dissolved in water).

Gross Contamination Levels: levels of groundwater contamination for any contaminant (except ethylene dibromide, benzene and the aliphatic and aromatic carbon fraction classes) that exceed 50 percent of the solubility of the contaminant at 25 degrees Celsius or 1,000 times the groundwater quality standard or interim groundwater quality standard established in 15A NCAC 2L .0202, whichever is lower; and levels of groundwater contamination for ethylene dibromide and benzene that exceed 1,000 times the federal drinking water standard set out in 40 CFR 141.

Groundwater: those waters occurring in the subsurface under saturated conditions.

Hazardous Substance: a hazardous substance defined in Section 101 (14) of the Comprehensive Environmental Response Compensation and Liability (CERCLA) Act of 1980 (but not including any substances regulated as a hazardous waste under Subtitle C or any mixture of such substances and petroleum).

Hazardous Waste: discarded material which, due to its quantity, concentration, or physical or chemical characteristics, may cause or significantly contribute to an increase in mortality, irreversible or incapacitating reversible illness, or pose a substantial threat or potential hazard to human health or the environment when improperly treated, stored, transported, disposed or otherwise managed (Federal regulations define a waste as a hazardous waste if it exhibits a characteristic of a hazardous waste (40 CFR 261.20 through 261.24); has been listed as hazardous (40 CFR 261.31 through 261.33); or is a mixture containing a listed hazardous waste and a non-hazardous solid waste (unless the mixture is specifically excluded or no longer exhibits any of the characteristics of a hazardous waste).)

In Situ Soil: soil or fill material that is in the ground and has not been disturbed.

Land Application: the process of remediating contaminated soil by spreading soil over land. Land application may include remediating soil by natural biological methods, enhanced biological methods, or volatilization.

Maximum Soil Contaminant Concentration: the concentration of a soil contaminant at which no further cleanup actions are required based upon the risk of harm posed by the contaminant.

Method Detection Limit: the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte (40 CFR 136 Appendix B).

Minimum Reporting Limit: the minimum reporting limit that must be achieved by laboratories for target analyte results submitted to the UST Section; it is a reporting limit established by the UST Section for the target analytes required for each approved analytical method as an alternative to the detection limit indicated in the method description and is listed for each analyte in the *Guidelines for Sampling*.

Petroleum or Petroleum Product: crude oil or any fraction thereof which is liquid at standard conditions of temperature (60 degrees Fahrenheit) and pressure (14.7 pounds per square inch absolute), but excluding substances defined as a hazardous substance in Section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980.

Petroleum Contaminated Soil or Soil Containing Petroleum Products: any soil that has been exposed to petroleum products because of any emission, spillage, leakage, pumping, pouring, emptying, or dumping of petroleum products onto or beneath the land surface and that exhibits characteristics or

## Definitions

concentrations of typical petroleum product constituents in sufficient quantities as to be detectable by approved analytical procedures.

Practical Quantitation Limit: the lowest concentration of a given material that can be reliably achieved among laboratories within specified limits of precision and accuracy by a given analytical method during routine laboratory analysis.

Receptor: any human, plant or animal, structure or surface water body that is or has the potential to be adversely effected by the release or migration of contaminants.

Release: any spilling, leaking, emitting, discharging, escaping, leaching or disposing into groundwater, surface water or subsurface soils. (Refer to statutes and regulations relevant to UST releases or to AST and surface releases.)

Responsible Party: a UST owner, UST operator, and/or landowner seeking reimbursement from the State Trust Fund, or any person who is responsible for a discharge or release of petroleum or a hazardous substance. (Refer to statutes and regulations relevant to UST releases or to AST releases and spills.)

Surface Water: all waters of the state as defined in G.S. 143-215.77 Article 21A, except for underground waters, such that "waters" shall mean any stream, river, creek, brook, run, canal, swamp, lake, sound, tidal estuary, bay, reservoir, waterway, wetlands or any other body or accumulation of water, surface or underground, public or private, natural or artificial, which is contained within, flows through, or borders upon this State, or any portion thereof, including those portions of the Atlantic Ocean over which this State has jurisdiction.

Soil or Regolith: a general term for the fragmental and unconsolidated geological material of highly varied character that nearly everywhere forms the surface of the land and overlies or covers bedrock. It includes rock debris of all kinds, volcanic ash, glacial till, alluvium, loess and eolian deposits, and vegetal accumulations.

Soil Scientist: an individual who is a Certified Professional in Soils through the NCRCPS (N.C. Registry of Certified Professionals in Soils) or a Certified Professional Soil Scientist or Soil Specialist by ARCPACS (American Registry of Certified Professionals in Agronomy, Crops and Soils) or a Registered Professional Soil Scientist by NSCSS (the National Society of Consulting Soil Scientist) or can provide documentation that he/she meets the minimum education and experience requirements for certification or registration by one or more of the organizations named in this Subparagraph or upon approval by the Director, an individual with a demonstrated knowledge of soil science.

Source Area: point of release or discharge.

Total Petroleum Hydrocarbons (TPH): the concentration of petroleum fuel contamination present.

Transmissivity: the ability of geologic material to transmit water.

## Definitions

Underground Storage Tank (UST): 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 (Refer to full definition in 15A NCAC 2N .0203.).

UST System: an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

Waste Oil: any used non-hazardous petroleum product other than crankcase oil. Crankcase oil mixed with other used non-hazardous petroleum products shall be considered as waste oil.

Water Table: the surface of the saturated zone below which all interconnected voids are filled with water and at which the pressure is atmospheric.

## Acronyms

|                        |                                                                      |
|------------------------|----------------------------------------------------------------------|
| <u>AFVR</u>            | Aggressive Fluid - Vapor Recovery                                    |
| <u>AST</u>             | Aboveground Storage Tank                                             |
| <u>ASTM</u>            | American Society for Testing and Materials                           |
| <u>CAP</u>             | Corrective Action Plan                                               |
| <u>CAS</u>             | Chemical Abstracts Service Number                                    |
| <u>CERCLA</u>          | Comprehensive Environmental Response, Compensation and Liability Act |
| <u>CFR</u>             | Code of Federal Regulations                                          |
| <u>CSA</u>             | Comprehensive Site Assessment                                        |
| <u>DENR</u>            | Department of Environment and Natural Resources                      |
| <u>DWR</u>             | Division of Water Resources                                          |
| <u>DWM</u>             | Division of Waste Management                                         |
| <u>EDB</u>             | Ethylene Dibromide (1,2 Dibromoethane)                               |
| <u>EPA</u>             | The Environmental Protection Agency                                  |
| <u>FID</u>             | Flame Ionization Detector                                            |
| <u>GCL</u>             | Gross Contamination Level                                            |
| <u>HCl</u>             | Hydrochloric Acid                                                    |
| <u>HNO<sub>3</sub></u> | Nitric Acid                                                          |
| <u>IAA</u>             | Initial Abatement Action                                             |
| <u>IAR</u>             | Initial Site Assessment Report                                       |
| <u>IATA</u>            | International Air Transport Association                              |
| <u>L.G.</u>            | Licensed Geologist                                                   |
| <u>LSA</u>             | Limited Site Assessment                                              |
| <u>MADEP</u>           | Massachusetts Department of Environmental Protection                 |
| <u>MDL</u>             | Method Detection Limit                                               |
| <u>MMPE</u>            | Mobile Multi-phase Extraction                                        |
| <u>MRL</u>             | Minimum Reporting Limit                                              |
| <u>MSCC</u>            | Maximum Soil Contaminant Concentration                               |
| <u>NC</u>              | North Carolina                                                       |
| <u>NCAC</u>            | North Carolina Administrative Code                                   |

## Acronyms

|                    |                                                                     |
|--------------------|---------------------------------------------------------------------|
| <u>NCDA&amp;CS</u> | North Carolina Department of Agriculture& Consumer Services         |
| <u>NCGS</u>        | North Carolina General Statutes                                     |
| <u>NCS</u>         | Notice of Contaminated Site                                         |
| <u>NFA</u>         | No Further Action                                                   |
| <u>NORR</u>        | Notice of Regulatory Requirements                                   |
| <u>NOV</u>         | Notice of Violation                                                 |
| <u>NPDES</u>       | National Pollutant Discharge Elimination System                     |
| <u>NRP</u>         | Notice of Residual Petroleum                                        |
| <u>OPHSCA</u>      | Oil Pollution and Hazardous Substances Control Act of 1978          |
| <u>PAH</u>         | Polycyclic Aromatic Hydrocarbon                                     |
| <u>PCB</u>         | Polychlorinated Biphenyl                                            |
| <u>P.E.</u>        | Professional Engineer                                               |
| <u>PID</u>         | Photoionization Detector                                            |
| <u>POTW</u>        | Publicly Owned Treatment Works                                      |
| <u>QA/QC</u>       | Quality Assurance/Quality Control                                   |
| <u>SAR</u>         | Soil Assessment Report                                              |
| <u>SCR/SCR</u>     | Soil Cleanup Report/Site Closure Request                            |
| <u>SM</u>          | Standard Method                                                     |
| <u>STF</u>         | State Trust Fund                                                    |
| <u>SVE</u>         | Soil Vapor Extraction                                               |
| <u>SVOC</u>        | Semi-Volatile Organic Compounds                                     |
| <u>SW</u>          | Solid Waste                                                         |
| <u>TCLP</u>        | Toxicity Characteristic Leaching Procedure (EPA Method SW-846 1311) |
| <u>TOC</u>         | Total Organic Carbon                                                |
| <u>TPH</u>         | Total Petroleum Hydrocarbons                                        |
| <u>TPH-DRO</u>     | Total Petroleum Hydrocarbons - Diesel Range Organics                |
| <u>TPH-GRO</u>     | Total Petroleum Hydrocarbons - Gasoline Range Organics              |
| <u>UST</u>         | Underground Storage Tank                                            |
| <u>UVF</u>         | Ultraviolet Fluorescence                                            |
| <u>USGS</u>        | United States Geological Survey                                     |
| <u>VOA</u>         | Volatile Organic Analysis                                           |

VOC Volatile Organic Compounds

## **1.0 Regulatory Background**

Underground Storage Tank (UST) systems are regulated by the Division of Waste Management (DWM), a division of the Department of Environment and Natural Resources (DENR). Its regulatory authority can be found in Title 15A of the North Carolina Administrative Code (NCAC), Subchapter 2N and Subchapter 2L. The rules establish criteria and standards applicable to underground storage tanks and include the requirements and procedures for permanently closing UST systems, investigating suspected releases, and performing initial response and abatement actions.

## **2.0 Purpose of the Guidelines**

The purpose of the *Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement*, hereafter referred to as the “*Guidelines*”, is to provide procedures for performing site checks to investigate suspected releases from regulated UST systems; to provide guidance for permanently closing regulated petroleum and hazardous substance UST systems; and to provide guidance for performing and reporting initial response and abatement action for releases from all UST systems. This document replaces all previous guidance documents issued by the UST Section pertaining to UST system closure and initial response and abatement actions. Any release discovered from a UST system during closure, during site check, or by other means must be initially addressed with initial response and abatement actions in accordance with this document and then, if further assessment is required, addressed in accordance with the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

All work performed pursuant to these *Guidelines* which involves site assessment, interpretation of subsurface geologic conditions, or preparation of corrective action plans or which requires detailed technical knowledge of site conditions must be performed by persons, firms, and corporations licensed by the North Carolina State Board of Professional Engineers or the North Carolina State Board of Licensed Geologists, as required under Title 15A NCAC 2L .0103(e). Furthermore, the title pages of the 20-Day Report and the Initial Abatement Action Report required by these *Guidelines* must display the seal and signature of the certified Professional Engineer or Licensed Geologist and the name and corporate certification number of the firm or corporation, as applicable.

Questions concerning the information presented in this document should be directed to the UST Section Central Office at 919-707-8171. Questions concerning a specific site should be directed to the UST Section regional office that is responsible for the county in which the site is located. The address, telephone number, and the jurisdiction of each regional office are presented in Figure 6, p. 36. Guidance pertaining to contamination from sources other than USTs is presented in Appendix F.

***Note: If State Trust Fund reimbursement is anticipated for any work related to a leaking UST, the parties concerned should be aware of all policies and procedures that pertain to the State Trust Fund to insure reimbursement eligibility. The North Carolina Commercial and Non-Commercial Leaking Petroleum Underground Storage Tank Cleanup Funds are regulated under 15A NCAC 2P.***

***Information related to the scope-of-work of tasks that may be required to be performed in accordance with the regulations and to the maximum rates allowed for these tasks is provided in the current version of the Reasonable Rate Document, which is available in electronic format from the UST Section's web page at <http://portal.ncdenr.org/web/wm/ust/tfb>.***

***The State Trust Funds may be used only for the cleanup of leaking petroleum USTs. Furthermore, some costs incurred for cleanup of leaking petroleum USTs are not reimbursable, as described in the most current version of the Task Scope-of-Work Document.***

***Owners or operators applying for participation in the North Carolina Commercial Leaking Petroleum Underground Storage Tank Cleanup Fund (STF) are cautioned: all required annual operating fees must be paid before a release is discovered, or reimbursement will not be available for any cleanup or third-party liability expense that is incurred. Questions related to State Trust Fund reimbursement should be directed to the Trust Fund Branch at 919-707-8171.***

## **3.0 Applicability of Regulatory Requirements**

### **3.1 Regulated UST vs. Non-Regulated UST**

This document provides guidance relevant to both regulated USTs and non-regulated USTs for any closure or site check activity through the initial abatement of a release. The term “regulated UST” is defined and distinguished from “non-regulated UST”. A “regulated UST” is any underground tank containing regulated substances, as defined in 15A NCAC 2N, specifically petroleum (including but not limited to gasoline, diesel and used/waste oil) or a hazardous substance (including halogenated or non-halogenated solvents). USTs which constitute exceptions to this definition are considered “non-regulated USTs” and include:

- USTs containing heating oil that is used on the premises where stored.
- Farm or residential motor-fuel USTs (such as those containing gasoline or diesel fuel) that hold 1,100 gallons or less in capacity. (To be considered exempt from the regulations, both farm and residential tanks must be 1,100 gallons or less in capacity and be used for non-commercial purposes. USTs located on farm or residential property which are used for fuel resale or for other commercial purposes are regulated.)
- USTs that hold under 110 gallons in capacity.

The difference between regulated and non-regulated USTs is clarified further under the definition of UST in 15A NCAC 2N .0203, and examples of regulated and non-regulated USTs are presented in Appendix C.

## 3.2 Applicability of UST Closure Requirements

Regulated USTs: Closure activities performed during the permanent removal of all regulated USTs (petroleum and hazardous substance USTs) must be conducted in accordance with the UST closure requirements provided in 15A NCAC 2N .0800. These requirements incorporate the federal underground storage tank requirements by reference in accordance with NCGS 150B-14(c).

Non-Regulated USTs: Most of the UST closure requirements applicable to regulated USTs are not applicable to non-regulated USTs. Non-regulated petroleum USTs (e.g., home heating oil USTs) are not required to be removed from the ground or closed by any specific procedure. Soil or groundwater samples are not required at the time of closure UNLESS a release is suspected or has been confirmed.

Non-regulated non-petroleum USTs (e.g., alcohol, vegetable oil, or propylene glycol USTs) also are not required to be removed from the ground or closed by any specific procedure. Soil or groundwater samples are not required at the time of closure UNLESS a release is suspected or has been confirmed.

## 3.3 Applicability of Initial Response and Abatement Requirements

Regulated USTs: For releases from **regulated petroleum USTs** (e.g., gasoline USTs), the responsible party is required to comply with the release response requirements of 15A NCAC 2N .0702, .0703, and .0705 and 15A NCAC 2L .0404(1) and thus perform specific initial response and initial abatement actions, including excavation of contaminated soil.

For releases from **regulated hazardous substance USTs** (e.g., halogenated solvent USTs), the responsible party is required to comply with the release response requirements of 15A NCAC 2N .0702, .0703, and .0705 and thus to perform specific initial response and initial abatement actions, including excavation of contaminated soil.

Non-Regulated USTs: For releases from **non-regulated petroleum USTs** (e.g., home heating oil USTs), the responsible party is required to comply with the release response requirements of 15A NCAC 2N .0702, .0703, and .0705 and 15A NCAC 2L .0404(1) and thus perform specific initial response and initial abatement actions, including excavation of contaminated soil.

For releases from **non-regulated non-petroleum USTs**, the responsible party is required, if the substance is not naturally occurring (or is naturally occurring but exceeds the naturally-occurring standard), to comply with the release response requirements of 15A NCAC 2L .0106 and thus perform initial response and initial abatement actions. **A flowchart illustrating the requirements for releases from non-regulated non-petroleum USTs is presented as Figure 5 on p. 35.** More specific procedural guidance for release response at non-regulated non-petroleum UST releases (e.g., alcohol, vegetable oil, or propylene glycol UST releases) is not presented in this document as the composition and properties of non-regulated non-petroleum substances vary widely. Therefore, for releases from non-regulated non-petroleum USTs the responsible party should contact the Corrective Action Branch of the UST Section for site specific guidance at (919) 707-8171.

Some non-regulated non-petroleum UST releases (e.g., hazardous waste UST releases) do not fall under the authority of the UST Section; these releases must be referred to the appropriate agency.

## **4.0 UST Site Check Guidelines for Regulated UST Systems**

### **4.1 Regulatory Authority**

A site check is required if a release from a regulated UST system has been suspected or confirmed by the presence, at the site or nearby, of the regulated substance as free product, dissolved product, or vapor in soils, sewer and utility lines, surface water, groundwater, etc; by unusual operating conditions; or by leak detection and/or tightness testing results, in accordance with 15A NCAC 2N .0601 and .0603 and .0701- .0704. A site check is required if a spill or overfill is known to have occurred at the site. A site check is also required if the UST system is suspected to be the source of an off-site impact, in accordance with 15A NCAC 2N .0602.

### **4.2 Site Check Description**

The site check assessment procedure requires sampling where contamination is observed or is most likely to be present at the site. The scope of assessment therefore includes the soil surrounding the entire UST system and the groundwater. The sampling procedure requires the same sampling protocol required for UST closure. The sampling protocol must consider the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth to groundwater, and any other factors appropriate for identifying the presence and source of the release. Site check activities are required of owners and operators of UST systems in any of the circumstances described below:

- 1) Evidence of a release is present at the UST site or is found offsite and may be related to a release at the UST site. Such evidence includes, but is not limited to, the discovery of the presence of regulated substances (such as dissolved product, free product, or vapors) in soils, basements, sewer or utility lines, and nearby surface water and groundwater;
- 2) Tightness test results for the UST system do not indicate that a leak exists, but environmental contamination indicates that a release from the UST system may have occurred;
- 3) The applied method of leak detection indicates a suspected release and a follow-up tightness test confirms that result;
- 4) A spill or overfill of a regulated substance has occurred.

***If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.***

### 4.3 Site Check Requirements

When conducting a site check, the procedures below must be included:

- 1) Soil samples must be collected around the perimeter of a single UST or around the perimeter of a set of USTs in a single pit, according to the sampling procedure described in **item #1** of 5.3.B, Removal of UST(s) underlain by a concrete pad. Samples must be collected within 3 feet of the UST(s) at a depth equal to the depth of the tank bottom(s) or no deeper than 2 feet below the depth of the tank bottom into the native soil.
- 2) One sample must be collected at the fill port of each UST (or under any catchment basin at the fill port) to document overfills.
- 3) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, turbine pumps or turbine containment sumps, and other areas where contamination is suspected or observed, as described in 5.3.F.

*Note that it may not be necessary to collect samples from around the entire system, as indicated in items 1-3 above, if the area of the suspected release is localized.*

*Note also that if the UST system contains an ethanol-gasoline blend, the UST Section will determine if the assessment required in items 1-3 is adequate.*

- 4) All soil samples must be analyzed by approved methods as specified in Table 3, p. 44.
- 5) If required by the UST Section, a permanent monitoring well, constructed according to Title 15A NCAC 2C, Well Construction Standards, must be installed as close as possible to and within 5 feet of the (part of the) UST system with the (suspected) release in a downgradient direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8.
- 6) If the results of the site check indicate that no soil contamination equals or exceeds 10 mg/kg TPH for petroleum (*or exceeds the soil-to-groundwater MSCC, or the MDL if no MSCC is established, for regulated hazardous substances*), no groundwater contamination exceeds the groundwater quality standard established in 15A NCAC 2L .0202, and no free product is present, then the results must be reported to the UST Section in a Site Check Report (Appendix A, p. 53). The Site Check Report must be submitted to the branch of the UST Section which requested it (to Permits and Inspections Branch, if required by a UST inspector, or to the appropriate regional office of the Corrective Action Branch, if required by an incident manager). The Site Check Report must be received by the UST Section within 30 days of the receipt of the Notice of Regulatory Requirements or the Notice of Violation. If it was necessary to remove all or part of the UST system to allow access for site check sampling, then the required UST closure report elements (UST-12 Format with UST-2 Form, Appendix A, p. 65) should be submitted as part of the Site Check Report. The reporting requirements are described in Section 8.0, and the outline of the format is presented in Appendix A, p. 53. No further action will be required.

7) If the results of the site check indicate that soil contamination equals or exceeds 10 mg/kg TPH for petroleum (*or exceeds the soil-to-groundwater MSCCs, or the MDL if no MSCC is established, for regulated hazardous substances*), groundwater contamination exceeds the 2L standards, or free product is present, then the initial response and abatement actions must be performed. **A flowchart illustrating the requirements for releases discovered during site checks is presented as Figure 1 on p. 31.**

Initial response actions which are required include submittal of a 24-Hour Release and Reporting Form (Appendix A, p. 59) to the UST Section within 24 hours following discovery of the release; action to stop the release; and identification and mitigation of hazards from exposure to pollutants.

Initial abatement actions include determination of the source of the release (if not previously identified); investigation and removal of free product; submittal of a 20-Day Report (Appendix A, p. 61) to the UST Section within 20 days following discovery of the release; and excavation of contaminated soil to the maximum extent possible, followed by confirmation sampling as described in Section 9.1 and in Table 3, p. 44. The final results of the initial abatement actions for a petroleum release must be reported in an Initial Abatement Action Report (Appendix A, p. 71), which must be submitted to the UST Section within 90 days following discovery of the release. (*The final results of the initial abatement actions for a hazardous substance release must be reported in a 45-Day Report, the requirements for which are addressed in the current version of the Guidelines for Assessment and Corrective Action for UST Releases; the 45-Day Report must be submitted within 45 days following discovery of the release.*)

The 24-Hour Report, the 20-Day-Report, and the Initial Abatement Action Report (*or the 45-Day Report, for a hazardous substance release*) must be submitted to the branch of the UST Section which requested it (to Permits and Inspections Branch, if required by a UST inspector, or to the appropriate regional office of the Corrective Action Branch, if required by an incident manager). If it was necessary to remove all or part of the UST system to allow access for site check sampling and/or excavation, then the required UST closure report elements (UST-12 Format with UST-2 Form, Appendix A, p. 74) should be submitted as part of the Initial Abatement Action Report. The reporting requirements are described in Section 8.0, and the outline of the format is presented in Appendix A, p. 71.

8) If the Initial Abatement Action Report for a petroleum release shows that post-excavation soil contaminant concentrations do not exceed the lower of the soil-to-groundwater or residential maximum soil contaminant concentrations (MSCCs) and reports that neither groundwater nor bedrock has been encountered in the excavation, then no further action will be required. However, if the Initial Abatement Action Report indicates that soil contaminant concentrations exceed the lower of the soil-to-groundwater or residential MSCCs or reports that groundwater or bedrock has been encountered in the excavation, then the responsible party must perform further assessment and submit a Limited Site Assessment Report within 120 days of the discovery of the release. The Limited Site Assessment Report format is presented in the *Guidelines for Assessment and Corrective for UST Releases*, current version.

## **5.0 UST Closure (and Change-in-Service) Guidelines for Regulated UST Systems**

The procedure for closing a regulated UST system consists of pre-closure notifications; cleaning, removal, and disposal of the system; collection and analysis of soil and/or groundwater samples to determine the presence or absence of a release; and reporting of the results. If no release is indicated by the results, no further action may be required. If a release is determined, then initial response and abatement actions (Section 6.0), including excavation of contaminated soil (Section 7.0), are required. **Flowcharts illustrating UST closure and initial release response and abatement actions for regulated petroleum USTs (Figure 2) and for regulated hazardous substance USTs (Figure 3) are presented on pages 32 and 33 respectively.**

A change-in-service is the continued but modified use of a UST system previously used to store a regulated substance to store a non-regulated substance. For example, an owner or operator of a UST system that stores ethylene glycol, a regulated substance used for de-icing airplanes, wants to change the use of the UST system to store propylene glycol, a non-regulated substance for de-icing airplanes. This is considered a change-in-service. To complete a change-in-service, tank owners and operators must follow the same procedures as for an in-place permanent closure of a regulated UST system (including all notifications and reporting, emptying and cleaning the UST system, and conducting a site assessment), except that the UST system is not filled with an inert substance but with a non-regulated substance. Changes-in-service are allowed only if no release is found during the site assessment. If a release is discovered, then the UST system must be removed from the ground and initial response and initial abatement actions must be completed. **Flowcharts illustrating a change-in-service and initial release response and abatement actions for regulated petroleum USTs (Figure 2) and for regulated hazardous substance USTs (Figure 3) are presented on pages 32 and 33, respectively.**

*If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.*

### **5.1 Pre-Closure Actions**

Before closure (or a change-in-service) of a regulated UST is initiated, the responsible party must contact the local fire marshal and/or local county or municipality for special closure or permit requirements. The responsible party must also file a UST-3 Form - Notice of Intent: UST Permanent Closure or Change-in-Service (Appendix A, p. 58) with the appropriate UST Section regional office 30 days before closure activities begin. The responsible party also must submit a copy of the UST-3 Form to the UST Section Central Office. [If a professional engineer (P.E.) or licensed geologist (L.G.) is supervising the closure, a UST-3 Form may be submitted at least five working days before the UST closure.]

## 5.2 Cleaning, Removal, and Disposal of USTs and Associated Piping and Dispensers

To close a regulated UST system, the responsible party first must clean the tank by removing all liquids and accumulated sludge.

A regulated UST system (including tanks, associated piping and dispensers) should be closed by removal. In-place closure of USTs may be performed only with the written approval of the UST Section; and normally only USTs which are determined to be inaccessible (e.g., located under substantial structures) will be approved for in-place closure.

If a tank is replaced with a new tank, the old piping and dispensers may continue to be used only if the piping and dispensers meet the requirements of 15A NCAC 2N and if closure soil samples collected in accordance with Section 5.3.F indicate that no contaminants are present at concentrations equal to or in excess of 10 mg/kg TPH (*or above soil-to-groundwater MSCCs for hazardous substances*). If contamination is present under the piping or dispensers, the old piping and dispensers may have to be removed and replaced.

During UST closure activities, the responsible party must ensure that all USTs are rendered non-hazardous prior to removal from the site and then are properly disposed. In selecting a tank closure contractor, the responsible party should ask the contractor where the tank(s) are to be disposed. All product, water and sludge generated during the closure activities must be properly stored, labeled, transported, and disposed. Tanks that are disposed in fields or dumping sites, or that are otherwise improperly discarded, may leak petroleum products and sludge into the environment. A tank owner will be held responsible for the cleanup of any environmental damage that occurs from improperly disposed USTs.

Individuals performing tank closure activities should adhere to the cleaning, removal, and safety procedures provided in the most recent versions of the following documents:

- **American Petroleum Institute**
  - Recommended Practice 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*.
  - Publication 2015, *Safe Entry and Cleaning of Petroleum Storage Tanks*.
  - Publication 2217A, *Guidelines for Work in Inert Confined Spaces in the Petroleum Industry*.
  - Publication 2219, *Safe Operating Guidelines for Vacuum Trucks in Petroleum Service*.
  - Recommended Practice 2003, *Protection Against Ignition Arising Out of Static, Lightning and Stray Currents*.
- **National Fire Protection Agency (NFPA)**
  - 70B, *Electrical Equipment Maintenance*.
  - 326, *Safe Entry of Underground Storage Tanks*.
  - 327, *Standard Procedure for Cleaning or Safeguarding Small tanks and Containers*.

- **The National Institute for Occupational Safety and Health**, *Criteria for a Recommended Standard: Working in Confined Spaces*.
- **Occupational Safety and Health Administration**
  - 29 Code of Federal Regulations Part 1910 (Occupational Safety and Health Standards).

### 5.3 Regulated UST Closure (and Change-in-Service) Assessment Requirements

Before permanent closure (or a change in service) of regulated USTs is completed, owners and operators must assess the UST site for the presence of a release where contamination is most likely to be present. Therefore, the scope of assessment is inclusive of the soil surrounding the entire UST system (the tank, connected piping, dispensers, and containment system) and of the groundwater in particular circumstances in which soil assessment is not adequate.

The assessment procedure to be performed is determined by the method selected for UST closure (removal of USTs, removal of USTs underlain by a concrete pad, and in-place closure of USTs) or by hydrogeological conditions encountered at the closure site. *(If the UST system contained an ethanol-gasoline blend, the UST Section will determine if the assessment procedure for any UST closure method is adequate or if it should be supplemented by the groundwater assessment described in 5.3.G.)*

#### 5.3.A Closure by Removal of USTs

Where closure by removal of USTs has been performed, the procedures listed below must be performed:

1) After the tank(s) have been removed, and before excavating any deeper, samples must be collected in the excavation pit directly beneath the mid-line location of the former tank. The number of samples required depends on the length (longest dimension) of the tank. These samples should be collected at evenly spaced intervals along the length of the tank, no deeper than two feet into the native soil, as follows:

|                      |       |                                    |
|----------------------|-------|------------------------------------|
| Less than 6 feet     | ----- | 1 sample                           |
| 6 to 20 feet         | ----- | 2 samples                          |
| >20 to 30 feet       | ----- | 3 samples                          |
| >30 to 40 feet       | ----- | 4 samples                          |
| >40 to 50 feet       | ----- | 5 samples                          |
| Greater than 50 feet | ----- | 1 sample per 10 ft. of tank length |

2) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, and other areas where contamination is suspected or observed, as described under 5.3.F.

3) The UST Section may direct that a permanent monitoring well, constructed according to 15A NCAC 2C Well Construction Standards, be installed in the pit or, if that is not

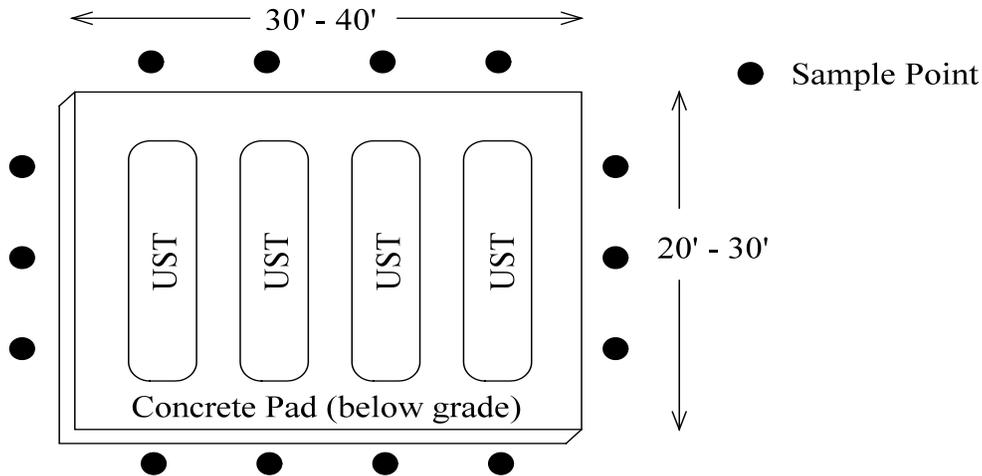
technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction (and/or under product lines, dispensers, or other areas), and that a groundwater sample be collected and analyzed as specified in Tables 4 and 8, if the soil assessment procedure described in items 1 and 2 is determined by the incident manager or compliance inspector to be inadequate to measure for the presence of a release at a particular site.

5.3.B Closure by Removal of UST(s) Underlain by Concrete Pad

Where closure by removal of UST(s) underlain by a concrete pad is performed, the procedures listed below must be performed:

1) Soil samples must be collected along the outside edge of the concrete pad, within 3 feet of the pad and no deeper than 2 feet into the native soil below the bottom level of the pad, around the full perimeter of the pad. The minimum number of samples required per side around the perimeter of the concrete pad, is as follows:

|                      |       |                                    |
|----------------------|-------|------------------------------------|
| Less than 6 feet     | ----- | 1 sample                           |
| 6 to 20 feet         | ----- | 2 samples                          |
| >20 to 30 feet       | ----- | 3 samples                          |
| >30 to 40 feet       | ----- | 4 samples                          |
| >40 to 50 feet       | ----- | 5 samples                          |
| Greater than 50 feet | ----- | 1 sample per 10 feet of pad length |



2) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, and areas where contamination is suspected or observed, as described under 5.3.F; and

3) To verify that no contamination is present under the center of the pad, either a sample must be collected no deeper than 2 feet under the center of the pad; or a permanent monitoring well, constructed according to 15A NCAC 2C Well Construction Standards, must be installed as close as possible to and within 5 feet of the concrete pad in a downgradient

direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8.

### 5.3.C In-Place Closure (or Change-in-Service) of USTs

In-place closure of USTs may be performed only with the written approval of the UST Section. Normally, only USTs which are determined to be inaccessible (e.g., located under substantial structures such as buildings, but not such as dispensers or canopies) will be approved for in-place closure. However, when in-place closure (or change-in-service) is allowed by the UST Section, the procedures below must be performed:

- 1) Soil samples must be collected around the perimeter of a single UST or around the perimeter of a set of USTs in a single pit, according to the sampling requirements described above in 5.3.B, Closure by Removal of UST(s) Underlain by Concrete Pad. Samples must be collected less than 3 feet from the UST(s) at the depth of the tank bottom or no deeper than 2 feet into the native soil below the depth of the tank bottom;
- 2) One sample must be collected at the fill port of each UST to document overfills;
- 3) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, and other areas where contamination is suspected or observed, as described under 5.3.F;
- 4) A permanent monitoring well, constructed according to 15A NCAC 2C Well Construction Standards, must be installed as close as possible to and within 5 feet of the UST(s) in a downgradient direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8; and
- 5) The tank must be thoroughly cleaned, according to the guidance in Section 5.2.

**The practice of boring through the bottom of a tank that is to be closed in-place in order to facilitate sampling directly under the UST is hazardous. If this procedure is performed, all applicable safety measures should be observed.**

### 5.3.D Closure of USTs in Areas with High Water Tables

Where groundwater is encountered in the excavation from which the UST or USTs have been removed or at the base of closed-in-place USTs, the procedures below must be performed

- 1) Soil samples must be collected in the sidewalls of the excavation immediately above the water table. One sample must be collected at a minimum interval of 10 linear feet around the perimeter of the excavation with a minimum of one sample per sidewall;
- 2) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, and other areas where contamination is suspected or observed, as described under 5.3.F; and

3) A permanent monitoring well, constructed according to 15A NCAC 2C Well Construction Standards, must be installed in the pit or, if that is not technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction. A groundwater sample must be collected and analyzed as specified in Tables 4 and 8. **Pit water samples will not be accepted.**

5.3.E Closure of USTs Located in or on Bedrock

When tanks are located in or on bedrock, the procedures below must be performed:

1) After the tank(s) have been removed, samples of backfill or of "native" soil must be collected in the excavation pit beneath the mid-line location of the former tank, from the interface between soil and rock. The number of samples required depends on the length (longest dimension) of the tank. These samples should be collected at evenly spaced intervals along the length of the tank, as follows:

|                      |       |                                    |
|----------------------|-------|------------------------------------|
| Less than 6 feet     | ----- | 1 sample                           |
| 6 to 20 feet         | ----- | 2 samples                          |
| >20 to 30 feet       | ----- | 3 samples                          |
| >30 to 40 feet       | ----- | 4 samples                          |
| >40 to 50 feet       | ----- | 5 samples                          |
| Greater than 50 feet | ----- | 1 sample per 10 ft. of tank length |

2) Soil samples must also be collected underneath associated product lines, dispensers, containment sumps, and other areas where contamination is suspected or observed, as described in 5.3.F; and

3) A permanent monitoring well, constructed according to 15A NCAC 2C Well Construction Standards, must be installed in the pit or, if that is not technically possible, as close as possible to and within 5 feet of the UST(s) in a downgradient direction, and a groundwater sample must be collected and analyzed as specified in Tables 4 and 8.

5.3.F Sampling underneath Product Lines, Dispensers, or Dispenser Islands

**For sampling under product lines (including lines under dispenser islands) the procedures listed below must be performed:**

- 1) The product lines must be completely exposed prior to sampling (*This procedure is not required for site checks.*);
- 2) Samples must be collected **no deeper than 2 feet** into the native soil beneath the product lines;
- 3) A minimum of one sample must be collected for each 10 linear foot interval along a line (and if the line is less than 10 feet in length, one sample still is required);

- 4) Samples must be collected at all fittings, especially joints, or wherever there is heightened potential for a release, and at all locations where staining is present or where contamination is suspected;
- 5) Samples are required under product lines even if it is planned that the lines remain for use with replacement UST(s).

**For sampling under dispensers, the procedures listed below must be performed:**

- 1) The dispenser piping must be completely exposed prior to sampling (*This procedure is not required for site checks.*);
- 2) Samples must be collected **no deeper than 2 feet** into the native soil directly below each individual dispenser;
- 3) Samples must be collected **no deeper than 2 feet** into the native soil directly below all couplings, pumps, and containment sumps, or wherever there is heightened potential for a release, and at all locations where staining is present or where contamination is suspected;
- 4) Samples are required under dispensers even if it is planned that the dispensers remain for use with replacement UST(s).

**For sampling under containment sumps and other areas where contamination is suspected, the procedures described below must be performed:**

Samples must be collected **no deeper than 2 feet** into the native soil directly below containment structures and other areas where contamination is suspected or observed. Samples must be taken from directly below the piping that enters the sump and beneath any defective area of the sump. If the containment sump is sitting directly on the tank, thereby preventing collection of samples under the sump, then samples must be collected along the perimeter of the sump within one foot of the sump. In addition, samples must be collected from any area where contamination is observed.

When only the product lines or the dispensers of a UST system are being replaced, soil samples are not required unless evidence of a release is observed.

When groundwater or bedrock is encountered in the trench or pit in which product lines, dispensers, or sumps are or were located or when the incident manager determines that soil assessment is not adequate to determine the presence of a release, a monitoring well must be installed.

### 5.3.G Additional Groundwater Assessment for Ethanol-Gasoline Blend UST Systems

If the UST system contained an ethanol-gasoline blend, the UST Section may direct that a permanent monitoring well, constructed according to 15A NCAC 2C Well Construction

Standards, be installed in the pit and/or under product lines, dispensers, or other areas and a groundwater sample be collected and analyzed as specified in Tables 4 and 8.

#### **5.4 Reporting of Regulated UST Closure Assessment Results**

Regulated Petroleum USTs: Within 30 days after closure has been completed, *if soil contaminant concentrations in closure samples do not equal or exceed 10 mg/kg TPH and if groundwater and bedrock are not encountered in the pit (or if either are encountered and groundwater contaminant levels are determined not to exceed the 2L standard limits)*, a UST Closure Report (Appendix A, p. 65) following the UST-12 format, and a UST-2 Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs (Appendix A, p. 70), must be completed and submitted to the branch of the UST Section which requested it (to Permits and Inspections Branch, if required by a UST inspector, or to the appropriate regional office of the Corrective Action Branch, if required by an incident manager). If the UST Closure Report is submitted to the Corrective Action Branch, a copy of the UST-2 Form also must be submitted to the Permits and Compliance Branch in the UST Section Central Office, so that the UST status may be changed to “permanently closed” and the tank fee account for the facility can be updated.

However, *if soil contaminant concentrations in closure samples equal or exceed 10 mg/kg TPH or if groundwater or bedrock are encountered in the pit and groundwater contaminant levels are determined to exceed the 2L standard limits*, within 90 days of discovery of the release, an Initial Abatement Action Report (Appendix A, p. 71), must be submitted instead. The Initial Abatement Action Report incorporates the requirements of the UST Closure Report, as previously described, and also presents post-excavation soil assessment information required under 15A NCAC 2L .0404(3) to demonstrate the extent to which the contaminated soil has been removed.

Regulated Hazardous Substance USTs: Within 30 days after closure has been completed, *if soil contaminant concentrations in closure samples are not above the soil-to-groundwater MSCCs (or the MDL if no MSCC is established for a contaminant) and if groundwater and bedrock are not encountered in the pit (or if either are encountered and groundwater contaminant levels are determined not to exceed the 2L standard limits)*, a UST Closure Report (Appendix A, p. 65) following the UST-12 format, and a UST-2 Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs (Appendix A, p. 70), must be completed and submitted to the branch of the UST Section which requested it (to Permits and Inspections Branch, if required by a UST inspector, or to the appropriate regional office of the Corrective Action Branch, if required by an incident manager). If the UST Closure Report is submitted to the Corrective Action Branch, a copy of the UST-2 Form also must be submitted to the Permits and Compliance Branch in the UST Section Central Office.

However, *if soil contaminant concentrations in closure samples are above the soil-to-groundwater MSCCs or if groundwater or bedrock are encountered in the pit and groundwater contaminant levels are determined to exceed the 2L standard limits*, within 45 days of discovery

of the release a 45-Day Report (*Guidelines for Assessment and Corrective Action for UST Releases*, current version) must be submitted instead.

## **5.5 Non-Regulated Petroleum UST Closure Assessment Requirements**

**Non-regulated petroleum USTs are not required to be removed from the ground or closed by any specific procedure. Soil or groundwater samples are not required on closure UNLESS a release is suspected or has been confirmed.**

**However, if a release from a non-regulated petroleum UST system is discovered, tank removal and soil and groundwater assessment requirements stipulated in Section 5.3 for regulated UST closure do apply**, as do initial response and abatement action requirements, including excavation (Sections 6.0 and 7.0). See Figure 4 for a flowchart illustrating initial response and abatement action requirements in the case of a release.

If sampling during closure is desired despite the absence of requirement, see Section 5.3 for recommended sampling locations

If any portion of a home heating oil tank (except the vent or fill lines) is visible above the surface of the immediately surrounding ground, the responsible party must notify the appropriate UST Section regional office and UST Section staff must determine if the tank is a UST prior to any activities being conducted under the UST program.

## **6.0 Initial Response and Abatement Actions Following UST Release**

### **6.1 Initial Response Actions**

For discharges and releases from regulated (petroleum and hazardous substance) USTs and non-regulated petroleum USTs, the responsible party is required to comply with the release response requirements of 15A NCAC 2N .0702 and/or 15A NCAC 2L .0404(1) within 24 hours of discovery of a release.

***If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.***

#### **6.1.A 24-Hour Release Report**

Evidence (including odor or vapor, free product, stained soil, analytical data indicating contamination of soil or groundwater) of discovery of a release from a regulated or non-regulated UST must be reported to the UST Section within 24 hours following discovery. The responsible party must complete a UST Form 61 (24-Hour Release and UST Leak Reporting Form), found in Appendix A, p. 59, and submit it (or transmit the information required thereon by telephone or electronic mail) within 24 hours to the appropriate regional office of the Corrective Action

Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by a UST inspector).

#### 6.1.B Action to Prevent Further Release

To prevent any further release of the substance from the UST system to the environment, the responsible party must take immediate steps, as follows: shut down the operation of all or part of the system; remove the substance from the system; repair, replace, or remove all or part of the system; and perform any other action deemed effective. The responsible party must immediately undertake an investigation to confirm the presence of any environmental contamination and determine the precise source of the release, if not previously determined by a site check, closure assessment, or other means.

#### 6.1.C Identification and Mitigation of Hazards from Exposure to Pollutants

The responsible party must take immediate action to identify and mitigate hazards resulting from exposure to pollutants. Water supply wells, surface water bodies, utility lines, basements, and other potential receptors must be identified and sampled, if deemed to be at risk. If impact to a receptor is determined, then the responsible party must act at once to mitigate the impact. For example, if a water supply well is impacted by contaminants from a UST release at concentrations which exceed the groundwater quality standards, then the sampling results must be sent immediately to the appropriate regional office of the UST Section and an alternate water supply must be provided by the responsible party.

#### 6.1.D Identification and Mitigation of Fire, Explosion, and Vapor Hazards

The responsible party must take immediate action to identify and mitigate fire, vapor, and explosion hazards posed by vapors or free product which have migrated from the UST system into utility lines, vaults, basements, or other subsurface features.

### **6.2 Initial Abatement Actions**

For discharges and releases from regulated (petroleum and hazardous substance) USTs and non-regulated petroleum USTs, the responsible party is required to comply with the initial abatement requirements of 15A NCAC 2L .0404(1) and/or 15A NCAC 2N .0703 and .0705.

***If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.***

#### 6.2.A Completion of Investigation to Confirm Presence of Environmental Contamination and Determine Source of Release

The responsible party must complete the investigation to confirm the presence of and/or determine the precise source of the release, if those determinations have not been accomplished during initial response or by a site check or closure assessment. The responsible party must

measure for the presence of a release wherever contamination of soil or groundwater is likely to be present.

#### 6.2.B Investigation and Recovery of Free Product

The responsible party must investigate to determine the possible presence of free product and, if free product is discovered, begin free product recovery within 14 days. Following the initial free product recovery event and the subsequent Free Product Recovery Report, the responsible party must investigate to determine the type, thickness, rate of recovery, and lateral extent of free product; evaluate relevant hydrogeological factors and potential receptors; and submit the results in a FP Recovery System Specification Report. In this report, the responsible party must evaluate recovery system options and propose a recovery plan which incorporates the most appropriate option. The plan should be designed to minimize the spread of contamination and treat, discharge, and dispose of free product in compliance with all applicable regulations. The objectives of the plan should be to halt migration and to remove free product to the maximum extent practicable, usually to a thickness of less than 0.01 foot. The report should conclude with a schedule for the free product recovery plan which includes implementation, attainment of free product recovery progress milestones, and submittal of reports. The responsible party must implement the free product recovery plan immediately upon approval and continue to execute the plan, simultaneously with all other required abatement, assessment, cleanup, and reporting activities, until free product has been removed or until the plan is superseded by the Corrective Action Plan. The responsible party is required to handle flammable product safely and competently in order to prevent fire or explosion. (See Section 8.8 for a discussion of reports.)

#### 6.2.C Continued Mitigation and Monitoring of Fire, Explosion, and Vapor Hazards

The responsible party must continue to mitigate and monitor any fire, explosion, and vapor hazards posed by free product or by vapors which have migrated into subsurface structures.

#### 6.2.D Remediation of Hazards Posed by Exposed Contaminated Soil

The responsible party must remedy hazards posed by contaminated soils exposed by assessment or excavation activities. Contaminated soil must be treated and disposed in compliance with state and local requirements. Refer to Section 7.4, p. 21, for guidance on disposal of contaminated soil from excavations.

#### 6.2.E Submittal of 20-Day Report

The responsible party must submit a 20-Day Report summarizing the initial abatement actions performed within the initial 20-day period within 20 days following release confirmation to the appropriate regional office of the Corrective Action Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by a UST inspector).

#### 6.2.F Excavation of Contaminated Soil

Excavation of contaminated soil is addressed in Section 7.0.

## **7.0 Initial Abatement - Excavation of Contaminated Soil Following UST Release**

*If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.*

### **7.1 Excavation of Contaminated Soil from Regulated Petroleum UST Releases**

#### **7.1.A Requirements for Excavation**

The responsible party must comply with the initial abatement requirements in 15A NCAC 2L .0106(f)(2) and (4) which necessitate the removal, treatment, or control of secondary pollution sources which would be potential continuing sources of contaminants to the groundwaters, such as contaminated soils, and those in 15A NCAC 2L .0404(1) and 15A NCAC 2N .0703, which require the prevention of further migration of the released substance into surrounding soils and groundwater. The Department specifically requires that the responsible party excavate contaminated soil immediately upon determining that contaminant concentrations in soil samples from a site check, a UST closure, or other preliminary investigation exceed the following action level:

Equal to or greater than 10 milligrams per kilogram (mg/kg) TPH, when the soil samples have been analyzed by the approved TPH methods listed in Table 3.

Initial abatement excavations should be carried out for each source of release on the site for which contaminant concentrations exceed the action level.

#### **7.1.B Limitations to Excavation**

At the initial abatement stage, the responsible party should attempt to remove all contaminated soil. Excavation should cease in any direction in which clean soil or bedrock is encountered or in which excavation threatens to harm a substantial structure and generally should cease in the vertical direction when groundwater is encountered.

Note: If State Trust Fund reimbursement is anticipated for soil excavation, initial abatement excavation should stop **no more than 5 feet laterally from the tanks, piping, or dispensers from which a release originated and no deeper than 17 feet below land surface, and the total volume excavated should not exceed 800 cubic yards** (exclusive of clean overburden excavated to facilitate access to contaminated areas).

However, excavation may be continued beyond 5 feet laterally and 17 feet below land surface vertically or in exceedance of a total volume of 800 cubic yards, but only with the written approval of the UST Section incident manager or compliance inspector. Approval should be based on on-site inspection by the UST Section staff and on field screening or, if appropriate, TPH analytical results.

### 7.1.C Sampling during and at Completion of Excavation

The licensed individual in charge of the over-excavation is expected to use his/her professional judgment to remove contaminated soil effectively while maintaining cost-efficiency; he/she must insure that only contaminated soil is removed. As releases usually migrate vertically downward from the source of the release, excavation should normally be directed vertically downward from the source area. During over-excavation any type of sample screening may be used at the discretion of the licensed individual, except that, if State Trust Fund reimbursement is anticipated, TPH analysis may be required by the UST Section to justify approval of excavation beyond the dimension and volume limits. However, final confirmation sampling and analysis must be conducted using the approved analytical methods described in Section 9.1 and listed in Table 3. A sample is required from the base of each excavation and from each of the sidewalls. A set of base and sidewall post-excavation confirmation samples must be collected from each excavation at the site. **If there are several excavations, then a separate set of samples is required from each excavation.**

Samples must be collected from sidewall and base locations where contamination is most likely to be present. One sample must be collected from each sidewall of the excavation. The sample(s) collected from the base of the excavation must be collected directly underneath the location(s) of highly contaminated UST closure (or site check) sample(s). If there were, following tank (or line) removal, several distinct areas of contaminated soil in a large, four-sided tank pit (or in a long, four-sided product line trench), four sidewall samples and a representative number of base samples should be collected from the subsequent over-excavation of that pit (or trench) and analyzed by the methods appropriate to the contamination at each location.

During the over-excavation of contamination from a regulated petroleum UST release, if groundwater or bedrock is encountered, then groundwater sampling will be required later as part of a Limited Site Assessment.

### 7.1.D Post-Excavation Reporting and Actions

At the completion of excavation and within 90 days of the date of release discovery, the responsible party must submit an Initial Abatement Action Report to the appropriate regional office of the Corrective Action Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The reporting requirements are described in Section 8.0 and the outline of the report format is presented in Appendix A, p. 71. The purpose of the Initial Abatement Action Report is to report and describe all initial abatement actions performed, including the over-excavation process and the post-excavation soil contamination assessment.

*If the Initial Abatement Action Report demonstrates that remaining unsaturated soil in the sidewalls and at the base of the excavation does not contain contaminant levels which exceed the soil-to-groundwater or the residential maximum soil contaminant concentration (MSCC), whichever is lower, that neither groundwater nor bedrock has been encountered in the excavation, and that groundwater contamination, if assessed, does not exceed the groundwater*

*quality standard limits, the discharge or release can be classified as low risk. No further action will be required.*

*However, if contaminant levels in exceedance of the lowest MSCCs remain in the soil following final excavation, if either groundwater or bedrock is encountered in the excavation, or if groundwater contamination exceeds the groundwater quality standard limits, then the responsible party must perform a Limited Site Assessment. A Limited Site Assessment Report must be submitted to the appropriate UST Section regional office within 120 days of the date of discovery of the release. The outline of the report format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.*

#### 7.1.E Installation of New or Replacement UST Systems in Former UST System Locations

**New or replacement USTs, piping, or dispensers should not be installed in a former UST system location until it has been demonstrated, based on sampling procedures and concentration limits established in this section, that soil contaminated in exceedance of the lower of the soil-to-groundwater or residential MSCCs has been removed.** In accordance with 15A NCAC 2N .0901(h), UST systems or UST system components may not be installed or replaced in areas where they will be in contact with contaminated soil or free product. Failure to excavate the contaminated soil prior to installing a new or replacement UST system component may result in the removal of the new or replacement UST system in order to excavate the contaminated soil.

## **7.2 Excavation of Contaminated Soil from Non-Regulated Petroleum UST Releases**

Once a release has been discovered or confirmed the cleanup actions for non-regulated petroleum UST releases (including heating oil UST releases) become regulated in accordance with 15A NCAC 2N .0700 and 15A NCAC 2L .0400 and therefore become subject to the requirements for assessment and cleanup specified therein. **(See flowchart illustrating non-regulated petroleum UST release response in Figure 4, p. 34)**

**Non-regulated USTs with greater than or equal to 1,100-gallon capacity.** When a release is discovered prior to or during the removal of a non-regulated petroleum UST system with a tank of capacity greater than 1,100 gallons, the responsible party must remove the contaminated soil in accordance with the soil excavation guidance and the assessment and reporting requirements presented in Section 7.1 for regulated petroleum USTs.

**Non-regulated USTs with less than 1,100-gallon capacity.** When a release is discovered prior to or during the removal of a non-regulated petroleum UST system with a tank of capacity less than 1,100 gallons (which includes most home heating oil tanks), the responsible party must remove the contaminated soil in accordance with the general soil excavation guidance and the assessment and reporting requirements presented in Section 7.1. However, the limits to excavation for these smaller non-regulated petroleum UST systems differ from those specified in Subsection 7.1.B, as described below.

At the initial abatement stage, the responsible party should attempt to remove all contaminated soil. Excavation should cease in any direction in which clean soil or bedrock is encountered or in which excavation threatens to harm a substantial structure and generally should cease in the vertical direction when groundwater is encountered.

Note: If State Trust Fund reimbursement is anticipated for soil excavation, initial abatement excavation should stop when a total volume of **38.5 cubic yards** of contaminated soil has been removed from the excavation (exclusive of clean overburden excavated to facilitate access to contaminated areas).

However, excavation may be continued beyond a total volume of 38.5 cubic yards may be conducted, but only with the written approval of the UST Section incident manager. Approval should be based on on-site inspection, if necessary, by the UST Section staff and on field screening or, if appropriate, TPH analytical results.

Post-excavation actions for non-regulated petroleum UST releases differ in one respect from those specified for regulated releases. For non-regulated petroleum UST releases, if groundwater is encountered in the excavation, a monitoring well must be installed at the location of the release source, and groundwater must be sampled. If groundwater contamination does not exceed the 2L standards *and any remaining soil contamination is below the lowest MSCCS*, the discharge or release may be classified as low risk, and no further action required.

### **7.3 Excavation of Contaminated Soil from Regulated Non-Petroleum UST Releases**

Once a release has been confirmed, initial abatement actions for releases from regulated, non-petroleum USTs (including USTs containing hazardous substances such as halogenated solvents) are subject to the corrective action requirements of 15A NCAC 2N .0700. Thus, contaminated soil must be excavated to the maximum extent possible, and post-excavation confirmatory soil samples must be collected and analyzed using approved analytical methods, as specified in Table 5, p. 46. **A flowchart illustrating the requirements for regulated hazardous substance UST releases is presented as Figure 3 on p. 33.**

### **7.4 Disposal of Contaminated Soil and Groundwater from Excavations**

Excavations may not be back-filled with contaminated soil. Pursuant to 15A NCAC 2T .1502 (4), soil is contaminated if analytical results from samples collected during the assessment or from the stockpile show the presence of contaminants at concentrations above the method detection limit (MDL). Once contaminated soil is excavated, it is considered a waste and must be properly disposed of, even if the contaminant concentrations are below applicable cleanup levels. A permit issued by the DWM is required if excavated contaminated soil is to be treated on site, and a certificate of approval is required if excavated contaminated soil is to be temporarily stored on site (See *Guidelines for Ex Situ Petroleum Contaminated Soil Remediation*, current version.). If soil is to be hauled offsite for treatment/disposal, then disposal manifests are required.

Furthermore, if State Trust Fund reimbursement is anticipated for hauling/treatment/ disposal, samples from the excavated contaminated soil stockpile must be collected in accordance with the composite sample protocol provided in *the Guidelines for Ex Situ Petroleum Contaminated Soil Remediation*, current version, and analyzed using TPH methods, as directed in Table 3, p. 44, under Preliminary Investigations.

Excavations must be filled with clean compacted fill that is similar to the native soil removed from the excavation. If gravel or some other permeable material is to be used, then a low permeability fill material must be used to cap the excavation.

If the tank pit or the excavation requires de-watering, the contaminated water must be properly treated to meet discharge levels allowed in a POTW or NPDES permit or must be properly disposed at a permitted facility.

Groundwater from pilot tests (for free product removal technology) must be captured and disposed of according to the regulations, as described in Appendix E.

Groundwater from well development, as well as drilling mud and cuttings, must be disposed of according to the instructions presented in Appendix E.

More comprehensive guidance on the proper disposal of contaminated soil and groundwater is presented in Appendix E – Disposal of Contaminated Soil and Groundwater.

## **8.0 Reporting Requirements**

*If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.*

### **8.1 Site Check Report**

The results of a site check required by the UST Section must be reported in a Site Check Report if the results indicate that no soil contamination equals or exceeds 10 mg/kg TPH for petroleum (*or exceeds the soil-to-groundwater MSCCs for regulated hazardous substances*), no groundwater contamination exceeds the 2L standards, and no free product is present. The Site Check Report must be submitted to the representative of the Permits and Inspections Branch or the appropriate regional office of the UST Section who issued the Notice of Regulatory Requirements or Notice of Violation in which the site check was requested within 30 days of its receipt. The outline of the format is presented in Appendix A, p. 53.

### **8.2 24-Hour Release and UST Leak Reporting Form (UST 61 Form)**

Evidence (e.g., odor, free product, stained soil) of discovery of a release from a regulated or non-regulated UST must be reported to the UST Section within 24 hours. A UST 61 Form (24-Hour Release and UST Leak Reporting Form), found in Appendix A, p. 59, must be completed and

submitted to the appropriate regional office of the Corrective Action Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by a UST inspector).

### **8.3 Notice of Intent: UST Permanent Closure or Change-in-Service Form (UST-3 Form)**

Before closure (or a change in service) of a regulated UST is initiated, the responsible party must contact the local fire marshal and/or local county or city municipality for special closure or permit requirements. The responsible party must also file a UST-3 Form - Notice of Intent: UST Permanent Closure or Change-in-Service (Appendix A, p. 58) with the appropriate UST Section regional office 30 days before closure activities begin. A copy of the UST-3 Form also must be submitted to the UST Section Central Office. [Exception: If a professional engineer (P.E.) or licensed geologist (L.G.) is supervising the closure, a UST-3 Form may be submitted at least five working days before the UST closure.]

### **8.4 20-Day Report**

Within 20 days after release confirmation the responsible party must submit a report summarizing the initial response and abatement steps taken within the first 20 days and any data or information available within that time period. The report must be submitted to the appropriate regional office of the Corrective Action Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The intent of this report is to present the information available within 20 days following the confirmation of the release. The outline of the report format is presented in Appendix A, p. 61.

### **8.5 UST Closure Report (following UST-12 Format) with UST-2 Form**

Within 30 days after a clean closure (no soil contamination equals or exceeds 10 mg/kg TPH for petroleum *(or exceeds the soil-to-groundwater MSCCs for regulated hazardous substances)*, and groundwater and bedrock are not encountered in the pit or groundwater contamination does not exceed the 2L standards) has been completed, a UST Closure Report (Appendix A, p. 65) following the UST-12 Format, and a UST-2 Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs (Appendix A, p. 70) must be completed and submitted to the appropriate regional office of the Corrective Action Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by UST inspector). A copy of the UST-2 Form must also be submitted to the Permits and Compliance Branch in the UST Section Central Office, so that the UST status may be changed to “permanently closed” and the tank fee account for the facility can be updated.

### **8.6 Initial Abatement Action Report**

On completion of initial abatement actions for petroleum releases, the responsible party must submit an Initial Abatement Action Report, a newly created report which is not to be confused with the 20-Day Report. The purpose of the Initial Abatement Action Report is to report the initial investigation which resulted in the discovery of the release (site check and/or UST closure) and all initial abatement actions performed, including determination of source(s),

removal of free product, over-excavation, and post-excavation soil contamination assessment. *(The new report thus is intended to fulfill the requirement under 15A NCAC 2N .0603 for regulated UST systems, that a report be submitted following a site check; the requirement under 15A NCAC 2N .0405, for regulated UST systems, that a UST closure report be submitted following closure or change-in service; and also the requirement under 15A NCAC 2L .0404(3), for regulated and non-regulated petroleum UST systems that a soil contamination report be submitted to show if the soil contamination was successfully cleaned up at the completion of the over-excavation.)*

The Initial Abatement Action Report presents the assessment results from any site check conducted by incorporating the requirements for a Site Check Report (Appendix A, p. 72). It also presents the results from any UST closure conducted (for regulated systems) following the UST-12 Format and a completed UST-2 Form - Site Investigation Report for Permanent Closure or Change-in-Service of USTs (Appendix A, p. 74). The Initial Abatement Action Report incorporates the results of any free product investigation and recovery actions.

If the Initial Abatement Action Report demonstrates that remaining unsaturated soil in the sidewalls and at the base of the excavation does not contain contaminant levels which exceed the soil-to-groundwater or the residential maximum soil contaminant concentrations (MSCCs), whichever is lower, that neither groundwater nor bedrock has been encountered in the excavation, and that groundwater contamination, if assessed, does not exceed the 2L standards, the discharge or release can be classified as low risk, and no further action will be required. **However, for regulated petroleum UST releases**, if contaminant levels in exceedance of the lowest MSCCs remain in the soil following excavation to the maximum extent possible, if either groundwater or bedrock is encountered in the excavation, or if groundwater contamination exceeds the 2L standards, then a Limited Site Assessment will be required. **For non-regulated petroleum UST releases only**, if groundwater is encountered in the excavation, a monitoring well must be installed at the location of the release source, and groundwater must be sampled and the results reported in the Initial Abatement Action Report. If contaminant levels in exceedance of the lowest MSCCs remain in the soil, if bedrock is encountered in the excavation, or if groundwater contamination exceeds the 2L standards, then a Limited Site Assessment will be required. However, if groundwater contamination does not exceed the 2L standards *(and bedrock is not encountered and soil contamination is below the lowest MSCCs)*, the discharge or release may be classified as low risk, and no further action required.

The responsible party must submit the Initial Abatement Action Report within 90 days following the date of discovery of the release to the appropriate regional office of the Corrective Action Branch of the UST Section (or to Permits and Inspections Branch, if the investigation was initiated by a UST inspector). The outline of the report format is presented in Appendix A, p. 71.

## **8.7 Limited Site Assessment Report**

If the soil contamination was not cleaned up successfully at completion of petroleum UST closure and subsequent excavation or if groundwater or bedrock was encountered during closure or excavation, then the responsible party must submit a Limited Site Assessment (LSA) Report. The responsible party must submit the LSA Report within 120 days following the date of

discovery of the release to the appropriate regional office of the Corrective Action Branch of the UST Section. The outline of the report format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

## **8.8 Other Reports (Free Product Recovery Report, 45-Day Report, Etc.)**

Free product investigation and removal are required as initial abatement actions. Therefore, free product assessment and removal which are performed during the initial 90 days following discovery of a petroleum release must be reported in the 20-Day Report and in the Initial Abatement Action Report, the formats of which incorporate the minimum requirements of the free product reporting (See Appendix A). Reporting of free product assessment and removal after the submittal of the Initial Abatement Action Report should be incorporated into the Limited Site Assessment Report. A separate Free Product Recovery Report is required for free product reporting only as directed by the UST Section based on site specific conditions. Following the initial recovery report, the responsible party must submit a Free Product Recovery System Specification Report in which an appropriate recovery plan is proposed. The formats of the Free Product Recovery Report and the Free Product System Specification Report are presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

For a regulated hazardous substance UST release, the responsible party is required to submit a 45-Day Report within 45 days of release discovery to complete reporting of initial abatement actions in the period following the 20-Day report and to present the initial site characterization. (See Figure 3.) The information required in the report includes the reporting of site check and/or UST closure activities and related assessment; determination of the source of the release; initial abatement actions including free product investigation and recovery, soil excavation and post-excavation assessment; and potential receptor and land use information. The format is presented in the *Guidelines for Assessment and Corrective Action for UST Releases*, current version.

## **9.0 Sampling Guidelines**

*If State Trust Fund reimbursement is anticipated, please refer to the current version of the Reasonable Rate Document for information about allowed reimbursement.*

### **9.1 Soil and Groundwater Samples Collected at Site Checks and Regulated Petroleum UST Closure and following Excavation of Contaminated Soil: Approved Methods**

#### **9.1.A Sampling: Site Checks and Regulated Petroleum UST Closure**

When site checks are performed, soil samples must be collected by the assessment procedures described in Section 4.3. When petroleum UST systems are closed, soil samples must be collected immediately following closure by the assessment procedures described in Section 5.3. Site check and closure samples must be analyzed using TPH methods (GRO, EPA 8015C and/or DRO, EPA 8015C), as directed in Table 3, p. 44. **To expedite activities, a twenty-four hour turn-around time for the analysis of closure and site check samples may be authorized.**

### 9.1.B Sampling: Over-Excavation following Site Checks or Regulated Petroleum UST Closure

If the results for any site check or closure sample equal or exceed 10 mg/kg TPH-GRO or TPH-DRO, then excavation of the contaminated soil in the unsaturated zone, followed by the collection of confirmatory samples, is required (as described in Section 7.1).

For post-excavation confirmation sampling, soil samples must be collected from the sidewalls and from the base of the excavation and analyzed using risk-based methods (EPA 8260B and/or 8270D and MADEP VPH and/or EPH) as directed in Table 3, p. 44. A sample must be collected from a location on each sidewall of the excavation where contamination is most likely to be present. The sample(s) collected from the base of the excavation must be collected directly underneath the location(s) of each highly contaminated site check or closure sample(s). Thus, if there was more than one highly contaminated closure sample location in a large tank pit, **a representative number of samples** must be collected from the base of the subsequent over-excavation and analyzed by the risk-based methods appropriate to each location.

A set of post-excavation confirmation samples must be collected from each excavation at the site. If there are several excavations, then a separate set of samples is required **from each excavation**.

During the over-excavation of contamination from a regulated petroleum UST release, if groundwater or bedrock is encountered, then groundwater sampling will be required later, as part of a Limited Site Assessment.

### 9.1.C Sampling: Approved Analytical Methods

All soil samples required at petroleum UST closures and site checks and for post-excavation confirmatory sampling must be analyzed using approved analytical methods, as specified in Table 3, p. 44. Metals analysis **will not be required** to confirm contamination from releases of virgin gasoline and fuel oils (medium/high boiling point fuels such as kerosene and diesel fuel) that are **not blended from used oil**. The contamination is assumed to be free of metals or to contain concentrations of metals below the allowable limits. Metals analysis **will be required** to confirm contamination from releases of used/waste oil or fuel oil **blended with used oil** (both motor oil and industrial oil).

All groundwater samples required at petroleum UST closures and site checks must be analyzed using approved analytical methods, as specified in Table 4, p. 45. Sample containers and preservation methods are listed for soil in Table 7, p. 47, and for groundwater in Table 8, p. 48.

### 9.1.D Sampling: Excavated Contaminated Soil Stockpile at Regulated Petroleum UST Releases

If State Trust Fund reimbursement is anticipated for the hauling/treatment/disposal of excavated contaminated soil, then soil samples must be collected from the soil stockpile in accordance with the composite sample protocol presented in the *Guidelines for Ex Situ Petroleum Contaminated Soil Remediation*, current version, and must be analyzed using TPH methods (GRO, EPA 8015C and/or DRO, EPA 8015C) as directed in Table 3, p. 44, under Preliminary Investigations.

## **9.2 Soil and Groundwater Samples Collected at Non-Regulated Petroleum UST Releases following Excavation of Contaminated Soil: Approved Methods**

### 9.2.A Sampling: Over-Excavation following Non-Regulated Petroleum UST Releases.

For initial abatement of a release from a non-regulated petroleum UST, contaminated soil must be excavated to the maximum extent possible and post-excavation confirmatory soil samples must be collected and analyzed using approved analytical methods as described in Section 9.1 and specified in Table 3, p. 44.

During over-excavation of contamination from a non-regulated petroleum UST release, if bedrock is encountered in the excavation, then groundwater assessment will be required later, as part of a Limited Site Assessment; but if groundwater is encountered in the excavation, the groundwater must be assessed at once and the results reported in the Initial Abatement Action Report.

All groundwater samples must be analyzed using approved analytical methods as described in Section 9.1 and specified in Table 4, p. 45. Sample containers and preservation methods are listed for soil in Table 7, p. 47, and for groundwater in Table 8, p. 48.

### 9.2.B Sampling: Excavated Contaminated Soil Stockpile at Non-Regulated Petroleum UST Releases

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>If State Trust Fund reimbursement is anticipated for the hauling/treatment/disposal of excavated contaminated soil, then soil samples must be collected from the soil stockpile in accordance with the composite sample protocol presented in the <i>Guidelines for Ex Situ Petroleum Contaminated Soil Remediation</i>, current version, and must be analyzed using TPH methods (GRO, EPA 8015C and/or DRO, EPA 8015C) as directed in Table 3, p 44, under Preliminary Investigations.</p> |
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## **9.3 Soil and Groundwater Samples Collected at Regulated Hazardous Substance UST Closure and following Excavation of Contaminated Soil: Approved Methods**

### 9.3.A Sampling: Hazardous Substance UST Closure

When regulated hazardous substance USTs are closed, soil samples must be collected immediately following closure (by the assessment procedures described under Section 5.3) and analyzed as directed in Table 5, p. 46. All groundwater samples collected at non-petroleum UST closures must be analyzed using the approved analytical methods specified in Table 6, p. 46.

A set of samples must be collected following UST closure from each distinct part of the UST system (from each UST pit, each dispenser or group of dispensers, each product line, etc., located in a distinctly separate area of the site). If parts of the system are located in different areas, then a separate set of samples is required **from each area**.

### 9.3.B Sampling: Over-Excavation following Hazardous Substance UST Closure

If the results for the most highly-contaminated closure sample exceed the soil-to-groundwater MSCCs, then excavation of the contaminated soil in the unsaturated zone, followed by the collection of confirmatory samples, is required (as described in Section 7.3).

## **9.4 Reference for Sampling: “Guidelines for Sampling”**

Soil and groundwater samples required for UST closures, site checks and over-excavation must be collected, transported and analyzed in accordance with the *Guidelines for Sampling*, current version (available in electronic format from the UST Section’s web page at <http://portal.ncdenr.org/web/wm/ust/guidance>). See also Tables 1-10 and Appendix D - Collecting Soil Samples.

## **10.0 References**

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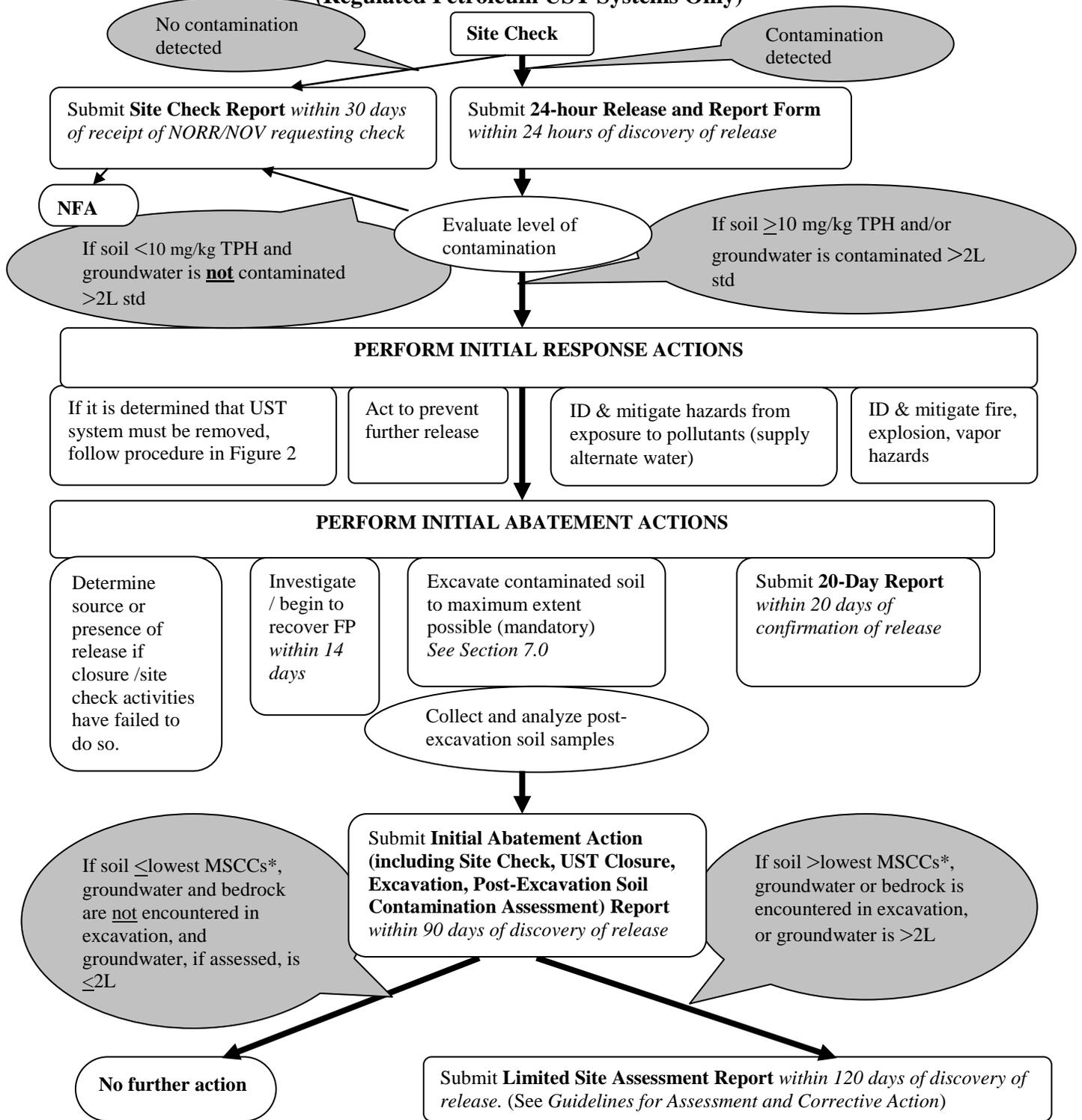
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## **Figures**

- Figure 1 Flowchart of Requirements for Releases Discovered during Site Checks
- Figure 2 Flowchart of Requirements for Closure and Initial Release Response and Abatement for Regulated Petroleum UST Systems
- Figure 3 Flowchart of Requirements for Closure and Initial Release Response and Abatement for Regulated Hazardous Substance UST Systems
- Figure 4 Flowchart of Requirements for Non-Regulated Petroleum UST System Releases
- Figure 5 Flowchart of Requirements for Non-Regulated Non-Petroleum UST System Releases
- Figure 6 Regional Office Locations and Map

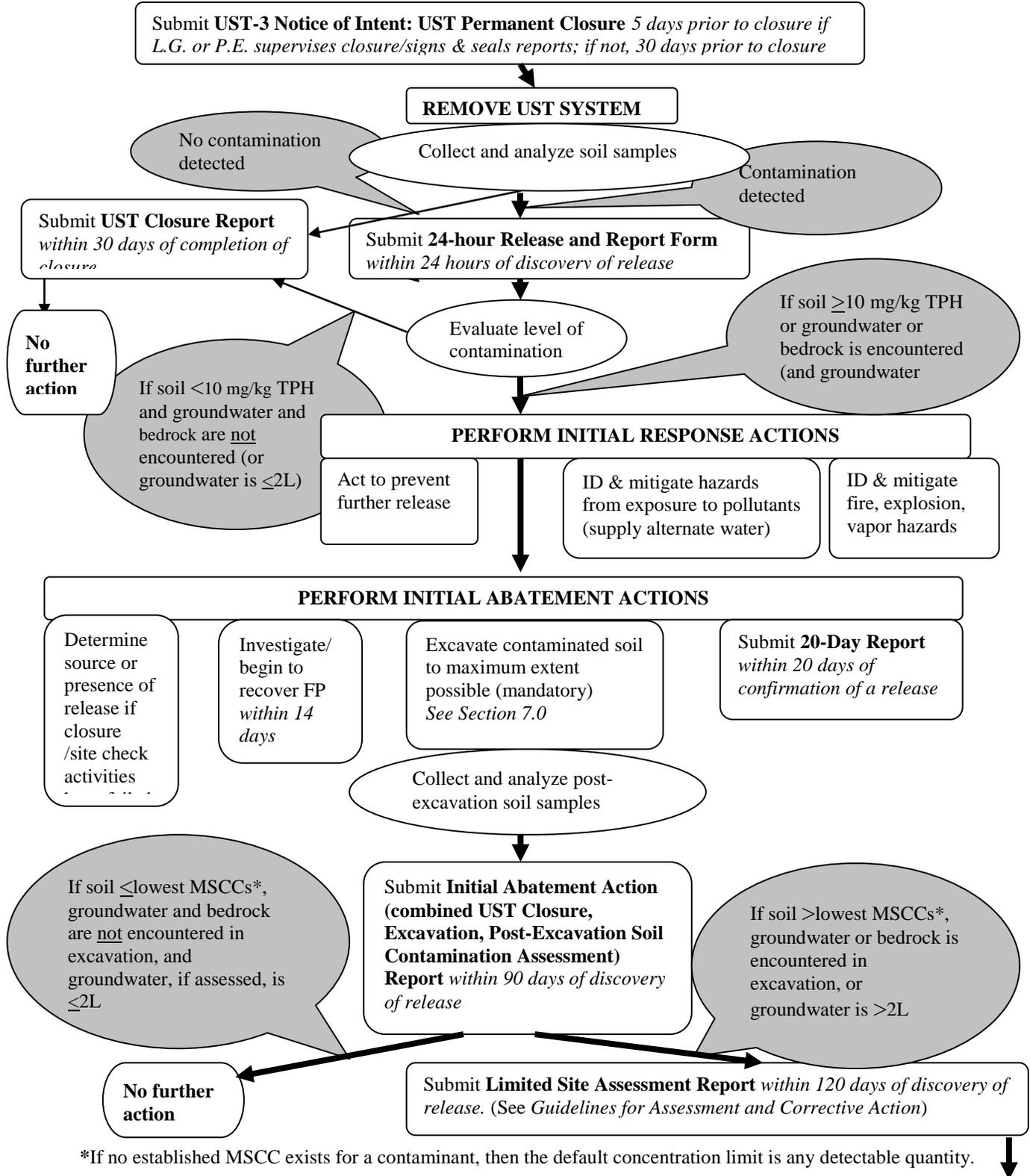
**Figure 1**  
**Flowchart of Requirements for Releases Discovered during Site Checks**  
**(Regulated Petroleum UST Systems Only)**



\*If no established MSCC exists for a contaminant, then the default concentration limit is any detectable quantity.

**Figure 2**

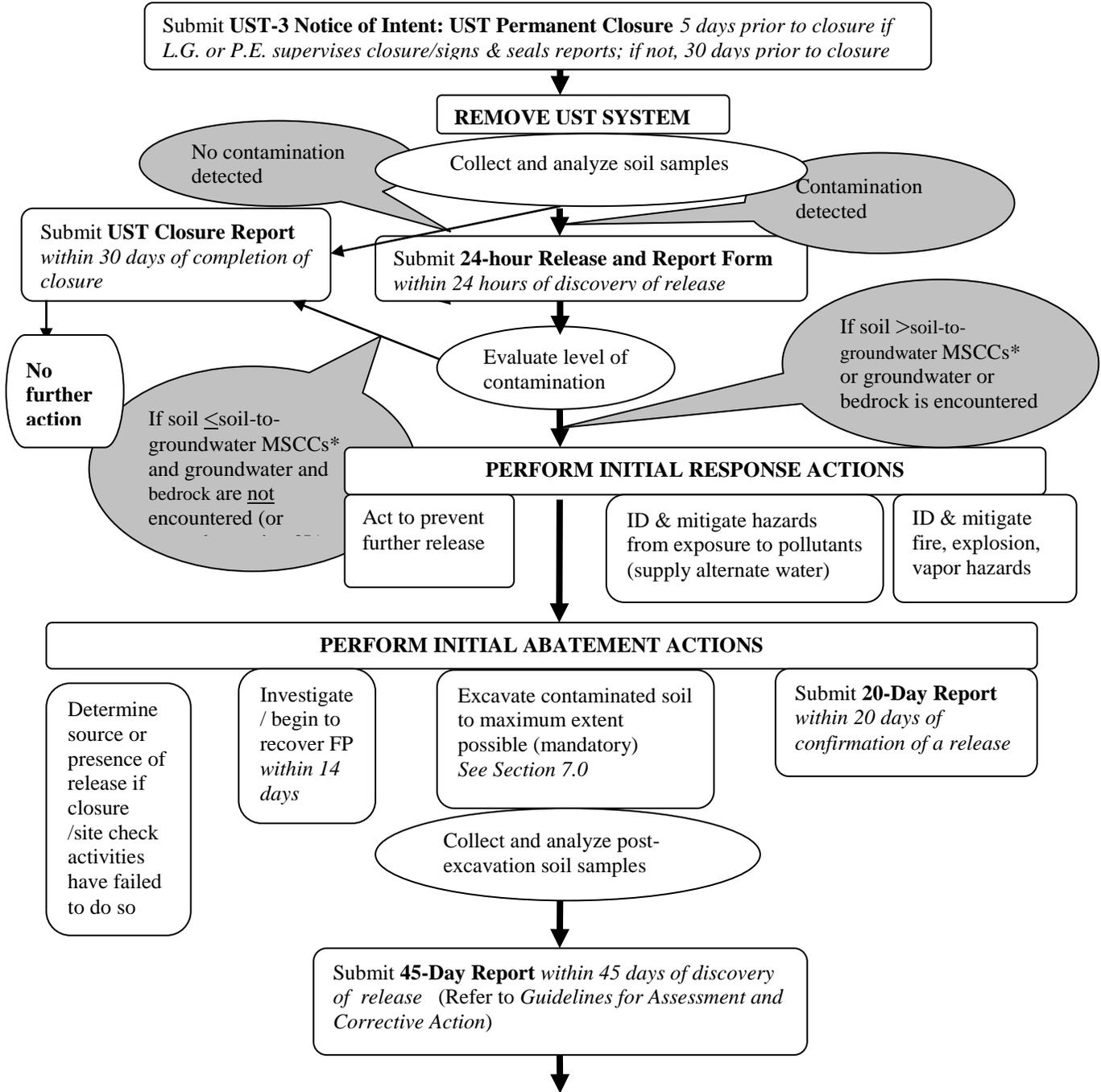
**Flowchart of Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for Regulated Petroleum UST Systems**



\*If no established MSCC exists for a contaminant, then the default concentration limit is any detectable quantity.

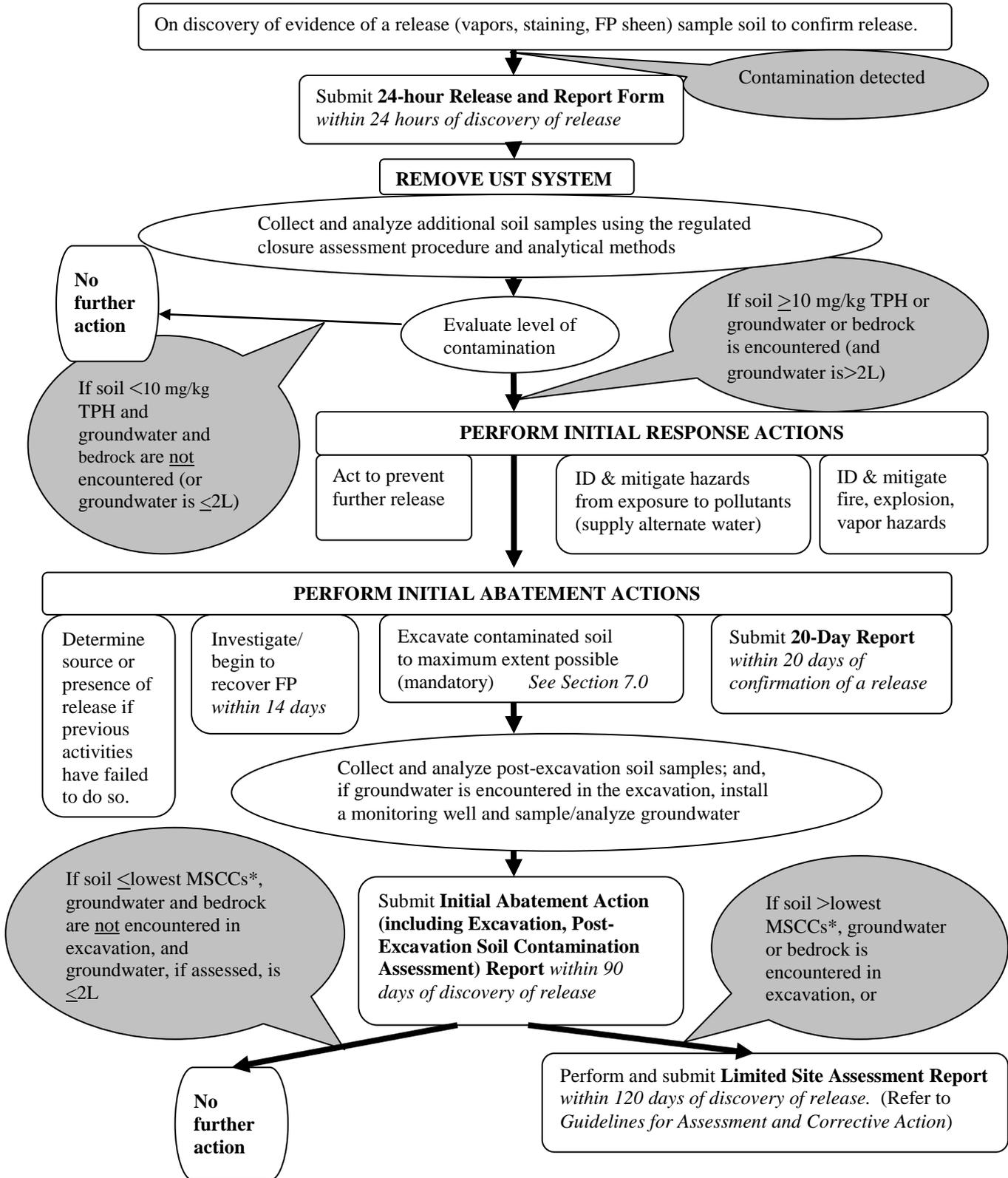
Figure 3

**Flowchart of Requirements for Closure (or Change-in-Service) and Initial Release Response and Abatement for Regulated Hazardous Substance UST Systems**



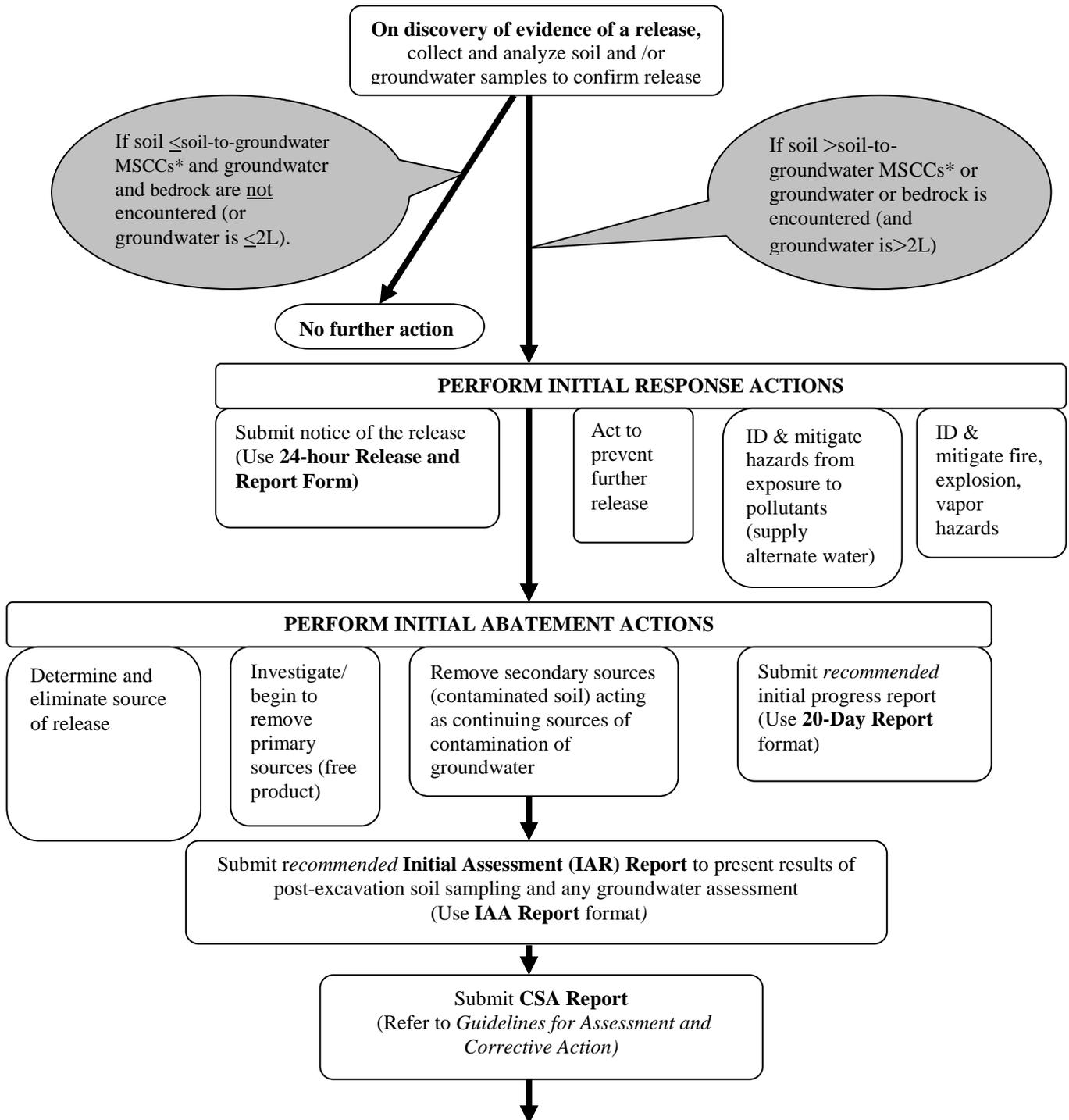
\*If no established MSCC exists for a contaminant, then the default concentration limit is any detectable quantity.

**Figure 4**  
**Flowchart of Requirements for Non-Regulated Petroleum UST System Releases**



\*If no established MSCC exists for a contaminant, then the default concentration limit is any detectable quantity.

**Figure 5**  
**Flowchart of Requirements for Non-Regulated Non-Petroleum UST System Releases**



\*If no established MSCC exists for a contaminant, then the default concentration limit is any detectable quantity.

**Figure 6  
Regional Office Locations and Map**

