

# MEMORANDUM

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**SUBJECT:** GUIDANCE DOCUMENT 01-2024D, Fourth Edition  
Storage Tank Program Technical Manual

**TO:** Regional Directors

**FROM:** Jeffery Steers

**DATE:** May 10, 2011

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**Summary:**

The Storage Tank Program Technical Manual was first issued on May 9, 1997. This Fourth Edition of the Storage Tank Program Technical Manual describes current DEQ procedures and guidelines for addressing releases of petroleum and regulated substances from storage tanks. The primary focus of this manual is to provide guidance related to the closure, release response and corrective action requirements for Underground and Aboveground Storage Tanks containing petroleum or oil. The procedures are also applicable to regulated Underground Storage Tanks (USTs) containing non-petroleum regulated substances.

This edition replaces Revision 3 of the Storage Tank Program Technical Manual issued October 4, 2001. All earlier revisions and manuals should be used for historical information only.

**Electronic Copy:**

An electronic copy of this guidance in PDF format is available for staff internally on DEQNET, and for the general public on DEQ's website at: <http://www.deq.virginia.gov>.

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# STORAGE TANK PROGRAM TECHNICAL MANUAL

DEQ Guidance Document # 01-2024D

(Fourth Edition, May 10, 2011)

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## **FOURTH EDITION SUMMARY OF NEW GUIDANCE AND CHANGES TO PROCEDURES**

### **Change 1. Releases from Fiberglass Underground Storage Tank Punctures**

Tanks manufactured after October 19, 1983 were required to contain “strike plates” (also known as “deflection plates”) underneath of fill openings. The Department of Environmental Quality (DEQ) has responded to petroleum releases caused by the repetitive sticking of a tank for inventory control where no strike plate had been installed. In order to prevent future tank punctures, DEQ sent a letter to tank owners identified in its database whose fiberglass tanks were installed prior to 1985 via a letter. In that letter, DEQ recommended that the owners of fiberglass tanks installed prior to 1985, check and upgrade their tank systems to meet industry standards. The requirement to comply with such industry standards is contained in the Virginia UST Regulation 9VAC25-580-50.1 (effective October 25, 1989). DEQ generally will take the position that releases caused by punctures to tank systems without a strike plate will not be eligible for reimbursement from the Virginia Petroleum Storage Tank Fund. For additional information, please see Section 2.1.1.7.

### **Change 2. Ethanol**

The Energy Policy Act of 2005, amended the Clean Air Act to establish a Renewable Fuel Standard Program (RFS Program) and remove the oxygenate mandate in the Reformulated Gasoline Program (RFG Program). By removing the RFG oxygenate standard and implementing the new RFS Program, ethanol usage has increased. Ethanol is miscible in water and likely to enter ground water near a release. However, it degrades rapidly through biodegradation processes and, therefore, it generally does not persist in the environment nor migrate significantly from its source. The Storage Tank Program typically does not require the analysis of ethanol when assessing an ethanol-gasoline release. The Case Manager should decide if sampling for ethanol is warranted based upon site-specific conditions. For additional information, please see Sections 2.1.5 and 5.4.3.1.5.

### **Change 3. Assumption of Liability**

An interested person who is not the responsible person, but who has a legal interest in the property, may “step into the shoes” of the responsible person and become eligible for reimbursement from the Virginia Petroleum Storage Tank Fund. An interested person must agree to assume liability for a petroleum cleanup in accordance with DEQ requirements in order to be eligible to request reimbursement from the Fund. DEQ limits the class of entities eligible to assume liability to those who have a legal interest in the property, i.e., those who have a lawful and substantial economic interest in the safety or preservation of property from loss, destruction or damage. DEQ may allow other people or entities to assume liability in those cases where there is a demonstrable incentive to complete the cleanup other than access to the Fund.

For additional information, please see Section 3.1.4 and the *Assumption of Liability* fact sheet in Appendix C.

#### **Change 4. Responsible Person is Deceased**

If a tank owner or operator who is the responsible person (RP) dies while cleanup of a release is ongoing, or if the RP dies after a PC number has been issued but before cleanup has commenced, Case Managers should work with the estate executor (also referred to as an estate administrator) to accomplish the cleanup. Working with the estate administrator/executor is an option only while the estate is open and in probate. If the estate of the deceased is settled and closed (i.e. probate is completed) DEQ will have no recourse against the estate administrator and the site may be enrolled in the State Lead Program.

If a release is discovered after an UST owner who is the RP has died and the deceased UST owner also owned the land where the tank is located, the heir(s) to the real property where the tank is located is presumed to be the RP(s). (Legal title to real property transfers to the heir(s) immediately upon death, although the paperwork and settlement of the estate may take much longer to complete.) For additional information, please see Section 3.1.6.

#### **Change 5. Defunct or dissolved businesses**

Generally, a corporation or LLC that has terminated or dissolved cannot be pursued for corrective action. If there is a question whether a business is still operating, staff can check the State Corporation Commission (SCC) database for the entity's status. If the SCC database indicates the status of the entity as "terminated," "cancelled," "dissolved," or "purged," the entity is usually defunct. When in doubt about whether an entity is defunct, staff should contact OSRR. In situations where the entity is found to be defunct and no tank operator exists for the cleanup, then the site should be enrolled in the State Lead Program. For additional information, please see Section 3.1.9.

#### **Change 6. First Edition of Volumes III, IV and V of the Virginia Petroleum Storage Tank Fund Reimbursement Guidance Manual**

Effective Date: March 1, 2007

#### **Change 7. Heating Oil Guidance**

Discharges from heating oil tanks are subject to the requirements of Article 11 of Virginia Water Control Law. Persons causing or permitting discharges of oil from these tanks are required to report, contain, and clean up the discharge. DEQ Storage Tank Program separates confirmed releases from heating oil tanks into four (4) categories: *No Further Action (NFA)*, *Category 1*, *Category 2*, and *Category 3*. The case will be assigned to a category based upon the information staff have about the site at the time the discharge is reported including the severity and extent of contamination, risks from the discharge, and the

size of the heating oil tank. This guidance was created as a separate document, effective March 1, 2007, and replaces the previous heating oil guidance in this manual. Please see Section 5.4.6 of this manual for additional information.

### **Change 8. Ethylene Dibromide and 1,2-Dichloroethane**

Ethylene Dibromide (EDB; a.k.a. 1,2-dibromoethane) and 1,2-Dichloroethane (1,2 DCA) were compounds used in leaded gasoline to prevent the buildup of lead oxides in engines. DEQ has observed that these compounds may persist in the environment and have the potential to affect drinking water supplies. Due to the persistence of these compounds once released into the environment and the low maximum contaminant levels (MCLs), DEQ Case Managers are advised to require groundwater sampling and analysis for these constituents on all sites where leaded gasoline was stored or thought to have been stored. EPA SW846 Method 8260 may be used to evaluate whether ethylene dibromide (EDB) and/or 1,2 Dichloroethane (1,2 DCA) are constituents of concern at the site; however, this method cannot achieve detection limits for the EDB MCL. Method 8011 or Method 504.1 should be used to reach the MCL of 0.05 ug/l when sampling to determine the presence of EDB in a drinking water supply. For additional information, please see Section 5.4.3.1.2.

### **Change 9. Diving Plumes**

A diving plume is a dissolved-phase contaminant plume that moves downward as the plume migrates away from the source. Diving plumes can make it difficult to properly delineate groundwater contamination and evaluate the potential impact to nearby receptors. Methyl tertiary-butyl ether (MTBE) and other oxygenates tend to migrate more significantly than other petroleum constituents due to their higher solubility in groundwater. They also typically signify the leading edge of a plume. Some investigative techniques often used to characterize a diving plume include nested wells, temporary well points, and direct-push sampling at multiple depths. For additional information, please see Section 5.4.3.1.4.

### **Change 10. Easements**

DEQ staff often manage cases where temporary property access is required to install monitoring wells, excavate soils, etc.; and a site access agreement is needed to complete this work. In some cases, the rights to install, operate, access, and maintain equipment on property indefinitely is required as part of corrective action, i.e. installation of a water supply well or installing a water line). Under these circumstances, an easement may be necessary. An easement is a legal document that grants one person the right to make specific, limited use of land owned by another person. Please see Section 5.3.2.2.8 for additional information.

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### **Change 11. Heating Oil Exemption**

DEQ has revised its heating oil exemption to mirror EPA's interpretation, which specifies that the exemption is applicable to tanks containing a product that is one of those specifically included in the definition of heating oil whenever that product is being entirely consumed on the premises for any purpose. Consequently, even if heating oil is consumed on the premises for a non-heating purpose, the tank is used for storing heating oil for consumption on the premises where stored and is eligible for the heating oil exemption. A tank containing a fuel other than heating oil can qualify for the exemption if the fuel is consumed entirely on the premises in equipment (e.g. heating equipment, boilers, furnaces, etc.) for which the "fuel of choice" would normally be heating oil. For additional information, please see Section 5.4.7.

### **Change 12. Aboveground Storage Tank Discharges into Secondary Containment**

DEQ has observed releases to the environment caused by failures (i.e. cracks in the structure) of Above ground Storage Tank (AST) secondary containment. Discharges to secondary containment that may cause a release into the environment must be reported to DEQ. According to §62.1-44.34:19 of State Water Control Law, oil discharges that "may reasonably be expected to enter state waters, lands, or storm drain systems" must be reported by the responsible person to DEQ immediately upon learning of the discharge. DEQ will generally take the position that activities performed to contain and cleanup a release to secondary containment at an AST facility is not a corrective action or eligible for reimbursement. Please see Section 2.3.4 for additional information.

### **Change 13. Natural Attenuation**

Natural attenuation is the use of unenhanced natural processes to assist with site remediation. These processes include dispersion, dilution, sorption, volatilization, biodegradation, and chemical or biological transformation. Typically, all petroleum contaminated sites undergo some degree of natural attenuation during the remediation of the release. At sites where there is a low risk of impact to potential receptors, monitored natural attenuation (MNA) may be considered an acceptable remedial method to be used in conjunction with ongoing remedial technologies. MNA that is expected to last greater than one year, or longer than four quarters of sampling should, in most instances, go through the Corrective Action Plan process. Please see Section 5.4.3.3.1 for additional information.

### **Change 14. Components of a Site Characterization Report**

Chapter 5 in the 3<sup>rd</sup> edition of the Storage Tank Program's Technical Manual outlined the requirements of a Site Characterization Report (SCR). Appendix J was developed to elaborate on these requirements and provide Case Managers more information on what to expect in an SCR. To assist both consultants and Case Managers in reaching an agreement concerning the number of report preparation hours that are reasonable, example SCRs have been made available along with a range of hours deemed appropriate for each of the reports. The range of hours were established by a workgroup of Case Managers and



consultants. These example reports along with the range of hours established for each report are located on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>.

### **Change 15. Abbreviated Corrective Action Plan**

On occasion, DEQ will receive a more complex Corrective Action Plan (CAP) than necessary to explain the proposed corrective action activities when an uncomplicated solution is all that is needed. Some corrective action activities can be described sufficiently in a one or two page CAP report. Abbreviated CAPs may be developed for any type of release at the discretion of the Case Manager. Please see Section 5.7.3.6 for additional information.

### **Change 16. Carbon Filtration Unit Fact Sheet**

A fact sheet summarizing DEQ's Carbon Filtration Unit (CFU) Program was developed to inform CFU customers of what they should expect from the initial assessment of their water supply to the installation of a CFU. This fact sheet may be provided by Storage Tank Program staff in addition to the verbal explanation of the CFU Program that staff already provide. Please see Appendix C for a copy of this fact sheet.

### **Change 17. Removal of Soil at Development Projects**

DEQ often receives questions regarding fund eligibility for the removal of petroleum contaminated soils or saturated soils that are removed during a development project. Please refer to guidance and the examples of soil disposal scenarios in Section 5.4.3.2.3 for more information.

### **Change 18. Regulatory and Release Information Matrix**

The regulatory matrix provides regulatory information for different ASTs and USTs. The release matrix originated from specific inquiries by Regional Staff concerning releases at large federal facilities with regulated product. Please see Appendix AD for more information.

### **Change 19. General Discharge Permit**

The reissuance of the General VPDES Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (9 VAC 25-120-10 et seq.) became effective on February 26, 2008, and replaced the General VPDES Permit for Petroleum Contaminated Sites and Hydrostatic Tests which expired on February 25, 2008. The reissuance of the permit created a few changes to the permit including adding wastewaters from sites contaminated by chlorinated hydrocarbon solvents to the list of discharges covered by the permit. This permit will expire February 25, 2013. Please see Section 6.1.2 for additional information.

### **Change 20. Virginia Department of Transportation**

Sometimes the Virginia Department of Transportation (VDOT) only acquires the portion of a petroleum impacted site needed for transportation purposes. In these situations, VDOT often chooses to complete the corrective action activities associated with the acquired property while the RP's consultant completes any additional corrective actions required at the site. In most cases, where the RP and VDOT are both performing the corrective action, VDOT's eligible reimbursement costs should be submitted in a claim by the RP's consultant, not by VDOT. Please see Section 3.1.5.2 for additional information.

### **Change 21. Remediation Optimization**

Corrective Action Plans submitted to DEQ staff are required to provide certain minimum information detailing the corrective action(s) proposed for a site. However, CAP submittals often do not contain a proposed alternative to the plan or a discussion of how the plan would be modified if the primary proposed corrective action does not succeed as anticipated. Corrective Action Plans rarely detail the analytical or operational criteria that would dictate a shift in corrective action strategy. A Corrective Action Plan should detail the pre-calculated analytical levels and/or operational data of the remediation system that would "trigger" a change in the remediation strategy. Please see Section 5.7.3.4 for additional information.

### **Change 22. Data Quality**

Decisions made within this program are highly dependent upon the analytical data for samples that are collected by the RP and RP's consultant. Section 5.4.3.1.8 discusses elements of data quality such as data verification, validation, and corrective action, sample holding time, lab checks of data quality, and qualified data.

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## 1.0 INTRODUCTION

This document is the Fourth Edition of the Storage Tank Program Technical Manual which was first issued on May 9, 1997. This edition describes current DEQ procedures and guidelines for addressing releases of petroleum and regulated substances from storage tanks. This guidance manual replaces Revision 3 of the Storage Tank Program Technical Manual issued October 4, 2001. All earlier revisions and manuals should be used for historical information only.

The procedures and guidelines contained within this manual are intended to: (1) protect human health and the environment within the Commonwealth through efficient and effective response to storage tank releases; (2) promote statewide consistency in the implementation of release response and corrective action; and (3) reduce time and expenses needed to complete release response and corrective action by determining necessary actions (to the extent possible) and by defining the scope of work prior to initiation of that work. The Department is committed to protecting human health and the environment and serving the citizens of the Commonwealth in a timely and efficient manner.

The primary focus of this manual is to provide guidance on closure, release response and corrective action requirements for Underground and Aboveground Storage Tanks containing petroleum or oil. The procedures are also applicable to regulated Underground Storage Tanks (USTs) containing nonpetroleum regulated substances. Since less than one percent of the regulated USTs registered with DEQ contain regulated substances other than petroleum, the manual does not discuss in great detail the specific requirements for non-petroleum regulated USTs. Unless specifically noted otherwise, the regulated UST procedures in this manual apply to both petroleum and non-petroleum regulated substances. Guidelines contained within this manual were also developed to conform with reimbursement guidance to responsible parties. The Virginia Petroleum Storage Tank Fund Reimbursement Guidance Manual is available on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>.

This manual was developed jointly by Central and Regional Office staffs and is intended as a guidance document for DEQ personnel. Consultants and persons in the regulated community may also find this manual a useful resource and is available on DEQ's website at the link above.

### 1.1 Regulatory/Statutory Framework for Storage Tank Cleanup

During the course of administering the Storage Tank Program and providing oversight for releases from storage tanks, DEQ staff have the opportunity to interface with many statutes and regulations. Listed below are short descriptions of some of the statutes and regulations that staff may deal with on a regular basis.

Article 9 of State Water Control Law (Code of Virginia, Section 62.1-44.34:8 through 9) - Article 9 provides DEQ with the authority to: (1) establish technical standards for USTs containing petroleum and regulated substances; (2) require the owner or operator of an UST to take corrective actions for a release of petroleum or regulated substance; and (3) seek recovery of costs incurred for undertaking corrective action or enforcement actions. This statute requires DEQ to promulgate regulations needed to carry out its duties with regard to USTs.

Article 11 of State Water Control Law (Code of Virginia, Section 62.1-44.34:14 through 23) - Article 11 prohibits the discharge of oil into state waters (and upon state lands and into storm drains) and provides DEQ with the authority to require the cleanup of oil discharges from most sources other than USTs covered under Article 9. Under Article 11, operators of certain types of facilities and vessels are required to develop oil discharge contingency plans and demonstrate financial responsibility. Article 11 also requires the Board to develop regulations for aboveground storage tanks. Persons discharging oil into state waters are required to report the discharge and contain and clean up that discharge.

9 VAC 25-580-10, et seq. Underground Storage Tanks; Technical Standards and Corrective Action Requirements - The UST technical regulations address technical standards for UST system design, installation, operation, release detection, and closure. The technical regulations also contain requirements for release reporting, investigating suspected releases, and corrective action. The regulations also require owners or operators of USTs to notify DEQ of the presence of these tanks.

9 VAC 25-120-10 et seq. General Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation for Discharges from Petroleum Contaminated Sites, Ground Water Remediation and Hydrostatic Tests - This general permit regulation governs the discharge of wastewater from sites contaminated by petroleum products. A previous iteration of the VPDES General Permit Regulation replaced the CAP General Permit Regulation on February 24, 1998.

9 VAC 20-81-10, et seq. Virginia Solid Waste Management Regulations - The solid waste management regulations establish standards for the handling of solid wastes, the disposal of solid waste, and the siting of solid waste management facilities. Staff may interface with the requirement of these regulations when dealing with the management or disposal of petroleum contaminated soil or debris.

9 VAC 20-60-11, et seq. Virginia Hazardous Waste Management Regulations - The Virginia Hazardous Waste Management Regulations provide for the control of all hazardous wastes generated, treated, stored, disposed, or transported within the Commonwealth. Staff may need to consult these regulations or interface with the hazardous waste inspection staff to evaluate if a particular waste (e.g. petroleum contaminated water, used oil) may be a hazardous waste.

9 VAC 25-91-10, et seq. Facility and Aboveground Storage Tank (AST) Regulation - The Facility and AST Regulation establishes requirements for registration, notification, and closure of individual ASTs and facilities within Virginia. This regulation also contains pollution prevention requirements, oil discharge contingency plan requirements, and groundwater characterization study requirements for ASTs and facilities. This regulation consolidates the following repealed regulations: the Oil Discharge Contingency Plan regulation (9 VAC 25-990-10, et seq.), the Facility and AST Registration Requirements Regulation (9 VAC 25-130-10, et seq.), and the AST Pollution Prevention Requirements regulation (9 VAC-25-140-10, et seq.). The authority for most investigative activities and/or remediation involving

storage tanks is provided by Article 9, 9 VAC 25-580-10, et seq., and Article 11. Although there are no regulations describing steps to be taken in the assessment and remediation of petroleum releases from ASTs, exempt USTs, or excluded USTs, there is a statutory requirement for these releases to be addressed (Article 11 for ASTs and exempt USTs; Article 9 for excluded USTs). Since corrective action for the assessment and remediation of petroleum releases is similar regardless of source, the manual uses corrective action guidelines which meet the requirement of the UST Technical Regulation. Regional staff members have the flexibility and authority to evaluate what constitutes reasonable and necessary site-specific corrective action requirements for all regulated substance releases. DEQ Division of Enforcement may enforce reasonable requirements specified by regional staff for Article 9 and 11 releases that have clearly been communicated to the responsible person.

#### 9 VAC 20-160-10 et seq. The Voluntary Remediation Regulation

The Commonwealth of Virginia developed this regulation and the accompanying Voluntary Remediation Program to allow owners, operators, or others interested in a contaminated property to voluntarily remediate releases of contaminants. Persons having sites contaminated by releases from regulated USTs or discharges of oil that are covered by Article 11 of Virginia Water Control Law may enter the Voluntary Remediation Program after receiving a case closure letter from the Storage Tank Program. For additional information, please see Section 5.9 of the Manual.

## 1.2 Definitions

Throughout this manual, the following terms will be used repeatedly. These definitions are provided to allow a greater consistency in their use and interpretation.

***Aboveground Storage Tank (AST)*** - Any one or combination of tanks, including pipes, used to contain an accumulation of oil at atmospheric pressure, and the volume of which, including the volume of the pipes, is more than 90% above the surface of the ground.

***Deferred USTs*** - USTs which are deferred from Parts II - V and VII of 9 VAC 25-580-10 et seq.:

1. Wastewater treatment tank systems (these tanks are not part of a treatment system having or needing a VPDES Permit nor are the contents of these systems discharged to a Publicly Owned Treatment Facility that has a VPDES Permit);
2. UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 USC 2011 et seq.);
3. USTs that are part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR 50, Appendix A;
4. Airport hydrant fuel distribution systems; and
5. UST systems with field constructed tanks.

**Excluded USTs** - The types of USTs which meet the definition of UST under Article 9, but are excluded from the requirements of 9 VAC 25-580-10 et seq.

1. Any UST system holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and other regulated substances;
2. Any wastewater treatment tank system that is part of a wastewater treatment facility regulated under §402 and §307 (b) of the Clean Water Act;
3. Equipment or machinery that contains a regulated substance for operational purposes such as hydraulic lift tanks and electrical equipment tanks;
4. UST systems with a capacity of 110 gallons or less;
5. UST systems that contain a de minimis concentration of regulated substance; and
6. Emergency spill or overflow containment USTs that are expeditiously emptied after use.

**Exempt USTs** - The types of USTs which are exempt from Article 9 of State Water Control Law and the requirements of 9 VAC 25-580-10 et seq.

1. Farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
2. USTs which contain heating oil that is used to heat the premises where the tank is located;
3. Septic tanks;
4. Pipeline facilities;
5. Surface impoundments, pits, ponds, and lagoons;
6. Storm-water or wastewater collection systems;
7. Flow-through process tanks;
8. Liquid traps or associated gathering lines directly related to oil or gas production and gathering operations; and
9. Storage tanks situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

**Facility** - Any development or installation within the Commonwealth that deals in, stores or handles oil.

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

**Heating Oil AST** - An AST with a storage capacity of 5,000 gallons or less which contains heating oil that is used to heat the premises where the tank is located.

**Motor Fuel** - a petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of a motor engine (this definition is from 40 CFR 280.12).

**Oil** - Means oil of any kind and in any form including, but not limited to, petroleum and petroleum by-products, fuel oil, lubricating oils, sludge, oil refuse, oil mixed with other wastes, crude oils and all other liquid hydrocarbons regardless of specific gravity.

**Partially Deferred USTs** - UST systems that store fuel for emergency power generator use. These USTs are deferred from Part IV of 9 VAC 25-580-10.

**Regulated Substance** - an element, compound, mixture, solution, or substance that, when released into the environment, may present substantial danger to the public health or welfare, or the environment (see Appendix A for a list of regulated substances). The term "regulated substance" includes:

1. Any substance defined in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, but not any substance regulated as a hazardous waste under subtitle C of the Resource Conservation and Recovery Act (RCRA) of 1976; and
2. Petroleum, including crude oil or any fraction thereof, that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute). The term "regulated substance" includes but is not limited to petroleum and petroleum-based substances comprised of a complex blend of conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

**Regulated UST** - An UST regulated by and subject to all of the requirements of 9 VAC 25-580-10 (Underground Storage Tanks; Technical Standards and Corrective Action Requirements).

**Release** - Any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an AST or UST into ground water, surface water or subsurface soils.

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

**Underground 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 the underground pipes connected thereto) is 10 percent or more below the surface of the ground. This term does not include any of the exempt USTs.

### 1.3 DEQ Regions

DEQ staff periodically receive calls from responsible persons or consultants requesting phone numbers or addresses of other DEQ Regional Offices. A map of DEQ regions is contained in Appendix B. This map also indicates the address, phone, and fax number for each of the Regional Offices.

## 2.0 RELEASE REPORTING REQUIREMENTS

When a release occurs from a storage tank, the owner and/or operator of that tank is required to report the release to one or more governmental agencies. Release reporting requirements are dependent upon the statutes and regulations governing the tank system from which the release occurred, the contents of the tank, and the nature of the release. This section provides staff with regulatory requirements and programmatic procedures for dealing with release reports. Table 2-1 (at the end of Chapter 2) summarizes reporting requirements for different types of storage tanks and lists the applicable statute(s) and/or regulation(s).

### 2.1 Release Reporting Requirements for USTs

Owners and operators of regulated USTs and partially deferred USTs are required to report releases from those USTs to DEQ in accordance with Parts V and VI of the UST Technical Regulation. Releases from deferred USTs must be reported to DEQ in accordance with Part VI of the UST Technical Regulation. Reporting requirements of 9 VAC 25-580-10 et seq. apply to all owners and operators of UST systems which meet the definition of "underground storage tank" and are not excluded from the requirements of the regulation under Section 20. Under Article 9 of State Water Control Law and 9 VAC 25-580-10 et seq., both the owner and the operator of an UST are jointly responsible for taking corrective actions in response to a release from an UST and this includes reporting releases. A fact sheet summarizing release reporting requirements is included in Appendix C.

Conditions indicating or potentially indicating a release include:

1. A regulated substance is present in the environment at or near the UST site. Regulated substances in contact with or otherwise in the immediate vicinity of an UST are believed to be adequate evidence, in most instances, for confirming a release. The following conditions provide evidence of a regulated substance at or near a site:
  - A. Vapors in a building
  - B. Sheen on surface water
  - C. Seepage of product from the ground
  - D. Contamination of nearby drinking water sources such as wells or springs
  - E. Analytical results indicating the presence of a regulated substance
    - 1a. Analytical results from samples collected during the closure of a petroleum storage tank:
      - TPH concentration in soil that is greater than or equal to 100 mg/kg.
      - TPH concentration in water that is greater than or equal to 1 mg/l.
      - A concentration of any other petroleum constituent (e.g. benzene) that is greater than the detection limit for that constituent.



- 1b. Analytical results from samples collected during the closure of a hazardous substance UST:
  - Analytical results for the substance stored in the tank that exceed the detection limit for that substance.
- 1c. Analytical results from samples collected at any time other than UST closure:
  - The concentration of any petroleum constituent or hazardous substance that is greater than the detection limit for that substance.

**NOTE: The concentrations listed above are reporting thresholds; they are not remedial endpoints.**

**NOTE: TPH soil results should be reported on a dry-weight basis. Usual and Customary Rates (UCRs) for analytical methods include all of the costs associated with performing the necessary steps of the respective methods.**

2. Product dispensing equipment is operating in an unusual manner.
  - A. Loss of product.
  - B. Water in the tank.
  - C. Overfill alarm.
  - D. Product dispensing equipment does not dispense product or dispenses product at a greatly reduced rate.
  - E. Alarm issued by automatic line leak detectors.
3. Monitoring results from a release detection method indicate a release may have occurred.
  - A. Free product in ground water monitoring wells.
  - B. Petroleum vapors in vapor monitoring wells.
  - C. Tank tightness test results indicating a release.
  - D. Inventory control discrepancies that indicate a release may have occurred (a gain or loss of 130 gallons of product + 1% of throughput).
  - E. Alarms from automatic tank gauges, interstitial monitors, sumps, etc.
  - F. Statistical inventory reconciliation results that potentially indicate a release or fail to meet regulatory requirements for leak detection over a specified period of time (see Section 2.1.1.1).
  - G. Results from any other type of approved monthly monitoring method that indicates a release may have occurred.

Upon receiving a report that one or more of these conditions exists at a site, the regional Case Manager shall determine if: (1) The tank owner or operator should be directed to proceed with release investigation and confirmation to evaluate whether a release has occurred; or (2) The tank owner or operator should be directed to begin release response and corrective action following a confirmed release from an UST system.

### 2.1.1 Suspected Releases - USTs

(Appendix C fact sheet – Suspected Releases)

Suspected releases must be reported to DEQ within 24 hours from the time that the release from a regulated UST or partially deferred UST (emergency generator UST) is first suspected. When a release report is received, Regional Office staff must decide whether the evidence confirms a release from an UST system or indicates that a release may have occurred. If the regional Case Manager believes that evidence indicates a suspected release, he/she shall direct the tank owner or operator regarding the measures which must be taken to evaluate whether a release has actually occurred. Depending upon the nature of the release, the Regional Office staff may require a system tightness test, a Site Check, or both. Regional staff will pre-approve tank tightness tests and/or Site Checks as appropriate for the site. Site Checks are required when environmental contamination is the reason a release is suspected. Results of a site check should be submitted to DEQ in a Release Investigation Report. See the *Elements of a Release Investigation Report* fact sheet in Appendix C for information on what should be included in the report.

In instances when a system tightness test is employed to confirm a release, §160 of the UST Technical Regulation requires that the owner or operator select a tightness test method that can detect a leak rate of at least 0.1 gallons/hour. Section 130 (A) (3) of the UST Technical Regulation further requires that the tightness test method have a probability of detection of at least 95% and a probability of false alarm of no more than 5%.

Activities performed to investigate a suspected release may be eligible for reimbursement provided that DEQ pre-approved these activities. Please see Section 2.1.5 of this document for additional information on the reimbursement of costs associated with investigating a suspected release.

**NOTE: The requirements for a suspected release letter and an example letter are included in Appendix E.**

#### 2.1.1.1 Releases Suspected by Statistical Inventory Reconciliation

Statistical inventory reconciliation (SIR) is a method that tank owners and operators may use to meet the release detection requirements of the UST Technical Regulation. SIR is considered an "other method" of release detection, not a type of inventory control (9 VAC 25-580-160.8). Failed SIR results, like all other non-inventory control release detection methods that indicate a release must be reported to DEQ within 24 hours unless a monitoring device is found to be defective, and is repaired, replaced, or re-calibrated immediately, and additional monitoring does not confirm the initial result (9 VAC 25-580-190.3.a). After a suspected release is reported, the tank owner/operator must: (1) Begin release investigation and confirmation to evaluate whether a release has occurred; and (2) Submit a release investigation report to DEQ.

An "inconclusive" SIR result means that the attempt to perform release detection for the tank during that month failed to meet regulatory requirements. The tank owner must immediately investigate to identify the cause of the inconclusive result and immediately correct the situation as described below.

Upon receiving the **first** "inconclusive" SIR result, the tank owner/operator must: (1) Immediately consult

their SIR vendor to assess the possible causes for the inconclusive test result; and (2) Make the changes recommended by the SIR vendor (i.e. change sticking practices, calibrate meters, etc.) to reduce the possibility of having future inconclusive SIR results. DEQ Storage Tank Program will, as a matter of practice, require tank owners/operators to perform a release investigation to evaluate if the tank is leaking when:

1. SIR results for two consecutive months are inconclusive; or
2. There are three inconclusive SIR results during any six month period.

Vendors performing SIR sometimes attribute failed or inconclusive SIR results to improper stick readings. SIR results that were inconclusive because of persons using incorrect procedures to collect data do not have to be reported to DEQ the first month that the test was inconclusive. Tank owners/operators are expected to use appropriate data collection techniques and take corrective measures to prevent the further use of erroneous data collection procedures. If SIR results for the following month are inconclusive, the tank owner/operator must report a suspected release to DEQ.

#### 2.1.1.2 Releases Suspected by Interstitial Monitoring

Interstitial monitors are used to check for leaks in the area between a tank and its secondary containment system. Certain monitors may indicate product leaking from the tank by the physical presence of that product in the liquid or gaseous forms. Other monitors may check for a change in condition that indicates a hole in the tank such as a loss of vacuum or a change in the level of a monitoring liquid that is placed in the interstitial space between the walls of a double-walled tank.

Interstitial monitoring results that indicate a leak may have occurred (i.e. suspected release) must be reported to DEQ within 24 hours unless UST system equipment is found to be defective but not leaking and is repaired, replaced, or re-calibrated immediately, and additional monitoring does not confirm the initial result (9 VAC 25-580-190.3.a). After a suspected release is reported, the tank owner/operator must: (1) Begin release investigation and confirmation to evaluate whether a release has occurred; and (2) Submit a release investigation report to DEQ.

- NOTES:**
- 1. A leak into a secondary containment structure represents an “unusual operating condition” and is reportable to the DEQ (9 VAC 25-580-190.2)**
  - 2. USTs containing CERCLA Listed substances (i.e. hazardous substance USTs) must have secondary containment to be in compliance with the Technical Regulation. Any breach in either the inner or outer wall makes the tank non-compliant and must be corrected regardless of whether a release to the environment occurred.**
  - 3. Petroleum USTs using secondary containment as the release detection method are non-compliant if a breach occurs in either the inner or outer walls of the tank. Breaches of this nature must be corrected regardless of whether a release to the environment occurred.**

**4. Many fiberglass tank manufacturers will replace a tank under warranty versus repairing a breach to the tank walls.**

2.1.1.3 Releases Suspected Due to Automatic Tank Gauging Results

Results from an automatic tank gauging (ATG) system that indicate a release must be reported to DEQ within 24 hours after the tank owner/operator receives the results, unless: (1) The owner/operator finds that the ATG is operating improperly and repairs the ATG system within that 24-hour period; or (2) The leak rate indicates interference occurred during the test (i.e. fuel was dispensed, recent fuel delivery was made, etc.) and the subsequent test passes. A DEQ tank inspector may be notified of a problem with the ATG that indicates that a release has occurred. In these instances, the tank inspector should notify the remediation division immediately so that a Case Manager can be assigned. Upon receiving a report of a release suspected due to ATG results, the Case Manager will require the tank owner/operator to perform release investigation to evaluate whether a release to the environment has occurred. Tank owners/operators finding improperly operating ATGs and making repairs after the ATG indicated a tank system failure should document and retain records regarding the nature of the ATG failure and the corrective measures taken.

**NOTE: Any passing ATG test within thirty days keeps the site in compliance.**

2.1.1.4 Releases Suspected Due to Failed Tightness Tests

Tank owners/operators may use system tightness tests to meet the release detection requirement. A system tightness test indicating a release must be reported to DEQ within 24 hours after failure unless the tightness test was incorrectly performed. If the failed tightness test is the only reason for suspecting a release, DEQ staff will usually require an additional tightness test, or a tracer (e.g. helium gas) test to be performed. A tracer test should indicate the most likely area within the tank system where a release has occurred. If the second tightness test or tracer test fails, DEQ will consider these two consecutive failed tests as confirmation of a release. The costs for a second test may be eligible for reimbursement if pre-approved by the Case Manager.

2.1.1.5 Releases Suspected by One of a Redundant Set of Release Detection Methods

DEQ staff may encounter situations where a tank owner/operator uses redundant release detection methods and one of the methods, not both, is inconclusive. DEQ may accept information from the redundant form of release detection instead of a tank tightness test if the additional release detection method used at the site meets the accuracy requirements of tank tightness testing as specified in the Technical Regulation. However, it is important to note that different release detection methods test different parts of a tank system. Case Managers, at their discretion, may require another leak detection method or a tightness test be performed to evaluate whether a release has occurred. Case Managers should work with tank compliance staff to identify the appropriate release detection method(s) that should be used for the specific tank system.

**Example: 2-1. Inconclusive SIR Results when a Redundant Release Detection Method is Used**

An UST owner uses statistical inventory reconciliation as his primary form of leak detection. This UST owner, however, also has an automatic tank gauging system (ATG) in place and uses this ATG as a backup. The ATG system has an accuracy of .1 gallons per hour and a probability of detection of .95 and a probability of false alarm of .05. SIR results for two consecutive months are inconclusive. ATG results for those same months did not indicate a release and/or the ATG was used as the tank test method to verify after two inconclusive SIR results that no release had occurred.

In this situation, ATG results may be used to prove that the tank is not leaking. However, inconclusive SIR results may indicate that there is a leak in the tank and/or the product lines. ATG results alone may not be sufficient at disproving the inconclusive SIR results. In addition to the ATG results, Case Managers, at their discretion, may require the submittal of line leak detection records or a line tightness test to evaluate whether a release has occurred from the tank system.

#### 2.1.1.6 Releases Suspected by Vapor Monitoring

UST owners/operators may use vapor monitoring as their method for release detection. Section 160.E of the UST Technical Regulation requires persons using vapor monitoring as their release detection method to assess the tank area to ensure that vapor monitoring will be effective for the site. Vapor monitors must be designed to detect any significant increase in concentration above the background of regulated substance stored in the tank.

To comply with the requirements of this method, persons using this method must identify "background" vapor conditions for their site. Tank owners/operators then should compare monthly monitoring results with background conditions to evaluate if vapor concentrations have significantly increased at the site. Refer to the the guidance document, *Evaluation of Vapor Monitoring Data for Petroleum Storage Tank Release Detection*, on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html> for information on how to use vapor monitoring data to establish whether a release may have occurred.

#### 2.1.1.7 Releases from Fiberglass Underground Storage Tank Punctures

DEQ has responded to a number of petroleum releases from older (pre-1985) fiberglass USTs. Many of these tanks do not have protective "strike plates" under tank openings to prevent punctures. The repetitive insertion of the inventory stick can puncture these tanks. Tanks manufactured after October 19, 1983, are required to have strike plates (also known as "deflection plates") installed at fill openings (see UL 1316 Section 6.1 (1986) "Standard for Safety - Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products"). Industry standards have required strike plates beneath fiberglass tank openings since approximately 1985.

Industry Standard UL 1316: 6. Deflection Plates:

6.1 A tank must have a deflection plate of steel at least 0.053 inch (1.35 mm) thick or aluminum at least 1/8 inch (3.2 mm) thick. The deflector plate must be at least 9 inches (229 mm) wide, and at least 1 square foot (0.009 m<sup>2</sup>) in area under (1) each opening, or (2) one opening that is marked as specified in paragraph 18.5. Paragraph 6.1 effective October 19, 1983.

18.5 If a tank has a steel deflection plate under only one opening as covered in item (2) of paragraph 6.1, the opening must be marked to indicate that dipstick measurements must be made only at that location. Paragraph 18.5 effective October 19, 1983.

The requirement to comply with such industry standards is contained in the Virginia UST Regulation 9VAC25-580-50.1 (effective October 25, 1989).

The industry has developed cost-effective methods to detect whether a tank contains strike plates and to modify a tank that lacks the plates. DEQ recommends safety checking pre-1985 fiberglass USTs for compliance with the industry standards and if necessary making modifications to avoid future tank bottom punctures.

**NOTE: Case Managers should consult DEQ Central Office to evaluate fund access for releases resulting from stick punctures. Releases caused by stick punctures may not be eligible for reimbursement from the VPSTF for tank systems that do not have strike plates or were not retrofitted with strike plates.**

#### 2.1.1.8 The National Work Group on Leak Detection Evaluations

The National Work Group on Leak Detection Evaluations (NWGLDE) is an independent work group comprised of state and federal employees who regulate storage tanks for their respective agency's regulatory programs. The NWGLDE's website at <http://www.nwglde.org/> contains information regarding evaluation of different tank tightness testing and release detection equipment that has undergone third party evaluations. Case Managers may want to refer to this website for additional information on leak detection methods and technologies.

#### 2.1.1.9 Autopsy Forms

Leaking Underground Storage Tank (LUST) site release forms or "autopsy forms" are designed to compile information about the causes of releases from regulated USTs. EPA's Office of Underground Storage Tanks (EPA OUST) manages this data in order to identify problems in new and upgraded tank systems. Staff should complete an autopsy form when applicable and submit it to the Central Office Remediation Manager. A copy of an autopsy form is contained in Appendix D. A site release form should be filled out and submitted to the Remediation Manager if all of the following circumstances are met:

1. There is a confirmed release from a federally regulated UST; and
2. The UST system is a new installation or a system that was upgraded to meet the 1998 upgrade requirements and is believed to be in operational compliance; and

3. There is no evidence that the site had a previous release; and
4. The release was caused by a known or suspected UST system failure (as opposed to a surface spill, construction accident, vandalism, etc.).

### **2.1.2 Confirmed Releases – USTs** (Appendix C fact sheet – Confirmed Releases)

A "release" is defined in 9 VAC 25-580-10 as any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an UST into ground water, surface water or subsurface soils. Owners and operators of USTs are required to report confirmed releases to DEQ within 24 hours from the time that the release was discovered. Regional staff, upon receiving a release report, will direct the responsible person regarding the actions needed at the site.

The following conditions usually will be considered by regional staff as evidence that a release occurred from an UST:

1. Environmental contamination is observed in close proximity to the UST system; and
2. The UST system fails a leak confirmation test after failing a tightness test or other type of leak detection method

Once a release has been confirmed, the tank owner or operator must:

1. Take immediate action to prevent further release of material from the UST; and
2. Identify and mitigate all fire, explosion, and vapor hazards in accordance with 9 VAC 25-580-240.

Federal regulation requires the person in charge of the facility from which a discharge of oil occurs to immediately report the following types of incidents to the National Response Center:

1. Discharges that cause a film, sheen or discoloration to the water surface or adjoining shoreline; or
2. Discharges that violate applicable water quality standards (40 CFR 110.10, 40 CFR 112).

If this is not practicable, reports may be made to the Coast Guard or EPA pre-designated on-scene coordinator for the geographic area where the discharge occurs as long as the person in charge of the facility contacts the National Response Center (800-424-8802) as soon as possible.

CERCLA requires the owner or operator of USTs containing hazardous substances to report spills or overfills of hazardous substances that result in releases to the environment that equal or exceed the CERCLA reportable quantity for the substance released (40 CFR 302). The tank owner or operator is required to report these releases to the National Response Center, to the Virginia Department of Emergency Management (DEM) at 804-674-2400 or 1-800-468-8892 (24-hour number), and usually to the county or city emergency services coordinator.

The Virginia Building Code requires the owner or operator of an UST containing hazardous materials to report any release of that material in quantities reportable under state, federal or local regulations to the local code official (usually the building inspector or fire marshal). The definition of hazardous materials in the Virginia Building Code includes materials which are flammable or combustible liquids and, therefore, includes most petroleum products.

**NOTE: Letter requirements and an example letter that staff may use following a confirmed release are included in Appendix E.**

### 2.1.3 Spills and Overfills - USTs

Owners and operators of petroleum USTs must report spills and overfills of petroleum to the environment if they:

1. Exceed 25 gallons; or
2. Cause a sheen on surface water.

UST owners or operators do not need to report spills or overfills of petroleum to the environment if:

1. The spill is 25 gallons or less; and
2. The spill is cleaned up within 24 hours; and
3. The release does not cause a sheen on surface waters.

Owners and operators of hazardous substance USTs must report spills and overfills that result in a release to the environment that equals or exceeds the reportable quantity for that substance under CERCLA (40 CFR 302) to the National Response Center and to DEQ within 24 hours of discovery.

Owners and operators of hazardous substance USTs do not need to report spills and overfills to DEQ provided that the spill or overfill is less than the reportable quantity for the substance and the spill or overfill is cleaned up within 24 hours.

**NOTE: It is recommended that UST owners and operators maintain records of petroleum spills and overfills that were less than 25 gallons, cleaned up within 24 hours, and did not reach state waters.**

### 2.1.4 Releases from Previously Closed UST systems

Prior to December 22, 1988, there were no EPA or DEQ requirements for closing USTs nor were there any requirements for assessing the site at the time of closure. If releases from a previously closed UST (i.e. an UST that was permanently closed prior to December 22, 1988) are believed to pose an actual or potential threat to human health or the environment, Section 340 of the UST Technical Regulation



provides DEQ with the ability to require the owner and/or operator of that previously closed UST to assess the site and close the UST in accordance with current regulatory requirements. Section 340 of the UST Technical Regulation also provides DEQ with the ability to require the owner or operator of an UST system that was removed prior to December 22, 1988, to assess the site if there is evidence of a release that may pose a threat to human health or the environment. If contaminated soil, ground water, or free product is discovered during the site assessment phase of tank closure, the owner/operator is required to begin corrective action in accordance with Part VI of 9 VAC 25-580-10 et seq. and this includes reporting the release to DEQ within 24 hours of confirming the release.

One of the issues that regional staff must frequently address when dealing with previously closed UST systems is determining who is responsible for the cleanup. Under Article 9, the owner of the UST is:

1. In the case of an UST in use or brought into use on or after November 8, 1984, the person who owns the UST; and
2. In the case of an UST in use before November 8, 1984, but no longer in use after that date, any person who owned the tank immediately before discontinuation of use.

For additional information and guidance on determining the owner and operator of an UST, please see sections 3.1.1.1 and 3.1.1.2 of this manual.

**NOTE: The term "owner" does not include any person who, without participating in the management of an UST or being otherwise engaged in petroleum production, refining, and marketing, holds indicia of ownership (e.g. lenders) primarily to protect the holder's security interest in the tank. For additional information, please see Section 3.1.5.1.**

### **2.1.5 Releases from USTs Containing E85**

E85 is an ethanol/gasoline fuel mixture that contains approximately 85% ethanol and 15% gasoline. Questions have been raised to DEQ regarding the regulatory status of USTs containing E85. 100%, non-denatured ethanol is not a regulated substance. Gasoline is a petroleum product and, therefore, is a regulated substance. Consequently, an UST containing E85 is storing an accumulation of regulated substances and, therefore, is an UST subject to the requirements of the UST Technical Regulation. The petroleum part of E85 is greater than the examples of de minimis concentrations discussed in the preamble to the Federal UST regulation and an UST containing E85 does not qualify for the de minimis exclusion. Releases from a UST containing E85 must be reported in accordance with the requirements in Part V of the UST Technical Regulation.

### 2.1.6 Virginia Petroleum Storage Tank Fund Reimbursement for Activities Associated with Confirming a Release

When a release is suspected from a regulated or partially deferred UST, the owner or operator of that tank must evaluate whether a release has occurred. As long as the tank system from which the release is suspected is eligible for VPSTF, costs for confirming a release may be eligible for reimbursement provided that:

1. Tightness testing performed to confirm a release was pre-approved by the Regional Office<sup>2-1</sup> via the Activity Authorization Form; and/or
2. The tank owner or operator requested and received pre-approval (via the Activity Authorization Form) from the Regional Office for specific site check activities.

Tasks which regional staff may commonly see on AAFs for release investigation and confirmation include:

<u>Task</u>	<u>Task Code (007 UCRs)</u>
• Disposal of petroleum-contaminated soil	T013
• Site Reconnaissance/Initial Site Map	T014
• UST system tightness testing for leak confirmation	T015
• Drill rig mob/dmob	T023
• Soil boring with drill rig - 5 foot sampling interval	T024
• Monitoring well installation	T025, T026
• Logging soil borings	T028
• Soil sampling	T030
• Monitoring well sampling	T031, T032

Additional or alternative tasks may be appropriate depending upon site conditions, and Regional Office staff have the authority to approve other tasks or activities as needed to complete the release investigation.

<sup>2-1</sup> The VPSTF may be used to reimburse tank owners and operators for costs incurred during the implementation of DEQ approved actions taken under Parts V and VI of the UST Technical Regulation (See the Petroleum Underground Storage Tank Financial Responsibility Regulation; 9 VAC 25-590-210.A.2). Staff should remind tank owners or operators that costs associated with tightness tests or other release detection methods performed to satisfy the release detection requirements of Part IV of the UST Technical Regulation are not eligible for reimbursement from the VPSTF.

## **2.2 REPORTING REQUIREMENTS FOR RELEASES FROM EXCLUDED USTS (9VAC25-580-20.B)**

The UST Technical Regulations promulgated pursuant to Article 9 of State Water Control Law exclude certain types of USTs meeting the statutory/regulatory definition of UST, from some of the regulatory requirements of the regulation. These excluded USTs are excepted from the requirements of Article 11 by §62.1-44.34:23 (Article 11) which states: "Nothing in this article shall apply to: ... (vi) releases from underground storage tanks as defined in §62.1-44.34:8." Article 9 applies to all excluded USTs (USTs that are excluded from the requirements of the UST Technical Regulation) as long as the UST contains petroleum or another regulated substance. Staff must remember that correspondence requiring corrective action for releases from excluded USTs should only refer directly to Article 9 (§62.1-44.34:9.9) and must not contain any references to the UST Technical Regulation.

### **2.2.1 USTs Containing Hazardous Waste**

UST systems containing hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act are excluded from the statutory requirements of Article 9 and the regulatory requirements of 9 VAC 25-580-10 et seq. (see 9VAC25-580-20.B.1). These tanks are, however, regulated under RCRA Subtitle C. The owner and/or operator of tanks containing hazardous waste are required to report any releases to the environment to the EPA Regional Administrator within 24 hours of discovery and to the National Response Center if the quantity of material released equals or exceeds the reportable quantity for that material. If the release creates an emergency situation, the owner and/or operator must immediately report the release to the designated on-scene coordinator or the National Response Center, State and local emergency officials, and the EPA Regional Administrator as described in Section 2.1.2. Storage Tank Program staff should direct persons requesting additional information or assistance regarding hazardous waste USTs to DEQ Hazardous Waste staff.

### **2.2.2 Wastewater Treatment USTs**

Wastewater treatment tank systems may meet the definition of an UST under Article 9 and also be subject to the requirements of a VPDES permit, a Virginia Pollution Abatement (VPA) permit, or a pretreatment permit. VPDES permits are required for point source discharges to surface water. VPA permits are required to manage pollutants when there is no discharge to surface waters. Wastewater treatment tank systems that discharge materials into a sanitary sewer are required to have a pretreatment permit from the Publicly Owned Treatment Works (POTW) that operates the sanitary sewer. A discharge from a wastewater treatment tank that is not in compliance with the permit for that wastewater treatment system must be reported to DEQ within 24 hours of discovery (9 VAC 25-30-90.9.b and 9 VAC 25-32-30.B.2). Corrective actions related to a release from a VPDES or pretreatment facility may, from a regulatory/statutory perspective, be administered either under the VPDES program or under Article 9. Corrective actions related to a release from a VPA facility may be administered under the VPA program or under the UST Technical Regulation (deferred USTs). When an unpermitted discharge has occurred from a permitted wastewater treatment tank system, DEQ Storage Tank Program staff must coordinate with DEQ water permit staff to identify the appropriate regulatory/statutory framework under which to

conduct corrective actions.

Emergency generator USTs that are part of the backup power system at permitted treatment facilities are regulated as USTs under the UST Technical Regulation but, are deferred from release detection requirements of the regulation. Emergency generator USTs at wastewater treatment facilities do not perform a treatment function (i.e. treatment does not take place within these tanks). These tanks are not considered integral to the treatment process nor do they directly contribute to treatment of wastewater, therefore, they are regulated as specified in the UST Technical Regulation.

One type of wastewater treatment tank that Storage Tank Program staff must periodically deal with is the oil-water separator UST. Oil-water separators commonly are tank units with compartments for separating the collected oil and water. The water is usually discharged to a POTW or receiving stream under a VPDES permit or pumped and hauled to a treatment facility under a Virginia Pollution Abatement (VPA) permit. Oil-water separator systems are inherently wastewater treatment tank systems and are typically regulated under the Clean Water Act and require a VPDES permit. These tanks are considered excluded UST systems pursuant to 9 VAC 25-580-20.B.2. If a water permit is not required for the system, then it is considered a deferred UST system pursuant to 9 VAC 25-580-20.C. If oil collected by an oil-water separator is pumped to a separate UST, this separate UST is subject to the requirements of the UST Technical Regulation if it is not specifically included in the water permit. Storage Tank Program staff encountering releases from oil-water separator tanks should coordinate activities with DEQ Water Permit staff.

### **2.2.3 All other Excluded USTs**

In addition to the USTs discussed in Sections 2.2.1 and 2.2.2 above, USTs that contain regulated substances for operational purposes (e.g. hydraulic lift tanks and electrical equipment tanks), UST systems of 110 gallons or less, UST systems containing a de minimis concentration of regulated substance, and emergency spill or overflow containment USTs are also excluded from the requirements of the UST Technical Regulation. Article 9 of State Water Control Law gives DEQ the authority to require UST owners and operators to undertake corrective actions following a release of a regulated substance from an UST. There are, however, no statutory requirements in Article 9 for reporting releases.

Releases of petroleum from hydraulic lift tanks, electrical equipment USTs, and from petroleum USTs of 110 gallons or less are eligible for reimbursement from VPSTF. Releases from other excluded USTs are not eligible for reimbursement. Owners and operators of these eligible tanks must report the release to DEQ if they wish to seek reimbursement for corrective action costs. Costs incurred for corrective actions performed more than 24 hours before the release was reported to DEQ and costs for work which was not pre-approved by DEQ will not be considered for reimbursement.

## 2.3 Reporting Requirements for Oil Discharges

Article 11 of State Water Control Law is a statute which prohibits the discharge of oil into state waters, storm drains, or upon state lands. This statute encompasses all oil discharges except:

1. Normal discharges from properly functioning vehicles and equipment, marine engines, outboard motors, or hydroelectric facilities;
2. Accidental discharges from farm vehicles or noncommercial vehicles;
3. Accidental discharges from fuel tanks of commercial vehicles or vessels that have a fuel capacity of 150 gallons or less (e.g. saddle tanks on trucks)<sup>2-2</sup>;
4. Discharges authorized by a valid permit issued by the board (DEQ) pursuant to §62.1-44.15 (a discharge permitted under the VPDES or VPA programs) or by the U.S. EPA;
5. USTs regulated under a state program;
6. Releases from USTs as defined in §62.1-44.34:8 (Article 9), regardless of when the release occurred;
7. Discharges of hydrostatic test media from a pipeline undergoing a hydrostatic test in accordance with Federal pipeline safety regulations; and
8. Discharges authorized by the federal on-scene coordinator and the Executive Director or his designee in connection with activities related to the recovery of spilled oil where such activities are undertaken to minimize overall environmental damage.

According to §62.1-44.34:19 of State Water Control Law, any person discharging or causing or permitting the discharge of oil into or upon state waters, lands, or storm drain systems<sup>2-3</sup> must immediately, upon learning of the discharge, notify the board (DEQ), the director or coordinator of emergency services appointed pursuant to §44-146.19 (Emergency Services and Disaster Law) for the political subdivision within which the discharge occurs, any other political subdivision reasonably expected to be affected by the discharge, and appropriate federal authorities.

DEQ often receives the question as to what volume of oil discharged into the environment must be reported. Notification is deemed to have been given for any discharge of oil from a facility to **state lands** in amounts less than 25 gallons as long as the record keeping requirements of subsection C of §62.1-

<sup>2-2</sup> The DEQ interprets this saddle tank exception as a combined or total capacity of 150 gallons. If the vehicle or vessel has a fuel capacity of greater than 150 gallons, it does not enjoy this exception.

<sup>2-3</sup> Oil discharges that "may reasonably be expected to enter state waters, lands, or storm drain systems" also must be reported by the responsible person to DEQ immediately upon learning of the discharge.

44.34:19.2 have been met and the oil has been cleaned up. Therefore, a discharge of oil to **state lands** does not need to be reported if the following criteria are met: (1) It is less than 25 gallons, (2) The oil is cleaned up, and (3) The record keeping requirements are met. In accordance with the record keeping requirements of subsection §62.1-44.34:19.2, a record of all discharges of oil to state lands in amounts less than 25 gallons must be established and maintained by the operator of a facility at the facility, or at another location approved by DEQ for a period of five years. At a minimum, documentation of a spill that is less than 25 gallons should include the date of the spill, volume and type of material spilled, and an explanation about the cleanup of the spill. Spills often occur at locations other than the facility (i.e. during transient activities). In these situations, the record keeping information should be kept at the facility, or at another location approved by DEQ.

Any discharge of oil, regardless of volume, to **state waters** that causes a film, sheen, or discoloration to water must be reported to DEQ, the director or coordinator of emergency services for the political subdivision within which the discharge occurs, any other political subdivision reasonably expected to be affected by the discharge, and appropriate federal authorities (e.g. National Response Center).

Storm drain systems are considered by DEQ to be state waters and, therefore, any discharge to a storm drain system must be reported to DEQ, the director or coordinator of emergency services for the political subdivision within which the discharge occurs, any other political subdivision reasonably expected to be affected by the discharge, and appropriate federal authorities.

Releases of hazardous materials (including many types of oil) must also be reported to the local code official in charge of administering the Uniform Statewide Building Code.

Under Article 11, the operator of the facility, tank, or vessel is presumed to be the person permitting the discharge of oil as this person has the responsibility for the day-to-day operation of that facility, tank, or vessel. The person causing the discharge may be the operator of the facility, tank, or vessel or may be a third party<sup>2-4</sup>. If a person other than the operator caused the discharge, both the person causing the discharge and the operator are responsible for reporting the discharge. The operator is still responsible for reporting the discharge (even if he/she did not cause the discharge) because it is believed that this person has the ability to control the access of other persons to the tank, facility, or vessel.

In the absence of other conditions that indicate a discharge (e.g. vapors, free product, stained soil), the following analytical results must be reported to DEQ as soon as the analytical results are received:

1. Analytical results from samples collected during the closure of exempt USTs and/or ASTs:
  - A. TPH concentration in soil that is greater than or equal to 100 mg/kg
  - B. TPH concentration in water that is greater than or equal to 1 mg/l
  - C. A concentration of any other petroleum constituent (e.g. benzene) that is greater than the detection limit for that constituent

<sup>2-4</sup> For the purposes of this document, third party is defined as any person who is neither the owner nor the operator of an UST or AST

**NOTE: TPH soil results should be reported on a dry-weight basis. UCRs for analytical methods include all of the costs associated with performing the necessary steps of the respective methods.**

2. Analytical results from samples collected at any time other than tank closure that exceed the detection limit for any petroleum constituent.

**NOTE: DEQ does not require the collection and analysis of samples when the following types of tanks are closed:**

1. Exempt USTs, and
2. ASTs containing less than 660 gallons of oil.

### 2.3.1 Significant Variation in Inventory Control – ASTs

Operators of ASTs at facilities having an aggregate aboveground storage capacity of 25,000 gallons or greater of oil are required to perform pollution prevention measures on ASTs at those facilities including the performance of inventory control. Each operator must use inventory control procedures that are capable of detecting a significant variation of inventory. A significant variation is considered a variation in excess of one percent of the storage capacity of each individual AST. For a refinery, a significant variation of inventory is a loss in excess of one percent by weight of the difference between the refinery's input and output.

Reconciliations of inventory measurements must be performed monthly. If a significant variation is found for two consecutive reconciliation periods, the operator must conduct an investigation to identify the cause of the variation. This investigation must be completed within five working days after the end of the second reconciliation period. If the investigation does not reveal the cause of the significant variation of inventory, the operator must notify DEQ and the local director or coordinator of emergency services. The operator must then conduct additional testing to identify the cause of the variation.

The following ASTs are granted a variance by the AST Regulation and are not subject to inventory control and testing for significant variations:

1. ASTs totally off ground with all associated piping off ground.
2. ASTs with a capacity of 5000 gallons or less located within a building or structure designed to fully contain a discharge of oil;
3. ASTs containing #5 or #6 fuel oil for consumption on the premises where stored.
4. ASTs with release prevention barriers (RPBs) with all associated piping off ground, with an established corrosion rate and cathodic protection that protects the entire area of the tank bottom;
5. ASTs with RPBs with all associated piping off ground and with secondary containment that is 72 hours impermeable;
6. ASTs that meet the construction and installation standards of STI - F911-93, F921-93, or F941-94

or equivalent standards approved by the board;

7. For refineries with a continuous leak detection monitoring system and cathodic protection of the AST and piping, a significant variation of inventory shall be considered a loss in excess of 3% by weight of the difference between the refinery's input and output;
8. Vaulted tanks meeting UL 2245 or an equivalent standard approved by the board;
9. An AST used in the production/manufacturing process with full containment that is 72 hours impervious; and
10. An AST of 12,000 gallons or less with full containment that is 72 hours impervious, inside a building and used for the storage of heating oil consumed on the premises.

### **2.3.2 Pressure Testing Failures - AST Piping**

ASTs at a facility that has an aggregate above ground capacity of 25,000 gallons or greater of oil must have the associated piping pressure tested at intervals not to exceed five years. Operators of these facilities are required to have an Oil Discharge Contingency Plan (ODCP) for the facility. The ODCP must describe equipment testing and the actions that will be taken by the facility operator should AST piping fail a pressure test. Facility operators must respond to pressure testing failures as specified in their approved ODCP.

If piping fails a test, DEQ will consider this to be a threat of a discharge of oil to Virginia Waters. The AST operator must immediately report the failed test to DEQ. Within 7 days after reporting the failure or another period of time as specified by DEQ or within the approved ODCP, the AST operator must: (1) identify the cause of the failed test; (2) evaluate whether a discharge of oil to the environment occurred; and (3) report this information to DEQ Regional Office.

### **2.3.3 Leak Detection Failures - ASTs**

ASTs at facilities having an above ground capacity of 25,000 gallons or greater of oil are required to have leak detection systems that are capable of detecting a leak from the AST and associated transfer piping in the shortest feasible time. These leak detection systems must be installed for all ASTs containing greater than 660 gallons of oil unless the tank is otherwise excluded from this requirement by the AST Regulation. Leak detection methods that may be used for ASTs and transfer piping include ground water monitoring, vapor monitoring, interstitial monitoring with release prevention barriers, visual monitoring, and statistical inventory reconciliation.

Operators of these facilities are required to have an Oil Discharge Contingency Plan (ODCP) for the facility. AST operators must immediately report failed leak detection results to DEQ Regional Office.



### 2.3.3.1 Inconclusive SIR Results - ASTs

Statistical inventory reconciliation (SIR) is a method that tank owners and operators may use to meet the leak detection requirements of the AST Regulation. If SIR results for one month indicate that the tank may be leaking (i.e. a failed SIR result), the AST operator must: (1) report a failed leak detection test to DEQ; (2) evaluate whether a discharge of oil has occurred; and (3) submit a release investigation report to DEQ.

An “inconclusive” SIR result means that the leak detection performed for the tank during that month failed to meet regulatory requirements. Upon receiving the first “inconclusive” SIR result, the AST operator must immediately consult their SIR vendor to assess the possible causes for the inconclusive test result.

DEQ Storage Tank Program will, as a matter of practice, require AST operators to perform a release investigation to evaluate whether the tank is leaking when:

1. SIR results for two consecutive months are inconclusive; or
2. There are three inconclusive SIR results during any six month period.

### 2.3.3.2 Interstitial Monitors - ASTs

Interstitial monitors are used to check the area between the bottom of an AST and its release prevention barrier or the space between transfer piping and the release prevention barrier. Interstitial monitoring systems may detect leaks based on electrical conductivity, pressure or fluid sensing, hydrostatic monitoring, visual monitoring, and vapor monitoring.

Interstitial monitors that indicate a breach or potential breach in the product containing tank do not necessarily indicate that the tank has released product to the environment. If an interstitial monitor indicates a breach or potential breach in the AST or transfer piping, the AST operator must identify: (1) the cause of the breach in the AST or transfer piping; and (2) if there was a discharge of oil to the environment. If the breach in the AST or transfer piping is found within 24 hours after the interstitial monitor indicated the problem, the breach is repaired, and the breach could not have caused a discharge of oil to the environment, a suspected release does not have to be reported to DEQ. Problems that cannot be found or repaired within 24 hours as well as problems that may have caused a discharge of oil to the environment must be reported to DEQ within 24 hours after the initial discovery of the problem.

## 2.3.4 Discharges to Secondary Containment - ASTs

Under the Facility and Aboveground Storage Tank Regulation (9VAC25-91-10 *et seq.*), facilities having an aboveground capacity of 25,000 gallons or greater and ASTs having a capacity of 25,000 gallons or greater are required to have a secondary containment dike or berm that meets the requirements of 40 CFR Part 112, NFPA 30, and 29 CFR Part 1910.106. Secondary containment also may be present, even though it is not required, at facilities having less than 25,000 gallons of storage capacity.

The Federal Oil Pollution Prevention Regulation does not specifically define secondary containment, however, SPCC Guidance for Regional Inspectors (EPA 2005) states that *secondary containment* provides temporary containment of spilled oil until the appropriate response actions are taken to abate the source of the discharge and remove oil from areas where it has accumulated before it reaches navigable waters and shorelines. New York's Handling and Storage of Petroleum Regulation (6 NYCRR Part 613) requires:

“The secondary containment system must be constructed so that spills of petroleum and chemical components of petroleum will not permeate, drain, infiltrate or otherwise escape to the ground waters or surface waters before cleanup occurs. The secondary containment system may consist of a combination of dikes, liners, pads, ponds, impoundments, curbs, ditches, sumps, receiving tanks and other equipment capable of containing the product stored.”

According to New Jersey, *secondary containment or diversion system* means any structures, devices or combinations thereof supplementary to the ordinary containers employed in the normal course of storage, transfer, processing, or use, designed and operated to prevent leaks of hazardous substances from becoming discharges (Title 7, Chapter 1E of the New Jersey Administrative Code). New York's Registration of Petroleum Facilities regulation (6 NYCRR Part 112) states *secondary containment* means containment which prevents any materials spilled or leaked from reaching the land or water outside the containment area before cleanup occurs.

After considering the definitions used by New Jersey and New York and accounting for guidance from EPA, it seems that *secondary containment* is any one or set of structures or devices that surround, underlie, or are proximal to the above ground oil containing vessel whose purpose is to collect and hold oil discharged from the oil containing vessel for a period of sufficient duration for the oil to be recovered before it reaches state lands or waters. Secondary containment of oil at a facility as described above is an intentional, planned action. Secondary containment structures or devices usually are of human construct. It is possible for secondary containment to involve or be comprised of naturally occurring landforms (depressions, basins, ponds) at a facility, however, for any naturally occurring landform (i.e. not of human construct) to be considered secondary containment it would need to be specifically identified as secondary containment in the facility's approved oil discharge contingency plan. Regardless of whether a secondary containment structure is naturally occurring or of human construct, Virginia's Facility and AST regulations require periodic evaluation or certification of secondary containment structures for compliance with the applicable requirements of 40 CFR Part 112, NFPA 30, and 29 CFR Part 1910.106.

#### 2.3.4.1 Reporting Requirements - Discharges to Secondary Containment

According to §62.1-44.34:19 of State Water Control Law, any person discharging or causing or permitting the discharge of oil into or upon state waters, lands, or storm drain systems or discharging or causing or permitting a discharge of oil which may reasonably be expected to enter state waters, lands, or

storm drain systems within the Commonwealth must immediately upon learning of the discharge notify the Board. Notice is deemed to have been given for any discharge of oil to state lands in amounts of less than twenty-five gallons if the discharge is cleaned up immediately, the oil does not reach surface waters, and the facility keeps a record of the incident. Secondary containment systems at facilities required to have such must be constructed so that any discharge from a primary containment system will not escape containment before cleanup occurs [40 CFR 112.7(c)]. Also, diked areas at onshore facilities must be “sufficiently impervious to contain oil” [40 CFR 112.8(c)(2)]. EPA does not specify permeability or retention time performance criteria (EPA 2005)<sup>2-5</sup>.

Most of the secondary containment systems at facilities having an aboveground capacity of 25,000+ gallons of oil involve the use of a dike or berm around the storage tanks. The berm typically is constructed of concrete or soil and the surface area within the dike or berm is concrete or compacted soil. Concrete and earthen materials are porous and also are permeable, to varying degrees, to different types of oil. The discharge of oil from the primary oil containing vessel to secondary containment constitutes, at a minimum, a discharge of oil that may reasonably be expected to enter state waters, lands, or storm drain systems. It is DEQ’s position that a discharge to secondary containment, regardless of the nature of the secondary containment system, constitutes a discharge of oil that may reasonably be expected to reach state lands or enter state waters if not addressed in a timely manner. **Discharges of oil to secondary containment, therefore, must be reported to DEQ immediately upon discovery of the discharge and PC#s should be assigned accordingly.** Should notifications initially be routed through the DEQ Pollution Response Program, the discharge incident could end up with an IR# and a subsequent PC#. Notification is deemed to have been provided to DEQ if the spill is less than 25 gallons, does not reach surface waters, is cleaned up immediately; and the facility maintains a record of the incident. If a spiller elects to notify DEQ of a spill of less than 25 gallons, a PC# or an IR# and a PC# should be assigned.

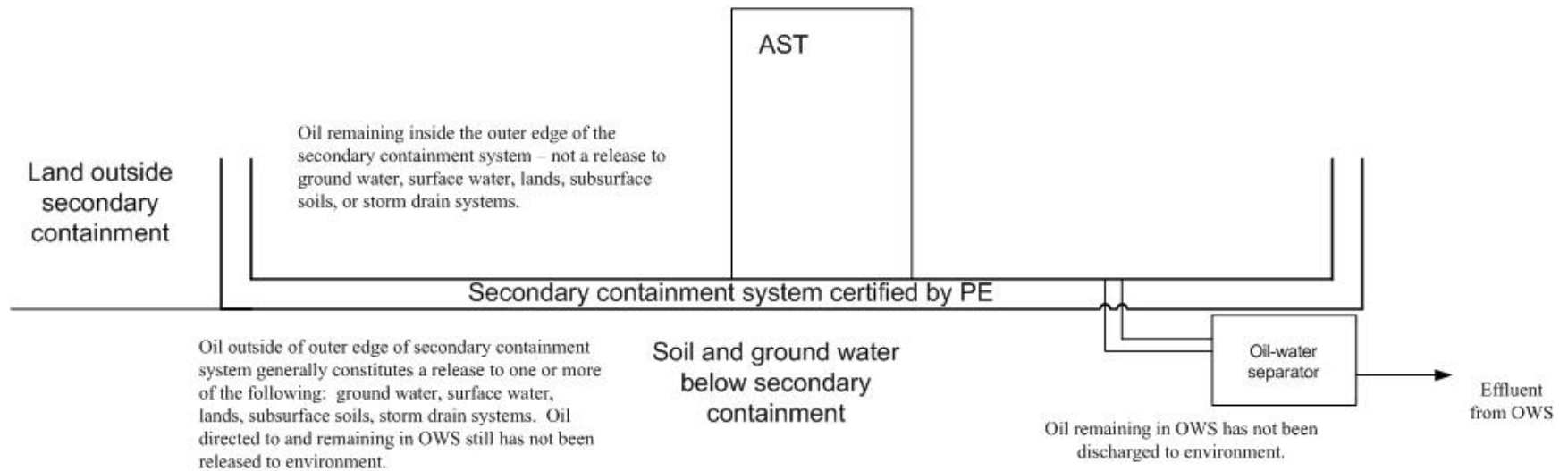
#### 2.3.4.2 Response, Investigation, Cleanup Actions and VPSTF Eligibility for Discharges into Secondary Containment

Once oil has been discharged to a secondary containment system, the operator of the facility has a duty to recover the product and take actions deemed necessary in the judgment of the Board to contain and clean up such a discharge or threat of discharge. Article 10 of State Water Control Law states that disbursements from the Fund may only be made “for containment and cleanup of a release from a *facility*. *Facility*, as defined in Article 10, means any development or installation within the Commonwealth that deals in, stores, or handles oil, and includes above ground storage tanks.

A secondary containment system is supposed to contain oil discharged from the primary storage system for a period of time that is sufficient to allow that oil to be recovered before it reaches land or water outside of the containment system. Based upon the purpose of secondary containment, it follows that secondary containment devices or structures are considered to be part of the facility and not the outside environment. **Since secondary containment systems are part of the facility, oil recovery activities undertaken within the secondary containment system will not be considered eligible for reimbursement.**

<sup>2-5</sup> EPA. 2005. SPCC Guidance for Regional Inspectors. EPA 550-B-05-001.

Figure 2-1. Discharges to Secondary Containment



Following a discharge of oil into secondary containment, DEQ staff may require an investigation to determine if oil or constituents of oil have spread to the environment beyond the secondary containment device. In all cases DEQ should request a discharge report that includes but is not limited to:

- Site Name
- Address
- RP/facility operator name, address, phone number, contact person
- Spill details (date, time, duration, material, amount, source, cause, areas affected)
- Response/Cleanup details (dates, times, cleanup activities, sampling data, disposal data)
- Corrective measures to prevent future discharges, if applicable

In deciding whether to require an investigation to determine if oil or constituents of oil have reached the environment (i.e. spread beyond secondary containment), staff should take into consideration factors including but not limited to, the size of the discharge, response actions taken to mitigate the discharge, the type of secondary containment, and proximity of receptors. Investigation that occurs in areas outside of the defined secondary containment system or device generally will be considered eligible for reimbursement.

#### 2.3.4.3 Discharges into Basements/Similar structures

Home heating oil ASTs frequently are located within basement areas or other structures. While a basement or similar structure may contain oil spilled in that location for some duration, these structures are not considered secondary containment devices because they are not identified as such in any spill contingency plan nor are they specifically designed or intended to hold oil in the manner of a secondary containment device.

The discharge of oil from a heating oil AST located in a basement or similar structure is believed to constitute a “threat of a discharge” to the environment and must be reported to DEQ immediately upon discovery of the discharge. Notification is deemed to have been provided to DEQ if the spill is less than 25 gallons, does not reach surface waters, is cleaned up immediately; and the homeowner maintains a record of the incident.

Article 10 of State Water Control Law states that disbursements may be made from the fund for corrective action costs incurred for releases of petroleum into the environment from USTs exempted in subdivisions 1 and 2 of the definition of underground storage tank (i.e. farm/residential USTs of 1100 gallons or less and USTs of 5000 gallons or less used for storing heating oil for use on the premises) and ASTs having a capacity of 5000 gallons or less used for storing heating oil for consumption on the premises. Article 10 defines “release” as:

“any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an underground storage tank or facility into ground water, surface water, or upon lands, subsurface soils or storm drain systems.”

This definition of release constrains reimbursement of costs associated with cleaning up a heating oil

discharge that occurred in a structure to the parts of cleanup related to land, ground water, surface water, and storm drain system. Basements or similar structures are not state lands, ground water, surface water, or storm drain systems. The removal of oil from a structure and the clean up of petroleum contaminated media and debris located within that structure usually will not be eligible for reimbursement. Costs for activities related to investigating and cleaning up areas outside of the structure may be eligible for reimbursement provided that negligence, willful misconduct, etc. were not causes of the release.

Staff should be aware that homeowners insurance may cover costs to clean and dispose of oil and oiled materials inside the house. Anything covered by insurance automatically is an ineligible cost under VPSTF.

### 2.3.5 Farm Tanks

Farm or residential USTs of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes are exempt from the requirements of the UST Technical Regulation, but subject to Article 11 if there is a discharge from the tank. A "farm tank" is a tank located on a tract of land devoted to the production of crops or raising animals including fish, and associated residences or improvements (UST Technical Regulation). The term "Farm" includes fish hatcheries, range land, and nurseries with growing operations.

The preamble to the Federal UST regulation further clarifies which tanks qualify as "farm tanks" by stating that farm tanks must be located on the farm property in order to be exempt from the UST regulation. The term "farm" **does not** include laboratories where animals are raised, land used to grow timber, and pesticide aviation operations. The "farm" definition **does not** include retail stores or garden centers where the products of nursery farms are marketed, but not produced.

In some instances, tanks may be located on sites having some agricultural or farming component, however, another land use is dominant at that site. Examples of this are state correctional facilities (state farms) and state university agricultural research facilities. The primary purpose of state correctional facilities is to incarcerate criminals, not produce agricultural products. Likewise, state university agricultural research facilities are primarily institutions of higher education and research, not farming operations.

When DEQ encounters a dual use where a tank owner uses the fuel tank for farming operations and for another type of commercial activity, the IRS business category of the facility is used to determine if the tank is subject to the requirements of the UST Technical Regulation. True farming operations utilize the IRS's Schedule F (farms) for reporting income. Business entities other than farms use Schedule C (sole proprietorships) or other schedules for reporting income. The IRS schedule used to report the use of the tank will be used by DEQ to evaluate whether the tank is exempt from the requirements of the UST Technical Regulation.

### 2.3.6 Propane Tanks

Propane is a gas at standard conditions of temperature and pressure, but generally is compressed into a liquid (e.g. propane tank) so it can be easily transported and stored. Propane commonly is used as fuel for engines, barbeque grills, and home heating systems. Propane ASTs are excluded from the AST Regulation pursuant to 9 VAC 25-91-30 which excludes an AST that is used to store propane gas, butane gas or other liquid petroleum gases. DEQ Storage Tank Program does not consider releases of liquefied propane and propane gas into the environment to be subject to the release reporting requirements under Article 11 of State Water Control Law.

According to the UST Technical Regulation, “regulated substance” include petroleum or any fraction thereof that is a liquid at standard temperature and pressure. Since propane is not a liquid at standard conditions of temperature and pressure (60°F and 14.7 pounds per square inch absolute), propane USTs are not subject to the requirements of the UST Technical Regulation.

## 2.4 Issuance of Pollution Complaint Numbers

When Regional Office Staff learn of a suspected or confirmed release (or discharge), a pollution complaint number (PC#) for the release/discharge must be issued. Pollution complaint numbers consist of a four-digit fiscal year prefix followed by a four-digit number assigned by the region. The fiscal year for the Commonwealth of Virginia is from July 1 through June 30. The four-digit prefix for releases/discharges discovered on or after July 1 of a calendar year will receive a prefix number for the next fiscal year (e.g. a discharge of oil reported on July 3 2001, will have a PC number of 2002-xxxx).

**NOTE: The fiscal year prefix on the PC numbers shown on correspondence, files, etc. may be the last two digits of the fiscal year. Staff entering data into the STORMS database must use an eight-digit PC # (four-digit fiscal year followed by the four-digit assigned number).**

Each DEQ region is assigned a block of numbers from which to use when issuing PC #s. The four-digit number assigned by regional staff after the two-digit fiscal year prefix must be unique to the individual site and cannot be assigned to any other sites. Generally, these numbers are assigned sequentially in the order that the release/discharge is reported or discovered.

#### Regional PC numbers

Southwest	1000 to 1999
Blue Ridge - Roanoke	2000 to 2999
Northern	3000 to 3999
Piedmont	4000 to 4999
Tidewater	5000 to 5999
Valley	6000 to 6999
Blue Ridge - Lynchburg	7000 to 7999

## 2.5 Fund-Eligible Petroleum Releases

(Appendix C fact sheet - Virginia Petroleum Storage Tank Fund (VPSTF))

One of the first questions that DEQ Regional Staff are asked when a person reports a release is if the costs for corrective action are eligible for reimbursement. Table 2-2 (at the end of this Chapter) lists the different types of tanks and summarizes fund eligibility for releases/discharges from these tanks. Staff may also provide interested persons with fact sheets that contain additional information on the Virginia Petroleum Storage Tank Fund (VPSTF) and financial responsibility (see Appendix C).

**NOTE: Staff must be aware that factors other than tank type and content affect reimbursement eligibility as discussed below. Additional factors affecting eligibility include negligence on the part of the owner or operator or that person's agent or employee, insurance coverage, and effective dates of VPSTF coverage under Article 10. Due to the fact that some of the variables affecting eligibility may not be known at the time a release is reported, it is recommended that regional staff state that a cleanup appears to be eligible based upon presently known information instead of stating unequivocally that the cleanup is eligible. RO staff should consult with OSRR when Fund access is a question both to assess whether the release is Fund eligible and to determine the best method to communicate the result to the responsible person. Generally, preliminary access decisions are prepared and sent by OSRR but occasionally they are included in the initial release letter. In the event that Fund access is denied, the responsible person must be notified and given an opportunity to seek resolution through the reimbursement/reconsideration process or other administrative proceeding.**

## 2.6 After-Hours Release Reporting

Releases may be reported directly to DEQ personnel during normal business hours or by fax during the evening or weekend. Reporting releases by fax during non-business hours is acceptable for meeting release reporting requirements under Virginia Law and Regulation provided that: (1) The person reporting the release provides information required on the Release Report Form (Appendix D); and (2) The release does not reach surface waters or otherwise create an immediate health hazard (e.g. vapors in a building or structure). It is recommended that any person reporting a release after hours by fax keep a copy of the fax confirmation.

Although reporting releases by fax is viewed by DEQ as a means by which a responsible person may meet his/her release reporting requirement, this method of release notification is not a substitute for receiving instruction from the Regional Office regarding the course of action to be taken following a release. If a responsible person reports a release via fax to DEQ, that person must call the appropriate DEQ Regional Office during the next business day to follow up on the release report and receive instruction from the regional staff.

**NOTE: Submittal of an UST closure report does not satisfy the release reporting requirement.**

Releases may also be reported during weekend or evening hours to the Virginia Department of Emergency Management at (804) 674-2400 or 1-800-468-8892 (24-hour number). The responsible person must contact the Department of Emergency Management and local emergency officials in all



instances where the release creates a hazardous situation (e.g. fire or explosion hazard). If the responsible person is unsure of whether a release has created an emergency situation, it is recommended that they contact the Department of Emergency Management. The Department of Emergency Management, in accordance with an agreement with DEQ, will immediately notify DEQ Regional Pollution Response Person in the following situations:

1. Releases of petroleum that reach state surface waters (except sheens);
2. Releases of petroleum that are greater than 150 gallons;
3. A release or potential release of cargo from a tank vehicle;
4. Fish kill within state waters;
5. Commercial vessel grounding or collision;
6. Release from a pipeline;
7. Train derailment with a confirmed release;
8. Tire fire;
9. Local, state, or federal emergency responder requests DEQ assistance;
10. Hazmat Incident
11. Blackwater Discharge
12. Radiological Incident

Routine releases reported to the Department of Emergency Management will, subsequently, be reported to DEQ by the Department of Emergency Management.

Releases that reach surface waters and cause a sheen must be reported by the responsible person to the National Response Center at 1-800-424-8802 (24 hour hotline).

## **2.7 Source Identification for AST/UST Releases**

When a release is reported, the source of the release must be identified. This is necessary to ensure that ongoing releases are stopped, appropriate measures are taken to clean up the release, and information for fund access is obtained.

Upon receiving a confirmed release report, regional staff will require the responsible person to characterize the release and ensure that all risks are addressed. Staff must also decide when the source of

contamination has been sufficiently investigated to ensure against ongoing releases. Staff may, at their discretion, require tightness tests or any other methods deemed appropriate to evaluate whether a release is continuing.

It is also important to identify the source of contamination. Corrective action costs associated with releases from fund-eligible tanks (see Table 2-2), including associated piping and loading racks, are usually eligible for reimbursement. If no absolute source of contamination is discovered (e.g. hole in tank or product lines), regional staff must consider site information including contamination characteristics at the site and use their professional judgment to evaluate whether contaminants were released from the UST or AST.

Staff should also review information received to evaluate whether ineligible sources (e.g. fuel spills from vehicles) contributed to the contamination at the site.

Although the source of the release may be eligible, the underlying cause of the release may render the release ineligible for reimbursement. Therefore, staff should also review PREP records and other reports received about the release to ensure that the release was not the result of one of the following types of actions:

1. Willful misconduct (e.g. deliberately releasing product from the tank onto the ground, cleaning concrete with gasoline or other fuels, etc.);
2. Negligence (e.g. pumping significantly more product into a tanker truck than the truck's storage capacity, pumping product into a monitoring well, etc.); or
3. Vandalism

Regional staff must advise Central Office when it is believed that vandalism, negligence or willful misconduct caused or contributed to the release. Recommendations concerning vandalism, negligence, or willful misconduct will be made by the legal staff in OSRR.

The Central Office staff are available to advise regional staff on issues concerning whether or not the source is an UST or AST; if the product released is petroleum, oil, or an ineligible regulated substance; eligible versus ineligible sources; occurrence determinations; and all other issues related to the Storage Tank Program. In the event that Fund access is denied, the responsible person must be notified and given an opportunity to seek resolution through the reimbursement/reconsideration process or other administrative proceeding. Generally, OSRR staff communicate preliminary access decisions in writing to responsible persons; however, in some cases, it may be appropriate to convey the access decision in the initial release letter. RO staff should consult with OSRR when Fund access is a question both to assess whether the release is Fund eligible and to determine the best method to communicate the result to the responsible person.

## 2.8 Petroleum Releases Caused by Willful Misconduct, Negligence, or Vandalism

Virginia Water Control Law requires UST owners and operators and AST operators to clean up releases from tanks that they own or operate. The Petroleum Underground Storage Tank Financial Responsibility Requirements Regulation prohibits DEQ from paying reimbursement when a release is caused, in whole or in part, by the willful misconduct (deliberately releasing product) or negligence of the tank owner or operator or their employees, agents, or contractors (9 VAC 25-590-210.A.5.b). Examples of negligence include:

1. An AST was knocked over by a person or vehicle;
2. An UST or UST line was punctured;
3. A hose from a dispenser was left open allowing the contents of the tank to discharge;
4. Product was pumped into a monitoring well instead of the fill pipe;
5. A valve was left open allowing the tank contents to discharge;
6. Product was pumped into a pipe that was not connected to the tank;
7. A fuel delivery driver failed to determine the available capacity of a tank before filling it or failed to monitor the fueling operation, leading to an overflow;
8. Secondary containment was inadequate, and
9. A fill pipe was cut off at ground level and left uncapped.

Regional staff must advise Central Office when it is believed that willful misconduct, negligence, or vandalism caused or contributed to the release. Recommendations concerning vandalism, negligence, or willful misconduct will be made by the legal staff in OSRR.

Vandalism is an exception to negligence in that vandalism is an act or omission committed by a third party who is neither the tank owner nor the operator, nor an agent, employee, or contractor of the owner or operator. DEQ may consider releases caused by vandalism for Fund access provided that the owner/operator whose tank has been vandalized: (1) reports the act of vandalism to the police; and (2) provides a copy of the police report to DEQ Regional Office. Upon receipt of a police report, the regional Case Manager will forward that report to OSRR for a fund access decision.

**NOTE: Staff may advise tank owners/operators that in order to qualify for the vandalism exception, the owner/operator must report the incident to the police. The burden of reporting and documenting vandalism rests with the RP.**

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Fund access recommendations for releases caused by vandalism will be made by the legal staff in OSRR. Regional staff requesting a recommendation regarding Fund access for a release caused by vandalism must provide OSRR with the following:

1. The pollution complaint number for the release;
2. The name of the tank owner/operator who is the responsible person for the release;
3. The type of tank (if any) or other source from which the release occurred;
4. The address of the site where the release occurred;
5. The facts concerning how the release occurred; and
6. A police report stating that the release was caused by vandalism

The legal staff of OSRR will review the information provided by the Regional Office and prepare a memo documenting the Fund access decision for the case. This memo will then be sent to the Regional Office and the claim processing staff. If a release caused by vandalism is Fund eligible, the responsible person will be eligible to request reimbursement for pre-approved, eligible and reasonable cleanup costs in excess of the financial responsibility requirement up to one million dollars for that occurrence.

In the event that Fund access is denied based on negligence, willful misconduct or vandalism, the responsible person must be notified and given an opportunity to seek resolution through the reimbursement/reconsideration process or other administrative proceeding. Generally, OSRR staff communicate preliminary access decisions in writing to responsible persons; however, in some cases, it may be appropriate to convey the access decision in the initial release letter. RO staff must consult with OSRR when the facts of the release suggest that negligence, vandalism or willful misconduct is a potential cause of the release both to assess whether the release is Fund eligible and to determine the best method to communicate the result to the responsible person.

## **2.9 Petroleum Contamination from Unknown Sources**

During the course of performing site assessments, site owners often discover petroleum contamination. Analytical results indicating concentrations of petroleum constituents that are greater than the detection limits must be reported to DEQ. Petroleum contamination from any source other than a regulated, deferred, or excluded UST must be administered in accordance with Article 11. Petroleum contamination from an unknown source will, therefore, be managed under Article 11.

The Fund provides reimbursement for corrective action costs resulting from petroleum releases from eligible tank systems. Costs incurred for cleaning up petroleum from unknown sources are not eligible for reimbursement.

## **2.10 Discharges of Petroleum or Regulated Substances from Municipal Storm Sewers**

Releases are often brought to the attention of DEQ when petroleum or other regulated substances are discharged from storm sewer systems. The VPDES Permit Regulation (9 VAC 25-31-10 et seq.) requires certain municipalities to have a VPDES Permit for their stormwater discharges. Petroleum or other regulated substances discharging from a storm sewer system may violate the permit limits for that system. If petroleum or other regulated substances are being discharged from a storm sewer, Storage Tank Program staff should inform the regional Permit Staff of this discharge. The regional staff should then contact the municipality and work with that entity to find the source that is discharging these constituents.

## **2.11 Contamination from Former Manufactured Gas Plants**

Former manufactured gas plants may be found in many of the cities and towns throughout the Commonwealth. During the process of manufacturing gas, tars, oils, and oily water were generated. These materials often contaminated the land and water at and near the gas manufacturing facility and are later brought to the attention of DEQ staff. Contamination from these sites poses special challenges for Storage Tank Program due to the mixture of contaminants that may be found as well as the regulatory framework within which cleanups may be conducted.

Historically, investigations and cleanups at these facilities have been overseen by DEQ Superfund and Voluntary Remediation Programs. This remains the preferred course of action as these programs are best able to affect a cleanup of all contaminants at the site. If DEQ Division of Land Protection and Revitalization determines that the cleanup at a particular former manufactured gas plant cannot be managed under the Hazardous Waste or Superfund Programs and there is no entity willing to undertake the cleanup under the Voluntary Remediation Program, DEQ Storage Tank Program may oversee cleanup of the oils and tars at these sites under Article 11 of Virginia Water Control Law. It is also possible that some or all of the cleanup of tars and oils may be administered under Article 9 of Virginia Water Control Law and the UST Technical Regulation, but the uncertainties and complex histories of these sites make this unlikely. In order to invoke Article 9 and the UST Technical Regulation, DEQ must possess or be presented with detailed historical and technical information which documents that the release of contaminants at the site came from a regulated UST and not from any other source. Appendix Y contains DEQ Storage Tank Program White Paper that provides additional information about the Storage Tank Program's position regarding the applicability of Articles 9, 10, and 11 of Virginia Water Control Law to contaminants from former manufactured gas plants.

## **2.12 Releases of Hazardous Substances from Regulated USTs**

DEQ Storage Tank Program staff periodically receive release reports for substances other than motor fuels. USTs containing CERCLA defined hazardous substances are subject to the requirements of the UST Technical Regulation provided that the tank is not otherwise excluded from the regulation or exempt

from the definition of UST.

**NOTE: Some of the more common types of hazardous substance tanks that are not subject to the requirements of the UST Technical Regulation include: (1)USTs containing hazardous wastes (excluded USTs); and (2) flow through process tanks (exempt USTs).**

Upon receiving a release report for a material other than a petroleum motor fuel, staff should check the SARA Title III List of Lists (Appendix A) to evaluate whether the material that was released is a CERCLA defined hazardous substance. Substances, chemicals, products, and materials listed in the SARA Title III List of Lists are CERCLA defined hazardous substances. When a release of a hazardous substance occurs, Storage Tank Program staff should contact the Regional Hazardous Waste Inspector to evaluate whether the facility from which the release occurred has a hazardous waste permit. Releases of hazardous substances at facilities having hazardous waste permits are potentially subject to RCRA Subtitle C corrective actions. If the facility does not have a hazardous waste permit and/or the DEQ Division of Land Protection and Revitalization has no interest in the site, the Storage Tank Program may oversee corrective actions under the UST Technical Regulation.

**NOTE: Cleanup of releases of CERCLA defined hazardous substances are not eligible for reimbursement from the Virginia Petroleum Storage Tank Fund.**

## 2.13 Applicability of Article 11 to Discharges of Hazardous Substances

Facilities utilizing or otherwise managing hazardous substances (substances defined under § 101(14) of CERCLA) may have discharges of those substances into the environment. The definition of oil listed in Article 11 includes “all liquid hydrocarbons regardless of specific gravity.” This clause in the definition has caused confusion regarding the applicability of Article 11 to the discharge of any liquid containing hydrogen and carbon from any unit other than a regulated UST.

The Virginia Water Control Board (one of the agencies placed in DEQ) posed this issue to the Attorney General’s Office. The Assistant Attorney General wrote an opinion that the term “liquid hydrocarbons” covers a large number of chemicals that would not be considered “oils” as that term is commonly understood. The Assistant Attorney General also stated a belief that the General Assembly probably did not intend to accomplish wholesale regulation of toxic substance spills by this law (Article 8, which was replaced by Article 11).

Most other Federal and State environmental laws including the Clean Water Act, CERCLA, and RCRA (see Subtitle I) all make distinctions between oil (or petroleum) and hazardous substances. DEQ Storage Tank Program realizes that the term “oil” in Article 11 may be interpreted as any liquid containing hydrogen and carbon. This broad interpretation is inconsistent with other environmental laws. Furthermore, it is appropriate to make a distinction between those materials or substances that are oils and those that are listed hazardous substances. DEQ Storage Tank Program will consider those materials, chemicals, and products defined in § 101(14) of CERCLA to be hazardous substances and not oil. Article 11, therefore, will not be applied to discharges of hazardous substances. **Only those releases of CERCLA listed substances from USTs subject to the requirements of Article 9 of Virginia Water Control Law and the Virginia UST Technical Regulation will be addressed by the Storage Tank**

**Program.** For additional background information on this subject, please see Appendix AB.

**NOTE: CERCLA defined hazardous substances are listed in the SARA Title III List of Lists. The List of Lists may be obtained on EPA's website at <http://yosemite.epa.gov/oswer/lol.nsf/homepage>.**

## 2.14 Used Oil

Used oils are regulated substances under the UST Technical Regulation. They are also oils under Article 11. The definition of used oil in the September 10, 1992, Federal Register is any oil that is refined from crude oil (or synthetic oil), that has been used, and as a result of such use is contaminated by physical or chemical impurities. These chemical or physical impurities may make used oil a hazardous waste and subject to the requirements of the hazardous waste regulations.

DEQ Storage Tank Program typically addresses releases or discharges of used oil into the environment under the UST Technical Regulation or Article 11 depending upon the source. The Storage Tank Program places the responsibility for determining if the used oil is a hazardous waste on the owner/operator of the storage tank and/or the spiller (Article 11). When a release of used oil is reported to DEQ Storage Tank Program, the Storage Tank Program will oversee the cleanup of that material under the UST Technical Regulation or Article 11 unless the tank owner states or otherwise provides information indicating that the oil is a hazardous waste.

### 2.14.1 Used Oil as a Hazardous Waste

Persons managing used oil should know if that material is a hazardous waste. Federal regulations presume that used oil will be recycled. Under this "recycling presumption," used oil is generally exempt from the hazardous waste regulations. Despite the exemptions provided by the recycling presumption, persons generating or managing used oil should be aware that used oil may still be regulated as a hazardous waste under the following conditions:

1. Used oil that contains greater than 1000 ppm of total halogens is *presumed* to have been mixed with halogenated hazardous wastes (e.g. chlorinated solvents) and is subject to the applicable hazardous waste regulations. However, a person may rebut this presumption by demonstrating through analyses or documentation that the used oil has not been mixed with halogenated hazardous waste. Persons may, for instance, show that the used oil does not contain detectable concentrations of listed halogenated hazardous wastes.

Certain types of oils contain halogenated materials that may cause the total halogen concentration (TOX) in the used oil to exceed 1000 ppm. Metalworking oils often contain chlorinated paraffins and refrigeration compressor oils may contain chlorinated fluorocarbons (CFCs). Persons generating used oils having TOX concentrations in excess of 1000 ppm are not required to test the oil for listed hazardous wastes if they can demonstrate that the used oil was a metalworking oil or refrigeration compressor oil.

2. Used oil mixed with a listed hazardous waste is a hazardous waste and must be managed accordingly.
3. Mixtures of used oil and characteristic hazardous waste may be a hazardous waste depending upon the characteristics of the combined mixture.
  - A. A mixture of used oil and an ignitable hazardous waste (the waste is hazardous only because of ignitability) is a hazardous waste only if the mixture exhibits the characteristic of ignitability.
  - B. A mixture of used oil and a waste that exhibits one or more hazardous characteristics other than ignitability is hazardous if the mixture exhibits **any** hazardous characteristic including ignitability.

Please see Figure 2-1 for a flowchart that may be used to evaluate whether used oil is a hazardous waste.

### **2.14.2 Releases of Used Oil from Regulated USTs**

Used oil is a regulated substance under the UST Technical Regulation and USTs containing this material are subject to the requirements of the UST Technical Regulation provided that the tank is not otherwise excluded or exempt from the requirements of the regulation. The most likely ways for an UST containing used oil to be excluded from the requirements of the UST Technical Regulation are for that tank to have a capacity of 110 gallons or less or for that tank to contain a hazardous waste.

Upon receiving a report of a release of used oil from a regulated UST, DEQ Storage Tank Program will proceed with the cleanup under the UST Technical Regulation unless the RP states or otherwise provides evidence that the used oil is a hazardous waste. Staff receiving a report of a hazardous waste release should refer the case to DEQ hazardous waste staff in the Division of Land Protection and Revitalization.

### **2.14.3 Discharges of Used Oil from ASTs**

Used oil discharged into the environment from ASTs or anything other than a regulated UST must be reported to DEQ and cleaned up in accordance with the requirements of Article 11. Upon receiving a report of a discharge of used oil from an AST or storage unit other than a regulated UST, DEQ Storage Tank Program will proceed with the cleanup under Article 11 unless the RP states or otherwise provides evidence that the used oil is a hazardous waste. Staff receiving a report of a hazardous waste release should refer the case to DEQ staff in the Division of Land Protection and Revitalization.

### **2.14.4 Used Oil ASTs for On-Site Heating**

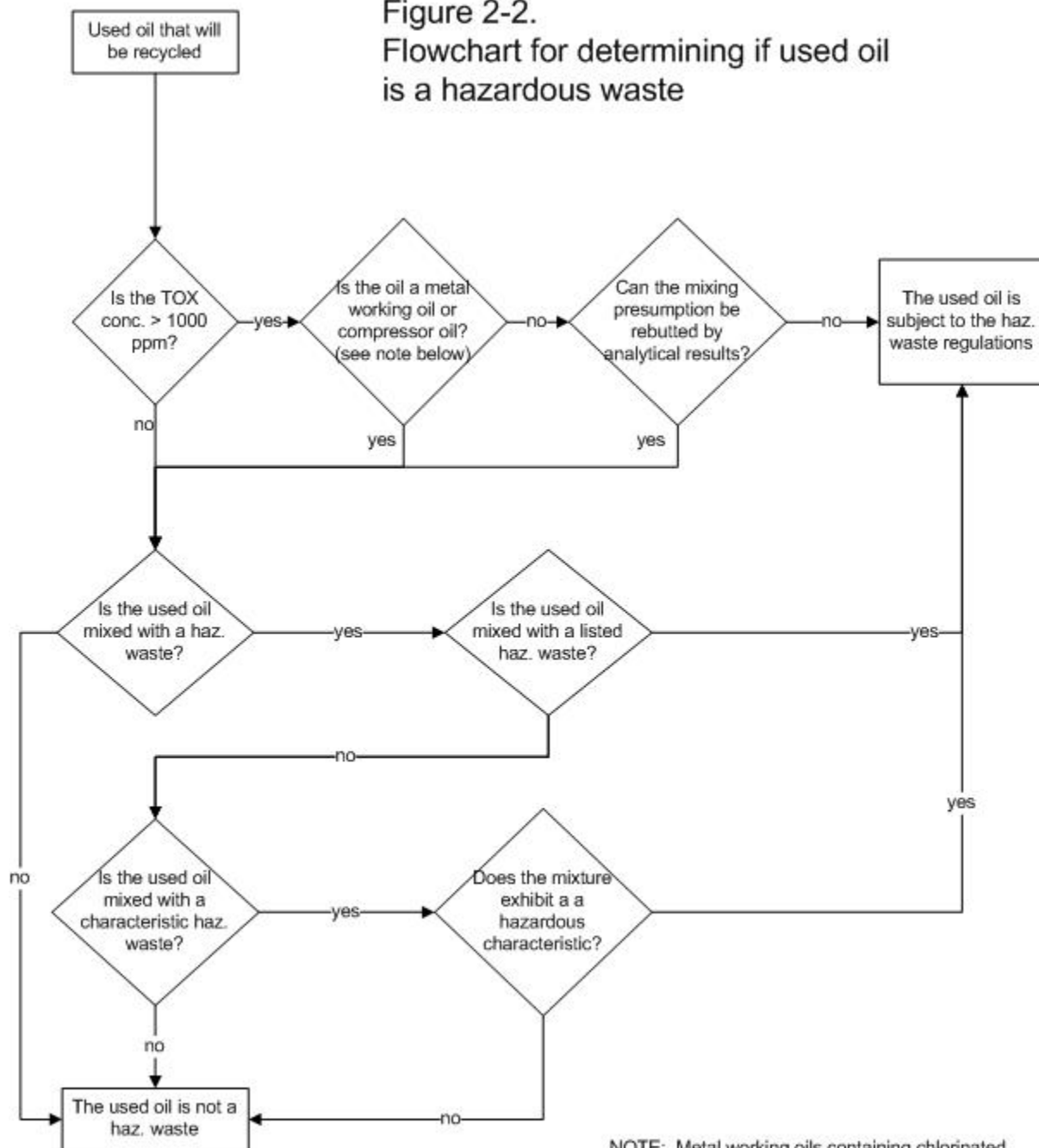
In general, used oil includes engine crankcase oil, machine lubricating oil, cutting oil, hydraulic oil, heat treating oil, and compressor oil. Used oil is sometimes used as a substitute for heating oil for on-site heating. ASTs storing used oil are usually considered heating oil ASTs as long as the used oil is entirely consumed to heat the premises where the tank is located. Costs incurred for cleaning up used oil releases



may be eligible for reimbursement if the release is from a heating oil AST.

**NOTE: "Waste oil" is not the same as used oil. Used oil mixed with a listed hazardous waste must be managed as a hazardous waste. This material is considered a hazardous waste fuel if it is burned for energy recovery.**

Figure 2-2.  
Flowchart for determining if used oil  
is a hazardous waste



NOTE: Metal working oils containing chlorinated paraffins and CFC containing refrigeration oils are excluded from the mixing presumption.

Table 2-1. Release Reporting Requirements

Tank Type	Required Reporting by Release Type		Applicable Statute or Regulation	Time Period for Reporting
	Suspected	Confirmed		
Regulated USTs	X	X	Article 9 VAC 25-580-10 et seq.	within 24 hours of discovering the release <sup>1</sup>
Deferred USTs: Types 1, 4, and 5		X	Article 9 9 VAC 25-580-10 et seq.	within 24 hours of discovering the release <sup>1</sup>
Types 2 and 3			See footnote 2	
Partially deferred USTs	X	X	Article 9 VAC 25-580-10 et seq.	within 24 hours of discovering the release <sup>1</sup>
Exempt USTs		X	Article 11 <sup>3</sup>	Immediately upon discovering the release <sup>4</sup>
Excluded USTs: Types 3 through 6			Article 9 9 VAC 25-580-10 et seq.	Reporting is not required by statute. However, the release must be reported within 24 hours to be eligible for VPSTF.
Type 1		X	See footnote 5	Immediately or within 24 hours depending upon the hazard
Type 2			See footnote 6	Within 24 hours of discovering the permit violation
ASTs		X	Article 11 <sup>3</sup>	Immediately upon discovering the release (discharge)

<sup>1</sup> Petroleum spills of less than 25 gallons do not have to be reported to DEQ if they are cleaned up within 24 hours and do not reach state waters. Spills of hazardous substances that are less than the reportable quantity for the substance and that are cleaned up within 24 hours do not have to be reported to DEQ (9 VAC 25-580-220).

<sup>2</sup> Federal Law may require reporting in addition to what is required under 9 VAC 25-580-10 et seq.

<sup>3</sup> Article 11 of State Water Control Law only applies to oil discharges.

<sup>4</sup> According to Article 11 (§62.1-44.34:19.A), notice of a release (discharge) is deemed to have been given if the discharge of oil is to state lands only, is less than 25 gallons, the operator of the facility maintains records in accordance with subsection C of §62.1-44.34:19.2 and the oil is cleaned up.

<sup>5</sup> A release of a hazardous waste that creates an emergency situation must be reported immediately to the National Response Center and, depending upon the situation, to state and local authorities and the EPA Regional Administrator (See 40 CFR 262.34(d)(5), 40 CFR 264.56(d)(1), 40 CFR 264.56(d)(2), 40 CFR 264.56(j), 40 CFR 265.56(d)(1), 40 CFR 265.56(d)(2), and 40 CFR 265.56(j)). Any release to the environment (unless it is equal to or less than one pound and cleaned up immediately) of a hazardous waste from a tank or secondary containment system must be reported to the EPA Regional Administrator within 24 hours. If the release is equal to or greater than the reportable quantity for that substance, the release must also be reported to the National Response Center (40 CFR 264.196(d)(1) and 40 CFR 264.196(d)(3)).

<sup>6</sup> The Surface Water Discharge Regulation requires the permittee to notify DEQ of spills or other unpermitted discharges promptly (within 24 hours) after learning of such a discharge (9 VAC 25-30-90.9.b).

Table 2-2. Fund Eligible Releases			
Tank Category	Specific Tank Type	Eligible for Corrective Action Costs	Eligible for 3RD Party Claims
Regulated USTs	USTs containing petroleum. See Virginia Code §62.1-44.34:11.A.2.e and §62.1-44.34:11.A.2.b	X	X
	USTs containing a regulated substance other than petroleum (i.e. a hazardous substance UST).		
Exempt USTs	Types 1 and 2. See Virginia Code § 62.1-44.34:11.A.2.e	X	
	Types 3 through 8		
	Type 9	X <sup>1</sup>	
Excluded USTs	Types 1 and 2		
	Type 3. See Virginia Code §62.1-44.34:11.A.2.a and '§62.1-44.34:11.A.2.b	X <sup>2</sup>	X <sup>2</sup>
	Type 4. See Virginia Code §62.1-44.34:11.A.2.a and §62.1-44.34:11.A.2.b	X <sup>2</sup>	X <sup>2</sup>
	Type 5		
	Type 6		
Deferred USTs	Types 1 and 2		
	Types 3 through 5. See Virginia Code §62.1-44.34:11.A.2.a and §62.1-44.34:11.A.2.b	X <sup>2</sup>	X <sup>2</sup>
Partially Deferred UST	See Virginia Code §62.1-44.34:11.A.2.a and § 62.1-44.34:11.A.2.b	X	X
ASTs at a Facility	ASTs that contain a product on which the fee imposed by Virginia Code § 62.1-44.34:13 is paid	X	
	ASTs that contain a product on which the fee imposed by Virginia Code § 62.1-44.34:13 is not paid		
Heating Oil AST	ASTs of 5,000 gallons or less used for storing heating oil for consumption on the premises where stored. See Virginia Code § 62.1-44.34:11.2.h	X	
<sup>1</sup> A storage tank situated on or above the surface of a mine shaft, tunnel, etc. is considered an AST and is eligible for corrective action costs if the tank contained a product on which the fee is collected or if it is a heating oil tank.			
<sup>2</sup> Costs for corrective actions and third party claims are eligible for reimbursement from the Fund provided that the tank contained petroleum.			

Table 2-3. Financial Responsibility Requirement for Regulated USTs	
Annual Throughput In Gallons	Corrective Action Per Occurrence FR Requirement
600,000 or less	\$5,000
600,001 - 1.2M	\$10,000
1,200,001 - 1.8M	\$20,000
1,800,001 - 2.4M	\$30,000
Above 2.4M	\$50,000

Table 2-4. Financial Responsibility Requirement for Regulated and Unregulated ASTs			
Net Annual Profits greater than \$10 million*		Net Annual Profits less than \$10 million*	
Total Storage Capacity for all AST facilities which operate in VA	Financial Responsibility Requirement	Total Storage Capacity for the AST Facility where the release occurred	Financial Responsibility Requirement
less than 4 million gallons	\$200,000	less than 25,000 gallons	\$2,500
4 million to 20 million gallons	Total Storage Capacity in VA x \$0.05 per Gallon	25,000 to 100,000 gallons	\$5,000
greater than 20 million gallons	Not Eligible for Reimbursement	greater than 100,000 to 4 million gallons	Facility Storage Capacity x \$0.05 per Gallon
		greater than 4 million gallons	\$200,000

\* Based on the financial statements of a company's Virginia facility operations from the fiscal year preceding the date the release was reported to DEQ. Profits from a company's operations at sites that do not meet the definition of a facility under §62.1-44.34:10 do not have to be counted when calculating Net Annual Profits.

## **3.0 RESPONSIBLE PERSONS**

### **3.1 Responsible Person Analysis**

The identity of the person responsible for cleaning up a petroleum release and/or complying with other regulatory and statutory requirements depends on several factors. As a general rule, the responsible person is the owner or operator of an underground storage tank (UST) on the date the release is reported to DEQ. For an AST release, the responsible person is the operator of an aboveground storage facility from which a discharge has occurred or the person who discharged or caused or permitted a discharge to occur. Differences in the statutory provisions defining and governing USTs and ASTs make it necessary for staff to consider each type of tank separately when analyzing responsible person issues.

DEQ regional staff is responsible for identifying the responsible person who will be required to conduct a cleanup under the State Water Control Law. Where more than one party can be considered a responsible person, DEQ regional staff is responsible for determining which party will be required to conduct a cleanup. The “Responsible Person Identification Worksheet” included in Appendix F can be used to assist staff with identifying the responsible person.

#### **3.1.1 Regulated, Deferred, Partially Deferred, and Excluded USTs** (Appendix C fact sheet - Responsible Person Identification (USTs))

Releases from regulated, deferred, partially deferred, and excluded USTs that contain petroleum are governed by Article 9 of State Water Control Law. The responsible person for the cleanup of a release from a regulated, deferred, partially deferred, or excluded UST is the owner and/or operator of the UST on the date the release is reported to or discovered by DEQ. UST owners and operators are equally liable for the cleanup under the State Water Control Law. As a procedural matter, the UST owner, who is usually identified on the 7530 form on file with DEQ, is typically expected to conduct the cleanup of a release. However, the UST operator may be required to conduct the cleanup in those instances where (1) the operator's conduct is the sole or primary cause of the petroleum release, (2) the owner has been determined to be unable to pay, or (3) the UST owner is a person or an entity that no longer exists or cannot be found.

Regional staff should first use information on the UST Notification Form to identify the UST owner. If there is no registered UST owner or operator, the Regional Case Manager should contact the current land owner to establish UST ownership. For USTs that are not registered with DEQ, common law presumes that the person or entity who owns the land is also the owner of the UST. Normally, these unregistered USTs are considered to be fixtures like a wall or fence, permanently attached to the land, which transfer with the land by deed as part of the real estate. It is possible, however, for fixtures such as USTs to be personal property of a person other than the land owner. It is not uncommon to have an UST site where the land is owned by one person and the USTs are owned and/or operated by other people. If it is unclear who the responsible person is, staff should contact OSRR for assistance.

### 3.1.1.1 Identifying an UST Owner/Responsible Person

Responsible person evaluations should be based on the following presumptions:

1. The release from the UST is presumed to have occurred at the time of discovery by DEQ or the date the release is reported to DEQ, whichever is earlier.
2. The UST owner listed on the Notification Form is the person responsible for cleanup and compliance with the UST Technical Regulation. Generally, the owner listed on the Notification Form is the responsible person regardless of whether the UST was used by this owner.
3. If DEQ has not received a Notification Form, the current land owner is presumed to be the UST owner.

When a release from an UST is reported to DEQ, the Regional Case Manager will first check the UST database for information provided on the UST Notification Form (Form 7530-2) for that tank.

#### 3.1.1.1.1 RP Identification Procedure when a Notification Form has been Submitted to DEQ

When a Notification Form has been submitted to DEQ, the UST owner listed on the Notification Form is presumed by DEQ to be the UST owner. The UST owner listed on the Notification Form may rebut this presumption by providing acceptable written evidence that:

1. Another person owns the UST (proof of ownership must be dated after the date of the Notification Form and prior to the date of the release);
2. The current UST system is not leaking and the release came from an UST system that was removed by a previous owner or belongs to another entity; or
3. The UST was not used after November 8, 1984, and the UST owner at the time of discontinuation of use was another person.

Acceptable written evidence that someone else owns the UST includes another UST Notification Form (signed by the new UST owner), a deed, a bill of sale, a court order, a lease agreement, a service contract or similar documentation indicating that someone else owned the UST at the time of the release. An affidavit by the owner listed on the Notification Form is not acceptable evidence for establishing ownership of the UST by another person. A detailed affidavit may be sufficient to establish when use was discontinued; however, it must be executed by a disinterested government official or other reliable disinterested third party who had personal knowledge of when the UST was taken out of use.

If the owner listed on the Notification Form provides sufficient evidence that someone else owned the UST at the time of the release or that the release was from a different UST, DEQ will require the person who owned the UST at the time of the release to conduct the cleanup. If the evidence is insufficient, the

person listed on the Notification Form as the UST owner will be identified as the UST owner, and, therefore, the responsible person liable for the cleanup of the release. Notification Forms must be signed by the tank owner or an authorized agent of the tank owner.

3.1.1.1.2      RP Identification Procedure when an UST Notification Form has not been Submitted to DEQ

If DEQ has not received an UST Notification Form for the site, the current land owner is presumed to be the UST owner/responsible person. The current land owner can rebut this presumption by providing a detailed written history of the site to the Regional Office which includes acceptable written evidence that:

1. Another person owns the UST (proof of UST ownership must be dated prior to the date of the release);
2. The UST was removed by a prior owner or operator;
3. The current UST system is not leaking and the release came from an UST system that was removed by a previous UST owner or located at another facility; or
4. The UST was not used after November 8, 1984, and the UST owner at the time of discontinuation of use was another person.

Acceptable written evidence that another person owns the UST includes DEQ Notification Form (signed by the UST owner), deed, bill of sale, court order, lease agreement, service contract or similar documentation. In general, an affidavit by the present land owner without additional proof is insufficient to establish ownership by another person. A detailed affidavit may, however, be sufficient to establish when use was discontinued if it is executed by a disinterested government official or other reliable disinterested third party who had personal knowledge of when the UST was taken out of use.

If the evidence is sufficient, the current land owner will not be identified as the UST owner/responsible person for the cleanup. If the evidence is insufficient, the current land owner will be considered the UST owner, and, therefore, the responsible person liable for the cleanup of the site.



**Example 3-1. Responsible Person Identification - UST Notification Form Submitted for the Site**

Example: Person A submitted an UST Notification Form to DEQ in January 1989, following the installation of 4 regulated USTs at a site. Person A sold the property to person B in June 1994. Person B operates the USTs but never submits a Notification Form to DEQ. Person B discovers a release at the site on March 4, 1997. Who is presumed by DEQ to be the responsible person?

Answer: The only Notification Form submitted to DEQ indicates that Person A is the UST owner. DEQ will, therefore, presume that person A is the RP. Person A can rebut this by providing a bill of sale, deed, court order, UST Notification Form (signed by the new tank owner), lease agreement, service contract or similar documentation indicating that another person owned the UST on March 4, 1997.

**NOTES: 1. In order to transfer ownership of the UST from person A to person B, a bill of sale or deed must specifically mention the USTs. Exception: If the deed transfers the real property without a specific reference to the tanks and any other sale documents are silent with respect to the tanks, DEQ will still consider person B to be the owner of the tanks if person B operates the tanks after the sale absent any explicit authority (e.g., lease agreement) to do so.**

**2. Person B, by virtue of being an UST operator, is also a responsible person. While DEQ Storage Tank Program will usually require the UST owner (presumed to be person A in this case) to comply with the regulations first, the operator (person B) is equally liable under State Water Control Law and may be required to take the necessary corrective actions if the owner cannot be found or is unable to proceed with corrective actions at the site.**

**Example 3-2. Responsible Person Identification - Property Owner Submits an UST Notification Form for Out of Service USTs**

Example: Person A bought a property in 1985 containing USTs that were taken out of service prior to November 8, 1984 (these tanks would be regulated USTs under today's standards). Person A never used the USTs but submitted a Notification Form to DEQ, informing DEQ of the presence of these tanks and Person A is listed on the Notification Form as the owner of these USTs. Contamination is found in the area in 1986 and is traced back to these out of service USTs. Who is the RP?

Answer: Person A is the registered UST owner on the date the release was reported. Person A is the responsible person unless he/she provides:

(1) a bill of sale dated after the Notification Form date and prior to the release date that specifically states that ownership of the USTs transferred as part of the sale; or

(2) evidence that the USTs were last used prior to November 8, 1984 by a different person in which case legal ownership ends with that person.. Person A in this instance might be able to use photos, an affidavit from a disinterested third party or county tax or real estate appraisal records to demonstrate when land use at the site changed. If the UST was taken out of service prior to November 8, 1984 and last used by someone other than Person A, then under the law Person A cannot be the owner, despite filing a Notification Form.

**NOTE: Person A could have crossed through "owner" on the Notification Form and signed it as "current landowner" to clarify that she did not own or operate the USTs.**

**Example 3-3. Responsible Person Identification - DEQ Never Received an UST Notification Form for the Site and Another Person Removes the USTs**

Example: Person A owns and operates a regulated UST on his property until 1982. In 1982, person A stops using the UST and sells the property to person B. Person B never uses the UST and in 1994, Person B removes the UST to make the property more appealing to prospective buyers. Contamination is found around the UST during tank removal. Who is the responsible person?

Answer: In a situation where the UST was taken out of use before November 8, 1984, the person who last used the UST before discontinuation of use is the responsible person. Person A, therefore, is the responsible person with the following caveats:

1. Person B, by virtue of being the present property owner, will be presumed by DEQ to be the responsible person until he provides written evidence that the UST was last used prior to November 8, 1984, and that he was not the last person to use the UST. Acceptable forms of evidence include a DEQ UST Notification Form (Form 7530-2) showing tank closure, a report or letter from the local building official or fire marshal indicating that the tank was taken out of service, a real estate appraisal showing that the property was used for another purpose prior to November 8, 1984, photos, or an affidavit from a disinterested third party. DEQ will not accept an affidavit from the present land owner as sufficient evidence that another entity is the responsible person.
2. In cases where a person other than the tank owner removed the tank, the person removing the tank will have an additional requirement of demonstrating that he/she did not cause the release during closure. In this example, Person B will have to provide documentation that he/she did not cause the release during removal of the tank. To meet this requirement, person B may provide a written statement from the building inspector or fire marshal who was present during the tank removal that removal operations did not cause the release.

**Example 3-4. Responsible Person Identification - DEQ Never Received a Notification Form for the Site and the USTs have been Removed from the Property**

Example: Person A owns a property containing several regulated USTs. In 1986, person A removes the USTs. In 1987, person A sells the property to person B. An environmental audit is performed on the property in 1997 and contamination is found. The audit also indicates that the property formerly contained regulated USTs and that those USTs appear to be the source of the contamination. Who is the responsible person?

Answer: Whenever USTs have been removed, the liability for the cleanup ends with the person who removed the USTs. Person A is the responsible person.

Person B, by virtue of being the present property owner will be presumed by DEQ to be the responsible person until Person B provides written evidence that someone else removed the USTs. Person B will also have to provide written evidence showing: (1) there were USTs on the property; (2) the USTs were removed; (3) the date they were removed; and (4) who was the tank owner at the time of removal. Documents that may be used to provide evidence that USTs were formerly on the property include: (1) DEQ UST Notification forms; (2) letters, reports, or other documents from a local building, fire, or other government official showing tanks were located on the site; (3) real estate appraisal documents indicating the presence of USTs at the property; and (4) a Sanborn Fire Map.

The burden of proof that regulated USTs were formerly present at the site and that someone else removed those USTs is on person B (i.e. the present property owner). If person B is unable to prove that USTs were present at the site, he is not only considered the responsible person, but he is not eligible to request reimbursement from VPSTF for costs incurred to cleanup the release. If person B can demonstrate that someone else removed the USTs and that person is unable to pay for the cleanup, deceased, or unknown, Person B may "step into the shoes" of the responsible person and be eligible to receive reimbursement from VPSTF after paying a financial responsibility of \$5,000.

Person B may also obtain the written consent of the responsible person to relinquish its rights to the Fund. At this point, Person B may "step into the shoes" of the responsible person and be eligible to receive reimbursement from VPSTF after paying the responsible person's financial responsibility requirement.

**Example 3-5. Responsible Person Identification - DEQ Never Received a Notification Form for the Site and the Current Land Owner Never Used the USTs.**

Example: Person A owns a property that contains several regulated USTs. In 1985, this person ceases to use the USTs. Person B purchases the property from person A in 1988. In 1995, contamination associated with the old tanks is found at the site. Who is the responsible person?

Answer: Person B is the responsible person unless he can show DEQ (using the UST Notification Form, bill of sale, etc.) that someone else is the owner of the leaking USTs. Many new owners claim that they never used the USTs, therefore, they should not be responsible for taking corrective action. Use is not an issue unless the USTs were last used prior to November 8, 1984. Since the USTs in this case were in use after November 8, 1984, the new owner (person B) bought the problem.

The new owner may also claim that the release occurred when someone else owned the tanks. Unless person B can provide documentation that a release was reported to DEQ, the Fire Marshall, or a building official before he took title to the property, person B is the responsible person.

### 3.1.1.2 Identifying an UST Operator

The definition of “operator” in Section 62.1-44.34:8 of the Code of Virginia states:

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

An operator is the person or entity having ultimate authority or the right to exercise control over the UST's day-to-day operations. An operator of an UST is a person or entity who has the responsibility for performing any of the requirements of the UST Technical Regulation. For example, an operator is a person or entity who is responsible for inspecting regulated substance deliveries; monitoring any regulated component of the UST system; or controlling surface spills of petroleum from an UST facility. Station or facility managers who are employees of the person or entity with superior authority over the UST's operations are not operators. In this case, the person with the superior authority over the USTs would be the operator.

A person may be both the operator and the owner of an UST. In addition, operators include, but are not limited to, persons or entities who operate USTs (a) leased or franchised from the UST owner, or (b) used by the operator as part of an exclusive supply contract.

Petroleum suppliers who provide product to a person or entity on a consignment basis are operators. A consignment arrangement is defined as follows: (a) the person or entity receiving the product does not purchase/own the product but does, however, receive a predetermined percentage of actual sales, and (b) the petroleum supplier has the responsibility for maintaining and gauging tanks, and performing UST regulatory requirements. A person or entity, which receives a product on a consignment basis and has no responsibility for performing any of the requirements of the UST Regulation, may not be an operator of an UST. Only the current operator is liable as a responsible person under the statute. The current operator means the operator at the time the suspected or confirmed release triggers the applicability of the

UST Regulation. As such, where the leaking UST in question has no operator at the time the release is reported, it will be deemed to have no operator for purposes of determining a responsible person under the statute.

If both the UST owner and operator are unknown or unable to pay for the cleanup, the site may become a state lead site.

### **3.1.2 Responsible Person Analyses - ASTs Having a Capacity of Greater than 660 Gallons of Oil**

Discharges of oil from facilities with ASTs of any size are governed by Article 11 of Virginia Water Control Law. Under Article 11, the person(s) responsible for cleaning up a discharge of oil is/are the person discharging, causing or permitting the discharge and any operator of the facility from which the discharge occurred. This Article differs from Article 9 in that a person who causes a discharge (sometimes called "the spiller") is also liable to conduct a cleanup, even if the spiller neither owns nor operates the facility where the discharge occurred. Additionally, the definition of operator in Article 11 includes more persons/entities than does the Article 9 definition of operator. The person who caused the discharge (the spiller) and the person who permitted the discharge (the facility operator) are equally responsible under the law. Where the spiller and the AST operator are different persons, DEQ will pursue the person who caused the discharge (the spiller).

In many instances, discharges from ASTs cannot be tied directly to a specific act committed by someone (i.e. the person causing the discharge). If the discharge from an AST of greater than 660 gallons is not a direct result of an action or failure to act by the person who caused the discharge (the spiller), DEQ staff will assign responsibility for the discharge to the person listed in the AST database as the person responsible for day to day operation of the facility or AST.

**NOTE: If the discharge was caused by a spiller and the spiller demonstrates financial incapability to perform the cleanup, DEQ will pursue the operator who is responsible for day to day operation of the tank.**

The person listed on the AST registration form as the tank operator can demonstrate that someone else is the responsible person by providing acceptable written documentation that:

1. Another person caused the discharge;
2. Another person is responsible for the day to day operation of the AST<sup>3-1</sup>;
3. The discharge came from an AST that was removed by a prior operator or at another facility.

<sup>3-1</sup> In rare instances, the person or persons presently operating an AST may be able to demonstrate that the discharge came from an AST that was operated by another person at the time of the discharge (i.e. another person owned, operated, rented, chartered, or otherwise controlled the day to day operation of the tank).

If the person listed on the AST registration form as the operator (in this context, the person having day-to-day control over the AST) no longer exists, cannot be found, or is financially incapable of performing the cleanup, DEQ will then consider the AST owner listed on the registration form to be the responsible person. If neither the operator nor the owner listed on the AST registration form exist or are financially capable of performing the cleanup, staff must contact OSRR for further guidance.

If no registration information has been submitted for the AST, DEQ will presume that the property owner is the AST operator and responsible person. The property owner may rebut this presumption by providing acceptable written evidence that:

1. Another person caused the discharge;
2. Another person is responsible for the day to day operation of the AST;
3. The discharge came from an AST that was removed by a prior operator.

Table 3-1. Summary: Responsible Person Priority for Discharges from AST having a capacity of greater than 660 gallons of oil.

1. The person causing the discharge (the spiller)
2. The operator who is responsible for the day to day operation of the AST
3. The AST owner
4. The person who owns the land where the AST is located
5. Another person (depending upon information presented to and obtained by DEQ)

**Example 3-6. Discharge from an AST at a facility that has not submitted a registration form to DEQ**

Example: A discharge of #2 heating oil occurs from a 100,000 gallon AST at a bulk oil facility. DEQ does not have an AST registration form for the facility. Who is the RP?

Answer: There is no evidence of a spiller in this example since we have no evidence that the discharge was caused directly by an act or failure to act. Since there is no spiller, DEQ would go to the registration form. Since a registration form was never submitted in this case, DEQ will go to the present property owner. The present property owner is the RP unless this person provides acceptable written evidence that another person is responsible for the day-to-day operation of the AST, or that another person caused the discharge.

### 3.1.3 Responsible Person Analyses - ASTs of 660 Gallons or Less and Exempt USTs

Discharges of oil from ASTs of 660 gallons or less and exempt USTs are governed by Article 11 of State Water Control Law. Under Article 11, the person responsible for cleaning up a discharge of oil is the person discharging, causing or permitting the discharge and any operator of the facility from which the discharge occurred. When DEQ receives a report of a discharge from an AST of 660 gallons or less or from an exempt UST, DEQ will consider the person who caused the discharge (the spiller) to be the responsible person.

In many instances, discharges from these tanks cannot be shown to be a direct result of an act or failure to act committed by a spiller. If the discharge from an AST of 660 gallons or less or an exempt UST is not a direct result of an act or failure to act, DEQ will presume that the property owner is the responsible person. The property owner may rebut this presumption by providing acceptable written evidence that:

1. Another person caused the discharge;
2. Another person is responsible for the day to day operation of the tank (see exception for home heating oil tanks in rental situations below); or
3. The discharge came from a tank that was removed by a prior operator.

**Example 3-7. Responsible Person Identification - exempt USTs remaining on a property**

Example: Person A purchases a farm which includes a house and several barns. Person B (the seller), who owned the property for the previous 8 years, did not farm the land and stated that he had no knowledge of any USTs on the property. Five years after purchasing the farm, Person A encounters a 500 gallon diesel UST while adding footers to expand one of the existing barns. Soil around the tank had a strong diesel odor indicating that oil had been discharged from the UST. Who is the responsible person?

Answer: USTs are considered fixtures of the property (there are no notification requirements for exempt USTs). When the property was transferred from person B to Person A, ownership of the UST transferred with the sale of the property. The fact that neither person used or even knew of the presence of the UST is irrelevant. The present property owner (Person A) is the responsible person.

**NOTE: This scenario would apply to any exempt UST.**

Staff may encounter situations where home heating oil USTs or ASTs of 660 gallons or less are present on a rented residential property. Article 11 defines the facility "operator" to include persons who own, operate, charter, rent, or otherwise exercise control over or have responsibility for a facility. Therefore, both the person who rents the property and uses the tank and the tank owner are "operators" of the facility and both are responsible persons under Article 11.

Under most residential rental agreements, the tank owner (usually the property owner) is responsible for maintaining the tank. Since the tank owner has the ultimate authority to maintain and replace the tank, DEQ Storage Tank Program will first pursue the tank owner for discharges from home heating oil USTs and home heating oil ASTs of 660 gallons or less unless the actions of another person (spiller) caused the discharge. See Sections 5.4.4 through 5.4.6 of this manual for information on heating oil releases.

- NOTES:**
1. **There may be situations where the renter is the tank owner. In those situations, DEQ will first pursue the renter for cleanup.**
  2. **Home heating oil ASTs > 660 gallons must be registered with DEQ. If there is no spiller, DEQ will assign first responsibility for discharges from these tanks to the person listed on the registration form as the AST operator (see Table 3-1).**



Table 3-2. Responsible Person Priority for Discharges from Home Heating Oil USTs and Home Heating Oil ASTs of 660 gallons or less

1. Spiller
2. Tank owner
3. Person renting the residence and using the tank
4. Another person (depending upon information presented to and obtained by DEQ)

Example 3-8. Responsible Person Identification - Home Heating Oil AST of 660 gallons or Less

Example: Person A owns a house that has a 275 gallon heating oil AST. The house is rented to person B. During severe weather, the AST falls over and oil is discharged. Who is the responsible person?

Answer: Both person A and person B are responsible persons. DEQ will assign first responsibility for this discharge to the tank owner. DEQ will presume that Person A (the property owner) is the tank owner since tanks are considered to be fixtures of the property. If person A is unable to conduct the cleanup, DEQ may look to person B since this person is also an operator of the tank and a responsible person.

**NOTE: Person A may rebut the presumption of tank ownership by providing evidence that someone else owns the tank.**

Example 3-9. Responsible Person Identification - Home Heating Oil AST of 660 gallons or Less

Example: Person A owns land on which a trailer park is located. Person B owns a trailer within the trailer park and owns the 275 gallon heating oil AST that supplies fuel for his trailer. During severe weather, the AST falls over and oil is discharged. Who is the responsible person?

Answer: DEQ will assign first responsibility for this discharge to person B (the tank owner) since this person had the ultimate authority to maintain the AST. If person B is incapable of performing the cleanup, DEQ may look to person A since this person is also an operator of the facility (Person A owns the facility on which the oil tank is located)

### **3.1.4 Persons Who Have Assumed Liability for Corrective Action** (Appendix C fact sheet - Assumption of Liability (“Stepping into the Shoes”))

As the UST and AST Programs developed, DEQ received requests for eligibility for reimbursement from the Virginia Petroleum Storage Tank Fund from people or entities who are not defined as storage tank owners or operators and/or who were not considered to be responsible persons under the State Water Control Law. These people or entities wanted to use sites for future development or sale, but were unable to begin construction or to find buyers due to contamination present at the site. In response, DEQ developed a procedure which allows interested persons, such as a current property owner who is neither the tank owner nor operator, to "step into the shoes" of the owner or operator.

**NOTE: The procedures below are different than those described for the Voluntary Remediation Program (VRP). The VRP allows owners, operators, or those persons interested in a contaminated property to voluntarily remediate releases of contaminants if the site meets certain criteria. See section 5.9.1 for additional guidance on the VRP.**

An interested person who is not the responsible person, but who has a legal interest in the property, may "step into the shoes" of the responsible person and become eligible for reimbursement from the Fund. An interested person must agree to assume liability for a petroleum cleanup in accordance with DEQ requirements to be eligible to request reimbursement from the Fund. If a person does not assume liability for the cleanup or is not the owner/operator, they are not eligible for reimbursement of cleanup costs.

The procedure requires the interested person to assume all corrective action liability for that occurrence which the law imposes on the owner or operator, and to agree to perform the cleanup as required by DEQ. Please note that, if a lender qualifies for the lender liability exemption, the lender will not be required to provide an agreement assuming liability in order to be eligible for reimbursement. See Section 3.1.5.1 below for additional information pertaining to lenders.

This procedure benefits both DEQ and the interested person, particularly in those situations where the owner or operator is unknown or unable to pay for the cleanup. The interested person, who may be the property owner but not the tank owner, can clean up the property in accordance with DEQ requirements and request reimbursement from DEQ. The procedure alleviates delays in completing the cleanup due to limited resources and/or the low priority of the site on the state lead priority list.

DEQ limits the class of entities eligible to assume liability to those who have a legal interest in the property, i.e., those who have a lawful and substantial economic interest in the safety or preservation of property from loss, destruction or damage. DEQ may allow other people or entities to assume liability in those cases where there is a demonstrable incentive to complete the cleanup other than access to the Fund. For example, an adjacent property owner who wishes to increase the value of his own property or keep the value of his property from further declining may be eligible to assume liability. Also, an entity with a legal interest in the responsible person, such as a parent corporation or a company who has purchased the assets of the responsible person, may be eligible to assume liability.

**NOTE: A person stepping into the shoes of an existing responsible person must meet the responsible person’s financial responsibility requirement. If the responsible person is deceased, defunct, or bankrupt then the person stepping into the shoes must meet the lowest financial responsibility for that tank type.**

**Refer to the financial responsibility requirement tables at the end of chapter two of this manual and to the Virginia Petroleum Storage Tank Fund Guidance Manual for eligible tank types and financial responsibility requirements.**

Persons who assume liability must provide DEQ with the following written statement before they begin the cleanup or request reimbursement:

(Name of Person Assuming Liability) assumes all liability for the completion of corrective action from the petroleum/oil contamination associated with PC # \_\_\_\_\_ and agrees to perform the corrective action in accordance with Virginia DEQ requirements.

In cases where a responsible person is unknown, deceased, no longer in existence, bankrupt or otherwise unable to pay as demonstrated by a DEQ inability to pay evaluation, there is no need to obtain the agreement of the responsible party to the transfer of reimbursement eligibility for that occurrence.

In cases where there is an existing responsible person, the person assuming liability must provide the statement assuming liability described above and obtain the following signed statement from the responsible person:

(Responsible Person Name) is the responsible person for the cleanup of the petroleum/oil release from the (insert tank type) located at (insert street address, city/county) and identified as PC # \_\_\_\_\_. (Responsible Person Name) quitclaims, assigns and releases all of its rights to reimbursement for corrective action costs from the Virginia Petroleum Storage Tank Fund associated with PC # \_\_\_\_\_ to (Name of Person Assuming Liability) and (Responsible Person Name) represents and warrants that (Responsible Person Name) has the right to make such quitclaim, assignment and release. (Responsible Person name) acknowledges that if (Name of Person Assuming Liability) fails to complete the cleanup for any reason, DEQ may require (Responsible Person name) to resume cleanup activities.

This agreement by the person interested in conducting the cleanup does not release the responsible person under the law from liability for cleanup or payment of third party claims. If the person who assumes liability for the cleanup is determined to be unable to pay for the cleanup at any time or fails to complete the cleanup, the Regional Office may inform the responsible person that the responsible person must complete the cleanup. The responsible person's eligibility to request reimbursement from the Fund will be restored if the responsible person completes the cleanup according to DEQ requirements. If the responsible person is unknown or unable to pay for the cleanup, the site may become a state lead site.

Persons assuming liability will not be eligible for reimbursement unless the cleanup is performed in accordance with instructions from DEQ Regional Office. In addition, persons assuming liability must complete the entire cleanup.

The Regional Office is responsible for initial identification of the responsible person for each site. The Regional Office staff may use the checklist, "Responsible Person Identification Worksheet," in Appendix F to assist in making the responsible person evaluation. If the Regional Office staff are unable to identify

the responsible person, the checklist and relevant documentation should be sent to OSRR for review. A written analysis of responsible person status will be provided to the Regional Office and the responsible person. Regional Office staff should forward the signed Assumption and Relinquishment statements to OSRR for review. OSRR staff will review the documents and follow up with the RP and the person assuming liability, if necessary. If the documentation is in order, OSRR will notify the appropriate Regional Office that the cleanup can move forward. OSRR will also notify reimbursement claims processing staff of the change in claimant. If the RP cannot be identified or found, OSRR may direct the site to become a state lead site.

### **3.1.5 Persons Who May Conduct Cleanups without Assuming Liability/Fund Eligibility**

The State Water Control Law was amended effective July 1, 1996, to allow certain persons or entities to conduct cleanups without assuming owner liability for USTs.

#### **3.1.5.1 Lenders**

The first change to the State Water Control Law provides an exemption from liability to persons or entities who have a security interest in real property on which regulated USTs are located ("lenders"). This exemption mirrors the exemption given in the federal Resource Conservation and Recovery Act. The Environmental Protection Agency promulgated the Lender Liability Regulation (40 CFR §280.200 through 280.230 (1997)) that allows security interest holders to foreclose on property with USTs and perform certain compliance activities (e.g., removing the UST, pumping the product out of the UST, reporting a release) without incurring liability as the UST owner. Lenders who foreclose on loans after July 1, 1996, are eligible to request that DEQ approve an exemption from UST owner liability. Lenders should notify DEQ Regional Office staff that the lender intends to request the exemption. Regional staff should refer the lender to the Central Office Financial Programs Manager who will review the request and approve exemptions. The Financial Programs Manager will send copies of approval letters to the Regional Office. Once the lender liability exemption has been approved, the lender may choose to conduct a cleanup of the site. The lender is required to obtain Regional Office preapproval for all activities and conduct the cleanup in accordance with DEQ requirements in order to be eligible for reimbursement.

Whether or not the lender agrees to conduct a cleanup, the lender would not be deemed to be an owner/responsible person under the State Water Control Law. Please note that the lender liability exemption is limited to loans made on property with regulated USTs. It does not apply to property with any other type of tank. In addition, **lenders may become responsible persons for regulated UST cleanups if they operate the USTs after the foreclosure.** Operator liability is not covered by the exemption. Any questions concerning this exemption should be addressed to the Central Office Financial Programs Manager.

### 3.1.5.2 Virginia Department of Transportation (VDOT)

The second change to the State Water Control Law affects VDOT. At any site where VDOT chooses to conduct corrective action activities on property acquired for transportation purposes, VDOT will not be required to assume liability or to be deemed to be the responsible person for that release. VDOT should notify the Regional Office staff of its intention to conduct a cleanup. If a release has occurred and the Regional Office staff determine that a cleanup is necessary, regional staff should request that VDOT send a letter outlining the facts of the case to the Central Office Financial Programs Manager who will review the request and approve exemptions. Copies of approval letters will be sent to the Regional Office. Once VDOT's exemption from liability has been approved, VDOT may choose to conduct a cleanup of the site. By law, there is no financial responsibility requirement imposed for these cleanups. VDOT is required to obtain Regional Office preapproval on an AAF for all activities and conduct the cleanup in accordance with DEQ requirements.

Sometimes VDOT only acquires the **portion** of a petroleum impacted site needed for transportation purposes. For example, VDOT may only acquire the property it needs to expand a road or install a storm sewer. In these situations, VDOT often chooses to complete the corrective action activities associated with the acquired property while the RP's consultant completes any additional corrective actions required at the site. In most cases, where the RP and VDOT are both performing the corrective action, VDOT's eligible reimbursement costs should be submitted in a claim by the RP's consultant, not by VDOT. The reimbursement program is not designed to accept claims from multiple claimants for the same PC Number.

In some situations, a viable RP no longer exists and the only remaining corrective actions needed for site closure are those corrective actions scheduled to be completed by VDOT. In these situations, the PC should remain open until the work is completed. Then, VDOT may complete and submit the reimbursement claim package.

In rare instances, property acquired by VDOT expands across the sites of multiple PC Numbers. These situations pose challenges for the Storage Tank Program and will be handed on a case by case basis. Staff should contact OSRR for information on how to proceed.

**Please note that the VDOT liability exemption is limited to property acquired for transportation purposes.** It does not apply to any facility where VDOT is the owner or operator of an UST or AST or deemed the spiller of a release. Regional staff having questions regarding issues related to the VDOT exemption may contact the Central Office Financial Programs Manager for further guidance.

**NOTE: In situations where VDOT acquires an entire property for transportation purposes and they elect to conduct the corrective action activities, VDOT must address and clean up the entire site impacted by petroleum contamination, not just the portion of the site involved with VDOT's transportation project.**

### 3.1.6 Responsible Person is Deceased

#### USTs, exempt USTs and ASTs

When a responsible person dies during cleanup, or the person who would have been considered the responsible person, dies before a release is discovered, Case Managers will have to evaluate who will conduct the cleanup. The following guidance is intended to assist staff with the scenarios that DEQ typically encounters in which a deceased person is the RP.

#### Responsible Person Dies during Cleanup

If a tank owner or operator who is the responsible person dies while cleanup of a release is ongoing, or if the RP dies after a PC number has been issued but before cleanup has commenced, Case Managers should work with the estate executor (also referred to as an estate administrator) to accomplish the cleanup. In such situations, the estate executor has a duty to preserve the assets of the estate from loss or waste while the estate is in probate, and this includes the contaminated property. (Probate is the legal process to administer the estate of the deceased.) Case Managers should look to the person who reported the release or the consultant (if one has been retained) for the identity of the executor. Case Managers also can contact the circuit court in the locality where the decedent lived to obtain the name and address of the estate executor for the deceased's estate. Information and boilerplate release letters for estate cleanups can be found in Appendix E under "Requirements for Confirmed Release Letters to Estate Administrators," "Example Letter: Confirmed Release for Article 9 (UST) Estate Administrator/Executor," and "Example Letter: Confirmed Release for Article 11 Estate Administrator/Executor."

Working with the estate administrator/executor is an option only while the estate is open and in probate. If the estate of the deceased is settled and closed (i.e. probate is completed) DEQ will have no recourse against the estate administrator. Liability for the cleanup in this circumstance does not transfer to the heirs. It does not matter that someone else has inherited the tanks because that someone was not the owner at the time of the release report. Consequently, unless another potential responsible person exists (e.g. the tank owner is dead but a tank operator exists), no RP exists for the release and the site may be enrolled in the State Lead Program.

#### **Example 3-10. Responsible Person Identification – Deceased RP**

Example: Person A reports a release and begins corrective action. During corrective action, Person A dies. Person B, the estate executor, refuses to continue the cleanup stating that Person A's heir should be responsible because he now owns the property. Who is the responsible person?

Answer: The responsible person is the owner or operator at the time the release is reported to the Board. Therefore, Person A is the RP and remains the RP even though the property may have passed to his heir. However, Person B, as the estate executor, has a duty under law to preserve the property from loss and waste. Furthermore, if the RP has not yet met his financial responsibility requirement for the cleanup, the cleanup can be considered a debt of the estate which must be addressed by the executor. The case manager should look to the estate executor to continue the cleanup.

**NOTE: For reimbursement purposes, the estate is treated as the claimant. Because the administrator/executor has the authority to administer the assets and debts of the estate, the executor can sign and submit reimbursement claims on behalf of the estate. The administrator/executor of the estate must submit the order issued by the circuit court qualifying him as executor along with his first reimbursement claim.**

**In the event that the property is held by a trust, the trust becomes the claimant and the trustee can sign and submit reimbursement claims upon providing documentation that he is the trustee.**

DEQ often encounters situations in which the estate is settled and the heir(s) wish to sell the property, but are unable to do so due to the existing petroleum contamination. In these cases, the heir(s) often elect to step into the shoes and be eligible to receive reimbursement from the Fund. A person must either assume liability for the cleanup or be the owner/operator in order to be eligible for cleanup costs. See Section 3.1.4 for additional information on persons assuming liability.

#### Responsible Person Dies before a Release is Discovered

If a release is discovered after an UST owner has died and the deceased UST owner also owned the land where the tank is located, the heir(s) to the real property where the tank is located are presumed to be the RP(s). (Legal title to real property transfers to the heir(s) immediately upon death, although the paperwork and settlement of the estate may take much longer to complete.) Although the RP for the release is presumed to be the heir(s) to the real property, the estate executor generally has control over the estate assets during probate. Therefore, the Case Manager should send the release letter to the estate executor and work with the executor to accomplish the cleanup. If the estate has settled and closed by the time DEQ becomes aware of the release or if the estate closes before the cleanup is complete, the Case Manager should look to the heir(s) of the real property to perform the necessary corrective action.

**NOTE: In the case of a deceased tank owner who is not the owner of the land where the tank is located, unless there is a tank operator to pursue, the liability for the cleanup ends with the tank owner's death and the site should be enrolled in the State Lead Program.**

In many situations the transfer of property upon death does not go through the probate courts. For example, property held in a living trust passes to the named beneficiaries without probate, or property held jointly between spouses often transfers to the surviving spouse upon the death of the other. Because these actions happen outside of the probate process, information on heirs may not be easily available. However, the estate executor should have this information. Case Managers should attempt to establish who the heir(s) is by speaking with the executor, or the person who reported the release and/or the person who hired the consultant. Case Managers should attempt to obtain a letter from the executor identifying the heir(s) to the contaminated property in order to document the RP. If further assistance is needed, staff should contact the Legal Coordinator of OSRR.

**Example 3-11. Responsible Person Identification – Deceased RP**

Example: Person A was the owner and operator of a gas station until the mid 1990s. Person A stopped using the tanks at that time but did not close or remove them. Person A dies and his estate is inherited equally by his children, Person B and Person C. During probate, the tanks are removed from the ground and a release is discovered and reported. Who is the responsible person?

Answer: The responsible person is the owner or operator at the time the release is reported to the Board. By law, Person B and Person C become the legal owners of the property at the point of Person A's death, and would be the RPs for this release. However, the estate executor has a duty to manage disposition of and preserve the estate assets, so the case manager should work with the estate executor to accomplish the cleanup, rather than attempt to deal with multiple RPs.

Caveat: If the estate closes before the cleanup is finished, the Department has the option of pursuing the heir(s) to the property. If the case manager discovers that the estate has closed (i.e. probate has ended) during the course of the cleanup, the Case Manager should contact the Legal Coordinator in OSRR for assistance in identifying the appropriate party to pursue.

Article 11 “Spiller”

If a person becomes liable under Article 11 as a spiller (discharges or causes a discharge) and dies during the cleanup, the Case Manager should contact the Legal Coordinator in OSRR for assistance. Under Article 11, a spiller is liable to the Commonwealth for any costs associated with cleanup and containment of the discharge. In these cases, DEQ will consider the cleanup to be a debt owed to the Commonwealth and will look to the estate administrator to complete the cleanup as part of estate administration.

**3.1.7 Miscellaneous Oil Releases (Article 11)**

Case Managers may encounter oil discharges to the environment that come from unknown or multiple sources. In situations where an UST is not a potential source, then the Case Manager must proceed pursuant to Article 11 of State Water Control Law. Under Article 11, the person responsible for cleaning up a discharge of oil is the person discharging, causing or permitting the discharge and any operator of the facility from which the discharge occurred. In many instances, miscellaneous oil discharges cannot be tied directly to a specific act committed by someone and establishing an RP is often difficult.

When DEQ receives a report of a discharge of oil from an unknown source, Case Managers should attempt to establish whether there are any probable sources. If there are several probable sources and one of them is an AST, then DEQ will presume that the oil originated from an AST, unless the evidence clearly indicates otherwise, and proceed with establishing an RP. See sections 3.1.2 and 3.1.3 for guidance on making an RP decision for AST releases.

If the source(s) are unknown, then Case Managers should attempt to establish a historical record of the site for evidence of someone causing the discharge in the past or evidence that the property stored oil (i.e. a facility) in the past. Staff should contact the Legal Coordinator of OSRR on a case by case basis to establish what forms of evidence regarding the site history would be sufficient for making a RP decision.



If there is not sufficient evidence to link the discharge to someone and the discharge is ongoing and continuing to impact human health or the environment, then DEQ may pursue the current landowner as the person “permitting” the discharge. See examples 3-12 and 3-13 below for additional information.

**NOTE: A person with a continual discharge on their property may be continuing to permit a discharge under Article 11 and be deemed responsible for cleaning it up regardless of whether they caused the discharge.**

#### Example 3-12. Miscellaneous Oil Discharge

Example: Person A purchased a piece of property and later discovered petroleum contamination on the property. There is no past evidence that a UST or AST existed on the property nor is there evidence to confirm that the oil discharge was caused by a previous owner. The contamination is impacting a neighbor’s supply well. Who is the RP?

Answer: There is no evidence of a spiller in this example because we have no evidence that the discharge was caused directly by an act or failure to act. The petroleum contamination is currently impacting a supply well; therefore, there is a continuing discharge to state waters (groundwater in this case). Staff should consider the present property owner to be the RP unless this person provides acceptable evidence that another person is responsible for causing the discharge or the contamination came from a tank previously located on the property. Under Article 11, a person permitting a discharge is liable for cleaning it up, regardless of whether the person caused the discharge.

#### Example 3-13. Miscellaneous Oil Discharge

Example: A person purchased several acres of land which has a 750 gallon AST that stored heating oil in the past and is no longer in use. The previous owner operated a vehicle repair garage on the property several years before the property was sold to the present owner. The current property owner excavated a portion of the land to build a house and petroleum stained soils were identified between the locations of the old garage and the AST. Who is the RP?

Answer: There are two possible sources: oil that may have originated from the previous garage activities that took place and the 750 gallon AST that is no longer in use. Because one of the sources is an AST, DEQ will presume that the oil originated from the AST, unless the evidence clearly indicates otherwise. The AST is greater than 660 gallons and, therefore, DEQ staff should assign responsibility for the discharge to the person listed in the AST database as the person responsible for day to day operation of the facility or AST. If no registration information has been submitted, see Section 3.1.2 of this manual for information on how to proceed.

### 3.1.8 Identifying Controlling Persons of Businesses

Case Managers may encounter situations where it is difficult to establish a contact person and address for a corporation or a limited liability company (LLC). The Clerk’s Office of the State Corporation Commission (SCC) serves as the filing office for corporations, LLCs, partnerships, and business trusts conducting business in Virginia. The Clerk’s Office staff and website (<http://www.scc.virginia.gov/clk/index.aspx>) can assist Case Managers attempting to locate contact information for the person(s) controlling these businesses. Staff may access the SCC’s electronic database (<http://www.scc.virginia.gov/clk/bussrch.aspx>) to obtain the principal mailing and street

address, the officers, directors and the registered agent of a corporation. Staff may also download a corporation's annual reports, which contain the same information, from the website. Finally, staff can obtain information by contacting the Clerk's Office Call Center at (804) 371-9733 or toll-free (in Virginia only) 1-866-SCC-CLK1 (1-866-722-2551).

**NOTE: The SCC's electronic database (The Clerk's Information System) also provides information on the status of corporation or LLC, e.g., whether the entity is active, voluntarily terminated or involuntarily terminated. See Section 3.1.9 below for additional information.**

The principal office and the registered agent of an LLC can be obtained from the Clerk's Office website as well. However, the controlling officers of an LLC (referred to as "members") are not listed in the SCC database. Case Managers may contact an LLC's registered agent to obtain this information; however, the registered agent may choose to protect the identity of the LLC's members and refuse to disclose their contact information. In these situations, Regional Office staff may send correspondence to the principal office for the LLC and to the registered agent regarding the petroleum contamination which the LLC is presumed to be responsible for cleaning up. If assistance is needed on developing the proper letter, staff should contact the Legal Coordinator of OSRR.

**NOTE: The State Corporation Commission will maintain records for a business entity in their database for 5 years following dissolution of that business. All business entity filings since 1980 have been imaged onto microfilm and are maintained by the Clerk's Office.**

### **3.1.9 Defunct or Dissolved Businesses**

Case Managers may confront situations where a business is identified as the tank owner in CEDS but the business is no longer active. If the business is neither a partnership, corporation, nor a limited liability company (LLC), then it is considered a sole proprietorship and the individual who owned the business is the person who is liable for cleanup and compliance.

Generally, a corporation or LLC that has terminated or dissolved cannot be pursued for corrective action. If there is a question whether a business is still operating, staff can check the SCC database (discussed above in Section 3.1.8) for the entity's status. If the SCC identifies the status of the entity as "terminated," "cancelled," "dissolved," or "purged," the entity is usually defunct. In many cases, however, the entity's operating authority has been terminated automatically by the SCC due to its failure to pay annual filing fees. The database will indicate if the termination was an automatic one due to nonpayment of fees. In this event, the Case Manager should begin by pursuing the entity and note in the correspondence that the SCC database indicates that the business has been terminated for non-payment of fees. Often the business, upon learning this information, will make the payment and become reinstated as an active entity. Also, if staff learn during the course of cleanup that an entity has terminated or if the termination date is recent relative to the release report date, staff should contact OSRR to evaluate whether to pursue the directors or members for the cleanup.

When in doubt about whether an entity is defunct, staff should contact OSRR. In situations where the entity is found to be defunct (other than the situation described in the preceding paragraph) and no tank operator exists for the cleanup, then the site should be enrolled in the State Lead Program.

**NOTE: If the entity is identified as “fictitious” in the SCC database status field, then the business is operating under a fictitious name. In this event, the SCC database will identify the true name of the entity and the entity’s principal address. If the entity is identified as “merged” then it has merged with another company and staff may call OSRR or the SCC Clerk’s Office for assistance in identifying the surviving company’s name.**

## **3.2 Ability to Pay Program**

If the responsible person is financially incapable of proceeding with the corrective action required by DEQ, regional staff should inform that person that the Virginia Petroleum Storage Tank Fund is available to reimburse them for reasonable and necessary costs of cleanup, whether or not the responsible person has paid the contractor. The responsible person should be cautioned not to expect full reimbursement because the amount reimbursed is subject to certain eligibility requirements, a deduction of a financial responsibility requirement, and the application of the Usual, Customary and Reasonable (UCR) rate schedule for corrective action costs.

If a responsible person claims to be financially incapable of proceeding with corrective action, even after considering reimbursement from the Fund, regional staff should inform the Office of Financial Assurance (OFA) so that an inability to pay application and additional guidance may be provided to the responsible person. Information that regional staff must provide to OFA include:

1. Responsible person name;
2. Responsible person address;
3. Responsible person telephone number(s);
4. Pollution complaint number;
5. Site name;
6. Number and type of occurrences;
7. Release report date;
8. Identification of RP's type of business entity:
  - A. Individual/sole proprietorship;
  - B. Bankrupt;
  - C. Corporation;
  - D. Partnership;
  - E. Estate;
  - F. Non profit organization; or
  - G. Other (limited liability company, government entity, etc.).

9. Filing deadline for the next report required for the case.
10. Whether a responsible person filed a tax return the previous year (this only applies to individuals).

Upon receiving this information, OFA will contact the responsible person and send the necessary forms and instructions to that person. OFA will also copy the Regional Office on correspondence with the responsible person.

Deadlines for filing inability to pay claims will, to the extent possible, correspond with the deadline for the next report required for the case. The responsible person will be allowed 30 days or the date of the next report (whichever is less) to complete and return their inability to pay claim. Responsible persons should, in all cases, be allowed at least 10 days to file an inability to pay claim.

After receipt of the completed claim form and other financial information, OFA will perform the Ability to Pay analysis. If the responsible person has been determined to be unable to pay but the site has not yet been referred for state lead, OFA will copy the Regional Office on the determination letter sent to the responsible person. In addition, OFA will send a memorandum to the regional Remediation Manager requesting that the site be referred to state lead. If the responsible person is determined to be able to pay, OFA will copy the Regional Office on the Ability to Pay determination letter sent to the responsible person. The regional Case Manager should then require the responsible person to perform the corrective action and/or refer the site to enforcement against the responsible person for failure to meet corrective action deadlines.

### **3.3 Occurrence Evaluation**

One of the functions that must be performed by the regional staff prior to the submittal of the first reimbursement claim is occurrence evaluation. Release occurrence determinations are necessary in order to establish the level of access that the tank owner or operator has to the Virginia Petroleum Storage Tank Fund (VPSTF) under Article 10 of State Water Control Law. For each occurrence, the owner or operator is eligible to request reimbursement from VPSTF between his/her financial responsibility requirement and one million dollars. If the owner or operator is eligible for third party liability costs, corrective action must be completed before third party costs will be reimbursed.

The responsible person and the Case Manager should monitor both: the cleanup costs and the remaining dollar amount available for reimbursement per occurrence. When a Case Manager projects that a site will reach its fund access limit before all required corrective actions are completed, the Case Manager should notify the RP (by letter) of the approximate dollar amount of remaining fund access. Since projected cleanup costs and the progression of cleanup activities varies for each case, Case Managers, at their discretion, may decide when it is appropriate to send a letter to the RP. An example letter can be located in Appendix E.

Based upon the requirements of Article 10 and the practical aspects of managing release response and corrective action, there are five factors that must be evaluated to identify the number of occurrences at a

site. These factors are: type of contamination, time, location, ownership, and tank type. When a release is reported, staff must first evaluate whether the type of contaminant released is a Fund-eligible product. In general, Fund-eligible products are petroleum motor fuels released from USTs; heating oil from heating oil USTs or ASTs; and oil on which a Fund fee is paid that is discharged from ASTs.

Once staff have identified that some or all of the release is Fund-eligible, the number of occurrences must be determined. The first consideration when determining the number of occurrences is tank ownership. Each tank owner (operator if an AST or exempt UST) is required by law to pay the financial responsibility requirement for his/her/its releases and/or discharges. Releases from tanks owned by different persons must, therefore, be considered separate occurrences.

After determining the number of owners for leaking tanks at the site, staff must consider the tank types from which releases/discharges occurred. Separate occurrences must be assigned for each different tank type that had a release or a discharge at the site. Releases from different types of tanks (i.e. a regulated UST and an AST of greater than 660 gallons) are separate occurrences even if they are discovered at the same time.

Next, the time that the release(s)/discharge(s) occurred must be evaluated. Releases or discharges from either the same type of tank or releases/discharges from different types of tanks that are discovered during different SCR Phases must be considered separate occurrences. If releases from a gasoline UST and a diesel UST (regulated USTs) at a site are found during the Site Characterization Phase, the tanks are owned by the same person, and the Case Manager decides that a single SCR can address both releases, the release from these USTs is considered to be one occurrence. If, however, the SCR addressed only the gasoline release and the diesel release was found during the Site Characterization Addendum Phase, this would constitute two occurrences since the releases were found during different corrective action phases.

Finally, staff must consider the location of the tanks. Releases from tanks of the same type (e.g. heating oil UST) that are owned (or operated) by the same person, and discovered during the same SCR Phase may be considered one occurrence provided that their spatial proximity allows these releases (or discharges) to be addressed as part of the same SCR. If the Case Manager determines that more than one SCR or cleanup must be performed to address releases at a site, releases addressed by a separate cleanup or SCR are separate occurrences. A worksheet containing a procedure that staff may use to identify the number of occurrences at a site is included as Appendix H.

**Example 3-14. Occurrence Evaluation - releases from multiple tanks with one owner**

Example: ACME Widgets reports a gasoline release from an UST system at its vehicle fueling and maintenance facility to DEQ. During the process of collecting environmental data for the SCR, ACME Widgets finds evidence that the used oil UST at the facility has also had a release and ACME reports this to DEQ. The used oil UST is located near the gasoline UST and the Regional Case Manager determines that one SCR should be completed to address releases from both tanks.

ACME Widgets completes the SCR and the Case Manager determines that Corrective Action is needed at the site. While the CAP is being developed, a release occurs from the diesel UST at the fueling and maintenance facility. How many occurrences are there at this site?

Answer: There are two occurrences.

ACME Widgets is the only tank owner at this site. A release from a gasoline UST (regulated UST) was reported to DEQ and triggered the investigation at the site. Before the SCR was submitted to DEQ, ACME found (and reported) a release from a used oil UST (regulated UST) to DEQ. Since the same entity owns both tanks, the tanks are both regulated USTs, the releases were discovered prior to submission of the SCR, and the Case Manager believed that one SCR could address release from both tanks, the release from the used oil UST and release from the gasoline UST can be handled as one occurrence.

The diesel UST at the site is also a regulated UST. The release from this tank occurred after the SCR was submitted, therefore, this release must be considered a separate occurrence.

**Example 3-15. Occurrence Evaluation - Multiple owners and tank types**

Example: Person A owns a property containing a gasoline station and is the registered owner of three gasoline USTs and one diesel UST at that site. During the process of upgrading the 3 gasoline USTs and 1 diesel UST at the station, evidence of a release is found around two of the gasoline USTs. The release is reported and Person A begins the Site Characterization Process. During the Site Characterization process, evidence of a diesel release is found in the vicinity of a diesel UST removed by the former property owner (Person B) and contamination is found around the heating oil UST for the gas station. How many occurrences are there at this site?

Answer: There are three occurrences.

Person A is the owner of the gasoline USTs and the operator of the heating oil UST. The releases from the two gasoline USTs may be considered one occurrence because the same person owns those tanks, they are the same type of tank (i.e. regulated USTs), the releases were discovered at the same time, and they can be addressed as part of the same SCR. Person A is also the operator of the heating oil UST. This must be considered a different occurrence because the heating oil UST is a different type of tank.

Person B is the responsible person for the diesel UST that had a release (the person who owned the UST when it was removed). The release from the diesel UST must be considered a separate occurrence because the owner of this tank is different than the owner of the gasoline USTs. If the two responsible persons agree and the Case Manager approves, a single cleanup of the tanks belonging to both owners may be undertaken. Even if a single cleanup is undertaken at this site, there are still three occurrences and each tank owner must pay his/her financial responsibility requirement.

**NOTE: The number of occurrences at a site must be identified in order for a reimbursement claim to be processed for the site. Staff must, out of necessity base occurrence determinations upon the known facts at the time a reimbursement claim is submitted. Staff may modify occurrence determinations for later claims upon receipt of new information that invalidates or changes the original or latest occurrence determination.**

### 3.4 Third Party Claims

Owners/operators of regulated USTs, deferred USTs (types 3 through 5), partially deferred USTs, and excluded USTs (types 3 and 4) may be eligible to receive reimbursement for costs associated with compensating third parties for certain injuries and/or damages caused by petroleum releases (see Table 2-2 for a summary of Fund Eligibility). Staff should inform interested parties that third party reimbursement claims are subordinate to corrective action reimbursement claims. Corrective Action has to be completed and the case must be closed by the Regional Office before third party claims for that occurrence may be approved. **Regional staff must refer all third party claims/requests to the Financial Programs Manager in the Central Office.** Additional information about third party claims can be found in Section 5.4.3.2.3. The third party disbursement guidelines are located on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>.

## 4.0 SITE WORK ACTIVITY PRE-APPROVAL REQUIREMENTS

Beginning in March 1995, it became necessary for the owner and/or operator or designated representative (e.g. consultant) to obtain Regional Office approval for all site work prior to beginning an investigation or cleanup. There are limited exceptions to this "pre-approval" requirement as discussed in this section and for emergencies and Initial Abatement Measures as outlined under "Initial Abatement Measures" in Chapter 5. The purposes of authorizing activities before they are undertaken are to: (1) ensure that all work undertaken for release response and corrective action is eligible for consideration for reimbursement from the Virginia Petroleum Storage Tank Fund (VPSTF); and (2) reduce the number of iterations of SCRs (Site Characterization Reports) and other reports by allowing regional staff, the tank owner or operator, and consultant to agree on release response and corrective action activities before work is performed at a site.

### 4.1 Activity Authorization Form

Activity authorization by the Regional Office is necessary to ensure that the appropriate level of work is accomplished to reduce environmental risks to an acceptable level. If an owner or operator wishes to conduct work in excess of that required by the Regional Office, the owner or operator may conduct such work. However, the owner or operator will *not* be eligible for reimbursement from the VPSTF for work performed in excess of that which was required and authorized by the regional Case Manager.

The mechanism through which approval of site work is requested by the owner or operator and granted by DEQ is the Activity Authorization Form (AAF). Owners or operators planning to seek reimbursement from the Fund must submit an AAF to the Regional Office for approval<sup>4-1</sup>. An AAF specifies the tasks and material items necessary to complete the phase or reimbursement period. The tank owner or operator must include all tasks and material items proposed for the site on the AAF in order for DEQ to consider them for reimbursement. The scope of work to be performed during the phase should be discussed briefly in the NOTES section of the AAF. AAFs are located in the Reimbursement Guidance Manual on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>.

**NOTES: 1. DEQ has AAFs for four separate time periods (pre-March 1995, March 1995 - December 1997, January 1998 - February 2007, and post March 1, 2007) as well as AAFs for discharges from small heating oil tanks. Please use the AAF that corresponds with the appropriate usual and customary rate (UCR) schedule as discussed in Section 4.2 of this Manual.**

<sup>4-1</sup> Regional staff may, at their discretion, direct responsible persons not having Fund access to submit AAFs for approval.



- 2. While every effort is made to keep current reimbursement information and forms in this manual, reimbursement procedures may change before this manual can be updated. Consultants and Responsible Persons using this manual should check the Storage Tank Program's Guidance web page (<http://www.deq.virginia.gov/tanks/guidance.html>) for the current version of the Virginia Petroleum Storage Tank Fund Reimbursement Guidance Manual and any applicable updates to ensure that they are using the most current forms and procedures. Failure to use current forms and procedures may result in the denial of claimed costs.**

The following information must be submitted to the Regional Office with the first AAF submittal for a particular site:

1. A topographic map illustrating the site (e.g. the appropriate section of a 7.5 Minute U.S.G.S. Quadrangle). At least one-half mile of surrounding area should be visible on the topographic map.
2. An appropriately scaled 1"=25' to 1"=50' site map illustrating locations of on- and near off-site buildings, storage tank locations (present and former), contamination (if known), sample locations, locations of proposed borings and monitoring wells and other site work, an arrow indicating expected ground water flow direction, and a north arrow. Basic risk information available from a site visit, such as the nature of the site/area water supply source, presence of basements, nearby surface water receptors, etc. must be included on the site map (Task T014). Regional staff may authorize T014 only once per site.
3. A summary of the scope of work (usually written in the comments section on the last page of the AAF).

Upon receipt of the AAF, the Regional Case Manager will review the proposed activities and approve or disapprove the work planned. It is important for DEQ staff to advise responsible persons and consultants that approval of work outlined in the AAF *does not* guarantee reimbursement of *costs* charged or incurred for the completion of these activities. The work approved must be verified by the Regional staff as: (1) having been acceptably performed (see Section 4.3.4); (2) necessary; and (3) eligible for reimbursement. In addition, Usual and Customary Rates (UCRs; see <http://www.deq.virginia.gov/tanks/guidance.html>) will represent the *maximum* dollar amount that DEQ will consider for reimbursement unless three acceptable bids received by the responsible person (or his/her consultant) can demonstrate the reasonableness of incurred costs. It is the joint responsibility of the consultant and the owner or operator to reach a mutual understanding of the prices charged by the consultant and how these prices relate to DEQ UCRs.

## 4.2 Usual and Customary Rate (UCR) Schedules

DEQ has developed four separate Usual and Customary Rate (UCR) schedules (see the VPSTF Reimbursement Guidance Manual at <http://www.deq.virginia.gov/tanks/guidance.html>) for task and material items that are eligible for reimbursement. Each UCR schedule may be used for work performed only within the effective dates and transition periods as listed below. Costs listed on the UCR schedules

for tasks and materials represent the maximum amounts that DEQ will reimburse for these items. DEQ also has developed AAFs for discharges from heating oil tanks of 1000 gallons or less using the rate schedules listed on the March 1, 2007 UCRs.

#### **4.2.1 1289 UCR Schedule**

The 1289 UCRs apply when Corrective Action activities were initiated after December 21, 1989, and prior to March 1, 1995. When a Corrective Action Phase or Reimbursement Period using 1289 UCRs continues beyond the 1289 UCR effective date (February 28, 1995), the 1289 UCRs remain in effect until a new Corrective Action Phase or Reimbursement Period is initiated. Costs for Work Performed units listed on a 1289 AAF for a Corrective Action Phase or Reimbursement Period that started after February 28, 1995, will be denied.

#### **4.2.2 395 UCR Schedule**

The 395 UCRs apply when the Regional Office receives the first AAF for a new Corrective Action Phase or Reimbursement Period after February 28, 1995, and prior to January 1, 1998. When a Corrective Action Phase or Reimbursement Period using 395 UCRs continues beyond the 395 effective date (December 31, 1997), the 395 UCRs remain in effect until the first AAF for a new Phase or Reimbursement Period is received by the Regional Office. Costs for Work Performed units on a 395 AAF for a Corrective Action Phase or Reimbursement Period that started before March 1, 1995, or after December 31, 1997, will be denied. For post approval, use the AAF and UCR Schedule that would have applied had the AAF been submitted before work was initiated.

#### **4.2.3 198 UCR Schedule**

The 198 UCRs apply when the Regional Office receives the first AAF for a new Corrective Action Phase or Reimbursement Period on or after January 1, 1998. Costs for work performed units listed on a 198 AAF for a Corrective Action Phase or Reimbursement Period that started before January 1, 1998, will be denied. For post approval, use the AAF and UCR Schedule that would have applied if the AAF had been submitted before work was initiated.

#### **4.2.4 007 UCR Schedule**

The 007 UCRs apply when the Regional Office receives the first AAF for a new Corrective Action Phase or Reimbursement Period on or after March 1, 2007. Costs for work performed units listed on a 007 AAF for a Corrective Action Phase or Reimbursement Period that started before March 1, 2007, will be denied. For post approval, use the AAF and UCR Schedule that would have applied if the AAF had been submitted before work was initiated.

### 4.3 Activity Authorization Procedures

In order to be eligible for reimbursement from the Fund, corrective action activities must be authorized in advance by the appropriate DEQ Regional Office. The Activity Authorization Form must be submitted to the Regional Office for approval in accordance with the schedule established by the regional Case Manager. The scope of work must be justified and listed in terms of specific tasks and material items from the appropriate UCR Schedule (see <http://www.deq.virginia.gov/tanks/guidance.html>) and a brief narrative must be included in the NOTES section of the AAF. The Case Manager will review the AAF and may require changes, such as the number and location of monitoring wells, number and type of samples, etc. Once the Case Manager approves and signs the AAF, the owner or operator may commence with work listed on the AAF.

#### Activity Authorization Process:

1. Within 24 hours of a release, the responsible person reports the release to the appropriate DEQ Regional Office. The Regional Office issues a Pollution Complaint (PC) number for the site and assigns a DEQ regional Case Manager. Information about obtaining authorization for emergency cleanup can be found in Section 2.2.3 of the VPSTF Reimbursement Guidance Manual dated March 1, 2007, at <http://www.deq.virginia.gov/tanks/guidance.html>.
2. The responsible person and consultant coordinate with the regional Case Manager to discuss and decide upon the activities necessary to abate the release and characterize the extent of the contamination, develop a site-specific scope of work, and determine in which phase the work will be authorized and completed.
3. The responsible person or consultant completes an AAF which lists proposed and contingent units for Task and Material items. Proposed units are all the units that the responsible party (or their representative) believes will be required to complete the scope of work based on their knowledge of conditions at the site. Contingent units allow for reasonable changes to the scope of work based on changing or previously unknown conditions or circumstances at the site that occur during implementation of the planned scope for work.
4. The responsible person or consultant must: sign and date the AAF; attach an Initial Site Map and a Topographic Map; and mail, email, or fax the AAF to the appropriate Case Manager.
5. The Case Manager will review the AAF for appropriate scope of work and associated proposed Tasks and Materials, communicate with the RP/consultant to resolve any AAF revisions necessary for DEQ approval, and send the signed pre-approved AAF back to the RP/consultant along with any necessary changes and DEQ comments. Only after the form is received by the RP/consultant may the authorized scope of work begin. DEQ Case Managers should only approve proposed units that are appropriate and necessary to complete the scope of work to meet DEQ regulatory requirements.

**NOTE: Pre-approval of proposed and contingent units is not a guarantee that these units will be verified on the work performed AAF.**

6. The consultant/contractor performs the scope of work authorized by the Case Manager on the approved AAF.
7. The responsible person or consultant must obtain DEQ Regional Office authorization for all work which will exceed the proposed plus contingent units on the approved AAF. This additional work may be authorized by revising the original AAF to include the additional units or by completing a new AAF, listing only the additional units to be performed (both AAFs will be submitted together later for verification by the Case Manager once work has been completed).
8. Once the report associated with the phase or sub-phase (i.e. Post SCR Monitoring or CAP Implementation sub-phases based on the submittal of progress reports) of work is completed, the RP or consultant should fill in the Work Performed column with the actual number of units performed for each item. The use of or need for the proposed or contingent units should be documented in the report or elsewhere (on the AAF, in an e-mail, etc.). If contingent units have been used, the RP or consultant should document the need for their use.
9. Upon completion of a phase or sub-phase, the appropriate report and the authorized AAF[s] with the Work Performed column completed are submitted to the Regional Office. The AAF should not be bound in the phase report. DEQ regional Case Managers may request additional documentation if they deem it necessary to verify Work Performed units presented on the AAF. The RP/consultant is encouraged to include copies of e-mails approving the use of contingent units or the modification of proposed units. The Case Manager will review all AAFs with the work performed and any reports submitted for the claimed phase. The Case Manager must verify this work performed before a reimbursement application can be processed; verification of a work-performed AAF will be completed within 30 days.
10. The Case Manager verifies that the work listed in the work performed column of the AAF has been performed and forwards a copy of the completed phase AAF to DEQ Central Office. If pre-approved units are not verified by DEQ, DEQ Case Manager will succinctly document the reason[s] for denial.
11. If the case is not ready for closure and needs more investigation or clean up, the Case Manager authorizes additional work under the next corrective action phase.
12. The claimant sends the reimbursement claim to DEQ Central Office in Richmond, Virginia. See Section 3.1 of the VPSTF Reimbursement Guidance Manual dated March 1, 2007, at <http://www.deq.virginia.gov/tanks/guidance.html> for more information about submitting reimbursement applications.

To facilitate a more rapid turn around time for AAF submittal, revision, and approval, the owner, operator, or consultant may fax AAFs to the Regional Office or submit AAFs as attachments in e-mails to individual DEQ Case Managers. Regional Office fax numbers that may be used for this purpose are as follows:

Blue Ridge Regional Office (Roanoke Office)	(540) 562-6725
Blue Ridge Regional Office (Lynchburg Office)	(434) 582-5125
Northern Virginia Regional Office	(703) 583-3821
Piedmont Regional Office	(804) 527-5106 or (804) 527-4254
Southwest Regional Office	(276) 676-4899
Tidewater Regional Office	(757) 518-2009
Valley Regional Office	(540) 574-7878

It is important to note that although certain activities may be required by laws other than Articles 9 or 11 or Parts V and VI of the UST Technical Regulation, these activities may not be eligible for VPSTF reimbursement. For example, costs to manage hazardous wastes (e.g. PCBs, chlorinated solvents) are not eligible for VPSTF reimbursement even though these activities are required by other laws. Costs to dispose of petroleum contaminated soil in accordance with the Solid and Hazardous Waste Management Regulations are only eligible for reimbursement if the Case Manager decides that this soil must be disposed to successfully complete Corrective Action at the site.

Federal facilities, unlike most tank owners or operators, are not eligible for reimbursement from the VPSTF. Regional staff may use their discretion when deciding if a particular Federal facility must submit AAFs. It is recommended that regional staff consider the objective of minimizing the number of report revisions when deciding whether AAFs should be required for a particular Federal facility.

During the course of evaluating information submitted on AAFs, regional staff should be aware of the types of errors that are frequently encountered. It is important for regional staff to find these errors as early as possible so that corrections can be made with minimal disruption of the reimbursement process.

Listed below are several of the primary items that staff should look for when evaluating AAFs. Additional items that staff should consider when evaluating AAFs are listed on the Work Verification Checklist (Appendix K).

1. Use the AAF that corresponds with the appropriate UCR Schedule (see Sections 4.2 through 4.2.3 of this Manual).
2. DEQ cannot reimburse responsible persons for costs associated with ineligible activities. When verifying work performed at a site, staff should compare the work performed with the list of ineligible activities provided in the Reimbursement Guidance Manual which can be downloaded at <http://www.deq.virginia.gov/tanks/guidance.html>. In addition to the costs listed, there may be additional costs that are ineligible.
3. Use only the Corrective Action Phases listed in Section 4.4.
4. Do not approve multiple phases on a single AAF (i.e. Site Characterization/Site Characterization

Addendum). Approve only one phase per AAF.

5. Make sure all items claimed and changes made on the AAF are legible.
6. On 395, 198, and 007 AAFs, please remember that tank removal costs including: (1) cost to excavate the tank pit; and (2) cost to remove the tank are not eligible for reimbursement unless tank removal is performed as part of the Corrective Action Plan Implementation Phase. If necessary, regional staff may grant written Interim Authorization and authorize the work under the CAP Implementation Phase. Work performed under Interim Authorization, for which DEQ does not have UCRs, must be bid in accordance with the Bidding Procedure for Corrective Action Implementation.
7. At leaking UST sites, the highest level of contamination is frequently found in the soil that was excavated in order to remove the UST(s). DEQ recognizes that this soil from the tank pit area often contains a significant percentage of the total mass of contaminants released at the site and this soil should be properly disposed as part of Initial Abatement. Although tank removal and soil excavation needed to remove the tank are not eligible for reimbursement, regional staff should approve the loading, hauling, and disposal of contaminated soil that was removed along with the UST. Table 7-1 lists tank capacities and associated soil amounts to be used for approval of loading, hauling, and disposal. Costs to backfill the tank pit should also be approved.

**NOTE: Regional Staff should check soil analytical information to ensure that soil disposal was justified. Disposal of uncontaminated soil should not be approved.**

8. Many storage tanks are located in areas that pose accessibility challenges. Consequently performing investigative and corrective actions is often difficult unless various structures or landscape elements are removed. **When authorizing fund eligible work at storage tank sites, DEQ staff should only authorize structure removals that are absolutely essential to the investigation or remediation. Costs to repair or replace structures that were removed to facilitate an investigation or cleanup are not reimbursable.**
9. The costs to restore structures damaged by the release or by corrective action activities that do not directly represent a risk to human health or the environment are not eligible for reimbursement. This exclusion does not apply to repairs necessitated by the installation of remediation equipment or repairs to remediation equipment.

#### 4.3.1 Work Plan Changes after Initiation of Site Work

Conditions encountered during Release Investigation and Site Characterization will at times necessitate changes in the scope of work outlined in the Activity Authorization Package. In order to allow moderate changes in work scope, the AAF contains two columns. The first column is for the best estimate of the anticipated level of site work. The second column allows for the usual contingencies that can occur during actual site work. Units listed in the contingency column are in addition to those in the proposed column. The owner, operator, or consultant may include additional footage for such things as an extra monitoring well, deeper than expected ground water, or additional sampling and analysis commensurate

with the additional well/drilling. This column also may be used for reasonably anticipated changes in the scope of work. For example, the planned work scope for a release expected to be minor may involve the installation of one monitoring well. The contingency built into the second column of the AAF might include the completion of two additional wells should site conditions warrant this activity.

If unforeseen conditions necessitate changes in excess of the proposed plus contingency amounts, the owner, operator, or consultant must obtain approval from the Case Manager before proceeding. In situations where the owner, operator, or consultant recognizes that additional work is necessary but it is an evening or weekend and the regional Case Manager is not available, the owner or operator may proceed with additional work at his own risk and must contact the Regional Office on the next business day. If the regional Case Manager agrees that the additional work was indeed necessary, the Case Manager will direct the owner or operator to either submit a revised AAF or develop an additional AAF for just the additional work. If the Case Manager does not agree that the work was necessary, he/she will modify the AAF or note on the AAF that the work was not approved and the work will not be eligible for consideration for reimbursement from the VPSTF.

One reason the activity authorization procedure was developed was to reduce the number of inadequate Site Characterization Reports. Staff should encourage communication with the owner or operator to allow for the submission of complete reports. If it is apparent during the development of a report that the original scope of work has changed, the regional Case Manager should authorize additional work to allow for a complete investigation and report. When the scope of work changes at a site, the owner or operator must submit an AAF to the Regional Office for approval before proceeding with the additional release response and corrective action activities.

**NOTE: Changes in the scope of work should not be confused with inadequately or improperly performed work. If staff believe that the work has been improperly or inadequately performed, they may refuse to verify the work or verify a smaller number of units on the AAF. See Section 4.3.4 for additional information.**

### 4.3.2 Post-Approval of Work

Starting in March 1995, tank owners and operators were required to receive approval from DEQ for release response and corrective action activities prior to the initiation of those activities. DEQ realizes, however, that there are certain types of situations where pre-approval is not possible. One such situation exists when the release causes a hazardous condition. In this instance, the owner or operator must take immediate action to abate the hazard regardless of whether activities have been pre-approved. When emergency actions have been taken without prior approval from the Regional Office, the owner or operator must contact the Regional Office at the first opportunity and submit an AAF to the Regional Office indicating the activities already initiated and the activities needed to complete that particular phase of work. Regional staff will then approve or disapprove the work depending upon whether they believe the work was necessary to abate hazards caused by the release.

It must be noted that work performed at the direction of local officials is not automatically eligible for reimbursement. When work is performed in accordance with directives from local officials and has not been pre-approved by the Regional Office, regional staff will evaluate that work on subsequently

submitted AAFs and evaluate whether it was necessary or warranted to comply with the requirements of Articles 9 or 11 or Parts V and VI of the UST Technical Regulation.

A second situation where an owner or operator does not need prior approval for site work is when site conditions make it necessary to exceed the proposed plus contingency units agreed upon in the approved AAF and the regional staff are not available (i.e. weekends or evenings). The owner or operator may proceed with the additional site investigation activities realizing that the regional Case Manager may consider these activities unnecessary and that DEQ might not reimburse the costs incurred for them. In this instance, it is highly recommended that the responsible person contact the Regional Office during the next business day regarding the additional investigative activities.

In summary, post approval of work is possible and warranted in certain situations. Regional staff have the authority to post approve work. Regional staff should, however, advise owners or operators and consultants of the risks associated with post approval.

**NOTE: The tank owner or operator must report releases to DEQ (see Section 2). Actions taken more than 24 hours prior to DEQ's receipt of a release report will not be considered for reimbursement regardless of whether these actions were warranted. Owners and operators of Exempt USTs 1 and 2 and heating oil ASTs can satisfy the 24 hour release reporting requirement by contacting the local emergency coordinator (Fire Marshal, Dept. of Emergency Management, etc.). The owner or operator of an Exempt UST 1 or 2 or a heating oil AST is still required to have an AAF signed by the Regional Office prior to submitting a reimbursement claim. Regional staff have the discretion not to approve work required by the local emergency coordinator if this work is not deemed necessary for corrective actions at the site.**

### 4.3.3 Verification of Work Performed

The claimant must include a completed copy of the AAF with the WORK PERFORMED column completed along with the required report for each phase of corrective action. **The AAF should not be bound in the required report.** If the AAF is not included and a claim is submitted, the Case Manager will be contacted by CO staff. Regional Office staff should remind the claimant that the AAF has not been submitted and that reimbursement claim processing will not proceed until the work performed AAF is completed and received.

Once a complete report and work performed AAF are received by the Regional Office, the Case Manager will complete the report review process and verify activities and items listed on the AAF within 30 days. The Case Manager must consider the following when verifying work performed:

1. A general evaluation of work performed should be made by comparing the AAF(s) with the report for that phase of corrective action or reimbursement period and then determining whether the report reflects the scope of work authorized. Some items can be verified using the information presented in tables within the report, boring logs, analytical data sheets, and other information contained in the report. The scope of work listed on the AAF can be compared to the number of feet, diameter, analytical methods, and number of analyses listed in the corresponding report. Other activities can only be inferred from information contained in the report. If



monitoring wells were installed, it may be inferred that there was a mobilization for this activity and that line location/mapping was probably performed.

2. Work performed units on the AAF that exceed the approved units (proposed plus contingent) or that were not previously approved (i.e. the proposed and contingent columns are blank) may be verified as being necessary provided that the regional Case Manager believes there is justification for the additional units.
3. The Case Manager should not verify units on the AAF for improperly or inadequately performed work. When a deficient report is received, staff should not verify the units claimed for the report and request the deficiencies in the report be corrected with no additional hours authorized.
4. Staff should not verify activities associated with ineligible releases. It is the responsibility of the claimant to segregate eligible and ineligible activities.
5. Staff should not verify ineligible activities, even if they were performed to address an eligible release. A list of ineligible activities is included in the Reimbursement Guidance Manual.
6. DEQ contractor will initiate the claim review process after receiving both the reimbursement application from the claimant and the verification package from the Regional Office.
7. Errors in the reimbursement claim or the verified AAF package may be corrected up to the time DEQ contractor completes the claim review and forwards the reimbursement decision to OSRR for final authorization. Claimants, upon finding errors in their reimbursement claim or verified AAF, may contact DEQ contractor and request in writing that the claim be rejected (**only the claimant, not the consultant, may request claim rejection**). Provided that the claim review has not been completed, the claim will be rejected. The claimant may then correct the errors, send a corrected AAF to the Regional Office for verification (if applicable), and re-submit the reimbursement application.

**NOTE: An example of the of the Petroleum Cleanup AAF Verification Form which is generated in CEDS for verifying work listed on AAFs, is contained in Appendix M.**

#### **4.3.4 Pending List**

The Pending List is a weekly report designed to notify Case Managers of claims submitted for reimbursement for which Central Office processing needs a Verified AAF. On Monday or the first working day of each week, a Fund Specialist in OSRR emails the Pending List to the regional Storage Tank Program Managers or their designees.

If a PC number is listed on the Pending List, and the phase report or Work Performed AAF has not been submitted to the Case Manager for approval, then the Case Manager can request that the Fund Specialist have the claim rejected until the phase is completed and a Work Performed AAF is submitted to the Regional Office for verification.

The Pending List includes a Suspense Date for each claim on the list. This Suspense Date is always on a Friday and it is the date by which the Case Manager must submit a Verified AAF to the Central Office. Suspense Dates are set so that Case Managers will have at least 30 days to verify the AAF. If a Case Manager has enough information to deem that a claim should be rejected, then they are strongly encouraged to request that the claim be rejected prior to the Suspense Date. A PC number with an 'R' to the right of the Suspense Date indicates that the Verified AAF request has reached the week of the Suspense Date. A PC number listed with an 'N' following the suspense date indicates the PC number is a new request that has not previously appeared on the report.

If a Case Manager cannot review and approve the Work Performed AAF by the Suspense Date, he/she may request an extension through their Regional Storage Tank Program Manger. Requests for extension should be submitted to the OSRR Director via email no more than 3 business days after the Suspense Date. The request for an extension should include the date by which the Verified AAF can be provided to the Central Office. **If an extension request is not submitted, the Central Office will reject the claim no later than 7 days after the Suspense Date.**

#### 4.3.5 Activity Authorization Forms for Heating Oil Releases

In order to encourage more consistency regarding the scope of work for heating oil tank releases, DEQ has established a classification system that assigns a category to these release sites. Under the classification system, heating oil releases are classified as No further action, Category 1, Category 2, and Category 3. See Section 5.4.6 for complete guidance pertaining to heating oil releases.

The scopes of work for Category 1 and Category 2 frequently utilize the same UCR units on an AAF. AAFs are located in the VPSTF Reimbursement Guidance Manual at <http://www.deq.virginia.gov/tanks/guidance.html>. Work for Category 3 sites will be placed on the the same AAF used for regulated sites. The consultant and Case Manager should work together to refine the scope of work to identify the appropriate number of units on the AAF for each site.

#### 4.4 Corrective Action Phases

Corrective Action Phases are DEQ recognized steps in the Release Investigation and Corrective Action Processes. Except for claims associated with reimbursement periods (see Section 4.5), reimbursement applications may be submitted only after the completion of one or more Corrective Action Phases. For the purposes of reimbursement, only the corrective action phases listed below may be used when completing and approving an AAF. The regional Case Manager should review AAFs to ensure that the correct and valid phase is listed.

<u>Corrective Action Phase</u>	<u>Report</u>
Release Investigation <sup>4-2</sup>	Release Investigation Report <sup>4-2</sup>
Initial Abatement	Initial Abatement Report
Site Characterization	Site Characterization Report
Site Characterization Addendum	Site Characterization Report Addendum
Phase II Initial Abatement	Phase II Initial Abatement Report
Post Site Characterization Monitoring	Periodic Monitoring Report
Corrective Action Plan Development	Corrective Action Plan
Corrective Action Plan Addendum	Corrective Action Plan Addendum
Corrective Action Plan Implementation	Monitoring/Operating Reports
Site Closure	Site Closure Report

#### 4.5 Corrective Action Phases with Reimbursement Periods

Unlike most Corrective Action Phases, work for Post Site Characterization Monitoring and Corrective Action Plan Implementation may take place over an extended period of time (greater than one year). DEQ realizes that preventing responsible persons from obtaining reimbursement until they complete Post Site Characterization Monitoring or CAP Implementation may pose economic difficulties and provide a deterrent to completing corrective actions at a site. Claimants, therefore, do not need to wait until the Post Site Characterization Monitoring and Corrective Action Plan Implementation phases are completed prior to submitting reimbursement claims for work performed during these phases.

Claim submissions for work performed during these phases is based upon "Reimbursement Periods" established by the responsible person. Individual Reimbursement Periods are established using the earliest and latest invoice dates. A reimbursement claim for a particular Reimbursement Period must include all of the costs for work performed during that Reimbursement Period. Costs submitted in later reimbursement claims that overlap a previous Reimbursement Period will be denied. Only four claims per calendar year may be submitted for Post Site Characterization Monitoring and only four claims per calendar year may be submitted for Corrective Action Plan Implementation.

##### Example 4-1. Reimbursement Periods

Example: The Corrective Action Implementation Phase of work is initiated on June 1, 1996. A remediation system is installed at the site and a reimbursement application is submitted on October 15, 1996, with invoice dates ranging from June 11, 1996, to October 1, 1996. What is the Reimbursement Period for this claim?

Answer: The Reimbursement Period for this claim is June 11, 1996, to October 1, 1996. The next CAP Implementation Phase reimbursement application cannot include any invoices dated between June 11 and October 1, 1996.

<sup>4-2</sup> The Release Investigation Phase and Release Investigation Report are recognized corrective action phases/reports for the 198 reimbursement program.

## **4.6 Bidding**

The pre-approval procedure for materials and equipment needed to implement the Corrective Action Plan at a site is different from the procedure used during other phases of corrective action. DEQ requires the responsible person to obtain bids for materials or equipment needed for CAP Implementation that have no established UCR and will cost more than \$1,000 over the duration of the CAP Implementation Phase. Regional staff may also require bidding in any phase where DEQ believes bidding is advantageous to the Commonwealth.

Prior to initiating work in a phase, the responsible person may elect to use bidding during any phase to demonstrate a DEQ established cost for a Task or Material is unreasonable.

DEQ expects that bidding will be used most often during the CAP Implementation Phase, since this phase typically includes the purchase and installation of remediation systems for which DEQ has not established UCRs. The following section provides guidance as to when bidding is required and how to properly bid work in order to be eligible for reimbursement.

### **4.6.1 Role of the Primary Consultant**

The responsible person may not have the technical expertise to develop bid specifications and review incoming bids for implementing Corrective Action Plans or other phases. The following procedures assume that the responsible person will retain a primary consultant to assist with the bidding process and oversee site work. Some of the functions the primary consultant may perform at most sites can include:

1. Preparing engineering design and specifications for remediation systems;
2. Developing bid solicitations;
3. Reviewing incoming bids and selecting the winning bids;
4. Overseeing work performed by subcontractors;
5. Installing the remediation system;
6. Providing project management throughout the corrective action process;
7. Operating and maintaining the remediation system;
8. Monitoring site conditions and remediation system effectiveness;
9. Preparing status reports as directed by DEQ;
10. Preparing or assisting with reimbursement application submittal; and

#### 11. Removing the remediation system.

The primary consultant is not required to bid any DEQ established Task or Material that is authorized on an AAF. The personnel time needed for performing primary consultant functions must be listed on the Material section of the AAF. When requesting personnel time to perform these functions, the primary consultant must list the specific activities to be performed in the comments section of the AAF.

**NOTE: A consultant may not bid on scopes of work at sites where it is managing the bid process.**

### **4.6.2 Ensuring a Fair Bid Process**

The responsible person or primary consultant should make every effort to ensure the bidding process is fair and unbiased because this is essential for effective competition. A list of contractors to be invited to bid should be prepared. Each contractor should be evaluated for financial capacity, integrity, and for the ability to complete a project of the size, scope, and complexity required. Those invited to bid should be fully qualified contractors who can meet all contract requirements. The responsible person or primary consultant should allocate sufficient time for bidders to prepare their bids. All bids should be solicited at the same time, allowing each bidder equal time to prepare a response. All bids should be delivered to a pre-designated place, not later than a specified time. A tabulation of all bids should be furnished to each bidder within ten days of the bid date and, for larger scope items, it is preferable that bids be opened in the presence of all bidders. By provisions in the instructions to bidders or in advertisements, the responsible person typically retains the right to reject any and all bids. However, rejection should not be used as a device to accept a bid submitted after the prices of others were made public, or to obtain an estimate of the cost of the work which is then awarded in separate contracts or to a bidder selected in advance. Any irregularities in the bids may be waived, provided this is done after careful study and in good faith. Under no circumstances should a bidder be permitted to alter a bid after all bids have been opened. The contract should be awarded to the lowest responsible bidder.

For more detailed guidance in competitive bidding procedures, refer to the American Institute of Architects Document A501/Associated General Contractors of America Document 325; *Recommended Guide for Competitive Bidding Procedures and Contract Awards for Building Construction*.

### **4.6.3 The Bid Process**

As with work that is not bid, pre-approval is recommended. However, in some situations, completing some of the following steps may not be practical or possible. Under those circumstances, proceeding without pre-approval is acceptable, however, the claimant or consultant must recognize the inherent risk in proceeding without approval and that proceeding without approval could result in denial of all bid costs.

*Step 1. The Responsible Person or the Primary Consultant Prepares and Submits Bid Summary and Activity Authorization Forms to the Regional Office for Approval*

The responsible person or primary consultant will identify which items will be bid and which items will be reimbursed based upon UCR schedules. To obtain approval for these activities, both a Bid Summary Form and an AAF must be submitted. Material or equipment which will be bid, must be listed on the Bid Summary Form and assigned a scope of work number. Tasks or materials which utilized UCRs must be listed on an AAF. Refer to the VPSTF Reimbursement Guidance Manual at <http://www.deq.virginia.gov/tanks/guidance.html> for copies of the bidding authorization forms. If applicable, a copy of the 198 UCR Bid Verification Form is located in Appendix N of this manual.

All non-bid activities planned for completion during the phase or sub-phase must be included on an AAF. AAFs should include personnel time needed to develop bid solicitations, evaluate bids, and other necessary items listed in Section 4.6.1. The Bid Summary Form and AAF must be submitted to the Regional Office for approval.

Every item or activity must be listed on either the Bid Summary Form or the AAF, not both.

*Step 2. Bid Summary and Activity Authorization Forms are Approved and Returned to the Responsible Person*

The Case Manager will review the AAF(s) and approve appropriate activities and units. The responsible person may also be directed to obtain bids for any task, equipment, material, or service and to modify the AAF and Bid Summary Forms accordingly.

The Case Manager will evaluate the information listed on the Bid Summary Form(s) and ensure that necessary items and services are included and that the scopes of work are appropriate. The Case Manager may request engineering designs or other detailed information on which the scopes of work on the Bid Summary Form are based. Once the Regional Office staff completes its review, copies of the approved AAF(s) and Bid Summary Form(s) will be returned to the responsible person.

The decision to rent or purchase equipment should be based on the option that gives the lowest overall cost. The responsible person or consultant may be required to demonstrate that purchasing is more cost effective than leasing or renting. The Case Manager may require rental or purchase after performing a lease vs. purchase analysis. See Section 4.6.9 for additional information on performing a lease vs. purchase evaluation.

If additional work or change orders for bids are required, additional AAFs and Bid Summary Forms must be submitted to the Regional Office for approval. See Section 4.6.7 for instructions regarding change orders.

*Step 3. Responsible Person Obtains and Submits Bids to the Regional Office for Review*

After receiving an approved Bid Summary Form, competitive bids for the scope(s) of work listed on the Bid Summary Form(s) may be obtained. A minimum of three qualified bids must be obtained for each scope of work identified on the Bid Summary Form. Bids must include shipping and freight charges and applicable taxes. All bids must be opened at the same time, preferably at a pre-designated time and location. After all bids are received and opened, copies of the bid solicitations, completed Bid

Comparison Form, and bids or phone bid documentation must be sent to the Regional Office for verification. The Bid Comparison Form lists the bids which were received for each scope of work, name of the company that provided the bids, the total amount of each bid, and the lowest bid that met the specified scope of work. Copies of the forms mentioned above are located in the Reimbursement Guidance Manual at <http://www.deq.virginia.gov/tanks/guidance.html>

Copies of the bids must be attached to the Bid Comparison Form and must be arranged in the order in which they are listed on the form.

*Step 4. The Regional Office Reviews the Bids*

Upon receiving copies of the bid solicitations, Bid Comparison Form(s), and bids or phone bid documentation, the Case Manager will confirm the bid selections. The Regional Office will retain copies of the bids and send a signed copy of the Bid Comparison Form to the responsible person, authorizing the responsible person to award the contracts.

*Step 5. The Owner/Operator Initiates Bid Work*

Once the Bid Comparison Form(s), signed by the Regional Office has been received, corrective action may begin.

*Step 6. Submittal of Completed Bid Work Progress and Activity Authorization Forms*

Before a reimbursement application can be processed, the responsible person must submit to the Regional Office: completed Bid Work Progress Forms, AAFs, and reports or other related work products required for the phase or Reimbursement Period. The Bid Work Progress Form lists work performed during the phase or sub-phase and indicates the cumulative percentage of work completed for each scope of work. The AAF indicates the number of units of work performed for non-bid items, unit-priced items, and/or change orders for the same phase or sub-phase.

The Case Manager at the Regional Office will review the AAF and the Bid Progress Form to verify that the specified work has been completed. The Case Manager is responsible for forwarding AAFs and Bid Work Progress Forms to DEQ Central Office for reimbursement processing. DEQ will reimburse up to the amount of the lowest bid which met the scope of work approved by the Case Manager.

*Step 7. Submitting an Application with Bid Costs*

A Bid Cost Worksheet is used to claim reimbursement for lump sum bid costs excluding shipping/handling and sales tax. An AAF Cost Worksheet is used to claim reimbursement for unit price bid costs, change orders, shipping/handling, and sales tax. Shipping/handling and sales tax are claimed as X-Codes. Each scope of work number for which costs are being claimed must be listed as well as a brief description. The scope of work number must match the number on all previous bid forms for the corresponding scope of work. DEQ will reimburse up to the amount of the lowest bid, which met the scope of work approved by the Case Manager plus up to 16% mark-up if the costs were not billed to the responsible person.

#### 4.6.4 DEQ General Bidding Requirements and Procedures

1. The scope of work must be clearly defined.
2. The bids must be obtained before the work is performed.
3. In most cases, bids are site-specific. However, some activities or items are performed or used repeatedly. If an activity or item has been properly bid, it may be possible to utilize the same bid to perform the same activity or procure the same item(s) for another site(s) under the following conditions:
  - The original and subsequent scope(s) of work are of comparable scale such that there is no expectation of obtaining additional savings through a new bid;
  - The original bid contained unit rates for the items or activity to be used and subsequent projects will be performed at the same unit rate as contained in the original bid;
  - If the original bid was for equipment, subsequent purchases of the same equipment are made at the same lump sum price; or
  - The Regional Office approves the subsequent activity, equipment, or items within one year of the date of the original bid.

**NOTE: The regional approval date is DEQ authorization date on the original Bid Comparison Form.**

When using a bid for work at another site, a copy of the original bid and original Bid Comparison form must be attached to a new Bid Comparison Form and submitted to the current Regional Office for approval prior to initiating work. The top of the new Bid Comparison Form should be filled out with the information for the new site and list only the company that will perform the work or supply the item. After use of the original bid is approved for the new site by the Regional Office, work may proceed. Costs are claimed using the standard bid forms and procedures.

4. DEQ recognizes that certain routine costs associated with operating and maintaining a remediation system will cost more than \$1,000 over the duration of the CAP Implementation Phase.

Disposable items (e.g. bag filters, microorganisms, seal oil, etc.) can be obtained using unit pricing. The number of units needed for each sub-phase will be authorized by the Regional Office. Once approved by the Regional Office, the unit price bid can be used for other site remediation systems.

Replacement parts or repairs after warranty expiration can be handled one of two ways:



- three (3) phone quotes or bids can be obtained at the time the part or repair is needed; or
  - justification may be provided to the Regional Office for a sole source purchase prior to obtaining the part.
5. If eligible and ineligible items or activities are contained in the same scope of work; the cost of just the eligible items or activities must be broken out. Further, the cost of the eligible items or activities in the selected bid must be the lowest of all bids regardless of the total amount of the bid. Bids that contain eligible and ineligible items or activities cannot be used at another site.
  6. Consultants cannot submit bids for scopes of work where the consultant or their firms are managing the bid process. DEQ believes that it would be a conflict of interest for the primary consultant to submit a bid for a scope(s) of work when the primary consultant also evaluates the incoming bids.
  7. The primary consultant may perform any task or provide material or equipment for which there are DEQ established UCRs as long as DEQ has not required bidding for that material/equipment.
  8. A minimum of three qualified bids must be received for each scope of work listed on the approved Bid Summary Form. If three qualified bids are not obtained, the primary consultant should evaluate solutions including soliciting bids from additional contractors and/or revising the specifications as needed to encourage additional bids and re-bid.
  9. A written bid must be received from each bidder in the format specified by the primary consultant. However, DEQ requires the cover page of each bid to include:
    - A. The scope of work;
    - B. The scope of work number;
    - C. The name of the bidding company;
    - D. The name of the person preparing the bid;
    - E. The date that the bid was offered;
    - F. For lump sum bids, the specific service, material or equipment and the respective number of units for each;
    - G. For unit price bids, the specific service, material or equipment and the type of unit;
    - H. The total price (including all taxes and shipping/handling fees) for that service or items and unit prices where applicable; and
    - I. The signature for an authorized agent for the bidder.
  10. All bids must be for the same scope of work including number of units and equipment size(s). Contracts will be awarded based on the Total Amounts including freight, shipping/handling, and applicable taxes.
  11. Bids can be solicited for either Lump Sum or Unit Price, or a combination of the two. Lump sum prices provide a fixed total cost for providing materials or services. Unit prices provide a cost per

item or work unit, and must be multiplied by the number of units used to arrive at the total cost. When a Lump Sum bid is approved, the claimant is authorized to perform the entire scope of work without additional approvals. When Unit Pricing is used, the number of units necessary for each phase or sub-phase must be authorized by DEQ Regional Office using the Unit Price Bid section of the Activity Authorization Form. In some cases, a lump sum price is provided with a contingent unit price for additional work beyond the specified scope in the lump sum. When contingent unit rates that are part of a lump sum bid are used, contingent units should be authorized on the AAF. For example, the scope of work calls for a lump sum bid for the excavation of 1,100 cubic yards of soil and a unit rate per cubic yard for any soil excavated in excess of 1,100 cubic yards. The lump sum bid amount is entered on the bid comparison form. The unit rate contained in the bid documents is used only when the soil excavation exceeds 1,100 cubic yards.

12. Each scope of work which is bid must be listed on a Bid Comparison Form. The Bid Comparison Form lists bids, which were received for each scope of work, names of bidders, and dollar amounts for the bids, and indicates the successful bid.
13. The responsible person and primary consultant are responsible for ensuring that work is performed according to the bid specifications, and verifying that work claimed for reimbursement is completed. The responsible person and the primary consultant are responsible for completely supervising and directing the work of all subcontractors.

#### **4.6.5 Bidding Requirements for the CAP Implementation Phase**

For sites with acceptable Corrective Action Plans, the Regional Office sends a CAP approval letter to the responsible person. If Interim Authorization of a CAP is requested and necessary, the Remediation Manager sends an Interim Authorization approval letter authorizing the requested actions to be taken under Interim Authorization. Upon receipt of the CAP or Interim Authorization approval letter, the responsible person or primary consultant will identify the scope(s) of work for activities and materials needed for the CAP Implementation Phase.

Bidding may occur at different times throughout the CAP Implementation Phase (i.e., design, construction/start-up, O&M). If the responsible person or primary consultant wishes to bid an item, a scope of work for this item or service must be developed and a scope of work number must be assigned. Bids for services, materials, and equipment may be combined or aggregated as deemed appropriate by the responsible person or primary consultant. The scopes of work that are to be bid for the duration of the CAP Implementation Phase are then summarized on a Bid Summary Form. CAP Implementation Phase work is authorized as follows:

1. Tasks and Materials on the UCR Schedule may be listed on an AAF for authorization by the Regional Office and are not required to be bid. In some cases, the Regional Office may identify Tasks or Materials with UCRs which must be bid. If this occurs the responsible person is required to modify the AAF and Bid Summary Forms accordingly.

2. Materials and equipment not listed in the UCR schedule which are reasonably expected to cost more than \$1,000 exclusive of mark-up over the duration of CAP Implementation must be listed on the Bid Summary Form, assigned a scope of work number, and bids obtained. The responsible person also has the option of bidding any activity or item, even if there is an applicable UCR. In these cases, reimbursement will be based upon the lowest bid even if it exceeds the UCR.

Activities or items should be logically organized or grouped to facilitate bidding and under no circumstances should activities or elements that logically belong together be split apart in an effort to avoid bidding. When this appears to occur, reimbursement will be limited to a total of \$1,000 for all the related scopes of work.

3. Activities or items not listed in the UCR schedule which are reasonably expected to cost less than \$1,000 over the duration of CAP Implementation, need not be bid. Rather, they are authorized on the Material section of the AAF. X-codes are used to claim items that do not have an M or C-code or UCR. To establish an X-Code, enter a three-digit code beginning with an "X" in the Code column. For each AAF, an "X" code must be unique, begin with X001, and be sequential, e.g. X001, X002, X003, etc.
4. Task T040, General Project Management, may not be used and costs associated with this task code will not be reimbursed during the CAP Implementation Phase. Personnel time needed for project management activities should be authorized on the Material section of the AAF. The primary consultant, when requesting personnel time, must specify on the AAF the activities to be performed and the amount of time that personnel at each level will spend on each activity.
5. Preparing a scope of work for bid may take considerable time to complete and could extend over multiple sub-phases. To request reimbursement for work performed during a sub-phase, the Bid Work Progress Form must indicate the cumulative percentage of the scope of work completed. This is the percentage of the scope of work that has been completed since the CAP Implementation Phase began through the end date of the sub-phase being claimed. New Bid Work Progress Form(s) must be completed to claim any remaining bid work in subsequent sub-phases.
6. An AAF that has been submitted with a CAP Implementation Phase reimbursement application cannot be used in any subsequent reimbursement applications. Work authorized on an AAF, but not performed, must be re-authorized on a new AAF in order to be eligible for reimbursement during a subsequent sub-phase.

**NOTE: To ensure site activities are not interrupted, AAFs listing activities to be performed during the next sub-phase should be authorized prior to completion of the current sub-phase.**

#### **4.6.6 Bidding Requirements Outside of CAP Implementation Phase**

The Regional Case Manager may require the use of bidding during any phase when the Case Manager believes bidding is advantageous to the Commonwealth. If the responsible person believes a Task or Material UCR is not reasonable, DEQ will also allow the use of bidding to demonstrate the reasonableness of the costs in any phase.

For phases without sub-phases (see Section 4.4), all bid work must be completed and claimed in the sole reimbursement application for the phase. The responsible person must take care to ensure that the Bid Work Progress Form, Verification Form, and reimbursement application include all bid work completed during the phase. Unclaimed bid work cannot be submitted in a reimbursement application for another phase.

In the Post Site Characterization Monitoring Phase, the bid work can be claimed following the same rules as the CAP Implementation Phase.

To request reimbursement for work performed during a Post Site Characterization Monitoring Sub-Phase, the Bid Work Progress and Verification Form must indicate the cumulative percentage of the scope of work completed. This is the percentage of the scope of work that has been completed since the Post Site Characterization Monitoring Phase began through the end date of the sub-phase being claimed. New Bid Work Progress and Verification Form(s) must be completed to claim any remaining bid work in subsequent sub-phases.

An AAF that has been submitted with a Post Site Characterization Monitoring Phase reimbursement application cannot be used in any subsequent reimbursement applications. Work which was authorized on an AAF but not performed must be re-authorized on a new AAF in order to be eligible for reimbursement during a subsequent sub-phase.

#### **4.6.7 Change Orders**

Any change to an approved lump sum bid scope of work is considered a Change Order. Change Orders can only be made to the original scope of work, not to a previous Change Order. Work which was not included as part of the approved bid scope of work requires Regional Office approval using either of the two following mechanisms in order to be eligible for reimbursement:

1. When the number of units of an approved bid scope of work increases, yet the unit costs (as specified in the successful bid) do not change, additional bidding for the Change Order units may not be required. Additional units may be authorized on the AAF. See Appendix 7 of the Reimbursement Guidance Manual for detailed instructions on completing the Bid Summary Form. The Reimbursement Guidance Manual can be downloaded from DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>.
2. When unit prices for a previously approved scope of work will be higher than those submitted on the original bid, or when a unit price was not included in the original bid, a new scope of work and scope of work number must be assigned. Work for these Change Orders must be bid using the bidding requirements of this section.

#### Example 4-2. Bidding Additional Work

Example: Bids which contained unit rates were obtained for excavating 300 tons of soil. After initiating work on site, it was determined that an additional 90 tons of soil should be excavated. A Bid Summary Form indicating the scope of work, the additional proposed number of units, and that this as a change order was submitted to the Regional Office. The Regional Office believed that the additional work was necessary, approved the scope of work, and returned a copy of the approved Bid Summary Form. Does the RP/primary consultant need to obtain bids for the additional soil to be excavated?

Answer. The RP/Primary Consultant does not need to obtain bids for the additional work. The original bid contained unit rates for soil excavation and these unit rates can be used for the additional work needed at the site.

### 4.6.8 Mark-up

Mark-up on costs that are incurred and billed by the primary consultant directly to the responsible person is not eligible for reimbursement. Only costs for subcontracted services, equipment, and materials obtained through an approved bid and billed to the responsible person by the primary consultant, are eligible for mark-up. See the VPSTF Reimbursement Guidance Manual located at <http://www.deq.virginia.gov/tanks/guidance.html> of this manual for more information on mark-up.

### 4.6.9 Evaluating Whether to Lease or Purchase

The monthly rates for remediation equipment (e.g., pumps, blowers, compressors, air strippers, hoses, etc.) listed in DEQ's UCR schedules are intended for use only when equipment is leased for short periods. If remediation equipment is authorized for extended periods using the monthly rates, the Fund might reimburse amounts that far exceed what it would have cost to purchase the equipment; therefore, purchasing the equipment using competitive bidding would result in a significantly lower cost to the claimant and the Fund. Consequently, when remediation equipment will be used for more than two months or 8 weeks, an analysis must be performed by the RP or consultant to evaluate whether it is advantageous to purchase the equipment rather than lease.

If leasing is the preferred option, the lease vs. purchase analysis must be performed, the analysis must support the leasing option, and the analysis and decision to lease must be approved by the Case Manager. The lease vs. purchase analysis is a straightforward comparison of the total hourly rental costs to 120% of the purchase amount plus taxes and delivery costs. The total projected operational hours used in the analysis should be consistent with timetables and schedules in the CAP or other phase report. Realistic adjustments for operational efficiency should be used and are typically between 80-90%. If the analysis shows that the total projected hourly lease costs will exceed 120% of the purchase price plus taxes and shipping, the RP or consultant must purchase the equipment using the bidding procedures found in Section 4.6 of this manual. The analysis must be included in the appropriate phase report (typically the CAP or CAP Addendum) for review and approval by the Case Manager.

When the lease vs. purchase analysis is performed, the option that is believed to result in the lower overall cost to the Fund must be selected. If leasing is deemed acceptable, the Case Manager will authorize the

system or components using the long-term hourly rates. Total reimbursement will not exceed 120% of the purchase amount plus taxes and shipping costs. If purchasing the system or component is found to be preferable but the RP or consultant owns a suitable system, the system may be used if the RP or consultant provides the same warranty as a new system or component and it performs as new. If DEQ approves the use of the RP's or consultant's system, then use of the system will be reimbursed using the appropriate lease rate up to 120% of the purchase amount plus taxes and shipping costs.

**NOTE: Performing a lease vs. purchase analysis is not required if the projected use of the remediation system or component is for one year or more and the components are purchased using Reimbursement Program bidding procedures.**

## **5.0 RELEASE RESPONSE AND CORRECTIVE ACTION**

Release response and corrective action comprise a set of procedures for managing releases of regulated substances and petroleum from the time of the release to the time when no further action is needed to address the release. The goal of these procedures is to ensure that all actions needed to protect human health and the environment are taken following a release of regulated substance. These procedures include guidelines for the initial response and abatement of hazards associated with a release, the characterization of the release (including risk assessment), and the remediation of the release.

Many of the procedures and reports contained within this Chapter are derived from Part VI of 9 VAC 25-580-10 et seq. and are required for releases from regulated, deferred, and partially deferred USTs. These procedures are applicable to releases from tanks not regulated by the UST Technical Regulation and regional staff may use these procedures to evaluate releases from exempt and excluded USTs and ASTs.

DEQ also has developed procedures for characterizing discharges of oil from heating oil tanks having a capacity of 1000 gallons or less. For additional information about procedures for characterizing discharges from small heating oil tanks, please see sections 5.4.4 through 5.4.7.

### **5.1 Initial Response**

Upon confirming that a release of petroleum from an UST has occurred, the responsible person is required to report that release to DEQ within 24 hours (9 VAC 25-580-240). For discharges of oil not subject to the requirements of Article 9, Article 11 states that any person causing or permitting a discharge of oil into or upon state waters, lands or storm drains within the Commonwealth shall immediately notify DEQ, the appropriate Federal authorities, and local emergency coordinators. Additional initial response activities include taking action to prevent the further release of petroleum into the environment and identifying and mitigating fire, explosion, and vapor hazards.

### **5.2 Confirmed Releases with DEQ Determination of No Further Action**

Tank owners and/or operators having confirmed releases from a tank are required to characterize the release, evaluate the extent of contamination, risks posed by the contamination, and the corrective actions needed to address those risks. DEQ uses this information to identify the actions that are needed to protect human health and the environment following a release.

DEQ will, in most instances, require the RP to characterize a site following a release at that site. Staff, however, have the authority to evaluate whether no further action is necessary at a site without requiring additional site characterization if, in their professional judgment, they have enough information to determine that no further action is warranted. When staff believe that no further action is warranted without requiring site characterization, staff will document via a memorandum, phone log, or letter to the site file their justification for closing the case without requiring site characterization. This document should describe known site conditions and state the following:

1. The source of contamination has been stopped;
2. The contamination does not pose a risk to known receptors;

3. No free product exists at the site; and
4. No petroleum saturated soils are present at the site.

The default position of DEQ Storage Tank Program is that the RP must characterize the site following a release of product (or discharge of oil) from a storage tank and submit a Site Characterization Report describing the severity and extent of contamination at the site, risks to receptors, and recommended corrective actions. Given the migration and toxicity characteristics of gasoline, RPs will almost always be required to provide a Site Characterization Report in accordance with Part VI of the UST Technical Regulation following a gasoline release.

- NOTES:**
1. **A PC number must be issued for all confirmed releases.**
  2. **The default position of DEQ Storage Tank Program is the RP must characterize the site following a release of product from a storage tank. DEQ Storage Tank Program will only issue a no further action determination prior to Site Characterization if the Case Manager is certain that enough information exists to characterize the site and evaluate whether the release poses no significant threat to human health and the environment.**

**Example 5-1. Confirmed Release – DEQ determination of No Further Action.**

**Area served by a municipal water system with NO nearby wells including municipal water supply wells**

A leak from a 250 gallon home heating oil UST was reported to DEQ. The tank has been out of service for several years. One soil boring was advanced adjacent to the UST to a depth of 6 feet. A soil sample was collected from the boring at six feet and PID readings were used to identify the location from which to collect the sample from this boring. The TPH concentration in the sample collected from this boring was approximately 200 mg/kg. The site is in a residential area and is served by municipal water. There is no surficial contamination at the site and there are no surface water bodies within one-quarter of a mile from the site.

**Recommended Action: Confirmed release – DEQ determination of No Further Action**

Based upon the site and receptor information, the Case Manager may determine that the release does not pose a risk to known receptors and no further action is warranted. The Case Manager may close the case with appropriate documentation in the case file.

**Example 5-2. Confirmed Release – Site Characterization Required**

A leak from a 250 gallon diesel UST was reported to DEQ. One soil boring was advanced adjacent to the UST. The TPH concentration in the sample was reported to be 800 mg/kg. It is unclear how this sample was collected and the sample may be a composite sample. The site is in a residential area that is served by municipal water. There are no nearby surface water bodies and no obvious receptors.

**Recommended Action: Confirmed Release – Site Characterization Required**

The sample collection information is not sufficient for staff to make a determination that further characterization by the RP is unnecessary



**Example 5-3. Confirmed Release – Site Characterization Required**

A service station selling gasoline is located in an urbanized, residential area that is served by municipal water. The gasoline USTs are removed from the site and the TPH concentration in soil samples collected from the bottom of the excavation range from 75 to 350 mg/kg. The TPH concentration in a composite sample collected from the excavated material was 850 mg/kg.

**Recommended Action: Confirmed Release – Site Characterization Required**

While risks to water supplies are not a concern at the site, risks may be posed by vapors in structures (buildings and storm sewers) and these risks need to be evaluated. There is also a need to evaluate whether free product is present. The site should go through the release response and corrective action process.

**Example 5-4. Confirmed Release – Site Characterization Required**

A 500 gallon diesel UST was removed from the ground. The UST was in poor condition and contained numerous corrosion holes. Stained soil was observed in the bottom of the excavation. The TPH concentration in a sample collected from the bottom of the excavation was 500 mg/kg. The site is in a residential area that is served by municipal water, however, a stream is located approximately 80 feet from the tank pit.

**Recommended Action: Confirmed Release – Site Characterization Required**

The stream is a potential receptor and contamination has not been delineated. The site should be further characterized and risks to the stream should be evaluated.

**Example 5-5. Confirmed Release – Site Characterization Required**

A gasoline UST was closed by removal from the ground. A composite soil sample of material excavated from the tank pit had a TPH concentration of 10,000 mg/kg. Soil samples collected from the bottom of the tank pit had TPH concentration of less than 100 mg/kg. The site is in an urban area and is served by municipal water.

**Recommended Action: Confirmed Release – Site Characterization Required**

Due to the migration and toxicity characteristics of gasoline, the RP should characterize the site to identify the extent of contamination, if free product is present at the site, and the risks posed by the release.

## **5.3 Initial Abatement**

### **5.3.1 Actions to Abate Immediate Hazards**

Actions taken to abate immediate hazards (fire/safety or environmental emergency) must be undertaken by the responsible person regardless of whether those actions have been pre-approved by the regional staff. Regional Office staff will post-approve work that was necessary to abate a hazard. If the regional staff believe the work performed was excessive or unnecessary, they may require the owner or operator to justify the actions taken before post-approving that work. Regardless of whether the work was necessary, the release must be reported to DEQ within 24 hours of confirmation in order for that work to be considered for reimbursement. Work performed more than 24 hours before the release is reported will not be considered for reimbursement.

Tank closure is not an Initial Abatement activity and is not eligible for reimbursement under most circumstances. DEQ, however, recognizes that the highest level of soil contamination at leaking UST sites is frequently found in soil excavated from the tank pit. Soil in the tank pit area often contains a significant percentage of the total mass of contaminants at a site and should be properly disposed as part of Initial Abatement. Although costs for removal and excavation of tanks are not eligible for reimbursement, the Regional Office should approve the loading, hauling, and disposal of the

contaminated soil that was removed along with the tank. Costs to backfill the tank pit also should be approved. The quantity of contaminated soil that will be approved for reimbursement can be computed by using Table 7-1. Table 7-1 lists the maximum quantity of soil that is eligible for reimbursement for a given UST capacity. The total amount eligible for reimbursement is determined by the "Maximum Soil Removal" amount for each tank removed.

When contaminated soil poses a fire/safety hazard or environmental emergency, the Regional Office staff may approve excavation of additional quantities of soil (beyond that necessary to excavate the tank(s) as defined in Table 7-1) and additional loading, hauling, disposal, and backfill of soil to address the emergency.

To be eligible for reimbursement, all *non-emergency* initial abatement measures must be approved by the Regional Office staff before work is begun. The owner or operator must submit an Activity Authorization Form listing the tasks that must be completed to abate hazards to the Regional Office for approval.

### 5.3.2 Actions to Abate Hazards from Impacted Water Supplies

Petroleum contaminated drinking water supplies represent instances of known receptor impact and must receive the highest level of priority and attention by staff. DEQ may provide an alternate water supply (AWS) whenever petroleum constituents or gasoline additives (e.g. MTBE) are detected in water supply wells. DEQ will, as a general practice, provide an AWS when private wells are impacted by petroleum and petroleum constituents are the primary contaminants of concern.

Public water supplies are regulated by the Virginia Department of Health and operators of these water supply systems are required to test for contaminants (including petroleum constituents) on a routine basis. DEQ will, as a general practice, provide an AWS or assistance to the operator of a public water supply well when the following criteria are met: (1) the well is contaminated with petroleum constituents (including petroleum additives); (2) the concentration of one or more of the petroleum constituents exceeds the Virginia Department of Health's standards for public water<sup>5-1</sup>; and (3) the petroleum constituents are the primary constituents of concern. The Storage Tank Program has a zero tolerance practice for petroleum constituents in private water supply wells to ensure human health is protected. The Virginia Department of Health's Office of Drinking Water enforces drinking water regulations and standards of the Virginia Public Water Supply Law and the federal [Safe Drinking Water Act](#). Additional questions about Virginia Drinking Water Standards should be directed to Virginia Department of Health's Office of Drinking Water at (804) 864-7500. Please see Table 5-6 for primary drinking water standards.

**NOTE: DEQ Storage Tank Program may not provide alternate water supplies when wells are impacted by both petroleum and other constituents (e.g. chlorinated solvents) and those other constituents of concern are: (1) present in greater concentrations than the petroleum constituents or (2) deemed by the Virginia Department of Health to pose a greater risk to persons utilizing the water supply.**

<sup>5-1</sup> The Virginia Department of Health has established a health advisory of 20 ug/l for MTBE. Additional questions about Virginia Drinking Water Standards should be directed to Virginia Department of Health's, Office of Drinking Water (804) 864-7500.

Water supplies and food safety at retail food establishments (e.g. convenience stores) are regulated by the Virginia Department of Agriculture and Consumer Services. Convenience store supply wells are often impacted by petroleum contamination when a release has occurred on site. Convenience stores or gas stations that have 15 or fewer seats at which food is served to the public on the premises and are not associated with a national or regional restaurant chain, are subject to the State Board of Agriculture and Consumer Services' Retail Food Establishment Regulations (2 VAC 5-585). Case Managers should notify the Department of Agriculture and Consumer Services' Food Safety and Security Division at (804) 786-3520 when a release has impacted the water supply of a retail establishment.

The provision of an alternate water supply (e.g. replacement well, connection to a public water supply system) is a type of corrective action and should, in most instances, go through the Corrective Action Plan process. It is also important that alternate water supplies be provided to the impacted parties as expeditiously as possible. Staff are encouraged to use the Interim Authorization process in order to minimize delays in the provision of an alternate water supply. In the interim, staff should refer all contaminated drinking water well sites to the Carbon Filtration Unit (CFU) Manager for evaluation and installation of a CFU as described below.

Cases involving the provision of an alternate water supply represent instances of documented receptor impact. Staff should, therefore, require a CAP and public notice for all cases involving the provision of alternate water supplies unless the responsible person contaminated his/her own water supply and the release is not expected to impact other receptors. If corrective actions other than the provision of an alternate water supply are not needed, the CAP may consist of a summary of the alternate water supply that has already been provided and any operation and monitoring schedules for that system (if applicable). The 007 UCRs provide a task for report writing (T100) and this limited CAP should be approved on a per hour basis. If the CAP preparation phase is performed under the 395 UCRs, staff may authorize work for the abbreviated CAP on a time and materials basis rather than using the task code in the UCRs for a standard CAP. See Section 5.7 for additional information regarding Corrective Action Plan procedures.

If a Case Manager finds that it is unlikely that site contaminant levels will be returned to non-detectable levels, then the most cost effective and suitable long-term solution for providing a clean water supply should be sought. The installation of a carbon filtration unit (CFU) usually is considered by DEQ to be a temporary AWS measure until a site can be supplied with a permanent petroleum-free alternate water supply such as a new water supply well or connection to a public water supply system. In some cases, a CFU may be the only available solution for the foreseeable future since site-specific geologic and hydrologic conditions may not be suitable for drilling a new well, access to a nearby property via an easement may not be feasible at the present time, and a connection to a public water supply may not be available. In these instances, a CAP and public notice should be required. The CAP may consist of a summary of the CFU that has already been provided during initial abatement and an explanation why providing a permanent alternate water supply is not feasible at this time. Endpoints specified in the CAP will include a petroleum-free drinking water supply for all impacted parties. The CAP must contain a re-evaluation schedule whereby the RP will re-assess the feasibility of providing replacement wells or public water connections to the impacted parties if those parties still have petroleum-contaminated water supplies. Public notice may be completed using, but not limited to, a direct mailing to impacted persons and persons potentially at-risk.

DEQ has several sites where a water supply has been impacted along with another type of receptor (e.g. a stream). In these situations, a CFU is usually installed on the supply well as a temporary solution. Then, more time and resources are often used to address the cleanup of the stream. DEQ has several sites where the million dollar cleanup limit has already been exhausted and a long-term solution to address the impacted supply well has never been accomplished, leaving no funding to further address the impacted well. Staff should be aware that providing a long-term solution to an impacted water supply should not

be subordinate to addressing other receptors at a site.

### 5.3.2.1 AWS Procedures When the Responsible Person is Known

DEQ Storage Tank Program will provide alternate water supplies when: (1) petroleum constituents are present in a private drinking water supply; or (2) petroleum constituents in excess of the Virginia Department of Health's standards are found in a public water system. When water supplies are impacted or potentially impacted and there is a known responsible person, regional staff must:

1. Ensure that the RP provides immediate relief to the impacted persons by supplying bottled water to the affected residence(s). If the RP cannot or will not provide bottled water, DEQ will provide bottled water via the CFU contractor. In rare instances, an impacted site may need a large potable water tank (cistern) for consumption and daily use; this should be arranged by the RP or their consultant. Please refer to Section 5.3.2.2.4 for more information about providing potable water.
2. Notify the RP of their responsibility to provide a permanent potable water supply as part of their corrective action requirements under 9 VAC 25-580-10 et seq., or Article 11 of State Water Control Law. Any alternate water supply (AWS) corrective action by the RP or their consultant must be pre-approved by DEQ. Alternate water supplies for community and/or public water systems also must be approved by the Virginia Department of Health and, in most cases, must be certified by a registered professional engineer.
3. Direct the RP to collect samples at locations where regional staff believe that water supplies may be contaminated by the release. Staff have the authority to direct the RP to collect samples regardless of whether complaints of contaminated water have been received. Staff may choose to have the CFU contractor collect samples. In this instance, the Case Manager should send the CFU Program Manager an email along with a completed AWS referral form so an assessment of the impacted site can be completed. The CFU contractor will, as a matter of practice, analyze the samples collected during the initial assessment for volatiles and semivolatiles regardless of the type of petroleum source using SW846 Methods 8260B and 8270D. Additional analyses must come at the request of the Case Manager. Table 5-1 provides guidance regarding the types of analyses that should be performed for different potential sources. Staff should refer to Section 5.3.2.2.5 for information on requesting a CFU assessment.
4. If an AWS is needed, DEQ regional staff will direct the RP to develop a plan for the long-term provision of an AWS. This plan must be submitted to the Regional Office for concurrence. If the approved AWS plan involves the installation of a new well or connection to an existing public water supply system (connection to an existing water main), these actions should be initiated by the RP as soon as possible under the CAP Implementation Phase (Interim Authorization may be used).
5. If the approved AWS plan involves a public water supply extension (i.e. extension of a water main) or the development of a community water supply and/or treatment system, the Regional Office will advise the Central Office State Lead Program Manager of the selected water supply alternative. The State Lead Program Manager will then coordinate the development and implementation of the appropriate AWS with the appropriate entity for that locality.

**NOTE: Connections to existing water mains are not considered public water supply extensions and must be initiated by the RP.**

At all sites where DEQ has decided that the appropriate immediate initial abatement measure is to install a carbon filtration unit (CFU) on the existing water supply system, the DEQ Case Manager will:

1. Advise the RP, in writing, that DEQ will undertake the CFU installation and Operations and Maintenance (O&M) of same.
2. Advise the RP, in writing, that all costs incurred by DEQ in providing the CFU and O&M will be applied towards the RP's dollar limit of corrective action costs from VPSTF. That is, the costs incurred by DEQ for providing the CFU/O&M and the RP's corrective action costs will be added together in determining the million dollar limit on the amount of funds that may be used from the VPSTF in performing corrective action at the site.
3. Advise the RP, in writing, that if the other (non AWS) corrective action costs total less than the RP's limit of financial responsibility, DEQ will cost recover CFU costs from the RP up to the financial responsibility limit amount. (Staff will probably address items 1-3 in the same letter).

**NOTE: The CFU contractor will, as a matter of practice, analyze the samples collected during the initial assessment for volatiles and semivolatiles regardless of the source using the respective Methods 8260B and 8270D. Additional analyses must come at the request of the Case Manager. Once the impacted water has been properly characterized, the CFU Program Manager and Case Manager will evaluate which analyses will be required during future sampling events.**

#### 5.3.2.2 Alternate Water Supply Procedures when the Responsible Person is Unknown

At sites where an impacted water supply is reported and the RP is unknown, DEQ will investigate the report and evaluate whether the water supply is contaminated. The CFU Program Manager typically will direct the CFU contractor to collect water samples from the water supply and submit the samples to their contracted laboratory for analysis. In rare instances, DEQ staff may be required to collect samples (please see sections 5.3.2.2.1 and 5.3.2.2.2 for additional information on sample collection and analysis). If a water supply is contaminated, the following guidelines should be used:

1. The CFU or State Lead contractor may be utilized to provide bottled water to the impacted persons. Bottled water will generally be used for individual residences as opposed to community water systems or public water supplies. In rare instances, an impacted site may need a cistern or water tank for consumption and daily use; the Regional Office may direct the State Lead Contractor to provide this water storage device.
2. The Regional Office should notify the impacted property owner and tenant that they will be contacted by the CFU Program Manager. The Case Manager should verify all contact information and any special site directions using the AWS referral form.
3. Contact the Central Office CFU Program Manager by email for an AWS assessment request and attach a completed AWS referral form (located in Appendix G). Please see Section 5.3.2.2.5 below for additional information on requesting an assessment.

Table 5-1. Decision Matrix for Water Supply Samples Collected by Responsible Persons				
Contaminant Source	Ground Water Characterized? <sup>1</sup>	Analyses	Recommended Methods <sup>2</sup>	Drinking Water Methods <sup>3</sup>
Gasoline	Yes	BTEX and MTBE	8021B	502.2, 524.2
	No	Volatile organics (including MTBE)	8260B	502.2, 524.2
Petroleum products other than gasoline	Yes	BTEX and MTBE	8021B	502.2, 524.2
		Semivolatile organics	8270D	525.2
	No	Volatile organics (including MTBE)	8260B	502.2, 524.2
		Semivolatile organics	8270D	525.2
Gasoline + other petroleum products	Yes	BTEX and MTBE	8021B	502.2, 524.2
		Semivolatile organics	8270D	525.2
	No	Volatile organics (including MTBE)	8260B	502.2, 524.2
		Semivolatile organics	8270D	525.2
Leaded Gasoline	Yes	BTEX, MTBE, and 1,2 DCA	8021B	502.2, 524.2
		EDB	8011	504.1
	No	Volatile organics (including MTBE and 1,2 DCA)	8260B	502.2, 524.2
		EDB	8011	504.1
Leaded Gasoline + other petroleum products	Yes	BTEX, MTBE, and 1,2 DCA	8021B	502.2, 524.2
		EDB	8011	504.1
		Semivolatile organics	8270D	525.2
	No	Volatile organics (including MTBE and 1,2 DCA)	8260B	502.2, 524.2
		EDB	8011	504.1
		Semivolatile organics	8270D	525.2

<sup>1</sup> DEQ Case Manager evaluates whether the ground water at the site is sufficiently characterized to identify the potential contaminants in local water supply wells. If the Case Manager believes that the local ground water has been sufficiently characterized, he/she may direct the RP to analyze water samples for BTEX and MTBE by 8021B. If the Case Manager believes that ground water has not been sufficiently characterized or that contaminants other than petroleum constituents may be present in the water supply well, the Case Manager should direct the RP to run a complete volatile scan on the samples by method 8260 B.

<sup>2</sup> The SW-846 methods are listed as the recommended methods. Staff may allow the use of other analytical methods as deemed appropriate.

<sup>3</sup> The drinking water methods are approved by EPA for detecting contaminants in drinking water.

**NOTES: 1. Samples collected as part of the Alternate Water Supply Program during the initial site assessment will be analyzed for both volatile organics and semivolatile organics. Additional analysis must come at the request of the Case Manager on the AWS referral form.**

**2. Method 8260 can be used if EDB is a constituent of concern at the site; however, this method cannot achieve detection limits for the EDB MCL. Method 8011 or Method 504.1 should be used to reach the MCL of 0.05 ug/l if one is sampling to determine the presence of EDB in a drinking water supply.**

4. The Regional Office will direct the State Lead Contractor to develop an AWS workplan. The CFUs installed by the DEQ CFU contractor will remain at the impacted site(s) until a permanent, long-term AWS solution is implemented or the CFUs become the long-term solution.
5. When the AWS to be provided is either a new well or connection to an available public water supply system, regional staff should utilize the State Lead Contractor to complete the approved corrective action.
6. When the selected, long-term (permanent) AWS is the extension of an existing public water supply system or the development of a community water supply system, the Regional Office shall advise the Central Office State Lead Program Manager of the selected water supply alternative. The State Lead Program Manager will then coordinate the development and implementation of the selected alternative with the appropriate entity for that locality.

#### 5.3.2.2.1 Collection of Water Samples from Potentially Impacted Water Supply Wells

The collection of water samples from impacted or potentially impacted water supply wells is a task typically performed by the CFU contractor. The Case Manager may request the RP or their consultant to collect samples and in rare instances, regional staff may need to collect samples. Regional staff may, at their discretion, also split samples with responsible persons. The objective of splitting samples is to increase confidence in the accuracy and precision of the analytical data. Regional staff are especially encouraged to split samples when they are unsure whether a well has been impacted. Staff must contact the CFU Program Manager when they wish to split samples between the CFU contractor and the RP so that the CFU contractor can be dispatched to the site. Staff may request the collection of a post-treated CFU sample if they believe it is warranted. Staff should contact the CFU Program Manager to request the collection of post-treated samples.

While staff may periodically encounter wells that are obviously contaminated, many instances of contamination will involve contaminant concentrations that are within one order of magnitude of the detection limits for those constituents. Obtaining samples from the water supply well that represent actual conditions within that well is a critical first step to protecting impacted receptors. Procedures that may be used to collect samples from potentially impacted water supplies are contained in Appendix Z. DEQ staff collecting samples from a water supply should follow the procedures, including the quality assurance/quality control recommendations in DEQ's Quality Assurance Project Plan – Alternate Water Supply Program, Document # 2009-05.

#### 5.3.2.2.2 Analysis of Samples from Potentially Impacted Water Supplies

The decision regarding which analyses to use for potentially impacted water supplies should be based on site specific information including probable/possible contaminant sources in the area and physical characteristics of the water (e.g. strong gasoline odor). DEQ staff have, on numerous occasions, observed organic type vapors emanating from a water supply, yet subsequent analyses indicated that BTEX and MTBE were below the detection limits for those constituents. DEQ also has observed MTBE and other volatile organics in water supplies in areas where there were no known sources or where the source was a product other than gasoline. In the interest of reducing the number of sampling visits to a site, staff are encouraged to analyze all water samples collected during the initial sampling event for volatile organics (including MTBE) and semivolatile organics regardless of the suspected source(s).

**NOTE: If ground water in the vicinity of a supply well has been adequately characterized and BTEX and MTBE are the chemicals of concern, future samples collected from a water supply may be analyzed only for BTEX and MTBE if it is deemed appropriate by staff.**

The analysis of samples collected by DEQ staff will usually be performed by personnel from the Division of Consolidated Laboratories (DCLS; Virginia Department of General Services). Analytical methods used by DCLS to quantify petroleum constituents, volatile organics, and semivolatile organics are EPA or other widely used procedures (e.g. California LUFT method for TPH). Table 5-2 lists and describes the DCLS water analysis methods that will most commonly be requested by DEQ Storage Tank Program staff.

Samples collected by staff from impacted or potentially impacted water supply wells will almost always be analyzed for volatile organics (including MTBE), semivolatile organics, or BTEX/MTBE. A sample matrix listed in Table 5-3 indicates the analyses that staff should request when samples will be sent to DCLS. Please note that duplicate samples from each sampling point must be sent to DCLS.

#### 5.3.2.2.3 Quality Control

The primary objective of water supply assessment sampling is to establish whether the water system is contaminated. Contamination may, in some instances, be obvious and samples are analyzed to confirm the type(s) of contaminants present and provide information for the preliminary design of an alternate water supply. Most of the time, however, impacted water supplies are reported to DEQ when a constituent becomes detectable via a faint taste or smell and the contaminant concentration in water is less than 100 ppb. When collecting assessment samples, the CFU contractor is required to collect one field blank from every location (residence or business) where a water supply sample is collected. The CFU contractor also is required to prepare a trip blank and this blank will be placed in the cooler and accompany all other samples collected throughout the sample collection and transport process. The purpose of these blank samples is to establish whether contaminants in a sample may have been introduced during the sample collection or transportation processes. If staff direct the RP or RP's consultant to collect assessment samples from water supplies, it is recommended that blank samples also be collected. These blanks only need to be analyzed if constituents are detected in the water supply samples.

#### 5.3.2.2.4 Providing Potable Water

If petroleum constituents are discovered in a water supply, the RP or their consultant must provide bottled water as soon as possible to ensure human health is protected and before a longer term solution can be provided. If the RP cannot or will not provide bottled water to the impacted persons, DEQ will provide bottled water via the CFU contractor or the State Lead contractor. If sampling indicates the presence of petroleum constituents, Case Managers should request bottled water be provided by the RP during the time required for the CFU contractor to perform a site assessment and install a CFU.

In rare instances, it may be more feasible for Case Managers to request the RP or their consultant install a water tank at an impacted site to provide potable water for daily use and consumption. A CFU may not be effective at removing petroleum contamination from ground water due to the degree of contamination or site-specific chemistry. Case Managers should work with Central Office staff to evaluate the feasibility of installing a cistern or water tank versus a CFU as a temporary solution.

When a site visit is completed by a Case Manager prior to that of the RP or consultant providing



analytical data from samples of the water supply, the Case Manager may use olfactory methods (e.g. strong fuel odor emitting from water or visual evidence of petroleum inside supply well casing) along with professional judgment to conclude the water supply is probably contaminated with petroleum constituents and that bottled water should be supplied to protect human health. If Case Managers decide upon a release investigation that petroleum contamination has likely impacted a water supply, bottled water should be provided at their discretion to ensure human health is protected while a longer term solution is developed.

Table 5-2. Description of DCLS Analytical Methods for Petroleum, Volatile Organics, and Semivolatile Organics in Water	
DCLS Analytical Method	Method Description
BTEX	A GC/MS method most like EPA 524.2. This method may also be used to identify and quantify MTBE.
VOCW	Volatile organic compounds in water. A GC/MS method most like EPA 524.
SVBW	Semivolatile organics (base neutral extraction) in water. A GC/MS method most like EPA 625.
SVW	Semivolatile organics (base neutral and acid extraction) in water. A GC/MS method most like EPA 8270. This method is the same as SVBW and the acid extraction picks up phenolic compounds
PIDW	A modified California LUFT Method that uses FID with pentane extraction. Quantitation is for Gasoline Range Only. Diesel range is qualitative only. Detection limits: gasoline range - 100 mg/l
LFW	Light fuels in water. A TPH method for gasoline range constituents in water. Detection limit is 100 ug/l
MRFW	Mid-range fuels in water. A TPH method for diesel and kerosene in water. Detection limit is 400 ug/l.

Table 5-3 Water Supply Sample Matrix for Samples to be Analyzed by DCLS				
Fuel released (contaminant source)	DCLS Method to Use	Container Required	Preservation/ Storage	Limits of Quantitation
Gasoline (local g.w. contaminants already characterized)	BTEX (incl. MTBE)	2 x 40 ml vials	Preserve w. HCL to <= pH 2 and store at 4°C (add 25 mg of ascorbic acid if chlorine is expected)	1.0 ug/l (5.0 ug/l for MTBE)
Gasoline (local g.w. not characterized)	VOCW (incl. MTBE)	2 x 40 ml vials	Preserve w. HCL to <= pH 2 and store at 4°C (add 25 mg of ascorbic acid if chlorine is expected)	1.0 ug/l (5.0 ug/l for MTBE)
Kerosene, jet fuels, diesel, fuel oils, petroleum products other than gasoline (local g.w. already characterized)	SVBW	2 x amber liter bottles	Store at 4°C Use sodium thiosulfate as a dechlorinating agent if chlorine is expected	5.0 ug/l
	BTEX (incl. MTBE)	2 x 40 ml vials	Preserve w. HCL to <= pH 2 and store at 4°C (add 25 mg of ascorbic acid if chlorine is expected)	1.0 ug/l (5.0 ug/l for MTBE)
Kerosene, jet fuels, diesel, fuel oils, petroleum products other than gasoline (local g.w. not characterized)	SVBW	2 x amber liter bottles	Store at 4°C Use sodium thiosulfate as a dechlorinating agent if chlorine is expected	5.0 ug/l
	VOCW (incl. MTBE)	2 x 40 ml vials	Preserve w. HCL to <= pH 2 and store at 4°C (add 25 mg of ascorbic acid if chlorine is expected)	1.0 ug/l (5.0 ug/l for MTBE)
Unknown	VOCW (incl. MTBE)	2 x 40 ml vials	Preserve w. HCL to <= pH 2 and store at 4°C (add 25 mg of ascorbic acid if chlorine is expected)	1.0 ug/l (5.0 ug/l for MTBE)
	SVW	2 x amber liter bottles	Store at 4°C Use sodium thiosulfate as a dechlorinating agent if chlorine is expected	5.0 ug/l
<b>NOTE: At most sites, staff will request that DCLS perform a complete volatile scan (including MTBE). Staff will only request the BTEX method (with MTBE) when ground water in the vicinity of the well has been characterized with respect to the potential contaminants in the area.</b>				

### 5.3.2.2.5 Request for a CFU Assessment

Once a Case Manager decides a water supply may be impacted with petroleum constituents and a PC Number has been issued, they may refer the site to the CFU Program Manager to dispatch the CFU contractor to perform an assessment. Case Managers must submit an AWS referral form to the CFU Program Manager for each supply well that they are requesting to be sampled. Two AWS Referral Forms were developed to ensure that the required information is submitted by the Case Manager to the CFU Program Manager. One form should be used for an assessment request at a single location and the other form should be used to submit multiple assessment requests (up to 3 locations) for the same PC Number. If more than three assessments are needed for the same PC Number, staff should contact the CFU

Program Manager and a referral form will be created to accommodate the site. **A separate AWS Referral Form is required for each PC Number.** Copies of the AWS referral forms and a copy of the job aid for completing the form are contained in Appendix G. During the CFU assessment, the CFU contractor will collect water samples and perform a site survey. Water samples will be analyzed by methods 8260 for volatiles and 8270 for semivolatiles with rush turnaround. During the site survey, the CFU contractor will evaluate the existing plumbing, electricity, and the current design of the water system to decide the most suitable location for a CFU to be installed (if required). The CFU contractor also will test the general chemical conditions of the water (pH, iron, sulfur, etc.) so that a system can be designed for the site should one be needed. Below are the procedures that Case Managers must follow when requesting a CFU assessment.

1. The consultant or the Case Manager must contact the owner of the impacted site and explain:
  - Their water supply well may be contaminated with petroleum constituents;
  - The possibility of having a CFU system installed by DEQ CFU contractor if petroleum contamination is identified in their drinking water supply well;
  - A representative from the Central Office AWS Program will contact them for verbal approval to have the CFU contractor proceed with an assessment; and
  - Their access to the Fund and what they should expect regarding costs and remediation activities.

**NOTE: A fact sheet in Appendix C summarizing DEQ's CFU Program was developed to inform CFU customers of what they should expect in the program from the initial assessment of their water supply to the installation of a CFU.**

2. Send the CFU Program Manager an email along with an attached AWS referral form with the following information:
  - The subject line of the email should include the following format: AWS referral; PC#XX-XXXX
  - Any additional information not already covered in the referral form that the Case Manager decides is important to include.

**NOTE: The AWS Program sometimes receives calls directly from the public requesting their water be tested due to petroleum odors. These calls will be forwarded to the appropriate Regional Office for further investigation before an assessment can be scheduled.**

#### 5.3.2.2.6 Addressing Aesthetic Water Problems in Replacement Wells

Installation of a replacement well is considered by DEQ to be a permanent solution for providing petroleum-free, quality water. The DEQ has observed aesthetic water problems in replacement wells installed to provide sites with a permanent clean water supply. Aesthetic problems (e.g. fixture staining, odor, and hard water) may occur in water supply wells as a result of changes in aquifer chemistry due to varying geologic and hydrologic conditions. Some of the more common problems and related chemistry include:

- A rotten egg odor, which may indicate the presence of hydrogen sulfide;

- Red staining, which may indicate an elevated level of iron in the water;
- Brown or black staining on laundry, which may indicate an elevated level of manganese in the water; and
- Hard water, which may indicate a high concentration of dissolved minerals (e.g. calcium and magnesium)

If an RP/consultant installs a replacement well on a water supply treated by DEQ's AWS Program, DEQ will monitor the replacement well to confirm the well is:

- Running properly;
- Free of petroleum contamination; and
- Free of aesthetic water chemistry problems

The DEQ usually will assist in correcting problems that may occur in replacement wells that are installed on water supplies treated in the AWS Program, including aesthetic water problems. Additional equipment (e.g. sulfur filter and water softener) needed to correct aesthetic water problems will be provided by DEQ as part of corrective action in order to ensure the customer has a quality water source. Once the new well is installed, the well, any applicable equipment (e.g. pump), and any additional equipment installed to improve water quality will belong to the well owner. Upon completion of the well installation and any post installation monitoring performed by the DEQ, the well owner will be responsible for all future maintenance and operational costs for the well, including all applicable equipment and materials. Equipment warranties generally vary from ninety days to one year depending on the piece of equipment; in all instances, the well owner should be identified as the holder of the warranty.

**NOTE: A consultant should notify the Case Manager as soon as they know when a CFU needs to be removed or altered due to the installation of a replacement well or a connection to a public water supply. Then, the Case Manager should relay this information to the CFU Program Manager. The majority of work performed as part of the CFU Program is scheduled months in advance. Notifying the CFU Program Manager will allow DEQ to update the CFU Program's work schedule to avoid any unnecessary site visits by the CFU contractor. The CFU Program Manager should also be notified when a site containing a CFU is part of a real estate transaction (i.e. property ownership changes).**

#### 5.3.2.2.7 Water Supply Well Abandonment

Installation of a replacement well or provision of a public water supply connection is considered by DEQ to be a permanent solution for providing petroleum-free water. To prevent the risk of exposure to contaminated groundwater and to prevent the threat of an impacted well acting as a conduit for additional contamination into the subsurface, an impacted well must be abandoned upon completion of a clean replacement well or public water supply connection. If a replacement well or public water supply connection is to be provided, the RP/consultant should send the property owner an offer letter to drill a replacement well or provide a public water connection; the letter must include an agreement to abandon their impacted well.

The DEQ has observed scenarios where the owners of impacted supply wells want to keep their wells operating for non-potable uses (e.g. irrigational purposes); DEQ does not allow the owners to continue to use their contaminated well for any purposes. A signed agreement must be in place before a replacement well is installed or a municipal water connection is completed. In some situations, it may be necessary for

staff to send a letter to the RP or a third party that explains DEQ's intent to abandon their contaminated well. An example supply well abandonment letter (not a boilerplate letter) is included in Appendix E. Staff can modify this example as needed to meet their site-specific conditions.

### 5.3.2.2.8 Obtaining an Easement for a New Well or a Water Line

DEQ staff often manage cases where temporary property access is required to install monitoring wells, excavate soils, etc. A site access agreement with the impacted landowner is typically required to complete this work. In some cases, the rights to install, operate, access, and maintain equipment on property for a longer duration is required, i.e. installation of a water supply well, installation of a water line, or installation of remediation equipment as part of corrective action. Under these circumstances, an easement may be necessary.

An easement is a legal document that grants one person the right to make specific, limited use of land owned by another person. An easement is granted by the owner of the real property (grantor) to another person (grantee) for a specific use. For example, a neighboring property owner could grant an easement across his property to permit a water line to be installed to bring water to an impacted owner's property. Easements are often granted to public utility companies to install utility lines on or under private property. **An easement only grants restricted use of the property as detailed in the deed of easement and plat, and is not a transfer of real property ownership.**

Easements are most often required for the provision of alternate water supplies, i.e. replacement wells. The following procedures should be followed to obtain an easement for the installation of a new well or installing a water line across a property:

1. Staff or RP/consultant determines that an off-site AWS will be necessary to meet site corrective action goals; procurement of an easement is necessary.
2. RP/consultant identifies one or more potential properties that may be suitable for the necessary off-site AWS. Although identifying several properties is preferred, it may only be possible to find one suitable property. A site map should be generated by the consultant representing at least the location and approximate dimensions (i.e. the area in square feet needed to install a well or water line) of the proposed easement on the subject property. This site map may be included in an SCR or an SCR addendum.
3. The RP/consultant identifies the property owner(s) of the proposed AWS location(s). Property owners can be identified by contacting the local tax office. Localities may have information posted through geographic information system (GIS) websites. Neighboring property owners may also be a resource for identifying the subject property owner(s).
4. The DEQ Case Manager sends an easement inquiry letter(s) (Appendix E) to the property owner(s) (grantor) which documents the RP's interest in a potential easement on their property and informs the property owner of the easement procedures. As stated in the inquiry letter, the grantor(s) is(are) urged to donate the easement, but can be compensated if necessary. Allow adequate time for the property owner to review the letter.
5. The Case Manager or Remediation Manager contacts the property owner(s) (grantor) to follow up on the easement inquiry letter. The purpose of this conversation is: to confirm that the letter was received and was reviewed; to determine if the property owner is potentially interested in granting

an easement; to determine if the property owner requests to be compensated for the easement; and to allow the property owner an opportunity to discuss any questions and/or concerns they may have.

6. The RP/consultant obtains the assessed fair market value of the referenced property(ies). Virginia State Law requires that localities assess taxable real estate at 100 percent of the fair market value, or the amount for which property would be expected to sell in the open market. Fair market value is derived by comparing a property to similar properties that have sold in the same area of the locality. Under Virginia State Law, real estate assessment records are public information. The RP/consultant should contact the local tax assessment office to obtain an assessment of the potential easement property(ies). The assessed property value(s) should be used to assist with negotiating the cost of an easement.
7. The Case Manager and/or Remediation Manager contacts the property owner (grantor) to negotiate terms for the proposed easement. The assessed value of the property and a site map showing the location and dimensions of the proposed installation (e.g. water supply well or water line) must be obtained prior to negotiations. Negotiations are best conducted face-to-face, but if negotiations are to proceed over the telephone, the site map should be submitted to the property owner for review prior to the beginning of negotiations. Results of the negotiations including all proposed terms and conditions must be forwarded to the Remediation Programs Manager in OSRR for review.

In addition to the assessed value, the grantor may require/request an appraisal of real property to establish a value of their property. An appraisal in Virginia must be completed by a certified appraiser. Upon completion of an appraisal (if required) and additional negotiations with the grantor, results of the negotiations including all proposed terms and conditions must be forwarded to SRR for review.

**NOTE: It may be more effective for staff to meet with the property owner in person to establish a mutual understanding of the proposed easement.**

8. The RP/consultant completes and submits an AAF to the Case Manager for proposed and contingent task and materials costs associated with the proposed easement. Typical items associated with securing an easement that may be reimbursable include:
  - Easement appraisal – This should be placed on the AAF as an X-code. The typical X-code rules will apply. Phone bids will be allowed.
  - RP Legal fees associated with preparing a well installation contract.
  - Legal fees associated with preparing the easement (to include the recording fee) – This should be placed on the AAF as an X-code. The typical X-code rules will apply. Phone bids will be allowed.
  - Surveyor – M-0011, Survey Crew Chief and M-0012 Survey Rod Man.
  - Easement purchase price – X-Code, must be approved for payment by SRR Staff. Bidding does not apply.
9. If the proposed easement is for the installation of a water supply well, the RP/consultant develops and submits a well installation contract to the property owner (grantor). The purpose of this contract is to ensure the easement will be granted upon successful completion of the well and to ensure that if the attempt to install a well on the property is unsuccessful, the RP will agree to remove any equipment from the property, properly abandon the boring, and restore the disturbed land as near as possible to its original condition (i.e. the condition of the property prior to drilling). DEQ must review well installation contracts to ensure that the contracts contain the

basic provisions necessary for a successful AWS, i.e. grantee has unrestricted rights to water from the replacement well and that the rights will convey to the successors and heirs of the grantee in perpetuity.

Regional staff may contact OSRR staff and request an easement contract that DEQ approved for another site. Regional staff and persons developing easement contracts must be aware that well installation contracts are unique and must be written to address site specific needs and conditions.

10. RP/Consultant completes the well installation or water line extension on the grantor's property and completes the water hookup to the grantee. With respect to a well installation, all warranty information provided by the well driller should be submitted to the grantee. After the well is installed and post installation monitoring is completed, the grantee will be responsible for all future costs to maintain and operate the well, including all applicable equipment and materials.
11. RP/consultant prepares and records the easement documents. An easement must be prepared by a licensed attorney and must be recorded at the appropriate local government office (generally the Circuit Court Clerk's Office of the locality in which the real property is located). The consultant or the RP will hire an attorney to prepare the easement document. All persons or entities having any ownership interest in the property must be identified and listed as grantors in the deed of easement and must sign the deed in the presence of a Notary Public. A surveyor may be hired by the attorney or consultant to properly define easement boundaries.
12. Upon successful recordation of the easement with the appropriate local government office, the RP or RP's consultant pays the grantor the agreed-upon easement fee.
13. The RP/consultant should include the well easement information in the CAP and prepare the Report and Work Performed AAF. If corrective actions other than the provision of an alternate water supply are not needed, the CAP may consist of a summary of the alternate water supply that has already been provided and any operation and monitoring schedules for that system (if applicable).
14. RP/consultant prepares the reimbursement claim for processing which should include the claim package, applicable invoices. If pre-approved by DEQ, this amount and associated costs to obtain the easement may be eligible for reimbursement from the Virginia Petroleum Storage Tank Fund (VPSTF).

### **5.3.3 Initial Abatement Report**

Section 250 of the UST Technical Regulation requires the tank owner or operator to perform Initial Abatement Measures unless otherwise indicated by DEQ. Initial Abatement Reports must describe the actions taken under Section 250.A of the UST Technical Regulation. The objective of the Initial Abatement Report is to inform the Regional Office of the actions taken to: (1) Mitigate hazards associated with a petroleum release; and (2) Prevent the further release of petroleum. When the Regional Office requires the submission of an Initial Abatement Report, the tank owner or operator usually will be required to submit the report within 20 days after confirming the release. Regional staff may, however, establish an alternative period for submitting the report and may also grant extensions for the submission of an Initial Abatement Report.

If the regional Case Manager believes that no actions are required under Section 250.A of the UST Technical Regulation, the Case Manager does not need to require the submission of a stand alone Initial

Abatement Report. In this type of situation, the Case Manager may direct the responsible person to include a discussion of Initial Abatement Measures in the Site Characterization Report.

A list of elements that usually need to be addressed in the Initial Abatement Report is contained in the *Elements of an Initial Abatement Report* fact sheet in Appendix C. This list is intended to inform owners/operators of the types of information which Regional Staff usually need to ensure that appropriate actions have been taken to mitigate hazards at a site.

Regional staff may, at their discretion, require the owner or operator to address issues not mentioned in this list if site conditions warrant the additional information.

DEQ staff have the authority under Article 9 of State Water Control Law to require owners or operators of excluded USTs to take corrective actions following releases from these tanks. DEQ believes that this authority allows staff to require the submission of reports following releases from these tanks. Reports are considered a necessary means of documenting that a release has been addressed.

Article 11 of Virginia Water Control Law is a broad statute that provides DEQ with the authority to require persons to clean up discharges of oil from sources other than regulated USTs. DEQ believes that Article 11 provides staff with the ability to require operators of ASTs or exempt USTs to submit reports as a means of documenting that a discharge has been addressed. Regional staff may, therefore, require Initial Abatement Reports for discharges of oil from exempt USTs or ASTs if site conditions warrant this activity.

## **5.4 Site Characterization**

### **5.4.1 Background and Goals**

Site characterization consists of activities performed to assess site and contamination conditions, risks posed by the release, and remedial options for cleaning up the release. Section 260 of the UST Technical Regulation requires that the owner or operator of a regulated, deferred, or partially deferred UST assemble information about the site and the nature of the release. The objective of site characterization is to obtain all information that is needed to make an appropriate and informed decision regarding the actions necessary to protect human health and the environment from the released materials.

Activities performed for characterizing releases from VPSTF eligible tanks are reimbursable as long as those activities are authorized by the regional staff. Prior to initiating site characterization activities, the responsible person and his/her consultant must fill out an Activity Authorization Form and send this form to the Regional Office. Regional staff shall review the form and approve, disapprove, or modify the proposed activities and units. The owner or operator should commence with Site Characterization activities upon receipt of the approved AAF from the Regional Office.

### **5.4.2 Work Performed on VDOT Property**

In order to characterize or clean up a release, responsible persons and their consultants may need to install monitoring wells or perform other work on Virginia Department of Transportation (VDOT) properties or rights-of-way. VDOT may require persons performing work on VDOT property to have a Land Use Permit for that activity. Regional Case Managers should remind responsible persons and consultants to check with VDOT about the need for a Land Use Permit when: (1) site characterization or remedial activities are proposed for VDOT properties or rights-of-way; or (2) petroleum contaminated water may



be discharged into a dry ditch on a VDOT property or right of way. **Case Managers do not need to wait for VDOT to issue Land Use Permits prior to approving activities on the AAF.**

### 5.4.3 Site Characterization Report Requirements

Section 260 of the UST Technical Regulation requires that a Site Characterization Report (SCR) be submitted to DEQ following a release from a regulated, deferred, or partially deferred UST. The SCR must be received by the Regional Office within 45 days following the release or within an alternative schedule as established by the Regional Office. **DEQ strongly encourages electronic submittal of reports to the regional Case Manager. Documents should be sent to the appropriate DEQ Case Manager's email address. The Storage Tank Program prefers to receive electronic reports in portable document format (PDF). Additional electronic formats may be acceptable and must be pre-approved by the Case Manager to ensure that DEQ has compatible software.** Upon completion of Initial Abatement activities, the responsible person shall prepare an AAF for work needed to characterize the site. The regional Case Manager, at his/her discretion, also may direct the responsible person to develop a narrative workplan describing proposed activities. The workplan (if required by the Case Manager) along with an Activity Authorization Form shall be submitted to the Regional Office and the regional Case Manager shall approve, disapprove, or modify the proposed tasks and units. The Case Manager shall then send a copy of the signed AAF back to the owner or operator and the owner or operator shall initiate Site Characterization.

A SCR consists of three main components; a site assessment, a risk assessment, and a remediation assessment. Each of these components is needed in order to identify the future course of action at a site. A list of elements that often need to be addressed in a SCR is included in Appendix J and in the *Elements of a Site Characterization Report* fact sheet in Appendix C. Regional staff have the authority to identify what issues the owner or operator must address to characterize a site.

#### 5.4.3.1 Site Assessment

The site assessment portion of the SCR deals with evaluating site and contamination conditions. Major components of the site assessment include evaluating the nature, extent and quantity of the release, characterizing the geologic and hydrologic conditions at the site, and determining current and future land and water uses at and near the site. Data collection is a critical part of site assessment. The data derived must subsequently be used to support risk and remediation assessments.

##### 5.4.3.1.1 Methyl Tertiary Butyl Ether (MTBE)

Methyl tertiary butyl ether (MTBE) is an oxygenate that is added to gasoline to reduce emissions from vehicles that run on gasoline. MTBE as a ground water contaminant tends to migrate farther from the source and at a faster rate than do other gasoline constituents. DEQ also has observed MTBE contamination in ground water near heating oil and diesel releases. Given the migration tendencies of this constituent, ground water at all gasoline release sites should be characterized for MTBE as well as the BTEX constituents. As with other constituents, the DEQ Case Manager will decide upon the number of samples that must be analyzed for MTBE in order to adequately characterize the site. Case Managers may base the number of samples and characterization needed on the potential receptors and degree of risk at the site. Depending upon site conditions and potential risks, staff also may direct tank owners/operators to analyze ground water at non-gasoline release sites for MTBE. Staff may, at their

discretion, direct tank owners/operators to analyze soils at a release site for MTBE.

**NOTE: All initial samples collected for potentially impacted water supply wells will be analyzed for MTBE.**

#### 5.4.3.1.2 Ethylene Dibromide (EDB) and 1,2-Dichloroethane (1,2 DCA)

Ethylene Dibromide (EDB; a.k.a. 1,2-dibromoethane) and 1,2-Dichloroethane (1,2 DCA) were compounds (lead scavengers) used in leaded gasoline to prevent the buildup of lead oxides in engines. Both of the compounds have other uses. EDB was widely used as an agricultural fumigant pesticide until it was banned for this use in 1983<sup>5-2</sup>, and 1,2 DCA is still used in industrial solvents. The MCL for EDB is 0.05 ug/l, and for 1,2 DCA it is 5 ug/l. DEQ has observed that lead scavengers may persist in the environment and have the potential to affect drinking water supplies. Due to the persistence of these compounds once released into the environment and the low MCLs, it is advised that DEQ Case Managers require ground water sampling and analysis for these constituents on all sites where leaded gasoline was stored or thought to have been stored. Case Managers should base the number of samples and characterization needed on the potential receptors and degree of risk at the site. Method 8260 may be used to evaluate whether EDB and/or 1,2 DCA are constituents of concern at the site; however, this method cannot achieve detection limits for the EDB MCL. Method 8011 or Method 504.1 should be used to reach the MCL of 0.05 ug/l if one is sampling to determine the presence of EDB in a drinking water supply.

**NOTE: Case Managers should advise the AWS program that analysis for EDB and 1,2 DCA should be performed when leaded gasoline is a potential contaminant of concern.**

#### 5.4.3.1.3 Analytical Methods

The analyses of samples are usually an integral component of the Site Characterization process. Section 260.A.2.a of the UST Technical Regulation states: "Samples collected for this site characterization shall be tested according to established EPA analytical methods or methods approved by the board." The sample analyses to be used during site characterization should, to the extent possible, be agreed upon by the owner or operator, consultant, and the regional Case Manager as part of the Activity Authorization process. When choosing the types of analyses to be performed during site characterization, all parties in the decision making process should consider how the information will be used in the site, risk, and/or remediation assessments and the decisions that must be supported by the data.

DEQ is often asked by the regulated and consulting communities what analyses are acceptable. Table 5-4 lists some of the methods that are commonly used for analyzing petroleum constituents. The methods listed in Table 5-4 are either EPA methods or methods developed by other states and are considered "approved" by DEQ provided that they are applied appropriately (e.g. a BTEX analysis may not be very applicable to the investigation of contamination resulting from a release of #6 fuel oil). Analytical methods not listed in Table 5-4 may be used with the concurrence of the regional Case Manager. Information about Petroleum Product Chemistry and different analytical methods is located in Appendix AA.

<sup>5-2</sup> EPA – EPA Acts to Ban EDB Pesticide, [EPA press release September 30, 1983]  
<http://www.epa.gov/history/topics/legal/02.htm>

The types of analyses listed in Table 5-4 are quantitative and performed within a laboratory setting. Semi-quantitative techniques may be used in situations where deemed appropriate by the regional Case Manager. The analysis of total volatiles with a portable flame ionization detector or photoionization detector is a type of semi-quantitative tool that is widely used and accepted within its limitations. More recently, immunoassay tests and spectrometric tests have also been used to evaluate petroleum contamination on a real time basis. These tests are also considered to be acceptable investigative methods when they are used in a manner that is within their limitations. When evaluating the potential applicability of immunoassay or spectrometric tests, it is recommended that the owner or operator, consultant, and Case Manager consider how the test results will be used, the detection limits, and the detection range (many of these methods have both upper and lower detection limits).

**In order to improve the quality of data on which decisions are based, DEQ Storage Tank Program requires the use of current determinative analytical methods 8021B, 8260B, and 8015-GRO where VOC information is needed. When soil samples will be analyzed for VOCs via 8021B, 8260B and/or TPH by one of the gasoline range methods, DEQ strongly encourages the use of EnCore™ or other EPA approved devices or methods to minimize the loss of volatile constituents after sample collection.** Under most conditions, soil will be analyzed for high levels (> 200 ug/kg) of VOCs. The decision to use any laboratory analytical methods at a specific site should only be made with the guidance and authorization of the Case Manager.

Historically, acid preservation (e.g. HCL) has typically been used to preserve water samples to be analyzed for the presence of petroleum constituents. Studies conducted by the EPA concluded that hydrolysis of ethers (e.g. MTBE, DIPE, etc.) can occur in acidified, aqueous samples when they undergo a heated purge prior to analysis such as in the sample preparation Methods 5030 or 5021. A heated purge may be necessary when ethanol and other alcohols are the target analytes. EPA concluded that a base preservation using trisodium phosphate dodecahydrate (TSP) is as effective at preserving the sample without causing hydrolysis of the ethers when samples are heated as part of the analysis<sup>5-3</sup>.

Samples collected during tank closure must be analyzed by an EPA or DEQ approved analytical method that is capable of determining if a release occurred from that tank. Please see Chapter 7 of this manual for additional information about tank closure procedures.

<sup>5-3</sup> EPA Office of Underground Storage Tanks. April, 2003. "Underground Storage Tanks Fact Sheet, Analytical Methodologies for Fuel Oxygenates."

Table 5-4. Acceptable Analytical Methods for Use at Petroleum Contaminated Sites			
Parameter	Analytical Methods	Applicable Medium <sup>1</sup>	"M code" from the 007 UCR Table
BTEX	EPA 502.2 EPA 524.2 EPA 602 EPA 624 EPA 8021B EPA 8260B	w w w w w & s w & s	M0108 M0116 M1361, M1362 M1379, M1380
BTEX and MTBE	EPA 602 (modified) EPA 8021B	w w & s	M1010 M1371, M1372
Oxygenates	EPA 8260B EPA 8015C	w & s w & s	M1379, M1380 M1365, M1367
Ethanol	EPA 8260B EPA 8015C	w & s w & s	M1379, M1380 M1365, M1367
TPH Gasoline and JP-4	California LUFT Method Wisconsin DNR - GRO EPA 8015C (modified TPH - GRO)	w & s w & s w & s	M0100, M0121 M1000, M1014 M1365, M1367
TPH Diesel, Fuel Oil #1, #2, and #4, Jet Fuel <sup>4</sup> , Kerosene	California LUFT Method Wisconsin DNR - DRO EPA 8015C (modified TPH - DRO)	w & s w & s w & s	M0101, M0122 M1001, M1015 M1366, M1368
TPH <sup>5</sup> Crude Oil, Fuel Oil #5, and #6, Used Oil, Hydraulic Oil	Wisconsin TRPH EPA 1664 <sup>2</sup> 8015C (modified TPH - ORO) <sup>3</sup>	s w w & s	M1450
PAHs/PNAs	EPA 525 EPA 610 EPA 625 EPA 8100 EPA 8270D EPA 8310	w w w w & s w & s w & s	M0110 M0117 M0143 M0149
Lead	Graphite Furnace Atomic Adsorption (GFAA)	w & s	M1680
EDB	EPA 504.1 EPA 8011 EPA 8260B	w w & s w & s	M1685 M1681 M1379, M1380
1,2 DCA	502.2 524.2 EPA 8260B EPA 8021B	w w w & s w & s	M1379, M1380 M1361, M1362

Table 5-4. Continued

<sup>1</sup> Applicable medium refers to the sample matrix that may be analyzed by the subject test method.

"w" refers to an analytical method that may be used to analyze water

"s" refers to an analytical method that may be used to analyze soil

<sup>2</sup> On May 14, 1999, EPA approved Method 1664 as part of EPA's effort to reduce the use of CFCs and meet the CFC phaseout agreed to in the Montreal Protocol. DEQ Case Managers should be aware of the following limitations of Method 1664 when considering its applicability to a given site:

1. Method 1664 is not applicable to the measurement of materials that volatilize at temperatures below approximately 85 degrees C.
2. Some crude oils and residual fuel oils contain significant percentages of materials that are not soluble in hexane. Accordingly, recoveries of these materials may be low.
3. The detection limit for Method 1664 is in the order of 5 mg/l.

<sup>3</sup> TPH-ORO is not an official modification of the EPA 8015C method.

<sup>4</sup> JP-4 is a wide-cut fuel made by blending gasoline and kerosene fractions in a 65 to 35 ratio.

<sup>5</sup> The 413 and 418 methods for TPH have been removed from this table. On March 12, 2007, EPA promulgated changes to the list of Clean Water Act methods at 40 CFR Part 136.3. This final rule withdrew these methods.

**NOTE: Many of the methods listed above for BTEX also may be used for MTBE.**

References:

EPA 100 - 400 Series – Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983.

EPA 500 Series – Analytical Methods Approved for Drinking Water Compliance Monitoring of Organic Contaminants, EPA, June 2008.

EPA 600 Series – 40 CFR, Part 136, 1992.

EPA SW-846 – Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Update IV to the Third Edition, January 2008.

Publ. – SW - 140. Modified GRO, Method for Determining Gasoline Range Organics, Wisconsin DNR, September 1995.

Publ. – SW – 141. Modified DRO, Method for Determining Diesel Range Organics, Wisconsin DNR, September 1995.

Publ. – SW – 143. Wisconsin DNR, 1992

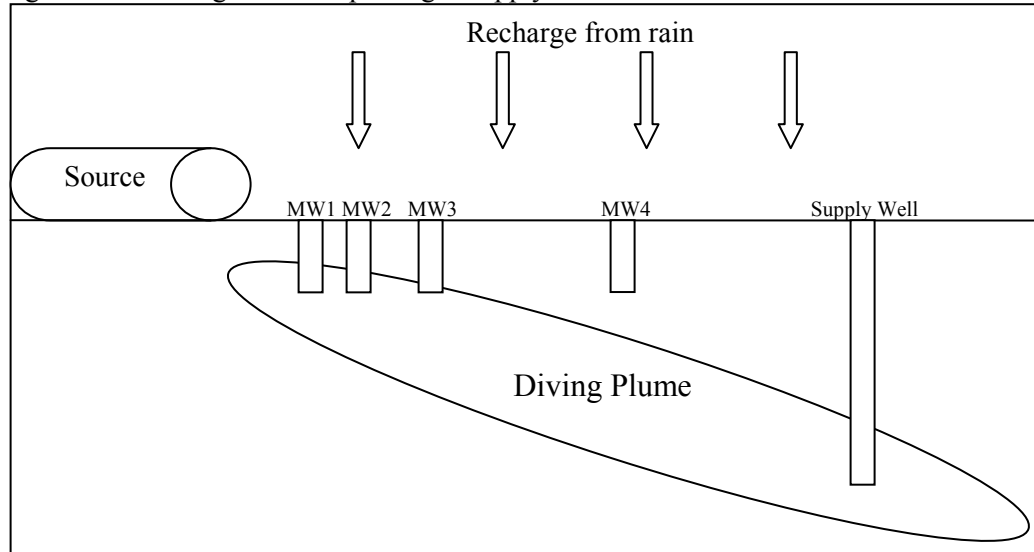
#### 5.4.3.1.4 Evaluation of Diving Plumes

A diving plume is a dissolved phase contaminant plume that moves downward as the plume migrates away from the source. DEQ has observed that petroleum hydrocarbon plumes associated with gasoline releases may move downward as a result of water table drawdown created by ground water withdrawal, movement of ground water through preferential flow paths, and natural surface water infiltration (recharge). Recharge entering the aquifer from above can push petroleum contaminant plumes downward as the plume migrates away from the source. MTBE and other oxygenates tend to migrate faster due to their higher solubility in ground water. They also generally identify the leading edge of a plume. Diving plumes are less likely in areas of lower permeability where recharge water does not infiltrate as well into the subsurface.

Diving plumes can make it difficult to properly delineate ground water contamination and evaluate the potential impact to nearby receptors. Conventional investigative methods (i.e. shallow wells screened across the water table) may underestimate the lateral and vertical extent of the dissolved phase plume. When characterizing sites, it may be necessary to include investigative methods capable of characterizing diving plumes to adequately evaluate the extent of a dissolved plume. Some investigative techniques often used to characterize a diving plume include nested wells, temporary well points, and direct-push sampling at multiple depths. Case Managers should base the number of samples and characterization needed on the potential receptors and degree of risk at the site.

**NOTE: Properly characterizing a diving plume is especially important when an impact or risk to a drinking water supply well is a concern. The figure below provides a basic visual representation of a diving plume impacting a supply well. MW1 – MW4 represent typical, shallow monitoring wells that are screened across the water table and these may not be sufficient to define the extent of a diving plume.**

Figure 5-1. Diving Plume Impacting a Supply Well



#### 5.4.3.1.5 Ethanol

Ethanol is a high octane fuel that is produced from renewable resources such as corn. The Energy Policy Act of 2005 amended the Clean Air Act to establish a Renewable Fuel Standard Program (RFS Program) and to remove the oxygenate mandate in the Reformulated Gasoline Program (RFG Program). By removing the RFG oxygenate standard and implementing the new RFS Program, ethanol usage has increased and MTBE usage has decreased since refiners are no longer obligated to use an oxygenate as of May 6, 2006. In February 2006, Colonial Pipeline, which serves Virginia, announced that it would discontinue shipping RFG with MTBE<sup>5-4</sup>. In the spring of 2006, many RFG marketers in Virginia began receiving supplies of gasoline containing up to 10% ethanol (E10) in order to replace the MTBE.

Ethanol is miscible in water and likely to enter ground water near a release. It degrades rapidly through biodegradation processes and, therefore, it generally does not persist in the environment nor migrate significantly from its source. However, 85% ethanol (E85) releases or neat ethanol releases into surface waters may create anaerobic conditions and cause a fish kill. The same would likely hold true for large E10 releases into surface waters. Human health risks from exposure to ethanol appear to be minimal, especially when compared with the risks posed by other gasoline constituents. EPA Methods 8015C and 8260B are appropriate methods for detecting ethanol. DEQ Storage Tank Program typically does not require the analysis of ethanol when assessing an E10 gasoline release. The Case Manager will decide if sampling for ethanol is warranted based upon site-specific conditions.

<sup>5-4</sup> O'Connor, M. J., 2006, Memorandum. Virginia Petroleum, Convenience and Grocery Association, Webpage on MTBE Phaseout/Ethanol Introduction in Virginia RFG Markets Within 30 Days. <http://www.vpcga.com/files/public/02-14-06MTBEMemorandum.pdf>.

### 5.4.3.1.6 Use of Ground Water Models

Modeling is a commonly used and accepted tool for predicting the behavior of ground water flow. Modeling may be used at many sites to evaluate whether a constituent will reach a receptor. In this type of application, the model will effectively evaluate the front edge of the plume. Models also may be used to estimate the maximum contamination that will reach a particular receptor and provide information on contaminant distribution within a plume. When modeling will be utilized to characterize ground water flow and the transport and fate of constituents at a site, it is recommended that staff, the responsible person, and the responsible person's consultant define the objective(s) of modeling for that site. The modeling objectives should be included in the in the SCR and/or the CAP.

Fate and transport models can be used by staff to estimate the movement and chemical alteration of contaminants as they move through ground water. They may assist with calculating site-specific endpoints and risks to receptors by entering site-specific data (e.g. ground water concentrations) into the model (i.e. calibrating the model), and adjusting the concentration values up and down to evaluate if a constituent present in a certain concentration near the source location could impact a receptor located at some distance from that source area. For example, a model can be used to evaluate whether a concentration present in a monitoring well near the source of petroleum release is likely to impact a downgradient supply well by calibrating the model with this value. Analytical models should be used when ground water flow or transport processes are relatively simple. The Domenico model and other analytical models (e.g. Bioscreen) can be used to evaluate fate and transport.

The two types of models that are generally used to predict ground water flow are analytical and numerical. The Domenico Model can be used to estimate contaminant transport in the saturated or the unsaturated zone. This model calculates the concentration of contaminants at any point and time downgradient of a source area of known size and concentration<sup>5-5</sup>. BIOSCREEN is a model which can simulate remediation through natural attenuation of dissolved hydrocarbons at petroleum contaminated sites<sup>5-6</sup>. The model is based on the Domenico analytical solute transport model. It has the ability to simulate biodegradation processes (e.g. advection, dispersion, adsorption, aerobic decay, etc.) at petroleum release sites.

Numerical models use approximations to solve differential equations describing ground water flow or contaminant transport. Numerical models should be used when ground water flow or transport processes are relatively complex. Site-specific conditions may require that a numerical model (e.g. MODFLOW, RT3D, AT123D, etc.) be used. MODFLOW is a three-dimensional ground-water flow model. MODFLOW simulates steady and nonsteady flow in an irregularly shaped flow system in which aquifer layers can be confined, unconfined, or a combination of confined and unconfined<sup>5-7</sup>.

**NOTE: All input parameters and an explanation for using them as well as any assumptions used in the models must be provided with the modeling results.**

<sup>5-5</sup> Domenico, P.A. 1987. "An analytical model for multidimensional transport of a decaying contaminant species:" Journal of Hydrology. Volume 91, pp. 49-58.

<sup>5-6</sup> EPA. January 30, 2008. Ground Water and Ecosystems Restoration Research.  
<http://www.epa.gov/ada/csmos/models/bioscrn.html#Top>

<sup>5-7</sup> USGS. April 21, 2008. Water Resources Applications Software.  
[http://water.usgs.gov/cgi-bin/man\\_wrdapp?modflow](http://water.usgs.gov/cgi-bin/man_wrdapp?modflow)

It is important that staff, consultants, and responsible persons recognize the limitations of ground water modeling when the model results will be used in the decision making process. Ground water models, despite their high degree of precision are, at best, qualitative predictors of future ground water flow<sup>5-9</sup>. Models used to predict ground water flow and the behavior of constituents in ground water at a site should be calibrated using site data to validate the use of that particular model at the site. It is also recommended that DEQ staff require predictions from ground water models to be verified in the field prior to reaching a final decision at the site. This verification is especially important in situations where receptors may be exposed to petroleum or other regulated substances.

Information regarding fundamental model equations and typical model input parameters is provided in Appendix O. This information is intended to provide staff with basic modeling background and typical ranges of values for various common input parameters. The model information and input parameters are not meant as a substitute for site specific data.

#### 5.4.3.1.7 Sample Collection Procedures

Decisions made about future actions required at leaking storage tank sites are highly dependent upon analytical data presented for the site. While there is some degree of variability in procedures used to analyze samples in a laboratory, there is a much greater variability in the procedures used to collect those samples. Reports provided to DEQ Storage Tank Program need to contain a description of the procedures that were used to collect the samples whose analytical results are presented in that report.

DEQ Storage Tank Program has developed generic soil and ground water sampling procedures that RPs and consultants may use at leaking storage tank sites. These DEQ soil and ground water sample collection procedures are presented in Appendix Z. Responsible persons and consultants are not required to use DEQ procedures and are encouraged, to develop and use sample collection procedures that account for site-specific conditions and data quality objectives.

#### 5.4.3.1.8 Data Quality

Decisions made within the Storage Tank Program are highly dependent upon analytical data for samples that are collected by the RP and RP's consultant. Data must, therefore, be of sufficient and known quality to support decisions made by the DEQ Storage Tank Program Staff.

#### Data Verification, Validation, and Corrective Action

The DEQ expects the RP and/or RP's consultant to review lab sheets, field notes, and other data-related documentation to verify the completeness of the data contained within those documents. The RP and/or RP's consultant also is expected to validate the data to ensure that proper methods and procedures were used to collect and analyze the samples.

When a report having analytical data is submitted to DEQ, the Regional Case Manager will review the report. Part of the review will include verifying that the field documents and lab report forms are complete.

<sup>5-9</sup> Rojstaczer, Stewart Alan. 1994. "The Limitations of Groundwater Models." Journal of Geologic Education. Volume 42, pp. 362 - 368.



### Sample Holding Time

Holding time is an important element that must be considered when evaluating the quality of data. Persons checking information provided by the lab must review the sample collection date and sample analysis date to ensure that the holding time for the requested analysis was not exceeded. If the holding time was exceeded, DEQ will consider the analytical result received and the type of decision that must be supported by the data. Table 5-5 contains a matrix of some of the types of samples that may be collected and actions that should be taken if holding times are exceeded.

Table 5-5. Decision Matrix for Samples that Exceed the Holding Time		
Purpose of Sample Collection	Result	Action
Samples collected to determine if private water supply well is impacted	A holding time is exceeded and the concentration of any petroleum constituent > method detection limit.	The sample result usually will be interpreted by DEQ as indicating the presence of petroleum in the well and DEQ will begin the AWS process. The Regional Case Manager has the authority to decide if another sample is needed.
	A holding time is exceeded and the concentrations of all petroleum constituents are below the method detection limits.	An additional sample must be collected and analyzed.
Samples collected to determine if public water supply well is impacted	A holding time is exceeded and the concentration of any petroleum constituent is above the Virginia drinking water standards or a health advisory issued by the Health Department.	DEQ will begin the AWS process. The Regional Case Manager has the authority to decide if another sample is needed.
	A holding time is exceeded and the concentrations of all petroleum constituents are below the method detection limits.	An additional sample must be collected and analyzed.
Samples collected to determine if a release has occurred	A holding time is exceeded and the concentration of any petroleum constituent exceeds the release reporting threshold.	A release is confirmed and the release response and corrective action process will be initiated.
	A holding time is exceeded and the concentrations of all petroleum constituents are below the pertinent release reporting thresholds.	An additional sample must be collected and analyzed
Samples collected during Site Characterization	A holding time is exceeded	The Case Manager will decide if additional samples are needed.
Samples collected to monitor remediation system effluent	The holding time is exceeded and analytical results for any parameter exceed the effluent limit for that constituent.	Take action to reduce effluent limits to meet effluent standards.
	The holding time is exceeded and analytical results are below effluent limits	Another sample must be collected and analyzed.
Samples collected for system design and operation and maintenance:	A holding time is exceeded and the concentration of any petroleum constituent > method detection limit and the analytical result is within one order of magnitude of the previous analytical result for that parameter.	The Case Manager will decide if an additional samples are needed.
	A holding time is exceeded and the concentration of all petroleum constituents are below the method detection limits.	An additional sample must be collected and analyzed.

### Laboratory Check of Data Quality

Laboratories are expected to use blanks to check data quality. After performing the calibration standards, laboratory personnel are expected to run a method blank in accordance with the method requirements or recommendations (i.e. a frequency of 5% for SW846 8000 series methods). The method blank must be performed on each system that is used to analyze samples by that particular method (i.e. if two GC/MS systems will be used, then a method blank must be run on each system).

The analysis of heavily contaminated samples potentially creates problems with the cross contamination of subsequent samples analyzed by the same equipment. The laboratory performing analysis must analyze an instrument blank should following the analysis of any grossly contaminated sample to demonstrate that the analytical equipment has been decontaminated.

Laboratories are expected to follow the QA/QC requirements for the analytical method(s) used to analyze the samples. Some of the types of QC tools used to evaluate method performance include matrix spikes and matrix spike duplicates, method blanks, surrogate recovery data, and initial calibration data. The RP and/or RP's consultant should check the lab QC information for all samples that were collected during the Site Characterization Phase. The DEQ Case Manager may check lab QC data for any set of samples if they believe that the data quality needs warrant this action.

Matrix spikes and matrix spike duplicates are tools that are used to evaluate the precision and accuracy of the analytical method on various matrices and to demonstrate acceptable recovery by the lab at the time of sample analysis.<sup>5-10</sup> Matrix spike and matrix spike duplicate samples must be analyzed at a frequency of one per 20 samples of the same matrix. According to EPA the recoveries of most compounds spiked into samples should be between 70 – 130 percent.<sup>5-11</sup> The relative percent difference between the matrix spike recovery and the matrix spike duplicate must be within the limits listed in Table 5-6.

Accuracy is estimated from the recovery of spiked analytes from the matrix of interest.<sup>5-11</sup> Laboratory performance is estimated from the recovery of spiked analytes in the matrix spike sample. Matrix spike recovery percent is calculated using equation (1) below.

$$(1) \quad \% \text{ recovery} = \frac{C_s - C_u}{C_n} \times 100$$

Where:

$C_s$  = the measured concentration of the spiked sample aliquot  
 $C_u$  = the measured concentration of the unspiked sample aliquot  
 $C_n$  = the theoretical concentration increase that results from spiking the sample

<sup>5-10</sup> EPA. 1994. Region III Modifications to National Functional Guidelines for Organic Data Review. Multi-media, Multi-Concentration (OLMO1.0 - OLMO1.9).

<sup>5-11</sup> EPA. 1996. Test methods for Evaluating Solid Waste, Physical/Chemical Methods (SW846).

Precision is estimated from the relative percent difference (RPD) of the concentrations measured for matrix spike and matrix spike duplicate pairs. The RPD is calculated using equation (2) below.

$$(2) \quad RPD = \frac{(C_1 - C_2)}{[(C_1 + C_2)/2]} \times 100$$

Where

C<sub>1</sub> = Measured concentration of the first sample aliquot

C<sub>2</sub> = Measured concentration of the second sample aliquot

Table 5-6. Matrix Spike and Matrix Spike Recovery and Relative Percent Difference Requirements		
Compound	RPD – water matrix	RPD – soil matrix
1,1-dichloroethene	≤ 14	≤ 22
Trichloroethene	≤ 14	≤ 24
Benzene	≤ 11	≤ 21
Toluene	≤ 13	≤ 21
chlorobenzene	≤ 13	≤ 21
These recommended relative percent difference values are from: EPA. 1994. Region III Modifications to National Functional Guidelines for Organic Data Review. Multi-media, Multi-Concentration (OLMO1.0 - OLMO1.9).		

Laboratories are expected to use method blanks to check data quality. After lab personnel perform the calibration standards, SW846 recommends that method blanks be prepared at a frequency of at least 5% (i.e. one method blank per 20 samples prepared at the same time and by the same procedures) for 8000 series methods. Lab personnel must analyze a method blank on each system that is used to analyze samples by that particular method (i.e. if two GC/MS systems will be used, then a method blank must be run on each GC/MS system). The analytical results from the method blank sample should be less than the lab's required reporting limit for that method.

Surrogates, also known as system monitoring compounds, are added to all samples prior to sample purging so that the lab may monitor analytical performance (some of the more common surrogate compounds are listed in Table 5-7). Laboratories are expected to evaluate surrogate recovery data from individual samples versus the recovery limits developed by the lab. Surrogate recovery is calculated using equation (3) below.

$$(3) \quad \text{Recovery (\%)} = \frac{\text{Concentration or amount of surrogate compound found}}{\text{Concentration or amount of surrogate compound added}} \times 100$$

Labs are expected to develop surrogate recovery limits in accordance with the analytical method requirements or recommendations.

Initial and continuing calibration of instruments also are required as a way of demonstrating that the equipment is capable of producing acceptable data for the constituents of interest. The RP, RP's consultant, or DEQ staff may request and review other lab QC data such as retention time, chromatograms and mass spectra as they believe necessary to meet the data quality needs of the individual pollution complaint case.

Table 5-7. Common Surrogate Compounds	
Compound	Compound Class
4-bromofluorobenzene	Volatile Organics
1,2-dichloroethane	Volatile Organics
Toluene	Volatile Organics
Nitrobenzene	Semi-volatile Organics
Fluorobiphenyl	Semi-volatile Organics
Terphenyl	Semi-volatile Organics
Phenol	Semi-volatile Organics
Fluoprophenol	Semi-volatile Organics
Tribromophenol	Semi-volatile Organics
Chlorophenol	Semi-volatile Organics
1,2-dichlorobenzene	Semi-volatile Organics
Source: EPA. 1994. <u>Region III Modifications to National Functional Guidelines for Organic Data Review</u> . Multi-media, Multi-Concentration (OLMO1.0 - OLMO1.9).	

### Qualified Data

Analytical data sheets provided by the lab should qualify and provide additional information about the data presented on the sheet. The RP and/or RP's consultant should check the qualifiers to ensure that the data returned by the lab will support the decisions that must be made during the particular phase of work at the site.

Certain types of qualified data may not be able to support the decisions that DEQ must make at a site. Common qualifiers that staff may encounter are listed in Table 5-8 along with the actions that the Case Manager usually will take when encountering these qualifiers. Corrective actions needed when these qualifiers are encountered must be determined by the Regional Case Manager and the RP and RP's consultant and will be based upon the data quality requirements for that data.

Table 5-8. Data Qualifiers and Typical Corrective Actions		
Qualifier	Description	Action
J	The analyte was positively identified but the quantification is an estimation	In most instances, no action will be needed. If an analyte is found, but below quantification limits in a water supply sample, the Case Manager should discuss this with the AWS Program Manager to determine if another sample should be collected.
U	The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit	No action needed.
R	The data are unusable due to deficiencies in the ability to analyze the sample and meet QC criteria	The sample data is unusable. Another sample must be collected unless the Case Manager believes the information from this sample and location is not needed for the decision making process during this particular phase of work.
B	The analyte was found in associated blank, as well as in the sample	The data cannot support decisions that must be made regarding alternate water supplies at that site and an additional water sample from that location must be collected and analyzed.

### 5.4.3.2 Risk Assessment

The risk assessment subsection of the SCR deals with evaluating risks to human and environmental receptors posed by the release. In the risk assessment, potential and impacted receptors (including sensitive receptors) must be identified, migration rates for the contaminant(s) must be estimated, and risks to individual receptors must be evaluated. All potential pathways of exposure including ingestion, inhalation, and dermal contact must be evaluated in the Risk Assessment. The Risk Assessment must also contain proposed remediation endpoints based upon site-specific risks. The overall goal of risk assessment is to evaluate risks to receptors so that endpoints for corrective action may be defined on a scientific and defensible basis.

Once free product and saturated soils have been removed to the extent that contaminant migration from these sources is minimized, a risk-based decision making process should be utilized to identify the future course of action at a site. Risk based decision making for corrective action is consistent with other regulatory programs such as CERCLA and RCRA Corrective Action and is encouraged by EPA for use in UST programs. It is important to keep in mind that the key decision to be made during all stages of release response and corrective action is: what actions are required to protect human health and the environment?

#### 5.4.3.2.1 Quantitative Risk Assessment

Regional staff have the flexibility to use their professional judgment when evaluating risks at a site. This policy has allowed flexibility regarding methodologies used for assessing risks at sites. It is believed that the Case Manager must have the authority to make decisions regarding the most appropriate course of action at a site. This includes the authority to decide what methodologies are most appropriate. It is recommended that DEQ Case Managers use quantitative risk assessment techniques in the risk-based decision making process when human or environmental receptors will or are likely to be exposed to regulated substances or petroleum constituents. Additional information which may be used to calculate risks is included in Table 5-9 and Appendix P.

It is important to note that although TPH may be a useful indicator of petroleum contamination for heavier fuels, TPH cannot be used in most traditional quantitative risk assessment techniques. Quantitative risk assessments are based upon the observed and/or predicted toxicological behavior of individual constituents. Toxicological information does not exist for TPH. It is recommended that semivolatile constituents such as the polynuclear aromatic hydrocarbons (PAHs) be evaluated when quantitative risk assessments are needed at sites involving the release of heavier petroleum products. Naphthalene is the most soluble of the PAHs in ground water and it is recommended that staff require responsible persons to obtain data regarding this constituent when site conditions warrant a quantitative risk assessment and the material released was diesel or fuel oil. Most other PAHs are soluble in only low concentrations; however, they may sorb readily onto soil and several, including benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, and chrysene, are suspected carcinogens. When humans may come into contact with soil that is contaminated by diesel or fuel oil, it is recommended that risks from the potentially carcinogenic PAHs be evaluated along with naphthalene.

Decisions regarding what level of risk is acceptable versus the level of risk which is not acceptable must be decided as a policy issue. Historically, most regulatory agencies have used a one in one million risk criterion as a threshold for environmental and occupational decisions. DEQ Storage Tank Program will use a calculated excess lifetime cancer risk of  $1 \times 10^{-6}$  (one in one million) for individual carcinogenic

constituents and a hazard index of 1 for non-carcinogenic constituents as the risk management thresholds for which corrective actions will be required for most pathways of exposure. The exception to this is the drinking water ingestion pathway where DEQ will establish endpoints based upon no exposure when petroleum constituents are present in a private water supply well (see Sections 5.3.2 through 5.3.2.2.3).

Table 5-9. Toxicological Data for Selected Petroleum Constituents.						
Constituent	Weight Class of Evidence	Reference Dose Oral (mg/kg-day)	Reference Concentration Inhalation (mg/m <sup>3</sup> )	Carcinogenic Slope Factor, Oral (mg/kg-day)	Inhalation Unit Risk (ug/m <sup>3</sup> ) <sup>-1</sup>	
Benzene	A	4.0E-03 I	3.0E-02 I	5.5E-02 I	7.8E-06 I	
Toluene	D	8.0E-02 I	5.0E+00 I			
Ethylbenzene	D	1.0E-01 I	1.0E+00 I	1.1E-02 C	2.5E-06 C	
Xylenes (mixture)	D	2.0E-01 I	1.0E-01 I			
MTBE			3.0E+00 I	1.8E-03 C	2.6E-07 C	
n-Hexane		6.0E-02 H	7.0E-01 I			
MEK	D	6.0E-01 I	5.0E+00 I			
Pyrene	D	3.0E-02 I				
Acenaphthene		6.0E-02 I				
Benzo(a) pyrene	B2			7.3E+00 I	1.1E-03 C	
Anthracene	D	3.0E-01 I				
Naphthalene	C	2.0E-02 C	3.0E-03 I		3.4E-05 C	
Chrysene	B2			7.3E-03 I	1.1E-05 C	
Benzo(k)fluoranthene	B2			7.3E-02 I	1.1E-04 C	
Fluorene	D	4.0E-02 I				
Fluoranthene	D	4.0E-02 I				
Benzo(b)fluoranthene	B2			7.3E-01 I	1.1E-04 C	
Benz(a)anthracene	B2			7.3E-01 I	1.1E-04 C	

Source of Weight class of evidence: EPA IRIS database

A Human carcinogen, with sufficient evidence from epidemiological studies  
 B1 Probable human carcinogen, with limited evidence from epidemiological studies  
 B2 Probable human carcinogen, with sufficient evidence from animal studies and inadequate evidence or no data from epidemiological studies  
 C Possible human carcinogen, with limited evidence from animal studies in the absence of human data  
 D Not classifiable as to human carcinogenicity, owing to inadequate human and animal evidence  
 I = EPA IRIS database  
 C = Cal EPA

Sources for Reference Doses, Carcinogenic Slope Factors, and Inhalation Unit Risks: EPA Region III Summary Risk Based Concentration Table, November 2010.

**NOTE: Reference doses, carcinogenic potency slopes, and inhalation unit risks are updated periodically. It is recommended that staff reference the EPA Region III Risk Based Concentration Table which is updated on a semi-annual basis.**

#### 5.4.3.2.2 Endpoint Determination and Future Use

Remediation endpoints are based on information generated during site characterization. Remedial endpoints must be designed to prevent receptor impact. The establishment of remedial endpoints based on a combination of risk and limits of the available technology is considered a reasonable and defensible method of protecting human health and the environment.

When developing endpoints, the responsible person and his/her consultant must consider current and known future land uses within the area. Future land uses that must be considered in the risk assessment are limited to planned land use changes that are: (1) documented in applications or plans filed with the local government; and/or (2) associated with ongoing construction activities. Planned land uses filed with the local government and existing uses identified up to completion of the public participation process of Corrective Action Plan Development must be considered when developing remedial endpoints. Zoning alone does not constitute a future use. Additional guidance on future use may be found in examples 5-6 through 5-13.

Whenever a corrective action is deemed necessary on a risk-to-receptor basis, the owner or operator must propose remediation endpoints for the site to achieve the appropriate level of risk reduction. These endpoints shall address each phase of the hydrocarbon or other compound(s) released as appropriate: free product, residual phases, dissolved phase, and vapor phase. Each remediation endpoint that is proposed should be technically feasible and, in the opinion of DEQ staff, cost effective. It should be kept in mind that acceptable remedial endpoints do not necessarily prevent all exposure to the constituents of concern. Endpoints must be based on risks to identified receptors.

Situations may arise where properties near release sites experience significant changes in land use after the SCR Phase or the CAP Development Phase have been completed. These changes in land use may create exposure pathways and result in impact to a receptor that did not exist at the time that the SCR was completed or the CAP was approved by DEQ. Remedial endpoints must out of necessity be based upon the facts that are known at the completion of the SCR or time of CAP approval. It is not feasible for DEQ to re-evaluate every release or re-open every case when land uses near the release site change. It is important for staff and responsible persons to remember that the conclusion of a DEQ approved cleanup does not remove liability from the responsible person for damages caused by the release. DEQ's position is that bodily injury or property damage resulting from a tank release that was not addressed in the risk-based Corrective Action Plan should be addressed via a third party claim. Third parties may seek compensation from the responsible person through the court system.

In addition, for regulated, excluded, deferred, and partially deferred USTs, Article 10 of Virginia Water Control Law allows disbursements from the VPSTF for third party claims. By law and regulation, third party claims for damages caused by releases from regulated, excluded, deferred, and partially deferred USTs cannot be considered until after cleanups are completed. The law allows the VPSTF to reimburse the RP for eligible third party costs in excess of the RP's third party financial responsibility amount up to one million dollars. See Va. Code 62.1-44.34:11(A)(2)(b) and the Virginia Petroleum Storage Tank Fund Third Party Disbursement Guidelines (<http://www.deq.virginia.gov/tanks/guidance.html>) for more information on third party claims.

Responsible persons should be aware that: (1) the monies spent on corrective action also count towards the one million dollars per occurrence limit and in cases involving extensive cleanup, there may be little money left over after corrective action is completed; and (2) there are limitations on the type of damages that may be reimbursed as well as requirements for establishing liability; and (3) they have up to two years to file for reimbursement for third party claims after their case has been closed.

- NOTES:**
- 1. Remediation in excess of that required on a risk basis, such as actions taken to make a property more marketable, may be undertaken by the responsible person as long as it is within the law, but will not be eligible for consideration for reimbursement from the VPSTF. The RP may wish to pursue additional cleanup under the Voluntary Remediation Program (VRP). Refer to Section 5.9 for additional information.**
  - 2. DEQ's future-use procedures are based on the presumption that the RP, with DEQ's concurrence, will take actions to ensure that risks to known future receptors are below the risk management thresholds established by DEQ Storage Tank Program. Actions taken by persons other than the RP are not eligible for reimbursement, regardless of whether DEQ would have required the RP to take these actions to address risks to present or known future receptors, unless the other persons "Step Into the Shoes" of the RP. DEQ staff, consultants, and RPs need to remember that the VPSTF can be used only to reimburse eligible RPs for reasonable and necessary costs associated with release response and required corrective action at a site.**

**Example 5-6. Future Use - Neighboring property developed after case closure**

Example. The "Save-a-Bunch" service station completed its cleanup in accordance with a DEQ approved CAP and the Regional Office issued a closure letter for the case. After the case was closed, the owner of an adjoining property decided to build an underground parking garage. The neighbor knows that he will need to de-water the site both during and after construction. Gasoline constituents are present in the ground water although, there is no evidence that these dissolved constituents are from a new release. The person building the parking deck wants DEQ to either: (1) re-open the case and require the RP to remediate the dissolved phase constituents so that a discharge permit will not be needed; or (2) require the RP to build and operate a treatment system and pay for costs to treat that water that must be discharged.

Course of Action: There is no evidence that this land use change was filed with the local government prior to DEQ's approval of the CAP for this release nor is there evidence that a known receptor was missed during SCR and CAP development at the site. DEQ will not re-open the case. If the person building the parking garage discharges petroleum contaminated water to surface water, he/she must have a VPDES permit for that discharge. The affected property owner should be directed to contact the RP to resolve any damage issues. Regional Office staff should provide a copy of the Virginia Petroleum Storage Tank Fund Third Party Disbursement Guidelines to the RP.

As a general rule, DEQ will not re-open closed cases unless: (1) new information indicates that the SCR missed a significant amount of contamination; or (2) the Site Characterization process missed a receptor.

**Example 5-7. Future Use - No documentation to support future use claim**

Example: DEQ is working with a RP to complete a CAP for a leaking storage tank site. During the public notice period, a nearby property owner announces that he intends to build on his now vacant property and wants the cleanup to "guarantee" that any development he undertakes will not be affected by any contamination remaining after the CAP is completed. This nearby property owner has not filed development plans with any local government body nor has he initiated contract negotiations. There is no documentation to support his claim that development will actually occur.

Course of Action: DEQ will not require the RP to modify the CAP to address this property owner's concerns. The CAP must address risks to receptors that presently exist at the site or will definitely exist in the future. Since there is no documented evidence to support the neighbor's claim of future development, the CAP does not need to address this unspecified and undocumented future use.



**Example 5-8. Future Use - Development plans on file prior to completion of the SCR**

Example: A RP has begun corrective actions in accordance with a DEQ approved CAP. During Corrective Action Implementation, a nearby property owner states that he has had to halt ongoing construction activities because he has encountered petroleum contaminants. Evidence indicates that this petroleum is associated with the RP's site.

The neighbor who is developing his site failed to comment during the public notice process even though he was notified directly (by letter) and informed about the intended corrective actions. This neighbor initiated site development prior to CAP implementation and filed development plans with the local government before the release occurred.

Course of Action: Since development plans were on file with the local government prior to DEQ's approval of the CAP, DEQ would consider this to be an existing use. Corrective actions must be modified to address receptors on the neighbor's property.

**Example 5-9. Future Use - Petroleum constituents discharged from a sump**

Example: The owner of an existing parking deck detects petroleum vapors and observes a sheen on water in the sump that he uses to keep the below-grade parking levels from flooding. Water from the sump is discharged into a municipal storm sewer. DEQ investigates the complaint and determines that the source of the problem is a gasoline UST at a nearby property.

Course of Action: Storm sewers are considered to be state waters. The discharge of dissolved petroleum constituents from the sump into a storm sewer constitutes a point source discharge of pollutants to surface water and a general or individual VPDES permit must be issued for this discharge. In addition to requiring the RP to conduct release response and corrective action, DEQ will require the tank owner to install a treatment system on the sump (if necessary) to meet permit effluent limitations. Storm drain systems are considered by DEQ to be state waters and, therefore, are considered receptors. The compliance point for the discharge must be at the point where the discharge enters the storm drain. If treatment of the effluent is needed to meet the Petroleum Discharge General Permit limits, the RP will be required to obtain coverage under the Permit and will be required to monitor and report in accordance with the Permit. Once the Storage Tank Program is satisfied that risk-based endpoints have been met for the site and the concentration of petroleum constituents in the effluent are below the waste load allocations calculated for the receiving stream (see Appendix U for the procedure for calculating waste load allocations), DEQ will close the leaking storage tank case. If petroleum constituents are still being discharged from the sump at the time of case closure, the responsibility for the discharge will transfer from the storage tank owner (the RP) to the parking deck owner and the discharge will be permitted in accordance with the regional VPDES program. The parking deck owner may pursue third party action against the RP as the case is now closed.

**NOTES: 1. The sump is not considered a receptor.**

**2. If the petroleum constituents continue to be discharged into the storm sewer after case closure, the responsibility for this discharge will transfer from the tank owner/operator to the operator of the sump. The municipality also will have to obtain coverage under a VPDES permit for constituents discharged from the storm sewer.**

**Example 5-10. Future Use - Dewatering at a neighboring property that was initiated after case closure**

Example: A property owner near a closed leaking UST site decides to develop his property. It will be necessary to dewater the site both during construction and after the development is complete. There are low, but detectable concentrations of dissolved petroleum constituents in the ground water at this site and evidence indicates that these petroleum constituents are probably associated with the closed leaking UST case. The person developing his property wants DEQ to reopen the case and require the responsible person to install and operate the dewatering system and obtain the discharge permit.

Course of Action: DEQ will not reopen the case and the RP will not be required to install or operate the dewatering system. The property owner will be responsible for the dewatering system and for meeting any and all permit requirements. Even though the dissolved phase concentrations are below the limits specified in the Petroleum Discharge General Permit, the person discharging water containing these constituents must have a VPDES permit (either an individual or a general permit).

If it is determined that influent concentrations are increasing and this increase is most likely the result of a new release, regional staff would assign a new case number and all potential responsible persons would be required to investigate. If a new RP was identified or it was determined that a new release was contributing constituents to the dewatering system, the RP for the new release would have to address the dewatering effluent and all other impacts/risks created by the release. Alternatively, if DEQ staff believed that the increase in effluent levels was caused by previously undiscovered contamination associated with the original release, the Regional Office could reopen the case and require a revised SCR and CAP (if necessary) that would address impacts from the release including, but not limited to, constituents being discharged from the dewatering system.

**Example 5.11. Future Use - discharge of constituents to the sanitary sewer**

Example: A property owner near a closed leaking storage tank site is performing construction dewatering that necessitates a discharge to the local sanitary sewer system. Due to petroleum contamination, this person must treat the discharge to meet the local discharge requirements. The discharger wants DEQ to reopen the nearby closed leaking storage tank case and compel the RP to manage the dewatering system so that it complies with local discharge requirements.

Course of Action: DEQ will not reopen the closed case unless there is evidence of a new release or evidence that a significant reservoir of contamination was overlooked during the site characterization process. The person discharging the petroleum contaminated water to the sanitary sewer must comply with the local government requirements and must address damages via a third party claim.

**NOTE: At those sites where the discharge goes into a sanitary sewer system, the person discharging the constituents or the RP (depending upon the closure status of the case) must satisfy any pretreatment requirements imposed by the local service authority. Neither the discharger nor the RP, however, will be required to have an individual or general VPDES permit for a discharge to a sanitary sewer system since the local service authority holds the ultimate permit for the discharge where it reaches state waters.**

**Example 5-12. Future use – Actions taken by a third party**

Example: The RP notifies DEQ of a release of gasoline at a service station following the removal of all the USTs at that site. The RP is a tenant who does not own the property. During the time that the RP is characterizing the site, the property owner leases the land to another person. This new tenant immediately excavates soil from the site, places 3 new gasoline USTs in the excavation, and announces that he plans to operate a gasoline station at this location. The soil removed to install these three new USTs is heavily contaminated by petroleum and the new tenant incurs costs for treating this soil at a thermal treatment facility. The new tenant then notifies DEQ and the RP that he has taken these actions and demands to be reimbursed from the VPSTF for costs incurred for treating the soil.

Course of action: The new tenant is not the RP as identified by DEQ and, therefore, is not eligible for reimbursement. The issue of whether DEQ would have required the RP to perform these same actions to reduce risks to a known future receptor is irrelevant. Third parties should be directed to contact the RP to resolve any damage issues. Regional Office staff should provide a copy of the Virginia Petroleum Storage Tank Fund Third Party Disbursement Guidelines to the RP.

**Example 5-13. Future Use – Neighboring property to be developed after post SCR monitoring commences**

Example: An SCR was performed due to a UST leak at a gasoline station and no receptors were identified. The RP has commenced post SCR monitoring in accordance with DEQ. A property developer would like to build a store nearby that includes a basement. The developer's environmental consultant believes the future basement may be impacted by petroleum vapors. No development plans have been filed with any local government agency. The developer requested that DEQ instruct the RP to perform further cleanup.

Course of Action: Because there were no development plans on file at the time the SCR was completed, DEQ will not require the RP to address potential risks to receptors in the basement of the proposed store. The SCR must address risks to existing or planned receptors. There were no receptors and the severity and extent of contamination was properly identified in the SCR.

**5.4.3.2.3 Removal of Petroleum Contaminated Soil and Petroleum Saturated Soil at Development Projects**

DEQ staff frequently encounter RPs or other parties that are interested in developing a property and development activities will include soil excavation. Typically, DEQ will require the RP to address petroleum contamination that, through a planned use, may impact a receptor, if evidence of the planned use is documented with the local government prior to SCR approval or CAP development. Completion of an approved corrective action is not a guarantee that all petroleum contaminated soil has been removed from the site. In some instances, even petroleum saturated soil may remain after case closure. For example, a Case Manager may decide that no further action is necessary to address petroleum saturated soil if no free product has accumulated on the water table and there are no risks to present and known future receptors from the contaminants in the soil.

**Removal of Petroleum Contaminated and/or Petroleum Saturated Soil – known future use**

Petroleum saturated soil needs to be characterized and evaluated at all sites where it is found. After the site is characterized, this corrective actions may be performed to remove the soil or otherwise reduce the concentrations of petroleum constituents in that soil. Persons also may demonstrate that the petroleum saturated soil is not contributing free product at the site, there are no significant risks to present or known future receptors from exposure to constituents in that soil, and the soil can remain with no further action.

The need to remediate petroleum-contaminated soil that is not “saturated” with petroleum is based upon risks to present and known future receptors.

Removal of petroleum-contaminated or saturated soil above what is needed to remove an UST should be performed as part of Phase II Initial Abatement or Corrective Action and occur after the site has been characterized. Risks from exposure to constituents in soil as well as identification of petroleum-saturated soil and its contribution to free product at the site are evaluated during Site Characterization. If corrective action is needed, the remediation assessment section of the Site Characterization Report must recommend the amount of soil be removed under subsequent Phase II Initial Abatement or Corrective Action.

Removing petroleum contaminated or saturated soil often is difficult due to the ability to access that soil without excessively disrupting site activities. When Site Characterization identifies petroleum contaminated or saturated soil that needs to be removed, subsequent removal of that soil may be delayed for a specified period of time if known future construction activities will provide a better opportunity to access the contaminated soil. In these situations, a Corrective Action Plan should be prepared specifying the soil to be removed and containing a timetable under which corrective actions will take place. If a party other than the RP will be developing the site and the RP and staff believe the best course of action is to wait until development to remove petroleum contaminated or saturated soil, the party developing the site needs to be involved in the corrective action planning process and agree to the corrective action plan developed for the site. Pollution complaint cases awaiting site development activities for corrective actions to begin should remain open until the approved corrective actions are completed.

Corrective actions approved by the Storage Tank Program are the activities that are necessary to address risks to present and known future receptors and the activities necessary to recover free product. Soil removal often is performed as part of development and approved corrective actions performed during site development may involve the hauling and disposal of petroleum contaminated or saturated soil as specified in the approved CAP. Persons developing a site may want or need to remove more soil than that specified in the CAP. Excavation, loading, and hauling of soil above what is specified in the approved CAP, however, will not be considered eligible for reimbursement.

#### Removal of Petroleum Contaminated and/or Petroleum Saturated Soil – unspecified/unplanned future use

Frequently, development projects are planned and undertaken at petroleum release sites after: (1) the SCR Phase has been approved with no CAP required; or (2) the CAP Development Phase has been completed. This type of case is a future use that was unknown at the time corrective actions were being evaluated for the site and, thus, will be managed in accordance with the Storage Tank Program’s future use policy. The DEQ will not re-open cases that involve future uses that were unknown and undocumented at the time corrective actions were being evaluated unless it is demonstrated that significant amounts of free product were missed during site characterization or risks to receptors present at the time the case was open exceeded the Storage Tank Program’s risk thresholds.

**Example 5-14. Scenario to evaluate Fund eligibility for soil disposal**

Scenario: A gasoline station with a petroleum release is the site for a future redevelopment project. Evidence of the redevelopment project was documented with the local government prior to completion of the SCR. Neither free product nor petroleum saturated soil was found at the site. The risk assessment performed as part of the SCR considered current and planned uses, including transient receptors (e.g. construction workers), and risks from contaminated soil were below DEQ's risk thresholds. No corrective action activities are necessary for this site. The developer needs to remove some of the contaminated soil for construction of footings and believes that DEQ should require the RP to pay for the loading, hauling, and disposal of the contaminated soil that will be excavated for the footings.

Course of Action: DEQ will not require the RP to remove the soil. Since there is no free product, no petroleum saturated soil, and risks from the contamination are below risk management thresholds DEQ believes no further action is necessary to address remaining soil contamination. The developer will be responsible for costs associated with removing, loading, hauling, and/or disposing that soil.

**Example 5-15. Scenario to evaluate Fund eligibility for soil disposal**

Scenario: A site with a gasoline release will impact a future site construction and development project on a neighboring property. This site construction project was documented with the local government prior to CAP development at this site. This development project involves the construction of a parking garage and a portion of the garage will be underground. Vapors from the petroleum contaminated soil will pose a risk to persons parking in the lower level of the garage. The development plans require an estimated 5000 tons of soil be removed to construct the lower level of the garage. The CAP prepared and approved for the site indicates that the removal of 500 tons of soil will adequately address the vapor risk. The developer believes the RP should be responsible for the loading, hauling, and disposal of all 5000 tons of soil.

Course of Action: The DEQ will require the RP to address the risk presented by the contaminated soil and deal with the risk as specified in the approved CAP. Therefore, the RP will be responsible for hauling and disposing of the 500 tons of contaminated soil that was required to be addressed in the CAP and these activities will be eligible for reimbursement provided this was a fund-eligible release. The DEQ will not require the RP to haul or dispose of soil above what is specified in the approved CAP and the management of any soil above what is specified in the approved CAP will not be considered eligible for reimbursement. Reimbursement will not be considered for costs associated with excavating or loading the 500 tons of soil because the developer needs to remove this soil in order to construct the garage and the equipment needed for excavating and loading soil already will be on site.

**NOTE: As a general rule, DEQ will not require a RP to remove the volume of contaminated soil or saturated soil at a development project that is required to be excavated to meet the project's construction needs. Only the hauling and disposal of these soils may be considered for reimbursement.**

**Example 5-16. Scenario to evaluate Fund eligibility for soil disposal**

Scenario: A gasoline station with a closed PC number is the site for a future redevelopment project. Free product was never found at the site while the case was open. Some petroleum saturated soils were left on site since they were not believed to be contributing to free product, they were beneath an unoccupied structure, and leaving the soils in place posed no risk to receptors.

Development plans were submitted to the locality after the case was closed. During the construction activities, a significant amount of free product was found in the area where petroleum saturated soil had been identified during Site Characterization. The construction activities associated with redevelopment have made the saturated soils accessible. The developer believes that the case should be reopened and that DEQ should request the RP to remove the remaining saturated soils.

Course of Action: Since significant free product was missed during Site Characterization, DEQ can re-open the case. If the free product was discovered during Site Characterization, it would have been addressed while the case was still open. The RP must remove free product to the extent practicable and, since petroleum saturated soils are now accessible and evidence suggests these soils may be a continuing source of free product, haul and dispose/treat those soils. Costs associated with hauling and disposing/treating the petroleum saturated soils will be eligible for reimbursement from the Fund.

As a general practice, DEQ usually requires all saturated soils be removed during corrective action activities. In this situation, saturated soils originally were allowed to remain at the site because no free product was found, they were beneath the structure, and they did not pose a risk to receptors. The soils should be addressed now because free product has been found and the petroleum saturated soil is readily accessible.

**Example 5-17. Scenario to evaluate Fund eligibility for soil disposal**

Scenario: A large heating oil release occurred on a commercial property. There are petroleum saturated soils and free product at the site. Some of the petroleum saturated soils were removed and five wells were installed for free product recovery as part of the CAP. The remaining petroleum saturated soils are beneath the parking lot of the property and the parking lot would need to be removed in order to remove the soil. The CAP did not require the removal of the saturated soils beneath the parking lot due to the difficulty of accessing them and since no receptors were identified. The PC is still open and free product recovery continues.

After the CAP was approved, a developer filed documents with the local government office. The developer plans to remove the parking lot and excavate large amounts of soil for a future building. Most of the saturated soil at the site will be excavated as part of the site re-development process.

Course of Action: Although the initial CAP did not require the removal of all of the saturated soils and planned use documents were not on file prior to CAP development, a CAP addendum related to removing the remaining petroleum saturated soil should be developed. Consequently, costs associated with hauling and disposal (not loading) of the petroleum saturated soil should be eligible for reimbursement from the Fund. The only reason the saturated soils beneath the parking lot were not addressed in the initial CAP was due to the difficulty in removing them. They should be removed since they are a continuing source of free product.

**Example 5-18. Scenario to evaluate Fund eligibility for soil disposal**

Scenario: A diesel release occurred at a commercial gas station. Site Characterization indicates that there is a small amount of petroleum saturated soil (less than 25 tons) at the site and no free product. Risks are below DEQ's risk management thresholds. Based upon the absence of free product and lack of risk, it is decided that the petroleum saturated soil can be left in place and the case is closed

Several years after case closure, the tanks are closed, and another entity purchases the property to develop it. The new land owner plans to excavate in the area where petroleum saturated soil was present and wants DEQ to re-open the case and pay for costs to haul and dispose/treat this soil.

Course of Action: DEQ closed the case because of lack of risks and no free product. DEQ will not re-open this case since no free product has been found and there is no evidence that significant risks to any receptors existing at the time the case was open were missed.

Petroleum Contaminated Soil at VDOT Projects

The Virginia Department of Transportation (VDOT) often initiates new road construction projects and/or upgrades to existing roads. As a result of these activities, VDOT may encounter contamination from sites that were closed by the DEQ Storage Tank Program. VDOT is slightly different than most other entities in that they do not have to file building plans with local governments. VDOT does, however, have a "Six Year Plan" that outlines future road construction projects. In order for DEQ to consider a VDOT project to be a known future use, the project must: (1) be included in the Six Year Plan; and (2) be funded. Case Managers can establish if a project is on VDOT's Six Year Plan and is funded using the following link <http://syip.viriniadot.org/>.

Regional Case Managers should advise consultants and others preparing Site Characterization Reports to review the VDOT Six Year Plan for the area to evaluate whether the release may pose risks to known future uses. If risks to known future receptors are found and exceed DEQ risk management thresholds, the RP should be required to mitigate the risks to appropriate levels.

**NOTE: The fact that VDOT may incur additional project costs to deal with contaminated materials does not constitute a risk. Moreover, lack of Fund access by VDOT is not a risk.**

5.4.3.2.4 Protection of Ground Water as a Resource

Releases from tanks or other containment systems commonly result in contamination of ground water. Once the source of contamination has been neutralized or eliminated, decisions regarding the necessity of and extent to which ground water must be remediated should be based upon a combination of risks and applicable remedial technologies. Ground water is not necessarily a receptor, but rather a medium through which constituents may migrate to a receptor.

When a potential receptor utilizes ground water as a source of potable water, DEQ will evaluate remedial options on the basis of preventing the receptor from being exposed to contaminated ground water via the ingestion pathway. Remedial endpoints must, therefore, be designed to prevent ingestion of contaminated water. DEQ has established this policy due to the low drinking water standards for certain petroleum constituents (e.g. benzene) and the potential for variability in constituent concentration within the impacted drinking water supply.

Corrective actions dealing with impacted drinking water supplies may take several forms. The corrective action may protect the receptor by: (1) reducing contaminant concentrations in the impacted medium, or (2) eliminating the pathway of contact between the receptor and the contaminant. The relative costs of these approaches and the risk reduction likely to be achieved should be compared when determining what type of corrective action to take. Other important issues to be considered include:

1. What costs are associated with an alternate water supply (AWS)?
2. Are the costs for AWS incurred once (e.g. installation of a deep well or hookup to public water) or do they recur on a continuing, long-term basis (e.g. maintenance of a carbon filtration system)?
3. Have wells or receptors already been impacted?
4. What is the number of wells impacted or likely to be impacted by the release?

#### 5.4.3.2.5 Transitory Receptors

Persons coming into contact with or having the potential to come into contact with contaminated media are considered receptors or potential receptors regardless of the duration of the exposure. Risks to transitory receptors must, therefore, be evaluated along with risks to chronic or long-term receptors.

A common type of transitory receptor at many sites is the construction worker. When construction workers will come into contact with contaminated media, risks to these individuals must be evaluated. It is important for staff to remember that the frequency and duration of exposure for transitory receptors such as construction workers are different than those for chronic or long-term receptors in a residential exposure scenario and risks to these persons must be evaluated accordingly.

**NOTE: DEQ believes that risks to persons involved with the cleanup of a regulated substance do not need to be considered in the SCR. These persons should be OSHA trained to deal with hazardous constituents and they are expected to utilize the appropriate procedures and personal protective equipment to reduce their exposure to acceptable levels.**

#### 5.4.3.2.6 Discharges of Regulated Substances to Surface Water

DEQ staff often deal with releases from storage tanks that reach surface water. The "Surface Water Standards with General, Statewide Application" (9 VAC 25-260-20) states:

"All state waters shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amount, or combinations which contravene established standards or interfere directly or indirectly with reasonable, beneficial uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life. Specific substances to be controlled include floating debris, oil, scum, and other floating materials;..."

This general standard indicates that petroleum or regulated substances entering surface water must be controlled. DEQ staff will require responsible persons to prevent releases from causing a sheen on surface waters or violating surface water quality standards (see Examples 5-10 through 5-17 for determining the person who should be the permittee at sites with future use issues).



Appendix R contains a list of in-stream values for constituents commonly associated with petroleum and provides suggestions to staff regarding methods that may be used to identify maximum concentrations of constituents that may be discharged to surface water via baseflow and interflow. The values for aquatic life were established at concentrations that are believed to be protective of beneficial uses of the receiving stream. The regional Case Manager shall have the ultimate authority to identify the appropriate means of establishing the maximum concentration of a constituent from a storage tank release which may be discharged to surface water via baseflow or interflow.

**NOTE: Effluent limits for point source discharges to surface water that have or need a VPDES permit shall be established by DEQ Permit Staff.**

#### 5.4.3.2.7 Drinking Water Standards and Remedial Endpoints

DEQ Storage Tank Program does not use drinking water standards as cleanup endpoints. The Storage Tank Program has a zero tolerance practice for petroleum constituents in private water supply wells. The provision and/or maintenance of a drinking water supply that is not contaminated by petroleum constituents is a remedial endpoint at all sites where drinking water supplies have been impacted or may be impacted.

DEQ Storage Tank Program considers the cleanup of the source area to endpoints that prevent impacts to water supplies to be the preferred method of protecting drinking water supplies. DEQ staff, tank owners/operators, and consultants need to be aware, however, that current cleanup technologies may not be able to prevent drinking water supplies from becoming contaminated at certain sites. The tank owner/operator and consultant must consider remedial alternatives related to both the cleanup of contaminants and the permanent provision of alternate water supplies in any situation where water supplies have been impacted or may be impacted by the release.

**NOTE: The provision of an alternate water supply that is highly unlikely to become contaminated may be the preferred course of action in those instances where the source is still active (i.e. the storage tanks are still being used) and future releases are possible.**

Remedial endpoints used by the Storage Tank Program are site-specific and risk-based. Moreover, remedial endpoints are based upon actual risks to current receptors and known future receptors (see Section 5.4.3.2.2 for additional information on endpoint determination and future use). Drinking water is only a pathway of concern when ground water in the area near the release is presently used as a drinking water source or plans have been filed with a governmental entity for using the ground water as a drinking water source.

Table 5-10. Primary Drinking Water Standards		
Constituent	MCLG <sup>1</sup> (mg/l)	MCL <sup>2</sup> (mg/l)
Benzene	Zero	.005
Benzo(a)pyrene	Zero	.0002
1,2-DCA	Zero	.005
Ethylbenzene	.7	.7
Ethylene dibromide	Zero	.00005
Styrene	.1	.1
Toluene	1	1
Xylenes (total)	10	10

<sup>1</sup> Maximum Contaminant Level Goal (MCLG) - The maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows for an adequate margin of safety. MCLGs are non-enforceable public health goals. (EPA Office of Ground Water and Drinking Water).

<sup>2</sup> Maximum Contaminant Level (MCL) - The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. MCLs are enforceable standards. The margins of safety in MCLGs ensure that exceeding the MCL slightly does not pose significant risk to public health. (EPA Office of Ground Water and Drinking Water).

**NOTE: The Virginia Dept. of Health has established an advisory level of 20 ug/l (.02 mg/l) for MTBE in public water supplies. The Virginia Health Department will notify or advise DEQ when the MTBE concentration in a public water supply equals or exceeds this concentration.**

#### 5.4.3.3 Remediation Assessment

The final section of the SCR is the remediation assessment. The primary purpose of the remediation assessment is to evaluate the potential for remediation at the site and the applicability of potentially appropriate remedial technologies. Along with considering the merits and feasibility of active remedial technologies, the owner or operator is also expected to evaluate the potential for natural attenuation at the site as well as case closure with no further action.

A description of and conceptual design for each potential remedial alternative should be included in the remediation assessment along with an estimated time frame for implementation and duration of the remedial alternative to achieve the risk based endpoints. The report must provide an estimate of the relative costs for the applicable technologies. Finally, the remediation assessment must contain a recommended course of action based upon all information generated during the site characterization process.

##### 5.4.3.3.1 Natural Attenuation

Natural attenuation is the use of unenhanced natural processes to meet remedial endpoints. These processes include dispersion, dilution, sorption, volatilization, biodegradation, and chemical or biological transformation. Typically, all petroleum contaminated sites undergo some degree of natural attenuation during the remediation of the release. Some of the factors that influence the effectiveness of natural attenuation include the types and concentrations of chemicals present, the extent and depth of the contamination, and site specific geologic and hydrologic conditions. Monitored Natural Attenuation (MNA) may be considered an acceptable remedial method to be used at sites with a low risk of impact to

potential receptors and where monitoring is necessary to validate that an impact to a receptor will not occur. In most instances, MNA is considered a long term corrective action and should go through the Corrective Action Plan process. In rare instances, MNA may be performed in conjunction with post SCR monitoring. In these situations, MNA activities that are expected to last longer than one year (more than four quarters of sampling) should go through the Corrective Action Plan process. An approved CAP will outline MNA as the long term corrective action and ensure that the CAP will not be altered due to future land use changes.

**NOTE: If a site is in the Post SCR Monitoring Phase and monitoring indicates that concentrations of petroleum contaminants are increasing or a potential receptor is discovered, then a Corrective Action Plan should be developed for the site.**

MNA relies on natural attenuation processes combined with periodic monitoring and active remediation technologies (if applicable) to achieve remedial endpoints. Periodic monitoring and model calibration is necessary to evaluate whether natural attenuation is working effectively at a site (i.e. the contaminant plume is behaving as predicted). At the discretion of the Case Manager, it may be necessary to monitor site geochemical parameters prior to and during MNA to identify the environmental conditions that may reduce or enhance the effectiveness of natural attenuation processes. These parameters include pH, oxidation reduction potential (ORP), concentrations of iron, oxygen, methane, sulfate, and nitrate in ground water, etc. It is important to note that certain petroleum constituents are better suited than others to be degraded through natural attenuation processes. For example, biodegradation is typically more effective at degrading BTEX than MTBE. Monitoring only for petroleum constituents and additives (e.g. MTBE, EDB) may not be sufficient to evaluate the effectiveness of natural attenuation.

In accordance with the EPA's Office of Solid Waste and Emergency Response directive 9200.4-17P, "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites," a monitoring program for natural attenuation should be designed to accomplish, but not limited to the following:

1. Demonstrate that natural attenuation is occurring (i.e. concentrations of contaminants are declining);
2. Detect changes in environmental conditions (e.g., hydrologic, geochemical, etc.) that may reduce the effectiveness of natural attenuation processes;
3. Identify contaminants that were generated through degradation of site contaminants;
4. Confirm the vertical and lateral extent of the dissolved phase plume is not expanding;
5. Confirm no impacts to downgradient receptors are occurring;
6. Identify new releases that could impact the effectiveness of the natural attenuation process;
7. Demonstrate the effectiveness of controls that were put in place to protect nearby receptors; and
8. Verify attainment of remedial endpoints.

#### 5.4.4 Investigation and Characterization of Discharges from Heating Oil Tanks

Releases from heating oil tanks are being reported with an increasing frequency as homeowners interface with fuel suppliers, real estate agencies, and local government about their heating oil tank. The scope of work required to investigate and complete corrective actions following a discharge from a heating oil tank can vary tremendously depending upon the extent and severity of contamination from the discharge and the risks posed by the discharge. This following guidance discusses the procedures by which DEQ will evaluate and manage discharges from heating oil tanks.

#### 5.4.5 Suspected and Confirmed Releases (Discharges) from Heating Oil Tanks

Discharges from heating oil tanks must be reported to DEQ and are governed by Article 11. Article 11 does not address “suspected releases.” The law, however, stipulates that the person causing or permitting a substantial threat of a discharge must take action deemed necessary by the Board to contain and clean up such a discharge or threat of a discharge.

Confirmed releases (discharges) from heating oil tanks must be reported to DEQ in accordance with the requirements of Article 11 of the State Water Control Law. DEQ has the responsibility to evaluate these situations and decide if further action or investigation is warranted. The following will be treated as confirmed releases from Home Heating Oil Tanks:

1. The presence of visible free product in the environment;
2. TPH concentrations in soil samples collected during tank removal that are 100 mg/kg or greater;
3. TPH concentrations in water samples collected from the tank pit area during tank removal that are 1 mg/l or greater;
4. An impacted receptor (e.g. petroleum contaminated water supplies, petroleum impacted surface water, petroleum vapors in a basement or crawlspace not associated with an oil furnace); and
5. Inordinate loss of fuel.

As discussed in the DEQ Reimbursement Manual, DEQ may post-approve reimbursement for emergency response actions needed to abate an immediate risk to a receptor. The tank operator or consultant should contact DEQ within 24 hours to seek approval for the work performed in these circumstances. Regardless of the necessity of actions, any work performed more than 24 hours prior to the time the release was reported will not be eligible for reimbursement.

The conditions listed below may indicate a potential threat of a discharge, but do not necessarily indicate that a discharge has occurred. Staff receiving reports of one or more of these conditions may **recommend** that the homeowner obtain additional information to evaluate whether a discharge has occurred. Staff **will not require** the collection of additional information.

Conditions indicating a potential threat of a discharge may include, but are not limited to:

1. An active tank with > 1 inch of water in the tank;
2. A report of problems with the oil furnace;

3. The combination of tank age and the context of its location (i.e. the tank is located in a subdivision with many discharges from home heating oil tanks); and
4. A PID/FID reading > background.

DEQ will not require tank operators to perform additional site activities to investigate the conditions indicating a potential threat of a discharge. DEQ does not reimburse the tank owner for these investigations since DEQ does not require them.

#### **5.4.6 Site Characterization and Categorization of Cases Following Discharges from Heating Oil Tanks**

Discharges from heating oil tanks are subject to the requirements of Article 11 of Virginia Water Control Law and persons causing or permitting discharges of oil from these tanks are required to report, contain, and clean up the discharge. The DEQ Storage Tank Program separates confirmed releases from heating oil tanks into four (4) categories: *No Further Action (NFA)*, *Category 1*, *Category 2*, and *Category 3*. These categories will be assigned based upon the information staff have about the site at the time the discharge is reported, severity and extent of contamination, risks from the discharge, and the size of the heating oil tank. Discharges from heating oil tanks having a capacity of greater than 1,000 gallons will be placed in *Category 3*. Case Managers should use the flowchart in Figures 5-2a through 5-2d to identify the appropriate approach for responding to discharges from heating oil tanks.

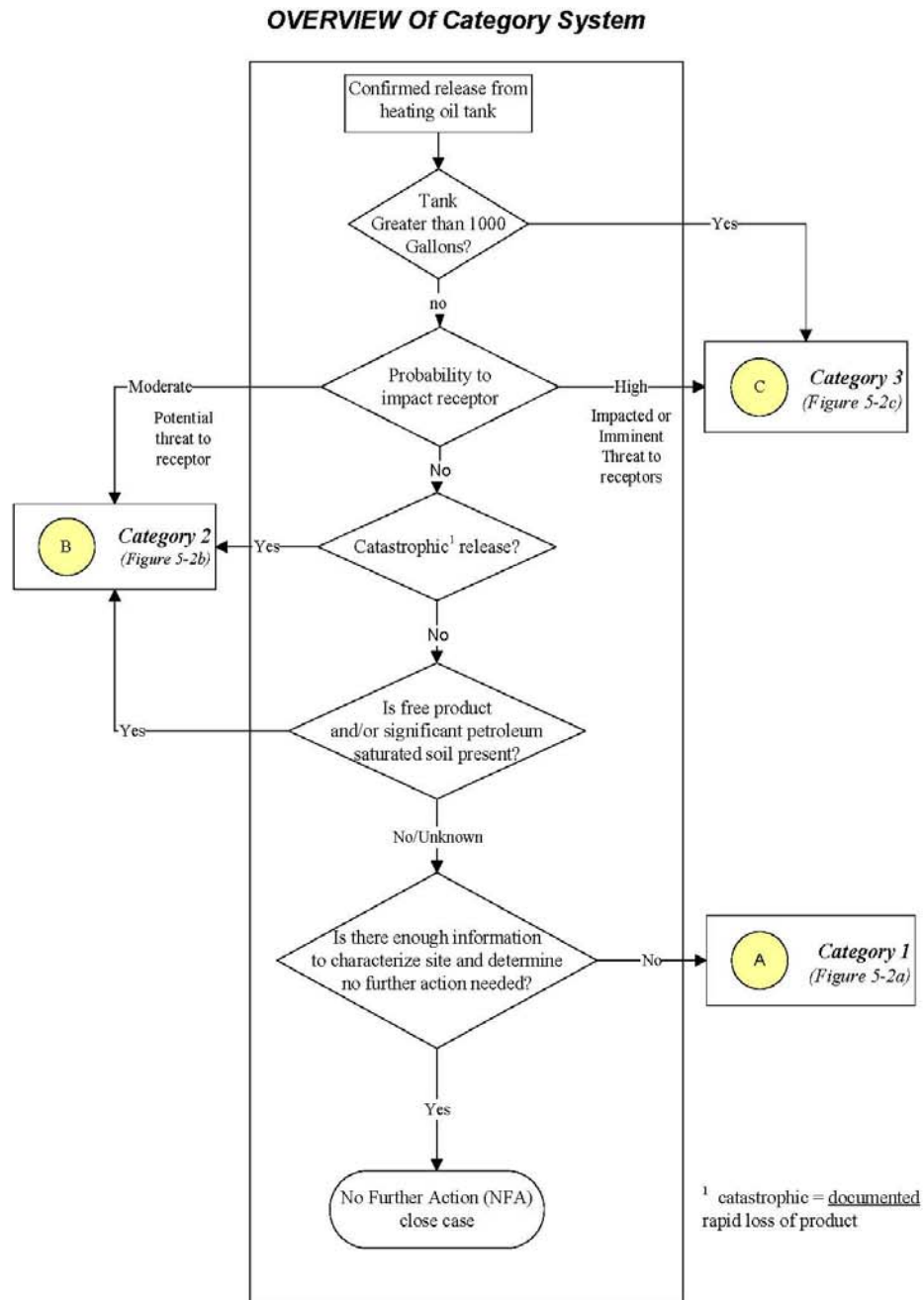
As with all other releases or discharges of petroleum or regulated substances into the environment, staff should ensure that appropriate actions are taken to protect human health and the environment. The release or discharge of oil from the tank and piping must be stopped, free product must be removed to the extent practicable, and petroleum saturated soil must be addressed in accordance with DEQ Storage Tank Program guidance.

##### **5.4.6.1 DEQ Evaluation for No Further Action**

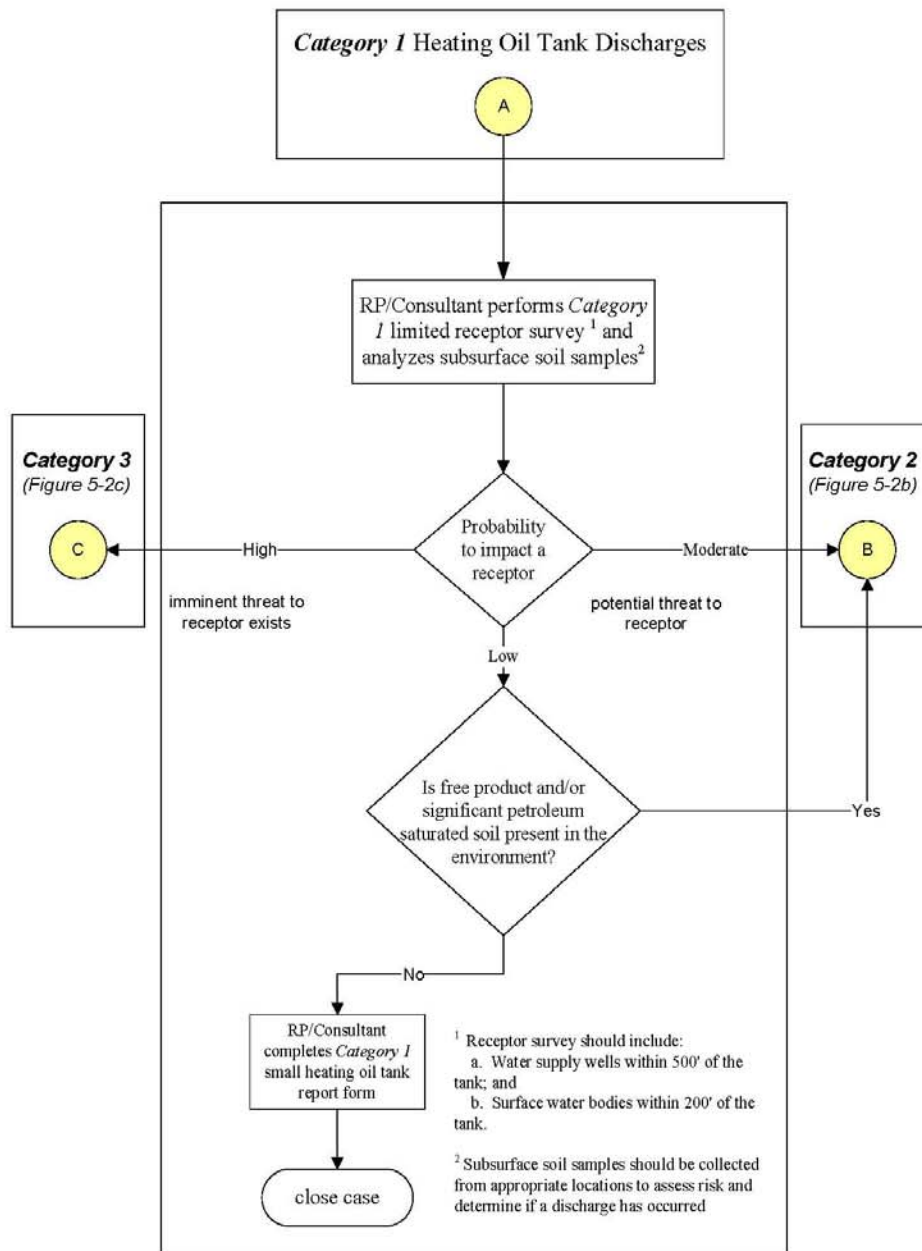
When a discharge from a heating oil tank is reported, the DEQ Case Manager may use existing information and professional judgment to evaluate whether no further action (*NFA*) is necessary at the site. *NFA* sites pose a low risk to impact receptors, have little or no free product, and minor amounts or no petroleum saturated soil. A *NFA* determination is appropriate at sites where the area is served by public water, the leaking tank has been out of service for an extended period and is not believed to be contributing product to the environment, and there is no reason to expect any impact(s) to receptor(s). Since *NFA* determinations constitute confirmed releases, a pollution complaint number is required for these cases.

If an out of service tank is present at the site, the Case Manager may recommend that the tank operator contact the local building official/fire marshal and properly close the tank. The Case Manager has the discretion to withhold the case closure letter until the tank has been properly closed if this action is believed necessary to prevent further discharges (*e.g.*, to prevent the UST, with fill and vent line still in place, to be inadvertently filled with product). An example case closure letter for a heating oil tank discharge is located in Appendix E.

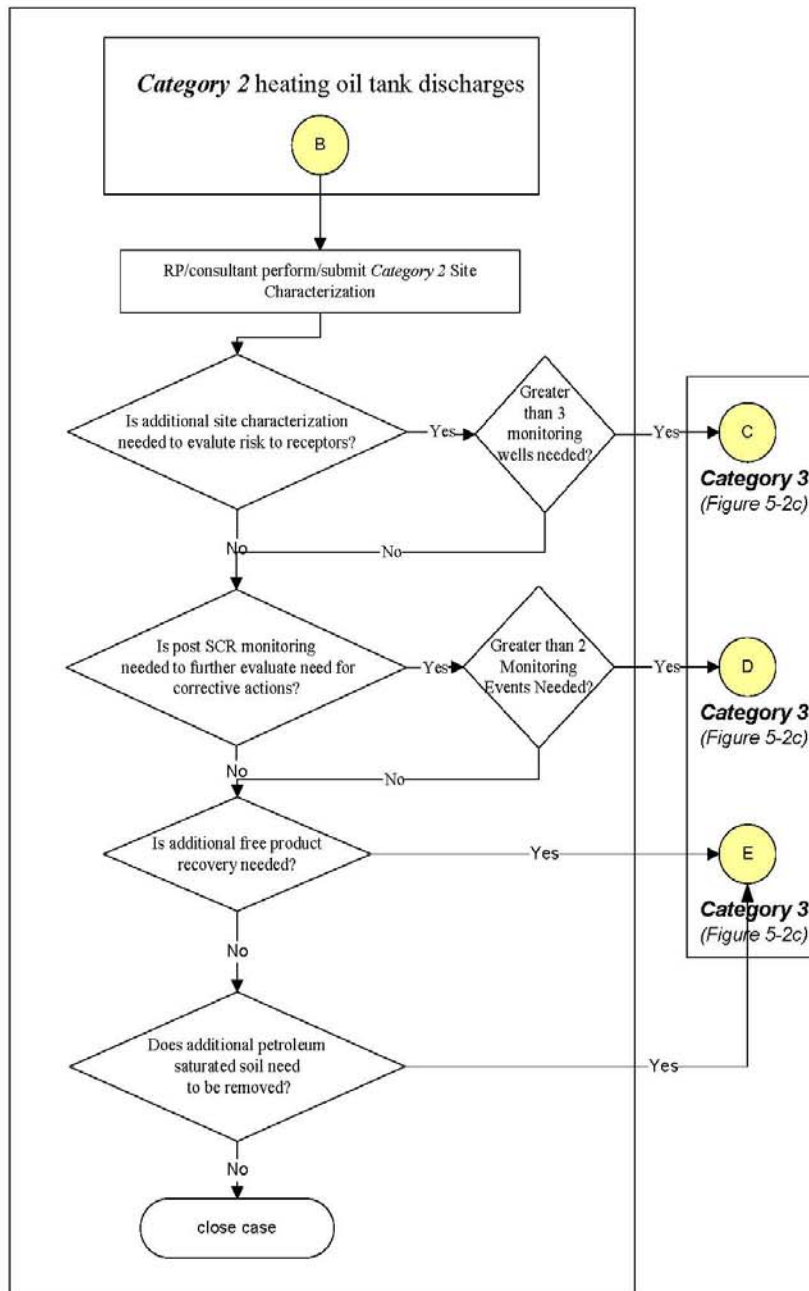
**Figure 5-2**  
Release Response at Heating Oil Tank Sites



**Figure 5-2a**  
 Release Response at Heating Oil Tank Sites

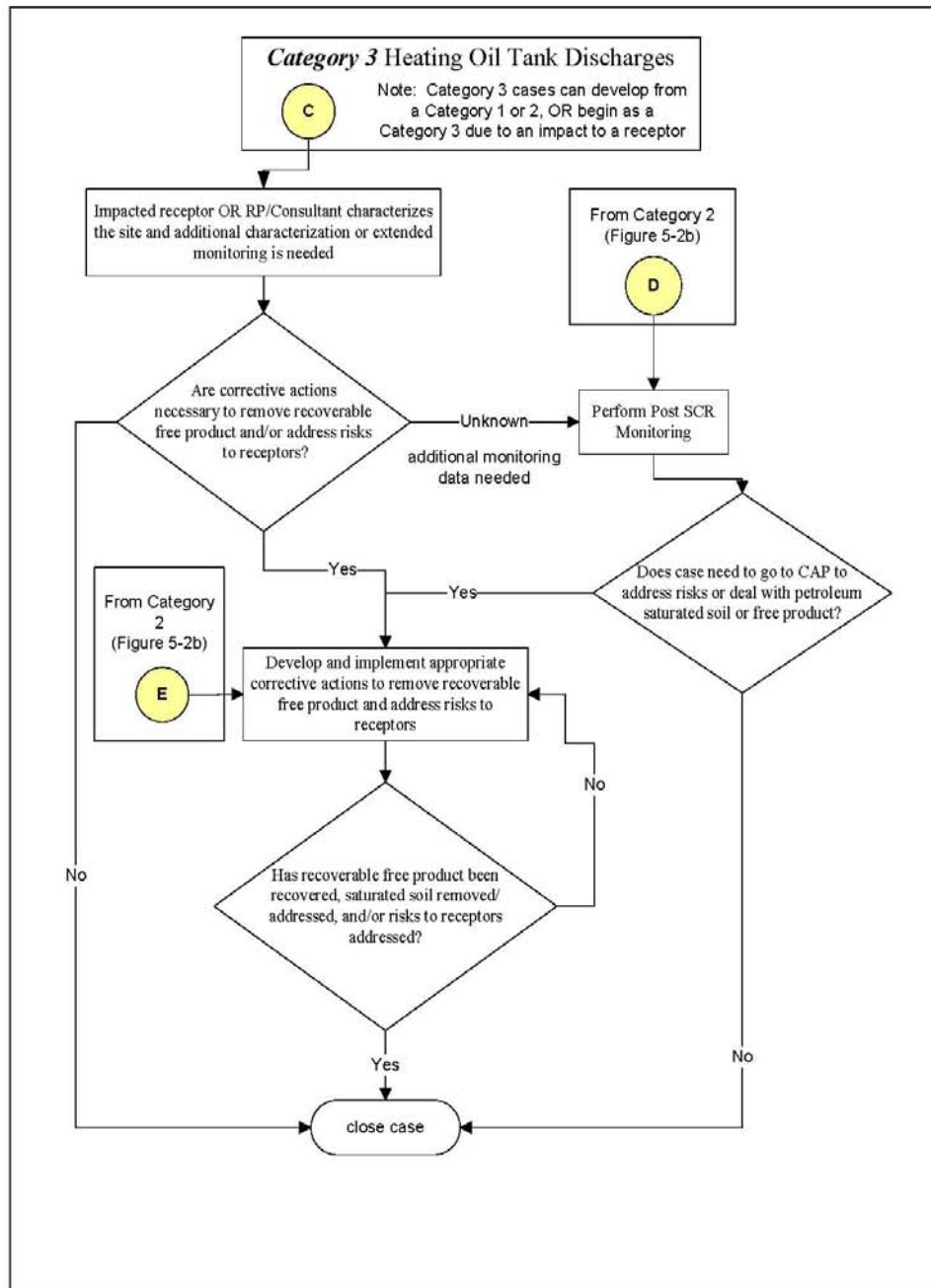


**Figure 5-2b**  
Release Response at Heating Oil Tank Sites





**Figure 5-2c**  
 Release Response at Heating Oil Tank Sites



### 5.4.6.2 Category 1 Heating Oil Tank Discharges

*Category 1* sites pose a low risk to impact receptors, have little, or no free product and minor amounts or no petroleum saturated soil. These sites only require limited field work and the submission of a Heating Oil Tank Release Characterization Report Form (Appendix AC). If an impacted receptor has not been identified at the time the discharge is reported and if DEQ has decided that the *NFA* category is not appropriate, the heating oil tank discharge will start as a *Category 1* site. At many *Category 1* sites an out-of-service heating oil tank is still in place. The DEQ Case Manager should authorize the removal and disposal of the remaining oil/water/sludge from the tank.

A *Category 1* site may be closed following completion of the Heating Oil Tank Release Characterization Report Form if the Case Manager determines that there is low risk to impact receptors, the discharge has been stopped, and site information indicates there is no recoverable free product and no significant amount of petroleum saturated soil.

#### ***Category 1 Reporting***

Discharges from home heating oil tanks for *Category 1* sites generally are reported to DEQ following the discovery of petroleum in the environment. Most often, the discovery of petroleum occurs during a Phase II investigation (e.g. the results from a sample taken exclusively for a property transaction). Less often, petroleum odors in the ambient air (i.e. breathing zone) above an UST are observed.

For Phase II investigations or other activity initiated at the request of a party other than DEQ staff:

- The time and materials to collect samples and all other work performed is not eligible for reimbursement.
- The cost of the sampling analysis indicating a confirmed release is eligible for reimbursement if the analytical results are reported to DEQ within 24 hours of their receipt by the tank operator or consultant.

#### ***Category 1 Scope of Work***

Typical work at a *Category 1* home heating oil tank site includes performing a visual receptor survey, collecting one to four soil samples and analyzing those samples for TPH/DRO, and preparing the Heating Oil Tank Release Characterization Report Form (Appendix AC).

##### Soil sample collection:

- After the site is assigned to *Category 1* for characterization, staff typically will authorize the collection of 1 to 4 soil samples along with analysis of the samples for Total Petroleum Hydrocarbons, Diesel Range Organics (TPH/DRO). These samples usually will be collected with a soil auger. The number of soil samples to be collected and analyzed will be agreed upon by the Case Manager and consultant on an AAF.
- It is recommended that samples not be collected from previous borings due to possible infiltration of rainwater or other factors that might dilute the contamination. However, if the Case Manager

and consultant agree that one or more samples are needed from a previous boring, any additional samples collected from that boring should be taken from at least two feet below the terminal depth of the previous boring to preserve data integrity.

Visual Receptor Survey:

A visual receptor survey is part of the *Category 1* investigation and involves identifying the location of wells within 500 feet of the tank and surface water within 200 feet of the tank. Well completion information is not required for wells identified as part of a *Category 1 receptor survey*.

Product/Fluid removal:

- The Case Manager should not authorize fluid removal if only water remains in the tank for the Category 1 case.
- Except for catastrophic release (as noted below) the Case Manager should only authorize fluids removal one time for each heating oil release.
- When fluids removal from the tank is authorized as part of a Category 1 investigation it is expected that the consultant will wait for the soil analytical results before pumping out the tank.
- In the event the analytical results of the samples collected indicate petroleum saturated soils, the consultant should notify the Case Manager and the case should be elevated to a *Category 2*. In this situation fluid removal should be done as part of the Category 2 tank removal to access product and/or petroleum saturated soils.
- If there is documented evidence of a rapid catastrophic release of product from the tank or if there is a chance of product overflow from the tank due to excessive rainfall or flooding, the tank fluids should be removed as soon as possible. The Case Manager should authorize the Junior Level Professional to return to the site and oversee the removal of fluids from the tank.
- DEQ will only authorize the removal of fluids from a tank more than once when the following situation occurs:
  - a) initial fluid removal is needed to abate a rapid catastrophic release of product from the tank or if there is a chance of product overflow from the tank due to excessive rainfall or flooding; and
  - b) the second fluid removal is needed to remove water (that has infiltrated into the tank since the initial fluids removal) so that the tank can be removed to access product and/or petroleum saturated soil.

Situations involving the rapid catastrophic release of product and the presence of free product and/or petroleum saturated soil generally will be elevated to home heating oil tank *Category 2*.

Report Preparation:

Staff will authorize report preparation time to complete the Leaking Heating Oil Tank Characterization Report Form (Appendix AC).

**Category 1 Work Authorization and Typical Units**

DEQ staff will authorize the materials, equipment, tasks, and personnel time needed to perform a limited site characterization and visual receptor survey, prepare the Heating Oil Tank Release Characterization Report Form, and prepare the reimbursement claim. Typical tasks, materials, and personnel needed to complete a *Category 1* Heating Oil Tank discharge investigation are outlined below. The *Category 1* AAF with summary instructions is located in the Reimbursement Guidance Manual on DEQ’s website at <http://www.deq.virginia.gov/tanks/guidance.html>.

Units for the following task, material, and personnel codes typically are authorized at *Category 1* heating oil tank sites include:

<b>1-2</b>	<b>Hours</b>	<b>M0003</b>	<b>Project Manager</b> (Initial Site Visit to plan field work to be performed by staff and visual receptor survey, 1-2 hours is expected for these activities)
*	<b>Hours</b>	<b>M1481</b>	<b>Project Manager Travel</b>
<b>4-6<sup>a</sup></b>	<b>Hours</b>	<b>M0005</b>	<b>Junior Level Professional</b> (Oversee sampling and log borings; oversee removal of product and fluids from tank if needed)
*	<b>Hours</b>	<b>M1483</b>	<b>Junior Level Professional Travel</b>
*	<b>Mile</b>	<b>M0617</b>	<b>Vehicle Mileage – autos, vans, and pick-ups.</b> (Up to three trips: for PM, for Jr. Level plus Technician, and for Jr. Level)
<b>1-4<sup>a</sup></b>	<b>Sample</b>	<b>T030</b>	<b>Soil Sampling w. Hand Auger</b> (Case specific; more than 1 sample usually will be authorized unless samples from previous work have been analyzed)
*	<b>Hours</b>	<b>M1485</b>	<b>Technician Travel</b>
*	<b>Each</b>	<b>M1157</b>	<b>Bailer - Disposable Polyethylene</b>
*	<b>Sample</b>	<b>M1366</b>	<b>Method 8015C - modified TPH-DRO in water/wastewater</b>
<b>2-4<sup>a</sup></b>	<b>Sample</b>	<b>M1368</b>	<b>Method 8015C - modified TPH-DRO in solid waste/soil</b>
<b>3-4<sup>b</sup></b>	<b>Hour</b>	<b>M1766</b>	<b>Vacuum Truck, includes operator and operating cost *</b>
	<b>Gallon</b>	<b>M1290</b>	<b>Free Product/Contaminated Water Disposal</b>
<b>1-2<sup>c</sup></b>	<b>hour</b>	<b>T100</b>	<b>Report Writing</b>
<b>1</b>	<b>Each</b>	<b>T040</b>	<b>General Project Management</b>
<b>1</b>	<b>Claim</b>	<b>T114</b>	<b>Reimbursement Claim Prep</b>

\* = Site Dependent

<sup>a</sup> = Most home heating oil tanks have a capacity of 550 gallons or less and 2 to 4 soil samples are expected to be sufficient to characterize the contamination in most cases. This total number of soil samples includes samples collected during a Phase II site assessment. If a sample was collected during a Phase II site assessment, analyzed, and the TPH concentration in that sample was above 100 mg/kg, but well below petroleum saturation, staff may be justified in authorizing only one additional sample from the opposite end of the tank. If a 1000 gallon home heating oil tank is encountered, more than four samples may be needed to adequately characterize the release. The number of hours allowed for a Junior Level Professional is expected to correspond with the number of samples that will be collected. If more than 4 samples are authorized by the Case Manager, the Case Manager may authorize more than 6 hours for the Junior Level Professional to oversee sampling, log the borings, and oversee the vacuuming of product from the tank (if needed). The number of samples authorized and the number of analyses authorized will be lower if samples were collected as part of a Phase II site assessment or activity directed by a party other than DEQ.

<sup>b</sup> = This is a typical minimum time for use of a vacuum truck in an urban area. Different amounts of time may be more appropriate if the tank is located in a rural area.

<sup>c</sup> = *Category 1* reports are provided on a fill-in-the-blank form (Heating Oil Tank Release Characterization Report Form) and one hour generally is believed to be a sufficient amount of time to prepare the report form. Up to two hours of report preparation may be justified in cases where greater than 4 samples, soil and/or water, were collected and analyzed, and if additional maps, aerial photographs and site photographs are included in the report.

### ***Transition from a Category 1 Heating Oil Tank Discharge to Another Category***

Discharges from heating oil tanks will be placed into *Category 1* if preliminary information indicates that there is little risk to receptors and there is little to no free product or petroleum saturated soil. Additional soil samples typically are collected during the *Category 1* Site Characterization and the tank operator and/or consultant are required to perform a receptor survey. Cases where a moderate threat to a water supply or surface water is believed to exist, the tank operator/consultant must contact the Case Manager and an appropriate course of action must be identified. If the receptor is believed to be at a moderate degree of risk, the case should be moved to *Category 2*. The discovery of significant petroleum saturated soil or free product in the environment also must be reported to the Case Manager and the site should be reevaluated according to Figures 5-2 – 5-2c. If an imminent threat to a receptor is found (typically the discharge point is in very close proximity to a water supply or surface water), the tank operator/consultant must contact DEQ and, with the Case Manager's concurrence, the site should be moved to a *Category 3* heating oil discharge so that a more detailed characterization may occur.

**NOTE: The discovery of petroleum saturated soil during the *Category 1* Site Characterization does not always indicate that a case should be moved to *Category 2*.**

**Example 5-19. A discharge from a heating oil tank is discovered and reported as a result of a Phase II Investigation**

The homeowner or prospective buyer directs a consultant to perform an investigation and collect samples from the vicinity of a heating oil tank. Analytical results from one or more of the samples collected as part of this investigation indicate that a discharge from the heating oil tank has occurred. The tank operator and/or consultant report the discharge to DEQ.

This investigation was initiated at the direction of an entity other than DEQ. The time to collect samples and other work performed as part of this investigation are not eligible for reimbursement. DEQ may reimburse the tank operator for costs associated with the analytical result(s) indicating a discharge has occurred provided that the discharge is reported within 24 hours of receipt of the analytical results.

If the site is placed into *Category 1*, staff will authorize the time and personnel needed for the consultant to return to the site and obtain additional samples. The consultant should not use the original boreholes to get a deeper sample; rather new borings should be made to ensure sample quality and integrity.

The Case Manager should not authorize fluid removal for a *Category 1* case if only water remains in the tank. When fluid removal from the tank is authorized as part of a *Category 1* investigation, it is expected that the consultant will wait for the soil analytical results before pumping out the tank. In the event the analytical results from the samples collected indicated the presence of petroleum saturated soils the consultant should notify the Case Manager and the case should be elevated to a *Category 2*. In this situation fluid removal should be performed as part of the *Category 2* tank removal to access product and/or petroleum saturated soils.

**Example 5-20. A heating oil discharge is reported due to sudden loss of fuel or petroleum odor in tank area**

DEQ staff generally will authorize time, tasks, and personnel needed to go to the site and obtain 2 – 4 soil samples and perform a visual receptor survey. Also included is lab analysis of samples for TPH/DRO, personnel time to complete the Heating Oil Tank Release Characterization Report Form, and prepare a reimbursement claim.

If there is documented evidence of a rapid catastrophic release of product from the tank or if there is a chance of product overflow from the tank due to excessive rainfall or flooding the tank fluids should be removed as soon as possible. The Case Manager should authorize the Junior Level Professional to return to the site and oversee the removal fluids from the tank. DEQ will only authorize the removal of fluids from a tank more than once when the following situation occurs:

- a) initial fluids removal is needed to abate a rapid catastrophic release of product from the tank or to reduce the chance of product overflow from the tank due to excessive rainfall or flooding; and
- b) a second fluid removal event is needed to remove water (that has infiltrated into the tank since fluid was initially removed from the tank) so that the tank can be removed to access product and/or petroleum saturated soil.

Catastrophic releases should be elevated to *Category 2* since petroleum saturated soil and/or free product are expected.

### 5.4.6.3 Category 2 Heating Oil Tank Discharges

Discharges at *Category 2* heating oil tank sites have free product, petroleum saturated soil, or are believed to present a threat to drinking water supplies or a surface water body. Limited soil excavation, free product removal and vapor mitigation may be performed at *Category 2* sites. Sites may also be placed into *Category 2* if petroleum vapors are present in non-living space structures (e.g. crawl spaces) and it is believed that the *Category 2* guidelines for limited soil removal with ventilation of the crawl space will address protection of human health. Conditions at heating oil tank sites indicating a rapid catastrophic loss of fuel should also be characterized as a *Category 2* heating oil tank discharge if petroleum saturated soil and/or free product are believed present. The Case Manager may determine that site-specific conditions do not warrant free product recovery or the remediation of petroleum saturated soil. Justification that free product removal or remediation of petroleum saturated soil is not necessary must be documented by the case manager in the case file with a written memorandum.

At *Category 2* sites with Phase II investigations or other activity initiated at the request of a party other than DEQ staff:

- The time to collect samples and all other work performed is not eligible for reimbursement.
- The cost of sampling analysis indicating a confirmed release is eligible for reimbursement if the analytical results are reported to DEQ within 24 hours of their receipt by the tank operator or consultant.

*Category 2* phases of work include Site Characterization, Site Characterization Addendum, Post SCR Monitoring, and Closure. Occasionally additional site characterization is needed (Site Characterization Addendum phase), as part of a *Category 2* investigation. When a total of 3 or less monitoring wells are necessary, site work should be completed as a *Category 2* site. (See section 3.3.2 for Transition from *Category 2* to *Category 3*)

It is anticipated that most of the heating oil cases not closed as *Category 1* site can be closed as a *Category 2* site.

#### ***Category 2 Scope of Work***

*Category 2* sites often can be characterized by excavating up to 26 cubic yards (approx. 39 tons) of petroleum saturated soil, and conducting field work. Normally work performed at a *Category 2* discharge includes equipment, labor, time, and travel necessary to investigate the discharge and remove and dispose of up to 26 cubic yards (approx. 39 tons) of saturated soil. Time is included to conduct a visual survey of potential receptors within 500 feet of the leaking tank, collect samples from the tank pit, prepare a *Category 2* narrative report (see the fact sheet in Appendix C for a list of typical report elements), and prepare a reimbursement claim. Some sites warrant the installation of one or more groundwater monitoring wells. When applicable, the following documentation should be included in the site report: all boring logs, well construction diagrams, lab analytical reports, hauling and disposal manifests, and local permits. Photographic documentation is helpful and it is suggested that the tank operator/consultant provide this in the report. Certain materials such as plastic tarps, hay bales and plywood sheets can be used at multiple sites. The Case Manager only will reauthorize these items when the useful life of these

materials is gone.

Typical tasks, materials, and personnel needed to complete a *Category 2* Heating Oil Tank discharge investigation are outlined below. The *Category 2* AAF with summary instructions is located in the Reimbursement Guidance Manual on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>. Based on site conditions, the Regional Case Manager may authorize additional Task and Material and units to characterize and clean up the site.

Units for the following task, material, and personnel codes typically are authorized at *Category 2* heating oil tank sites include:

<b>1-2</b>	<b>Hour</b>	<b>M0003</b>	<b>Project Manager</b> (Initial Site Visit to plan field work to be performed by staff and visual receptor survey, 1-2 hours is expected for these activities. The Project Manager may oversee removal of fluid/product from the tank on the initial site visit [as approved by the Case Manager] if there is documented evidence of a catastrophic release and the materials remaining in the tank must be removed as soon as possible. In this situation, the Case Manager should authorize an additional 1 to 2 hours for a Project Manager to oversee removal of fluids from the tank.)
*	<b>Hour</b>	<b>M1481</b>	<b>Project Manger Travel</b>
<b>1</b>	<b>5% Per Claim</b>	<b>T040</b>	<b>General Project Management</b>
<b>8-10</b>	<b>Hour</b>	<b>M0004</b>	<b>Mid-Level Professional</b> (Supervise field work including soil excavation and removal of fluids from the tank and collect soil samples from backhoe bucket during the process of removing petroleum saturated soil. The typical amount of soil excavated from these sites is 10 to 20 tons. Eight hours is a reasonable amount of time for a mid-level professional where less than 13 tons of soil is excavated. An additional hour or two of time for the mid-level professional may be warranted when 13 – 20 tons of soil will be excavated. Additional hours for a mid-level professional may be warranted if the excavation of greater than 20 tons of soil is authorized by DEQ Case Manager.)
*	<b>Hour</b>	<b>M1482</b>	<b>Mid-Level Professional Travel</b>
<b>8-10</b>	<b>Hour</b>	<b>M1670</b>	<b>Equipment Operator</b> (Eight hours is believed to be sufficient in most cases. Additional hours may be authorized as deemed necessary. When a skid steer and mini-excavator combination is authorized, typically 2 operators for a total of 16 – 20 hours should be authorized)
*	<b>Mile</b>	<b>M0617</b>	<b>Vehicle Mileage – autos, vans, and pick-ups.</b>
<b>1</b>	<b>Day</b>	<b>M1771</b>	<b>Backhoe Loader – 75 HP, 4wd, 15,000 lb operating weight.</b> (In lieu of a backhoe loader, different equipment such as a Skid Steer Loader [Bobcat 853H] in combination with mini-excavator may be authorized. A total of 1 Heavy Equipment Mob/Demob should be authorized for Skid Steer and Mini Excavator.)
<b>2-4<sup>a</sup></b>	<b>Sample</b>	<b>M1368</b>	<b>Method 8015C</b> - modified TPH-DRO in solid waste/soil. (Additional samples may be authorized as needed by the Case Manager.)
*	<b>Sample</b>	<b>M1366</b>	<b>Method 8015C</b> - modified TPH-DRO in water/wastewater. May be authorized as needed by the Case Manager.
<b>3-4<sup>b</sup></b>	<b>Hour</b>	<b>M1766</b>	<b>Vacuum Truck</b> - includes Operator & Operation Cost (a 3 – 4 hour minimum may apply)
*	<b>Ton</b>	<b>T012</b>	<b>Thermal or Bio-treatment of petroleum contaminated soils</b> (Maximum expected is 39 tons)



*	<b>Gallon</b>	<b>M1290</b>	<b>Free Product/Contaminated Water Disposal</b>
<b>1-4<sup>a</sup></b>	<b>Sample</b>	<b>T133</b>	<b>Grab Sample</b> - Sample collected with backhoe or directly by hand. (The collection of up to 4 soil samples is expected to be typical at most sites having tanks of 550 gallons or less. Staff may require additional samples for larger tanks or to further delineate contamination as required by site conditions. Some or all of these samples may be collected with the backhoe bucket during the removal of petroleum saturated soil.)
<b>1</b>	<b>Round Trip Mob</b>	<b>T036</b>	<b>Heavy Equipment Mob/Demob</b> (A total of 1 should be authorized for Skid Steer and Mini Excavator)
*	<b>Sample</b>	<b>T086</b>	<b>Domestic Well Sampling</b>
*	<b>Hour</b>	<b>T132</b>	<b>Subsurface line location</b>
*	<b>Roll</b>	<b>M0058</b>	<b>Poly film (100' x 20') – 6 mil.</b> (Up to one roll of poly film may be authorized on a case-specific basis provided that the poly film will be used to contain petroleum contaminated soil prior to disposal. Staff will not authorize poly film if it will be used only for placement of the removed storage tank.)
*	<b>Sq. Ft.</b>	<b>T047</b>	<b>Re-seeding &lt; 1 acre</b> Re-seeding disturbed area (recommend using perennial/annual blend)
<b>1</b>	<b>Site</b>	<b>T014</b>	<b>Site Reconnaissance, initial site map</b> (This must be a to-scale map showing utilities, wells, septic fields, etc.)
*	<b>Hour</b>	<b>M0005</b>	<b>Junior Level Professional</b> (M005 only will be authorized for this person to supervise a Technician collecting soil samples with a hand auger [T030] in those cases where higher level personnel [mid-level professional, PM] are not already on site. This person will not be needed at all <i>Category 2</i> sites. Time for a Junior Level Professional to log soil borings is included in T028.)
<b>8-10</b>	<b>Hour</b>	<b>M0007</b>	<b>Technician</b> (Assists with excavation and general site work including moving soil and materials by hand. A technician will only be authorized in conjunction with M1771. A technician is not needed if two equipment operators are present at the site.)
*	<b>Hour</b>	<b>M1485</b>	<b>Technician travel.</b>
<b>6-10</b>	<b>Hour</b>	<b>T100</b>	<b>Report Preparation</b> (6 hours is expected to be sufficient for simple sites where 3 or 4 soil samples were collected and analyzed. If wells were installed, domestic wells were sampled or additional soil or ground water samples were collected, additional report writing hours corresponding with the complexity of the site should be approved. See Appendix D for reporting elements.)
<b>1</b>	<b>Claim</b>	<b>T114</b>	<b>Reimbursement Claim Prep</b>

**Tasks/Codes for Soil hauling and Backfilling:**

**If contaminated SOIL HAULING is less than 25 miles to the disposal facility the following codes may be utilized to haul contaminated soil away and bring in backfill materials.**

**1 Day M1299 Dump truck - tandem, 12 ton capacity** (Generally 1 day is sufficient for both soil hauling and backfill. If site conditions or delays at the disposal facility require additional time an additional ½ day may be authorized for backfill.)

OR

**1 Day M1300 Dump truck - three axle, 16 ton capacity** (Generally 1 day is sufficient for both soil hauling and backfill. If site conditions or delays at the disposal facility require additional time an additional ½ day may be authorized for backfill.)

**\* Ton M1725 Gravel.- #57 crushed stone.**

**If contaminated SOIL HAULING is 25 miles or more to the disposal facility, the contractor/consultant may claim the soil hauling T-code(s).**

*	<b>Ton/Mile</b>	<b>T075</b>	<b>Soil Hauling &lt; 75 Tons the First 100 Miles</b> (use T076 for additional miles > first 100)
*	<b>Ton/Mile</b>	<b>T076</b>	<b>Soil Hauling &lt; 75 Tons Over 100 Miles</b> (use only when miles > 100 in T075)
*	<b>A Code</b>		<b>Minimum hauling charge</b>
*	<b>Cubic Yard</b>	<b>T042</b>	<b>Backfilling</b>

**These Items/Codes are Expected when Monitoring Wells are Installed, Sampled, and/or Water Supply Wells are Sampled:**

*	<b>Sample</b>	<b>M1379</b>	<b>Method 8260B – Volatile Organics GC/MS in water/wastewater</b> (for analyzing water from domestic wells)
*	<b>Sample</b>	<b>M0149</b>	<b>Method 8270C – semi-volatile organics in water/wastewater</b> (for analyzing water from domestic wells)
*	<b>Round trip MOB</b>	<b>T023</b>	<b>Drill rig MOB/DMOB</b>
*	<b>Linear Foot</b>	<b>T025</b>	<b>Monitoring Well Installation, 2” dia. using HAS</b>
*	<b>Linear Foot</b>	<b>T079</b>	<b>Monitoring Well Installation, 2” diameter using Air Rotary</b>
*	<b>Hour</b>	<b>T028</b>	<b>Log soil borings.</b> Used to log monitoring wells or borings installed with a drill rig, task requires Jr. Level Prof.
*	<b>Hour</b>	<b>M1483</b>	<b>Junior Level Professional Travel</b> (only to be used when Jr. Level Prof. is at site to log soil borings [T028] or supervise a Tech collecting soil samples with a hand auger [T030])
*	<b>Well</b>	<b>T118</b>	<b>Monitoring Well Sampling, 2” diameter</b> (sampling performed by Technician).
*	<b>Sample</b>	<b>T086</b>	<b>Domestic Well Sampling</b>
*	<b>Hour</b>	<b>M1485</b>	<b>Technician travel.</b> (Tech samples monitoring wells [T118], domestic wells [T086], and collects soil samples w. a hand auger [T030]. Additional technician travel time and mileage to take samples to the lab may be authorized in conjunction with T028 {this additional time and mileage may be used in lieu of shipping M0099}).
*	<b>Sample</b>	<b>M1375</b>	<b>Method 8021B, BTEX/MTBE/Naphthalene in water/wastewater</b> (generally will be used for water samples collected from monitoring wells)
*	<b>Cooler</b>	<b>M0099</b>	<b>Shipping Laboratory Samples (up to 50 pounds).</b> (Use this code only in combination with T028 to send samples to the lab. In lieu of M0099, time for a technician to take samples to the lab may be provided.)

\* = Site Dependent

<sup>a</sup> = Most home heating oil tanks have a capacity of 550 gallons or less and 2 – 4 soil samples are expected to be sufficient to characterize the contamination in most cases. This total number of soil sample includes samples collected during any assessments performed at the request of parties other than DEQ staff. If a 1000 gallon home heating oil tank is encountered, more than four samples may be needed to adequately characterize the release. The number of samples authorized and the number of analyses authorized may be different if samples were collected as part of an activity directed by a party other than DEQ.

<sup>b</sup> = This is a typical minimum time for use of a vacuum truck in an urban area. Different amounts of time may be more appropriate if the tank is located in a rural area.

### ***Transition from a Category 2 Heating Oil Tank Discharge to Category 3***

*Category 2* phases of work include Site Characterization, Site Characterization Addendum, Post SCR Monitoring, and Closure. Occasionally additional site characterization is needed (Site Characterization Addendum phase), as part of a *Category 2* investigation. When more than 3 monitoring wells in total are necessary at a site, the *Category 2* site should transition to *Category 3*.

Two Post SCR monitoring events after the initial sampling may be performed under *Category 2* provided that the Case Manager believes this action is appropriate. The site must transition to *Category 3* if additional Post SCR Monitoring events are performed.

If the Tank operator/consultant finds more extensive petroleum saturated soil and/or free product during the *Category 2* Site Characterization Phase or if an imminent threat to drinking water supplies or surface waters is identified the Case Manager should be notified prior to completing the *Category 2* Site Characterization Report. If these conditions exist the Case Manager should elevate the case to a *Category 3*. In these cases the Site Characterization (including any additional work authorized by the case manager) should be completed under *Category 3 Site Characterization Phase*.

#### **5.4.6.4 Category 3 Heating Oil Tank Discharges**

Discharges at *Category 3* heating oil tank sites have impacted or present a high probability to impact a receptor or involve discharges from heating oil tanks having a capacity of greater than 1,000 gallons. These sites require a SCR before determining appropriate corrective actions. The Case Manager, tank operator, and consultant need to decide upon the scope of work needed to characterize the site. Work for *Category 3* sites follows the program's normal procedures for release response and corrective action. The Case Manager may require initial abatement, an appropriate site characterization, and, if warranted, the development and implementation of a Corrective Action Plan.

Discharges involving an impact to a drinking water supply or surface water body will be considered *Category 3* heating oil tank discharges.

#### **5.4.6.5 Activity Authorization at Heating Oil Tank Sites**

Activity Authorization Forms have been developed specifically for the work likely to be performed at *Category 1* and *2* heating oil tank sites. These forms are located in the Reimbursement Guidance Manual on DEQ's website at <http://www.deq.virginia.gov/tanks/guidance.html>. Activities performed at *Category 1* and *2* sites are performed in the Site Characterization Phase. Occasionally, it may be necessary to perform limited additional work at *Category 2* sites in the Site Characterization Addendum and Post SCR Monitoring Phases.

When a site advances from one category to a higher category, the Case Manager should collect all AAFs for that particular phase of work and verify the work performed with one Verification Form. In these instances, the Case Manager has the option to have the RP/consultant combine all approved work for the site onto one AAF for verification.

When monitoring well installation is authorized at a *Category 2* site, abandonment of those wells generally will be performed in a separate Closure Phase. Task T114, Reimbursement Claim Prep should be authorized for the well abandonment done during this Closure Phase.

Sites that transition from one category to another within the Site Characterization Phase are eligible for only one claim preparation task for the Site Characterization Phase.

**Example 5-21. Activity Authorization and verification during a transition from a *Category 1* to a *Category 2* case.**

A site assessment is performed for a real estate transaction and samples are collected the vicinity of a 500 gallon heating oil UST. One of the samples is reported to have a TPH concentration of 450 mg/kg. The discharge is reported to DEQ, the site is in a subdivision where all houses are served by public water, and there are surface water bodies within 200 feet of the tank.

Based upon the initial sample results, the case is assigned to *Category 1* and the tank operator (and his/her consultant) is directed to collect 3 additional samples from below the tank with a hand auger. The consultant returns to the site and collects three additional samples. Subsequent analyses indicate that the TPH concentration in two of the samples exceeds DEQ's soil saturation levels for #2 fuel oil. These results are reported to DEQ.

The case should transition to *Category 2* and site characterization should be completed under *Category 2*. The Case Manager may verify the work performed while the case was in *Category 1* on the *Category 1* AAF and then approve and verify (as appropriate) *Category 2* work on a *Category 2* AAF.

Another option the Case Manager has is to direct the consultant to place all *Category 1* work performed on the *Category 2* AAF and the Case Manager can verify all work when the Site Characterization Phase is completed.

#### 5.4.6.6 Excavation or Intrusive Work Near Structures

Home heating oil USTs may be found in close proximity to houses or other buildings. DEQ expects the tank operator/consultant to exercise all care when performing release response and corrective actions for home heating oil discharges to minimize, to the extent possible, risk to the building. Damages to buildings are not reimbursable expenses. If the tank operator/consultant believes that excavation or other intrusive activities may present a risk to damaging a building, the tank operator/consultant needs to contact the DEQ Case Manager prior to initiating work. The tank operator/consultant and Case Manager may then decide upon a scope of work that can meet the release response and corrective action objectives without compromising the integrity of the building.

### 5.4.7 Heating Oil Exemption

State Water Control Law exempts tanks used to store heating oil for use on the premises where stored from the definition of an “underground storage tank”. In the past, this exemption was applicable to tanks containing heating oil only if the heating oil was consumed on the premises for the purpose of generating heat. A tank containing a fuel other than heating oil could qualify for the exemption if the fuel was consumed on the premises for the **purpose of generating heat**.

DEQ has revised its heating oil exemption to mirror EPA’s interpretation, which is that the exemption is applicable to tanks containing a product that is one of those specifically included in the definition of heating oil (listed below) whenever that product is being **entirely consumed on the premises for any purpose**. Consequently, even if heating oil is consumed on the premises for a non-heating purpose (e.g. providing fuel for an emergency generator), the tank is used for storing heating oil for consumption on the premises where stored and is eligible for the heating oil exemption. A tank containing a fuel other than heating oil can qualify for the exemption if the fuel is consumed entirely on the premises in equipment (e.g. heating equipment, boilers, furnaces, etc.) for which the “fuel of choice” would normally be heating oil.

This change affects a relatively small number of compliance evaluations (decisions about which tanks are subject to the regulation) and financial responsibility evaluations (primarily decisions concerning the financial responsibility that should apply to a reimbursement claim). Figure 5-3 contains a decision tree delineating the decision-making logic outlined above.

#### Distinguishing between Heating Oil and Motor fuel

This new interpretation of heating oil exemption makes it necessary for Case Managers to resolve whether the product in the tank at issue is heating oil versus motor fuel.

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

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

Distinguishing between heating oil and motor fuel is simple if the product is clearly stated as one of those listed in either definition. However, No. 2 fuel oil, often known as “heating oil,” is very similar to No. 2 diesel fuel that is also sometimes called “heating oil.” No. 2 diesel fuel is one of the specified types of motor fuel and is not a specified type of heating oil. Both products are dyed for tax purposes when they are being sold for off-road use. Practically speaking, dyed No. 2 diesel fuel is difficult to distinguish from dyed No. 2 fuel oil. Therefore, unless there is compelling evidence to the contrary (i.e. owner/registration

indicates tank contains diesel fuel; tank is solely for emergency power generation), DEQ will assume any dyed No. 2 product to be No. 2 fuel oil (i.e. in the case where a heating oil tank is filled with diesel by the supplier.)

### Substitutes for Heating Oil

The definition of heating oil allows fuels other than those specifically listed therein to be exempt from regulation if they qualify as substitutes for heating oil. The definition applies to any fuel, including motor fuel that is used in equipment for which the “fuel of choice” is a listed type of heating oil and it only applies to fuel that is consumed entirely on the premises. Consequently, an UST containing motor fuel that is used in an incinerator, boiler, furnace, or similar equipment which would normally burn heating oil rather than motor fuel, would qualify for the exemption. Conversely, if the motor fuel is used to power a motor generator (e.g. emergency generator, etc.), then even if that motor generator produces power for heating equipment, then the heating oil exemption would **not** apply. This is because the motor fuel is being used in equipment for which the fuel of choice is motor fuel, not heating oil.

**NOTE: This interpretation is based on the preamble to the federal regulation (40 CFR 280 September 23, 1988), in which EPA writes that a fuel being burned in a motor engine cannot qualify as a substitute for heating oil because an engine’s or motor’s “fuel of choice” is motor fuel, not one of the specified types of heating oil.**

### Dual Use Tanks

Volume III of the Storage Tank Program Compliance Manual states:

#### **“Dual Use” or “Multiple Use” USTs**

Many USTs contain fuel that is used for multiple purposes. In such cases, the use with the most restrictive (environmentally protective) regulatory standard is the use that governs. A tank used for both regulated and unregulated purposes is therefore considered a regulated UST, and a tank used for a partially regulated purpose and a fully regulated purpose would be considered fully regulated. For example, many hospitals and public facilities have oil storage tanks, the contents of which are used for two purposes: (1) to heat the premises (an unregulated use) and (2) to power an emergency generator (a partially regulated use). Such tanks are treated as regulated emergency generator USTs.

Although DEQ’s dual use policy is not changing, the reinterpretation of the heating oil exemption policy means that the example above will have to be clarified because all consumptive uses of heating oil qualify for the exemption, which eliminates the need for a “dual use” analysis in some cases. Instead, an example of a scenario where a dual use analysis would be applied is a hospital or public facility using undyed (or dyed offroad) No. 2 diesel fuel in a boiler (an unregulated use) to heat the premises and in a motor generator to provide emergency power (a partially regulated use). These tanks would be partially regulated.

### Financial Responsibility

This reinterpretation of the heating oil exemption will **not** be applied retroactively to **closed** reimbursement cases. For prospective and currently open reimbursements, the DEQ can evaluate and adjust financial responsibility requirements for those pollution complaint cases affected by this heating oil exemption. To obtain an adjustment of the financial responsibility requirement in any open reimbursement case, the claimant may file a reconsideration claim or the Case Manager may provide an amended occurrence evaluation for any open claim. Case Managers are not required to initiate such evaluations of their own volition.

Heating oil USTs greater than 5,000 gallons were regulated before July 1, 1996. Reimbursements are still open for some releases from this type of tank. Financial responsibility requirements for these releases are not affected by this reinterpretation. Consequently, releases reported from greater than 5,000 gallon heating oil USTs before July 1, 1996, will continue to be treated as regulated occurrences and the sliding scale financial responsibility amount applies.

#### Example 5-22. Applicability of the UST Regulations As Determined by Fuel Type and Use

Example: An UST of an unknown size contains one of the specified types of heating oil and the fuel is consumed on site for any consumptive use. Is this tank exempt from the UST regulations?

Answer: Yes, this tank is exempt from the UST regulations because the tank contains a specified type of heating oil that is being consumed on site.

#### Example 5-23. Applicability of the UST Regulations As Determined by Fuel Type and Use

Example: An UST of an unknown size contains motor fuel and is being consumed on site in a furnace. Is this tank exempt from the UST regulations?

Answer: Yes, this tank is exempt from the UST regulations because the motor fuel is solely being used in a device for which one of the specified types of heating oil would normally be the fuel of choice.

Example 5-24. Applicability of the UST Regulations As Determined by Fuel Type and Use

Example: An UST greater than 110 gallons contains motor fuel that is being consumed on site in a boiler and to fuel vehicles for a commercial enterprise. Is this tank exempt from the UST regulations?

Answer: No, this is a fully **regulated** tank. A tank used for both regulated and unregulated purposes is considered a **regulated** UST. This is a dual use situation where the first use is in the boiler and the second use is to fuel vehicles as part of a commercial enterprise. One use (boiler) qualifies for the heating oil exemption and is an **unregulated use** because the motor fuel is being consumed in a device for which one of the specified types of heating oil would normally be the fuel of choice. The second use (fueling vehicles) is a fully **regulated use** because (1) the tank is greater than 110 gallons, (2) the fuel is not a specified type of heating oil or being used in a device for which one of the types of heating oil would normally be the fuel of choice, and (3) the tank does not qualify for the farm/residential exemption since it is being used for a commercial enterprise.

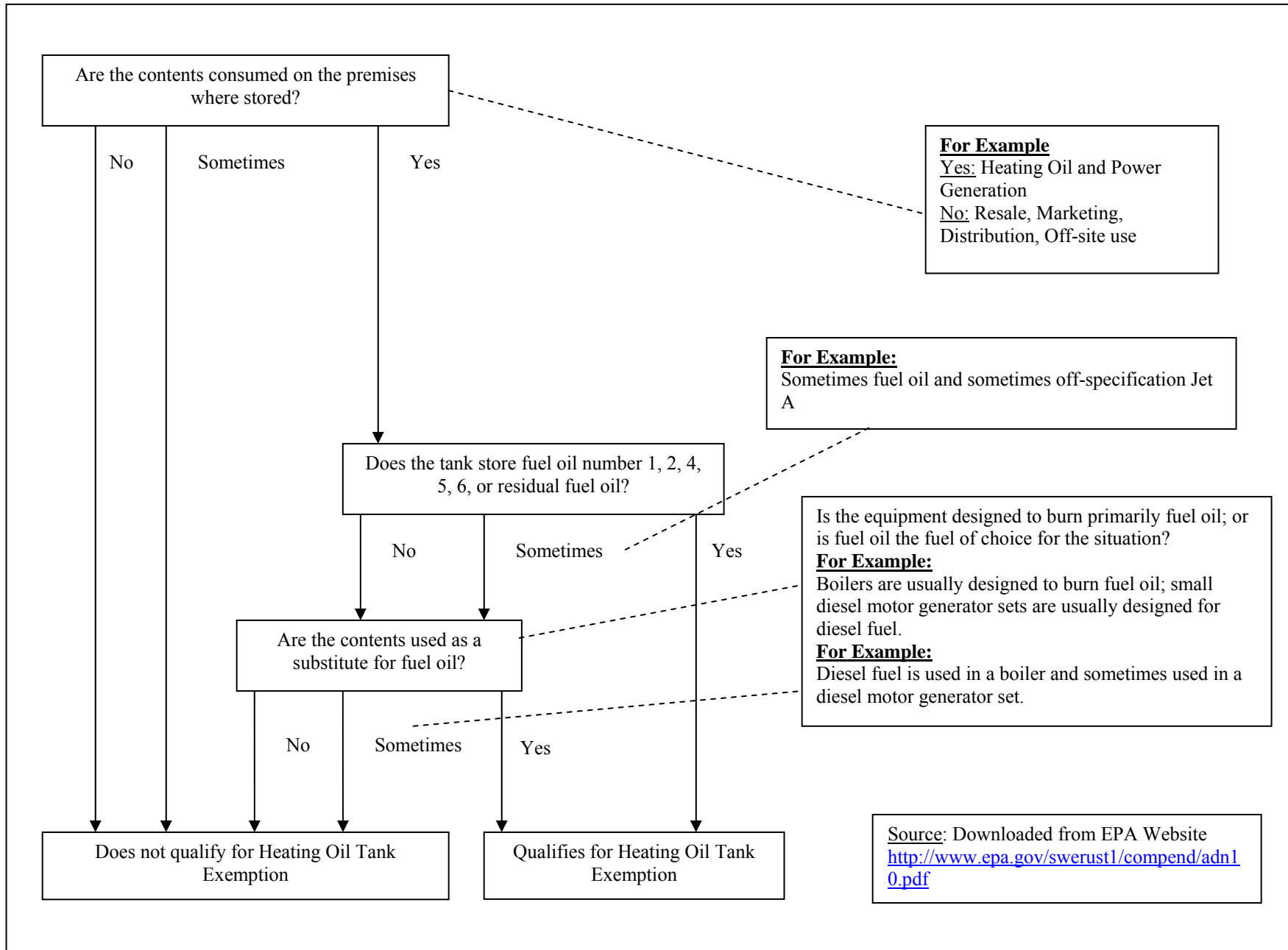
Example 5-25. Applicability of the UST Regulations As Determined by Fuel Type and Use

Example: An UST that contains dyed No. 2 fuel oil that is used only on the premises in a furnace, in an emergency power generator, and to fuel motor vehicles that operate on the premises. Is this tank exempt from the UST regulations?

Answer: Yes, this tank is exempt from the UST regulations because the tank contains a specified type of heating oil that is being entirely consumed on site and, therefore, the nature of its consumptive use is immaterial.



**Figure 5-3. Does my tank qualify for the heating oil exemption?**



## 5.5 Free Product Removal

(Appendix C fact sheet - Elements of a Free Product Removal Report)

Section 9 VAC 25-580-270 of the UST Technical Regulation requires the removal of free product to the maximum extent practicable. Moreover, free product removal must be conducted in a manner that minimizes the spread of contamination into previously uncontaminated zones. In most instances, free product thickness should be .01 feet or less unless continued recovery efforts cannot attain this minimum and more aggressive recovery methods are not warranted based upon lack of receptors, other considerations including the lack of product mobility, or excessive costs to try to recover the product in low risk scenarios. It is recommended that regional staff consider the free product removal goal of preventing the spread of contaminants into previously uncontaminated areas when deciding if free product removal may be terminated.

Free product removal may be initiated prior to the Corrective Action Plan/Permit process and may be conducted during any corrective action phase. Although free product removal may be conducted independently of formal corrective actions, long-term free product removal efforts are considered a type of corrective action and should be incorporated into a Corrective Action Plan if they will continue after the completion of the Site Characterization Phase.

The owner or operator is not required to bid the installation and operation of a free product recovery system if the free product removal system is installed prior to the completion of the Site Characterization Phase. Approval for such free product recovery activities shall be handled through the activity authorization process. Free product removal systems installed after completion of the Site Characterization Phase must be bid using the process outlined in Sections 4.6 through 4.6.5. Responsible persons and consultants should refer to the VPSTF Reimbursement Guidance Manual at <http://www.deq.virginia.gov/tanks/guidance.html> for additional information about bidding requirements.

If free product is being removed at a site, a Free Product Removal Report will be due within 45 days after confirming the release, within 45 days after free product is first encountered, or on a schedule as established by the Regional Office. Additional reports, if necessary, will be required on a schedule as established by the Regional Office. The *Elements of a Free Product Removal Report* fact sheet in Appendix C provides a suggested set of elements to be addressed in the Free Product Removal Report. Regional staff, at their discretion, may request or require additional information, or request that the free product removal information be submitted within another report (such as a Post-SCR Monitoring Report).

## 5.6 Petroleum Saturated Soil

When subsurface contamination is found, DEQ requires the responsible person to stop the source of contamination, recover all practicably recoverable free product, and remove or otherwise address petroleum saturated soils to prevent the continued accumulation of free product on the water table. DEQ has defined petroleum saturated soil as the residual concentration of a particular petroleum product at which the product will flow through the soil at a rate not to exceed  $1 \times 10^{-5}$  meters per day. Soil saturation concentrations have been defined for six petroleum products and these concentrations are listed in Table 5-7.

Table 5-11. Soil Saturation Values by Petroleum Product (all values represent TPH in Parts Per Million)					
Gasoline	Kerosene	Diesel	Fuel Oil #2	Fuel Oil #4	Fuel Oil #6
8,300 ppm	11,200 ppm	11,000 ppm	13,000 ppm	18,000 ppm	44,700 ppm

It is important for staff to realize that the petroleum saturated soil concentrations listed in Table 5-7 are not risk based concentrations nor will they prevent petroleum constituents in the dissolved phase from leaching into ground water. The values listed in Table 5-7 represent the petroleum concentrations that are likely to contribute to or result in free product at a site.

Petroleum saturated soils are considered to be a continuing source of free product. These soils must be addressed as deemed appropriate by the regional Case Manager. Regional staff may require the tank owner or operator to actively treat or remove those soils regardless of risks posed by constituents in those soils. Staff also may decide that no further action is needed to address these soils if there is no free product, there are no risks from the petroleum, and there is no benefit associated with removing or treating the soil.

As with free product removal, petroleum saturated soil may be addressed during any corrective action phase. Actions taken to remove or treat petroleum saturated soil must be pre-approved by the Regional Office.

**NOTE: Staff and responsible persons must realize that the soil saturation concentrations are not remedial endpoints. Remedial endpoints at all sites will be established on a risk to receptor basis.**

## 5.7 CORRECTIVE ACTION

(Appendix C fact sheet – Elements of a Corrective Action Plan)

Corrective action may be defined within the scope of the Storage Tank Program as those measures or actions which are undertaken to reduce contamination and/or risks from that contamination on a long-term basis. This definition is quite broad and may encompass initial abatement measures. Fundamental differences between initial abatement measures and corrective actions are related to risk characteristics and the temporal scale required to address those risks. Initial Abatement Measures are, by nature, actions which must be undertaken quickly in order to abate an acute hazard. Corrective actions, by contrast, generally take longer to implement and focus principally on risks posed by chronic exposure.

The basic objective of corrective action is to reduce risks to impacted or potentially impacted receptors. Most of the time, risk reduction will be achieved through the cleanup of contaminated media. Risk reduction may, on occasion, be achieved by breaking the pathways of contact between the receptor and contaminant(s). Examples of this include providing a public water connection or a new water supply well to users of an impacted well and using institutional controls (e.g. placing fences or other barriers around the contaminated zone to prevent receptors from coming into contact with contaminants).

When site characterization has been completed, the regional staff must decide the future course of action at the site. Factors to consider when determining the necessity of undertaking corrective actions include:

1. Is there a continuing fire, explosion, health, or safety hazard posed if corrective action does not occur?
2. What are the chronic exposure risks to receptors? Is the carcinogenic lifetime risk created by the released constituent(s) greater than  $10^{-6}$  (one in one million) or is the hazard index for non-carcinogenic constituents greater than 1?
3. What would be the result/impact of undertaking no corrective action?
4. Will corrective action measurably reduce risks to one or more receptors?
5. What is the most cost-effect method by which to remove the contaminant mass required to achieve the desired risk reduction?

Regional staff have the authority to determine whether corrective action is required for a release. It is expected that regional staff will usually require corrective actions to be undertaken for the following situations:

1. There are continuing acute hazards caused by the release (e.g. fire, explosion, exposure of a receptor to a concentration of a constituent that is acutely toxic);
2. A water supply well has been impacted;
3. There is a risk that a water supply well (or wells) may be impacted by contaminants;
4. There is a discharge or potential discharge of dissolved phase constituents to surface water in excess of the water quality standards;
5. There is a discharge of petroleum or other regulated substance causing a sheen, film, or emulsion on surface water;
6. Recoverable free phase contamination remains at the site after the SCR has been approved;
7. Petroleum saturated soil exists at the site and may/will continue to act as a source of free product;
8. Vapors from regulated substances are chronically present in a subsurface structure; and
9. The estimated lifetime cancer risk for any carcinogenic constituent released at the site exceeds one in one-million and /or the hazard index for non-carcinogenic constituents exceeds one.

### 5.7.1 Phase II Initial Abatement

Phase II Initial Abatement comprises a limited scope of corrective actions which may be performed after the site characterization phase has been completed. Phase II Initial Abatement was developed as an administrative procedure to allow the tank owner or operator to undertake limited corrective actions (upon receiving DEQ approval) without having to develop a formal CAP. In observance of DEQ's original intent, Phase II Initial Abatement should be limited to situations where the removal of residual soil contamination is the only type of corrective action needed.

In contrast with Initial Abatement Measures, **Phase II Initial Abatement Measures may only be undertaken with Regional Office approval prior to the initiation of those activities.**

Activities performed under Phase II Initial Abatement are the excavation and Treatment or Disposal of Petroleum Contaminated Soil. Petroleum contaminated soil may be excavated and treated or disposed at a permitted treatment, storage, or disposal facility as a Phase II Initial Abatement Activity. The volume of soil to be excavated may not exceed 500 cubic yards (approximately 375 tons).

Phase II Initial Abatement may be used after the following conditions have been met:

1. A SCR for the site has been received by the Regional Office that delineates the extent of saturated soil contamination;
2. The amount of soil proposed for excavation is expected to remove the primary source of contamination AND does not exceed 500 cubic yards.

**NOTE: Bidding is required when transporting and disposing of more than 250 tons (approximately 333 cubic yards) of contaminated soil. Therefore, Case Managers should evaluate the quantities of soil scheduled for removal, since bidding may be required for this phase of work.**

3. Regional staff direct the responsible person to proceed with Phase II Initial Abatement.

If the corrective action does not meet the Phase II conditions listed above (for example, the soil excavation volume will exceed 500 cubic yards), the Case Manager should use Interim Authorization (discussed below in Section 5.7.2) to address the corrective action, NOT Phase II Initial Abatement.

Phase II Initial Abatement Procedure:

1. The Regional Office receives a SCR that sufficiently defines the area of soil contamination. The remediation assessment of the SCR must specify the following:
  - volume of soil to be removed;
  - depth to which soil removal will occur;
  - criteria for removing contaminated soil (the concentration of adsorbed phase constituents in soil to be removed);
  - a description of sampling methodology to be used during the excavation process; and

- a description of the soil treatment or disposal location (i.e. What type of a site is involved? Does the facility have a waste management permit?)
2. The owner or operator and regional Case Manager believe that Phase II Initial Abatement is appropriate for the site and the conditions under which Phase II Initial Abatement (listed above) may be used are met.
  3. The owner or operator submits an AAF for the proposed Phase II Initial Abatement activities. A Bid Summary Form must be submitted for non-UCR items and when transporting and disposing of more than 250 tons of contaminated soil (approximately 333 cubic yards).
  4. The regional Case Manager reviews the AAF and Bid Summary Form and approves appropriate activities and units. The Case Manager sends the AAF and Bid Summary Form to the owner or operator along with a letter authorizing the proposed activity and requiring the owner or operator to submit a report upon completion of Phase II Initial Abatement summarizing the work completed.
  5. The owner or operator initiates and completes Phase II Initial Abatement and sends a report summarizing those activities to the Regional Office.

**NOTE: Phase II Initial Abatement is believed to be an appropriate administrative tool to use for most types of corrective action involving limited soil removal and treatment/disposal except.**

**Exceptions:**

- **In situations where the soil will be excavated and subsequently, land farmed, bioremediated, or otherwise treated at a site that does not have a waste management permit, a Corrective Action Plan must be submitted and public notice must be performed. It is believed that public notice is important in this type of situation in order to inform the neighbors of the proposed activity and allow them the opportunity to comment on the proposed actions.**
- **If the amount of soil to be excavated exceeds 500 cubic yards, a Corrective Action Plan must be submitted and public notice must be performed. Interim Authorization may be used if soil removal must be expedited to prevent potential significant migration of contamination to the groundwater.**
- **If Phase II Initial Abatement is performed and later goes to corrective action, the Phase II activities must be incorporated into the Corrective Action Plan.**

### **5.7.2 Interim Authorization**

Responsible persons may initiate corrective actions prior to Regional Office approval of the CAP through the Interim Authorization process. As indicated in section 9 VAC 25-580-280 of the UST Technical Regulation, the purpose of Interim Authorization is to promote a more effective cleanup by allowing remedial efforts to be initiated in a timely manner.

Criteria for Initiating Corrective Actions under Interim Authorization:

1. Cleanup must consist of activities that are necessary to minimize contamination and promote a more effective cleanup of contaminants at the site.
2. Cleanup activities must not interfere with the development of the SCR or the CAP.
3. Cleanup activities performed under Interim Authorization must not result in a discharge to surface water until a CAP or VPDES permit is issued.
4. Interim Authorization should not be granted prior to the submission of a SCR unless: (1) an emergency situation exists at a site; or (2) a potable water supply well has been impacted and an alternate water supply is needed. Regardless of whether Interim Authorization has been granted, a SCR must be submitted for the site.
5. Actions performed under Interim Authorization must be incorporated into a CAP for the site. **In all instances where Interim Authorization has been granted, a CAP must be required and public notice must be performed.**
6. A detailed description of work to be performed under Interim Authorization must be provided to the Regional Office.

Interim Authorization Procedure:

1. The owner or operator requests the initiation of corrective actions under Interim Authorization. Along with this request, the owner or operator must submit an AAF, a Bid Summary Form, and a description of the actions to be taken to the Regional Office.
2. The regional Case Manager reviews the information submitted and approves appropriate activities and units.
3. The Case Manager sends the AAF and Bid Summary Form to the owner or operator and directs the owner or operator to bid scopes of work listed on the Bid Summary Form in accordance with the procedures for Bidding Corrective Action Plan Implementation (See Sections 4.6 - 4.6.5 of this Manual).
4. The owner or operator obtains bids for scopes of work listed on the Bid Summary Form and submits these bids to the Regional Office for review along with a Bid Comparison Form.

5. The regional Case Manager verifies the bid selections, signs the Bid Comparison Form, and returns that form to the owner or operator along with a letter providing Interim Authorization to proceed with the specified scope of work. The letter should contain a report deadline for the Interim Authorization activities that are to be completed.

**NOTE: The Regional Remediation Manager or Compliance and Enforcement Manager should sign the Interim Authorization Letter.**

6. In most cases, staff should require the RP to initiate public notice to any persons who will be affected or potentially affected prior to corrective actions performed under Interim Authorization. Examples of ways to Public Notice this work are listed in Section 5.3.7.1.2.
7. The owner or operator initiates the actions approved under Interim Authorization.
8. The Interim Authorization activities must be included in a Corrective Action Plan after Site Characterization is complete. If the Interim Authorization activities are the only corrective actions needed at the site, an abbreviated CAP, explaining these activities may be submitted. Please see Section 5.7.3.6 for additional information on abbreviated CAPs.

#### 5.7.2.1 Interim Authorization to Achieve Case Closure

Sometimes it is necessary or prudent for corrective action to be initiated prior to the development of a CAP and, in some instances, a very simple corrective action is the only type of corrective measure necessary to achieve case closure. For example, the connection of a residence or business having a petroleum-impacted private water supply well to an existing public water supply system often is performed during the site characterization. In this type of situation, connection to the public water system should be completed under Interim Authorization in a CAP Implementation phase. Interim Authorization CAP Implementation can occur simultaneously with a site characterization phase, but should be completed as a separate phase on an AAF. The following procedures should be used when a corrective action necessary to achieve case closure is completed prior to the CAP Development phase:

1. A phase of work is in progress and corrective actions will be performed concurrently with this phase. The corrective action should be performed as Interim Authorization under the CAP Implementation phase using the Interim Authorization procedures discussed above in Section 5.7.2.
2. In most cases, staff should require the RP to initiate public notice to any persons who will be affected or potentially affected prior to corrective actions performed under Interim Authorization. However, in some situations, it may not be feasible to provide public notice to all applicable persons prior to commencing corrective action activities (refer to example 5-26).
3. Two AAFs will be used; one for the non-CAP phase and the second for the CAP Implementation phase.
4. The applicable phase reports are submitted for review along with both work-performed AAFs for



verification. If corrective actions performed under Interim Authorization and another phase of work occur concurrently, staff may at their discretion allow one report to be submitted combining the two phases of work.

If separate reports are preferred, the RP or Case Manager can generate a letter CAP summarizing the corrective actions completed under Interim Authorization.

**Example 5-26. Interim Authorization and Public Notice**

Several domestic wells have been impacted by petroleum constituents. A public water supply line is located in the right-of-way adjacent to each of the properties having an impacted well. Interim Authorization is used during a site characterization to connect the homes having petroleum impacted water supplies to the public water system. Public notice is used to notify the affected persons prior to commencing Interim Authorization activities. Time did not permit the RP to initiate public notice to persons whose water supplies might be at risk (i.e. neighboring properties) prior to completing the corrective actions at the impacted properties. These connections to a public water system are the only actions necessary to achieve case closure.

Recommended Action: The RP should initiate public notice to potentially affected persons describing the work that was completed as soon as possible. A minimum of 30 days should be provided to allow time for review and comment before case closure can be granted.

### 5.7.3 Corrective Action Plan and Approval Process

Corrective actions that need input from DEQ should go through the Corrective Action Plan (CAP) and Approval process instead of Phase II Initial Abatement. All corrective actions involving the remediation of constituents in ground water should go through the Corrective Action Plan and Approval process. In general, any corrective action involving a remediation system needs to go through the CAP and Approval process. Sites needing free product recovery after the completion of the SCR should also go through the Corrective Action Plan and Permit process as well as any case in which an alternate water supply has been required.

Statutory and regulatory procedures are different for regulated USTs than they are for exempt USTs, excluded USTs, and ASTs. This manual explains regulatory and administrative procedures for conducting corrective action for both regulated and unregulated tanks. Guidelines contained within this document were written with the intent of minimizing administrative and procedural differences between the two groups of tanks while remaining within the specified scope and requirements of individual statutes and regulations.

### 5.7.3.1 Corrective Action Plans and Approvals for Regulated, Deferred, and Partially Deferred USTs

#### Corrective Action Plans

The UST Technical Regulation (9 VAC 25-580-280) states that DEQ, upon reviewing information provided by the Site Check through Site Characterization activities, may require the UST owner/operator to develop and submit a Corrective Action Plan (CAP) for dealing with contaminated media. The plan that is submitted to DEQ must provide for the adequate protection of human health and the environment. If a CAP is required, owners/operators must submit the plan according to a schedule and format established by DEQ.

A CAP utilizes information derived during Initial Abatement and Site Characterization and proposes corrective measures that should be used to reduce risks posed by the release to acceptable levels or to remove free product to the extent practicable. CAPs must include a detailed description of the corrective actions proposed, projected endpoints, a schedule of implementation, and operational and post operational monitoring schedules. A list of elements that usually need to be addressed in a CAP is included in the *Elements of a Corrective Action Plan* fact sheet in Appendix C.

Information required by the UST Technical Regulation (9 VAC 25-580-280) and needed in almost every CAP includes:

1. Remedial endpoints;
2. A monitoring schedule;
3. A contingency for the provision of an alternate water supply (if applicable);
4. A description and schedule of system operation and maintenance;
5. A remediation optimization plan that includes:
  - A. A provision for an alternative technology
  - B. Calculations that support when to change or terminate remediation techniques based on the efficiency of the system.
6. A proposed time table for system installation;
7. A schedule for the submission of status reports;
8. A description of and schedule for post operational monitoring;
9. A recommended public notice procedure; and

10. A description of actions taken to obtain any federal, state, or local permits that are necessary to implement the CAP.

When evaluating a CAP, it is recommended that regional staff consider the following:

1. Is the design/system flexible to accommodate changes in site conditions?
2. Can a significant portion of the targeted phase be removed in a timely, cost-effective manner?
3. Are endpoints for individual phases internally consistent (e.g., is the residual phase endpoint adequate to maintain the dissolved phase endpoint)?
4. Are the proposed endpoints necessary to achieve adequate protection of human or environmental receptors?
5. Can remediation progress of all phases be effectively monitored during the cleanup?
6. Is the proposed monitoring plan adequate for measuring the effectiveness of the remediation?
7. Is the post-remediation monitoring period adequate to demonstrate maintenance of the endpoints?
8. What permits are needed and what actions are needed to obtain those permits?
9. What wastes will be generated as a result of remediation and how will these wastes be handled and/or disposed?
10. If the corrective action involves clean up of one or more phases of contamination, has (or will) the source of petroleum been eliminated or contained?
11. Is it clear from the CAP what criteria (vapor, dissolved) must be reached before implementing an alternative technology or shutting down the remediation system?
12. Does the CAP propose alternatives (i.e. alternative remediation activities) that would be implemented if the primary proposed corrective action does not succeed as anticipated?

Regional staff should review the efficiency of the remediation system and the progress of the CAP Implementation towards the endpoints throughout the corrective action process. Periodic reviews with the consultant are highly encouraged. For information on Remediation Optimization, please see Section 5.7.3.4.

### Corrective Action Plan Approval

Owners and operators who submit a CAP to DEQ must obtain a Corrective Action Plan Approval for the actions outlined in the CAP (9 VAC 25-580-290). A CAP Permit may take one of several forms depending upon the type of Corrective Action Planned for the site. Tank owners or operators undertaking

corrective actions involving a point source discharge to surface waters are required to have a General VPDES Permit for Discharges from Petroleum Contaminated Sites (9 VAC 25-120-10 et seq.) or a VPDES Permit (9 VAC 25-30-10 et seq.) for that discharge. Corrective actions not involving a point source discharge to surface water may be permitted simply by a letter from the regional Remediation Manager or the Compliance and Enforcement Manager to the owner or operator stating that corrective actions outlined in the approved CAP may be undertaken. The regional Case Manager may issue the Corrective Action Plan Approval letter if the Remediation Manager or Compliance and Enforcement Manager is away from the office for greater than one day.

Steps involved in obtaining a permit for corrective action involve submission of a CAP to the Regional Office, Regional Office review of the CAP, public notice, and approval of the CAP by DEQ. Discussed in the sections below are permits required for different types of corrective actions and the public notice process.

**NOTE: A Local Government Ordinance Form (LGOF) was formerly required as part of the CAP approval process. Senate Bill 763 removed the requirement for the LGOF from State Water Control Law. This bill amends Section 62.1-44.15:3 of State Water Control Law by removing the requirement that applicants for a DEQ water permit provide a LGOF.**

#### 5.7.3.1.1 Cancellation of Corrective Action Activities

If site cleanup and risk mitigation has been achieved at a given site, the site may be monitored or closed as determined by the regional Remediation Manager or the Compliance and Enforcement Manager. The Case Manager has the authority to cancel the CAP activities if the Remediation Manager or Compliance or Enforcement Manager is away from the office for greater than one day. Post operational monitoring is often needed to demonstrate that the corrective actions taken will maintain the remedial endpoints for the site. It is recommended that staff require post operational monitoring as part of the CAP when corrective actions involve: free product removal, the remediation of vapor phase constituents, and treatment of contaminated ground water.

Conditions at a site may change between the time that a SCR is completed and a CAP is implemented. If a previously requested CAP is no longer deemed necessary, staff may terminate the CAP request and the site may be monitored or closed as determined by the regional Case Manager.

**NOTE: A CAP Approval must be issued by the Regional Office for every case where Interim Authorization has been granted. If actions taken under Interim Authorization achieve the remedial endpoints prior to the completion of the CAP, the CAP may describe actions taken under Interim Authorization and any post operational monitoring that is needed before the case may be closed.**

### 5.7.3.1.2 Public Notice

Section 9 VAC 25-580-300 of the UST Technical Regulation requires UST owners or operators to provide notice to the public for all releases where DEQ is requiring a CAP. This notice may include, but is not limited to publication in local newspapers, block advertisements, publication in a state register, letters to individuals, or personal contacts. Regardless of the method(s) used, the **notice must reach those members of the public directly affected by the release and/or planned corrective action.**<sup>5-12</sup> Public notice requirements for Exempt, Excluded USTs, and ASTs are covered in Section 5.7.3.2.

It is recommended that the responsible person initiate public notice during the development of the CAP. Interested members of the public will then be able to review the report concurrently with Regional Staff and provide comments in a timely manner, thereby minimizing the time needed to begin CAP Implementation. The public notice published by the responsible person must:

1. Identify the responsible person, list the location of the release, and provide a responsible person contact to answer questions regarding the release.
2. State that DEQ is requiring the development of a CAP to address cleanup of a regulated substance at the site.
3. State the date the CAP will be provided to the Regional Office.
4. Provide the Regional Office address and telephone number and the name of the regional Case Manager or representative who may be contacted for additional information. The notice should also direct interested persons to send all written comments to the regional Case Manager or other designated DEQ representative.
5. Establish the date by which the Regional Office will accept written comments. This date must be a minimum of 30 days after the CAP is submitted to the Regional Office.
6. State that the Regional Office may hold a public meeting if there is significant public interest.

Please see Appendix S for a sample Public Notice.

<sup>5-12</sup> Persons considered directly affected by the release and/or corrective action include adjacent property owners and all other persons whose ground water and/or property have been contaminated as a result of the release.

In addition to the elements listed above, staff should consider the following recommendations when directing the responsible person to proceed with public notice:

1. If the notice will be published in a newspaper, it should be published at least once per week for two consecutive weeks, thereby, increasing the opportunity for interested members of the community to observe the notice.
2. Newspapers utilized for public notice should have a general circulation within the area affected by the release.
3. Persons affected by the release or proposed corrective actions should be contacted directly (e.g. by letter).

The Regional Office must hold a public meeting to consider comments on the proposed corrective action if the Regional Director determines that there is a significant public interest or for any other appropriate reason. Prior to holding the public meeting, the Regional Office must:

1. Review the CAP.
2. Determine that the CAP is complete.
3. Allow any person who requests, an opportunity to review the complete CAP prior to the public meeting.

If a public meeting is held, the Regional Director (or his/her designated representative) is responsible for facilitating the meeting. Persons attending the meeting should be encouraged to sign an attendance list provided by DEQ so that they may be provided with a summary of the meeting and staff recommendations. Within 14 days after the public meeting, a memorandum must be prepared for the Regional Director's approval. This memorandum must summarize the significant issues identified at the public meeting and contain staff recommendations regarding issues that must be addressed in order to complete the CAP. After the Regional Director approves staff recommendations, staff may proceed with the processing of the CAP and CAP Permit. The Regional Office must provide a copy of the memorandum summarizing the meeting and staff recommendations to all persons who attended the meeting.

Occasionally a responsible person will modify the corrective action approach at a site *after* going through the required public notice process. This action often prompts DEQ staff to question whether the responsible person should be required to provide a second public notice. The critical elements that staff should consider when evaluating the need for additional public notices during the corrective action phase are related to endpoints and receptors. According to the UST Technical Regulation, the responsible person must provide public notice when corrective actions do not achieve cleanup levels specified in the CAP and DEQ is considering termination of corrective action at the site. The intent of this requirement is to allow impacted and/or interested persons to know of and provide comments on proposed remedial endpoints for the site. Staff should require the responsible person to provide additional public notice if remedial endpoints are changed from those in the original, approved CAP and DEQ is considering the approval of these new endpoints.

The UST Technical Regulation also stipulates that the responsible person must provide public notice to persons directly affected by the release or planned corrective action. The intent of this part of the public notice requirement is to inform persons impacted or potentially impacted by the release or planned corrective action that corrective action will be taking place. When the corrective action approach is modified after CAP approval, but remedial endpoints are not changed, the decision to provide additional public notice should be based upon an evaluation of persons impacted or potentially impacted by the contaminants and persons impacted or potentially impacted by the corrective action. If the change in corrective actions at a site may affect persons not notified originally, the responsible person must ensure that these persons are notified of the planned corrective actions. If the change in corrective action technology or approach will not cause a change in persons affected by the contaminants or corrective action, the RP is not required to provide additional notice to the public.

- NOTES:**
- 1. If persons provided comments during the original public notice period, staff may, in the interest of public relations, recommend that the RP notify the persons who commented during the original public notice/comment period of the proposed corrective action changes.**
  - 2. Public notice is not needed following a change in remedial technology at a site unless: (a) the remedial endpoints are changed; or (b) individuals not notified as part of the original public notice may be impacted by the new corrective actions.**

#### 5.7.3.2 Corrective Action Procedure for Exempt USTs, Excluded USTs, and ASTs

At the present time, regulatory guidelines do not exist for corrective action procedures for exempt USTs, excluded USTs, and ASTs. Article 11 (exempt USTs and ASTs), on the subject of corrective action states:

"any person discharging or causing or permitting a discharge of oil into or upon state waters... must, immediately upon learning of such a discharge or threat of discharge implement any applicable oil spill contingency plan approved under this article or take such other action as may be necessary to contain and clean up such a discharge..."

The Powers and Duties section of Article 9 gives the board the authority to:

"Require the owner or operator of an underground storage tank to undertake corrective action for any release of petroleum or any other regulated substance..."

This provides DEQ with the authority to require the cleanup of releases of regulated substances and petroleum from USTs that are excluded from the requirements of the UST Technical Regulation.

Procedures used for administering corrective actions for tanks regulated by the UST Technical Regulation are considered applicable to releases from other types of storage tanks and will usually be used by staff for releases from exempt and excluded USTs and ASTs. Corrective Action Plans are believed to be appropriate and necessary for describing proposed remedial activities and, therefore, will usually be requested by DEQ when corrective actions are needed for releases from exempt and excluded USTs and ASTs.

In contrast with the UST Technical Regulation (9 VAC 25-580-10 et seq.), there are no requirements for owners or operators of exempt USTs, excluded USTs, and ASTs to have an approved corrective action plan prior to initiating corrective action. Corrective actions for tanks not subject to the requirements of the UST Technical Regulation will usually be approved by a letter from the regional Remediation Manager or Compliance and Enforcement Manager stating that the Regional Office concurs with the CAP and that corrective actions may be initiated. This letter may be important in the reimbursement process and may serve as additional documentation that the Regional Office was involved in the decision making process and concurred with the proposed corrective actions.

Proposed corrective actions involving a point source discharge to surface water may be approved under the General VPDES Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests. Many petroleum bulk facilities already have an individual VPDES permit and the existing permit may be modified to incorporate the additional discharge.

Public notice is required for corrective actions involving releases from regulated USTs, deferred USTs, or partially deferred USTs. It is not required for unregulated tanks unless a VPDES or other individual permit is required for the planned corrective action. DEQ believes that public notice is an important part of due process and may be undertaken at the discretion of DEQ or the operator. Moreover, it is highly recommended that public notice be used when the release or intended corrective actions may impact members of the surrounding community.

### 5.7.3.3 Non-Attainment of Endpoints

Throughout the corrective action implementation process, the progress of remediation should be continually monitored and the assumptions, based on modeling, risk, etc., should be continually assessed. A thorough assessment should be made by the Case Manager periodically throughout the corrective action process to ensure that the corrective action activities remain viable and efficient and that progress toward reaching remediation goals is being made. If the chosen corrective action is not adequately addressing or reducing risks, or the current corrective action efficiency rate has dropped, and/or progress toward reaching remedial goals is not being made, alternative corrective actions (which should be described in the original CAP) should be considered. Where remedial endpoints may be achieved by continuance of the current mode of remediation, the plan should be continued. Where it is shown that altering or changing the plan would be more effective, that course should be followed.

Corrective actions not meeting remedial endpoints set forth in the CAP must be evaluated before the CAP may be terminated and case closure may be granted. Section 300 of the UST Technical Regulation requires the UST owner or operator to provide public notice if implementation of the approved CAP does not achieve the remedial endpoints specified in the approved CAP and termination of the CAP is being considered by DEQ.



#### 5.7.3.4 Remediation Optimization

Corrective Action Plans submitted to DEQ staff are required to provide certain minimum information detailing the corrective action(s) proposed for a site. However, CAP submittals often do not contain a proposed alternative to the plan or a discussion of how the plan would be modified if the primary proposed corrective action does not succeed as anticipated. An exit strategy and/or modification strategy should be incorporated into every Corrective Action Plan as identified in ITRC's guidance document, *Exit Strategy—Seeing the Forest Beyond the Trees*<sup>5-13</sup>.

Corrective Action Plans rarely detail the analytical or operational criteria that would dictate a shift in corrective action strategy. For example, a drop in the vapor effluent might indicate that changing from a liquid ring system to a vacuum truck or an SVE system would be more efficient. An ideal Corrective Action Plan should detail the pre-calculated analytical levels and/or operational data of the remediation system that would “trigger” a change in the remediation strategy. Triggers are monitoring results that, if reached and maintained for a specified period of time, indicate that it is time to begin a new course of action. For example, triggers could consist of remediation system efficiency rates or ground water analytical levels.

The Corrective Action Plan should also explore the timeframe at which post-operating monitoring would cease after specified triggers have been met. Conversely, contaminant levels that would trigger a more aggressive corrective action should also be considered in the Corrective Action Plan. For example, post-remediation monitoring at a site may indicate increasing levels of contamination that would necessitate resuming active corrective action. Identifying the level of contamination or efficiency rate in the CAP at which this would occur will ensure that active remediation resumes in a timely manner.

#### Measuring Performance Metrics

Performance metrics can be measured using the long-term monitoring schedule that is included in most CAPs. However, triggers must be prescribed in the CAP so operational and risk-response metrics (listed below) can be measured. Remediation action objectives (RAOs) as defined by ITRC, are the remediation objectives that must be achieved to reduce risks and hazards to potential receptors to acceptable levels under reasonable exposure scenarios. RAOs are expressed as statements and often reference the numeric endpoint concentrations. According to ITRC (2006), metrics often used for evaluating performance include:

- “Operational metrics for engineered systems (e.g., fluid extraction rates, treatment system efficiencies, discharge requirements)
- Risk-reduction metrics (e.g., plume stability or recession, product or soil removal, and land-use controls)
- Response completion metrics or site closeout criteria (e.g., RAOs, confirmatory monitoring requirements)”

<sup>5-13</sup> From: ITRC (Interstate Technology & Regulatory Council). 2006. *Exit Strategy—Seeing the Forest Beyond the Trees*. RPO-3. Washington, D.C.: Interstate Technology & Regulatory Council, Remediation Process Optimization Team. [www.itrcweb.org](http://www.itrcweb.org).

CAP Implementation monitoring reports are typically submitted quarterly or semi-annually. Routine evaluation (i.e. a meeting between the Case Manager, the RP, and the consultant) of these reports should result in the optimization of the remediation system, time, and cost management. Regular assessments will create an opportunity to discuss any changes or clarifications needed to be made to the corrective action strategy and monitoring parameters outlined in the CAP. The purpose of each meeting is to continually fine-tune the remediation process in order to bring each site toward closure.

The key to a successful Corrective Action Plan is to plan for contingencies that might occur during the remediation. Contingencies should be outlined in the CAP in order to ensure a smooth transition to an alternate remediation strategy or modification of the existing strategy if conditions warrant. Logical decision-making should be applied to setting the triggers and pathways that follow. **The ITRC document states: “Simple ‘if (a specified condition occurs)-then (a specified action will be taken)’ decision statements can be developed to identify how performance monitoring data will be used to assess performance, and which conditions are cause for concern.”**

#### 5.7.3.5 Bidding Corrective Action Implementation

Bidding was developed by DEQ as a mechanism to assist owners/operators with controlling costs for release response and corrective action at sites with access to the VPSTF. VPSTF procedures require the owner or operator to complete a competitive bidding process for certain types of costs associated with Corrective Action Plan implementation. Bidding is required during the Corrective Action Plan Implementation phase for materials and equipment not listed in the UCR Tables and costing more than \$1,000. Staff should see Section 4.6 for additional information about bidding procedures. Responsible persons and consultants seeking additional information about bidding should refer to the VPSTF Reimbursement Guidance Manual at <http://www.deq.virginia.gov/tanks/guidance.html>.

#### 5.7.3.6 Abbreviated Corrective Action Plans

All Corrective Action Plans address or provide information about proposed corrective actions, projected endpoints, schedule of corrective action implementation, and operational and post operational monitoring. However, in some instances, staff receive a more complex CAP than necessary to explain the proposed corrective actions. Some corrective action activities can be described sufficiently in a one or two page abbreviated CAP. For example, an abbreviated CAP may be sufficient for the connection of a residence or business having a petroleum-impacted private water supply well to an existing public water supply, aggressive fluid vapor recovery, or for monitored natural attenuation at sites where there is a low risk of impact to potential receptors.

Example 5-27. Exit Strategy Example from ITRC (2006)

- 1) Risk-Petroleum at Site A – Private well near property boundary~1/4 mile to the NW, groundwater flow generally NW (see CSM pages 12-20 for locations of drinking water receptors)
  - a) Remedial goal-Source area groundwater below a concentration of 7 ppm benzene (see CSM page 19, and RA pages 70 -75 for fate and transport decisions)
  - b) Remedial method(s)-SVE/AS (see pilot test report)
  - c) Metrics
    - i) Response complete-When groundwater concentration is below 7 ppm benzene at MW-1 (source well) for four consecutive events
    - ii) Compliance monitoring-Quarterly for the first year and semi-annual thereafter at source MW-1, and sentinel wells MW-2 & MW-3 (located between source and receptor)
    - iii) SVE/AS system monitoring
      - (1) Injection point pressure
      - (2) Etc.
  - d) Contingencies
    - i) From compliance monitoring
      - (1) If concentration at MW-2 increases over 40% for two events, review of the SVE/AS system will be performed; alternative technologies may be considered (state what would support the decision to switch technologies)
      - (2) If concentration in MW-3 increases, additional remedial actions will be performed (state what they would be) or consideration will be given to relocating the private well
    - ii) Operational monitoring
      - (1) If the injection point pressure starts increasing past a specified point, jet injection wells
      - (2) If measurable progress towards the remedial goal is not documented by the groundwater monitoring program – system operation will terminate and be reviewed for optimization or an alternative strategy (identified here) will commence
- 2) Risk-Petroleum at Site A – Utilities ...

Versatility by the Case Manager, consultant/RP is an important part of the “Exit Strategy Optimization”. Site condition changes, such as a second release or a new receptor, may necessitate modifying remediation strategies and exit timeframe. Contingencies on how to handle modifications should be present in the CAP. New risk evaluations may be necessary. Cost estimates will need to be revised.

“A performance-based exit strategy provides a flexible framework within which evolving site conditions and technical understanding can be applied to reduce uncertainties and to plan for the unexpected, while meeting the responsibilities of sound environmental management and efficient use of resources.”

Source: ITRC (Interstate Technology & Regulatory Council). 2006. *Exit Strategy—Seeing the Forest Beyond the Trees*. RPO-3. Washington, D.C.: Interstate Technology & Regulatory Council, Remediation Process Optimization Team. [www.itrcweb.org](http://www.itrcweb.org).

Like CAPs detailing more complicated corrective actions, an abbreviated CAP should include an exit strategy and/or proposed remedial alternatives to the plan explaining how the plan would be modified if

the primary proposed corrective action does not succeed as anticipated. Therefore, an abbreviated CAP should not only include a monitoring schedule and projected endpoints, but also a process to evaluate whether the CAP is effective. For example, an abbreviated CAP describing natural attenuation should include a discussion of what actions would be taken if the concentrations of petroleum contaminants begin to increase. An assessment should be completed by the Case Manager periodically throughout the corrective action process to ensure that the corrective action activities discussed in the abbreviated CAP remain viable and efficient. Where it is shown that alteration or changing the plan would be more effective, that course should be followed.

Regional staff should communicate with the RP or the consultant to request what is needed in an abbreviated CAP. Some regions have developed their own abbreviated CAP outlines for specific releases that are typically less complex (e.g. small home heating oil releases). Abbreviated CAPs may be developed for any type of release at the discretion of the Case Manager. Please see Section 5.7.3 and its subsections for additional information on the development of Corrective Action Plans.

#### Example 5-28. Abbreviated CAP example scenarios

Scenario 1: A home heating oil tank release has occurred. Petroleum saturated soils have been removed, three monitoring wells have been installed, and the site has been characterized. There are no potential receptors, but free product remains at the site. A CAP is requested to perform aggressive fluid vapor recovery (AFVR) on the three monitoring wells until all recoverable free product has been removed.

Scenario 2: A release from an old farm tank was discovered when the on-site domestic well became contaminated by petroleum constituents. During site characterization, no free product or petroleum saturated soil were found. The only receptor identified during site characterization is the property well which has been impacted by dissolved petroleum constituents. A CAP is requested for the construction of a new replacement well.

Scenario 3: A line leak occurred at a gas station. The site has been characterized and there are no petroleum saturated soils or receptors, but two monitoring wells contain several inches of free product. The RP's consultant and the Case Manager believe that several free product recovery events with a VAC truck is all that will be needed to remove the free product. A CAP is requested to recover the free product in the two wells to the extent practicable. This CAP will not require the design of a remediation system.

#### 5.7.4 Delegation of Authority

In the past, a Case Manager was permitted to sign interim authorization letters and corrective action plan approval letters when a Remediation Manager was absent from the office for more than one day. In accordance with DEQ agency policy statement, effective October 31, 2008, a Case Manager no longer has the authority to sign in the absence of a Remediation Manager for duties which are the responsibility of the Remediation Manager, unless these duties have been specified for the Case Manager as well. Delegation of Authority (i.e. signing authority) generally changes in DEQ with changes in the administration. OSRR will supply Regional Office Staff with updated changes to the policy as they occur.

## 5.8 Monitoring Well Abandonment

(Appendix C fact sheet – Monitoring Well Abandonment)

DEQ and the State Health Department reached an agreement whereby DEQ will oversee the abandonment of monitoring wells installed as a requirement of either Article 9 or Article 11 of State Water Control Law. The goal of well abandonment is to prevent surface contamination from reaching ground water via the well.

Monitoring wells must be abandoned either in accordance with Section 3.11 of the State Health Department Well Abandonment Regulations or other requirements established by DEQ. DEQ staff may use the following guidelines when overseeing well abandonment:

1. *DEQ regional staff have the option to decide whether monitoring well abandonment should be a case closure criteria.*

If staff decide that case closure should be tied to monitoring well abandonment, staff should advise the responsible person that the case will be closed as soon as the AAF for well abandonment is signed by the Regional Office. When the 198 UCRs apply to the phase of activities under which monitoring wells will be abandoned, Task Codes T082 through T084 should be used this activity. If earlier UCR schedules apply to the phase, monitoring well abandonment activities other than grouting are reimbursable on a time and materials basis. Grouting is reimbursed in accordance with "M" codes 602 through 607.

2. *Surface completion components of the well including the vault, manhole, and riser should be removed.*
3. *Well casing should be removed below grade where it is unlikely to be exposed at the surface in the future.*

4. *The well must be filled and grouted.*

Deep wells (in this case, wells extending to a depth of greater than 20 feet below grade) must be grouted from grade to at least 20 feet below grade. The remainder of the deep well must be filled with grout or another inert material. Shallow wells (wells that are 20 feet or less in depth) must be grouted from grade to the well's terminal depth.

**NOTE: It is recommended that a bentonite/grout mixture be used to improve the sealing properties of the well filling material.**

## **5.9 The Relationship between the Storage Tank Program and the Voluntary Remediation Program at Leaking Storage Tank Sites**

### **5.9.1 Summary of Voluntary Remediation Program**

The Commonwealth of Virginia established a Voluntary Remediation Program (VRP) to allow owners, operators, or those persons interested in a contaminated property to voluntarily remediate releases of contaminants. Sites are eligible for participation in the VRP if: (1) remediation has not clearly been mandated by the EPA, DEQ, or a court pursuant to CERCLA, RCRA, the Virginia Waste Management Act, the Virginia Water Control Law, or other applicable statutory or common law; or (2) jurisdiction of the statutes listed in clause 1 have been waived (9 VAC 20-60-30.C). After a VRP participant completes remediation under the VRP, DEQ issues a “Certification of Satisfactory Completion of Remediation” to the person cleaning up the site. This certificate provides immunity to enforcement action under Virginia Law, but is dependent upon the identification of the nature and extent of contamination presented to DEQ.

### **5.9.2 Interface Between the Storage Tank Program and the Voluntary Remediation Program (VRP)**

The investigation and remediation of petroleum or regulated substances released from regulated USTs and the cleanup of oil discharges required under Article 11 of Virginia Water Control Law will be overseen by DEQ Storage Tank Program. Responsible persons or other individuals wishing to obtain a “Certification of Satisfactory Completion of Remediation” from the VRP may enroll in the VRP only **after the Storage Tank Program has closed the case**. DEQ will not accept enrollment into the VRP while the case is still active (open) under Articles 9 or 11 of Virginia Water Control Law. Persons wishing to enroll in the VRP after receiving a case closure letter from the Storage Tank Program must be aware that: (1) additional site characterization and/or remediation may be required by the VRP before a certificate is issued; (2) cleanup levels may be significantly lower than levels required by the tank program for closure; and (3) **none of the costs incurred for work performed under the VRP are eligible for reimbursement from VPSTF**.

## **6.0 MANAGEMENT OF PETROLEUM CONTAMINATED MEDIA**

Petroleum contaminated wastes often are generated during storage tank closure, site characterization, and corrective action. These materials also may be generated during construction or property development activities. The purpose of this section is to discuss the regulatory and statutory requirements and provide general guidance for managing and handling petroleum contaminated media. Please keep in mind that the guidelines for managing contaminated media discussed in this manual are only for petroleum contaminated materials and do not apply to petroleum contaminated materials mixed with a listed hazardous waste or meeting the definition of a hazardous waste.

### **6.1 Management of Petroleum Contaminated Water**

During the course of tank closure, site characterization, and corrective action it is often necessary to deal with petroleum contaminated water. Article 1 of State Water Control Law (Section 62.1-44.5) states: "Except in compliance with a certificate issued by the Board, it shall be unlawful for any person to (1) discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances,.." Persons discharging sewage, industrial wastes, or other wastes into or adjacent to state waters are required by 9 VAC 25-30-50.A of the Permit Regulation to have a VPDES or VPA permit for that activity. Persons discharging petroleum contaminated water to surface water via a point source are required to obtain coverage under a VPDES permit for those discharges. In most instances, point source discharges of petroleum contaminated water may be permitted by the General VPDES Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (Petroleum Discharge General Permit). If regional staff believe that an individual permit is more appropriate than the general permit for a discharge, staff have the option of the tank owner/operator to seek an individual VPDES permit.

DEQ realizes that these requirements present difficulties for conducting and completing certain types of site characterization activities (e.g. aquifer testing) in a timely and cost effective manner. In order to promote more timely and cost effective site characterizations, DEQ has developed procedures for the on site land application of contaminated water which provide increased flexibility in the handling and disposal of this material.

#### **6.1.1 Land Application of Petroleum Contaminated Water**

Water contaminated by leakage from petroleum storage tanks may be applied to land at the site if the conditions outlined below are followed. In all instances, it shall be the sole responsibility of the tank owner or operator to either provide adequate treatment of the petroleum contaminated water or certify that such water is not contaminated above specified thresholds prior to land application on site.

Criteria for on site land application of ground water

1. The Regional Office must be notified prior to the land application of ground water near a drinking water supply well.
2. The purged ground water must not discharge to any storm sewer or surface waters.
3. The purged ground water must be applied to the land in such a way that it will infiltrate over the delineated dissolved phase plume, as best as known, and within the property boundaries of the site, preferably near the point of origin.
4. There must be no presence of liquid phase hydrocarbons, including a sheen or emulsion on the purged ground water.
5. The purged ground water may not be land applied during saturated or frozen ground conditions.
6. All actions taken must be described in the respective report toward which they occurred.

Criteria below are for on-site land application of large waste water discharges (e.g. water from aquifer tests and tank pit dewatering). These criteria are required in addition to 1 - 6 listed above.

7. In all instances, water samples from the appropriate location(s) must be collected and analyzed prior to discharging that material. The quality of water to be land applied shall not exceed the Petroleum Discharge General Permit requirements for freshwater as indicated in Tables 6-1 and 6-2. It is important to note that these standards are ambient water quality criteria used for the protection of aquatic life and are not meant for protecting human health. These criteria, therefore, should not be applied where humans may come into contact with the waste water. Acceptable concentrations of individual constituents must be considered on a case by case basis when humans may come into contact with the waste stream. In all cases, human receptors should be exposed to no more than a  $1 \times 10^{-6}$  excess lifetime cancer risk from contact with the constituent(s) being released. The hazard index for exposure to non-carcinogenic constituents may not exceed a value of one.
8. Water discharged onto the land must be sampled at least once every eight hours of the discharge activity. Turn-around time for analysis should be 24 hours or next business day. If sampling confirms that concentrations of dissolved constituents exceed the concentrations listed in Tables 6-1 and 6-2, the discharge must cease until these discharge limits can be maintained.
9. Samples should be analyzed for the appropriate constituents of concern using EPA/DEQ approved methods or, for these purposes only, on-site immunoassay tests.
10. All records of the disposal and testing should be maintained by the responsible person until the case is closed.



After initiating the land application of petroleum contaminated water, the responsible person must immediately notify the Regional Office of failure to meet or maintain any of the conditions listed above. The Case Manager will then identify the appropriate course of action. In all instances, the land application of large volumes of petroleum contaminated water (usually from aquifer tests and tank pit dewatering) must be stopped if the effluent exceeds the limits specified in Tables 6-1 and 6-2. Moreover, these discharges may not be re-started until the responsible person is capable of maintaining the discharge limits.

Table 6-1. Discharges to Freshwater, Wastewater Contaminated by Gasoline	
Constituent	Maximum Discharge Level
Benzene	50 µg/l
Toluene	175 µg/l
Ethylbenzene	320 µg/l
Total Xylenes	33 µg/l
MTBE	1,840 µg/l
pH	6.0 - 9.0 (standard units)
Total Recoverable Lead <sup>1</sup>	$e^{(1.273(\ln \text{ hardness}))-3.259}$
Ethylene Dibromide (EDB) <sup>1</sup>	5.3 µg/l
1,2 Dichloroethane (1,2 DCA) <sup>1</sup>	990 µg/l
Ethanol <sup>2</sup>	4100
<sup>1</sup> Required only if fuel is leaded <sup>2</sup> Required only if gasoline contains > 10% ethanol  Contaminant concentrations were taken from the effluent limitations listed for freshwater receiving waters (not listed as public water supplies) in the VPDES <b>Permit Regulation For Discharges From Petroleum Contaminated Sites, Groundwater Remediation and Hydrostatic Tests</b>	

Table 6-2. Discharges to Freshwater, Wastewater Contaminated by Petroleum Products Other than Gasoline	
Constituent	Maximum Discharge Level
Naphthalene	10 µg/l
Total Petroleum Hydrocarbons	15 mg/l
pH	6 - 9 (standard units)
Contaminant concentrations were taken from the effluent limitations listed for freshwater receiving waters (not listed as public water supplies) in the VPDES <b>Permit Regulation For Discharges From Petroleum Contaminated Sites, Groundwater Remediation and Hydrostatic Tests</b>	

## 6.1.2 General VPDES Permit for Petroleum Contaminated Sites, Groundwater Remediation and Hydrostatic Tests

The General VPDES Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (9 VAC 25-120-10 et seq.) was reissued and became effective on February 26, 2008. This new permit regulation replaced the General VPDES Permit for Petroleum Contaminated Sites and Hydrostatic Tests which expired on February 25, 2008. The General VPDES Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (Petroleum Discharge General Permit) may be used to authorize point source discharges of petroleum contaminated water to surface water. Discharges that may be granted coverage under this permit include: tank pit dewatering, purging ground water monitoring wells, aquifer testing, hydrostatic testing of petroleum storage tanks and pipelines, ground water recovery associated with the recovery of free product, or discharges resulting from another petroleum product cleanup activity approved by DEQ.

The Petroleum Discharge General Permit applies only to discharges of petroleum contaminated water, water contaminated with chlorinated hydrocarbon solvents, or water generated by hydrostatic tests. For the purposes of this general permit, "petroleum products" means petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents and used oils. Petroleum products do not include hazardous waste as defined by the Virginia Hazardous Waste Regulations, 9 VAC 20-60. "Chlorinated hydrocarbon solvents" means solvents containing carbon, hydrogen, and chlorine atoms and the constituents resulting from the degradation of these chlorinated hydrocarbon solvents.

### 6.1.2.1 Changes to the Permit in 2008

1. Changed the title of the regulation to "General Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation For Discharges From Petroleum Contaminated Sites, Groundwater Remediation and Hydrostatic Tests" to more clearly indicate the scope of permit coverage.
2. Added "wastewaters from sites contaminated by chlorinated hydrocarbon solvents" to the list of discharges covered by the permit. Added effluent limitations and monitoring requirements for discharges of water contaminated by chlorinated hydrocarbon solvents.
3. Expanded the scope of the regulation to allow discharges to waters listed as public water supplies. However, discharges within five miles upstream of a public water supply intake are not authorized by this permit.
4. Added several constituents to the list of parameters to be monitored during discharge operations. These changes are based upon the increased use of ethanol and better understanding of lead scavenger compounds used in leaded gasoline.
5. Removed the monitoring requirement for volatile organics (VOCs), semi-volatile organics (SVOCs), and dissolved metals for discharges of water contaminated by used oil.

6. Modified the existing effluent limits for total recoverable lead, xylenes, and naphthalene.

#### 6.1.2.2 Procedures for Granting Coverage under the Petroleum Discharge General Permit

1. Regional staff identify discharges from a petroleum contaminated site that should be permitted under the Petroleum Discharge General Permit. Alternatively, persons wishing to discharge petroleum contaminated water may request coverage under this general permit.
2. Storage Tank Program Staff should send the following to the permit applicant:
  - A. a letter directing the discharger or permit applicant to complete the Registration Statement (see Appendix E for an example letter)
    1. The person applying for coverage under the permit should be the person that will be responsible for operating the treatment facility (remediation system). In most cases, this probably will be the tank owner or operator, however, entities other than the tank owner/operator such as the contractor performing corrective actions may be the facility operator.

**NOTE: Consultants are permitted to sign the registration statement since they are often responsible for operating the treatment facility. If a consultant signs the registration statement, they are responsible for meeting the requirements of the permit.**

2. Staff should encourage persons applying for permits to identify and list all probable surface water discharges that may occur throughout the lifetime of release response and corrective action at the site. If the applicant fails to list a type of discharge that will subsequently occur at the site, a revised Registration Statement will have to be submitted to the Regional Office and coverage under the Petroleum General Permit will have to be modified in order to incorporate the additional discharge.
- B. a copy of the General Permit Registration Statement (<http://www.deq.virginia.gov/vpdes/permitfees.html>)
- C. instructions for completing the Registration Statement (<http://www.deq.virginia.gov/vpdes/permitfees.html>)
3. The permit applicant returns the Registration Statement to the Regional Office
4. The Case Manager (Storage Tank Program) performs an administrative review to ensure that the Registration Statement is complete by checking the following:
  - A. all items have been completed; only item 18 may be left blank;
  - B. a topographic map meeting the requirement in item 15 is attached;
  - C. a diagram of the proposed treatment system is attached; and
  - D. the Registration Statement is signed and dated. Persons that may sign the Registration Statement include:
    1. A responsible corporate officer of a corporation
    2. A general partner of a partnership
    3. The proprietor of a sole proprietorship

4. A principal executive officer or ranking elected official of a public agency or municipality
5. A consultant as long as he/she is responsible for operating the treatment facility

For additional information, please see the Instructions for Completing the General VPDES Permit Registration Statement (<http://www.deq.virginia.gov/vpdes/permitfees.html>).

If any of the above are not complete, the applicant must provide the necessary information before the Registration Statement may be processed.

5. The Case Manager performs a technical review of the Registration Statement whereby the Registration Statement is evaluated for site-specific conditions that prevent coverage under the Petroleum General Permit.
  - A. Evaluate whether the applicant is able to discharge the petroleum-contaminated water to a central sewer system. If item 16 on the Registration Statement indicates that the applicant has the option of discharging to a central sewer system, coverage usually should not be granted. If the sewer is present but the operator of the sewer system has denied access to the sewer, coverage may be granted under the Petroleum Discharge General Permit.
  - B. Locate the proposed discharge(s) into the receiving stream by using information provided in item 9 of the Registration Statement and the attached topographic map (item 15). Identify stream basin class, section, and special standards (if applicable) for the proposed discharge location. If the receiving water is within five miles upstream of a public water supply intake or to state waters specifically named in other regulations or policies which prohibit such discharges, coverage cannot be granted under the general permit. If the discharge is prohibited, indicate non-acceptance at the bottom of the Registration Statement.
  - C. Evaluate whether the applicant currently holds an individual VPDES permit. If the applicant currently holds an individual VPDES permit (item 17 on the Registration Statement), anti-backsliding must be considered. Contact the regional staff in the Water Permits Program for guidance if the applicant currently holds an individual VPDES permit.
  - D. Evaluate whether the applicant plans to discharge a hazardous waste. If item 19 of the Registration Statement indicates there will be treatment or disposal of hazardous waste, coverage under the Petroleum General Permit cannot be granted.
  - E. Identify the type of petroleum products that contaminated the water to be discharged (item 5 of the Registration Statement). Use the following table to determine the effluent limitation page(s) to include in the permit:
  - F. Review the attached diagram of the treatment system included with the Registration Statement along with information on the frequency of discharge (item 10), length of discharge (item 11), and flow rate of discharge (item 13). Evaluate the conceptual design to determine if the proposed treatment works should be able to treat the waste stream to meet the effluent limitations. If staff believe that effluent from the proposed treatment system will not meet the applicable effluent limitations, staff must require changes in the system before granting coverage under the Petroleum General Permit.

Characteristic of Water Body Receiving Discharge	Type of Petroleum Contamination				
	Gasoline	Non-Gasoline Products	Both Gasoline and Non-Gasoline Products	Total Petroleum Hydrocarbons from Hydrostatic Tests	Chlorinated Hydrocarbon Solvents
Freshwater not listed as public water supply	Part IA1	Part IA3	Part IA1 and Part IA3	NA	NA
Freshwater listed as public water supply	Part IA2	Part IA4	Part IA2 and Part IA4	NA	NA
Saltwater	Part IA6	Part IA7	Part IA6 and Part IA7	NA	NA
All receiving waters	NA	NA	NA	Part IA5	Part IA8

Not Applicable (NA) indicates that effluent limitations do not exist in the permit

6. The Case Manager approves the Registration Statement
7. The Case Manager completes the bottom of the Registration Statement by:
  - A. Indicating acceptance of the Registration Statement.
  - B. Filling in the date.
  - C. Listing the basin, stream class, section, and special standards that apply to the discharge(s) (outfalls).
8. The Case Manager assembles the permit pages
  - A. Assign the permit number  
For existing permitted facilities, the permit number will be the same one that was used for the previous issuance. For new facilities, the permit number will be generated by CEDS when the facility is entered into the system. Regional staff should remember that the last four digits of the permit number have to be typed in on all of the permit pages (including the cover page) before the permit is mailed to the permittee.
  - B. Complete the Permit Cover Page  
The cover page must be printed on DEQ letterhead. Staff must fill in the General Permit number and the effective and expiration dates of the Petroleum General Permit (Feb. 26, 2008, and Feb. 26, 2013, respectively).
  - C. Assemble Part I effluent limits pages that are applicable to the approved discharge  
Staff compiling the permit package should enter the general permit number for the facility and page numbers on the top right corner of each page of the Part I effluent limits applicable to the discharge. Staff should also add outfall numbers to the end of the first sentence on each effluent limit page. Staff may list multiple outfalls on the same effluent page.

Staff have the flexibility to evaluate whether multiple discharge activities may be considered one outfall or multiple outfalls. As a general rule, wastewater generated by different processes that is treated by a common treatment system can usually be considered one outfall.

- D. Assemble Part I.B Special Conditions  
Staff must print the special conditions listed in Part I.B and include this with the permit package. The general permit number for the facility and page number should be placed on the top right corner of each page.
- E. Assemble Part II Conditions Applicable to all VPDES Permits  
Staff should enter the general permit number on the top right corner of each page of Part II.
- F. Ensure that Discharge Monitoring Reports (DMRs) are Created  
DMRs must be generated for each outfall. Procedures for generating DMRs may be region specific, however, the Case Manager is responsible for ensuring that the DMRs are created and that the correct parameters and limits are included on the DMR(s). Regional staff should prepare DMRs to include the applicable limitations and monitoring requirements as listed on the Part I.A pages assigned to the outfall. Staff must remember that DMRs are required for each outfall. Effluent limitations for each outfall must be entered into the Compliance Auditing System.
- G. Write the Permit Coverage Letter  
Regional Remediation Managers and Compliance and Enforcement Managers are authorized to sign General Permit Coverage Letters (see Appendix E for an example Permit Coverage Letter). When multiple discharge activities are considered to be the same outfall, the transmittal letter should specify the discharge activity under which the monitoring samples should be collected.
- H. Include a copy of the Termination of Coverage Request form with the Permit Package  
This form allows the permittee to request termination of coverage for the entire facility and for individual outfalls. Please see <http://www.deq.virginia.gov/vpdes/permitfees.html> for a Termination of Coverage Request form.

**NOTE: No changes to the language of the general permit are authorized.**

- 9. The Case Manager sends the Permit Package to the Remediation Manager or Compliance and Enforcement Manager for signature on the transmittal letter.
- 10. After the Remediation Manager or Compliance and Enforcement Manager signs the transmittal letter, the Case Manager provides a copy of the transmittal letter and the DMRs to the Regional Compliance Auditor.
- 11. The Regional Remediation Program must retain copies of all Petroleum General Discharge Permits issued in that region.
- 12. Transmit the Permit Package to the permittee. The Permit Package will include the following:
  - A. Permit Transmittal Letter
  - B. The appropriate effluent limitations pages with outfall numbers specified on the pages
  - C. Part I.B Special Conditions
  - D. Part II
  - E. DMRs
  - F. Permit Cover Page
  - G. Termination Request Form

### 6.1.2.3 Permittee Submittal of Discharge Monitoring Reports

Once coverage under the Petroleum Discharge General Permit has been granted, the permittee is required to submit DMRs on a monthly basis until coverage under the permit is terminated. DMRs are due on the tenth of each month and must contain monitoring results from the previous month. Permittees must remember that **DMRs must be submitted monthly for each outfall regardless of whether a discharge occurred from that outfall during the previous month.** If there was no discharge from a particular outfall during the previous month, the permittee should write "no discharge" on the DMR(s) for that outfall.

Permittees must send DMRs to the DEQ Regional Compliance Auditor by the tenth of each month. Case Managers receiving DMRs should forward them to the Compliance Auditor. Information contained on the DMR will then be entered into CEDS.

**NOTE: If a permittee collects and analyzes multiple samples per month from a particular outfall, the permittee must list the highest values on the DMR and submit lab sheets for all analyses conducted with the DMR.**

### 6.1.2.4 Permit Modification and Termination of Coverage

The addition or deletion of outfalls covered under the Petroleum General Permit may be processed as minor modifications to the existing permit. Permittees seeking permit coverage for sources or discharge activities not identified on the original Registration Statement should send an amended Registration Statement to the Case Manager. The Case Manager will:

1. Review the amended Registration Statement
2. Approve the additional outfalls (if appropriate)<sup>6-1</sup>
3. Ensure that DMRs are developed for the new discharge(s) (if the Regional Case Manager considers the new discharge to be a new outfall).
4. Provide DMRs for all new outfalls to the Compliance Auditor so that the new outfalls can be recorded in the compliance tracking and CEDS databases.
5. Send a letter to the permittee indicating approval of the permit modification. DMRs for the new outfalls should be included with the letter.

<sup>6-1</sup> Regional staff have the authority to decide whether new discharging activities should be considered new outfalls. Generally, this decision will be based upon the system that will treat water from this new activity. If petroleum contaminated water from the new activity will be treated by an existing treatment system, staff will usually consider this activity to be part of the existing outfall and no new DMRs will be needed. Conversely, if water from the new activity will be treated by a new treatment system, this new system will be considered a new outfall.

Permittees may also request termination of coverage for individual outfalls or for the entire site. Permittees seeking to terminate coverage for individual outfalls or the entire site should fill out a Termination of Coverage Request form and submit that form to the Case Manager. The Case Manager will then review the termination request and approve or reject the request. Upon terminating coverage for an outfall or site, the Case Manager must inform the Compliance Auditor of this modification of the permit. The Case Manager will then send a letter confirming termination to the permittee.

#### 6.1.2.5 Transferring Permits

Coverage under a General Permit may be transferred from one permittee to another provided that the permittee notifies DEQ at least 30 days prior to the proposed date of transfer. This notice must include a written agreement between the existing and new permittee and specify the date on which permit responsibility, liability, and coverage should be transferred from one person to the other. As long as the entity that will become the new permittee agrees to all conditions and responsibilities of the present permit, they may fill out the Permit Transfer Agreement Form (<http://www.deq.virginia.gov/vpdes/permitfees.html>) and submit it to the Regional Office.

The regional Case Manager will review the transfer request and decide if the permit needs to be revoked, modified, or re-issued. Provided that no changes (other than changing the permittee's name, address, etc.) are needed, permit coverage is automatically transferred to the new permittee on the date requested.

#### 6.1.3 Individual VPDES Permits

In the rare instances where the discharge cannot be granted coverage under the Petroleum General Permit, an individual VPDES permit may be issued. Individual permits will generally be used when: (1) the responsible person has specifically requested an individual permit; (2) the Regional Director evaluates whether an individual permit is more appropriate than the General VPDES Permit due to the complex nature of the site; or (3) an individual permit is required by the Permit Regulation (e.g. an existing VPDES permittee proposes to discharge effluent through an existing VPDES outfall). Procedures are outlined in the OWRM (Office of Water Resources Management) Permit Manual, and will not be discussed further within this manual. Additional information on VPDES permits can be found on DEQ's website at <http://www.deq.virginia.gov/vpdes/homepage.html>.

#### 6.1.4 Re-infiltration of Treated Ground Water into the Subsurface

Depending on site conditions, responsible persons may find it advantageous to utilize the effluent from a treatment system to promote soil flushing and preclude a ground water shortage at the remediation site. DEQ staff may approve remediation plans that call for the re-infiltration of treated water provided that the area of re-infiltration is within the defined contamination zone and the use of re-infiltration can be demonstrated to be beneficial to the overall cleanup effort. DEQ's position is that re-infiltration performed in a manner as described above is not injection or disposal of a waste but is an integral process to site remediation.



### **6.1.5 Offsite Disposal of Petroleum Contaminated Water**

If wastewater cannot be reasonably treated to meet the concentrations listed in Tables 6-1 and 6-2 or there are impervious surfaces or saturated surficial soils at the site, or the costs to treat and reinfiltrate or release as part of a VPDES permit are too high due to the contaminant amount in the water, the responsible person should consider having that water treated at an offsite facility. Facilities are available to both recycle and treat waste water/petroleum mixtures. The ratio of petroleum to water that may be recycled is decided by individual recyclers. In all instances, it is the responsibility of the tank owner or operator to obtain proper analyses of the wastewater as required by the recycling or treatment and disposal facility. Reimbursement eligibility from the VPSTF will be based upon: (1) prior approval of the activity by the Regional Office; and (2) the selection of the least expensive option which is feasible for the site.

### **6.1.6 Remediation Injection Wells**

The Safe Drinking Water Act established the Underground Injection Control (UIC) Program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water. The UIC Program defines an injection well as any bored, drilled, driven shaft or a dug hole, where the depth is greater than the largest surface dimension that is used to discharge fluids underground. The Commonwealth of Virginia's UIC Program is implemented through EPA's Region III office. There are five classes of injection wells within the UIC Program.

In the past, DEQ has maintained that the UIC Program is related to material disposal and not remediation. However, Class V wells do include aquifer remediation wells that are installed to prevent, control, or remediate petroleum contamination in groundwater. Fluids (e.g. bioremediation agents or chemical oxidation agents) are often injected into the subsurface to assist with groundwater remediation and are considered Class V injection wells and governed under the UIC Program.

As defined by 40 CFR 144 § 144.81, Class V injection wells are not included in Class I, II, III, or IV. Typically, Class V wells are shallow wells used to place a variety of fluids directly below land surface. However, if the fluids placed in the ground qualify as a hazardous waste under the Resource Conservation and Recovery Act (RCRA), the well is either a Class I or Class IV well, not a Class V well.

Class V injection wells are "authorized by rule." This means that an injection well may be operated without a permit as long as program requirements are met. These program requirements include:

1. Submitting basic information about Class V injection wells to the EPA Region III UIC Director which includes: the address of the owner/operator, physical location of the injection well, type of fluid disposed, and number of injection wells used. This information is requested on national form "Inventory of Injection Wells" OMB No. 2040-0042 and is located at <http://www.epa.gov/safewater/uic/7520s.html> and in Appendix W of this manual.
2. Constructing, operating, and closing Class V injection wells in a manner which protects underground sources of drinking water.

**NOTE: EPA may request additional information or require a permit in order to ensure that ground water quality is adequately protected.**

## 6.2 Management of Petroleum Contaminated Soil

Managing petroleum contaminated soil frequently is an issue during UST closure, boring and monitoring well installation, and soil excavation associated with corrective action or Phase II Initial Abatement. Non-hazardous petroleum contaminated soil that is excavated or moved/graded meets the definition of "solid waste" under the Virginia Solid Waste Management Regulations (VSWMR; 9 VAC 20-81-10 et seq.).

### 6.2.1 Options for the Treatment and Disposal of Petroleum Contaminated Soil

Under Virginia Law and Regulation, the responsible person has several options for managing petroleum contaminated soil that is generated during storage tank closure or release response and corrective action.

- Petroleum contaminated soil may be managed at the release site or another site owned by the responsible person under the auspices of the DEQ Storage Tank Program.
- Petroleum contaminated soil may be transported to a solid waste management facility (e.g. landfill, soil treatment facility), permitted under the VSWMR, to accept petroleum contaminated soil. A list of active, permitted solid waste management facilities in Virginia can be located at the following link:  
<http://www.deq.virginia.gov/export/sites/default/waste/pdf/aswmffeb2011.pdf>. Not all solid waste management facilities accept petroleum contaminated soil. Persons seeking to dispose petroleum contaminated soil are advised to contact the facility prior to transport to determine the waste acceptance requirements for that facility.
- If the material meets the requirements for re-use as fill, the responsible person may manage this material in accordance with the disposal requirements listed in section 660.D.2 of the VSWMR (see Section 6.2.2).
- Section 95.C.7 of the VSWMR conditionally exempts certain non-hazardous petroleum contaminated soil from the requirements of the solid waste regulation as long as no open dump, hazard, or public nuisance is created. This exemption applies to:
  - “Non-hazardous, contaminated soil that has been excavated as part of a construction project and that is used as backfill for the same excavation or excavations containing similar contaminants at the same site, at concentrations at the same level or higher. Excess contaminated soil from these projects is subject to the requirements of the VSWMR.”
  - “Non-hazardous petroleum contaminated soil that is treated to the satisfaction of the DEQ in accordance with section 660 of the VSWMR.”

Furthermore, section 660.E of the VSWMR exempts soil contaminated by a petroleum storage tank release from the limits and/or testing requirements for contaminated soil listed in sections 660.D.2.a through c of the regulation as long as the total volume of soil is less than 20 cubic yards and the soil is not a hazardous waste.

The following sections discuss options that responsible persons have when treating or disposing petroleum contaminated soil and provide guidelines for each option.

### 6.2.1.1 Management of Petroleum Contaminated Soil at the Site Where the Release Occurred

On-site management of petroleum contaminated soil is an option that may be considered at many sites provided that constituents within the soil do not create immediate hazards at the site. DEQ staff will use the following guidelines when evaluating requests for the management (including treatment) of petroleum contaminated soil at the location where the release occurred:

1. Above ground treatment of petroleum contaminated soil  
Petroleum contaminated soil may be treated above the ground at the release site provided that:
  - A. Risks from constituents in the soil are evaluated and do not exceed applicable risk management thresholds at any time during the corrective action process;
  - B. The responsible person develops a CAP and goes through a public notice/public comment process before initiating this type of treatment;
  - C. DEQ issues a Corrective Action Plan approval letter authorizing this activity;
  
2. Placement of petroleum contaminated soil in an excavation or boring  
Petroleum contaminated soil may be returned to the excavation or boring from which it originally came or another excavation on the same site<sup>6-2</sup> provided that:
  - A. This soil is not saturated with petroleum (Petroleum saturated soil may not be placed back in a boring or excavation unless staff have evaluated this course of action and believe that this material is unlikely to be a continuing source of free product at the site);
  - B. Constituents within the soil are not believed to create an immediate health hazard; and
  - C. Risks from constituents in this soil are evaluated during the Site Characterization process.

**NOTE: Soil should not be placed in an excavation other than the one from which it originally came unless the surrounding material is also contaminated by petroleum and is more heavily contaminated than the material being backfilled.**

3. Temporary on-site storage of petroleum contaminated soil  
Petroleum contaminated soil that has been excavated, generated from borings or monitoring wells, or otherwise managed at the site must be contained until this material is properly treated or disposed. Petroleum contaminated soil may not be placed directly on the ground unless: (1) that soil meets the criteria as listed in section 660.D.2.d of the VSWMR and no open dump, hazard, or public nuisance is created; or (2) the responsible person has received a CAP approval or Interim Authorization approval letter from DEQ specifically authorizing the on-site treatment of that material.

<sup>6-2</sup> Interpretation of what constitutes the "same site" may pose a challenge at facilities covering large tracts of land that are owned by one RP (e.g. military bases). DEQ Storage Tank Program staff should interpret "same site" in the case of large facilities to mean the area that can be adequately addressed by the same SCR.

Analytical testing requirements for petroleum contaminated soil managed at the release site will be established by the Storage Tank Program staff. Soil may not be re-used as fill unless it meets the requirements of the VSWMR (see Section 6.2.2 of this manual).

#### 6.2.1.2 Treatment and Disposal of Petroleum Contaminated Soil at Permitted Solid Waste Management Facilities

Conditions at certain sites make it more practicable and cost effective to dispose or treat petroleum contaminated soil at a facility permitted under the VSWMR than to treat the soil on site or offsite under the auspices of the DEQ Storage Tank Program. Responsible persons wishing to treat or dispose petroleum contaminated soil at permitted solid waste management facilities are required to characterize the soil in accordance with: (1) Section 660 of the VSWMR; or (2) the permit requirements of the facility at which the soil will be treated or disposed (i.e. the RP must contact the facility operator to identify what analyses are required before the facility will accept the material).

Waste characterization requirements are discussed further in Sections 6.2.3, 6.2.3.1, and 6.2.3.2 of this manual and in the Guidelines for Special Waste Disposal found on the DEQ website (<http://www.deq.virginia.gov/waste/wasteforms.html>).

**NOTE: Bidding is required when transporting and disposing of more than 250 tons (approximately 333 cubic yards) of contaminated soil.**

#### 6.2.1.3 Offsite Treatment of Petroleum Contaminated Soil at Facilities Owned and Operated by the Responsible Person

DEQ recognizes the technical viability and cost effectiveness that may potentially be achieved by remediating petroleum contaminated soil at offsite properties that are owned by the tank owner or operator. Staff should use the following guidelines when considering the offsite treatment of petroleum contaminated soil at sites that are owned by the tank owner or operator and that are not permitted by the VSWMR:

1. If possible, soil should be remediated at the site where the release occurred rather than offsite. This will reduce the possibility of contaminating a previously uncontaminated site.
2. Soil treated at a site other than where the release occurred must be treated until it meets the standards in Section 660.D.2.d of the VSWMR (see Section 6.2.2 of this manual). The reason for this is that contaminated material has been moved from a contaminated site to one that presumably is not contaminated.
3. The treatment of petroleum contaminated soil at a site owned by the tank owner or operator is a type of corrective action. It is DEQ's position that a public notice process must be used before soil is taken to or treated at a site which is not permitted pursuant to the VSWMR. Once at such a site or facility, the soil must be managed in such a way that no open dump is created.

4. A CAP must be developed and DEQ must approve the CAP authorizing soil treatment at a site that does not have a waste permit before the tank owner or operator may proceed with this type of corrective action.

The criteria listed below are consistent with siting requirements in the VSWMR. It is recommended that staff consider these criteria when evaluating sites owned by the responsible person and not permitted under the VSWMR for suitability for the treatment of petroleum contaminated soil.

1. The treatment activity should not be located in a floodplain or in any way restrict the flow of the base flood, reduce the temporary water storage capacity of the floodplain (100 year floodplain), or result in washout of solid waste.
2. The treatment activity at a site should not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife.
3. The treatment activity at a site should not cause a discharge of pollutants to state waters.
4. The treatment activity should be located at least 100 feet from any regularly flowing surface water body;
5. The treatment activity should be more than 500 feet from any well or source of drinking water.
6. The treatment activity should be more than 200 feet from a residence, school, daycare center, hospital, nursing home, or recreational park.

#### 6.2.1.4 The Offsite Treatment or Disposal of Petroleum Contaminated Soil at Sites Neither Owned by the Responsible Person nor Permitted Pursuant to Virginia Law and Regulation

Petroleum contaminated soil (soil contaminated by petroleum and not meeting the fill material requirements in Section 660.D.2.d of the VSWMR) may not be treated at a site that is owned by someone other than the UST/AST owner or operator unless that site has the appropriate solid or hazardous waste management permit. The issue of who owns the site on which treatment takes place is critical as to whether that treatment may be permitted under a Corrective Action Plan. A Corrective Action Plan approval letter authorizes the UST owner or operator to conduct corrective actions specified in an approved Corrective Action Plan. If soil is treated at a site that is owned by someone other than the UST owner or operator, the UST owner or operator does not have ultimate control over that property and, therefore, does not have the ultimate control over corrective actions performed on that property.

### 6.2.2 Requirements for Re-use as Fill Material

Petroleum contaminated soil meeting the following testing and disposal requirements (Section 660 of the

VSWMR) may be used as fill material with certain restrictions:

#### Testing Requirements for Re-use as Fill

##### Petroleum Testing

- TPH concentration of less than 50 mg/kg
- Total BTEX concentration of less than 10 mg/kg

##### Hazardous Waste Testing

- Waste is not hazardous
  - Pass tests for corrosivity, ignitability, reactivity, and toxicity (TCLP)
- Total Organic Halogen (TOX) concentration is less than 100 mg/kg

Staff should be aware that responsible persons may use their knowledge of the waste and declare a waste non-hazardous without having to test that material by TCLP or TOX. Persons wanting to dispose of petroleum contaminated soil as clean fill usually can certify that the soil is non-hazardous if the sole source of contamination is an unleaded motor fuel, fuel oil, or unused motor oil and the total BTEX concentration in that soil is less than 10 mg/kg. Unleaded motor fuels, fuel oils, and unused motor oil are not expected to contain significant concentrations of metals or halogenated compounds, nor are they expected to contain pesticides. Soils contaminated solely by these petroleum products, therefore, would not be expected to fail TCLP metals, halogenated compounds, or pesticides. If the benzene concentration in the soil is less than 10 mg/kg, that soil would not be expected to fail TCLP for benzene because a 20:1 dilution factor is used in that procedure.

#### Disposal Requirements

Petroleum contaminated soil containing less than 50 mg/kg TPH and total BTEX less than 10 mg/kg may be used as fill material with the following restrictions (Section 660.D.2.d of the VSWMR):

1. May not be disposed closer than 100 feet from any regularly flowing surface water body.
2. May not be disposed less than 500 feet from any well or source of drinking water.
3. May not be disposed within 200 feet of a residence, school, hospital, daycare center, nursing home, or recreational park.
4. If the soil is disposed on a property not owned by the generator, the generator must notify the property owner that the soil is contaminated and disclose the nature of the contamination.

### **6.2.3 Waste Characterization Requirements for Disposal/Treatment at a Permitted Waste Management Facility**

Petroleum contaminated soil that is treated or disposed at a permitted waste management facility must be tested in accordance with the waste characterization requirements of the Virginia Solid and Hazardous Waste Management Regulations. Chapter 60, Part 262.11 of the Virginia Hazardous Waste Management Regulations requires any person who generates a solid waste to evaluate whether that waste is a hazardous waste. Persons who generate solid wastes may evaluate whether this waste is hazardous by either: (1)

testing the waste; or (2) applying knowledge of the hazardous characteristics of such wastes. The testing requirements for hazardous waste for petroleum contaminated soil must be performed in accordance with Section 660.B of the VSWMR.

### 6.2.3.1 Analytical Testing Requirements for the Disposal/Treatment of Petroleum Contaminated Soil at a Permitted Solid Waste Management Facility

The VSWMR require that one composite sample be collected for every 250 cubic yards of soil to be disposed and analyzed by appropriate SW-846 methods. DEQ staff in the Solid Waste Program will determine on a case-specific basis the appropriate the tests that are appropriate for the soil to be disposed. Typical tests often required when disposing petroleum contaminated soil include:

1. Paint Filter Liquids (EPA Method 9095);
2. Total Petroleum Hydrocarbons (EPA Method 8015C);
3. The concentration of benzene, toluene, ethylbenzene, and xylene (EPA Method 8021B);
4. Total Organic Halogens (TOX) (EPA Methods 9020B or 9022); and
5. Toxicity by the Toxicity Characteristic Leaching Procedure (TCLP).

**NOTE: Petroleum contaminated soil that is treated under a CAP approved by the DEQ Storage Tank Program is conditionally exempt from the VSWMR. Testing requirements for soil that will be treated under the CAP shall be specified in the approved CAP.**

### 6.2.3.2 Application of Knowledge of Waste in Lieu of Testing

As an alternative to analyzing the waste prior to disposal, the person generating the waste may apply his/her knowledge of the hazardous characteristics of the waste based on the materials and processes involved and certify that the waste is not hazardous. With regards to petroleum contaminated soil, the person generating the waste often can certify that a waste is non-hazardous as long as the sole source of contamination is an unleaded motor fuel (see section 1.2 for a definition of motor fuel), fuel oil, or unused motor oil from a regulated, deferred, or partially deferred UST.

Providing a certification that petroleum contaminated soil is non-hazardous is more difficult when the source is not a regulated, deferred, or partially deferred UST. The reason for this is that sources other than regulated, deferred, or partially deferred USTs are subject to the complete testing requirements of TCLP. Persons wanting to dispose of soil that was contaminated by petroleum from sources other than regulated, deferred, or partially deferred USTs often can certify that the soil is non-hazardous if the sole source of contamination is an unleaded motor fuel, fuel oil, or unused motor oil and the total BTEX concentration in the soil is less than 10 mg/kg. For example, petroleum contaminated soil from a home heating oil release may be a non-exempt material where one could use their knowledge in lieu of testing.

Unleaded motor fuels, fuel oils, and unused motor oil are not expected to contain significant concentrations of metals and halogenated compounds, nor are they expected to contain pesticides. Soil contaminated solely by these petroleum products, therefore, would not be expected to fail TCLP for metals, halogenated solvents, or pesticides. If the benzene concentration in the soil is less than 10 mg/kg, the soil would not be expected to fail TCLP for benzene because a 20:1 dilution factor is used in that analytical procedure.

Persons applying knowledge of a waste in lieu of testing should be aware that operators of treatment or disposal facilities might not accept wastes without analyses. It is recommended that responsible persons wishing to pursue this option contact the facility where the waste will be disposed and/or treated in order to evaluate whether a certification that the soil is not hazardous will be acceptable.

**NOTE: Petroleum contaminated media and debris from USTs subject to the corrective action requirements of the UST Technical Regulation (i.e. regulated, deferred, and partially deferred USTs) are exempt from the TCLP testing requirements for constituents D018 through D043 (organics; 40 CFR 261.4). For example, petroleum contaminated soil from a release of a regulated UST at a gasoline station would typically be considered exempt from TCLP testing for constituents D018 through D043. Petroleum contaminated media and debris from sources other than regulated USTs do not enjoy this exemption and persons generating these wastes may have a greater difficulty certifying that the waste will not fail TCLP for one or more of the organic constituents (e.g. benzene).**

#### **6.2.4 Management of Petroleum Contaminated Soil at VDOT Road Construction Sites**

During the course of constructing and maintaining roads, the Virginia Department of Transportation (VDOT) often encounters petroleum contaminated soil. DEQ and VDOT reached an agreement whereby VDOT may excavate petroleum contaminated soil and stockpile that material near the excavation in order to complete a maintenance or installation project. Upon completion of the project, VDOT may re-deposit this soil in the excavation from which it originally came without triggering the requirements of the Solid and Hazardous Waste Management Regulations. VDOT may not place petroleum saturated soil back in the excavation nor may the excavation of soil interfere with ongoing corrective actions. When petroleum contaminated soil is encountered during a road construction project, VDOT also needs to advise the appropriate DEQ Regional Office so that DEQ may ensure that the release has been or will be evaluated.

The VSWMR allows persons excavating non-hazardous petroleum contaminated soil to use that material as backfill in the original excavation or other excavations at the same site provided that the surrounding materials contain similar contaminants at equal or greater concentrations (9 VAC 20-81-95.C.7.d). This exemption to the requirements of the VSWMR may allow VDOT additional flexibility when managing petroleum contaminated soil at road construction sites. Section 95.C.7.f of the VSWMR conditionally exempts from regulation non-hazardous petroleum contaminated soil when that soil is incorporated into asphalt pavement projects.

**NOTE: Utility companies performing maintenance or installation work along a right of way may manage petroleum contaminated soil as described above.**



### **6.2.5 Management of Petroleum Contaminated Soil at Sites Closed by DEQ Storage Tank Program**

Remedial endpoints at leaking storage tank sites are based upon risks to known receptors at the time that the site is characterized and corrective actions are undertaken. Closure of a leaking storage tank case by DEQ does not guarantee that all contamination has been removed from the site. Persons developing or otherwise working on sites that formerly contained leaking storage tanks may find contaminated materials. Persons encountering petroleum contaminated soil at sites that have been evaluated and closed by DEQ have the following soil management options:

1. place the soil back in the excavation from which it came,
2. place it in another excavation on the same site provided that the surrounding material is also contaminated by petroleum at equal or greater concentrations than the backfill (see 9 VAC 20-8195.C.7.d,
3. dispose the material per the requirements of section 660.D of the VSWMR, or
4. treat or dispose of the material at a permitted waste management facility.

The DEQ Storage Tank Program will become involved when a site owner encounters petroleum contaminated soil and a release has never been reported to DEQ. In this type of case, Storage Tank Program Staff must first evaluate whether a release has occurred. If staff believe that a release has occurred, the RP must be identified and release response and corrective action must be initiated.

The DEQ Storage Tank Program has the ability to re-open cases should the need arise. DEQ is likely to re-open cases only in those instances where: (1) recoverable free product is encountered; or (2) risks to a receptor exceed our risk management thresholds and the receptor and pathway were present at the time of Site Characterization.

**NOTE: If a site owner encounters petroleum contaminated soil and is unsure whether DEQ has evaluated a release at that site, that person must contact DEQ.**

## 6.3 Emission of Petroleum Constituents into the Atmosphere Resulting from a Release and Remediation

Petroleum releases and the cleanup of petroleum releases may cause the emission of petroleum constituents into the atmosphere. There are two basic issues that must be considered regarding the emission of petroleum vapors following a release and during the ensuing cleanup. The first issue that must be addressed is whether the vapor emission is sufficiently large as to require a permit for that emission. The second issue involves determining whether the emissions pose unacceptable risks to specific receptors. These two issues must be considered because air permit requirements are not based upon site specific conditions and do not consider risks to individual receptors.

### 6.3.1 Air Discharge Permitting Requirements

Petroleum constituents may be released into the atmosphere as a result of activities related to cleaning up petroleum releases. Examples of vapor emitting remedial activities include soil aeration, vapor extraction, air stripping, and soil incineration. Soil incinerators are often used to remove petroleum constituents in soil. All incinerators must have a permit prior to operation (see 9 VAC 5-80-10 and 9 VAC 5-80-11). Additional permits for individual incinerators are not required when an incinerator is relocated provided that a permit for that incinerator has already been granted under 9 VAC 5-80-10.A.3 and:

1. emissions from the unit at the new location would be temporary;
2. emissions from the unit would not exceed its allowable emissions;
3. the unit would not undergo modification or reconstruction;
4. the unit is suitable to the area in which it is located; and
5. reasonable notice (not less than 15 days) is given to the appropriate DEQ Air Regional Office prior to relocation.

Responsible persons conducting corrective actions involving the discharge of constituents to the atmosphere may need to obtain a permit for those discharges. The primary constituents which will evaluate whether an air permit is needed for corrective action are volatile organic compounds (VOCs), toxic pollutants<sup>6-3</sup>, and lead. Facilities having volatile organic compound (VOC) emission rates less than 10 tons per year and lead emission rates less than .6 tons per year are exempt from permitting 9 VAC 5-80-11. Exemption levels for toxic pollutants are based on threshold limit values (TLVs), please see

<sup>6-3</sup> A "toxic pollutant" is defined as any air pollutant for which no ambient air quality standard has been established. Particulate matter and volatile organic compounds are not toxic pollutants as generic classes of substances but individual substances within these classes may be toxic pollutants because of their toxic properties or because a TLV has been established. Virginia Air Quality Policy No. 5 (AQP-5) contains a list of priority pollutants used in permitting.

Appendix U for TLV definitions). Facilities with an uncontrolled emission rate of a toxic pollutant equal to or less than the exempt emission rate calculated by using the exemption formulas for the applicable threshold limit value shall be exempt from permitting requirements 9 VAC 5-80-11. If more than one exemption formula applies to a toxic pollutant emitted by a facility, the uncontrolled emission rate of that pollutant shall be equal to or less than both applicable exemption formulas in order for the source to be exempt for that pollutant. Please see Appendix U for the exemption formulas and threshold limit values for selected petroleum constituents.

Air emissions from petroleum liquid storage and transfer operations may be regulated (i.e. need a permit) depending upon facility throughput and storage capacity of individual tanks. As a general rule, only large bulk storage and transfer facilities (i.e. oil terminals) are required to have air permits. If a facility is required to have an air emission permit, additional emissions from petroleum cleanup activities may also be covered under that permit. It is recommended that responsible persons conducting petroleum cleanups at bulk facilities contact the Air Permits section of the appropriate DEQ Regional Office if cleanup

activities may result in a significant emission of volatile organics, toxic pollutants, or lead into the atmosphere in order to evaluate whether the existing permit may need to be modified.

**NOTE: It is recommended that staff advise responsible persons who are planning to conduct vapor emitting corrective actions to contact the Air Permits staff to evaluate whether a permit is needed for the planned activity.**

### 6.3.2 Determining Risks from Air Emissions

Permit requirements for toxic constituents emitted from a petroleum release or cleanup activity are based upon TLVs for individual constituents. It is believed that the use of TLVs to identify acceptable emission limits may not be protective of human health in all instances. TLVs are established with the intention of protecting workers in an occupational exposure setting and assume a 40 hour per week exposure duration and a robust worker population. The approach used to establish TLVs does not consider non-occupational exposures nor does it consider the exposure of sensitive receptors to the regulated substance. ACGIH (1993) states:

"These limits are intended for use in the practice of industrial hygiene as guidelines or recommendations in the control of potential health hazards and for no other use, e.g, in the evaluation or control of community air pollution nuisances; in estimating the toxic potential of continuous, uninterrupted exposures or other extended work periods; ..."

Risks from the emission of constituents into the atmosphere as a result of a release must be evaluated as part of the Risk Assessment during the Site Characterization Phase. Owners/operators proposing to undertake corrective actions that result in the release of petroleum constituents into the atmosphere must also estimate the risks to receptors from these activities. Emissions from a particular corrective action may not require an air discharge permit and still pose unacceptable risks to individual receptors. In all cases, risks from vapor phase constituents emitted during corrective action may not exceed the applicable risk management thresholds (i.e. excess lifetime cancer risk of one in one million and a hazard index of 1).

## 7.0 Storage Tank Notification and Closure

Properly closing inactive or outdated storage tank systems is an important measure in preventing ongoing and/or future releases from tank systems. The procedures required for storage tank closure are variable depending upon site conditions and the set of regulations which govern the individual tank system. Due to the regulatory framework within which storage tank closure must take place, closure procedures/requirements will be discussed separately for the following types of tanks:

1. Regulated and partially deferred USTs;
2. Excluded, deferred, and exempt USTs 1 and 2;
3. Individual ASTs having a capacity of greater than 660 gallons of oil; and
4. Individual ASTs having a capacity of less than or equal to 660 gallons of oil.

Regardless of tank type, contaminated soil, free product, or other indicators of a release must be reported to DEQ and the tank owner or operator must initiate release response and corrective action.

**Storage tank closure is not generally considered by DEQ to be a corrective action activity. Costs associated with storage tank removal are not, therefore, eligible for reimbursement from VPSTF under most circumstances. The exceptional case where storage tank closure costs may potentially be eligible for reimbursement is when closure is performed under Interim Authorization or Corrective Action Plan Implementation and the activity is pre-approved by DEQ.**

The highest level of soil contamination at leaking UST sites is often found in the vicinity of the tanks, lines, and dispensers and this soil is often excavated at the time of UST closure in order to remove the tank system. DEQ recognizes that soil in the vicinity of the UST(s) typically contains a significant percentage of the total mass of regulated substance released at the site and proper disposal of this soil should be addressed as part of Initial Abatement. Although tank removal and soil excavation needed to remove the tank are not eligible for reimbursement, the Regional Office should approve the loading, hauling, and disposal of this soil (if contaminated) and backfill of the tank pit under the following conditions:

1. A release is reported to DEQ within 24 hours of discovery;
2. The UST system is eligible for reimbursement under the VPSTF (see Table 2-2); and
3. Loading, hauling, and disposal is limited to the amount of soil that was necessary to remove the UST(s). Table 7-1 lists tank capacities and maximum soil amounts to be used for approval of loading, hauling, and disposal of petroleum contaminated soil excavated during UST closure.

**NOTE: Excavated soil must be sampled prior to disposal. Costs associated with managing soil classified as clean fill may not be reimbursable.**

Table 7-1. Maximum Contaminated Soil Eligible for Reimbursement Based Upon UST Capacity at a Leaking UST Site				
UST Capacity (Gallons)	UST Dimensions (feet)	UST Displacement (cubic yards)	UST Excavation (W x L x H, ft)	Maximum Soil Removal (yd <sup>3</sup> / tons)
550	4 x 6	2.7	7 x 12 x 7	19 / 28.5
1000	4 x 11	5	7 x 17 x 7	26 / 39
2000	5.5 x 12	9.9	8.5 x 18 x 8.5	38 / 57
3000	5.5 x 18	14.8	8.5 x 24 x 8.5	49 / 73.5
4000	5.5 x 24	19.9	8.5 x 30 x 8.5	60 / 90
5000	8 x 13	24.7	11 x 19 x 11	60 / 90
6000	8 x 16	29.6	11 x 22 x 11	69 / 103.5
8000	8 x 21	39.5	11 x 27 x 11	82 / 123
10000	8 x 27	49.4	11 x 33 x 11	99 / 148.5
12000	8 x 32	53.9	11 x 38 x 11	111 / 166.5
15000	10.5 x 24	74	13.5 x 30 x 13.5	129 / 193.5
20000	10.5 x 31	98.8	13.5 x 37 x 13.5	151/226.5
25000	10.5 x 38.75	124.2	13.5 x 45 x 13.5	180/269
30000	11.5 x 40	153.8	14.5 x 46 x 14.5	204 / 306

Assumptions:

1. Dimensions are for a standard sti-P3 single-walled UST
2. Displacement (cubic yards) = capacity (gallons) x 1 cubic foot / 7.5 gallons x 1 cubic yard / 27 cubic feet
3. When deriving the excavation dimensions, it was assumed that the top of UST was three feet below grade and three feet of clearance were factored in for both ends and one side.
4. Maximum soils excavated = excavation - UST displacement
5. Maximum soils excavated is for a single UST only. It is expected, in excavations containing more than one UST, that less material will be generated per UST.
6. A conversion factor of 1.5 was used to convert cubic yards to tons.

**NOTE: Soil excavated during UST closure should be limited to that which is necessary to remove the UST(s). The removal of saturated soil may be justifiable, however this activity must be authorized by the Regional Office: (1) during a corrective action phase (e.g. Initial Abatement); and (2) prior to implementation, in order to be considered for reimbursement. Bidding is required when transporting and disposing of more than 250 tons (approximately 333 cubic yards) of contaminated soil. Please see Section 4.6 for additional information on bidding.**

## 7.1 Regulated USTs and Partially Deferred USTs

### 7.1.1 Permanent Closure

(Appendix C fact sheet - Regulated Underground Storage Tank (UST) Closures)

The procedures contained in this section outline the requirements for closure of regulated UST systems in accordance with Sections 320 and 330 of the UST Technical Regulation 9 VAC 25-580-10 et seq. Tank owners and operators are required to permanently close all substandard (non-upgraded) UST systems that are out of service for over one year<sup>7-1</sup>. Closure must be performed for the UST system and this includes the piping. If the UST will remain in service but product lines are taken out of service, the UST system owner or operator must close the lines in accordance with the UST Technical Regulation. Please note that site assessment is required even when only the product lines are taken out of service. UST system closure steps are as follows:

1. The owner or operator must contact the local building official or the building official's designee (often the fire official) and obtain a building permit to proceed with the UST closure. Inspections and site visits by the local code official must be coordinated through that official's office as required under the Uniform Statewide Building Code. A copy of the building permit must be included in the closure report.

**NOTE: A representative of the Department of General Services will function as the building official for facilities owned by the Commonwealth of Virginia.**

2. The owner or operator must remove all regulated substances, including sludges, from the tank. Removal of the sludges may necessitate professional tank cleaning. In all instances, it is the responsibility of the owner or operator to ensure that all steps in the tank closure process are carried out in a manner that minimizes the risk of explosion due to vapors and other hazards. The regulated substance and sludge removed from the tank must be properly disposed in accordance with the Virginia Solid and Hazardous Waste Management regulations. It is recommended that copies of disposal manifests be included in the closure report.

<sup>7-1</sup> When an UST system is temporarily closed for more than 12 months, the tank owner or operator must permanently close that UST system if it does not meet:

1. The performance standards for new UST systems in 9 VAC 25-580-50; or
2. The upgrading requirements in 9 VAC 25-580-60.

The tank system does not, however, have to meet spill and overfill requirements of the regulation. Owners and operators of UST systems not meeting these performance standards may request an extension of the 12 month temporary closure period from the building official. Persons seeking this extension must complete a site assessment in accordance with 9 VAC 25-580-320 before they may apply for the extension.

3. DEQ recommends that USTs be removed from the ground if at all possible.<sup>7-2</sup> Where allowed by the local code official, USTs may be closed in place by filling them with an inert substance that is approved by the local code official (e.g., sand, gravel, cement slurry) subsequent to product/sludge removal and tank cleaning. Disposal manifests for the tank and piping should be included in the closure report.
4. A site closure assessment is required in all cases except where an UST has been monitored monthly with vapor detection wells or ground water monitoring wells immediately prior to closure and monitoring indicates that no release has occurred. The site closure assessment is discussed in more detail in Section 7.1.1.2. The Closure Assessment will be reviewed by the regional staff and staff may require additional information if the Closure Assessment was performed improperly or the information submitted to DEQ is incomplete.
5. Within 30 days after closure, the tank owner or operator must submit an amended UST Notification Form (Form 7530-2) for the tank(s) closed along with a Tank Closure Report to the appropriate Regional Office. In instances where a release is reported to the Regional Office, only the UST Notification Form needs to be submitted, and a complete Tank Closure Report is not required. Refer to <http://www.deq.virginia.gov/tanks/contacts.html> or Appendix B for the appropriate Regional Office addresses.

Observation of contaminated soils or ground water or the presence of free product *must* be reported to DEQ by the owner or operator within 24 hours. **The submittal of a tank closure report does not meet the release reporting requirement.**

#### 7.1.1.1 UST Closure Reporting Requirements

A Closure Report must be received by DEQ within 30 days after one or more regulated UST systems are permanently closed. The Closure Report must contain the following:

1. An updated UST Notification Form (Form 7530-2);
2. A copy of the building permit;
3. The UST closure assessment;
4. All analytical results (include a statement of the analytical method used) and chain of custody forms; and
5. A site map showing tanks, piping, and sample locations and sample depths (including depth to ground water if known).

<sup>7-2</sup> USTs closed in place remain a potential liability to present and future land owners. For additional information, please see Chapter 3 of this document.

It is recommended that copies of the applicable disposal manifests for the tank(s), soil(s), and sludges also be included in the closure report.

#### 7.1.1.2 UST Closure Assessment

Section 330 of the UST Technical Regulation requires that the UST site be assessed at the time of closure. The purpose of this assessment is to evaluate whether a release from the UST system occurred. As part of this assessment, the owner or operator must measure for the presence of a release where a release would most likely be detected. Since releases may occur from any portion of the UST system that routinely contains product, the owner or operator must assess the product lines and dispenser area as well as the tank basin. This assessment is required in all instances unless vapor monitoring or ground water monitoring were conducted as part of release detection up until the time of closure and monitoring indicates that a release has not occurred.

**NOTE: A closure assessment is required when product lines are taken out of service independently of the UST.**

Samples collected to meet the sampling requirement of Section 330 may be either water or soil depending upon the conditions of the site (product type, backfill, depth to ground water, etc.). *Soil samples taken from below the ground water table in either the tank pit or from soil borings are **not** acceptable to confirm a clean tank closure as this would not be a location most likely to indicate a release if one had indeed occurred.* Regardless of the media sampled, all samples must be collected from discrete locations. Composite samples (i.e. soil mixtures or water mixtures) are not acceptable.

**NOTE: Sampling is only required to confirm that a release has not occurred. The owner or operator is not required to collect samples during closure if petroleum stained soil, free product, or other indicators of a release are observed and a release is reported to the Regional Office. Once a release has been confirmed, regional staff may direct the tank owner/operator to collect samples from the tank basin, line trenches, dispenser area(s), etc. as part of Site Characterization.**

Samples collected during closure may be analyzed by any appropriate EPA or DEQ approved analytical method (see Table 5-4 for a list of approved methods). Beginning on January 1, 1999, soil samples that will be analyzed by Method 8015 - GRO (gasoline range organics) must be collected using an EPA approved sampling device such as an EnCore™ sampler or other approved device. Analytical results for samples collected during UST closure that equal or exceed 100 mg/kg TPH (soil) or 1 mg/l TPH (ground water) must be reported to the Regional Office within 24 hours of receipt of the results. If the UST contained a non-petroleum regulated substance, analytical results indicating detectable concentrations of any constituent stored in that tank must be reported to the Regional Office within 24 hours.

**NOTE: For additional guidance on the management of petroleum contaminated media, please see Chapter 6 of this manual.**



### 7.1.1.3 Federal Regulation Closure Assessment Requirements

Occasionally, staff may need to review UST closure information for USTs that were closed between December 22, 1988, and October 25, 1989. When reviewing these closures, staff should be aware that the UST closure requirements in the Federal Regulation are slightly different than Virginia's requirements. According to the Preamble to the Federal UST Regulation, soil gas samples and visual inspection of the tank excavation may be sufficient to evaluate whether a release from the UST system occurred. The Federal UST Regulation also does not require closure samples from petroleum storage tanks to be analyzed for TPH. The Federal Regulation indicates that measurement methods used for UST closure samples should be appropriate for identifying releases from the UST system.

### 7.1.2 Temporary Closure

(Appendix C fact sheet – Regulated Underground Storage Tank (UST) Temporary Closure)

The owner or operator of an UST must submit an UST Notification Form (Form 7530-2) to DEQ within 30 days following cessation of use of that UST. DEQ will consider USTs that have been out of service for 30 days or more, but not permanently closed, to be temporarily closed. When a tank owner or operator wishes to temporarily close an UST system, he/she must obtain a permit from the Building Official and the system must be inspected. All applicable maintenance and release detection methods must continue during the temporary closure period unless the UST remains empty throughout the temporary closure period. Once an UST system has been temporarily closed for three months, the product lines, pumps, manways, and ancillary equipment must be capped; the vent lines must remain open and functioning.

Substandard UST systems that have been temporarily closed for 12 months must be permanently closed or upgraded to current standards for new UST systems. The Building Official may, based upon site-specific conditions, grant an extension of the 12-month temporary closure period. Owners of substandard USTs wishing to apply for this 12-month extension must complete a site assessment in accordance with Section 330 of the UST Technical Regulation before submitting their extension request to the building official. This site assessment must be submitted to DEQ along with an amended UST Notification Form that informs DEQ that the owner of the substandard UST will seek a temporary closure extension from the Building Official.

**NOTE: Although owners/operators of substandard USTs may temporarily close those tanks, DEQ recommends that all substandard USTs be upgraded or permanently closed by December 22, 1999.**

### 7.1.3 Pre-regulation Closures

USTs taken out of service prior to December 22, 1988, are considered to be previously closed UST systems and are not subject to closure requirements of the UST Technical Regulation provided that the tank is unused and no evidence of a release exists. If these tanks are brought back into use or a release is suspected or discovered at the site, then the appropriate section(s) of the UST Regulations apply. Pre-regulation closure means the cessation of use (i.e. input or withdrawal of regulated substance from the UST). If the owner of an UST containing a regulated substance maintains that there has been no input or

withdrawal of regulated substances from the UST since prior to December 22, 1988, the UST is considered closed. Any UST that was not so "closed" by December 22, 1988, must be properly closed by obtaining a building permit from the local code official and complying with the UST Technical Regulation (9 VAC 25-580-10 et seq.).

Additional measures taken by the owner or operator of an UST to close an already closed UST (e.g. inerting the tank or removing the tank) are not considered DEQ-regulated UST activities unless a release is suspected or discovered (9 VAC 25-580-340). If someone wishes to take such measures, they must still obtain the required building permit and proceed as directed by the local code official.

If any evidence of a release is discovered as a result of "re-closure," then a release from the UST system must be reported and release response and corrective action must be initiated.

#### **7.1.4 UST Notification Requirements**

(Appendix C fact sheet – Notification of Underground Storage Tanks (USTs))

Owners of regulated and partially deferred USTs are required to notify DEQ when new UST systems are brought into use. These persons must also notify DEQ when there is a change in: (1) tank ownership; (2) tank status (a tank is temporarily or permanently closed); (3) the tank and/or piping system (the tank and/or lines are upgraded, release detection equipment is added); or (4) the substance stored. UST owners and owners of property containing USTs that were taken out of service before May 8, 1986, are required to notify DEQ of the existence of these tanks. Title 42, Section 6991a of the U.S. Code states:

“For each underground storage tank taken out of operation after January 1, 1974, the owner of such a tank shall, within eighteen months after November 8, 1984, notify the state ... of the existence of such tanks (unless the owner knows the tank was subsequently removed from the ground).”

Section 70 of the UST Technical Regulation requires property owners to submit an UST Notification Form to DEQ when USTs at the site were taken out of service prior to January 1, 1974, and left in the ground. A summary of UST notification requirements is contained in Table 7-2.

Table 7-2. Notification Requirements for Regulated and Partially Deferred USTs			
UST Service Dates	Person Required to Notify	Notification Deadline	Regulatory Citation
USTs brought into use after May 8, 1986	UST owner	within 30 days of bringing UST into service	9 VAC 25-580-70
USTs taken out of service between January 1, 1974, and May 8, 1986, that remained in the ground after May 8, 1986	UST owner	May 8, 1986	42 USC Section 6991a
USTs taken out of service before and remaining in the ground after January 1, 1974	Property owner	July 1, 1987	9 VAC 25-580-70

- NOTES:**
1. Notification must be provided on the UST Notification Form (Form 7530-2).
  2. Notification must be provided to DEQ for all USTs (except exempt and excluded USTs) present at a site regardless of whether they are currently in use. For example, even if an UST was taken out of service in 1956, the property owner must notify DEQ if this UST is currently present at the site.

## 7.2 Closure Requirements for Deferred USTs, Exempt USTs 1 and 2, and Excluded USTs

Chapter 32 of the Virginia Building Code states that a permit is required "to install, remove, repair or alter a stationary tank for the storage of flammable or combustible liquids or modify or replace any line or dispensing device connected thereto." Persons wishing to close a home heating oil tank or other UST not regulated under the UST Technical Regulation should contact the local building official regarding the permits that are required to close that tank.

The UST Technical Regulations do not specify closure procedures for deferred USTs, exempt USTs, and excluded USTs. The tank owner or operator is not required by DEQ to collect water or soil samples as part of closure, nor is the owner or operator required to submit any type of closure notification to DEQ. If evidence of a petroleum release is discovered, the owner or operator must notify DEQ that a release has occurred and take actions as necessary to abate hazards caused by the release. For specific guidance on Exempt UST 2 releases, please refer to the Heating Oil Guidance in Section 5.4.4.

## 7.3 Closure Requirements for ASTs

### 7.3.1 ASTs Having a Capacity of Greater than 660 Gallons of Oil

Above ground storage tank (AST) operators wishing to close ASTs having a capacity of greater than 660 gallons of oil<sup>7-3</sup> must close those tanks in accordance with Section 120 of the Facility and Aboveground Storage Tank Regulation (9 VAC 25-91-10 et seq.). In order to close an AST, the AST operator<sup>7-4</sup> must:

1. Register the AST and pay the appropriate fee if the tank has not previously been registered (see Section 7.3.1.2 for more information on AST Registration Requirements).

**NOTE: A registration fee is not required at the time of closure if the operator has paid the registration fee for the AST or facility within 5 years prior to closure.**

2. Obtain the required permits and inspections
  - A. The AST owner/authorized representative will obtain permit(s) and inspection(s) from the local code official as required by the Uniform Statewide Building Code, the BOCA® National Building Code, and the NFPA Code. DEQ will then review the permits and inspection reports.

or
  - B. Where a permit is not issued by the local code official, the AST owner/authorized representative must contact DEQ for an inspection at least 14 days prior to commencing closure operations. If the AST is operated by the Commonwealth of Virginia, the Department of General Services shall function as the local code official.

and
  - C. If the closure is in response to containment and cleanup actions that necessitate AST removal, the AST owner/authorized representative must immediately notify the local code official and DEQ.

<sup>7-3</sup> ASTs located on a farm or residence used for storing motor fuel for noncommercial purposes with an aggregate storage capacity of 1100 gallons or less are excluded from the requirements of the Facility and Aboveground Storage Tank Regulation.

<sup>7-4</sup> Although the term "operator" includes a variety of persons (entities) who may share joint responsibility for compliance with the AST and Facility Regulation, DEQ will look first to the AST owner or duly authorized representative of the facility or AST when fixing responsibility for compliance with the registration requirement. Please see Section 100.C of the AST and Facility Regulation for additional information on who may be a "duly authorized representative".

3. Perform closure operations including:

A. Removing all liquids, sludges, and vapors from the AST and associated piping;

All wastes must be disposed in accordance with all applicable state and federal requirements.

B. Removing vapors and providing adequate ventilation for tanks that are closed in place;

Vent lines must remain open and they must be maintained in accordance with applicable codes. All access openings to the tank must be secured and the AST must be secured from tampering and flooding. The name of the product last stored, the date of permanent closure, and PERMANENTLY CLOSED shall be stenciled on the AST in a readily visible location. Piping must be disconnected and all pipes closed in place must be vapor free and capped or blind flanged.

C. Assess the site prior to completing closure operations;

1. When assessing the AST site, the owner/authorized representative must sample and test for the presence of petroleum hydrocarbons in any areas where contamination is likely to have occurred. Sampling and testing must be performed in accordance with EPA approved methods or methods approved by DEQ (see Table 5-4).

a. The owner/authorized representative must submit an updated registration form to DEQ along with:

1. Copies of lab results
2. A description of the area sampled
3. A photograph of the site indicating the areas sampled
4. A site map indicating the location of the closed AST and piping along with sample locations and depths

b. If contamination or other evidence of a release is discovered, the owner/authorized representative must immediately notify DEQ and initiate cleanup as required by DEQ.

**NOTE: Analytical results for samples collected during AST closure that equal or exceed 100 mg/kg TPH (soil) or 1 mg/l TPH (ground water) must be reported to the Regional Office upon receipt of these results. Analytical results for other petroleum constituents that exceed the detection limit for that constituent must be reported to DEQ upon receipt of the analytical results.**

2. DEQ may consider an alternative to soil sampling during closure if the AST owner/authorized representative demonstrates that:

- a. There is no evidence of past or present contamination by providing records of monthly release detection monitoring for the previous 12 months; and
- b. The facility or AST has operated an approved leak detection system.

3. Have a closure inspection conducted by the local code official and provide permits and inspection reports from the local official to DEQ for review. If the local code official cannot inspect the site, the owner/authorized representative must contact DEQ at least 14 days prior to closure so that DEQ may perform an inspection.

4. Maintain all records relating to compliance with the AST closure requirements for a minimum of 5 years after notifying DEQ of the completed closure.

#### 7.3.1.1 Closure of Previously Closed ASTs

AST owners/authorized representatives who permanently closed ASTs prior to the effective date of the Facility and AST Regulation (June 24, 1998) may be required by DEQ to assess the site and close the AST in accordance with Section 120 of the Facility and AST Regulation. DEQ staff may require ASTs closed prior to June 24, 1998, to be closed in accordance with current requirements in situations where: (1) staff believe that the closure activities performed at the site may have been inadequate to prevent ongoing and/or future discharges from the AST; and/or (2) a discharge from the AST is suspected.

**NOTE: DEQ will require closure documentation for AST closures performed on or after September 22, 1993.**

#### 7.3.1.2 AST and Facility Registration Requirements

Article 11 of Virginia Water Control Law (Section 62.1-44:34:19.1 of the Code of Virginia) requires the operator of a facility having an aggregate aboveground storage capacity of more than 1320 gallons of oil or an operator of an individual AST with a storage capacity of more than 660 gallons of oil to register the facility or AST with DEQ and the local director/coordinator of emergency services. Registration fees are required at the time of registration. Facilities or ASTs installed after June 24, 1998, cannot be registered until: (1) the AST owner/authorized representative obtains (from the building official) and DEQ reviews the permits, inspection reports, and certification of use required in accordance with the Uniform Statewide Building Code, the BOCA7 National Building Code, and the NFPA Code; or (2) DEQ inspects the facility or AST.

Information that must be provided to DEQ as part of AST and/or facility registration includes:

1. The facility and AST owner and operator information including the owner's/operator's name, address, and phone number(s);
2. Facility information including the facility name, type, address, contact person, contact person's phone number, and aggregate storage capacity;
3. Tank and piping information including storage capacity, product stored, AST type(s) and design(s), and construction standards;
4. Other information that may be reasonably requested by DEQ; and
5. Owner certification of information.

The AST and Facility Regulation (Section 60) requires the AST/facility operator to submit a registration

fee. Registration fees are required for:

1. initial registration;
2. new installations;
3. conversion (e.g. an UST is converted to an AST, the product stored in an AST changes from a non-oil product to an oil product);
4. ASTs brought back into use after permanent closure;
5. registration renewal (required every five years or when title to the AST and/or facility is transferred); and
6. the transfer of title to a facility (change in ownership).

Fees are required for initial AST registration and AST registration renewal. AST owners/authorized representatives should send the AST Registration Form (DEQ Form 7540-AST) or the AST Registration Renewal Form (DEQ Form 7541-AST) along with the appropriate fee to:

Virginia Department of Environmental Quality  
Office of Financial Management  
P.O. Box 1104  
Richmond, VA. 23218

Copies of the AST Registration Form can be downloaded from DEQ's website at <http://www.deq.virginia.gov/tanks/fnf.html>.

### 7.3.1.3 AST and Facility Notification Requirements

The owner or authorized representative of any AST having a capacity of greater than 660 gallons of oil must notify DEQ within 30 days after any AST:

1. Upgrade;
2. Major repair;
3. Replacement (relocating, or repositioning of an existing AST); or
4. Change in service (i.e. change in operation, conditions of the stored product, specific gravity, corrosivity, temperature or pressure that has occurred from the original that may affect the tank's suitability for service).

**NOTE: Fees are not required for AST Notification.**

### 7.3.2 Individual ASTs Having a Capacity of Less than or Equal to 660 Gallons of Oil

DEQ has no registration, closure reporting, or sampling requirements for the closure of ASTs having a capacity of less than or equal to 660 gallons of oil. If a discharge of oil is discovered during closure, however, the discharge must immediately be reported to DEQ.

Operators wishing to install, remove, repair, or alter any AST that contains a flammable or combustible liquid (as defined in the Uniform Statewide Building Code) must obtain a permit from the building official before initiating that activity. Spills and leaks of flammable or combustible liquids from stationary tanks (including ASTs) must be promptly reported to the local code official.

## 7.4 Storage Tank System Contractors

DEQ often receives inquiries from the business public regarding the Commonwealth of Virginia's requirements for the installation and removal of storage tank systems. This guidance is intended to provide Case Managers with information that they can use when working with contractors. It is not intended to explain all of the necessary requirements for working in the Commonwealth of Virginia. Persons working on storage tank systems including the installation and removal of tanks as part of their profession should be aware of the following information:

Pursuant to § 36-99.6 of the Code of Virginia:

A. The Board of Housing and Community Development shall incorporate, as part of the Building Code, regulations adopted and promulgated by the State Water Control Board governing the installation, repair, upgrade and closure of underground and aboveground storage tanks.

B. Inspections undertaken pursuant to such Building Code regulations shall be done by employees of the local building department or another individual authorized by the local building department.

**NOTE: The designated building official is often the local fire official.**

The Code of Virginia, as amended, in Title 54.1, Chapter 11 permits the Board for Contractors, through the Department of Professional and Occupational Regulation (DPOR) to issue regulations that explain what is required of contractors who wish to work in Virginia. DPOR's website at <http://www.dpor.virginia.gov/dporweb/dpormainwelcome.cfm> contains information regarding regulations for contracting in the Commonwealth of Virginia including entry, renewal, and reinstatement requirements, as well as standards of practice. The Virginia General Assembly, not the Board for Contractors, is responsible for creating and amending the statutes found in the Code of Virginia. **Contractors should stay informed of revisions to the regulations and the statutes that govern their profession or occupation.**

Persons working on storage tank systems in Virginia should be familiar with standard business practices associated with their profession prior to conducting work in the Commonwealth. The American Petroleum Institute (API) and the Petroleum Equipment Institute (PEI) provide information regarding recognized industry standards. Information can be found at their respective websites, <http://www.api.org/> and <http://www.pei.org/>. Contractors may want to refer to these resources and additional resources prior to conducting work in the Commonwealth.