

# CHAPTER 16

## HAZARDOUS MATERIALS



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## HAZARDOUS MATERIALS

This chapter provides the procedural guidelines for assessing potential hazardous and toxic substances that may be encountered during the construction and operation of roadway projects. The primary reasons for identifying these sites is the risk to the health and safety of construction workers and the cost and schedule delays of remediating (control, clean-up, and disposal) hazardous wastes at contaminated sites during construction of the roadway.

The assessments begin with identifying properties that are, or may be, contaminated with hazardous materials within the project study area so that the presence of these properties may be factored into the selection of alternatives and design considerations. Additional assessments are usually conducted when a project's location indicates a likelihood that contaminated materials may be encountered. The assessment also evaluates potential exposure for worker health and safety, disposal options for contaminated materials, or remedial measures if necessary.

### 16.1 Definitions

**Hazardous substances** – Elements, compounds, mixtures, solutions, and substances that, when released into the environment, may present substantial danger to the public health or welfare or to the environment.

**Hazardous waste** – A solid waste, or combination of solid wastes that, because of quantity, concentration, or physical, chemical, or infectious characteristics, may 1) cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or 2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

**Hazardous waste/contaminated sites** – Sites on which the release of any hazardous substance, hazardous waste, or petroleum products has occurred, or is suspected to have occurred, and that release or suspected release has been reported to a government entity.

**Potentially Responsible Party (PRP)** – Any individual or entity including owners, operators, transporters, or generators who may be liable for the cleanup of contamination under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Section 107(a). The U.S. Environmental Protection Agency (USEPA) will usually ask PRPs to conduct the investigation and to perform the cleanup before using Superfund money.

## 16.2 Legislation, Regulations, and Guidance

This section provides the legislation, regulations, and guidance most likely to apply to and be associated with typical transportation projects with hazardous materials issues. This list is not all-inclusive, as site-specific conditions may be encountered where additional and unique regulations may apply. In these instances, District of Columbia Department of Transportation (DDOT) and its consultants must coordinate with appropriate regulatory agencies to ensure compliance with the applicable regulations. Key legislation, regulations, and guidance are provided in the following sections; the types of sites likely to be affected are identified following each item.

### 16.2.1 Federal Legislation and Regulations

- 42 United States Code (USC) 103, CERCLA and Superfund Amendments and Reauthorization Act of 1986 (SARA, also known as the federal Superfund program), Superfund sites.
- 40 Code of Federal Regulations (CFR) 61, Clean Air Act (CAA), National Emissions Standard for Hazardous Air Pollutants, asbestos abatement and demolition sites.
- 33 USC 1251 et seq., Clean Water Act (CWA), sites potentially affecting water bodies.
- 40 CFR I, Resource Conservation and Recovery Act of 1976 (RCRA), and Office of Solid Waste and Emergency Response Directive 9902.3 2A (May 31, 1994), RCRA sites.
- 42 USC 82, Solid Waste Disposal, solid waste management and disposal.
- 40 CFR 761 (15 USC), Toxic Substances Control Act of 1976 (TSCA), polychlorinated biphenyl (PCB) sites.

### 16.2.2 District of Columbia Legislation and Regulations

- District of Columbia Water Pollution Control Act of 1984, District of Columbia Code Annotated Sections 6-921 to 6-940, District of Columbia Municipal Regulations Title 21, Section 2200 et seq.
- 40 CFR Part 281, District of Columbia Underground Storage Tank Program
- District of Columbia Hazardous Waste Management Act of 1977, effective March 16, 1978, as amended, District of Columbia Law 2 64; District of Columbia Code Sections 8-1301 to 8-1322

### 16.2.3 Guidance Documents

- American Society of Testing and Materials (ASTM) E 1527. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process
- ASTM E 1903, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process
- Federal Highway Administration (FHWA) Environmental Guidebook – Hazardous Waste and Brownfields

### 16.3 Agency Roles

DDOT and its consultants must work together to ensure that the appropriate regulatory agencies are involved as required. Agency coordination is described in more detail in Chapter 12, Agency Coordination Process. The primary agencies that will most likely be involved in reviewing the hazardous materials assessment include DDOT Environmental Division, District of Columbia Department of the Environment (DDOE) Hazardous Waste Division, USEPA, and FHWA.

- **DDOT Project Development & Environment Branch** – DDOT incorporates environmental management into its decision-making process to provide context-sensitive and environmentally sustainable solutions for the DDOT operations and District of Columbia transportation projects.
- **DDOE Hazardous Waste Division** – The Hazardous Waste Division enforces the provisions outlined in the District of Columbia Hazardous Waste Management Act of 1977. The Hazardous Waste Program regulates the waste generated by commercial, federal, state, and local government facilities from generation to disposal.
- **USEPA Region 3** – USEPA has approval authority for site investigation, corrective action work plans, final corrective action, and closures of RCRA, CERCLA, and Toxic Substances Control Act of 1976 (TSCA) sites. USEPA also regulates and approves permits for the operations at RCRA sites.
- **FHWA** – Environmentally, FHWA's role is to protect and enhance the natural environment and communities affected by highway transportation. FHWA reviews the potential environmental mitigation activities.

### 16.4 General Methodology Analysis or Evaluation

#### 16.4.1 Existing Conditions/Affected Environment

The first step of a typical hazardous waste assessment is referred to as a Phase I Environmental Site Assessment (ESA) and generally follows the most current version of ASTM E 1527. The Phase I ESA will identify hazardous wastes or contamination sites that may be encountered in a project study area and the PRP for the contamination. The Phase I ESA typically provides the information that is needed for the Existing Conditions/Affected Environment section of the NEPA document. It is important to note that the Phase I study area usually includes the area within a radius of 1 mile around the project area because contamination in adjacent areas, such as petroleum constituents or solvents in the subsurface or groundwater, can migrate into the project area.

#### *The Phase I ESA comprises two steps.*

**Database and Historical Reviews** – The Phase I assessment begins with a regulatory database review to determine if any areas of concern or contaminated sites are known to occur in the project area. The review identifies reported releases of hazardous or toxic materials to the environment as well as businesses and industries that use, generate, store, transport, and/or dispose of regulated hazardous materials. Usually, a private database search company is contracted to perform a computerized search of available environmental state and federal environmental databases. At a minimum, database searches should include sources identified in the ASTM standard. In addition, sites on the National Priorities List (NPL), Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) lists, leaking underground storage tank (LUST) sites, landfills, body shops, and maintenance yards must be identified. The result is a summary report that shows the

regulatory record of contaminated sites with site location maps.

Other searches that can be performed under Phase I may include the review of historic aerial photographs and maps, Sanborn fire insurance maps, old city directories, and title searches. The purpose of the historical records review is to identify previous uses of properties in the project area commonly associated with the generation, storage, and transportation of hazardous materials. The level of the additional records search will depend on the project.

**Field Corridor Review** – The investigator visits the project area to verify occupants, locations, addresses, and uses of properties identified in database searches and to search for visible evidence of hazardous materials releases at listed sites or other sites in the project study area. Observations should be documented in field notes and photographs. Detailed property inspections beyond those areas that can be viewed from public roadways are not expected. The investigator should interview regulatory agency staff and property owner/occupants, as necessary, to clarify any information obtained through the database search and field visit.

Screening each site helps determine which ones pose potential impact to the project area. The criteria for determining these sites to include in the assessment are as follows:

- Include sites where spills or releases required further remedial action
- Include sites with known and documented releases of contamination to the soil and/or groundwater that are within 400 feet of the project area
- Eliminate underground storage tank (UST) sites not associated with documented LUSTs
- Eliminate hazardous waste generators that do not have documented releases to the environment

Identified sites should be ranked as areas of “low risk” to “high risk” or “no concern” to “high concern.” Generally, higher rankings go to those sites located within the project area. The farther a site is from the project area, the lower the ranking.

- **High risk/high concern** – Any properties where there are known and documented releases of contamination to the soil and/or groundwater, with respect to their proximity and potential to impact the project area. These include CERCLA sites; RCRA corrective action sites; RCRA transportation, storage, or disposal sites; sites that DDOE has identified as hazardous waste sites; or any property where examiners during field corridor reviews or site visits observed the evidence of hazardous material release.
- **Moderate risk/potential concern** – Properties in proximity to the project area where examiners observed the potential for hazardous materials during a field corridor review or site visit and/or in which examiners observed sloppy housekeeping practices to the extent that the potential for environmental contamination is higher than it would have been had normal waste management practices been followed. These include sites where contamination has been documented, but there is no longer a high concern because of remedial action or site-cleanup activities.
- **Minimal risk/no concern** – Properties, such as vacant or commercial properties, where examiners observe low or no potential for hazardous materials during site visits.

For a NEPA document, it is the discretion of the project manager to have a standalone report summarizing the results

of the Phase I ESA, or to incorporate the results into the Affected Environment section of the document.

The locations of hazardous materials sites, particularly high- and moderate-risk sites, should be identified on drawings illustrating other environmental constraints for consideration during project siting and alternatives analysis. Sites that include asbestos, lead-based paint (LBP), polychlorinated biphenyls (PCBs), radon, USTs, LUSTs, and sites undergoing regulatory investigations or cleanup under RCRA or CERCLA should be specifically reported.

Figure 16-1, Hazardous Material Analysis Process, illustrates a flowchart of the hazardous waste assessment process.

### 16.4.2 Determination of Hazardous Material Impacts

Each alternative is evaluated for potential impacts using the mapping of the ranked sites. Contaminated properties that are located in or adjacent to an alternative can be considered to have a potential impact. Construction in a contaminated area, particularly with high and moderate risk, impacts the project by adding risk to the construction workers, as well as cost and potential construction schedule delays.

Typically, for sites in the project area, the project team would review the regulatory files (such as the District UST Program, CERCLA, and RCRA) to discern the current knowledge and status of the contamination at the site and to determine the potential impact to the project. From this information, the level of impact to the project from special construction techniques to manage or minimize exposure to the contamination can be estimated.

If the file does not contain adequate documentation of the site, then additional soil, surface water, or groundwater testing – known as Phase II ESA – may be necessary to determine the extent of the contamination and the risk that

the site poses for the project. Phase II ESAs are discussed further in the next section.

### 16.4.3 Identification of Appropriate Mitigation Measures

The owner or PRP, as identified by USEPA or DDOE, retains the responsibility for performing studies and remediation of a contaminated property. However, to protect construction workers and to ensure that the hazardous material is controlled during construction, DDOT may need to implement some mitigation measures during construction.

Mitigation will depend on the type and extent of contamination, the level of documentation that is available, and current or planned actions for site remediation already established. As mentioned above, the site may be fully documented in a regulatory record, and mitigation measures can be established from these records. If the site has not been well documented, additional Environmental Assessments (EAs), generally referred to as Phase II ESAs, may be necessary to verify the presence of hazardous materials in soil, groundwater, and other media (as appropriate) and to characterize the nature and extent of contamination at the targeted site or within the area targeted for acquisition. These assessments should be completed during the early design phase of the project.

The Phase II field investigation generally follows the most current version of ASTM E 1903. The project team will perform the following steps to complete the Phase II ESA.

1. Develop a proposed scope of work or Phase II investigation work plan
2. Identify media to be sampled, proposed sample locations, depths, analytical parameters, and basis for proposed samples

3. Perform field investigation
4. Characterize the nature and extent of contamination
5. Summarize findings in a Phase II technical report

Based on the results of the Phase II ESA, DDOT will coordinate with the appropriate federal and state agencies to identify the proper design and construction procedures. The design of the project must be coordinated with the agencies to ensure that it is compatible with the remediation plans for the site. For example, if long-term groundwater monitoring is required, the project design and monitoring network should be coordinated to minimize conflicts. In some cases, the roadway construction project may provide an opportunity to further site remediation. For example, a new roadway may be used as a maintained engineering barrier to eliminate a pathway to human exposure.

### Construction Mitigation Measures

Construction mitigation measures are site-specific, depending on the type and extent of the contamination. Typically, measures to minimize worker exposure and to control hazardous materials during construction are determined with the cooperation of the regulatory agencies during the detailed design of the highway.

The project team should adhere to the District of Columbia Hazardous Waste Management Plan for the use, storage, and disposal of all hazardous materials that it brings on to the project site during the construction phase.

There may be occasions when the team may encounter regulated materials during construction. In these instances, construction must stop, and the regulatory agencies consulted for appropriate action.

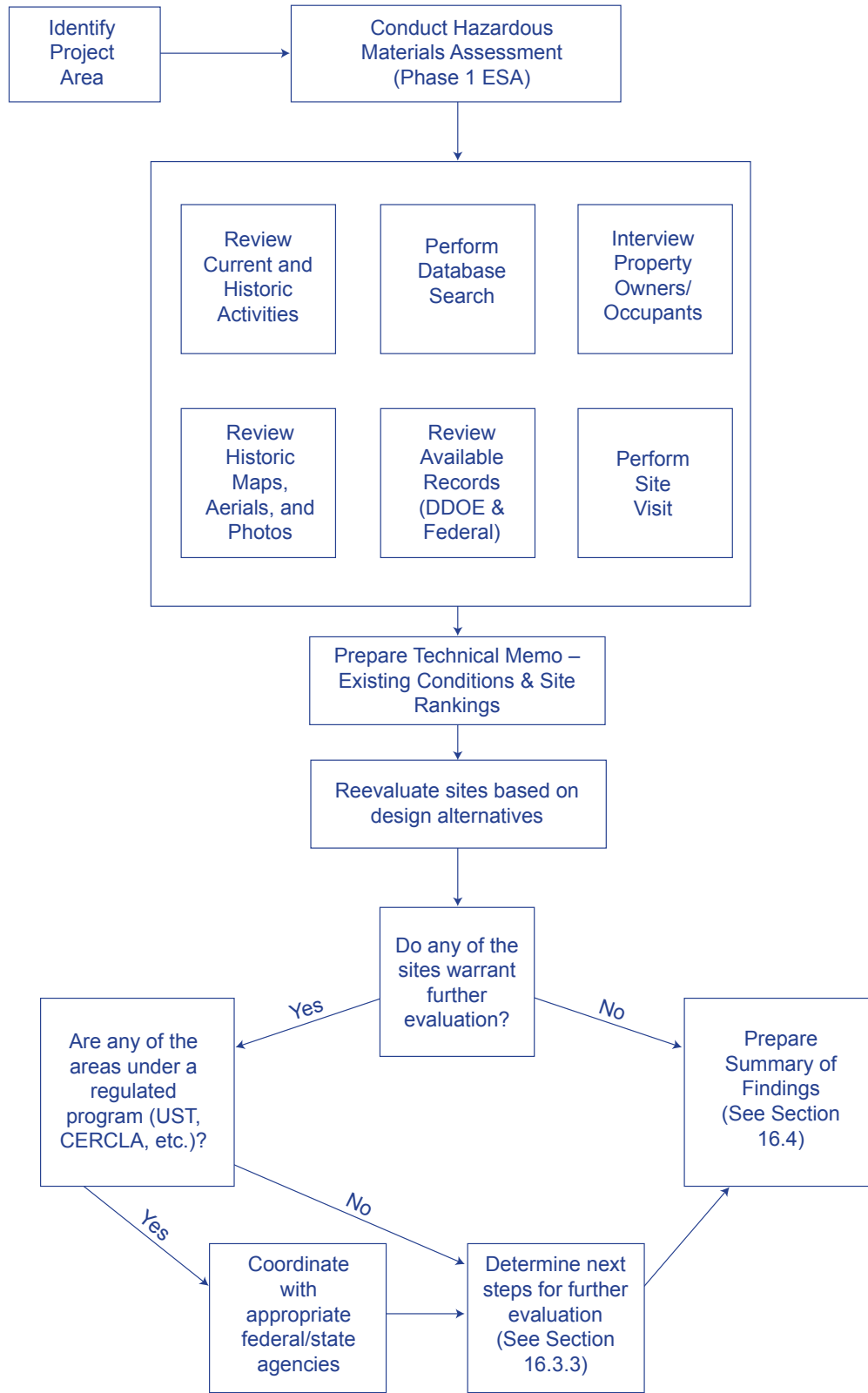
## 16.5 Format and Content of Documentation

The summary of findings for the hazardous materials section of environmental documents should follow a consistent format, one that generally corresponds to the NEPA section on affected environments report (such as an EA or an Environmental Impact Statement [EIS]).

- **Affected Environment** – As noted above, it is at the project manager's discretion to require a standalone Phase I ESA report to be referenced in the NEPA document, or to create the hazardous materials sections of the NEPA document directly from the study results. In either case, the documentation of Affected Environment should include:
  - Methodology – A general description of the processes used to evaluate existing conditions or affected environment and determine any potential long-term and short-term impacts that may occur during construction or as a result of the project alternative designs.
  - Regulatory Records Database Review Summary – As summarized in Section 16.3.1
  - Historical Records Review Summary – As summarized in Section 16.3.1.
  - Site Screening Results – As summarized in Section 16.3.1.
  - Site Rankings and Descriptions of Areas of Concern – The list of rankings should include sites located within or near the project area and be based on the extent of known or potential contamination. Accompanying each ranking should be a brief description of the site and a description of known or potential contamination present.
  - Recommendations for Phase II studies, if needed.



**Figure 16-1 Hazardous Materials Analysis Process**



- **Review of Impacts and Environmental Consequences** – This section should provide a description of the potential impacts that could occur if any of the alternatives are implemented. It should also include a review of long- and short-term impacts along with any construction-related impacts that could occur.
- **Identification of Appropriate Mitigation Measures** – A list of mitigation measures should be identified based on the types of potential impacts expected with each alternative. Many of the mitigation measures for hazardous material issues typically encompass construction-related impacts, such as the handling, storage, and the use and disposal of hazardous materials during construction; the disposal of existing hazardous materials such as asbestos or LBP; and the mitigation of known contamination during construction.
- **Environmental Commitments** – The Environmental Commitments for hazardous materials may include commitments for additional site studies, coordination of final plans with DDOE, coordinate with DDOE /PRP to avoid conflicts with current remediation procedures and activities, site-specific restoration details, and construction materials storage and waste disposal.
- **Appendices** – The appendices typically include a copy of the database search used to help determine areas of concern and any additional EAs that were performed to characterize the nature and extent of contamination at specific sites.

## 16.6 Project Development Process Guidance

The early planning stages of the project provide the best opportunity to effectively address any known potential contamination problems that may be encountered during the project. These problems could then can be

avoided, eliminated by changing one or more aspects of the project design, or scheduled for remediation as part of the construction project. The initial hazardous materials assessment should be performed concurrently with the EA or EIS preparation, and in conjunction with other environmental investigations, such as threatened and endangered species studies or wetland surveys, so that contaminated sites can be considered with other environmental constraints in the analysis of alternatives.

## 16.7 Continuation through Design and Construction

The documentation process for developing the appropriate procedures for implementing ongoing investigation plans for contaminated sites, negotiating closure agreements with regulatory agencies, implementing site remediation and groundwater monitoring (when necessary), and reporting will be site specific and will follow the appropriate regulatory requirements and guidance accordingly for each site.

### 16.7.1 Final Design of Mitigation Measures

The project design team will need to establish plan notes and procedures for the final construction plans. Concepts for dealing with hazardous materials will be developed in the NEPA document, and included in the Environmental Commitments. Based on these commitments, the design team will develop the details of excavation, the handling, and disposal of contaminated earth or groundwater in cooperation with the regulatory agencies. Specifications for monitoring and reporting must also be incorporated into the final project plans.

Project plans should also adhere to the District of Columbia Hazardous Waste Management Plan for the use, storage, and disposal of all hazardous materials brought on to the project site during a project's construction phase.

## 16.7.2 Procedures for Addressing Regulated Materials Identified During Construction

In some instances, even when the full process is followed and the initial hazardous materials assessment and field investigations have been performed, field workers may encounter unknown hazardous materials during construction. When this occurs, the construction contractor must stop work immediately and notify DDOT. DDOE must be notified by DDOT, and DDOE will arrange for investigation of the suspect materials and, if necessary, management and removal of the materials.

The project team should assess the hazardous materials to determine if they must be removed immediately, managed, or disposed of, or to what degree characterizing the nature and extent of the waste materials is necessary before remedial activities can be performed. In most cases, waste characterization profiling (for disposal purposes) can be done in conjunction with a removal action.

If the contamination encountered is extensive or complex in nature, the project team should determine the scope and magnitude of a field investigation and arrange for an appropriate level of characterization. DDOT will notify USEPA or DDOE, as appropriate, and begin negotiations for site assessment, remediation, and closure so that the construction activities are minimally affected.

## 16.8 Additional Information

### Websites

- 42 USC 103, CERCLA and SARA of 1986: <http://www.epa.gov/superfund/policy/cercla.htm>
- 40 CFR 61, Clean Air Act, National Emissions Standard for Hazardous Air Pollutants: <http://www.epa.gov/air/caal>

- 40 CFR I, RCRA; and Office of Solid Waste and Emergency Response Directive 9902.3-2A: <http://www.epa.gov/rcraonline/>
- 42 USC 82, Solid Waste Disposal (solid waste management and disposal): <http://uscode.house.gov/download/pls/42C82.txt>
- 40 CFR 761 (15 USC), Toxic Substances Control Act of 1976 (TSCA), PCB sites: <http://www.epa.gov/lawsregs/laws/tsca.html>
- ASTM Standards, E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process: <http://www.astm.org>
- ASTM Standards, E1903, Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process: [www.astm.org](http://www.astm.org)
- FHWA Environmental Guidebook, “Hazardous Wastes and Brownfields,” <http://www.environment.fhwa.dot.gov/guidebook/index.asp>
- District of Columbia Lead-Based Paint Management Program: [http://www.ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495190,ddoeNav\\_GID,1486,ddoeNav,31375/313771.asp](http://www.ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495190,ddoeNav_GID,1486,ddoeNav,31375/313771.asp)
- District of Columbia Underground Storage Tank Program (DC UST Program): [http://www.ddoe.dc.gov/ddoe/cwp/view,a,1209,q,494854,ddoeNav\\_GID,1486,ddoeNav,31375/313771.asp](http://www.ddoe.dc.gov/ddoe/cwp/view,a,1209,q,494854,ddoeNav_GID,1486,ddoeNav,31375/313771.asp)

### General Information

- District of Columbia Hazardous Waste Management Act of 1977, effective March 16, 1978, as amended (District of Columbia Law 2 64; District of Columbia Code Sections 8-1301 to 8-1322)

- District of Columbia Hazardous Waste Management Regulations, Chapter 42 – Standards for the Management of Hazardous Waste and Used Oil
- District of Columbia Water Pollution Control Act of 1984, District of Columbia Code Annotated Sections 6-921 to 6-940, District of Columbia Municipal Regulations Title 21, Section 2200 et seq.
- District of Columbia Underground Storage Tank Regulations, Title 20 DCMR, Chapter 55