

Hazardous Materials in Project Development Manual



Revised September 2018

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Purpose

This manual provides procedures and guidance regarding hazardous materials/waste issues as they relate to the development and execution of transportation projects in the areas of advanced planning, environmental documentation, right-of-way, design, and construction. The manual was revised and updated to:

- Reflect improved business practices and current department organizational units;
- Improve readability; and
- Correct and update references to specifications and federal policies and guidance.

Contents

This version includes the following revision and updates

Chapter 1 – Introduction

- Removed references to ENV's Pollution Prevention and Abatement (PPA) Branch and the Environmental Continuous Improvement team
- Updated references to TxDOT specifications

Chapter 2 – Advanced Planning and Environmental Documentation

- Replaced references to the Environmental Tracking System Database (ETS) with the Environmental Compliance Oversight System (ECOS)
- Removed the sub-section regarding Outside Guidance and Standard Practices
- Clarified the descriptions and uses of the three types of hazardous materials site assessment standards

Chapter 3 – Right-of-Way

- Updated citations to TxDOT manuals
- Removed unnecessary content that is either covered by Right-of-Way Division manuals or not strictly under the purview of ENV's Environmental Resources Management Section

Chapter 4 – Design

- Updated references to FHWA guidance and policy
- Updated references to TxDOT divisions
- Updated tables

Chapter 5 – Construction

- Updated the major steps to follow when hazardous materials/waste are encountered during construction
- Updated citations to TxDOT Standard Specifications
- Updated the notification and coordination steps during construction

Chapter 6 – Hazardous Materials Service Contracts

- Added an introduction to contracts
- Added a subsection to describe division/district and ENV Responsibilities
- Removed unnecessary content that is not strictly under the purview of ENV's Environmental Resources Management Section
- Updated content in Section 4 Purchase of Service

Chapter 7 – Training

- Rewritten to focus on TxDOT-offered training available to TxDOT staff and contractors

Supersedes

This revised manual supersedes prior versions of the manual.

Contact

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Archives

Past manual notices are available in a [PDF archive](#).

Table of Contents

Chapter 1: Introduction

| | |
|--|-----|
| Section 1: Overview | 1-2 |
| Scope of Guidance | 1-2 |
| Responsibilities | 1-2 |
| Obtaining Assistance | 1-2 |
| Section 2: Hazardous Material Concerns | 1-4 |
| Hazardous Materials/Waste | 1-4 |
| Why Address Hazardous Materials in Project Development? | 1-5 |
| Concerns for TxDOT Pertinent to Hazardous Materials Issues | 1-6 |
| Section 3: TxDOT Decisions and Communication | 1-8 |
| Decision-Making Process | 1-8 |
| Communication | 1-9 |

Chapter 2: Advanced Planning and Environmental Documentation

| | |
|---|------|
| Section 1: Overview | 2-2 |
| Goals | 2-2 |
| Procedure Overview | 2-2 |
| Section 2: Site Assessments and Investigations | 2-4 |
| Definition and Purpose | 2-4 |
| Types of Site Assessments | 2-4 |
| Initial Site Assessment (ISA) | 2-4 |
| Phase II Environmental Site Assessments or Investigations (PH II ESA) | 2-14 |
| Section 3: Planning and Preliminary Engineering Considerations | 2-16 |
| Planning and Programming | 2-16 |
| Comprehensive Development Agreements | 2-16 |
| Disclosure and Right of Entry | 2-17 |
| Early Coordination with Property Owners/Regulatory Agencies | 2-17 |
| Preliminary Design and Feasibility Studies | 2-17 |
| Alternative Analysis and Selection | 2-18 |
| Project Development Considerations | 2-19 |
| Project Files | 2-22 |
| Section 4: Environmental Documentation and Clearance | 2-24 |
| Overview | 2-24 |
| General Requirements for Hazardous Material Discussions | 2-24 |
| Draft Environmental Impact Statement (DEIS) | 2-25 |
| Final Environmental Impact Statement (FEIS) | 2-25 |

| | |
|--|------|
| Supplemental EIS and Re-Evaluation Documents | 2-26 |
| Environmental Review and Clearance..... | 2-26 |
| Chapter 3: Right-of-Way | |
| Section 1: Overview..... | 3-2 |
| Goals | 3-2 |
| Procedure Overview..... | 3-3 |
| Complete Assessments/Investigations..... | 3-3 |
| Advanced Acquisition of Right-of-way..... | 3-3 |
| Postponing Acquisition | 3-4 |
| Appraisals | 3-4 |
| Agreements | 3-4 |
| Deed Recordation..... | 3-5 |
| Temporary Leases (Lease Backs) | 3-5 |
| Local Public Agency Acquisition..... | 3-5 |
| Cost Recovery | 3-6 |
| Section 2: Asbestos-Containing Materials..... | 3-7 |
| TxDOT's Perspective (Overview)..... | 3-7 |
| Owner Retention, Acquisition and Sale of Improvements..... | 3-8 |
| Options for Obtaining Asbestos Services | 3-10 |
| Chapter 4: Design | |
| Section 1: Overview..... | 4-2 |
| Goals | 4-2 |
| Procedure Overview..... | 4-2 |
| Section 2: Environmental Site Assessment and Investigations | 4-5 |
| Section 3: Design Considerations and Factors..... | 4-6 |
| Avoidance and Minimization..... | 4-6 |
| Design Considerations..... | 4-6 |
| Section 4: Contamination Factors and Considerations during Construction..... | 4-8 |
| Contamination Factors during Construction | 4-8 |
| Contamination Considerations during the Construction Design Phase..... | 4-8 |
| Section 5: Plans, Specifications & Estimates (PS&E) Requirements | 4-13 |
| Plans..... | 4-14 |
| Specifications..... | 4-14 |
| Estimates | 4-15 |
| Section 6: Cost Recovery and Accounting..... | 4-16 |
| Chapter 5: Construction | |
| Section 1: Overview..... | 5-2 |
| Goals | 5-2 |

| | |
|--|-----|
| Procedure Overview. | 5-2 |
| Section 2: TxDOT Standard Specifications. | 5-4 |
| Item 3.60 – Definition of Hazardous Materials or Waste | 5-4 |
| Item 7.3 – Laws to be Observed | 5-4 |
| Item 6.10 – Hazardous Materials. | 5-4 |
| Section 3: Anticipated Hazardous Materials Encountered during Construction | 5-5 |
| Coordination | 5-5 |
| Implement Provisions and Oversight. | 5-5 |
| Documentation. | 5-5 |
| Section 4: Unanticipated Hazardous Materials Encountered during Construction | 5-6 |
| Discovery | 5-6 |
| Notification and Coordination | 5-6 |
| Characterize the Contaminant and Develop Preventive Action Plan. | 5-7 |
| Documentation. | 5-8 |
| Section 5: Cost Recovery and Accounting. | 5-9 |
| Federal Participation | 5-9 |
| Cost Accounting. | 5-9 |
| Responsible Parties | 5-9 |

Chapter 6: Hazardous Materials Service Contracts

| | |
|--|-----|
| Section 1: Overview. | 6-2 |
| Procedure Overview. | 6-2 |
| Introduction to Contracts | 6-2 |
| Division/District Responsibilities | 6-2 |
| ENV Responsibilities: | 6-3 |
| Section 2: Statewide HMM-Specific Engineering Services Contracts | 6-4 |
| Introduction to Contracts | 6-4 |
| Section 3: Statewide HMM-Specific Scientific Services Contracts | 6-5 |
| Introduction to Contracts | 6-5 |
| Section 4: Purchase of Service. | 6-6 |
| Introduction to Contracts | 6-6 |
| Hazardous Material Service Purchase of Service Specifications. | 6-6 |

Chapter 7: Training

| | |
|--|-----|
| Section 1: Overview. | 7-2 |
| Hazardous Materials Management (ENV114). | 7-2 |
| Individualized ISA Training (ENV424). | 7-2 |
| eLearning Courses: | 7-2 |

Chapter 1: Introduction

Contents:

[Section 1: Overview](#)

[Section 2: Hazardous Material Concerns](#)

[Section 3: TxDOT Decisions and Communication](#)

Section 1: Overview

Scope of Guidance

For the purpose of the Hazardous Materials in Project Development Manual, project development includes the following four functional areas.

- Advanced planning and environmental documentation
- Right-of-way
- Design
- Construction

This manual is organized into the following chapters and appendices

1. Introduction
2. Advanced Planning and Environmental Documentation
3. Right-of-Way
4. Design
5. Construction
6. Hazardous Materials Services Contracts
7. Training

Responsibilities

The Environmental Affairs Division (ENV) is responsible for coordinating hazardous materials management issues and serves as the initial point of contact for each district.

Each district is responsible for ensuring coordination of hazardous material issues during planning and project development. To facilitate this coordination, the district should consider assigning a single hazardous materials coordinator for project development or a hazardous materials team consisting of members from all functional areas. The assignments of district personnel and/or section responsibilities rest with the district.

Obtaining Assistance

Persons conducting or coordinating environmental site assessments and investigations should be familiar with applicable federal, state and local environmental laws and regulations. Additionally, knowledge of hydrogeologic, environmental engineering, manufacturing processes, chemistry and

biological processes may be necessary. A multi-disciplinary team of experienced professionals may be needed to assess or investigate projects at high risk for hazardous materials impacts. This team may include structural and environmental engineers, geologists, hydrogeologists, biologists, chemists, toxicologists, and/or industrial hygienists. The team will identify major concerns and any corrective or preventative activities required to resolve them. These activities may include health and safety training, acquisition of licenses and permits, and/or coordination with regulatory agencies.

Some districts may already have in-house staff with the knowledge, education, and experience necessary to perform or coordinate corrective or preventative activities. However, a district may also opt to use environmental consultants on statewide contract with the Texas Department of Transportation (TxDOT) to perform this work. The services of environmental specialty contractors may also be required. District personnel can contact ENV for assistance.

TxDOT employees can obtain additional information on occupational safety, health, and training in the TxDOT Occupational Safety Manual, particularly the chapters on hazardous materials, safety rules, and standards.

Section 2: Hazardous Material Concerns

Hazardous Materials/Waste

Hazardous materials/waste are defined in Item 1 Article 3.60 Hazardous Materials or Waste of *TxDOT's Standards Specifications* (November 2014). Hazardous materials/waste include, but are not limited to:

- Explosives
- Compressed gas
- Flammable liquids
- Flammable solids
- Combustible liquids
- Oxidizers
- Poisons
- Radioactive materials
- Corrosives
- Etiological agents
- Other materials classified as hazardous by Title 40 Code of Federal Regulations (CFR) – Part 261 ([40 CFR 261](#)) or applicable state and federal regulations.

The term “hazardous materials” refers to a broad category of hazardous wastes, hazardous substances and toxic chemicals that can negatively impact human health or the environment. The presence or suspected presence of hazardous material that may potentially influence a project creates a multitude of problems affecting right-of-way acquisition, project development and construction.

The definition of “hazardous materials” also includes “chemicals of concern” as defined in Title 30 of the Texas Administrative Code (TAC) ([30 TAC 350](#)) – Texas Risk Reduction Program (TRRP), as well as any media (such as soil and water) contaminated by those chemicals of concern.

A “chemical of concern” is any chemical with the potential to adversely affect ecological or human receptors due to its concentration, distribution, and mode or toxicity. Depending upon the program area, chemicals of concern may include the following:

- Solid waste, industrial solid waste, municipal solid waste, and hazardous waste as defined in the Texas Health and Safety Code 361.003, as amended, and the Texas Water Code 26.263, as amended.
- Hazardous constituents as listed in 40 CFR 261 – Appendix VIII, as amended

- Constituents on the groundwater monitoring list in 40 CFR 264 – Appendix IX, as amended.
- Constituents as list in [40 CFR 258](#) – Appendices I and II, as amended
- Pollutant as defined in Texas Water Code 26.001, as amended
- Regulated substance as defined in Texas Water Code 26.342, as amended, and 30 TAC 334.2 (related to Definitions), as amended
- Petroleum product as defined in Texas Water Code 26.342, as amended, and 30 TAC 334.122(b)(12) (related to Definitions for ASTs), as amended
- Other substances as defined in Texas Water Code 26.039(a), as amended, and daughter products of the aforementioned constituents

Why Address Hazardous Materials in Project Development?

Hazardous materials/waste sites can pose a myriad of legal, regulatory, financial, and technical problems to the department. TxDOT becomes exposed to substantial liability when it purchases a contaminated parcel of lands or if it owned property when wastes were placed there (either by past agency practices, by third-party illegal disposal practices, or by the activities of tenants). Under a number of federal and state statutes, claims can be made against the department for a variety of cleanup costs, as well as for personal or property damages. In addition to these costs, the additional time delay that results from cleaning up a contaminated site can add significantly to overall project costs. Department personnel – unfamiliar with the signs and property of hazardous waste – can expose themselves to considerable safety and health risks.

For the above reason, and to address compliance with the National Environmental Policy Act (NEPA) [42 USC 4321](#) et seq. and the Federal Highway Administration's (FHWA) [1988 Interim Guidance](#), issues related to hazardous materials must be considered throughout project development.

If unavoidable, NEPA requires mitigation of adverse impacts to the environment. FHWA provides the following directives to meet the NEPA requirements:

- Identify hazardous material concerns early in the planning process
- Evaluate and document the feasibility of avoidance and minimization of hazardous materials involvement
- Facilitate cost recovery from responsible parties

TxDOT's interests include actions to:

- Avoid or minimize liability for environmental remedial action
- Avoid or minimize unnecessary costs, such as field changes and contractor downtime due to unanticipated encounters of hazardous materials
- Protect the health and safety of the public, contractors, and TxDOT staff

The best engineering solutions are developed when issues are identified early. These solutions avoid or minimize concerns to meet communities' transportation needs as effectively and efficiently as possible.

In the National Cooperative Highway Research Program (NCHRP) Report 351, "Hazardous Wastes in Highway Rights of Way," the Committee on Hazardous Wastes in Highway Rights-of-Way of the Transportation Research Board, state that an effective way to deal with hazardous waste is early discovery and assessment. The report states:

Some of the alternatives that might flow from such a strategy of early discovery and assessment in descending order of the level of avoidance include:

- Realignment to avoid the site completely
- Realignment to minimize the contaminated property taken
- Redesign to avoid disturbing the contaminated portion of the property
- Redesign to minimize the disturbance of the hazardous waste
- If disturbance is unavoidable, securing cleanup by the property owner prior to acquisition
- If prior cleanup is unattainable, use of low-cost, but often time-consuming, remediation techniques
- Use of fast, but often expensive, techniques to clean up the site
- A decision not to build if the costs of all the alternatives exceed the project's benefits

The earlier in the project development phase the problem is discovered, the more of these choices may be available.

Concerns for TxDOT Pertinent to Hazardous Materials Issues

The following are examples of the health and safety, environmental, project planning, liability, cost and public concerns of TxDOT related to hazardous materials management:

- Health and safety concerns include the abilities to:
 - ensure the safety of public and TxDOT personnel
 - avoid worker exposure to contaminants and provide notification to contractors
 - develop construction health and safety plans
 - determine long-term or maintenance health and safety considerations
- Environmental concerns include the abilities to:
 - avoid or minimize further hazardous material releases into the environment
 - determine appropriate re-use or disposal requirements

Project planning and development concerns include the abilities to facilitate:

- preferred alignment selection
- planning and scheduling
- the incorporation of special measures into the project's Plans, Specifications and Estimates (PS&E)
- Liability concerns include the abilities to:
 - avoid or minimize cost of litigation against the FHWA and TxDOT
 - avoid or minimize potential for future liability and/or cleanup responsibilities
 - establish innocent landowner and eminent domain defenses
- Minimizing costs concerns include the abilities to:
 - avoid or minimize project redesign
 - minimize corrective action and disposal costs
 - avoid or minimize construction delays or downtime costs
 - facilitate cost recovery or responsible party clean-up
- Public image concerns include the abilities to:
 - avoid or minimize delay in completing projects
 - avoid adverse publicity

Section 3: TxDOT Decisions and Communication

Decision-Making Process

Regardless of the stage at which a hazardous materials concern is identified, a decision must be made to revise the location of the project, redesign the project, delay the project, minimize the impact to the project, or terminate the project. This decision should be based on cost/benefit evaluations and risk assessments, which depend upon the types of contaminants present, level of health risk, contaminant fate¹ The physical, chemical, and biological processes that impact the movement of contaminants through affected media and feasible treatment options.

If a hazardous materials site cannot be avoided, then the project should be designed to minimize hazardous materials impacts. To minimize the impact most effectively, the environmental site assessments and investigations must be comprehensive to determine the extent and severity of the contamination of concern. The level of investigation should correlate to the amount of information the TxDOT needs to determine the following:

1. Can the contamination be effectively remediated prior to letting without causing undue traffic flow interruption or redundant excavation?
2. Can the construction contractor work in the contaminated areas without exceeding the permissible exposure limits (PEL) for the chemical of concern? In other words, is the construction site safe for the contractor?

Decision-making during the construction phase of the project is usually limited to unanticipated hazardous materials/waste sites encountered during ongoing construction activity. In cases of anticipated site(s) where there is a strong certainty that hazardous materials/wastes are present, project-specific action should already have been sequenced in the plans.

If hazardous materials are discovered in a work zone, the first determination the engineer must make is the impact, if any, a work stoppage might have on construction site safety. For example, could stopping the work have a disastrous effect on the project, such as the collapse of an earth wall or retaining structure? Once that determination is made and a stage has been reached at which the work can be safely stopped, the contaminants must be identified and concentrations determined to assess whether the exposure level is above that permitted by the Occupational Safety and Health Act (OSHA). The next decision the engineer must make is whether the project should be terminated, suspended or altered to avoid or mitigate the effects of the hazardous materials/waste. The contract(s) may be amended to accommodate whatever decision is made. If the decision is made to continue with the project, a careful investigation must follow to examine the possibility of concurrently executing both clean-up and construction activities and to establish the sequence offering optimum accomplishment of both objectives.

1.The physical, chemical, and biological processes that impact the movement of contaminants through affected media

Communication

Communication between districts and divisions is essential in determining the most effective and economic method of proceeding with project development. Figure 1-1 depicts the communication flow that should occur during project development between advanced planning, right-of-way, design and construction functional areas.

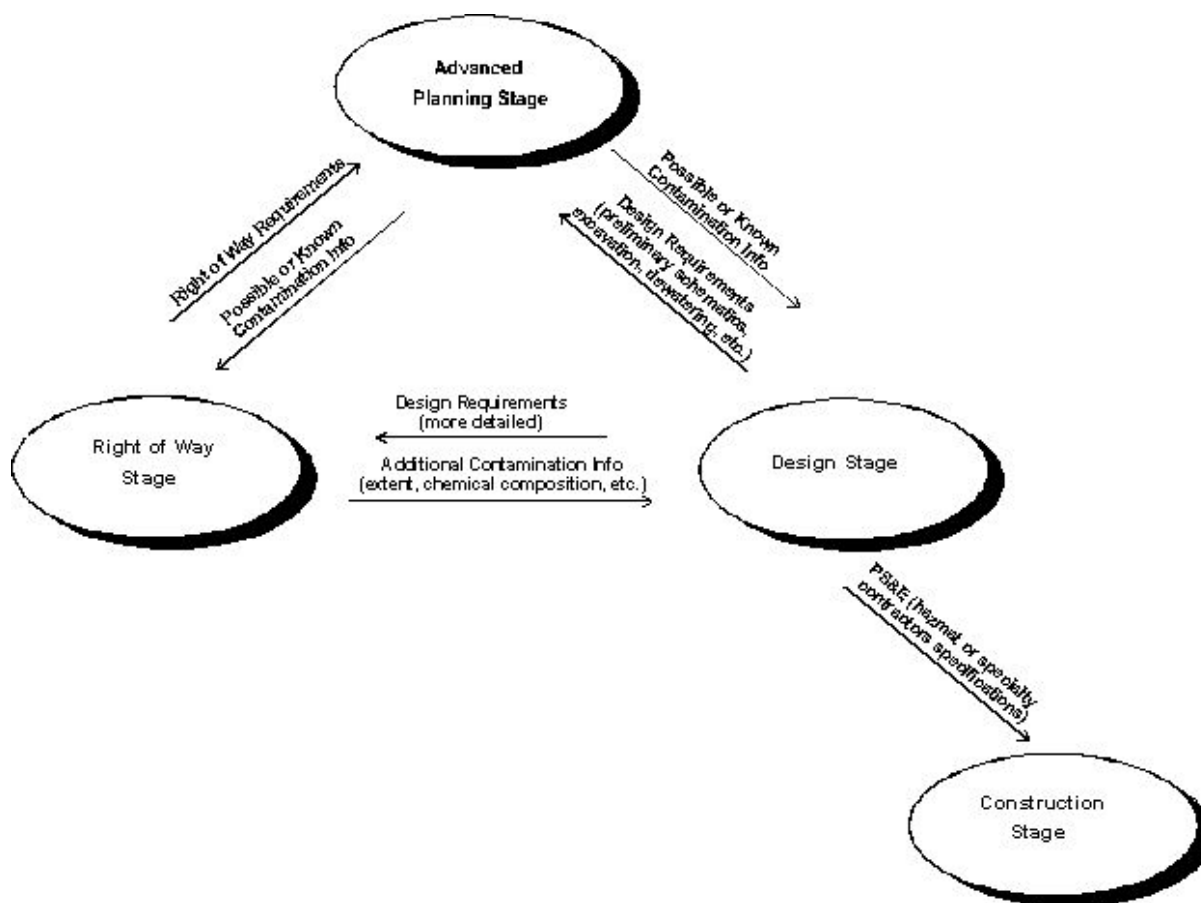


Figure 1-1.

Chapter 2: Advanced Planning and Environmental Documentation

Contents:

[Section 1: Overview](#)

[Section 2: Site Assessments and Investigations](#)

[Section 3: Planning and Preliminary Engineering Considerations](#)

[Section 4: Environmental Documentation and Clearance](#)

Section 1: Overview

Goals

The following goals should be accomplished during the advanced planning and environmental documentation stages of project development:

- Assessment of hazardous material concerns in the early planning stage of project development
- Consideration of hazardous material concerns in alignment selection
- Determination of any additional investigation, consideration and/or coordination required for subsequent stages of project development because of the known or possible presence of hazardous materials
- Coordination of assessment and/or investigation findings, decisions, considerations, and commitments with affected parties, entities, district functional areas, divisions, and agencies
- Documentation of the hazardous materials assessment, alignment selection decisions regarding hazardous materials, and preliminary commitments due to the known or possible presence of hazardous materials.

Procedure Overview

Although this manual focuses primarily on transportation projects, other types of right-of-way or property acquisition efforts may benefit from the information provided. These include, but are not limited to, advanced or hardship acquisition, corridor preservation, maintenance facility acquisition, enhancement projects, and transit projects.

Hazardous material contamination may be encountered on any transportation project during construction. Contamination sources can be found in existing, adjacent, and proposed right-of-way. The potential for contamination should be assessed as early as possible when developing transportation plans or during project programming and development. Often, if the problem is identified early, more options are available to avoid or minimize impact to the project and to implement a cost-effective approach for handling the hazardous material contamination. The findings of site assessments and investigations should be well documented.

During advanced planning, early participation is needed from the following:

- Local entities such as city, county, metropolitan planning organizations, or utilities
- Other affected district functional areas, such as planning and programming, advanced project development, environmental, right-of-way, design and construction staff
- TxDOT divisions such as Environmental Affairs (ENV), Right of Way (ROW), Design (DES) and Construction (CST)
- The Federal Highway Administration (FHWA).

Information obtained during site assessments and investigations must be communicated from one functional area to another within districts and divisions, either in writing or orally (such as in project design concept meetings).

Known or possible hazardous materials concerns, including cost considerations, should be integrated into the project coordination, alignment selection, and decision-making processes. The decision-making process requires experience and knowledge of procedures in hazardous materials, right-of-way negotiation and acquisition, property management, design, and construction. Additional discussions and meetings may be required to determine the most cost-effective approach to handling known or potential hazardous material contamination. The financial impact of pursuing further investigation and/or preventive action should also be considered. Other environmental issues, health and safety concerns, design feasibility, liability, and costs must be considered when rendering the decision to avoid, minimize, redesign or properly handle the concern prior to or during construction.

Early coordination with potentially responsible parties (PRPs) and regulatory agencies is recommended. Preliminary or required commitments should be identified or outlined during advanced planning, prior to finalizing environmental documentation and the project decision-making process. Affected parties, entities, district functional areas, divisions and FHWA, as appropriate, must agree to commitments for further investigation, site closure, preventive action, and/or waste management.

The documentation for state and federal environmental approvals or clearances should provide full and open disclosure of any environmental consequences that may result from the proposed project. The assessment and investigation findings, decisions, considerations and, coordination should be documented in the project files and summarized in any required environmental documentation. Required permits, approvals, and coordination should be specifically identified in the environmental document.

In addition to the environmental document, information about known or possible hazardous material contamination and related commitments to address the contamination must be tracked, documented, and stored in TxDOT's Environmental Compliance Oversight System (ECOS). This information should be forwarded to the appropriate planning, advanced project development, environmental, right-of-way, design, and construction staff to facilitate communication. Commitments will require continued coordination in all stages of project development to ensure that any concerns are properly handled prior to or during construction. Design changes should be reassessed for possible hazardous material concerns. In some cases, there may be property management requirements to consider during post-construction maintenance activities. Assessing the risks of hazardous material early on, and communicating any resulting concerns to the appropriate district and division personnel throughout the various stages of project development, will help to avoid surprises and reduce costs.

Section 2: Site Assessments and Investigations

Definition and Purpose

A site assessment or investigation is defined as the process of identifying the presence or likely presence of any hazardous materials on a property, where conditions indicate a release or threatened release of hazardous materials into structures on the property or into soils, groundwater, or surface water on the property.

The purpose of a site assessment or investigation is to gather information about the project area and determine the potential for and/or extent of impacts to the project area from hazardous materials, for us in TxDOT's decision making process.

According to the Council on Environmental Quality (CEQ), which is responsible for implementing National Environmental Policy Act (NEPA), the requirements of NEPA should be integrated with other planning and environmental review procedures. Therefore, environmental studies established to meet appropriate inquiry or due diligence requirements under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or to determine appropriate hazardous material management and disposal plans, should be combined with the NEPA process.

FHWA provides general guidelines for identification of hazardous material sites. A copy of this guidance can be found on the [Hazardous Materials Environmental Compliance Toolkit](#):

Types of Site Assessments

TxDOT uses the following three types of hazardous materials site assessments:

- Initial Site Assessment (ISA) – This is a non-intrusive assessment for identifying and evaluating hazardous materials and waste sites that could potentially impact a roadway project.
- Phase I Environmental Site Assessment (ESA) – This is a non-intrusive, generally site-specific assessment. The Phase I ESA is conducted in accordance with American Society for Testing and Materials (ASTM) E 1527 standards.
- Phase II Environmental Site Assessment (ESA PH II) – This is an intrusive assessment conducted to confirm the presence of soil or groundwater contamination or waste through the collection and analysis of representative site samples.

Initial Site Assessment (ISA)

The ISA is the primary site assessment tool for investigating TxDOT projects for the possible presence of hazardous materials, and is used during the advanced planning phase. The ISA process is very similar to the Phase I ESA process, but the primary difference is the ISA typically covers

multiple parcels of land for a project corridor, as opposed to the single parcel for business development typical for an ASTM Phase I ESA.

TxDOT uses the ISA to evaluate property that may be affected by contamination. The purpose of an ISA is to gather as much information about the possible presence of contamination within the proposed project limits. The project limits would include the existing or proposed right-of-way and easements, including areas stretching from surrounding or adjacent properties. The ISA is a non-intrusive assessment; the information is gathered without actually collecting and testing soil or groundwater samples. Information gathered from an initial site assessment should also be considered in alternative analysis and selection.

The steps of the ISA consist of the following:

1. Reviewing project design and right-of-way requirements
2. Identify project activities such as excavations or dewatering
3. Reviewing existing and previous land use
4. Reviewing regulatory agency databases and files
5. Performing project site visits or field surveys
6. Conducting interviews
7. Determining the need for further investigation, considerations and/or coordination
8. Determining the likelihood for hazardous materials impacts to the proposed project

While professional judgment is used to determine the appropriate level of investigation for each component of an ISA dependent upon the project's design and right-of-way requirements.

The ISA should be performed as early as possible in project development, preferably prior to schematic development. If design and right-of-way requirements change, the entire ISA or some individual components may require re-evaluation to determine whether the findings are still valid. Any new information or changes to the project requirements should be examined to determine if further assessment, research, or investigation for hazardous materials is needed.

The latest version of the ISA report form can be found on the [Hazardous Materials Environmental Compliance Toolkit](#)

Project Requirements: Information about the general, approximate or anticipated project design, and right-of-way requirements should help when evaluating the chances of encountering hazardous material contamination. Design and right-of-way requirements may also be used to determine the appropriate level of inquiry for the ISA. The information can also be used to identify areas requiring additional research or consideration during the subsequent stages of project development. Priority can be assigned to the area(s) most likely to encounter hazardous material contamination.

Even though specific details may not be available during the early stages of project development, the following design and right-of-way requirements and information related to the limits of the entire project should be obtained and reviewed, if applicable:

- Existing or proposed location of geotechnical borings, or soil cores, and associated drilling logs
- Proposed location and depth of borings, columns, piers, or drilled shafts
- Locations and depths of excavations, such as vertical alignment, or profile changes, cuts, trenches, and/or storm sewers
- Anticipated de-watering requirements and depth to groundwater level
- Displacement, structure removal or structure modification requirements
- Locations of proposed right-of-way acquisition and easement requirements
- Locations and types of known encroachments
- Locations, depths, and types of proposed utility and pipeline adjustments
- Timeframes and contracting decisions for any proposed utility adjustments (prior to construction, during construction, joint bids)
- Documentation and/or findings of any related environmental assessments, testing or studies previously performed

Generally, when additional right-of-way acquisition, easements, displacement, structure removal, structure modification, underground utility adjustments, pipeline adjustments, column, pier, drilled shafts and excavation are **not** required, the project should have a **low potential for encountering hazardous material contamination during construction**.

Although shallow, contaminated soil may require special considerations during typical grading practices, excavations are more likely to adversely impact the environment and human health and possibly delay construction. The following are examples of project requirements at the **highest risk of encountering hazardous material contamination during construction**:

- Significant excavation or cuts
- Vertical alignment changes
- Underpasses
- Trenching
- Tunneling
- Storm sewers
- Pipeline and underground utility installation or adjustments
- Confined spaces

- De-watering

Projects requiring excavation within confined spaces and/or limited means of entry may require investigation to identify any special considerations necessary to ensure worker health and safety during construction. It is especially important to determine the potential for encountering contamination on projects that require de-watering. Drainage or de-watering of contaminated groundwater can adversely impact human health and the environment, as well as off-site corrective action activities that may be underway, if not handled properly. Preliminary project requirements for de-watering should be determined as early as possible. If the project requires de-watering, then further research or investigation may be necessary to confirm whether the groundwater is contaminated.

Projects requiring the displacement of either commercial or industrial businesses, such as retail service stations with underground storage tanks, have a high potential for hazardous materials.

Projects requiring bridge, building or other structure removal/modification may require asbestos or lead-based paint inspection surveys (sampling and analysis) to determine proper abatement, waste disposal, and contractor safety considerations according to applicable regulations.

Existing and Previous Land Use Information: Review of existing and previous land use information helps to identify earlier uses or occupancies likely to have led to hazardous material contamination. The review of land use information should address not only potential sites within the proposed project limits (including sites within both the existing and proposed rights of way); they should also assess the potential for contamination migrating from adjacent or surrounding properties.

Concerns may exist from land uses that previously existed on the property. Incorporating ASTM standards, property uses should generally be identified from the present back to the first developed use or 1940, whichever is earlier. The year 1940 reflects the increased levels of industrial development, chemical manufacturing and waste generation that occurred prior to and following World War II. Sources of contamination can exist from operations prior to 1940; therefore, research prior to 1940 may be necessary to reach a higher confidence level if the project requires significant excavation, de-watering or right-of-way acquisition.

In general, projects within or adjacent to undeveloped, agricultural cultivated fields, ranch, pasture and residential areas have a low potential for hazardous material contamination. Existing rights-of-way could have possible concerns not identified during earlier acquisition or corridor preservation. Many older roadway intersections may have abandoned gasoline stations and unregistered underground storage tanks. Previous land use of some existing rights-of-way may have also included previous chemical storage, manufacturing, or industrial properties. A few examples of land uses that typically generate, treat, store, or dispose of hazardous waste, hazardous substances, hazardous materials, petroleum products, or solid waste include:

- Automotive or engine salvage, repair and maintenance facilities
- Manufacturing, industrial or processing facilities such as creosote plants, coal tar gas plants, and electroplating facilities

- Oil depots and refineries
- Aboveground and underground petroleum storage tank facilities
- Service industries, such as oil and gas equipment service, dry-cleaning, laundry, photographic processing, printing and analytical laboratory operations
- Rail or switching yards
- Landfills, disposal and recycling facilities
- Oil and gas exploration facilities such as wells, separation tanks and circulation pits
- Military bases.

Visual evidence of previous land use may be difficult to identify from only site visits and field surveys. The readily available TxDOT sources of land use information listed below should be reviewed for all projects:

- United States Geological Survey (USGS) 7.5 minute topographic maps:
 - sources of topographic maps include TxDOT, USGS and others
- Past and present aerial photographs:
 - sources of aerial photographs include TxDOT, municipal/county planning offices, soil conservation field offices and Council of Governments web sites

United States Department of Agriculture (USDA) Soil Conservation Surveys:

- sources of soil surveys include TxDOT and soil conservation field offices and web sites
- Right-of-way maps and files:
 - sources include TxDOT district right-of-way sections
- TxDOT Temporary Use of Right-of-Way Agreements:
 - sources of temporary use agreements include TxDOT district maintenance sections
- Affected property owner notifications from the TxDOT district office, area office, or maintenance sections, and/or district environmental coordinator

Older TxDOT schematics developed for public meetings and hearings may identify former businesses, buildings and improvements in the proposed alignment. TxDOT aerial photograph archives should also be reviewed for photographs along or near the project limits. TxDOT right-of-way files and possibly local entity acquisition files may have listed purchased and retained items. This information may identify the type of business in operation at the time of acquisition. As built plans, which verify construction activities including fill, cuts and structure removal, may also provide information either identifying concerns or developing requirements for further investigation. Any temporary use agreements for monitoring well and remediation systems should be reviewed for the project limits to determine the level of contamination, potentially responsible

parties and points of contact. Districts may also receive written notification from adjacent landowners or responsible parties of contamination on the existing right of way.

Reviewing additional land use resources may not be necessary, depending upon the project requirements and whether readily available sources (as discussed above) are sufficient. Additional research should be considered for commercial parcels that have been abandoned or appear undeveloped within urban, commercial and industrial areas; lending institutions or the private sector may have been wary of investing or developing potentially contaminated property.

Additional land use information may be found through the following sources:

- Fire insurance or fire hazard maps
 - sources include local libraries, historical societies, commercial services, and fire insurance companies
- Building department records
 - sources include municipal and county building departments
- Local street or city directories
 - sources include libraries of local governments, historical societies, colleges, and universities
- Property tax files
 - sources include county appraisal offices
- Recorded land title or deed records
 - sources include private title companies, municipal/county recorder, and/or clerk offices
- Zoning and land use maps or records
 - sources include municipal and county planning departments
- Site plans
 - sources include regulatory agency files and property owners

A title records search is generally not practical for an ISA in the advanced planning stage. However, if the prior land use at the site of the proposed project is dubious, then research of the title records should be considered. Research on title records (chain of title) can provide valuable information including environmental liens or deed recordation of contamination, and closure requirements. Additionally, the names of previous property owners may suggest the types of land use or previous operations on the property. Any title searches should be discussed and coordinated with district right-of-way staff.

Regulatory Agency Databases and Files: The purpose of the regulatory agency database and file review is to identify known sources of contamination and involvement with registered or regulated sites. The Texas Commission on Environmental Quality (TCEQ) and EPA provide regulatory

database information under the Texas Public Information Act and Freedom of Information Act, respectively.

Recommendations for regulatory database searches and the minimum suggested search distances are identified in the ASTM standards. Additional information about individual data-bases and obtaining databases directly from the regulatory agencies or list searches from commercial vendors is provided in [Chapters 2, 3 and 4](#) of Hazardous Materials in Project Development

The database search should address the regulatory status of any site within the proposed project limits, both existing and proposed right-of-way, as well as potential sources of contamination from adjacent or surrounding properties. In general, emphasis should be on sites within or directly adjacent to the proposed project limits unless excavation, de-watering and/or utility adjustments have been proposed. The minimum search distance should be sufficient to evaluate alternatives, minor shifts in the alignment and other possible re-design options to avoid hazardous material involvement. For proposed project limits covering several miles and/or with a high density of commercial or industrial facilities, it is generally more cost effective or timely to plot the sites of a database search (list search) using geographic information system (GIS) mapping.

In some cases, the minimum search distance could change depending upon local geologic or hydrogeologic and land use conditions. However, there are problems with reducing the minimum search distance. Some larger facilities may have office addresses registered at the outer limits of the minimum search distance, although the hazardous material or chemical storage operations associated with these facilities may be within or adjacent to the proposed project limits. The minimum search distance should be reduced on a case-by-case basis. The justification for each reduction must be reasonable, well-documented and dependent upon project excavation and right-of-way acquisition requirements.

Caution should be used when interpreting the list search information. Even sites not listed as regulated or registered may be contaminated from improper hazardous material handling or disposal. Once obtained, the list search should be field-checked for possible unmapped data and incorrect addresses. If asked, most commercial vendors will provide additional services to reduce the number of unmapped sites. A single database should not be used as the sole source of information about a release or regulated site. Information in one database should be checked against as many sources as practical. Additionally, regulatory databases information is constantly updated and revised; therefore, the date of the database search is very important. A list search may need to be updated throughout project development.

The list search data should be compared with preliminary right-of-way and design requirements to determine involvement with registered or regulated sites. For example, proposed displacements, structure removal, tank removal, and/or excavation requirements should be determined for each identified regulated site within the proposed project limits. If proper containment and waste management practices are followed, any site registered as Registered Petroleum Storage Tank (RPST) or Resource Conservation and Recovery Act (RCRA) Generator is not necessarily contaminated. However, these sites may require additional considerations for tank removal or waste disposal if proposed right of way is required from them.

Caution should also be used when interpreting the reported status of a site. Sites with “case closed” status may still have contaminated soil or groundwater. Corrective action of contaminated areas underneath buildings may not have occurred due to safety or structural integrity concerns. Additionally, health-based or risk-based closures may allow some contamination to remain in place if contaminants are under certain regulatory levels or if proper deed record requirements are met. Unfortunately, risk-based remediation closures performed by private parties may not have adequately addressed potential impacts due to highway construction or related construction worker exposure.

It should also be noted that the information contained in databases may be insufficient to determine the chances of encountering contamination. Additional information from regulatory agencies or property owners may be necessary to determine right-of-way acquisition, property management, design or construction considerations for registered or regulated sites. Investigation reports and correspondence contained in the case files can be reviewed at regulatory agency regional and/or central records offices. As discussed below, federal and state regulatory agencies can also provide details on site status and enforcement actions. To review regulatory files or discuss site status with a regulatory agency, identification numbers or facility information contained in the regulatory databases is often required.

Project Site Visit or Field Surveys: Some potential hazardous materials concerns may not be identified in the land use or regulatory database research. The purpose of a project site visit/field survey is to visually observe the existing and proposed right-of-way, the periphery of the project limits and structures located within the project limits for possible concerns. A project site visit/field survey should also include observations of surrounding and adjacent land use. A project site visit/field survey should be conducted following or in conjunction with a preliminary review of available project plans, topography maps, aerial photographs, and regulatory database lists.

Windshield surveys, observations from public land or having concerns about existing right of way on adjacent properties are typically not sufficient for the initial site assessment, especially if right-of way acquisition is required. However, an initial windshield survey can be helpful depending upon the project requirements, length of the proposed project limits, land use and whether right of entry is permitted. If right of entry cannot be obtained, then additional individual site surveys should be considered for subsequent stages of project development. A windshield survey one-quarter to one mile from the proposed project limits should also be performed to determine the potential for contamination migration to the proposed project from surrounding properties.

Possible concerns to note during the project site visit or field survey include, but are not limited to, the following:

- Chemical or waste storage concerns including:
 - underground storage tanks, fill pipes, and vent lines
 - aboveground storage tanks
 - electrical and transformer equipment
 - injection wells, cisterns, sumps, and dry wells

- vats, labeled/unlabeled drums, canisters, barrels, and bottles
- spills, stockpiling, surface dumping such as trash, garbage, refuse or rubbish, or half exposed or buried debris
- Soil concerns including stained, discolored, barren, exposed or foreign soil (fill)
- Surface water or drainage area concerns including:
 - oil sheen or films on surface water, seeps, lagoons, ponds, or drainage basins
 - changes in drainage patterns from possible fill areas
- Vegetation concerns including dead, damaged, or stressed vegetation
- Biological concerns including dead animals, radioactive materials, and medical waste
- Protected area concerns including security fencing, placarding, or warning signs

Field notes should be taken during the project site visits/field surveys. Photographs should be taken of any suspected or potential environmental contamination. The locations, distances and compass orientations/directions of photographs and environmental concerns should be noted on available maps or site plans.

Interviews: The purpose of conducting interviews is to confirm any concerns about the existence of potential hazardous material contamination. Individuals to consider for interviews include:

- Current/former property owners or operators of proposed right-of-way
- Existing or former employees
- Local residents
- Regional and local regulatory agency staff
- Regional or local emergency response staff

Property owners, operators and/or employees can provide valuable information about operations and activities that may have involved hazardous materials. Local residents, including TxDOT area maintenance office staff, may be aware of current or former operations on a parcel of land and may be able to describe situations warranting further investigation. TxDOT staff may also know of contamination problems that have required ongoing maintenance.

Depending upon the length of the project and/or number of parcels, interviews with property owners, operators, employees and local residents may not always be practical during the advanced planning stage of project development. Interviews concerning specific sites of concern with TxDOT staff, local entities or regional regulatory agencies may be more feasible. Regional and local regulatory or emergency response agencies include local fire departments, city or county environmental health departments, and regional TCEQ offices. If railroads or oil and gas facilities exist along the proposed project limits, district offices of the Railroad Commission of Texas (RRC) offices can also be contacted. The following is a list of local and regional regulatory and

emergency response agencies, or planning departments and the types of information available from each:

- Regional TCEQ offices
 - available correspondence, files and permit registration for listed or regulated sites
 - status or specific information about sites
- District RRC offices
 - citations, enforcement actions and cleanup status of oil and gas fields, and facilities
 - naturally occurring radioactive materials (NORM)
 - oil and gas pipeline spills
- Municipal and county environmental health departments
 - abandoned or unregistered landfills
 - public complaints
 - spills

Municipal and local fire department administration

- train accidents or derailments
- spills

Some caution should be taken when considering the information obtained during interviews. Memories fade and people interviewed may not always be forthright. Therefore, the initial site assessment should not rely solely upon information obtained from property owners, operators, employees, or the public.

The names, addresses, and phone numbers of all individuals interviewed should be documented with the dates and times of the interviews. Memoranda to the project file, completed records of communication forms, and letters confirming the information discussed should also document conversations.

Determine Need for Further Investigation, Considerations, or Coordination: If no concerns are identified during the ISA, then no further research, coordination, investigations or considerations are necessary. However, for some projects an ISA may not be sufficient; evaluation of the preliminary information obtained during an ISA may indicate the need for further research or investigation (i.e. “unresolved” issues). In general, additional research or regulatory file review should be completed before the next stages of project development begin to resolve whether investigation, additional considerations or coordination are needed.

Limitations in the ISA may warrant more assessment or investigation in subsequent stages of project development. These limitations include, but are not limited to, structures not entered, right-

of-entry access denial by property owners and insufficient interviews of property owners or operators for appropriate inquiry.

The need for additional investigation will depend upon the project design and right-of-way requirements. For example, additional investigation may be required for projects with significant excavation or de-watering, structure removal, or right-of-way acquisition of properties with past land uses at high risk of hazardous material concerns.

In general, hazardous materials issues should not prevent a project from receiving environmental clearance. However, these issues must be tracked and resolved during future phases of the project development process or during and after the project's construction if necessary.

Phase II Environmental Site Assessments or Investigations (PH II ESA)

The main purpose of conducting a PH II ESA is to determine whether known or possible contamination might be encountered during construction. The information from a PH II ESA may be useful in developing cost-effective preventive action plans or specifications to handle any contamination found. A PH II ESA may also help to determine closure requirements of regulated facilities or contaminated areas. A PH II ESA should include the following activities:

- Develop a soil and/or groundwater sampling and analysis plan, such as locations of borings, depths of borings, locations of monitor wells, groundwater gradient, and hydrogeologic or hydraulic testing
- Identify and characterize the contamination through sampling and analytical testing
- Determine the horizontal and vertical extents of contamination that might be encountered prior to or during construction
- Assess worker safety and public health exposure concerns
- Determine the regulatory handling, reuse and/or disposal requirements for contaminated media
- Recommend a cost-effective preventive action plan to ensure the contamination is not aggravated.

Sampling and analysis can be very expensive. The most cost-effective approaches will vary on a case-by-case basis. Several factors determine when and how to conduct a cost-effective environmental site investigation. For example, the sampling and analysis plan should limit the number of investigations or remobilization. However, multiple or phased investigations may be necessary for some projects or individual sites; detailed information about a project's proposed excavation and de-watering requirements may be needed to develop an adequate sampling and analysis plan. One option is to perform more detailed design activities during advanced planning to facilitate the investigation. Another option is to postpone investigation until the project details are known later in the project development process. It may also be more cost-effective to combine geotechnical testing with environmental testing.

Since a preferred alternative or alignment could change during the environmental process, investigations should be performed after approval of the environmental documentation, public involvement or environmental clearance. To determine whether possible contamination exists on a proposed right of way, investigations depend on property owners providing access or right of entry. If right of entry is refused, the investigation may be postponed until the eminent domain process or until after acquisition.

FHWA has specific guidelines for projects requiring Environmental Impact Statements (EIS). Prior to selection of a project alternative, detailed design activities and additional investigations may be necessary to evaluate the impact and obtain sufficient information for the project decision-making process. Sufficient information is necessary to characterize the site, identify the type and extent of contamination, and estimate disposal, waste management or cleanup costs. It may also be necessary to determine alternative treatment, cleanup, disposal measures, and associated costs. Assuming that right of entry can be obtained, the hazardous materials assessment should be completed and documented in the Final EIS prior to circulation; however, it is not necessary to complete all investigations prior to environmental clearance. If a contaminated site cannot or will not be cleaned up prior to acquisition and it is decided to proceed with the project, then a more detailed site investigation can be performed after clearance. More detailed site investigations may be needed to determine waste characteristics, hydrogeologic conditions and/or extent of contamination.

For all projects, hazardous materials assessment should be completed prior to finalizing the Plans, Specification and Estimates (PS&E). If the analytical testing does not reveal contamination, then there is added support that contingencies or special provisions are not required in the PS&E.

Section 3: Planning and Preliminary Engineering Considerations

Planning and Programming

Coordination with Local Entities: Local public agency or entity agreements with city and county agencies or a metropolitan planning organization (MPO) may often be developed prior to the ISA for off-system or enhancement projects. These agreements typically require local entities to be responsible for the remediation of any identified hazardous material concerns. These agreements should also delegate responsibilities for performing and funding site assessments, additional investigation, permits, site closure, preventive action, waste management, monitoring during construction and post-construction monitoring.

The potential liability and estimated costs for additional testing and analysis, site closure and/or waste management may create a need for additional approvals and/or funding from the local entity or MPO. If site assessments identify known or possible hazardous material contamination, then additional and continued coordination will be necessary between the district and the appropriate local entity.

Project Scheduling: Site assessments, investigations, coordination, and handling of hazardous material contamination can increase the amount of time required to complete environmental documentation, environmental clearances, right-of-way acquisition, and the plans, specifications and estimates (PS&E). Additional time may be needed to cost effectively handle hazardous material contamination, during either the right-of-way acquisition process or construction.

Prior to development of transportation plans and project programming, FHWA Interim Guidance **strongly advises** consulting with regulatory agencies and reviewing regulatory lists of known hazardous waste sites scheduled for cleanup. Whenever possible, known or possible hazardous material contamination should be considered prior to project scheduling. Involvement with hazardous material contamination should also be considered when developing or changing funding and letting schedules. Planning and programming staff should be advised of potential concerns and warned that project scheduling might be affected. Scheduling consideration guidance is available at TxDOT's Environmental Compliance Toolkits website.

Comprehensive Development Agreements

For Comprehensive Development Agreements (CDA), such as Design/Build projects, the hazardous materials process will be dictated by the contract terms. The developer's and TxDOT's responsibilities with regards to the identification and management of potential hazardous materials sites will be specifically addressed in the contract. The hazardous materials process can vary between CDAs, therefore, it is important to read the contract terms to fully understand the process and the entities' responsibilities.

Disclosure and Right of Entry

Disclosure of the purposes of site assessments and investigations for hazardous material contamination should be incorporated into right-of-entry agreements. Any right-of-entry agreements required by the property owner other than the approved TxDOT form agreements should be reviewed by TxDOT's General Counsel Division.

Due to potential hazardous materials liability and enforcement actions, right of entry may be denied or difficult to obtain from property owners. Under the Texas Public Information Act, any TxDOT information, assessment, file or environmental document must be available as a public record unless a related lawsuit is pending. Information may also be discussed with regulatory agencies during the early stages of project development. Therefore, confidentiality regarding any contamination found during site assessments and investigations cannot be guaranteed or implied. Other options to address property owner confidentiality concerns include allowing the property owner to review draft reports or oral reports prior to the preparation of final reports, and separating recommendations from the assessment, or investigation report findings. These alternate options should be considered on a case-by-case basis.

If a property owner denies access, then portions of the site assessments and investigations may have to be postponed until right of entry can be obtained in later stages of project development during the right-of-way negotiation, acquisition or eminent domain process.

Early Coordination with Property Owners/Regulatory Agencies

As stated in [FHWA's 1988 Interim Guidance](#), further investigation and/or coordination may be necessary to confirm the presence or absence of contamination and to determine the extent and severity, appropriate methodology, and preliminary costs of corrective or preventive action. Sites under investigation, corrective action, enforcement, permit plans and/or closure plans regulated by either EPA or TCEQ will require early coordination to determine site status, obtain approval for intrusive sampling and analysis plans, and determine design considerations that might be needed during construction. Coordination may occur with both the applicable regulatory agency(s) and the responsible property owner or operator of the site.

When appropriate, assistance from appropriate state and federal regulatory agencies should be sought to minimize involvement. Requests for assistance or coordination with federal, state and local agencies to assess the degree of contamination, scope of treatment and disposal measures should also be considered, initiated and documented during advanced planning and subsequent stages of project development. Coordination with regulatory agencies, property owners or local agencies may take place concurrently with project development.

Preliminary Design and Feasibility Studies

Early project planning should include conducting ISAs prior to or in conjunction with the preliminary design and feasibility study stages of project development. The potential for

encountering hazardous material contamination should be considered and incorporated into the following:

- Design concept
- Preliminary design schematics
- Preliminary route location, feasibility and investment studies
- Preliminary right-of-way requirements
- Preliminary utility requirements
- Preliminary hydraulic or storm sewer design
- Preliminary cost estimates.

Preliminary Design Concept Conference: The information gathered from site assessments and investigations should be discussed in design concept conference meetings for the project. The Preliminary Design Concept Conference (PDCC) form, developed by the TxDOT Task Force on Design Concepts, contains a section to include pertinent hazardous material information. Districts should contact the Design Division (DES) for more information about the PDCC form.

Environmental Permits, Issues, and Commitments Sheets: An Environmental Permits, Issues and Commitments (EPIC) Sheet was developed to communicate information that should be considered in the PS&E. The EPIC sheet contains a section to include pertinent hazardous material information. Known, unresolved hazardous materials issues are also tracked in ENV division's Environmental Compliance Oversight System (ECOS) through the use of Issues, Identifications, and Resolution (IIR) forms and assigned tracking tasks.

Preliminary Design Schematics and Right-of-Way Maps: If not avoided, hazardous material contamination concerns will need to be further addressed during later stages of project development. Copies of the preliminary schematics should include references to known or suspected hazardous material contamination or regulated sites. Additional surveying of known or possible hazardous material contamination concerns can be incorporated with either the preliminary schematic or right-of-way maps. Whether surveyed or hand-drawn, examples of possible concerns to note on preliminary schematics or maps include, but are not limited to, monitoring or exploration wells, contaminated fill, underground storage tanks, fill pipes, pump islands and above-ground storage tanks.

Alternative Analysis and Selection

U.S. Department of Transportation (USDOT) and EPA initiatives encouraging redevelopment of brownfields will likely support transportation-related brownfield redevelopment and may result in increased involvement with hazardous materials during construction. Due to the added costs and liability risks associated with hazardous materials involvement, known or possible hazardous material concerns should be integrated into the project coordination, alignment alternative,

corridor/route selection and decision-making processes. The financial impact on transportation funds or budgets should be considered in the alternative analysis.

Experience and understanding of procedures in right-of-way negotiation and acquisition, property management as well as, design and construction will be required in the decision-making process. Consideration of other environmental issues, health and safety concerns, design feasibility, liability and costs must also be part of the decision to either avoid, minimize the involvement (redesign) or properly handle the concern prior to or during construction. Preliminary or required commitments should be identified or outlined during advanced planning and the project decision-making process. As appropriate, affected parties, local entities, and affected district functional areas must agree to commitments for further investigation, regulatory agency coordination, approvals and permits, corrective action and site closure as well as, preventive action and/or waste management.

Appropriate investigation levels for ISAs of each alternative should be comparable. In alternative analysis, known or possible hazardous material sites should be compared qualitatively rather than quantitatively. A comparison of the total number of regulated or registered sites for each alternative is not sufficient, because the costs and requirements for one type of regulated site or contamination problem cannot be compared directly with those of a different type of regulated site or contamination problem. However, similar sites with the same types of contamination, priority and status, with similar project involvement, could be compared.

As stated in the [FHWA's 1988 Interim Guidance](#), a decision must be made as to whether the costs and delays of contamination involvement warrant the selection of an alternate route. Additional factors such as other environmental issues and right-of-way, utility, construction and maintenance costs should be considered. For example, engineering design and utility considerations are associated with constructing and maintaining a roadway built on a landfill. Those considerations include increased construction and maintenance costs due to possible bridge structures, post-closure requirements, health and safety monitoring, methane collection and monitoring, leachate filtration/monitoring systems and settling. Other factors include liability issues and responsibilities for possible groundwater contamination. The feasibility of avoiding the landfill entirely, minimizing involvement with minor alignment changes or constructing a bridge over the landfill requires evaluation of the costs and benefits.

Project Development Considerations

Geotechnical Soil Borings/Soil Core Hole Drilling Considerations: If hazardous material contamination is suspected, then any required soil core hole drilling for pavement, retaining walls, bridges and other structures can be combined with required environmental sampling and analysis to minimize costs.

Additional provisions or contingency language may be needed in the scope of services or proposals for geotechnical soil boring/soil core hole contracts on a project-specific basis if contaminated soil and/or groundwater might be encountered. For example, special considerations for health and safety monitoring, personal protective equipment, proper handling and disposal of soil cuttings,

alternative drilling techniques to prevent migration and plugging may be required for soil core hole drilling.

Right-of-Way Considerations: Regardless of the potential for encountering contamination during construction, special considerations for hazardous material concerns during the right-of-way negotiation and acquisition process may be necessary. Regulatory agency and property owner coordination may still be required, depending upon the regulatory status of a site. For example, plugging of groundwater monitoring or exploration wells may be required by applicable regulations. Other concerns can include asbestos, underground storage tank removal, permit status notifications, and site closure.

Land use restrictions or post-closure care requirements may be recorded in the deeds of parcels to be acquired. Corrective action cases may need to be re-opened for sites or facilities due to proposed land use changes. The terminology and requirements for corrective action cases differ from those of a risk-based assessment for a facility according to the federal or state regulatory status. For example, requirements for a permitted landfill will differ from those for a petroleum storage tank facility. Additional information on asbestos-containing materials, petroleum storage tanks, leaking petroleum storage tank facilities and other permitted or regulated sites is provided in Chapter 3, “Right of Way.”

Utility or Pipeline Agreement and Adjustment Considerations: Abandoned utilities or pipelines containing crude oil, polychlorinated biphenyls (PCB) or asbestos-containing materials (ACM) may have to be removed during construction. TxDOT utility installation notices, joint use and standard utility agreements typically include general statements about following applicable federal, state, and local regulations. The responsibilities for handling or disposing of hazardous materials must be determined. On a case-by-case basis, specific hazardous material or spill reporting requirements should be considered in the agreements. If unknown or unanticipated contamination is encountered during utility maintenance, adjustments or installation, the utility company should be required by the agreement to notify the district so that possible involvement during any proposed construction can be determined.

The potential for encountering contamination should be addressed early in project development to prevent or minimize delays in completing utility adjustments. Adjustments to utilities or pipelines that involve hazardous materials may impact construction projects. A district may decide that a particular project requires joint bids with the municipalities to handle utility adjustments during construction. Whether the utilities are adjusted prior to or during construction, the extra time needed to arrange for special handling of contamination may delay construction, or impact construction scheduling. For example, installation or adjustment of telephone fiber optic cable within contaminated soil may require special protection, such as trench lining and/or soil disposal.

Hydraulic and Storm Sewer Design Considerations: If handled improperly, de-watering and storm sewer installation in contaminated soil or groundwater are at the greatest risk of worker exposure and further releases into the environment. If unanticipated contamination is encountered and special provisions or arrangements have not been made, then construction delays and/or contractor disputes or claims are likely. Areas needing significant excavation, trenching, tunneling and/or de-watering typically require more assessment and/or further investigation to determine if contamination will be encountered during construction. If de-watering of contaminated

groundwater is necessary, then specialty contractors, engineering controls, monitoring and testing, temporary collection, filtration, approval from regulatory agencies and/or discharge permits may be required.

Design Changes and Re-Evaluations: The following steps should be performed for design changes and re-evaluations:

1. Review documentation for original and/or subsequent ISA(s). If an ISA has not already been performed, one is required for the portions of the project that have not already been constructed.
2. Review documentation for any investigations performed after the original environmental documentation, such as investigations to confirm the presence of, determine the extent of or determine proper handling requirements for contamination.
3. Determine if any changes, new information or circumstances require further assessment, research or investigation. Re-evaluate the original ISA to determine if assumptions based on preliminary design or right-of-way requirements are still valid.
4. Perform follow-up site visits and update regulatory database list searches.

Plans, Specifications and Estimates (PS&E) Considerations: If site remediation cannot meet regulatory closure requirements prior to construction or during the right-of-way acquisition process, then monitoring of remediation systems and their access may need to be integrated into the design of the proposed project. Coordination with regulatory agencies and the property owner/responsible parties may be necessary to ensure that the roadway construction does not adversely affect remediation, site closure and/or post-closure care of the site.

The management and disposal of contaminated soil, groundwater and waste must be conducted in accordance with applicable federal and state requirements and in a manner that will not adversely affect human health and/or the environment. If a hazardous material concern cannot be avoided prior to construction, a preventive action plan, such as a Soil and Groundwater Management Plan, will serve to reduce the impact of contamination encountered during construction. A preventive action plan may include, but is not limited to, the following:

- Construction phasing
- Health and safety plans or considerations
- Waste management reuse or disposal options
- Permitting requirements
- Monitoring
- Sampling and analysis plans
- Specifications for engineering controls
- Filtration systems

- Ventilation systems

Special specifications, provisions or contingencies can be incorporated into the PS&E to reduce the potential for construction delays, claims, forced accounts, or field change orders. Employed by the local entity, TxDOT or the prime highway contractor, specialty contractors, or subcontractors can be used to implement the preventive action plan during construction. Incorporating special specifications, provisions or considerations into the development of the PS&E is further discussed in Chapter 4, “Design.”

Property Management or Maintenance Considerations: If a site cannot meet regulatory closure requirements prior to construction or during the right-of-way acquisition process, then closure may need to be obtained after project construction. Additionally, a site may have post-closure requirements for maintaining vegetation, caps or drainage after construction. Any post-closure responsibility must be communicated to the district maintenance staff.

Project Files

District and division project files are consulted at various stages of project development. A completed copy of the ISA checklist or report should be kept in the district project files. Due to possible cost recovery and right-of-way documentation requirements, incorporating or developing central hazardous material files or electronic databases for tracking information by project and/or parcel should be considered.

Supplemental documentation should be organized and catalogued in the project files. Supplemental documentation includes, but is not limited to, the following:

- Detailed site observations
- Photographs
- Location(s) of identified concerns
- Correspondence
- Records of communications for all interviews
- Copies of regulatory lists or file information reviewed
- Copies of or references to aerial photographs
- Maps
- Field logbooks
- Field data
- Specialty contractor or subcontractor agreements
- Chain-of-custody records
- Analytical laboratory data

- Quality assurance and quality control reports
- Computer files
- Reports

Section 4: Environmental Documentation and Clearance

Overview

Environmental documentation for state or federal clearances should be customized to adequately address the nature, scope and complexity of the individual transportation project. The following are the CEQ's general guidelines for compiling NEPA environmental documentation. The text should:

- Be analytical rather than encyclopedic
- Show why more study is not warranted
- Offer a brief discussion, except for significant issues
- Offer concise and plain language, incorporating graphics and tables where appropriate
- Reduce emphasis on background material
- Emphasize decision-making issues and assess impact rather than justify decisions
- Incorporate references to data or reports that are readily available into document
- Combine environmental documentation with other documentation where appropriate.

It is inappropriate to include all information used to assess the potential for encountering hazardous material contamination and difficult to do so while maintaining a concise environmental document.

General Requirements for Hazardous Material Discussions

All projects should be assessed for possible hazardous materials involvement; any required environmental documentation should include a discussion about hazardous materials, even if no concerns are found. This discussion should provide sufficient evidence that the project was adequately investigated for known or possibly unknown hazardous material contamination within the proposed project limits. The following are general guidelines for hazardous material discussions:

- Describe types and/or scopes of site assessments and/or investigations conducted
- State who performed the site assessments and/or investigations
- Disclose any limitations of the site assessments or investigations
- Discuss whether further investigation is needed
- Provide justification for any postponement or dispensing of further investigation
- Summarize the findings of the site assessments or investigations for each alternative considered

- Discuss any early coordination or consultation with the regulatory agencies, local entity or property owners
- Justify avoiding or not avoiding known or suspected hazardous material contamination within the preferred alternative or corridor alignment
- Summarize efforts to avoid or minimize involvement with known or suspected hazardous material contamination sites during construction
- Disclose known or suspected hazardous material contamination that is expected to be encountered during construction
- Discuss any required special considerations, contingencies or provisions to handle known or suspected hazardous material contamination during right-of-way negotiation and acquisition, property management, design and/or construction
- Discuss any required further coordination, approvals, permits and site closure with the regulatory agencies.

Example language for different scenarios to be used as guidance, but not as standard paragraphs, is provided in at TxDOT's Environmental Compliance Toolkits website.

Draft Environmental Impact Statement (DEIS)

In addition to the general requirements above, the following are the FHWA Technical Guidance ([T.6640.8A](#)) for documentation to be compiled for a draft environmental impact statement (DEIS):

- A map clearly delineating the extent of the site in relation to alternative project alignments
- The number and types of sites or structures, extent of contamination and alternative treatment or disposal measures
- The results of coordination with EPA, state/local agencies and the public
- A description of previous plans, if any, for cleanup of the sites
- Sufficient information to allow a reasonable evaluation of alternatives
- Justification for not avoiding the site.

Final Environmental Impact Statement (FEIS)

Additional hazardous materials assessment investigations should be completed before circulating the final environmental impact statement (FEIS). Results of these investigations may help to determine the impact on a project alternative and provide estimates of the extent of contamination and cost of preventive action during construction. The results of these investigations should be presented in the FEIS.

In addition to the general requirements discussed above, the following is a list of items required in FEIS documentation, according to FHWA Interim Guidelines for the preferred alternative:

- A description of the results of continuing coordination with EPA, state/local agencies and the public
- Documentation of the resolution of hazardous material issues to the extent possible
- A detailed description of the site(s), contamination, agreed upon treatment or disposal measures and costs of the remedial plan to the extent possible

Supplemental EIS and Re-Evaluation Documents

A DEIS or FEIS may be supplemented at any time. An EIS should be supplemented if changes to the project can result in significant environmental impacts not already evaluated in the EIS, or if new information or circumstances relevant to environmental concerns might result in significant environmental impacts not already evaluated in the EIS. Depending upon the length of time taken to complete project development, state and federal “findings of no significant impact (FONSI)” projects may also require re-evaluation documentation. Items to accompany any required supplemental EIS or re-evaluation documents include:

- A summary of new findings
- Status of any further investigation
- Coordination with regulatory agencies or property owners during right-of-way negotiation and acquisition
- Facility or site closure
- Corrective action
- Any plans to handle contamination or hazardous materials during construction.

Environmental Review and Clearance

If contamination is identified prior to construction and provisions are made to handle the contamination according to applicable regulations and/or coordinated with applicable regulatory agencies, the project should not have a significant impact on the environment. However, due to high costs of hazardous material contamination involvement, possible or known concerns may affect the decision-making and alignment selection processes.

ENV reviews EA and EIS documents to evaluate whether sufficient research or disclosure has been provided regarding the potential for encountering hazardous material contamination within the proposed project limits. Any required permits, coordination with regulatory agencies or special considerations for hazardous material contamination must be disclosed. If disclosure does not appear to be sufficient, revisions or clarifications must be made before the documentation can be submitted to FHWA or approved to proceed with the next stages of project development.

If the ISA does not reveal any involvement with hazardous materials, the document is approved and the project can proceed to the next stages of project development. If concerns are revealed, the

project can still be approved with the understanding that commitments for the project will be followed throughout the next stages of project development and construction.

Commitments for further investigation, approvals, permits, and coordination regarding hazardous materials should be summarized in approval and clearance letters. Copies of the environmental document and approval/clearance letters should be forwarded to appropriate right-of-way, design, and construction staff.

Chapter 3: Right-of-Way

Contents:

[Section 1: Overview](#)

[Section 2: Asbestos-Containing Materials](#)

Section 1: Overview

Goals

The following goals should be completed prior to or during the right-of-way stage of project development as it pertains to acquiring fee or easement rights for contaminated property or improvements:

- Initiate, complete, or update environmental site assessments and/or investigations, as needed
- Coordinate decisions with district, affected divisions, and FHWA staff to avoid or minimize involvement with previously unknown contamination that was not disclosed in the environmental document
- Determine if preventive and/or corrective actions can be performed prior to construction (preventive actions refer to cleanup and other activities required effecting the construction of the highway project. Corrective action refers to activities required by state or federal regulations and performed by a responsible party to protect human health and the environment.)
- Negotiate and allocate responsibility for any required corrective action, closure, post-closure care or future environmental liability among property owners, operators, jurisdictional regulatory agencies, local entities, and TxDOT, as applicable
- Arrange petroleum storage tank (PST) and leaking petroleum storage tank (LPST) investigations, removal, and closure
- Determine whether cost recovery from responsible parties is appropriate, taking into account the [FHWA Interim Guidance](#) (Federal Highway Administration (FHWA) Hazardous Waste Sites Affecting Highway Project Development (1988))
- Coordinate with the Right of Way Division (ROW) Legal Section, the General Counsel Division and Texas Office of Attorney General, as appropriate, to determine if and how cost recovery should be pursued
- Arrange asbestos-containing material (ACM) inspections, abatement project design, notification, abatement, air monitoring, and demolition, as needed
- Monitor assessments, investigations, closure and corrective action, and communicate the status and findings to affected planning, environmental, design and construction staff
- Coordinate and transfer any required post-closure responsibility to TxDOT district maintenance sections.

Procedure Overview

This chapter focuses on hazardous materials issues encountered prior to, or during the right-of-way negotiation and acquisition process. Once the negotiation and acquisition process is complete, some of the following guidance may not apply. More information about right-of-way procedures is provided in the Right of Way Manuals Volumes 1 through 8 which can be found using the Online Manual search tool at ../Default.aspx

Asbestos and petroleum releases from leaking underground storage tanks are the most common hazardous material concerns addressed during the right-of-way negotiation and acquisition process. The following sections provide guidance for asbestos-containing materials (ACM), petroleum storage tanks, and other contaminated sites; each is distinctly different with regard to cleanup procedures and governing regulations. For more information, contact the Environmental Affairs Division (ENV) Environmental Resources Management (ERM) Section.

Complete Assessments/Investigations

One of the first steps during the right-of-way negotiation and acquisition process is to determine if the initial site assessment (ISA) for hazardous materials should be updated or supplemented. New site conditions may exist or previous conditions may have become apparent since the ISA was performed during earlier planning stages of project development. TxDOT is not authorized to enter property without expressed written consent from the property owner through a right-of-entry agreement, easement or deed. In cases where right-of-entry was denied during earlier stages of project development, additional attempts to obtain right-of-entry should be considered. Similarly, interviews with the property owners or operators concerning possible contamination may not have been feasible or practical during advanced planning stages. These interviews should be conducted, if possible, and documented during the right-of-way negotiation and acquisition process.

As environmental site assessments and investigations are completed, the findings should be communicated to the appropriate district planning, environmental, design and construction staff, and affected divisions. If preventive or corrective action cannot be performed prior to construction, then the scope of any environmental site investigation should include providing data to prepare for any necessary preventive action during construction activities.

Advanced Acquisition of Right-of-way

Advanced acquisition may allow preventive or corrective action activities to be completed prior to construction in a more cost-effective manner. The advanced acquisition of a hazardous material site does not necessarily mean that TxDOT will assume responsibilities for corrective action or cleanup. ENV should be contacted for site-specific guidance when the advanced acquisition of parcels with hazardous materials or contamination is considered. ROW can provide additional information regarding procedures for advanced acquisition and corridor preservation.

Postponing Acquisition

The acquisition of right of way or transfer of title may need to be postponed on a case-by-case basis, depending upon the potential for TxDOT to become liable for corrective action. Eventually, either acquisition or easements must be acquired prior to letting. The following agreements or instruments allow preliminary engineering and the project to proceed while postponing acquisition:

- Right-of-entry agreements
- Possession and use agreements
- Easements.

Appraisals

Parcels are appraised "as if clean." Many appraisers are not qualified to detect the presence of contamination, therefore, some sites may be appraised "as if clean" even though they are impacted by contamination. The value of contaminated real estate may not be accurately estimated by simply deducting the estimated remediation or compliance cost from the unaffected value. Other factors may influence value, including a positive or negative perceived impact on marketability (stigma) and the possibility of change in the highest and best uses. After the original "as if clean" appraisal is obtained, an appraiser with contamination expertise should be considered for some parcels. Districts should contact ROW for information on obtaining appraisal experts. Additionally, expert technical services for estimating corrective action costs may be obtained through ENV statewide environmental contracts.

Agreements

Where possible, TxDOT should avoid or limit its liability for corrective action by negotiating agreements with responsible parties. Agreements should be negotiated when petroleum storage tank systems, permitted facilities, waste management units and contaminated soil or groundwater exist within the existing or proposed right-of-way or easement. The agreements with owners, operators, or other responsible parties should address, but are not limited to, the following:

- Delegation of responsibility for removal, disposal, corrective action, closure and/or post-closure care
- Provisions for contingencies if contamination is encountered
- Assurances that project-specific design requirements and construction worker safety are addressed in any risk assessment or corrective action plan
- Consideration of TxDOT's input when making decisions related to corrective action, closure and post-closure care requirements
- Allowing TxDOT to recover costs, where appropriate.

ROW has developed underground storage tank (UST) removal and indemnity agreements to address responsible party corrective action, including provisions for cost recovery if the party does not fulfill its responsibilities under the agreement. Standard UST removal and indemnity agreements can be obtained from the ROW Engineering Section. Agreements should be reviewed and edited to meet site specific needs by the ROW Legal Section.

ENV can assist district and ROW personnel in deciding if hazardous materials issues and potential TxDOT liability might be handled through agreements or possibly through regulatory programs designed to limit future landowner liabilities. Refer to the online ROW manuals for additional information on types of agreements that might be utilized for hazardous materials issues.

Deed Recordation

Deed certifications and recordations regarding “Notice of [type of substance] Contaminated Site” are required under certain regulatory program regulations.

Deed recordation is generally required in the following circumstances on a case-by case basis based on a combination of the remaining contaminant concentrations and the future anticipated use(s) of the site:

- When future land use is likely to become more environmentally sensitive
- When engineering or institutional control is necessary to prevent current or future exposure
- To eliminate potential expose pathway
- When engineering control, such as a cap must be maintained to prevent exposure to surface contamination
- When land was formerly used as a municipal solid waste landfill or dump

If deed recordation is needed on a property considered for acquisition, it is preferable that the owner perform the deed recordation prior to acquisition. TxDOT’s policy is to not allow restrictive covenants to be placed by others on property owned by the Department. Refer to the online ROW Manual, Volume 6 for specific deed recordation procedures.

Temporary Leases (Lease Backs)

Districts should be cautious of leasing right-of-way back to owners or operators with permitted or regulated operations involving hazardous substances, waste or materials. TxDOT may be held liable if hazardous materials or wastes are not managed properly. To reduce liability to TxDOT, some operations may need to be discontinued or closed prior to or upon acquiring the property.

Local Public Agency Acquisition

A local public agency may acquire right-of-way and easements. Before transferring a title to the State, TxDOT should obtain confirmation that hazardous material concerns have been addressed

from the acquiring agency. TxDOT should review documentation of appropriate inquiry, reports or checklists. The transfer of the title may need to be postponed until corrective action, closure and/or post-closure care issues are resolved. TxDOT may need to enter agreements with the local public agency and other parties regarding acquisition of right-of-way and easements. Additional information about local public agency acquisition should be obtained from ROW.

Cost Recovery

Issues related to the acquisition of contaminated property and cost recovery have become more complicated in recent years due to the promulgation of risk-based corrective action regulations. A risk-based closure of a site allows contamination to be left in place as long as the contaminants do not constitute environmental or health hazards to on-site or off-site receptors given the property uses. As a result, TxDOT is increasingly confronted with the acquisition of contaminated properties that may have already been, or are eligible to be, closed by the jurisdictional regulatory agency.

Cost recovery and the allocation of corrective action responsibilities depend upon the purpose of the cleanup. If the purpose of the cleanup is solely to meet the transportation project's construction requirements, and otherwise would not have been required by regulation, then the cleanup costs should not be borne by the responsible party. On the other hand, if contaminated property constitutes a health risk to the general public above and beyond those incurred during the transportation project's construction activities, then cleanup costs should be borne by the responsible party. Cost recovery issues are complicated, especially when related to disposal. Negotiation with the property owner and/or responsible party may be necessary on a case-by-case basis. The ROW Legal Section should be consulted for assistance.

The decision to recover costs through legal action should be coordinated with ROW Legal Section, GCD and Texas' Office of the Attorney General, as appropriate.

Section 2: Asbestos-Containing Materials

TxDOT's Perspective (Overview)

Proposed right-of-way or easements may be encumbered by buildings or facility structures. Federal and state asbestos laws and regulations apply to the removal and disposal of obstructions including the remains of houses, foundations, floor slabs and basements. When required asbestos inspections, notifications, and abatement actions must be completed prior to the demolition or renovation of structures within the right-of-way. Although TxDOT Standard Specification, Item 100, Preparing Right of Way requires removal and disposal of all obstructions from the right-of-way and from designated easements, asbestos-related activities are to be completed prior to letting of the transportation construction contract. Asbestos services and demolition typically occur after the right-of-way or easements have been acquired. If not accomplished prior to letting, then asbestos-related activities associated with preparing the right-of-way should be agreed upon in a contract separate from that of roadway construction. Right of way structure asbestos remediation and demolition activities are generally handled through the ROW Division during the right of way acquisition process.

Inspection (Asbestos Survey): An asbestos inspection or survey is performed to determine the presence, location, condition and friability of ACM by visual or physical examination, or by collecting samples of such materials. An owner must have a thorough inspection performed prior to any renovation or dismantling within a public building, commercial building or facility, including preparations for partial or complete demolition. Asbestos inspections or surveys must be performed by an asbestos consultant with an asbestos inspector working for the firm.

Typically, an asbestos inspector will base their estimate of the required number of samples on the square footage of a building or structure. However, the true number of samples will depend upon the actual number of homogeneous areas encountered during the survey.

Asbestos Abatement Project Design (Abatement Specification): An asbestos abatement project design, specification for asbestos removal is typically required for most demolition. Asbestos abatement project design includes the following components:

- Inspection, evaluation and selection of appropriate asbestos abatement methods
- Project layout; the preparation of plans, specifications and contract documents
- Review of environmental controls, abatement procedures and personal protection equipment employed during the project

Chapter 25 of the Texas Administrative Code (TAC) (25 TAC 295.34), requires that the project design to address friable ACM be prepared by either a licensed asbestos consultant for a school or public building, or by an accredited project designer for a commercial building. In a commercial building, non-friable material does not require a design but must be treated in accordance with National Emissions Standards for Hazardous Air Pollutants (NESHAP).

Ten (10) Day Notification: Notification is required for the demolition of any facility or public building, whether or not asbestos has been identified. In a facility, a notification to abate amounts described in NESHAP must be submitted to the DSHS by the facility owner and/or operator. If a licensed abatement contractor or consultant is not required, the task may be delegated to the demolition contractor. The notification may only be signed by the legal owner, his designated legal representative, the operator of the site, the licensed abatement contractor or a licensed consultant.

The DSHS Demolition/Renovation Form (APB #5) combines the notification requirements of NESHAP and Texas Asbestos Health Protection Rules (TAHPR). The notification form must be postmarked at least 10 working days (not calendar days) prior to the abatement project start date, except in the case of an emergency or ordered demolition. If asbestos abatement prior to demolition is not required, then only the 10-day notification to DSHS for demolition is required. A telephone facsimile (FAX) is not acceptable. Notification can also be made using the online [Asbestos Notification System](#)

Work must commence on the date shown on the notification. If there is a change in the start date, then an addendum must be sent to DSHS at least 10 working days prior to the revised start of work. Notifications that do not meet the 10-day requirement or are incomplete are considered to be improper and may result in enforcement proceedings.

Abatement and Monitoring: Asbestos abatement is the removal, encapsulation or enclosure of asbestos to reduce or eliminate airborne concentrations of asbestos fibers or amounts of ACM. Once the specification, if required, and proper notification have been completed, abatement can occur before performing the demolition or renovation activity.

Facility owners are required to abate all friable asbestos-containing building material (ACBM) or ACM which may become friable regulated asbestos-containing material (RACM) in accordance with NESHAP. Public building owners are required to abate friable and non-friable ACBM in accordance with NESHAP and TAHPR.

The asbestos abatement contractor is responsible for providing the proper temporary storage and final disposal of waste asbestos. A person must be licensed as an asbestos transporter to engage in the transport of asbestos in the state of Texas. All asbestos-containing waste material is to be delivered to an approved Texas Commission on Environmental Quality (TCEQ) facility (permitted landfill) for disposal or follow the regulations of the receiving state.

Demolition: Once any required abatement has been performed and notification has occurred, the structure can be demolished.

Owner Retention, Acquisition and Sale of Improvements

Three typical scenarios in which asbestos must be considered are routinely encountered during the right-of-way acquisition process:

- Owner retention of the improvement
- TxDOT acquisition of improvement

- TxDOT acquisition and sale of improvement.

Owner Retention of Improvement Option: The first scenario is unique in that the real property acquisition does not include the improvements, typically residential structures. TxDOT property acquisition policy allows for owner retention of an improvement in return for a credit of the retention value of that improvement. For example, a residential property owner may elect to retain a house or mobile home and remove it from the property acquired by TxDOT. Under these circumstances, ownership of the improvement never passes to the State.

Demolition of residential structures may not be exempt from NESHAP once the land beneath the facility or structure is acquired by the State. TxDOT should notify the legal owner of the residential structure that demolition should not be performed on-site until it is confirmed that asbestos-related activities are performed by persons with the appropriate valid license, registration, accreditation, or approved exemption. Due to the additional requirements, it is doubtful that the legal owner of a residential structure will want to demolish the structure on-site.

TxDOT Acquires and Retains Ownership of Improvement Option: The second scenario results from any combination of circumstances by which TxDOT comes into actual ownership of a structure and must then take action to remove and dispose of the improvement. When TxDOT acquires ownership of the improvement, explicit responsibility for ACM rests solely with TxDOT.

Generally, TxDOT sells the acquired improvement, discussed in the following option. However, if TxDOT does not sell or transfer the legal ownership of the improvement, the inspection, notification, specification, abatement, and disposal of ACM in accordance with applicable requirements are incumbent upon TxDOT. When TxDOT decides to retain ownership of an improvement, a district should contract with an asbestos consultant to perform an asbestos inspection and/or survey. The same asbestos consultant can also be contracted to provide an abatement project design specification, if needed. It is generally more cost effective for a single consultant to conduct the asbestos survey, abatement project design, notification, independent third-party air monitoring, and final report.

TxDOT should confirm that any contractor or consultant performing asbestos-related activity on the right-of-way has the appropriate valid license, registration, and accreditation, or approved exemption. TxDOT should also request a copy of the completed notification form, and documentation that the form was received by DSHS, to confirm that notification requirements have been met.

TxDOT Acquires and Sells Ownership of Improvement Option: The third scenario results from circumstances similar to those of the earlier scenarios in which TxDOT becomes the owner of improvements such as public buildings and/or facilities. TxDOT's surplus property procedures include transferring the title or ownership of improvements to a purchaser. In this scenario, TxDOT does not perform the abatement on the improvement but sells the improvement outright by issuing an Invitation for Bid (IFB) to conduct a sale of improvement through the competitive bid process.

Options for Obtaining Asbestos Services

The ROW Division's procedures for dealing with asbestos in right-of-way structures are found in the ROW Manual, Volume 6. Additional information on obtaining asbestos services from consultants and contractors is provided in [Chapter 6](#) (Hazardous Materials in Project Development).

Chapter 4: Design

Contents:

[Section 1: Overview](#)

[Section 2: Environmental Site Assessment and Investigations](#)

[Section 3: Design Considerations and Factors](#)

[Section 4: Contamination Factors and Considerations during Construction](#)

[Section 5: Plans, Specifications & Estimates \(PS&E\) Requirements](#)

[Section 6: Cost Recovery and Accounting](#)

Section 1: Overview

Goals

As described in the FHWA Interim Guidance Summary regarding hazardous materials in project development, the following goals should be considered during design:

- Avoid contamination, if possible
- Minimize construction activity and costs involving hazardous materials
- Recover costs.

One of the main goals of the design process is to provide as much information as possible to TxDOT consultants and the district's advanced project development, environmental, and right-of-way staff regarding design details (such as locations of excavations and de-watering requirements). This disclosure will allow the most thorough environmental site assessment possible. As preliminary design requirements are finalized, assumptions made during project planning for the initial site assessment may need to be re-evaluated.

Due to the increased costs associated with hazardous materials management, information regarding known or possible hazardous material concerns should be integrated into the project coordination, alignment selection, and decision-making processes.

If contamination cannot be avoided, or cleaned up prior to construction, the project designer, in conjunction with ENV division staff, should develop procedures, plan notes, specifications and plan details to address contamination concurrent with construction.

Procedure Overview

This chapter provides guidance for those rare cases when contamination cannot be avoided or cleaned up prior to construction. For example, in situations where soil and groundwater contamination is widespread, cleanup could potentially take years; it may not be feasible to delay construction until cleanup is complete. Also, in some situations it may be cost-prohibitive to clean an area to non-contaminated levels. In such a case the corrective action plan may call for a risk-based closure, which allows contaminated soil and groundwater to remain in place. However, special handling considerations may be necessary if the contamination is encountered during construction.

For the most part, TxDOT's preparation and work activities regarding contamination issues during construction are preventive, not corrective actions.

The following are some terms relevant to design, and their definitions:

- **Corrective Action:** Cleanup, removal or stabilization of contaminated soil and/or groundwater as required by environmental regulations. The goal of corrective action is typically to obtain regulatory closure of the affected site.
- **Preventive Action:** Cleanup, removal, or stabilization of contaminated soil, and/or groundwater as required prior to or during construction or maintenance projects. In contrast with corrective action, preventive action is concerned primarily with worker safety, as well as ensuring that the existing contamination problem is not aggravated by the project.
- **Aggravate:** To contribute to or cause further releases into the environment, resulting in exacerbation of existing soil or groundwater pollution by:
 - removing contaminated soil or groundwater by excavation or pumping and improperly handling, storing, or discharging the soil or groundwater,
 - creating pathways for contaminant migration, and;
 - obstructing ongoing or impending corrective actions.
- **Specialty Contractor:** A contractor with the training, experience and equipment necessary to perform construction-related services within contamination zones. Specialty contractors perform work in areas where Occupation Safety and Health Administration (OSHA) training requirements and/or pollution liability concerns prevent the general contractor from performing such work. Underground storage tank removal contractors constitute a large statewide pool of potential specialty contractors.
- **Soil and Groundwater Management Plan (SGMP):** A project-specific, written document that becomes a special provision of the Plans, Specifications, and Estimates (PS&E) for a project that details specific locations where contamination may be encountered during construction, and specific requirements to be followed by the construction contractor when working in those locations.

Environmental regulatory considerations drive many decisions during the design of a project within a contaminated area. Work involving contamination during construction is usually concerned with preventive action, rather than corrective action. Examples include installation of migration-proof pipe/utility trenches within contamination zones, as well as removal of a petroleum storage tank during construction in compliance with the Texas Commission on Environmental Quality (TCEQ) regulations.

This guidance provides the framework around which effective and economic measures for dealing with hazardous materials contamination during project design can be established. If contaminated or potentially contaminated areas cannot be avoided within a proposed construction site, several options for handling construction are available to project designers. These options should be carefully considered to make the most appropriate decision early in the project development stage. Preventive action of contaminated areas should only be incorporated into the PS&E when justification can be provided for not avoiding the site, or when preventive action of the contaminated material cannot reasonably be accomplished in a separate contract prior to the roadway construction contract.

Petroleum-contaminated soils are the most widespread form of contamination encountered by TxDOT in highway construction activities. The ability to resolve problems associated with petroleum contamination quickly and at relatively low cost is a significant factor in the feasibility of many projects. The standard procedures presented in this section are best suited to this type of contamination, although they may also be used to address other contaminant types.

The procedures outlined below should be followed to determine how to proceed on projects with potential hazardous material contamination.

1. Coordinate as early as possible with the Hazardous Materials Management Section of ENV when contamination is suspected to be encountered on a project.
2. Provide enough detail and adequate information to determine how to avoid or minimize work in contaminated areas. Environmental site assessments and investigations are driven by the project design and should.
3. Analyze design and construction considerations/factors to determine the most efficient and cost-effective way to develop and implement a preventive action plan.
4. Develop the PS&E to incorporate any necessary contract provisions once a method for preventive action has been chosen,

Section 2: Environmental Site Assessment and Investigations

Keys to success in dealing with potentially contaminated sites are:

- Early identification and assessment
- Early coordination with:
 - Design Division (DES)
 - Environmental Affairs Division (ENV)
 - Right of Way Division (ROW)
 - Construction Division (CST)
 - Procurement Division (PRO)
 - Professional Engineering Procurement Services (PEPS)
 - Federal Highway Administration (FHWA)
 - Responsible parties, local entities and regulatory agencies
- Early determination and use of measures to avoid or minimize involvement during construction activities at the site.

Environmental site assessments should be performed early in the project development process to identify potentially contaminated sites. The findings of an initial site assessment or investigations performed by the district may indicate the need for more detailed assessment that can potentially influence project design. This more detailed assessment will generally be a comprehensive site investigation designed to fully characterize the type, concentration, and location of hazardous materials likely to be encountered during construction. The results of the assessment will be utilized for:

- Development of a preventive action plan
- Development of plans and specifications
- Monitoring/testing during design and construction.

It is necessary to coordinate with TxDOT divisions, FHWA, TCEQ and other agencies to ensure timely and efficient project development. The results of the environmental site assessment and investigations are the basis for design and construction considerations. Right-of-way acquisition and utility adjustments should also be analyzed as part of the project development phase.

The environmental site assessment and investigations should provide adequate information so that all design considerations and factors can be examined and analyzed with regard to possible contamination within the proposed project limits. This information should focus on identifying, quantifying, and delineating the vertical and horizontal extents of soil and groundwater contamination that will be affected during construction.

Section 3: Design Considerations and Factors

Avoidance and Minimization

TxDOT should analyze each project alternative carefully; the goal being to select the most cost-effective option that is least likely to impact the environment and best serves the purpose of the project. Several factors must be considered in the decision to avoid or minimize involvement with hazardous materials including health and safety concerns, design feasibility, maintenance after construction, liability, costs, and other environmental issues.

If contamination is encountered and cannot be avoided, TxDOT should make every effort to have the owner, operator, and/or responsible party investigate and clean up the contamination prior to acquisition. If it cannot be cleaned up prior to acquisition and construction, the project designer should find ways to minimize involvement or impacts with hazardous materials by redesigning the project or properly handling the concern prior to or during construction. It may be necessary to develop procedures, plan notes, specifications and/or plan details to address contamination concurrently with construction (e.g. an SGMP). In some cases, requirements for proper management of hazardous materials or special considerations for post-construction maintenance activities may also apply.

Design Considerations

When there is a strong degree of certainty that hazardous material contamination exists within the project limits, coordination with affected TxDOT divisions should begin early in the project development process. Each TxDOT district should develop its own procedures based on the information found in this manual and designate responsible persons for determining and coordinating project development activities when there is a possibility of encountering hazardous material contamination during construction. Project designers should coordinate with TxDOT divisions through designated district personnel. If needed, Chapter 6: Hazardous Materials Services Contracts provides instructions to acquire consultant and contractor services with the assistance of ENV and PRO staff.

All design and construction activities involving hazardous material contamination should comply with state and federal rules and regulations. Coordination with the TCEQ throughout project development and construction may be necessary. Consultants may be needed to develop the preventive action plan and provide coordination with other agencies, depending upon the district staff's expertise and experience. The preventive action plan details the plans and specifications for monitoring and testing, health and safety plans, waste management, and other items that may be needed. The cost-effective project design should also:

- Determine who will accomplish the work activities in the contaminated areas
- Determine how and when construction sequencing should occur
- Determine how costs associated with contamination will be taken into account

- Assign responsibilities to the parties involved in the construction contract.

If possible, preventive action should be accomplished prior to construction on the roadway project. When contamination is located within the proposed right-of-way limits, the best way to minimize traffic flow interruption is to coordinate the implementation of the preventive action and construction plans. When preventive action and roadway construction plans are let as separate contracts, the designs should be coordinated to eliminate redundant excavation.

- Type of contamination
- Severity of contamination
- Location of contamination
- Design, construction and traffic delays
- Right-of-way acquisition
- Utility adjustments
- Design requirements (for example: reconsider storm sewer placement to avoid or minimize excavation in contaminated areas, elevated rather than depressed roadway sections, and dewatering requirements)
- Costs associated with preventive action

Section 4: Contamination Factors and Considerations during Construction

During the design phase, it is necessary to determine how preventive action will be accomplished during construction and delegate responsibility for the various activities.

Many construction-related considerations and factors should be analyzed to determine the most efficient and cost-effective design.

Contamination Factors during Construction

When the preventive action for the contaminated materials cannot reasonably be accomplished by a separate contract prior to construction, several factors should be analyzed to determine the best method for incorporating the preventive action into the PS&E. These factors include:

- Type and severity of contamination
- Area of contamination as related to project size and sequencing
- Time and traffic constraints
- Possible reuse of contaminated soil
- Estimated cost of preventive action.

Contamination Considerations during the Construction Design Phase

During the design phase, several construction considerations should be addressed in areas where the environmental site assessment and/or investigations indicate the possibility of contamination. The district should work closely with the divisions to determine the most cost-effective, efficient manner of handling contamination on a project. The following options for handling contamination are available; **any one or a combination thereof** may be used:

1. **Prior to Construction:** Preventive action occurs prior to roadway construction by the owner, operator or party responsible for causing the contamination, or by a specialty contractor via TxDOT contract or prearranged purchase order
2. **Emergency Contract:** Preventive action occurs during construction after an emergency contract is issued for a TxDOT specialty contractor
3. **Prearranged Purchase Order:** Preventive action occurs during construction via a prearranged purchase order for a state specialty contractor
4. **Change Order:** Preventive action is performed during construction by the prime construction contractor or subcontractor using a change order
5. **Prime Construction Contractor:** Preventive action occurs during construction when the prime construction contractor or specialty subcontractor is required to perform work;

6. **Responsible Party:** Preventive action occurs during construction by those responsible for causing the contamination.

Option 1 - Prior to Construction: Option 1 is the preferred choice for sites known to be contaminated. This option provides for cleanup prior to roadway construction and allows normal construction activities to be conducted by the prime construction contractor without delay or additional costs. Option 1 is best suited for contaminated sites within the proposed right-of-way that can be cleaned up with little or no disruption to traffic. However, if redundant excavation will occur when using two separate contracts, other options may need to be considered.

Table 4-1: Option 1 - Prior to Construction

| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> Avoids/minimizes contractor downtime and costs Avoids/minimizes contractor disputes/claims | <ul style="list-style-type: none"> Increases preliminary engineering costs May delay letting/construction schedules May not be feasible, especially if groundwater contamination is present May unnecessarily duplicate excavation |

Option 2 - Emergency Contract: Option 2 requires TxDOT to suspend construction in the area of the contamination in order for the emergency contractor to perform preventive action activities. To reduce delays and associated costs, coordinate with CST, ENV and PRO if an emergency contract is required. Working with PRO early in construction phases when an emergency contract is needed will help to ensure a smooth transition from the prime construction contractor's work to the specialty contractor's work with minimal delays. The disadvantage of Option 2 is the inherent conflict of having two firms, both on contract to TxDOT, working on the same job site at the same time.

Table 4-2: Option 2 - Emergency Contract

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> Avoids termination of contract | <ul style="list-style-type: none"> Increases operating budgets Possible construction delays Increase potential for contractor downtime and costs Increase potential for contractor disputes/claims |

Option 3 - Prearranged Purchase Order: Option 3 can be useful for certain types of recurring contamination, such as those encountered by large urban districts. District blanket purchase orders may also be useful when advance notification of known contamination is made. This option allows a specialty contractor to be available on short notice when contamination is encountered; prices for different work activities have already been competitively bid and are charged for each project as needed. ENV maintains Master Blanket Purchase Orders with specialty contractors to provide rapid response to contamination issues. Option 3 may still require TxDOT to suspend construction activities in the area of contamination so the specialty contractor may perform preventive action activities. However, delays should be minimized since a contract already has been approved for the preventive action work. Option 3 is especially useful in addressing soil only LPST contamination

that may have migrated into the project limits from an off-site source. For many soil only LPST sites, the construction activity may be viewed as an extension of a site investigation. As long as the prime construction contractor knows to discontinue work if/when contamination is encountered, the transition back and forth between the prime construction contractor and specialty contractor can proceed smoothly and efficiently without the need for an expensive preconstruction environmental site investigation. Groundwater contamination in general requires additional protective measures that are likely outside of this option.

Table 4-3: Option 3 - Prearranged Purchase Order

| Advantages | Disadvantages |
|--|--|
| <ul style="list-style-type: none"> • Avoids termination of contract • May minimize construction delays | <ul style="list-style-type: none"> • Increases operating budgets • Potential for contractor downtime and costs • Potential for contractor disputes/claims |

Option 4 – Change Order: Option 4 may be used in accordance with Item 4 (4.0, Scope of Work) of the Standard Specifications for Construction of Highways, Streets and Bridges. Option 4 may be useful when a reasonable cost can be negotiated with the prime construction contractor to perform the preventive action work. In most cases, the prime construction contractor must subcontract for this work; it may be more cost-effective to use Options 2 or 3. However, there are advantages to this method. The prime construction contractor has more control of the work activities, delays are reduced, and reductions in work conflicts due to outside contractors are avoided. The prime construction contractor can also employ an industrial hygienist to monitor permissible exposure limits (PELs) on the project site. The district should coordinate with CST and ENV when negotiating for change orders to ensure the cost effectiveness of the prime construction contractor's offer.

Table 4-4: Option 4 - Change Order

| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> • Avoids termination of contract • May minimize construction delays • Reduces potential for contractor downtime and costs • Reduces potential for contractor disputes/claims | <ul style="list-style-type: none"> • Increases construction costs • May not be cost effective • Costs are not by competitive bid • Contractor may not be willing or able |

Option 5 - Prime Construction Contractor: When requiring the prime construction contractor to perform preventive action, typically through the use of an SGMP included in the PS&E, Option 5 should be used only in exceptional cases. Option 5 may be necessary when it is not feasible to clean up contamination prior to starting the roadway project. Option 5 also minimizes the number of independent contractors working in the same location, reducing the potential for conflicts. When contamination is located under the proposed roadway, an effective way to minimize traffic flow interruption is to coordinate the preventive action and construction schedules. The designs should also be coordinated to eliminate redundant excavation. For example, the standard preventive action philosophy is to return a contaminated area to its original condition. Without coordination, the possibility exists that the preventive action contractor will excavate and dispose of the contaminated soil and replace it with clean soil. If the site is in a cut section, the prime construction

contractor would then haul away the fill that had just been brought to the site. When the prime construction contractor is responsible for performing the preventive action or by subcontracting with a specialty contractor, this coordination is easier to ensure.

While in some situations it may be necessary for the prime construction contractor to be responsible for all aspects of the preventive action, in other situations it may be appropriate to limit the prime construction contractor's responsibility to on-site activities only. For instance, the prime construction contractor would be responsible for conducting (either with his own forces or those of a specialty subcontractor) on-site work in contaminated areas of a project, including moving materials to a TxDOT-designated storage area or incorporating the materials into the project. In this case, the prime construction contractor would not be responsible for any off-site related work. TxDOT or the local entity would procure the services of a specialty contractor to load, haul and dispose of materials at an off-site disposal facility.

Approval from the TxDOT Administration is necessary before preventive action work can be incorporated into the PS&E. The district should work closely with ENV, DES, and CST during the early stages of project development when Option 5 is considered. The district is encouraged to consult with DES for development and review of plans, requirements and specifications.

Typically, the mitigation for this option is paid through a force account that is setup prior to letting the construction project. A force account is a fund that is setup to pay for mitigation work and is not competitively bid by prospective bidders. The force account amount is determined by an Engineer's estimate that is developed by estimating the costs to perform the mitigation work, the contractor's health and safety requirements, and increased construction costs caused by the mitigation work.

Table 4-5: Option 5 - Prime Construction Contractor

| Advantages | Disadvantages |
|---|--|
| <ul style="list-style-type: none"> • May be only feasible option • Avoids redundant excavations • Costs are usually handled under a force account and paid at cost plus fixed fee • May avoid contractor downtime costs • May avoid contractor disputes/claims | <ul style="list-style-type: none"> • Increases construction costs • May not be cost effective • May limit number of contractors bidding |

Option 6 - Responsible Party during Construction: Option 6 is feasible only when the responsible party is willing and able to perform the preventive action. Prior to finalizing the PS&E, arrangements with the responsible parties should be made. These arrangements can be incorporated into the acquisition process when additional right-of-way is required. This option may also be used when unanticipated contamination is encountered during construction. With this option, the need for cost recovery is avoided or minimized. Significant coordination between the prime construction contractor and the responsible party's specialty contractors will be necessary to prevent or limit the prime contractor's downtime. Note the in some industrial or commercial areas it may be difficult to identify the responsible party, or there may be several contamination plumes which have commingled.

Table 4-6: Option 6 - Responsible Party During Construction

| Advantages | Disadvantages |
|--|---|
| <ul style="list-style-type: none">• Does not increase construction costs• Does not require cost recovery• Avoids termination of contract | <ul style="list-style-type: none">• Possible construction delays• Increase potential for contractor downtime and costs• Increase potential for contractor disputes/claims• Possible construction requirement conflicts |

Section 5: Plans, Specifications & Estimates (PS&E) Requirements

After determining the best option(s) from Section 4 for the project, PS&E requirements should be addressed to provide the prime construction contractor with adequate information to perform work activities in the most safe and efficient manner possible.

The PS&E should integrate all the pieces together to provide the basis for the construction contract(s). Details explaining the activities that must be provided (if any), how they will be accomplished and who will be responsible should be included in the PS&E.

Again, early coordination with the divisions and FHWA is important when incorporating hazardous material contamination activities into the PS&E. ENV and DES field coordination personnel can help districts develop plans, specifications and estimate requirements based on the requirements of the method chosen for preventive action during construction. ENV personnel can help to determine monitoring and testing requirements and to coordinate preventive action plans with TCEQ, if required. PRO can assist in the preparation of an emergency contract or purchase order. These contracts may be prepared in advance, so they are ready to execute if there is a strong certainty of encountering contamination. ENV can assist in obtaining environmental engineering services.

Emergency contracts, pre-arranged purchase orders, or change orders to perform preventive action (Options 2, 3 or 4, respectively) can be used for known contamination sites and when unanticipated contamination is encountered during construction. If an investigation or the environmental site assessment indicates there is a chance of encountering contamination, the provisions of Item 6.10 – Control of Materials of the Standard Specifications for Construction of Highways, Streets and Bridges would apply. If contamination is encountered during construction, preventive action can be accomplished by issuing an emergency purchase order for a specialty contractor, a purchase order for a state specialty contractor already under contract to the district or ENV, or a change order allowing the prime construction contractor to perform the work, or hire a subcontractor. In any case, TxDOT must hire an environmental consultant to perform tests, develop preventive action plans, and coordinate with regulatory agencies. If there is a strong likelihood that contamination will be encountered, these services should be coordinated with ENV early to ensure consultant availability and avoid costly delays.

If Option 2 (emergency contracts), 3 (pre-arranged purchase orders), 4 (change orders) or 6 (the responsible party option) is chosen, it may only be necessary to include plan notes to inform the construction contractor that contamination is possible. Environmental site assessment and investigation reports can be made available to prospective bidders. If known contamination exists, the plans should include as much information as possible about the location/nature of the contamination and reiterate the provisions of Item 6 in the Standard Specifications for encountering contamination. The plans should minimize interruption to the prime construction contractor's operations. If possible, work sequencing should be developed, allowing the prime construction contractor to work simultaneously in other areas while the specialty contractor performs preventive action at the contaminated site.

For all of the options discussed above, plan notes can be added to supplement Item 6 provisions and require the prime construction contractor to monitor PELs in accordance with Occupational

Safety and Health Administration (OSHA) requirements. A note in the plans can require the prime construction contractor to employ an industrial hygienist to monitor PELs in areas suspected or known to be contaminated; this allows the prime construction contractor to work until the need arises for a specialty contractor. It may not be economical to employ a consultant during construction activities when there is only a slight chance of encountering contamination or where contamination amounts/levels are minimal.

When conditions require the use of a TxDOT specialty contractor to perform any preventive action activities — as opposed to the prime construction contractor — plan notes or details may be added to the PS&E alerting the contractor of potential contamination. Any information provided in the PS&E will allow the prime construction contractor to better prepare an accurate bid based upon possible delays and areas excluded from work.

Option 5 should be used only in exceptional cases. Approval from the TxDOT Administration is required to allow preventive action work to be incorporated into the PS&E. When Option 5 is chosen, it is necessary to add provisions to the PS&E requiring the prime construction contractor to perform preventive action activities. The level of detail needed in the plans will increase substantially.

Plans

The plans should show contamination location(s) and handling requirements. Detailed information that may be provided as part of the plan includes:

- **Project Layout Sheets** indicating the locations of potentially contaminated sites and the preferred locations of stockpiles that may be needed within the project limits
- **Contamination Layout Sheets** that may be used to show the contaminated sites in greater detail than the project layout sheets, if needed
- **Sequence of Work Sheets** developed to minimize impact to construction and traffic and clearly delineate potentially contaminated sites
- **Quantity Sheets** developed to separate construction items involving special description codes for work in contaminated areas; this aids in cost accounting and recovery efforts.

Specifications

Several special provisions may be required to allow the prime construction contractor to work with contaminated materials. General notes can be added to supplement the information provided in the special provisions and special specifications. TxDOT's environmental consultant will be instrumental in developing plan specifications for the preventive action work. Some of these specifications are explained as follows:

- **Special Provision – “Important Notice to Contractors (Contamination Information)”**: This special provision provides information concerning location, monitoring

and testing requirements and responsibilities, excavation and de-watering procedures, as well as general preventive action information.

- **Special Provision to Item 7 – “Legal Relations and Responsibilities to the Public”:** Item 7 should be supplemented by a special provision providing for any additional insurance that may be required and for the prime construction contractor’s Health and Safety Plan. This special provision should indicate that a portion of the work is located within a contaminated area. The Health and Safety Plan should conform to all federal and state requirements for contractor personnel involved in construction activities within contaminated sites. Compliance with this plan is required for all contractors' onsite personnel. Additionally, a special provision to Item 7 should be included requiring the prime construction contractor to obtain a minimum amount of insurance, based on the limitations of amount of liability in the Civil Practice and Remedies Code - Section 101.023, to protect TxDOT. The prime construction contractor could include additional coverage, but it would be subject to competitive bids as overhead (special provision to Item 7). It is assumed that the bonding company would require pollution liability insurance for the contractor's bond for the project.
- **Special Provision “Control of Materials”: 6.10 – “Hazardous Materials”** should be amended to require the prime construction contractor to be responsible for removal or disposition of hazardous materials on any site owned or controlled by the State.
- **Special Provision to Item 110, “Excavation”: 110.2 - “Construction”** should be supplemented to provide information for handling contaminated excavation. The 110.4 - “Payment” schedule should be supplemented to provide special bid item descriptions to separate out the costs that are actually attributable to the contamination.
- **Special Provision to Item 400 – “Excavation and Backfill for Structures”:** Provision 400.31 - “Excavation” should be supplemented to provide information for disposal of contaminated excavation and de-watering activities. The 400.5 - “Payment” schedule should be supplemented to provide special bid item descriptions itemizing the costs actually attributable to the contamination.
- **Special Specification “Impermeable Liner”:** This specification may be needed to prevent contaminants from re-entering newly constructed storm sewers.
- **Other:** Special provisions should be provided for other items of work involving excavation of contaminated materials, such as drilled shafts and retaining walls.

Estimates

The estimate should provide special bid item description codes for all items involving excavation of contaminated materials. This provides accountability for possible cost recovery actions.

Section 6: Cost Recovery and Accounting

Cost recovery is a very important consideration in design. Early coordination with the potentially responsible parties (PRPs) is encouraged. When an investigation identifies contamination, the responsible parties should be notified of the results. The appropriate regulatory agency should also be notified of the results in accordance with applicable regulations.

Prior to construction, TxDOT should attempt to negotiate with known PRPs to have them assume financial responsibility for contamination. The PRPs should be notified of their obligations for corrective action or closure of the site. This prior notification is a prerequisite to litigation for recovery of costs.

Accurate cost accounting during the project is important; it distinguishes the costs actually attributable to the contamination from those that would have been incurred in the construction project without contamination. Thorough records and documentation should be kept for potential use in cost recovery actions.

Chapter 5: Construction

Contents:

[Section 1: Overview](#)

[Section 2: TxDOT Standard Specifications](#)

[Section 3: Anticipated Hazardous Materials Encountered during Construction](#)

[Section 4: Unanticipated Hazardous Materials Encountered during Construction](#)

[Section 5: Cost Recovery and Accounting](#)

Section 1: Overview

Goals

The hazardous materials goals for the construction stage of project development include:

- Implementation of the preventive action plan that was developed in the design stage for any contamination anticipated to be encountered during construction
- Development and implementation of procedures to handle or manage unanticipated contamination encountered during construction
- Documentation of implemented preventive provisions and actions

Procedure Overview

One benefit of performing environmental site assessments early in project development is that unanticipated contamination encountered during construction is potentially minimized. When contamination is unexpectedly encountered in a construction project, potential negative consequences include:

- Injury to workers and the public
- Damage to equipment and property
- Delays in construction, damage claims by the contractor
- Additional costs for the procurement of consultant services, specialty contractors, and field changes.

If hazardous materials are discovered during construction, project construction may be delayed until a lengthy, complex process of investigation produces acceptable measures to handle the contamination. Also, if the unanticipated encounter with hazardous material contamination aggravates the problem, such as causing a further release of contaminants, then TxDOT may become partially liable for the environmental consequences and required cleanup of the release.

When hazardous materials are identified during earlier phases of the project development and it is determined that cleanup is not feasible prior to construction, then preventive action may be incorporated into the construction project. Preventive action refers to cleanup and related activities required to affect the construction of the highway project. Corrective action refers to activities required by state or federal regulations to be performed by a responsible party to protect human health and the environment.

See Chapter 4, Section 4, “[Contamination Factors and Considerations during Construction](#),” for a list of options for cost effectively and efficiently handling contamination on a project.

TxDOT Standard Specifications do not provide for the inclusion of analytical testing, preventive action or management of contaminants in the construction contracts, since these are outside the scope of "Highway Construction." If such preventive measures are required of the prime construction contractor or specialty subcontractor (Option 5), they should be included by special provision. See Chapter 4, Section 5 "Plans, Specifications & Estimates (PS&E) Requirements." regarding special provisions. Otherwise, refer to Options 2, 3, 4 and 6 in Chapter 4: Design, Section 4. Even if the prime construction contractor will not carry out preventive measures, the PS&E may include general notes or notifications designed to avoid or minimize contractor downtime.

Construction-related responsibilities for managing anticipated hazardous materials may include:

- Coordinating between the prime construction contractor, specialty contractor(s), consultant(s) and other subcontractors
- Implementing provisions for the mitigation of hazardous materials or waste
- Implementing oversight provisions for preventive action aspects of the contract
- Documenting the actions taken for sub-items related to preventive action.

For unanticipated hazardous materials/waste encountered during construction, the major steps to follow after discovery are:

1. Stop work in the affected location
2. Identify the unanticipated issue (if this can be performed safely)
3. Secure the site to protect workers and the public
4. Notify the proper authorities and responsible parties
5. Characterize the contaminant(s)
6. Determine potential impacts to proposed construction improvements and to the environment
7. Determine the worker safety and public exposure concerns
8. Develop and implement hazardous materials/waste management measures
9. Document the event starting with discovery.

FHWA may choose not to contribute funding toward additional costs related to hazardous materials if "due diligence" was not used in assessing the project limits during the planning stages of the project. If unanticipated contamination is encountered during construction, it may be necessary to defend any actions taken by TxDOT with thorough documentation to ensure continued FHWA participation.

Section 2: TxDOT Standard Specifications

Item 3.60 – Definition of Hazardous Materials or Waste

The term hazardous materials/waste is defined in TxDOT Standard Specifications (Item 3.60 Hazardous Materials or Waste). Hazardous materials or waste include, but are not limited to, "explosives, compressed gas, flammable liquids, flammable solids, combustible liquids, oxidizers, poisons, radioactive materials, corrosives, etiologic agents and other materials classified as hazardous by 40 CFR 261, or applicable state and federal regulations." This definition is very broad and the requirements for handling, testing, removal and disposal may differ depending upon applicable federal, state and local laws and regulations.

Item 7.3 – Laws to be Observed

Per TxDOT Standard Specifications (Item 7.3 Laws to be Observed), the Contractor shall observe and comply with all federal, state, and local laws, ordinances and regulations. It is important to note that under the Occupational Safety and Health Act (OSHA), the contractor (employer) is still responsible for the health and safety of his/her employees.

Item 6.10 – Hazardous Materials

TxDOT Standard Specifications (Item 6.10 Hazardous Materials) addresses hazardous materials discovered on sites that are owned or controlled by the State. Per Item 6.10, materials used in the project shall be free of any hazardous materials. The Engineer should be notified immediately if any materials are suspected of containing hazardous materials.

Item 6.10 also discusses the responsibilities for existing materials and materials delivered to the project containing hazardous materials. For existing materials, the State is responsible for testing and removal and the Engineer may suspend work. For materials delivered, the contractor is responsible for testing and removal.

Section 3: Anticipated Hazardous Materials Encountered during Construction

This section covers hazardous materials identified during earlier phases of the project development process, where preventive action has been incorporated into the project and/or provided for in the plans, specifications and estimates (PS&E).

Coordination

Coordination is necessary between the prime construction contractor and specialty contractor(s), consultant(s) and other subcontractors, to avoid duplicated activities or unnecessary downtime. Typically, a specialty contractor or subcontractor under the guidance of an environmental consultant will execute preventive action while working with the prime construction contractor under the overall control of the Engineer. Effective coordination between these parties and their work is important. A Pre-Bid Conference or partnering meeting should be considered. The Engineer should also consider phasing (whether part of the original contract or not) to minimize scheduling conflicts between the prime construction contractor and specialty contractors.

Implement Provisions and Oversight

During construction, the provisions for worker and public safety, as well as handling and disposal of hazardous materials or wastes, must be implemented. The contract may provide special compliance requirements for the handling, treatment or transportation of hazardous materials, worker qualifications, and safety practices. These special provisions should be high-lighted so the contractor and inspectors are aware of them from the beginning. Specialized oversight provisions will require the participation of consultants or environmental agencies.

Documentation

The district construction office and the Engineer are primarily responsible for generating and maintaining a thorough record. During construction, any actions taken for the sub-items related to preventive action must be documented. Appropriate reports conclude the preventive action phase of the project.

Section 4: Unanticipated Hazardous Materials Encountered during Construction

This section covers unanticipated hazardous materials that may be encountered during construction activities, after the contract has been awarded.

Discovery

Identifying and recognizing potential hazardous materials issues is the first step to reduce potential risk of project delay, additional costs and possible litigation. During the construction process, indicators of possible contamination include, but are not limited to:

- Rusted barrels and containers
- Stained or discolored earth, as contrasted to adjoining soil
- Fill material containing debris other than construction-related items
- Household trash covered by earth or other material that appears to be interspersed with industrial debris
- Gasoline smells or other odors that emanate when the earth is disturbed
- Oily residue intermixed with earth
- Sheen on groundwater
- Cinders and other combustion products like ash.

Structures such as abandoned oil & gas lines, asbestos cement (transite) pipe and underground storage tanks also require special handling when disturbed.

Notification and Coordination

When the contractor or TxDOT staff member encounters materials that, upon visual observation or odor, seem likely to contain hazardous materials, he/she must notify the project/Area Engineer immediately, per Item 6.10, TxDOT Standard Specifications . The Engineer must take the following notification and coordination steps to deal with hazardous materials after discovery:

- Secure the suspected area for worker and public safety as needed. If possible, relocate the contractor on the project to avoid or minimize construction downtime.
- Notify the Environmental Affairs Division (ENV) and the District Construction Office.
- Determine applicable regulations; ENV can assist. If notification is required or additional regulatory assistance desired, the district construction office should notify the local office of the Texas Commission on Environmental Quality (TCEQ). ENV is available to facilitate communication and coordination with the TCEQ.

- Confirm or evaluate whether special provisions are needed. The Engineer may contact ENV for assistance in contracting for statewide environmental engineering consultant services.
- If possible or practical, identify and notify the responsible parties for preventive action and/or cost recovery.

When hazardous materials are discovered, TxDOT assumes responsibility from the contractor for testing, removal or disposition. The standard provisions of the contract address compensation to the contractor for delays and work stoppages. In accordance with Item 4.4 of the TxDOT Standard Specifications, the contractor should be given the option to perform the testing, removal and/or disposition as "extra work" by a change order(s). The Engineer may need to obtain proposals and estimated costs for "extra work" from consultants and/or specialty contractors to compare with the estimate from the contractor. If the "extra work" is not an option, work should be suspended wholly or in part through proper notice to the contractor. If possible, re-deploy the contractor on the construction project to avoid or minimize construction downtime.

Another option is to arrange for an emergency contract for a specialty contractor. Some districts may have prearranged purchase orders for specialty contractors and/or laboratories. An environmental consultant may be necessary for testing or developing preventive action plans. ENV can provide statewide environmental engineering, testing, consulting, remediation and abatement contract services as needed.

Coordinate between the Construction Division (CST), the Design Division (DES), ENV, the prime construction contractor, specialty subcontractor, environmental consultant, responsible parties, and other agencies. At this time, consider "partnering" to reduce the possibility of future claims.

Coordinate the implementation of preventive action with the construction activities of the project. This may involve concurrent activities by consultants, specialty contractors, and the prime construction contractor/subcontractors.

If work is suspended, then the District Construction Office and Engineer will issue a "notice of resumption of suspended work" to the prime construction contractor when preventive action is completed.

Characterize the Contaminant and Develop Preventive Action Plan

It may be necessary for the prime construction contractor or TxDOT to hire a consultant to identify and characterize the contamination through sampling and analytical testing. The objectives of the consultant's investigation include:

- Determining characteristics of the soil, groundwater and vapor, including groundwater recovery rates, vertical/horizontal extent of contamination, and chemicals of concern
- Assessing worker safety and public exposure concerns
- Determining handling and/or disposal requirements for any contaminated media unearthed during the construction process

- Recommending a preventive action plan to ensure the problem is not aggravated and to avoid or minimize TxDOT liability
- Determining necessary requirements to allow the prime construction contractor to resume work following suspension.

Consultants may also develop specifications to complete portions of the construction within contaminated environments. Data obtained from the investigation will enable the consultant to develop specifications related to groundwater treatment or filtration systems, ventilation systems, ongoing site monitoring, contaminated material disposal/reuse options, and permitting. Environmental consultants can be procured through the statewide engineering program administered by the Professional Engineering Procurement Services (PEPS) Division. Alternatively, established environmental engineering and scientific services contracts can be utilized through the ENV Division.

Documentation

As discussed earlier, the District Construction Office and the Engineer are primarily responsible for generating and maintaining a thorough record. Appropriate reports close out the preventive action part of the work; a proper resumption order restarts the construction. The Engineer completes the records by carefully noting all the actions taken from the time the initial notification was received up to closure with regulatory agencies.

Section 5: Cost Recovery and Accounting

Federal Participation

FHWA may choose not to contribute to the additional costs related to hazardous materials if due diligence was not observed in assessing potential impacts within the project limits during the planning stages of a federal-aid project. Federal participation in preventive action costs depends upon a solid defense of the actions taken when unanticipated contamination is encountered. This defense includes a thorough record of all circumstances and actions taken, including coordination with regulatory authorities, worker/public safety plan actions and step-by-step preventive action measures. Once generated, this record will serve as a valuable management tool and may be useful for a variety of accounting issues.

Cost Accounting

Claims, litigation and expectations of cost recovery from affected parties are all possible results when a contaminated site is discovered. For these reasons, and also to make management decisions related to statistical data collection, it is essential to track the costs that can be attributed to hazardous material issues on a site. One effective method is to assign a unique numbering system for paying items related to the hazardous material on site.

Responsible Parties

In some past cases, TxDOT has successfully identified, contacted and made arrangements with responsible parties for cost recovery or handling hazardous materials without litigation. These arrangements have a greater chance of success if negotiated prior to letting. Arrangements can still be initiated when unanticipated contamination is encountered during construction.

If possible or practical, identified responsible parties should be contacted before costs are incurred. The responsible parties may be more willing to make arrangements if allowed to participate in developing preventive action measures. Additionally, if the responsible parties are undergoing other corrective action, they may have the resources to handle the contamination within an acceptable time frame.

Chapter 6: Hazardous Materials Service Contracts

Contents:

[Section 1: Overview](#)

[Section 2: Statewide HMM-Specific Engineering Services Contracts](#)

[Section 3: Statewide HMM-Specific Scientific Services Contracts](#)

[Section 4: Purchase of Service](#)

Section 1: Overview

Procedure Overview

The following chapter provides direction for obtaining environmental services related to hazardous materials management (HMM) by one of the following types of contracting processes.

- Statewide HMM Engineering Services Contracts
- Statewide HMM Scientific Services Contracts
- Statewide HMM Purchase of Service Contracts

Introduction to Contracts

The Environmental Affairs Division (ENV) provides statewide consultants that are available to perform environmental services related to hazardous materials issues for facility and transportation related projects. ENV provides technical oversight regarding the administration of statewide contracts, as well as technical assistance to districts and divisions requesting services. This guidance is focused on hazardous materials related services provided by these contracts. For further assistance, please contact ENV.

Division/District Responsibilities

District (requesting entity) Responsibilities: The entity requesting services (which could be a district or division) has the following responsibilities:

1. Identify the need for HMM services
2. Contact ENV to discuss service required
3. Provide project related information and constraints - this can include construction project schematics, plan profiles, project location(s), and any other issues related to the project
4. Obtain right-of-entry, if required
5. Obtain access to a funding source, if required by ENV
6. Provide site access and assistance with a pre-proposal field visit, if required
7. Review and approve proposal and cost estimate
8. Assist in scheduling field work
9. Provide site inspections and final onsite project acceptance, if required
10. Review and comment on project deliverables, if required

11. Accept and approve the deliverables as the office-of-record.

ENV Responsibilities:

1. Assist in determining the need for HMM services
2. Determine the type of services and contracts required for the project
3. Prepare a project specific scope of work (SOW)
4. Coordinate and review the consultants proposal
5. Release the consultant (or contractor) to perform the scoped work
6. Provide technical oversight in the administration of the contract
7. Interpret project results and determines next steps, if required
8. Review and approve project deliverables
9. Pays invoice(s)
10. Perform contract related management

Section 2: Statewide HMM-Specific Engineering Services Contracts

Introduction to Contracts

ENV maintains engineering contracts that are used to perform hazardous materials related engineering services.

The following services are provided by HMM Engineering Contracts

- Soil and Groundwater Management Plans (SGMP) development and oversight
- Plans, Specification, and Estimate (PS&E) modification and construction plan design and review
- Engineer's Cost Estimate for potential construction costs
- Spill Prevention and Control Countermeasures (SPCC) Plan development and review
- State and federal permits requiring an Engineer's Seal
- Other engineering services related to HMM issues

Section 3: Statewide HMM-Specific Scientific Services Contracts

Introduction to Contracts

ENV maintains scientific services contracts that are used to perform hazardous materials related services (non-engineering).

The following services provided by HMM Scientific Services Contracts

- Asbestos inspections, management plans, and Operation and Maintenance (O&M) plans
- Lead containing paint inspection and abatement management plans
- Mold inspections and removal oversight
- Soil and Groundwater Management Plans (SGMP) non-engineering
- Construction oversight related to HMM issues
- Initial site assessments and Phase I ESAs
- Regulatory file reviews and assistance
- Phase II Environmental Assessments and Evaluations
- Geophysical investigations
- Remediation corrective action
- Underground storage tank investigations and remediation
- Monitoring well plugging and abandonment
- Other non-engineering services related to HMM issues

Section 4: Purchase of Service

Introduction to Contracts

ENV maintains Master Blanket Purchase Orders that are used to assist TxDOT in performing hazardous materials related services (non-professional).

The following services are provided by HMM Purchase Orders

- Asbestos, lead-in-paint, and mold abatement
- Transite pipeline removal and disposal
- Environmental laboratory services
- Contaminated soil and groundwater collection and disposal
- Construction assistance related to HMM issues
- Right-of-way waste collection and disposal
- Remediation corrective actions
- Aboveground and underground storage tank removal
- Waste characterization and disposal
- HMM related laboratory services
- Weather-related disaster recovery services related to HMM issues
- Other non-professional service related to HMM issues

Hazardous Material Service Purchase of Service Specifications

The districts/divisions/or offices have the option of hiring a specialty contractor through the purchase of services process. Table 6-1 lists available hazardous material service specifications.

Table 6-1 Purchase of Service Specifications (Hazardous Material Services)

| Type of Contract | Point of Contact | TxDOT Specification/Latest Revision |
|---|----------------------|--|
| Inspect, Sample and Test for Asbestos Containing Materials and Monitor Abatement Projects | Procurement Division | Standard Specification No. TxDOT-910-38-06 |
| Asbestos, Lead-in-Paint, and Mold Abatement Services | Procurement Division | Standard Specification No. TxDOT-926-78-05 |
| Environmental Analytical Laboratory Services | Procurement Division | Standard Specification No. TxDOT-962-22-10 |

Table 6-1 Purchase of Service Specifications (Hazardous Material Services)

| Type of Contract | Point of Contact | TxDOT Specification/Latest Revision |
|---|-------------------------|--|
| Incident Response Service (response to accidents along highway rights of ways or TxDOT facilities, pickup and disposal of TxDOT generated non-emergency wastes) | Procurement Division | Standard Specification No. TxDOT-926-45-40 |
| Hazardous Materials Management and Remediation Services | Procurement Division | Standard Specification No. TxDOT-926-78-75 |
| Removal of Petroleum Storage Tank System(s) | Procurement Division | Standard Specification No. TxDOT-068-78-65 |

Chapter 7: Training

Contents:

[Section 1: Overview](#)

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The following courses are recommended training for professionals performing or overseeing the Hazardous Materials Management (HMM) Initial Site Assessment (ISA) process related to TxDOT construction and maintenance projects. Additional training is recommended to manage HMM processes outside of the ISA process (i.e. Phase I and II Environmental Site Assessment (ESA), and management plan). Contact the Environmental Affairs Division (ENV) Environmental Resources Management Section (ERM) for further information.

Hazardous Materials Management (ENV114)

Introduction: Designed to provide an overview of the ISA and HMM process. The course will instruct staff how to conduct a more effective ISA for hazardous materials issues relating to transportation projects and to prepare the appropriate documentation of the findings.

- TxDOT course taught by ENV-ERM staff
- Taught yearly
- Consultants welcome to attend

Individualized ISA Training (ENV424)

Introduction: This personalized training will provide a detailed overview of the ISA process. The training has no pre-set curriculum and is tailored to meet the needs of individuals attending.

- TxDOT course taught by ENV-HMM ERM staff
- Taught when requested (Contact ENV-HMM ERM)
- Consultants welcome to attend

eLearning Courses:

Introduction: Designed to provide an overview of the ISA and the HMM process. The nine online courses will instruct staff how to conduct more effective ISAs for hazardous materials issues relating to transportation projects and to prepare the appropriate documentation of the findings. These nine courses combined are equivalent to ENV114.

- ENV415: Introduction to the ISA Process
- ENV416: Regulatory/Legal Issues
- ENV417: Defining Site Assessments
- ENV418: HAZMAT Management
- ENV419: Land Use Concerns

- ENV420: Using Regulatory Databases
- ENV421: Conduct Field Survey
- ENV422: Prepare NEPA Doc
- ENV423: Preparing Recommendations