



## Guidance Document

# Phase II Environmental Site Assessments For Harris County Projects

As part of the Harris County Public Infrastructure Department – Architecture and Engineering Division (HCPID-AED) design and project process, consideration is given to avoidance and minimization in regard to hazardous materials and petroleum products that could negatively impact human health, worker protection, and the environment. It is best to consider the potential for the presence of hazardous materials and petroleum products early in the project development process. HCPID-AED actions to address the potential for hazardous materials and petroleum products impacts start with a Phase I Environmental Site Assessment. Additional information regarding a Phase I Environmental Site Assessment is presented in a separate section of this manual.

If hazardous material and/or petroleum product contamination and/or recognized environmental conditions (RECs) are identified during the Phase I Environmental Site Assessment, then further research, investigation, consideration, or coordination may be necessary. In general, additional research or regulatory file review should be completed before beginning an environmental site assessment or investigation (ESA) to resolve whether investigation, consideration, or coordination is needed. The need for additional investigation may also depend upon the project design and ROW requirements or indications of possible contamination observed during construction. Indicators of possible contamination during construction include the following:

- Rusted barrels and containers
- Underground storage tanks
- Stained or discolored soil and/or oily residue intermixed with soil
- Fill material containing debris other than construction-related items
- Gasoline smells or other odors which emanate when the soil is disturbed
- Sheen on groundwater
- Cinders and other combustion products like ash

An ESA can include both non-intrusive and intrusive methods. Some common terms for an ESA include “preliminary site investigations”, “limited site assessment/investigation” and “Phase II Environmental Site Assessment.” Depending upon the type of



contamination or regulated site involved, other terms for environmental site investigations may apply.

For pre-acquisition projects, assuming that right of entry can be obtained, it is recommended that the ESA be completed prior to acquisition; 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 include those to further determine waste characteristics, hydrogeologic conditions and/or extent of contamination. For all projects, ESAs should be completed prior to finalizing the plans and specifications. If the analytical testing does not reveal contamination, then there is added support that contingencies or special provisions are not required in the plans and specifications.

## 1.0 ESA PURPOSE AND PLANNING

A site assessment or investigation can be 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 soils, groundwater or surface water on the property. The purpose of a Phase II ESA is to identify and evaluate known or potentially contaminated sites that may:

- ◆ affect the environment or onsite workers during construction
- ◆ create significant construction impacts, and/or
- ◆ incur cleanup liability to HCPID

Early characterization and evaluation of sites impacted with hazardous materials during project planning and prior to construction can assist HCPID to:

- ◆ Decrease the possibility of exposing the public and environment to unanticipated hazardous substances.
- ◆ Minimize liability associated with cleanup costs and environmental impacts.
- ◆ Prevent major construction cost overruns and delays.
- ◆ Identify areas requiring additional investigation before ROW acquisition.



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- ◆ Plan appropriate mitigation measures and/or preventative action for ROW planning.
- ◆ Assist in determining closure requirements of regulated facilities or contaminated areas.

The Phase II ESA will not always identify all the contamination on the site since the investigation limited in scope, and is based on information obtained in previous reports, planned areas of construction, and/or acquisition plans. In addition, unidentified contamination may be encountered during construction that was not anticipated. The purpose of the Phase II ESA is not intended to provide a comprehensive understanding of the extent of impact to soil or groundwater.

The most cost-effective approaches for an ESA will vary on a case-by-case basis. As such, HCPID-AED will assess design and ROW requirements to determine how much inquiry is practical or appropriate for the ESA. 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.

## **2.0 ESA COMPONENTS**

The individual components of the Phase II ESA for most HCPID-AED projects will include the following which are selectively discussed in more detail in the following sections. Obtaining sufficient information from the ESA 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.

An important initial step of the ESA process is selecting the environmental consultant who will be preparing the Phase II ESA. Phase II ESA field sampling and reporting should be performed under the guidance of qualified staff that hold one or more of the following professional licenses/registrations:



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- ◆ TCEQ LPST Corrective Action Project Manager (CAPM) / LPST PM
- ◆ State licensed professional geologist or engineer

An ESA will generally include the following activities:

- ◆ obtain and review previous environmental assessments, testing, and/or studies as provided by HCPID, and available HCPID plans and maps of the project area.
- ◆ develop a scope of work for the investigation
- ◆ 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
- ◆ evaluate the findings relative to applicable regulations and site closure requirements .

The conclusions and recommendations developed during a Phase II ESA can be included in the final report or presented in a separate document, depending on the project objectives. Typical conclusions and recommendations can include the following:

- ◆ assessment of worker safety and public health exposure concerns
- ◆ determination of the regulatory handling, reuse and/or disposal requirements for contaminated media
- ◆ recommendation of a preventive action or management plan for future construction activities.
- ◆ recommendation of additional investigation to further delineate and/or understand the extent of the contamination.

Useful references that relate to various types of Phase II ESAs include, but are not limited to, the following:

- ◆ 30 TAC §334 – Underground and Aboveground Storage Tanks
- ◆ 30 TAC §350 – Texas Risk Reduction Program (TRRP)



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- ◆ Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) Guidance Documents (RG-2, 3, 4, 4a, 6, 7, 8, 10, 12, 14, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 32, 33, 34)
- ◆ TCEQ “Determining Which Releases are Subject to TRRP” (October 2003)
- ◆ TCEQ LPST Guidance RG-36 “Risk-Based Corrective Action for Leaking Tank Sites”
- ◆ TCEQ Update Bulletin – PST Fact Sheet (March 2009)
- ◆ TCEQ LPST Guidance RG-411 “Investigating and Reporting Releases for Petroleum Storage Tanks (PSTs)” (May 2009)
- ◆ ASTM E1903-97 (2002) “Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process (Phase II ESA)” Since the ASTM Phase II ESA Standard Guide was developed for commercial real estate transactions, additional services or modifications to the ASTM Standard Practices are needed to specifically address ROW or corridor projects.

### **3.0 HAZARDOUS MATERIAL ESA AND PETROLEUM STORAGE TANK ESA**

The scope of work for investigations is the blueprint for the Phase II ESA and development of the scope of work is key to the successful completion of the investigation. The two primary types of ESA typically required during ROW projects are sites impacted by hazardous materials or petroleum hydrocarbon-related material, and Petroleum Storage Tank (PST) (known or “ghost” USTs) sites. The beginning of scope of work development starts with identifying the areas of concern to be investigated, identifying the potential chemicals of concern (COCs) to be investigated, and the source of criteria to be used to evaluate investigation findings [(Petroleum Storage Tank (PST) or Texas Risk Reduction Program (TRRP)]. The HCPID-AED Precinct Coordinator will provide the environmental consultant with any knowledge or experience with the project area that may be pertinent to the ESA.

Because of the immense variety possible in hazardous material or non-PST related scopes of work, it is not possible to discuss specific scopes of work; however, general guidance is presented below in Section 3.1. A separate section (Section 3.2) discusses PST sites since the TCEQ has specific guidance for the removal of PSTs and closure of PST sites.



### 3.1 Hazardous Material ESA

The scope of work should identify the objective of the Phase II ESA, the work to be completed (including sampling locations, number of samples, sampling methodology (including field screening methods), depths at which samples will be collected, and limitations and assumptions), the parameters to be investigated, investigation-derived waste handling procedures, and the quality assurance/quality control (QA/QC) criteria to be applied. The scope of work should also include arrangements for utility clearance either by utilizing Texas One Call or obtaining utility location maps from HCPID or a combination of both methods. Because the investigation at a hazardous material or non-PST site is unique to the situation, only general guidance relative to invasive sampling methods and QA/QC criteria are presented below.

Many Phase II ESAs will be performed in a phased manner: an initial screening investigation which determines whether COCs are present in the soil and groundwater at the site above applicable regulatory levels and additional investigations which further delineate the identified soil and/or groundwater impacts. The scope of work proposals submitted to HCPID by environmental consultants should be reviewed by qualified staff within HCPID to verify that the objectives and purpose of the Phase II ESA will be accomplished satisfactorily.

Data collection can be accomplished through invasive methods (sampling of surface water, soil vapor, soil and groundwater) or non-invasive methods or a combination of both. Examples of non-invasive methods include geophysical surveys and soil gas investigations. When implemented alone, non-invasive results are more likely to be qualitative and inconclusive. During invasive methods of data collection, a number of techniques are used to obtain soil and water samples (drilling, hand auger, hand tools, surface water/sediment samplers, etc.), depending on local conditions, known subsurface geology, and/or objectives of the assessment.

Soil samples are typically collected from soil borings that are advanced using direct push technology (DPT), hollow-stem auger methods, mud rotary, or air rotary methods. Groundwater samples can be collected from soil borings that have been converted to either temporary monitor wells or permanent monitor wells; however, the groundwater flow direction and gradient can only be determined with a sufficient number of permanent monitor wells. If drilling methods are utilized to collect soil and/or groundwater samples, the driller should be licensed in the State of Texas.



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Soil and groundwater samples collected for laboratory analysis are the primary means for identifying the presence and extent of contamination hazardous to human health or the environment. Collection of a sufficient number of soil and/or groundwater samples is necessary to adequately conclude the presence or absence of contamination and whether a release has occurred. Selection of analytical methods and proper sample-handling techniques are critical to a successful Phase II ESA. Improper or incomplete sample or analysis planning and improper sampling handling may invalidate sampling results or make the results legally indefensible.

Most laboratory methods are selected based on the specific objectives of the Phase II ESA; although, many are dictated by specific provisions of regulatory documents or rules. In Texas, analytical data must be generated by a lab that the Texas Laboratory Accreditation Program (TLAP) has accredited under the National Environmental Laboratory Accreditation Conference (NELAC) standard for matrices, methods, and parameters of analysis. The Texas Commission on Environmental Quality (TCEQ) has a downloadable list of certified laboratories along with the analytical methods the laboratory is certified to perform on their website. In addition, selection of a laboratory should be based on the ability of the laboratory to meet the project objectives and/or regulatory action or screening levels.

QA/QC procedures are included in a scope of work to allow for an overview of the quality of the data collected. Since most Phase II ESA are limited in scope, the standard laboratory QA/QC is usually adequate. The QA/QC methods for more extensive investigations could include written decontamination procedures, instrument calibration, preparation and analysis of trip blanks, equipment blanks, duplicate samples, and/or other QA/QC procedures.

The methods of handling investigation-derived waste (IDW) generated during the Phase II ESA should also be included in the scope of work. HCPID is ultimately responsible for overseeing and managing the disposal of IDW; although, most environmental consultants can assist HCPID with waste characterization and disposal upon request.



### 3.2 Petroleum Storage Tank ESA

Since Petroleum Storage Tanks (PSTs) (known or unknown (“ghost”) USTs) are the most common environmental concerns identified during HCPID ROW projects and since the TCEQ has specific guidance for PST sites, the following paragraphs outline a general scope of work for these types of sites. A more detailed guide to PST removal and investigation is provided in the TCEQ document RG-411 – Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs) and RG-475 – PST Super Guide: A Comprehensive Guide to Compliance in Texas.

As part of the PST investigation process, HCPID should also research the applicable TCEQ databases for available information about the USTs. The PST Registration Database can tell whether a facility is registered with the TCEQ and provide technical information about registered PSTs. The Leaking Petroleum Storage Tank (LPST) Database Query page can find current and historic information about known LPST sites.

When an unanticipated underground storage tank (UST) system is discovered in the right-of-way, especially if it is located in the path of construction, it will need to be removed from the ground. Do not allow the prime contractor, subcontractor, or HCPID personnel to handle or disturb the tanks or the surrounding soil. To properly remove the UST system from the ground, HCPID should contact a registered UST contractor that employs the appropriately trained and licensed personnel and who holds the appropriate license and registration from the TCEQ.

The following is the information that is needed to assist the UST contractor in preparing a bid/cost proposal for the UST system removal (if some of the information is unknown - then state that it is unknown or provide an estimate; e.g., size estimated at 2,000 gallons):

- ◆ The number and size of the UST(s)
- ◆ The contents (product stored) and estimate of the volume of fluids remaining in the UST(s)
- ◆ Type and thickness of surface cover over the tanks (concrete, asphalt, soil) and whether there is a need to relocate or remove objects or structures (canopy, dispensers, building, etc)



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- ◆ The location of the tanks, including the proximity to the roadway and need for traffic control
- ◆ Location of underground or aboveground utilities
- ◆ Special backfill compaction requirements
- ◆ Removal time frame.

Prior to the removal of the UST system, HCPID is required to provide written notification to the TCEQ at least 30 days in advance of the UST removal activity, using a TCEQ authorized form (UST Construction Notification Form --- TCEQ-0495). The form must be sent to the TCEQ's central office in Austin or to the appropriate TCEQ Regional Office. The UST contractor may submit the form on HCPID's behalf. If time is critical, after the submission of the Construction Notification Form, HCPID may request a waiver of the 30 day requirement from the TCEQ's Regional Office to accelerate the construction schedule. Additionally, HCPID or its' contractor must contact the appropriate TCEQ Regional Office 24 to 72 hours in advance of initiating construction activities. HCPID or its' contractor should also notify local government (city and/or county) and the local and/or state Fire Marshal of the intent to remove a UST system. Any necessary permits, if applicable, should be obtained.

All existing USTs are required to be registered, unless they have been properly and permanently removed from service pursuant to TCEQ regulations. Previously unknown tanks, sometimes referred to as "ghost" tanks, are not required to be registered, if they are permanently removed from service within 60 days of the date HCPID became aware of the tanks on an existing right-of-way. For USTs discovered within the right-of-way, HCPID should not be listed as the UST Owner, but as the property owner. The amended TCEQ-0724-Form (Underground Storage Tank Registration and Self-Certification Form), if applicable, can be included in the removal report.

The removal activities should be documented by either the removal contractor or an environmental consultant. After USTs are removed, representative soil samples from the tankhold and beneath the associated piping and dispenser equipment and/or tankhold water/groundwater should be collected and analyzed to determine whether a release has occurred. The TCEQ PST rules specify that the collection of UST site assessment soil samples should be supervised by a person currently licensed by the TCEQ as a UST installer onsite supervisor or as a CAPM/LPST PM.



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The sampling methods, types, location, and number of samples depend on the site. The sampling and analysis plan should generally follow the TCEQ guidance document RG-411 – Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs). To ensure that any release of a regulated substance is detected and quantified, you must consider the following when designing your sampling plan.

- ◆ how the UST is being removed from service (closed in-place, permanently removed, etc.)
- ◆ characteristics of the substance stored in the UST
- ◆ characteristics of the backfill material and surrounding soils
- ◆ whether tankhold or groundwater is present, and (if so) its depth with relation to the UST system and the surface of the ground.

After the completion of the removal activity, the contractor or environmental consultant will provide HCPID with a written report documenting the UST excavation, removal, and contamination assessment. Results of investigative procedures should be reported to the TCEQ on form TCEQ-00621 (Release Determination Report Form, revised March 16, 2009) and submitted with the removal report. A copy of this report is required to be submitted to the TCEQ within 30 days after the completion of the removal activity.

If it is determined, after the tank removal, that there was a release from the UST system then an environmental assessment and other corrective action / preventative actions will be required. Additionally, owners and operators are required to notify the TCEQ within 24 hours after the discovery or notification of the release. This reporting can be accomplished via a telephone call to the TCEQ Austin Central Office at (512) 239-2200 and the submission of the tank removal report.

Additional investigation will be necessary to determine the extent and delineate the PST release if the site is designated as an LPST site by the TCEQ. Development and execution of a scope of work at a PST site will generally follow the same protocol as a hazardous material ESA although the findings will be reported in the TCEQ-0562 Assessment Report Form (ARF). HCPID may want to request a written report for the PST additional investigation that follows the hazardous material ESA report format in addition to the ARF if the ARF is not adequate for the project requirements.



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Useful TCEQ PST Publications and Forms

- ◆ *Underground Storage Tank Registration and Self-Certification Form (TCEQ-0724)*
- ◆ *Underground & Aboveground Storage Tank Construction Notification Form (TCEQ-0495)*
- ◆ *Technical Guidance: Am I Regulated (RG-42)*
- ◆ *Release Determination Report Form (TCEQ-00621, revised March 16, 2009),*
- ◆ *Investigating and Reporting Releases from Petroleum Storage Tanks (PSTs) (RG-411)*
- ◆ *Assessment Report Form (TCEQ-0562, revised August 28, 2009)*
- ◆ *PST Super Guide: A Comprehensive Guide to Compliance in Texas (RG-475, August 2009)*

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#### 4.0 Report and Supporting Documentation

The Phase II ESA report depends on the nature of the project and the findings of the Phase I ESA and/or discipline report. As discussed in the previous section, the reporting for a Phase II ESA at a PST site require specific TCEQ PST forms. A typical hazardous material Phase II ESA report should contain, at a minimum, the following information. Appendix A provides an example of a Phase II ESA typical table of contents which can be modified according to the scope of work.

- ◆ Summary of site background and the Phase I ESA RECs which were investigated during the Phase II ESA and/or the construction observations which prompted the Phase II ESA.
- ◆ Discussion of the scope of work, including the selection of boring locations and sampling methodology and analysis.
- ◆ Discussion of the site stratigraphy and, if deemed relative, its relation to the types and location of the contamination identified.
- ◆ Maps and figures with the project area clearly marked that are necessary to present the investigation activities, boring logs and/or monitoring well reports, and photographs of the site and/or documenting the investigation.
- ◆ Discussion of the laboratory analysis performed and results compared to applicable regulatory action levels or screening levels.
- ◆ Analytical summary tables and good quality copies of laboratory data with quality assurance/quality control (QA/QC) methods and verification. If the laboratory data is voluminous and not easily included in a bound report, the data can be copied onto a CD that will be attached to the Phase II ESA report.
- ◆ Findings of the investigation which should include identification of any contamination found, its likely extent, comparisons to applicable regulatory action or screening levels, and potential impact on human health and the environment.
- ◆ Conclusions and recommendations which could include additional investigations, development of preventative action or management plans, waste characterization, and/or site closure requirements. The conclusions and recommendations can be presented in a separate document.



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A Draft Phase II ESA report should be submitted to HCPID-AED for review so that revisions incorporated into the final Phase II ESA report can also be included in the PER and the need for additional investigation can be identified early. The Engineering Prime Consultant will review the Draft Phase II ESA before submittal to HCPID-AED Project Manager to verify that the Phase II ESA was completed according to the approved scope of work, and that the project description and limits are correct (ROW, detention ponds, easements, etc.). At the time the Draft Phase II ESA report is submitted for review, a meeting should be scheduled with HCPID-AED to discuss the findings, conclusions, and recommendations as well as the final form of the report. The Final Phase II ESA report should be included as an electronic copy on a CD.

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## ACKNOWLEDGEMENTS

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