Leaking Petroleum Storage Tank (LPST) Program Guidance Updates and Common Issues at LPST Sites

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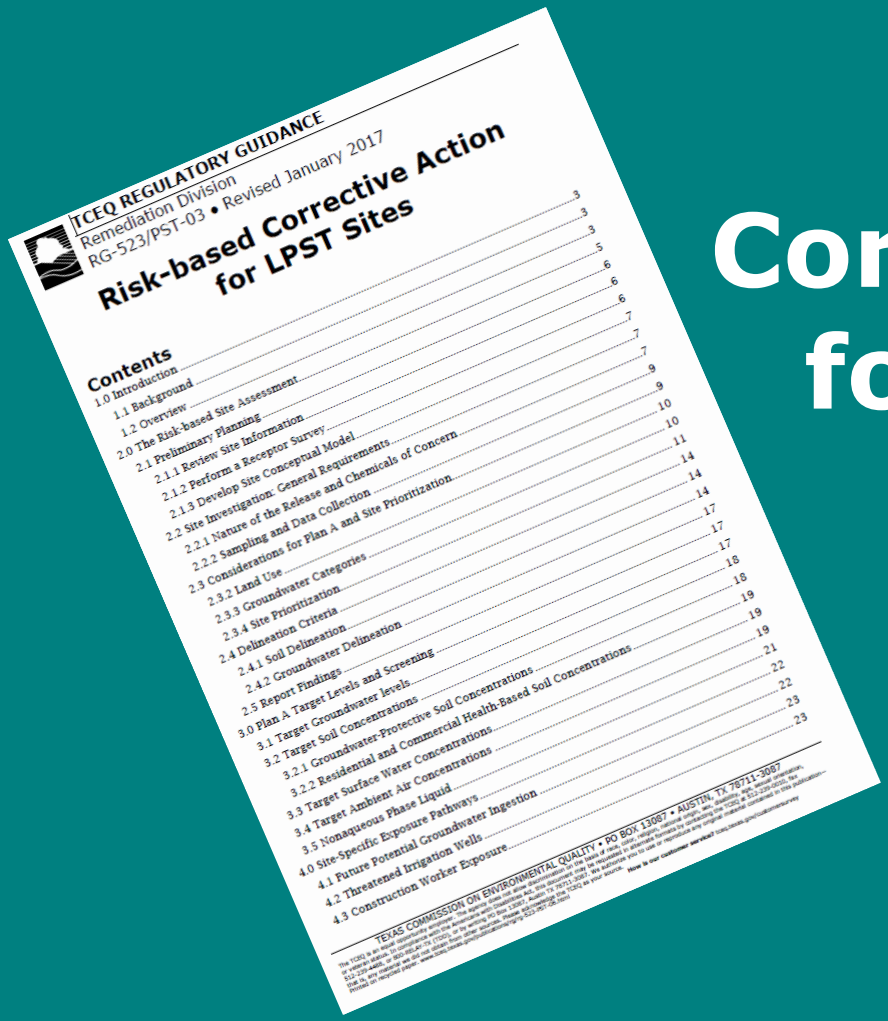
Environmental Trade Fair 2017

Petroleum Storage Tank Program Completed Guidance Updates

RG-523/ PST-03	• Risk-Based Corrective Action (RBCA) for LPST Sites • formerly RG-36
RG-523/ PST-10	• Corrective Action Plans for LPST Sites • formerly RG-41
RG-523/ PST-11	• Operation, Monitoring, and Performance of Remediation Systems at LPST Sites • formerly RG-261


TCEQ REGULATORY GUIDANCE
Remediation Division
RG-523/PST-03 • Revised January 2017

Risk-based Corrective Action for LPST Sites

Contents

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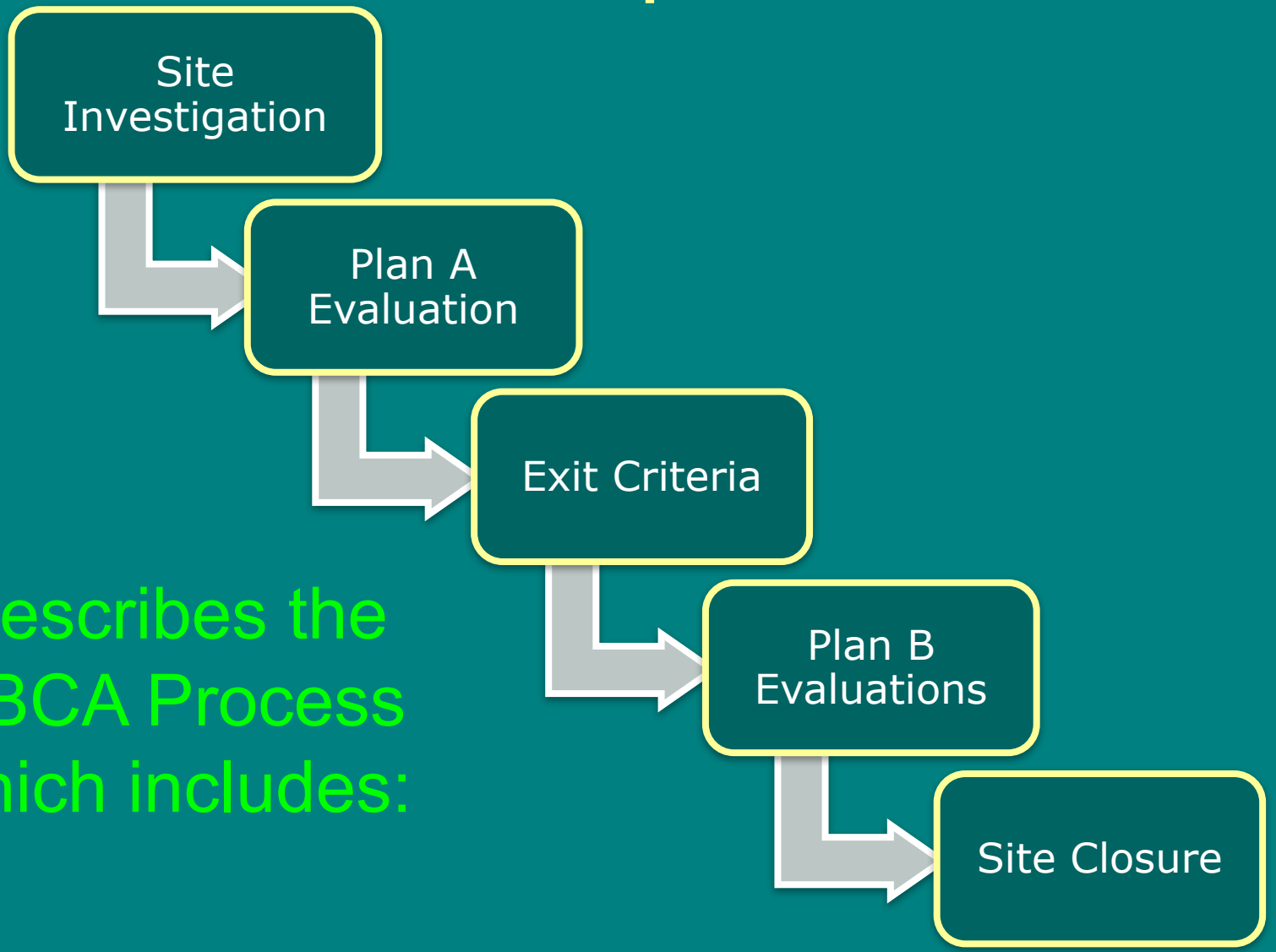
Risk-Based Corrective Action for LPST Sites

RG-523/PST-03

RG-523/PST-03
Risk-Based Corrective Action (RBCA)
Purpose



Describes the RBCA Process which includes:

RG-523/PST-03
Changes for 2017

- Formerly RG-36 (previously revised 1994)
- Updated tables and flow charts
- Incorporates components of RG-175
- Incorporates multiple Interoffice Memoranda
- Surface Water Dilution Factor

RG-523/PST-03
Incorporates the following Interoffice Memoranda

- Chapter 334 Closure Criteria for Domestic Irrigation Wells, 9/6/06
- Process for Expedited Closure for Evaluation of Priority 4.1 Petroleum Hydrocarbon LPST Sites, 7/17/03
- Guidance for Leaking Petroleum Storage Tank (LPST) Sites Located on State Designated Major/Minor Aquifers or Local Water Supply, 11/1/99

RG-523/PST-03
Incorporates the following Interoffice Memoranda (cont'd)

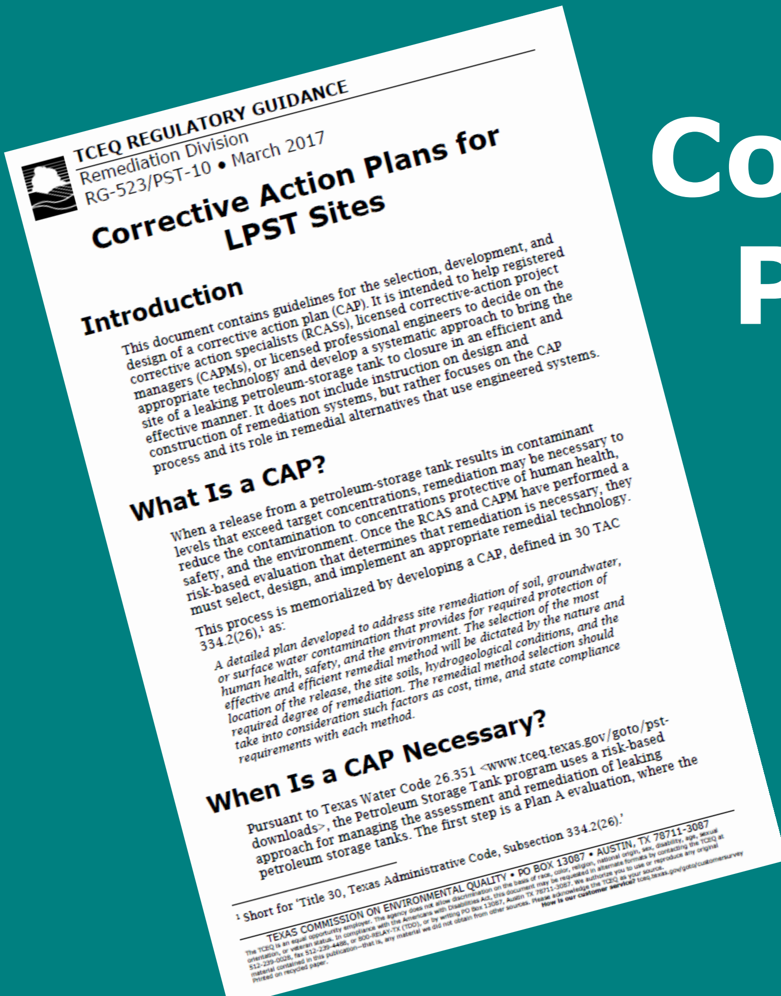
- Adjustment to March 6, 1997 Protective Concentrations in Groundwater for Construction Worker Exposure to Account for Time-Averaged Exposure, 8/12/97
- Clarifications and Amendments for Implementation of RG-36, 3/6/97
- Guidance for Judging the Adequacy of Contaminant Delineation for Purposes of Determining if Further Corrective Action is Needed, 2/10/97
- Process for Evaluation Petroleum Hydrocarbon LPST Sites Exceeding Target Concentrations, 2/10/97

RG-523/PST-03

Surface Water Dilution Factor

If contaminant of concern (COC) concentrations at the point of exposure (POE) exceed target surface water standards, TCEQ accepts 15% dilution for groundwater releases to lakes, perennial streams and rivers, and tidal water bodies. Target levels for POE become target surface water standards appropriate for the surface body divided by the dilution factor.

The POE for groundwater discharge to surface water should be set at a point up-gradient of the surface water body. The standards should be met before the point of discharge to the surface water.


TCEQ REGULATORY GUIDANCE
Remediation Division
RG-523/PST-10 • March 2017

Corrective Action Plans for LPST Sites

Introduction

This document contains guidelines for the selection, development, and design of a corrective action plan (CAP). It is intended to help registered corrective action specialists (RCASs), licensed corrective-action project managers (CAPMs), or licensed professional engineers to decide on the appropriate technology and develop a systematic approach to bring the site of a leaking petroleum-storage tank to closure in an efficient and effective manner. It does not include instruction on design and construction of remediation systems, but rather focuses on the CAP process and its role in remedial alternatives that use engineered systems.

What Is a CAP?

When a release from a petroleum-storage tank results in contaminant levels that exceed target concentrations, remediation may be necessary to reduce the contamination to concentrations protective of human health, safety, and the environment. Once the RCAS and CAPM have performed a risk-based evaluation that determines that remediation is necessary, they must select, design, and implement an appropriate remedial technology.

This process is memorialized by developing a CAP, defined in 30 TAC 334.2(26),[1] as:

A detailed plan developed to address site remediation of soil, groundwater, or surface water contamination that provides for required protection of human health, safety, and the environment. The selection of the most effective and efficient remedial method will be dictated by the nature and location of the release, the site soils, hydrogeological conditions, and the required degree of remediation. The remedial method selection should take into consideration such factors as cost, time, and state compliance requirements with each method.

When Is a CAP Necessary?

Pursuant to Texas Water Code 26.351 <www.tceq.texas.gov/goto/pst-downloads>, the Petroleum Storage Tank program uses a risk-based approach for managing the assessment and remediation of leaking petroleum storage tanks. The first step is a Plan A evaluation, where the

[1] Short for 'Title 30, Texas Administrative Code, Subsection 334.2(26).'

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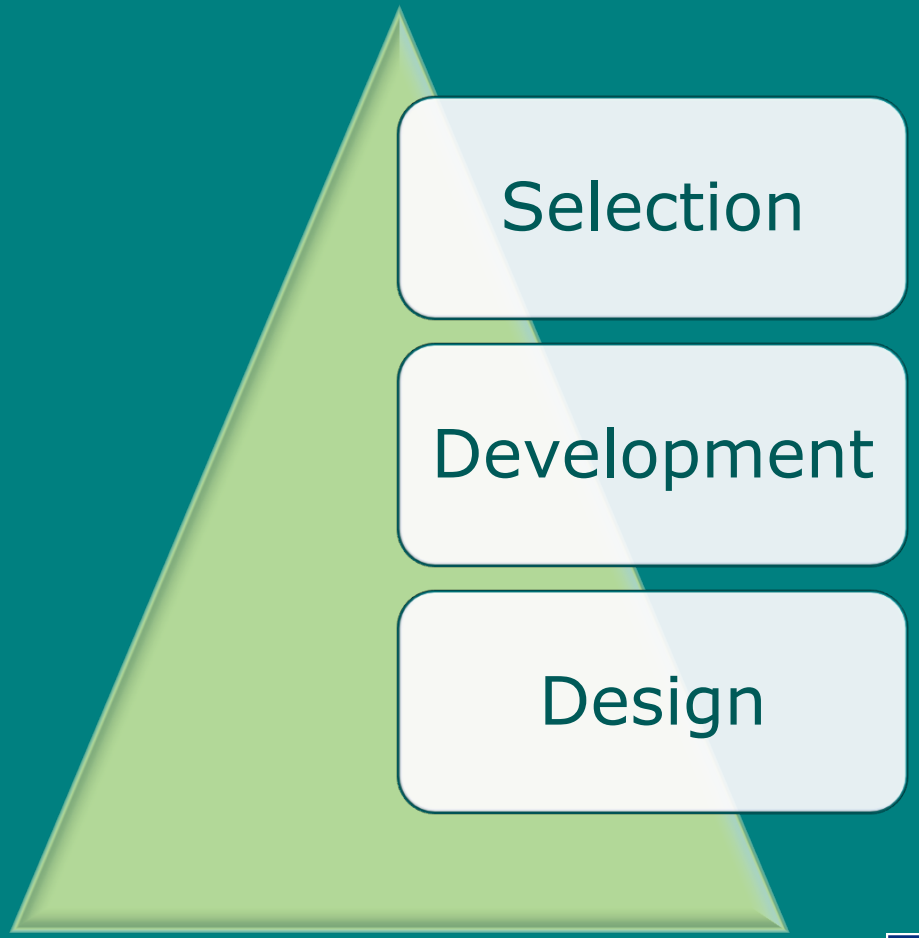
Corrective Action Plans for LPST Sites

RG-523/PST-10

Corrective Action Plans (CAPs)
RG-523/PST-10
Purpose

- Contains guidelines for the following:

- Does NOT include instruction on design and construction of remediation systems, but rather focuses on the CAP process and its role in remedial alternatives that use engineered systems.



CAPs for LPST Sites
RG-523/PST-10
Changes for 2017

Formerly RG-41 (previous revision 2009)

New updated interactive forms and worksheets, including the following:

- Remedial Technology Screening (RTS) form (TCEQ-00695)
- Notice of Remediation System Installation (NRSI) (TCEQ-00694)
- CAP Worksheets (TCEQ-00707)

CAPs for LPST Sites
RG-523/PST-10
Changes for 2017 (con't)

- Cost proposal requirements removed.
- System modifications now require P.E. oversight.
- Although guidance only addresses engineered CAPs, TCEQ also recognizes non-engineered remedial activities (chemical oxidation or similar technologies which may not require a detailed CAP).

CAPs for LPST Sites
RG-523/PST-10
RTS Form

Contains the minimum criteria for specific remedial technologies to perform effectively at any given site. Feasibility tests are used to evaluate the selected technology further.

Must be submitted with work plan for feasibility test.

CAPs for LPST Sites
RG-523/PST-10
RTS Form- Changes for 2017

REMOVED

- In Situ Bioremediation: Rarely used in the PST Program.
- Natural Attenuation: Considered a groundwater monitoring activity with a special set of monitoring requirements.

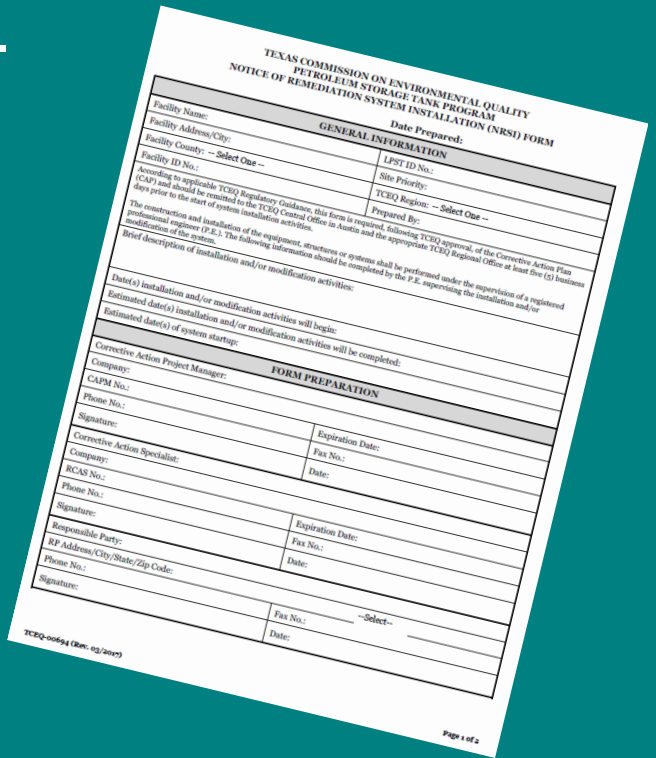
ADDED

+ Enhanced Aerobic Bioremediation: General category for oxygen-based remediation technology, including:
  + Injection (e.g., biosparging)
  + Extraction (e.g. bioventing)

CAPs for LPST Sites
RG-523/PST-10
NRSI Form (TCEQ-00694)

- Following TCEQ approval of the CAP, submit the form to the appropriate TCEQ regional office and the central office in Austin at least five business days before system installation.

SUBMIT



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
PETROLEUM STORAGE TANK PROGRAM
NOTICE OF REMEDIATION SYSTEM INSTALLATION (NRSI) FORM

Date Prepared:

GENERAL INFORMATION

Facility Name:
Facility Address/City:
Facility County: -- Select One --
Facility ID No.:
LPST ID No.:
Site Priority:
TCEQ Region: -- Select One --
Prepared By:

According to applicable TCEQ Regulatory Guidance, this form is required, following TCEQ approval, of the Corrective Action Plan (CAP) and should be remitted to the TCEQ Central Office in Austin and the appropriate TCEQ Regional Office at least five (5) business days prior to the start of system installation activities.

The construction and installation of the equipment, structures or systems shall be performed under the supervision of a registered professional engineer (P.E.). The following information should be completed by the P.E. supervising the installation and/or modification of the system.

Brief description of installation and/or modification activities:

Date(s) installation and/or modification activities will begin:

Estimated date(s) installation and/or modification activities will be completed:

Estimated date(s) of system startup:

FORM PREPARATION

Corrective Action Project Manager:
Company:
CAPM No.:
Phone No.:
Signature:
Expiration Date:
Fax No.:
Date:

Corrective Action Specialist:
Company:
RCAS No.:
Phone No.:
Signature:
Expiration Date:
Fax No.:
Date:

Responsible Party:
RP Address/City/State/Zip Code:
Phone No.:
Signature:
--Select--
Fax No.:
Date:

TCEQ-00694 (Rev. 02/2017)

Page 1 of 2

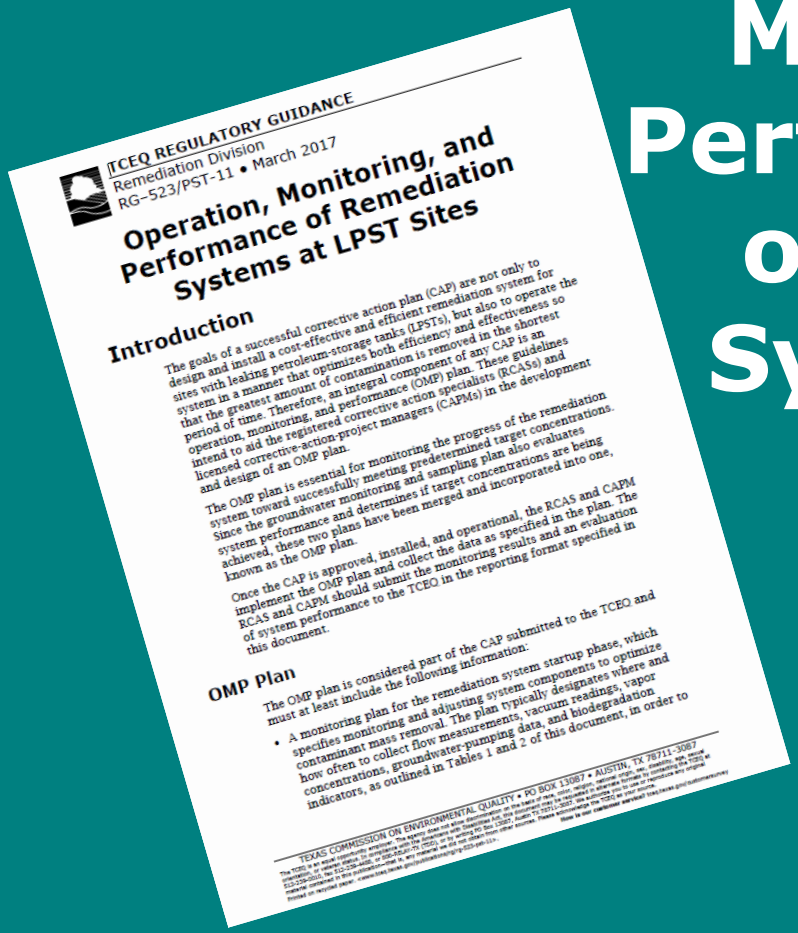
CAPs for LPST Sites
RG-523/PST-10
CAP Worksheets (TCEQ-00707)
Changes for 2017

REMOVED

- Biopiles
- Thermal Desorption
- Bio Sparging
- In Situ Bioremediation
- Natural Attenuation

ADDED

- Soil Vapor Extraction (SVE)
- Enhanced Aerobic Bioremediation: Includes Injection (e.g., biosparging) and Extraction (e.g. bioventing)



TCEQ REGULATORY GUIDANCE
Remediation Division
RG-523/PST-11 • March 2017

Operation, Monitoring, and Performance of Remediation Systems at LPST Sites

Introduction

The goals of a successful corrective action plan (CAP) are not only to design and install a cost-effective and efficient remediation system for sites with leaking petroleum-storage tanks (LPSTs), but also to operate the system in a manner that optimizes both efficiency and effectiveness so that the greatest amount of contamination is removed in the shortest period of time. Therefore, an integral component of any CAP is an operation, monitoring, and performance (OMP) plan. These guidelines intend to aid the registered corrective action specialists (RCASs) and licensed corrective-action-project managers (CAPMs) in the development and design of an OMP plan.

The OMP plan is essential for monitoring the progress of the remediation system toward successfully meeting predetermined target concentrations. Since the groundwater monitoring and sampling plan also evaluates system performance and determines if target concentrations are being achieved, these two plans have been merged and incorporated into one, known as the OMP plan.

Once the CAP is approved, installed, and operational, the RCAS and CAPM implement the OMP plan and collect the data as specified in the plan. The RCAS and CAPM should submit the monitoring results and an evaluation of system performance to the TCEQ in the reporting format specified in this document.

OMP Plan

The OMP plan is considered part of the CAP submitted to the TCEQ and must at least include the following information:

- A monitoring plan for the remediation system startup phase, which specifies monitoring and adjusting system components to optimize contaminant mass removal. The plan typically designates where and how often to collect flow measurements, vacuum readings, vapor concentrations, groundwater-pumping data, and biodegradation indicators, as outlined in Tables 1 and 2 of this document, in order to

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Operation, Monitoring, and Performance (OMP) of Remediation Systems at LPST Sites

RG-523/PST-11

OMP of Remediation Systems at LPST Sites RG-523/PST-11

Purpose

- Guidelines for development and design of an OMP plan.
- OMP plan is essential for monitoring the progress of the remediation system toward successfully meeting predetermined target concentrations.
- Includes groundwater monitoring and sampling plan.

OMP of Remediation Systems at LPST Sites RG-523/PST-11

Changes for 2017

- Document formerly known as RG-261 (previous revision 1998)
- Cost proposal requirements and Reimbursement Program references removed
- New updated interactive form: Operation, Monitoring, and Performance Report (OMPR) (TCEQ-00696)

OMP of Remediation Systems at LPST Sites RG-523/PST-11

Changes for 2017 (con't)

- New Report: System Status Report
- New monitoring requirements
- Goal of the OMP plan is to have a minimum of 85% system runtime while effectively recovering contamination.

OMP of Remediation Systems at LPST Sites
RG-523/PST-11
System Status Report (SSR)

- New report
- Required if operating time or performance are not meeting design criteria, or if a receptor is threatened or impacted.
- Evaluates shorter operating period (60-day) outlining system information, chronology, and system operation, and maintenance information, as well as system performance monitoring, and groundwater monitoring information.
- Should be submitted with all necessary tables, maps, etc.

OMP of Remediation Systems at LPST Sites RG-523/PST-11

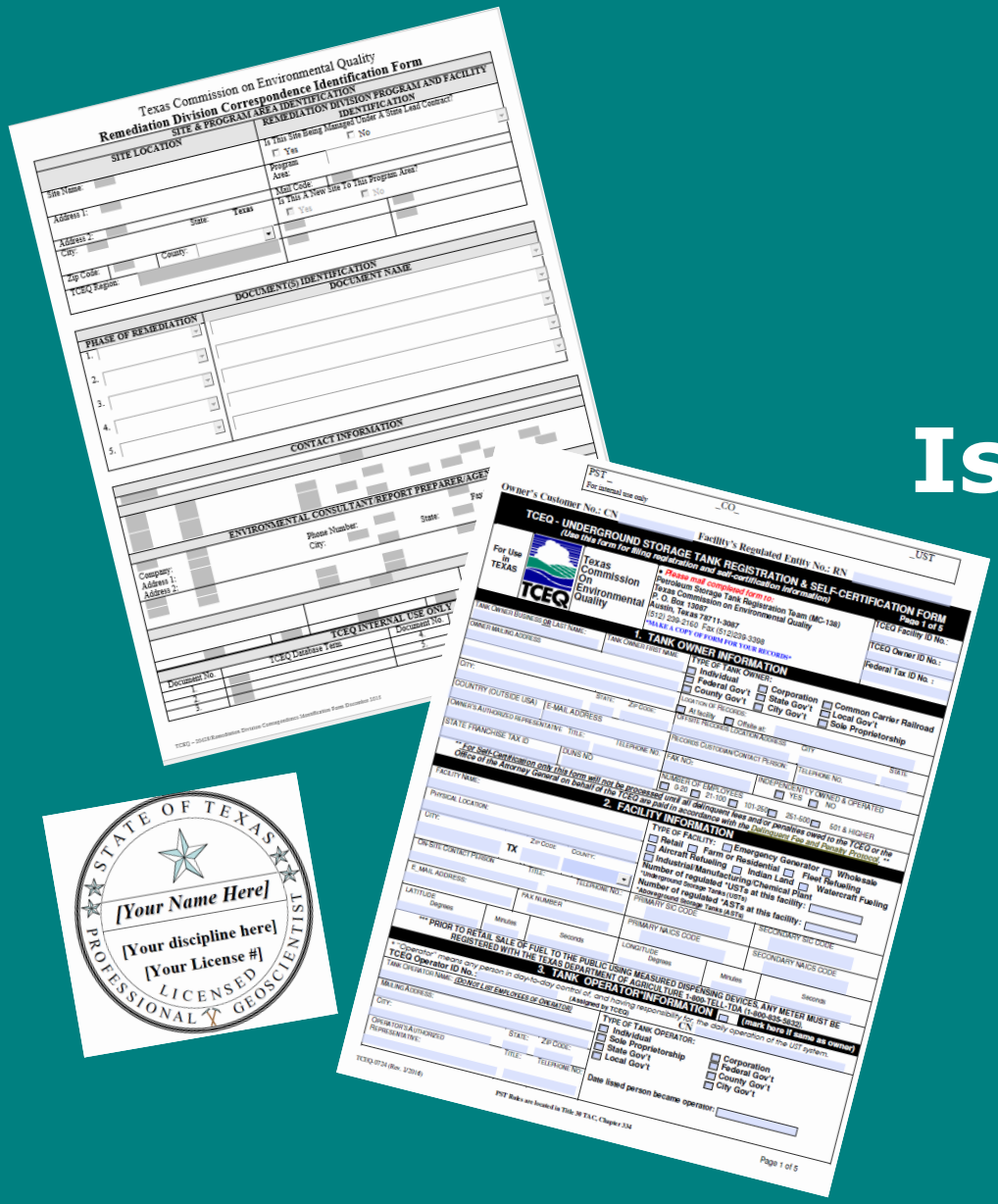
New Monitoring Requirements

- Clock meter readings: Recorded for each portion of the remediation system each site visit
- Vapor monitoring frequencies: Influent / effluent samples; changed from quarterly to monthly.
- Recovery well gauging: During each site visit, measure depth to water, depth to NAPL, and depth to pump inlet.

Petroleum Storage Tank Program
Guidance Updates In-Progress

- Investigating and Reporting Releases from Petroleum Storage Tanks
  - RG-411 (Reissue as RG-523/PST-01)
- Soil and Groundwater Sampling and Analysis
  - RG-14 (Reissue as RG-523/PST-05)

Common Issues at LPST Sites



Common Issues at LPST Sites

- Correspondence ID Form
- Amended UST Registration
- Action Levels vs. Target Levels
- Source Area Assessment
- Soils – Vertical Delineation
- Soils - Health-Based vs. Construction Worker Target Levels
- Water Well Searches
- Risk-Based Exposure Levels (RBELs) for Future Use
- Professional Geoscientist Seals
- Site Closure Request Form

Common Issues at LPST Sites

Correspondence ID Form

(TCEQ-20428)

- Must be included with every report. When multiple reports are bound together, submit one form listing all of the included reports.
- Documents accurate corrective action/site activities.
- Facilitates timely reviews.

Common Issues at LPST Sites

Amended UST Registration and Self-Certification Form (TCEQ-0724)

- Originals should be sent to the PST Registration Team (MC-138), TCEQ, P.O. Box 13087, Austin, TX 78711-3087.
- Copies should be included with the RDR submitted to the Remediation Division/ PST-DCRP Section.

Common Issues at LPST Sites

Action Levels vs. Target Levels

- Action Levels – Gets a site into the program.
- Target Levels – Gets a site out of the program.
- These terms should not be used interchangeably.

Common Issues at LPST Sites

Source Area Assessment

- Establish a sufficient monitoring well network to adequately define the plume and demonstrate plume stability and decreasing concentrations in all directions from the source.
- Generally four consecutive quarterly groundwater monitoring events are required to sufficiently document subsurface conditions, including plume stability. This guideline should be considered before reducing the sampling frequency.

Common Issues at LPST Sites

Soils - Vertical Delineation

- Soil borings must be advanced to a depth of at least five feet beyond the depth at which the limit of soil contamination is reached as indicated by field observations and field screening. If groundwater is encountered before vertical delineation is achieved, the boring should be completed as a monitoring well and a groundwater sample collected.
- Plan A concentrations should not be used as vertical delineation criteria.

Common Issues at LPST Sites

Residential and Commercial Health-Based Soil Concentrations vs. Construction Worker Target Levels

- Applicable from ground surface to 15 feet. Applies to the vadose zone, not the saturated zone.
- Commercial/Residential Levels apply to the entire site.
- Generally, Construction Worker Target Levels apply approximately within 15 feet of an existing or potential future utility corridor.
- Sometimes both apply to the same area.

Common Issues at LPST Sites

Water Well Searches

- Verify the existence and usage of all water wells identified as potential receptors within 0.5 miles of the site. This information establishes the Site Priority, Beneficial Groundwater Use Category, and the assessment and closure criteria for the site.
- Water wells screened in or hydraulically connected to the impacted zone should be considered potential receptors, even if unused.
- Water wells with incomplete or unknown construction details should be considered potential receptors.

Common Issues at LPST Sites

Risk-Based Exposure Levels (RBELs) for Future Use

- **Why are they necessary?**
  - To protect future use of the affected groundwater zone.
- **When do they apply?**
  - When there is local use of the affected groundwater or a state-designated major or minor aquifer is affected.
- **Where do they apply?**
  - At the adjacent property boundaries, which become the hypothetical point-of-exposure (POE).

Common Issues at LPST Sites

Professional Geoscientist Seals

- Work requiring interpretation or analysis of geoscientific data requires a PG seal, including:
- Soil boring logs.
- Groundwater gradient maps.
- Geologic cross sections.
- Aquifer test analyses.
- Additional info available on the Texas Board of Professional Geoscientists website at www.tbpg.state.tx.us.

Common Issues at LPST Sites

Site Closure Request Form (TCEQ-0028)

- Complete the form when requesting closure.
- Should include all applicable attachments, such as detailed site maps, current groundwater gradient map, cumulative tables of soil and groundwater analytical results, waste manifests, etc.

Questions

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