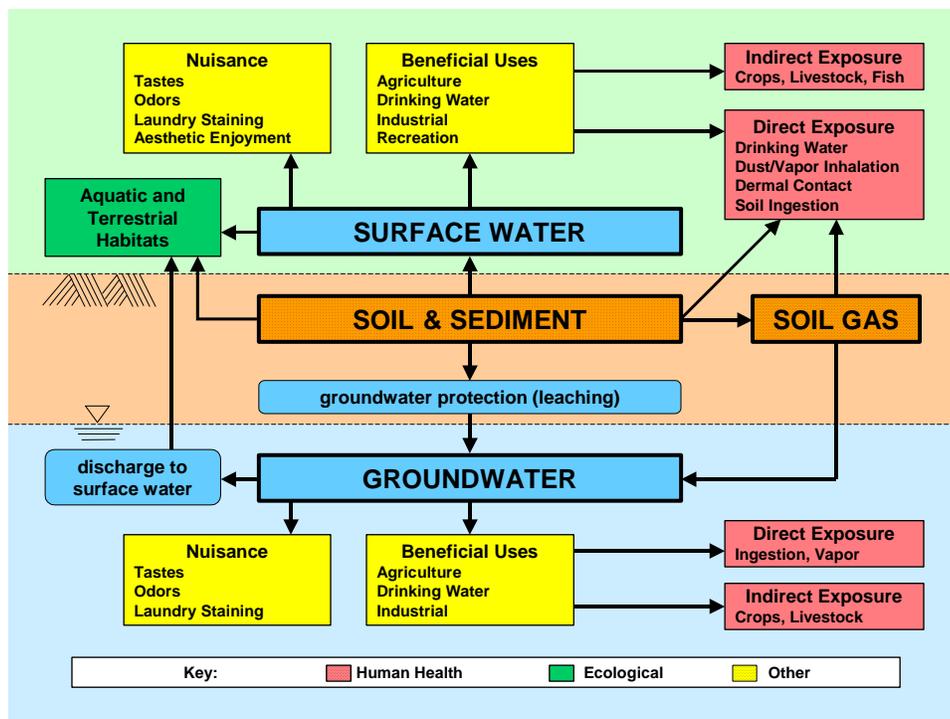


# California Uniform Site Assessment Tools



## 2007

Regional Water Quality Control Boards  
Department of Toxic Substances Control  
State Water Resources Control Board

25 June 2007

 <p>State of California <b>Arnold Schwarzenegger</b> Governor</p>	 <p>California Environmental Protection Agency <b>Linda S. Adams</b> Secretary of the Environment</p>	 <p>State Water Resources Control Board Regional Water Quality Control Boards <b>Tam Doduc</b> Chair</p>	 <p>Department of Toxic Substances Control <b>Maureen F. Gorsen</b> Director</p>
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# California Uniform Site Assessment Tools

## Acknowledgements

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This publication is a technical report. No policy or regulation is either expressed or intended.

The primary contributing agencies and their mission statements are:

The Department of Toxic Substances Control's mission is to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

The State Water Board's mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.

The Regional Water Board's mission is to develop and enforce water quality objectives and implementation plans that will best protect the State's waters, recognizing local differences in climate, topography, geology and hydrology.

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# 1. Introduction

The Uniform Site Assessment Tools (Tools) are designed to assist project managers from the nine California Regional Water Quality Control Boards (Regional Water Boards), the Department of Toxic Substances Control (DTSC), and the State Water Resources Control Board (collectively referred to as the Agencies) in their oversight of the investigation of contaminated sites in California. The Tools are designed to help provide a consistent and comprehensive approach to site assessments conducted with oversight from the Regional Water Board or from DTSC. This document does not constitute policy, regulation, or requirements.

The objective of the Tools is to assist Agency project managers in determining whether a site assessment has gathered sufficient information to evaluate all potential pathways of exposure to contaminants of concern. The generalized site assessment process is diagrammed in Figure 1, and a typical site assessment consists of the elements diagrammed in Figure 2. The site assessment elements can be used to develop a Conceptual Site Model, which is a visual representation of the distribution of pollutants and potential exposure pathways at a site. One variation of a Conceptual Site Model is shown in Figure 3.

The core of the Uniform Site Assessment Tools is a listing of the typical site assessment elements in a checklist format, as presented in Section 8. The checklist has been developed to assist the project manager in evaluating relevant exposure pathways, identifying data gaps, and updating the Conceptual Site Model. The Tools and the checklist have been developed to be sufficiently general to apply to all potentially contaminated sites. Therefore, not all checklist elements will apply to all sites. A project manager can determine if a checklist item applies to the conditions at a specific site. Experience and professional judgment continue to be a key aspect for determining the appropriate level of investigation. The Tools recognize that specific site assessment tasks must be performed by qualified professional personnel in accordance with California laws and regulations.

The Tools includes a Table of References that identifies some of the existing technical guidance documents relating to site assessment activities. The Reference section is not meant to be comprehensive.

In summary, the Tools provide a common set of criteria to assist DTSC and the Regional Water Boards in the site assessment process. This should result in a common approach to site assessment in compliance with all applicable laws and regulations that responsible parties, consultants, regulators, and the general

public can use as a basis for performing and reviewing site assessments, regardless of the particular oversight Agency.

These Tools are designed to be a living document and are intended to be updated on a continuous basis as needed.

## **2. Background**

The Department of Toxic Substances Control, the State Water Resources Control Board and the nine Regional Water Quality Control Boards are a part of the California Environmental Protection Agency (Cal/EPA). The Agencies address cleanup of contaminated sites, including Brownfields sites, as one of their functions.

The Agencies entered into a Memorandum of Agreement (MOA) in March 2005 to improve coordination between DTSC, the State Water Board and the Regional Water Boards regarding the oversight of investigation and cleanup activities at Brownfields sites. The MOA was developed to ensure effective and expeditious investigation and cleanup of Brownfields sites in a manner that is protective of public health and safety and the environment. The MOA also committed the Agencies to develop a uniform site assessment tool to evaluate environmental and health related issues at Brownfields sites. As a consequence, the Agencies worked together to clarify their existing site investigation processes and to develop the Uniform Site Assessment Tools (Tools) as a resource for Agency project managers. While the MOA directed the Agencies to address site assessment at Brownfields sites, the Tools are designed to be appropriate for any contaminated site, not just for Brownfields sites.

## **3. Objectives**

The objectives of the Uniform Site Assessment Tools are to achieve the following:

1. Provide uniform minimum criteria for evaluating site investigations, resulting in a consistent approach among the Agencies.
2. Assure efficient use of limited Agency resources for oversight.
3. Encourage efficient and timely site investigations by responsible parties.
4. Create a consistent and fair approach to site investigation that may encourage more parties to cleanup voluntarily.

## 4. Principles

The following principles guided the development of this document. The Uniform Site Assessment Tools should:

1. Accommodate a broad range of site complexities from simple to very complex.
2. Be protective of health and the environment.
3. Recognize that there are a large variety of constituents, site conditions and exposure scenarios.
4. Be a living document incorporating existing guidance and new technical guidance as it becomes available.
5. Be transparent by clearly outlining the elements that both DTSC and the Regional Water Boards consider when evaluating a site investigation and assessment of a potentially contaminated site.

## 5. Overview

The key component of the Uniform Site Assessment Tools is a checklist of elements (Site Assessment Checklist) that should be considered as the investigation of a contaminated site proceeds. A generalized summary of the overall process of site investigation is presented in Figure 1. Relevant environmental information is collected about a site through a review of historical operations, identifying recognized environmental impacts. Then, a sampling program is designed based on existing knowledge of site conditions. Data generated during the investigation is reviewed and augmented, if necessary. The data is also evaluated to assess potential impacts to human health, the environment and/or water quality. This information is then documented in a comprehensive site assessment report.

The Site Assessment Checklist elements include a site description, site conditions, data collection, data evaluation, comparison to screening criteria, and effects on human and ecological receptors, and water quality. Each element of the checklist should be considered for a site, but not all of the elements may be applicable to a site. In other words, a project manager should consider the applicability of each checklist element to their site and evaluate on a site-specific basis whether or not that element needs to be included for a sufficient site characterization. Site characterization needs to be sufficient to identify the constituents of concern, the lateral and vertical extent of pollutants, all affected media, and chemical transport characteristics. The site characterization also needs to be sufficient to support an evaluation of risks to human health, the environment, and water quality. Experience and professional judgment of

qualified personnel continue to be a key aspect for determining the appropriate level of investigation for any given site. All engineering and geological work shall be conducted in conformance with applicable state law, including but not limited to, Business and Professions Code sections 6735 and 7835.

Information developed for each of the checklist elements helps to define the Conceptual Site Model of a site. A Conceptual Site Model, when complete, represents a visual understanding of a site, its contaminants, affected media, transport and exposure pathways, and potential receptors. When all relevant avenues of pollutant migration have been identified, quantified, and evaluated, the information and resultant recommendations are included in a site assessment report. The relationship between the checklist elements, the Conceptual Site Model, and the Site Assessment Report are illustrated in Figure 2.

A compilation of existing technical guidance documents that may be used in conjunction with the Site Assessment Checklist are provided in the Table of References. The Table of References provides the project manager with additional sources of information that may assist them with specific checklist elements. As with the checklist elements, not all entries in the Table of References will be applicable to all sites. For easy reference by the user, the Table of References will be transferred into a web-based application. As of this writing, the web-based application is under development.

## **6. Conceptual Site Model**

A generalized Conceptual Site Model is shown in Figure 3. This Conceptual Site Model illustrates possible contaminant transport mechanisms and exposure pathways from various media that may be impacted: air, soil, sediments, and water, including soil vapor, groundwater, and surface water. As the site assessment proceeds, the site information generated is used to update all aspects of the Conceptual Site Model that are relevant to the site.

The updated Conceptual Site Model assists the project manager to determine if additional characterization is needed. For example, if a chemical is found in soil, the project manager must assess if it is likely to leach to groundwater, volatilize to an indoor air environment, migrate to surface water through overland runoff, or have the potential for contact by site receptors. The model can be used to suggest if additional sampling may be needed in order to characterize the lateral and vertical extent of pollution, and to identify the exposure pathways that may warrant protection. A Conceptual Site Model can also illustrate when additional characterization is not needed. For example, if constituents of concern (and their breakdown products) are not volatile, there would be no need to investigate the vapor phase transport pathway.

## 7. Checklist Overview

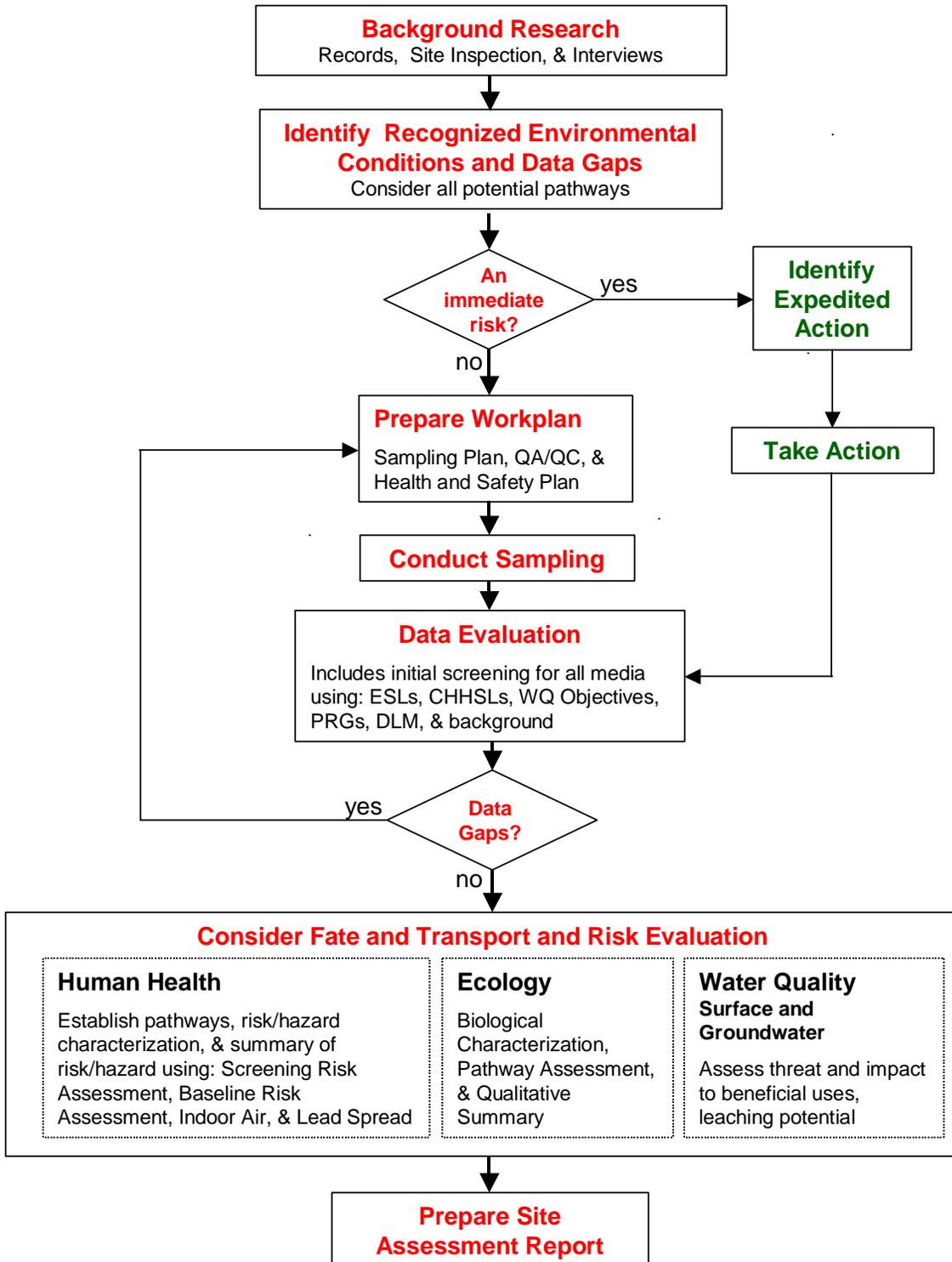
As shown in Figure 2 and detailed in the checklist in Section 8, the checklist elements identify information that assists the project manager in developing a comprehensive understanding of the site, including defining the Conceptual Site Model. The Site Description and Site Conditions elements of the checklist provide existing information about the site. If this level of information is sufficient to identify all relevant potential pathways for the Conceptual Site Model, then the site data can be compared to appropriate screening criteria. This can assist in determining if human health, ecological health, or water uses are potentially impaired or threatened, and whether further action is warranted.

If the Site Description and Site Conditions are not sufficient to fully develop the Conceptual Site Model, then additional data collection may be needed and a work plan should be submitted to the appropriate lead oversight agency for review and concurrence. Once the collected data is evaluated and the Conceptual Site Model updated, a subsequent round of agency review occurs. If additional data gaps are identified in the Conceptual Site Model, then data collection and evaluation should continue until the site is sufficiently characterized such that all exposure and transport pathways have been identified and evaluated. Interpretations should be made by qualified professional personnel.

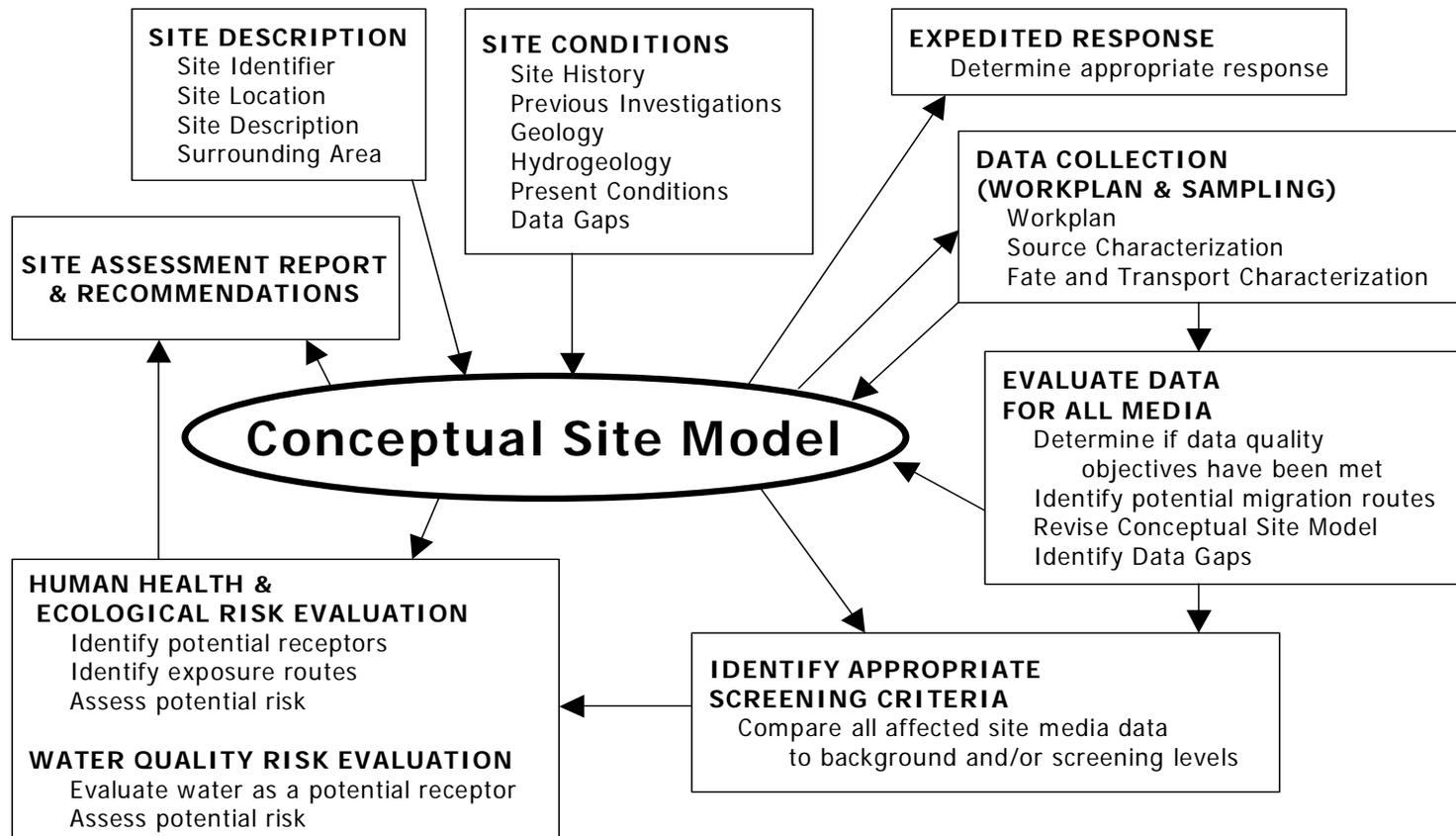
At any point in the investigation, the data may reveal that an expedited response action is needed to protect human or ecological health or water quality. Expedited Response is a separate checklist element. Project managers need to consider this possibility early in the site assessment process.

The elements in the Site Assessment Checklist will be evaluated and revised after the Tools have been in use for a period of time. The Tools will be revised and updated as needed.

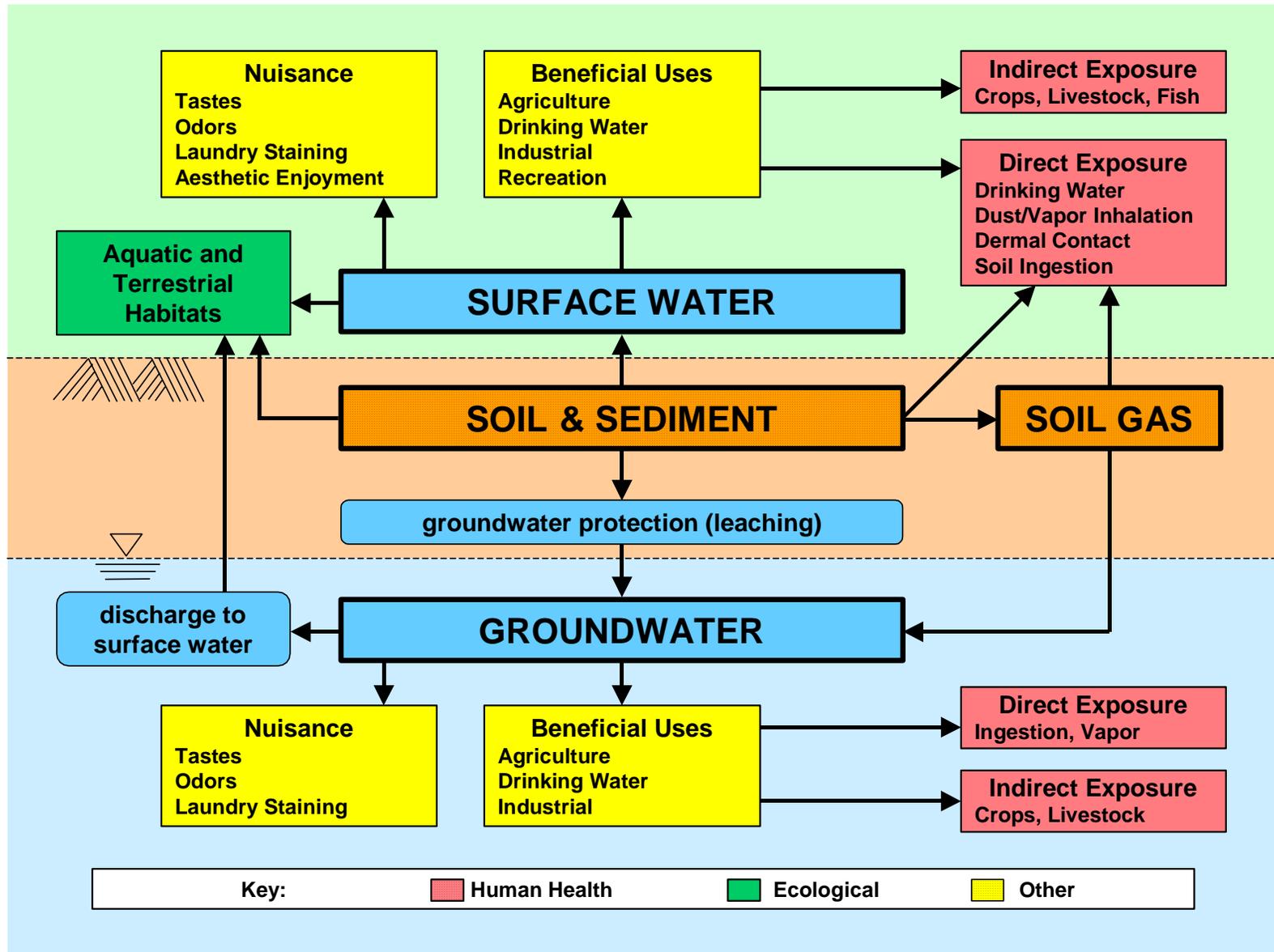
**FIGURE 1. Process Diagram**



## FIGURE 2. Role of Conceptual Site Model in Site Assessment Process



# FIGURE 3. Conceptual Site Model Potential Environmental Concerns and Exposure Pathways



# 8. Site Assessment Checklist

Please keep in mind that some checklist items may not be applicable at a given site.

*Complete Incomplete Not Applicable*

*Comments*

<b>8.1 Site Description</b>			
<i>OBJECTIVE: Provide information necessary to identify and describe the Site.</i>			
_____	_____	_____	<b>Site Identifier</b> Site name, alternative names, etc.
_____	_____	_____	<b>Site Location</b> Street address(es), APN(s), latitude and longitude, site location map.
_____	_____	_____	<b>Site Description</b> Discuss site features and land uses such as acreage, buildings, operational areas, containers, tanks, delivery lines, sumps, drainage patterns, surface impoundments, wells, sewer lines or septic systems, overhead and underground utility lines, pilings, backfill materials, surface water bodies, topography, property boundaries and other features. Include reasonably anticipated foreseeable uses of the site. Must include figure showing locations of site features. May include geological map, topographic map, aerial photo, or other figures.
_____	_____	_____	<b>Surrounding Area</b> Describe surrounding businesses and land uses including water bodies, topographic features, etc.

<b>8.2 Site Conditions</b> <i>OBJECTIVE: Identify All Potential Recognized Environmental Conditions</i>			
_____	_____	_____	<b>Site History</b> Summarize site uses since the site was first developed. Review historical documents and records. Follow ASTM Standard E1527-05 Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process or U.S. Environmental Protection Agency's All Appropriate Inquiries requirements. Identify all potential contaminants of concern.
_____	_____	_____	<b>Previous Investigations</b> Identify all previous investigations and cleanup activities, including any Phase I and Phase II investigations. Identify any documented releases, recorded environmental cleanup liens, engineering or institutional controls.
_____	_____	_____	<b>Geology</b> Identify any subsurface site features that affect the movement of contaminants, such as lithology, fractures, lenses, fill material, soil horizons, soil properties and other features. Include any boring logs and if appropriate, cross sections.
_____	_____	_____	<b>Hydrogeology</b> Describe the regional and local hydrogeology in terms of known aquifers, confining layers, discontinuities, historic groundwater level variations, hydraulic gradients, and any other features of significance.
_____	_____	_____	<b>Present Conditions</b> List all potential recognized environmental conditions. This should include all known or threatened releases either on-site or nearby, and observations of improper materials handling or spillage.

Complete Incomplete Not Applicable

Comments

_____	_____	_____	<p><b>Data Gaps</b></p> <p>Identify any additional information needed to ascertain if releases have occurred or are threatened.</p>	
<p><b>8.3 Expedited Response</b></p> <p><i>OBJECTIVE: The main goal is to prevent immediate health threats from exposure to the contaminant, to address other hazards such as explosion risks, and to prevent contaminant migration to unaffected areas.</i></p>				
_____	_____	_____	<p><b>Determine appropriate expedited response</b></p> <p>Interim remedial actions may be appropriate in instances such as discovering an immediate health threat, free-phase product, buried containers that may pose health or explosion threat, exposed pollutants that could migrate to residential areas or surface water, or other scenarios in which a rapid response would limit exposure and spread of pollutants. Other local, state, federal agencies, and the public may need to be notified as appropriate (e.g. local fire departments, water agencies, Department of Fish and Game, etc.)</p>	
<p><b>8.4 Data Collection (Workplan &amp; Sampling)</b></p> <p><i>OBJECTIVE: Provide information necessary to prepare and implement a field sampling workplan that will obtain sufficient analytical data to identify the hazardous materials releases at the Site and to characterize the nature and extent of the releases. Data must be of sufficient quality and quantity for use in risk and water quality assessments.</i></p>				
_____	_____	_____	<p><b>Workplan</b></p> <p>The Workplan/Sampling Plan should at least include the following items:</p>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ Site Description</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ Site Conditions</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ Sampling Rationale and Objectives, including criteria for expanding sampling scope, if warranted</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ Sample Locations and Media</li> </ul>	

<i>Complete</i>	<i>Incomplete</i>	<i>Not Applicable</i>		<i>Comments</i>
_____	_____	_____	▪ Standard Operating Procedures	
_____	_____	_____	▪ Sample Containers, Preservation, and Holding Times	
_____	_____	_____	▪ Sample Packaging and Handling Procedures	
_____	_____	_____	▪ Sample Documentation/Chain of Custody Procedures	
_____	_____	_____	▪ Analytical Methods	
_____	_____	_____	▪ Reporting Limits (Detection Limits)	
_____	_____	_____	▪ Data quality objectives for Quality Assurance and Quality Control	
_____	_____	_____	▪ Investigation-Derived Waste Management	
_____	_____	_____	▪ Schedule for implementation and reporting	
_____	_____	_____	▪ Health and Safety Plan.	
_____	_____	_____	▪ Public Participation as appropriate	
_____	_____	_____	<b>Source Characterization</b> Collect samples of environmental media for appropriate laboratory analysis to investigate all recognized environmental conditions and to characterize the nature and extent of detected hazardous materials or pollutant releases. Consider collecting background samples to determine conditions prior to releases. (Footnotes found at end of checklist)	
_____	_____	_____	▪ soil <sup>1</sup>	
_____	_____	_____	▪ air <sup>2</sup>	
_____	_____	_____	▪ groundwater <sup>3</sup>	
_____	_____	_____	▪ surface water <sup>4</sup>	

Complete Incomplete Not Applicable

Comments

_____	_____	_____	▪ sediments <sup>5</sup>	
_____	_____	_____	▪ soil vapor <sup>6</sup>	
_____	_____	_____	▪ background <sup>7</sup>	
_____	_____	_____	<p><b>Fate and Transport Characterization</b></p> <p>Collect samples of environmental media in order to evaluate the migration potential of chemicals at the site. Analyses that assist with fate and transport modeling, risk assessments, and remediation potential can include soil characteristics (soil bulk density, grain size distribution, porosity, effective permeability, moisture content, organic carbon content, redox potential, pH), and chemical properties (solubility, vapor pressure, partial pressure, specific gravity, diffusion coefficient, partitioning coefficient) and others.</p>	
<p><b>8.5 Evaluate Data for all Media</b></p> <p><i>OBJECTIVE: Evaluate data for all media for use in applicable assessments for fate and transport, human health, the environment, water quality, and for use in developing appropriate remediation strategies.</i></p>				
_____	_____	_____	<p><b>Determine whether data quality objectives have been met</b></p> <p>Based on the field sampling workplan, verify that data quality objectives were met, that detection and reporting limits are within regulatory screening limits and /or are suitable for use in risk and water quality assessments, and that the appropriate sampling and analytical methods were used.</p>	
_____	_____	_____	<p><b>Identify Potential Migration Routes</b></p> <p>Based upon chemical and site characteristics, identify potential migration routes. For example, chemicals may volatilize into air, or migrate within the soil column, or leach into groundwater, or runoff into surface water, or transport through air via wind-blown dust, or migrate by other means. Is the constituent in or have potential to migrate to:</p>	
_____	_____	_____	▪ soil	

Complete Incomplete Not Applicable

Comments

Complete	Incomplete	Not Applicable		Comments
_____	_____	_____	<ul style="list-style-type: none"> <li>air</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>groundwater</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>surface water</li> </ul>	
_____	_____	_____	<p><b>Revise Conceptual Site Model</b></p> <p>Update site conceptual model for all potential 1) sources; 2) release mechanisms; 3) migration pathways; and 4) exposure routes based analysis of site data for all media.</p>	
_____	_____	_____	<p><b>Identify Data Gaps</b></p> <p>Identify if any additional information is needed to ascertain if releases could migrate at concentrations that could pose a threat to public health, the environment and/or water quality. If additional data is needed to characterize the site, then prepare a workplan, perform the site assessment, evaluate the data, and update the Model as previously described.</p>	
<p><b>8.6 Identify Appropriate Screening Criteria</b></p> <p><i>OBJECTIVE: Based upon constituent fate and transport characteristics and potential migration routes, determine if additional investigation, characterization, or risk assessment is necessary.</i></p>				
_____	_____	_____	<p><b>Compare all effected site media data to background and/or screening tools</b></p> <p>Background concentrations, screening levels, and site-specific modeling are some tools that can be used comparatively to assist regulators in identifying if additional characterization, risk evaluation, or cleanup actions are needed. At sites with multiple contaminants of similar toxicological effects, cumulative effects must be considered.</p> <p>Media specific screening tools and/or models include but are not limited to the following:</p>	
_____	_____	_____	<ul style="list-style-type: none"> <li><i>Air:</i> California Human Health Screening Levels (CHHSLs); Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (DTSC's Vapor Intrusion Guidance), Environmental Screening Levels (ESLs)</li> </ul>	

Complete Incomplete Not Applicable

Comments

_____	_____	_____	<ul style="list-style-type: none"> <li>▪ <i>Soil:</i> Designated Level Methodology, California Human Health Screening Levels (CHHSLs); US EPA Region 9 Preliminary Remediation Goals (PRGs), Sediment Quality Remediation Targets (SQRTs), Environmental Screening Levels (ESLs), Region 4's Interim Site Assessment and Cleanup Guidebook.</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ <i>Sediments:</i> Sediment Quality Remediation Targets (SQRTs), Environmental Screening Levels (ESLs).</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ <i>Groundwater/Surface Water:</i> Water Quality Objectives, Maximum Contaminant Levels (MCLs), Environmental Screening Levels (ESLs).</li> </ul>	
_____	_____	_____	<ul style="list-style-type: none"> <li>▪ <i>Soil Vapor:</i> California Human Health Screening Levels (CHSSLs), DTSC's Vapor Intrusion Guidance, Environmental Screening Levels (ESLs).</li> </ul>	

## 8.7 Human Health and Environmental Risk Evaluation

*OBJECTIVE: Evaluate the risk that the constituents of concern pose to human health, and the biota.*

_____	_____	_____	<p><b>Identify Potential Receptors</b></p> <p>Identify potential receptors and exposure scenarios. Adult and child residents should be considered regardless of land use unless land use restrictions preclude residential uses. Other potential receptors include onsite workers (e.g., commercial workers, industrial workers, construction, utility and landscape workers), site visitors, recreators, off-site receptors and biota, including endangered or threatened species.</p>	
_____	_____	_____	<p><b>Identify Exposure Routes</b></p> <p>Identify exposure routes for the potential receptors. Source media include air, soil, sediments and water, including groundwater and surface water and soil gas. Exposure routes include ingestion, inhalation, and dermal contact, surface runoff and leaching through soil.</p>	
_____	_____	_____	<p><b>Assess Potential Risk</b></p> <p>If there is a significant risk, a response plan must be prepared.</p>	

<b>8.8 Water Quality Risk Evaluation</b> <i>OBJECTIVE: Evaluate the risk that the constituents of concern pose to surface water or groundwater.</i>			
_____	_____	_____	<b>Evaluate Water as a Potential Receptor</b> Identify exposure scenarios such as transport of contaminants in runoff, leaching through the soil profile, through conduits, or downgradient migration. Site-specific models can be used to help determine if there is a potential for water quality to be degraded through soil leaching, surface runoff, or aqueous transport.
_____	_____	_____	<b>Assess Potential Risk</b> If there is a significant risk, a response plan must be prepared.

- <sup>1</sup>Soil data is collected to provide information on 1) type and concentration and vertical/lateral extent of contaminants in soil; 2) background or ambient and anthropogenic levels in soil; 3) source identification; 4) potential impacts to surface water and ground water; 5) potential impacts to ambient air and indoor air; and 6) human and ecological risk. Samples are lithology dependent and should be discrete; and are typically collected at the surface and subsurface.
- <sup>2</sup>Air sampling is generally conducted to monitor worker health and safety and/or off-site contaminant migration during removal/remedial actions. Ambient air and/or indoor air sampling may also be performed as part of site characterization activities for evaluation as part of the human health risk assessment process. Air sampling instruments are specialized for vapor/gas and dust/particulates. **Ambient Air vs. Indoor Air** - Except for subsurface vapor intrusion into indoor air (see "Sampling for Volatile Organic Compounds" below), sampling for contaminants in air (Air Monitoring) is generally not conducted for screening level assessments. Instead, potential risk for air pathway contaminants are based on known contaminant concentrations in soil which are used to estimate the probable concentration of contaminants in the air.
- <sup>3</sup>Groundwater sampling is conducted to provide data for use in evaluating 1) type and concentration of contaminants and vertical and lateral extent of contaminants and/or breakdown products in groundwater; 2) background and anthropogenic levels in groundwater; 3) source identification; 4) potential impacts to indoor air; 6) human risk; and 5) protection of beneficial uses of groundwater. Water samples are typically collected from monitoring wells and as "grab" samples from direct push investigations.
- <sup>4</sup>Surface water sampling (streams, ponds, lakes, surface drainage, surface impoundments, sumps, and catch basins) is conducted to provide data for use in evaluating 1) type and concentration of contaminants in surface water; 2) background and anthropogenic levels in surface water; 3) source identification; 4) potential impacts to groundwater; 5) potential impacts ambient air; and 6) human and ecological risk. Samples are collected at various locations along water courses/water bodies.
- <sup>5</sup>Sediment sampling is conducted to provide information on 1) type and concentration and vertical/lateral extent of contaminants; 2) background; 3) source identification; 4) potential impacts to surface and groundwater; 5) potential impacts to ambient air; and 6) human and ecological risk. Sediments include solids and organic matter overlain by a water body such as stream, pond, subsurface drainage, sump, surface impoundments, catch basins, and other water bodies.
- <sup>6</sup>Sampling for Volatile Organic Compounds (VOCs) is conducted to provide data to evaluate 1) type and concentration and vertical/lateral extent of contaminants and/or their breakdown products; 2) anthropogenic levels; 3) source identification; 4) potential impacts to surface and groundwater; 5) potential impacts to ambient air and indoor air; and 6) human risk. Insitu soil vapor/soil gas sampling is preferred over soil matrix (core samples) and groundwater samples.
- <sup>7</sup>Background samples are collected to distinguish between site related contamination (e.g., manufactured compounds) and background (e.g., naturally occurring) or anthropogenic (manufactured compounds) contaminant levels for all affected media. Background samples should be collected outside of the area of contamination. Soil and soil vapor samples should be collected based on soil type. Upwind samples should be collected for air. Upgradient samples should be collected for sediment, surface water, and groundwater.

## 9. Table of References

Agency	Guidance Document	Year	Activity	Description	Web Address and/or Document Identifier
API	Strategies for Characterizing Subsurface Releases of Gasoline Containing MtBE (methyl tert-butyl ether)	2000	Assessments	Petroleum Institute publication.	<a href="http://api-ep.api.org/Publications/">http://api-ep.api.org/Publications/</a> (API Bulletin 11, for purchase only)
ASTM	Guide for Site Characterization for Environmental Purposes	2004	Assessments		<a href="http://www.astm.org/">http://www.astm.org/</a> (D 5730 04 for purchase only)
ASTM	Guide for Developing and Implementing Short-Term Measures	1999	Planning		<a href="http://www.astm.org/">http://www.astm.org/</a> (D 5745 95 for purchase only)
ASTM	Terminology Relating to Soil, Rock, and Contained Fluids	2004	Terminology		<a href="http://www.astm.org/">http://www.astm.org/</a> (D 653 04 for purchase only)
ASTM	Guide for Environmental Site Assessments: Phase 2	2002	Assessments		<a href="http://www.astm.org/">http://www.astm.org/</a> (E 1903 97 for purchase only)
ASTM	Environmental Site Assessments: Phase 1	2005	Assessments		<a href="http://www.astm.org/">http://www.astm.org/</a> (E 1527 05 for purchase only)
ASTM	Environmental Site Assessments	2005	Assessments		<a href="http://www.astm.org/">http://www.astm.org/</a> (E 1528 05 for purchase only)
ASTM	Guide for Remediation of Ground Water by Natural Attenuation	2004	Remediation		<a href="http://www.astm.org/">http://www.astm.org/</a> (E 1943 98 for purchase only)
ASTM	Guide for Risk-Based Corrective Action	2004	RBCA		<a href="http://www.astm.org/">http://www.astm.org/</a> (E 2081 00 for purchase only)

Agency	Guidance Document	Year	Activity	Description	Web Address and/or Document Identifier
ASTM	Environmental Site Assessments: Phase 1	2002	Assessments		<a href="http://www.astm.org/">http://www.astm.org/</a> (E 2247 02 for purchase only)
Cal/EPA	Active Soil Gas Investigations Advisory	2003	Assessments	Describes methodologies for obtaining reliable soil gas data.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=94677">http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=94677</a>
Cal/EPA	Human Exposure Based Screening Numbers Developed to Aid Estimation of Cleanup Costs	2005	Remediation		<a href="http://www.oehha.ca.gov/risk/pdf/screenreport010405.pdf">http://www.oehha.ca.gov/risk/pdf/screenreport010405.pdf</a>
Cal/EPA	Use of California Human Health Screening Levels in Evaluation of Contaminated Properties	2005	Assessments		<a href="http://www.calepa.ca.gov/Brownfields/documents/2005/CHHSLsGuide.pdf">http://www.calepa.ca.gov/Brownfields/documents/2005/CHHSLsGuide.pdf</a>
DTSC	Application of Borehole Geophysics at Hazardous Substances Release Sites	1995	Geophysics	Aids in the selection of borehole geophysical tools, provides recommended QA/QC procedures, and presentation of resulting data.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=13761">http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=13761</a>
DTSC	Application of Surface Geophysics at Hazardous Substances Release Sites	1995	Geophysics	Aids in the selection of surface geophysical tools, provides recommended QA/QC procedures, and presentation of resulting data.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=13770">http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=13770</a>
DTSC	Abandoned Mine Lands Preliminary Assessment Handbook	1999	Assessments		<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=94170">http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=94170</a>
DTSC	Aquifer Testing for Hydrogeologic Characterization	2003	Sampling	Aids in the design and performance of aquifer tests, provides recommended QA/QC procedures, and presents a standardized approach to the presentation of resulting data.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=13779">http://www.dtsc.ca.gov/loader.cfm?url=/commonsp/ot/security/getfile.cfm&amp;pageid=13779</a>

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DTSC	CalTox	1994	Assessments	A spreadsheet model that relates concentration of chemical in soil to risk of adverse human health effects.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=12771">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=12771</a>
DTSC	Drilling, Coring, Sampling and Logging at Hazardous Substance Release Sites	2003	Sampling	Aids in the selection of drilling methods and sampling equipment, provides recommended QA/QC procedures, and gives a standardized approach to the description of samples and presentation of resulting data.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13788">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13788</a>
DTSC	Ground Water Modeling for Hydrogeologic Characterization	1995	Model	Guidelines for the application of ground water and containment transport models to the characterization of hazardous substance release sites.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13797">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13797</a>
DTSC	Guidance Document for the Implementation of the United States Environmental Protection Agency Method 5035: Methodologies for Collection, Preservation, Storage, and Preparation of Soils to be Analyzed for Volatile Organic Compounds	2004	Sampling		<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=93424">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=93424</a>
DTSC	Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities	1996	Assessments		<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=12022">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=12022</a>
DTSC	Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air	2005	Assessments		<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=11492">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=11492</a>

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DTSC	Guidelines for Hydrogeologic Characterization of Hazardous Substance Release Site	1995	Assessments	Addresses the hydrogeological portion of site characterization.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13733">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13733</a>
DTSC	LeadSpread	1998	Assessments	A spreadsheet tool for evaluating exposure and the potential for adverse health effects resulting from exposure to lead in the environment.	<a href="http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm">http://www.dtsc.ca.gov/AssessingRisk/leadspread.cfm</a>
DTSC	Monitoring Well Design and Construction for Hydrogeologic Characterization	2003	Terminology	Modification of 1991 revision of USEPA Test Methods for Evaluating Solid Waste, Volume II, Chapter 11.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13806">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13806</a>
DTSC	Public Participation Policy and Procedures Manual	2001	Public Participation	Detailed guidance for public participation actions at various sites under DTSC lead.	<a href="http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=5095">http://www.dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=5095</a>
DTSC	Preliminary Endangerment Assessment	1994	Assessments		<a href="http://165.235.111.242/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=14240">http://165.235.111.242/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=14240</a>
DTSC	Reporting Hydrogeologic Characterization Data at Hazardous Substance Release Sites	2003	Reporting	Intended to help responsible parties and regulators achieve and maintain consensus on hydrogeologic aspects of site investigations and avoid delays in completing investigations at sites where ground water contamination is a concern.	<a href="http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13815">http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13815</a>
DTSC	Representative Sampling of Ground Water for Hazardous Substances	1995	Sampling	Intended to provide guidelines for the sampling and analysis of ground water used for the characterization of hazardous waste sites.	<a href="http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13824">http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=13824</a>
DTSC	Site Mitigation Process (Public Participation Manual, Chapter 3)	2001	Assessments		<a href="http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=5091">http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=5091</a>

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DTSC	Site Screening Guidance	1997	Assessments	Provides guidance for conducting site screenings, a Drive-by Record form, and a Site Screening Form.	<a href="http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=4723">http://dtsc.ca.gov/loader.cfm?url=/commonspot/security/getfile.cfm&amp;pageid=4723</a>
DTSC	Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities	1992	Assessments	Guidance supplements USEPA Risk Assessment Guidance for Superfund, Volume 1, 1989.	<a href="http://dtsc.ca.gov/AssessingRisk/Supplemental_Guidance.cfm">http://dtsc.ca.gov/AssessingRisk/Supplemental_Guidance.cfm</a>
DWQ	Department of Water Quality Technical Library	Various		Waterboard Intranet: downloadable publications of many topics pertaining to water quality, site investigation, remediation.	<a href="http://waternet.epanet.ca.gov/dwq/pubs/">http://waternet.epanet.ca.gov/dwq/pubs/</a>
DWR	California Well Standards	1981	Terminology	Water Well Standards, Includes supplemental in 1990	<a href="http://rubicon.water.ca.gov/b17099/b17099.pdf">http://rubicon.water.ca.gov/b17099/b17099.pdf</a> (Bulletin 74-81 not available online)  <a href="http://www.dpla2.water.ca.gov/publications/groundwater/CA_Well_Standards_Bulletin74-90_1991.pdfqww_standards/">http://www.dpla2.water.ca.gov/publications/groundwater/CA_Well_Standards_Bulletin74-90_1991.pdfqww_standards/</a> (Bulletin 74-90)
ITRC	ITRC/USEPA Consortium for Site Characterization Technology Partnership– FY-97 Summary Report	1998	Sampling	State participation in the USEPA verification of PCB (polychlorinated biphenyl) field analytical and well-head monitoring and soil and soil-gas sampling technologies.	<a href="http://www.itrcweb.org/Documents/ASC-2.pdf">http://www.itrcweb.org/Documents/ASC-2.pdf</a>
ITRC	Multi-State Evaluation of an Expedited Site Characterization Technology: Site Characterization and Analysis Penetrometer System–Laser-Induced Fluorescence (SCAPS–LIF)	1996	Sampling	California Certification, USEPA Verification, and multi-state acceptance of the SCAPS sensor for in situ subsurface field screening method for polynuclear aromatic hydrocarbons (PAHs).	<a href="http://www.itrcweb.org/Documents/ASC-3.pdf">http://www.itrcweb.org/Documents/ASC-3.pdf</a>

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ITRC	Multi-State Evaluation of the Site Characterization and Analysis Penetrometer System–Volatile Organic Compounds (SCAPS–VOC) Sensing Technologies	1997	Sampling	Evaluation and approval of SCAPS-deployed hydrosparge VOC sensor for real-time in situ detection of VOCs below the water table.	<a href="http://www.itrcweb.org/Documents/ASC-4.pdf">http://www.itrcweb.org/Documents/ASC-4.pdf</a>
ITRC	Dense Non-Aqueous Phase Liquids (DNAPLs): Review of Emerging Characterization and Remediation Technologies	2000	Assessment	Review of three general types of emerging DNAPL characterization technologies—including geophysical, cone penetrometer, and in situ tracers— and two categories of emerging DNAPL remediation technologies—thermal enhanced extraction and in situ chemical oxidation.	<a href="http://www.itrcweb.org/Documents/DNAPLs-1.pdf">http://www.itrcweb.org/Documents/DNAPLs-1.pdf</a>
ITRC	An Introduction to Characterizing Sites Contaminated with DNAPLs (dense non-aqueous phase liquids)	2003	Assessment	A primer discussing scientific approaches and strategies used to characterize sites known or suspected to be contaminated with DNAPLs	<a href="http://www.itrcweb.org/Documents//DNAPLs-4.pdf">http://www.itrcweb.org/Documents//DNAPLs-4.pdf</a>
ITRC	Technical and Regulatory Guidance for Using Polyethylene Diffusion Bag Samplers to Monitor Volatile Organic Compounds in Groundwater	2004	Sampling	A guide for regulators, technology users, and stakeholders to facilitate the use of polyethylene diffusion bag sampling, particularly for long-term monitoring.	<a href="http://www.itrcweb.org/Documents/DSP-3.pdf">http://www.itrcweb.org/Documents/DSP-3.pdf</a>
ITRC	Technology Overview of Passive Sampler Technologies	2006	Sampling	Overview of 12 passive sampling technologies and describes each technology's basis of operation, intended applications, advantages, limitations, and development status.	<a href="http://www.itrcweb.org/Documents/DSP_4.pdf">http://www.itrcweb.org/Documents/DSP_4.pdf</a>

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ITRC	Real-Time Measurement of Radionuclides in Soil: Technology and Case Studies	2006	Sampling	Provides overview of the benefits of a streamlined data collection approach that has proven effective at radionuclide contaminated sites.	<a href="http://www.itrcweb.org/Documents/RAD_4Web.pdf">http://www.itrcweb.org/Documents/RAD_4Web.pdf</a>
ITRC	Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management	2003	Assessments	Introduces the Triad approach to conducting environmental work, which increases effectiveness and quality and reduces project costs.	<a href="http://www.itrcweb.org/Documents/SCM-1.pdf">http://www.itrcweb.org/Documents/SCM-1.pdf</a>
ITRC	The Use of Direct Push Well Technology for Long-term Environmental Monitoring in Groundwater Investigations	2006	Sampling	Provides guidance concerning the use of Direct Push wells for long-term environmental groundwater monitoring.	<a href="http://www.itrcweb.org/Documents/SCM_2_ForWeb.pdf">http://www.itrcweb.org/Documents/SCM_2_ForWeb.pdf</a>
ITRC	Characterization and Remediation of Soils at Closed Small Arms Firing Ranges	2003	Assessments	Assists practitioners in formulating a proper strategy for removing the threat that metal, particularly lead, presents at closed small arms firing ranges	<a href="http://www.itrcweb.org/Documents/SMART-1.pdf">http://www.itrcweb.org/Documents/SMART-1.pdf</a>
ITRC	Vapor Intrusion Pathway: A Practical Guide	2007	Assessments	A generalized framework for evaluating the vapor intrusion pathway.	<a href="http://www.itrcweb.org/Documents/VI-1.pdf">http://www.itrcweb.org/Documents/VI-1.pdf</a>
ITRC	Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios (A Supplement to Vapor Intrusion Pathway: A Practical Guide)	2007	Sampling	This document provides detail on investigative approaches, assuming a site needs further investigation as described in "Vapor Intrusion Pathway: A Practical Guide".	<a href="http://www.itrcweb.org/Documents/VI-1A.pdf">http://www.itrcweb.org/Documents/VI-1A.pdf</a>
LA County	Guidelines for Report Submittals	1993	Reporting	Guidelines for underground storage tank investigation reports	<a href="http://www.swrcb.ca.gov/rwqcb4/html/programs/us/LACountyGuidelines93.pdf">http://www.swrcb.ca.gov/rwqcb4/html/programs/us/LACountyGuidelines93.pdf</a>

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RWQCB	Designated Level Methodology for Waste Classification	1989	Assessments	Region 5 - shows how to classify various wastes so appropriate disposal practices may be selected, and how to determine appropriate cleanup levels.	<a href="http://www.swrcb.ca.gov/rwqcb5/available_documents/guidance/dlm.pdf">http://www.swrcb.ca.gov/rwqcb5/available_documents/guidance/dlm.pdf</a>
RWQCB	Guidelines for Electronic Submittal of Quarterly Groundwater Monitoring Reports	2004	Reporting	Geotracker instructions.	<a href="http://www.waterboards.ca.gov/ust/cleanup/electronic_reporting/docs/ab2886_primer.pdf">http://www.waterboards.ca.gov/ust/cleanup/electronic_reporting/docs/ab2886_primer.pdf</a> <a href="http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting/">http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting/</a>
RWQCB	Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater  Interim Final – February 2005	2005	Assessments	Region 2- provides conservative (Tier 1 type) environmental screening levels for chemicals commonly found at sites where releases of hazardous chemicals have occurred	<a href="http://www.swrcb.ca.gov/ust/regulatory/docs/CCR_Title23_5_14_01.pdf">http://www.swrcb.ca.gov/ust/regulatory/docs/CCR_Title23_5_14_01.pdf</a>
RWQCB	Interim Site Assessment and Cleanup Guidebook	1996	Assessments	Region 4 - discusses assessment and cleanup process, identifies oversight agencies, defines requirements for site closure, and appeals process.	<a href="http://www.swrcb.ca.gov/rwqcb4/html/programs/remediation/May1996_VOC_Guidance.html">http://www.swrcb.ca.gov/rwqcb4/html/programs/remediation/May1996_VOC_Guidance.html</a>
RWQCB	LNAPL (Light non-aqueous phase liquids) Guidance	1998	Remediation	Region 9 - list of minimal information required for Corrective Action Plans where LNAPL is present.	<a href="http://www.waterboards.ca.gov/rwqcb9/units/tsmc/lnapl.pdf">http://www.waterboards.ca.gov/rwqcb9/units/tsmc/lnapl.pdf</a>
RWQCB	Methods Manual for Water Quality Data Gathering and Analysis	2003	Sampling	Region 1 - Primarily surface water guidance.	<a href="http://www.waterboards.ca.gov/northcoast/down/092203WQ-NCWAP-Manual.pdf">http://www.waterboards.ca.gov/northcoast/down/092203WQ-NCWAP-Manual.pdf</a>

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RWQCB	MtBE (methyl tert-butyl ether) Detection Method Guidance	1999	Lab	Region 9 - analytical method guidance.	<a href="http://www.waterboards.ca.gov/sandiego/units/tsmc/MTBE%20Detection.pdf">http://www.waterboards.ca.gov/sandiego/units/tsmc/MTBE Detection.pdf</a>
RWQCB	MtBE (methyl tert-butyl ether) Guidance Document	2001	Assessments	Region 8 - supplemental guidance for characterization and cleanup of UST releases containing MtBE	<a href="http://www.waterboards.ca.gov/santaana/pdf/mtbe_guidance.pdf">http://www.waterboards.ca.gov/santaana/pdf/mtbe_guidance.pdf</a>
RWQCB	MtBE (methyl tert-butyl ether) Sampling Requirement	1998	Sampling	Region 9 - Reminder of new SB521 language.	<a href="http://www.waterboards.ca.gov/sandiego/units/tsmc/MtbeMandatory.pdf">http://www.waterboards.ca.gov/sandiego/units/tsmc/MtbeMandatory.pdf</a>
RWQCB	Nonpurge Method Guidance	1997	Sampling	Region 9 - Nonpurge sampling ok for wells containing only Total Petroleum Hydrocarbons constituents.	<a href="http://www.waterboards.ca.gov/sandiego/units/tsmc/Purge.pdf">http://www.waterboards.ca.gov/sandiego/units/tsmc/Purge.pdf</a>
RWQCB	Petroleum Hydrocarbon Cleanup Approach or Soils	1997	Remediation	Region 6 - describes guidelines for when No Further Action is required at sites where petroleum hydrocarbons remain in soil.	<a href="http://www.waterboards.ca.gov/lahtontan/files/soilcusr.pdf">http://www.waterboards.ca.gov/lahtontan/files/soilcusr.pdf</a> <a href="http://www.swrcb.ca.gov/rwqcb6/files/soilcufs.pdf">http://www.swrcb.ca.gov/rwqcb6/files/soilcufs.pdf</a> (FACT SHEET)
RWQCB	Sensitive Aquifer Guidance	1996	Assessments	Region 9 - In relation to two area water district maps.	<a href="http://www.waterboards.ca.gov/sandiego/units/tsmc/mapexpltr.pdf">http://www.waterboards.ca.gov/sandiego/units/tsmc/mapexpltr.pdf</a>
RWQCB	Supplemental Guidance for the Prioritization of Investigation and Cleanup of UST Releases Containing MtBE	2001	Assessments	Region 8 - specific assistance to regulatory agencies in the prioritization of the investigation and cleanup of petroleum release sites from UST's within the Santa Ana Region.	<a href="http://www.waterboards.ca.gov/santaana/pdf/mtbe_guidance.pdf">http://www.waterboards.ca.gov/santaana/pdf/mtbe_guidance.pdf</a>

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RWQCB	Tri-Regional Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites	1990	Assessments	Recommendations for investigating underground tanks, - Regions 1, 2, and 5	<a href="http://www.waterboards.ca.gov/centralvalley/available_documents/ug_tanks/usttri-reg.pdf">http://www.waterboards.ca.gov/centralvalley/available_documents/ug_tanks/usttri-reg.pdf</a>
RWQCB	UST Program Site Closure Process	1999	Closure	Region 6 - describes site closure process for UST cases.	<a href="http://www.waterboards.ca.gov/lahontan/UST/Site_Closure_Process_Fact_Sheet.pdf">http://www.waterboards.ca.gov/lahontan/UST/Site_Closure_Process_Fact_Sheet.pdf</a> <a href="http://www.swrcb.ca.gov/rwqcb6/UST/Staff_Report.htm">http://www.swrcb.ca.gov/rwqcb6/UST/Staff_Report.htm</a> (case closure process--complete)
RWQCB	A Compilation of Water Quality Goals	2003	Assessments	Region 5 – numerical limits that implement water quality objectives for beneficial uses.	<a href="http://www.waterboards.ca.gov/centralvalley/available_documents/wq_goals/index.html">http://www.waterboards.ca.gov/centralvalley/available_documents/wq_goals/index.html</a>
RWQCB	UST Program Site Investigation and Remediation	1999	Assessments	Region 6 - describes the Water Board approach to UST investigations and cleanups.	<a href="http://www.swrcb.ca.gov/rwqcb6/UST/ustinves.pdf">http://www.swrcb.ca.gov/rwqcb6/UST/ustinves.pdf</a> (FACT SHEET)
RWQCB	Water Quality Site Assessment	1992	Assessments	Region 5 - Chemical parameters for soil and ground water plus flow charts.	<a href="http://www.swrcb.ca.gov/rwqcb5/available_documents/site_cleanup/WQSiteAssessment.pdf">http://www.swrcb.ca.gov/rwqcb5/available_documents/site_cleanup/WQSiteAssessment.pdf</a> (DRAFT-1992)
SWRCB	Guidelines for Investigation and Cleanup of methyl tert-butyl ether (MtBE) and Other Ether-Based Oxygenates	2000	Assessments	Intended to assist managers and staff at state and local regulatory agencies with the task of overseeing the investigation and cleanup of sites where there has been or may have been releases of MtBE-laden petroleum.	<a href="http://swrcb2.swrcb.ca.gov/ust/cleanup/docs/mtbe_finaldraft.pdf">http://swrcb2.swrcb.ca.gov/ust/cleanup/docs/mtbe_finaldraft.pdf</a>
SWRCB	Public Participation at Cleanup Sites, Final Draft	2005	Public participation	Public participation actions differ by the degree of public exposure and public interest.	<a href="http://www.calepa.ca.gov/EnvJustice/ActionPlan/Phasel/June2005/PPGuidelines.pdf">http://www.calepa.ca.gov/EnvJustice/ActionPlan/Phasel/June2005/PPGuidelines.pdf</a>

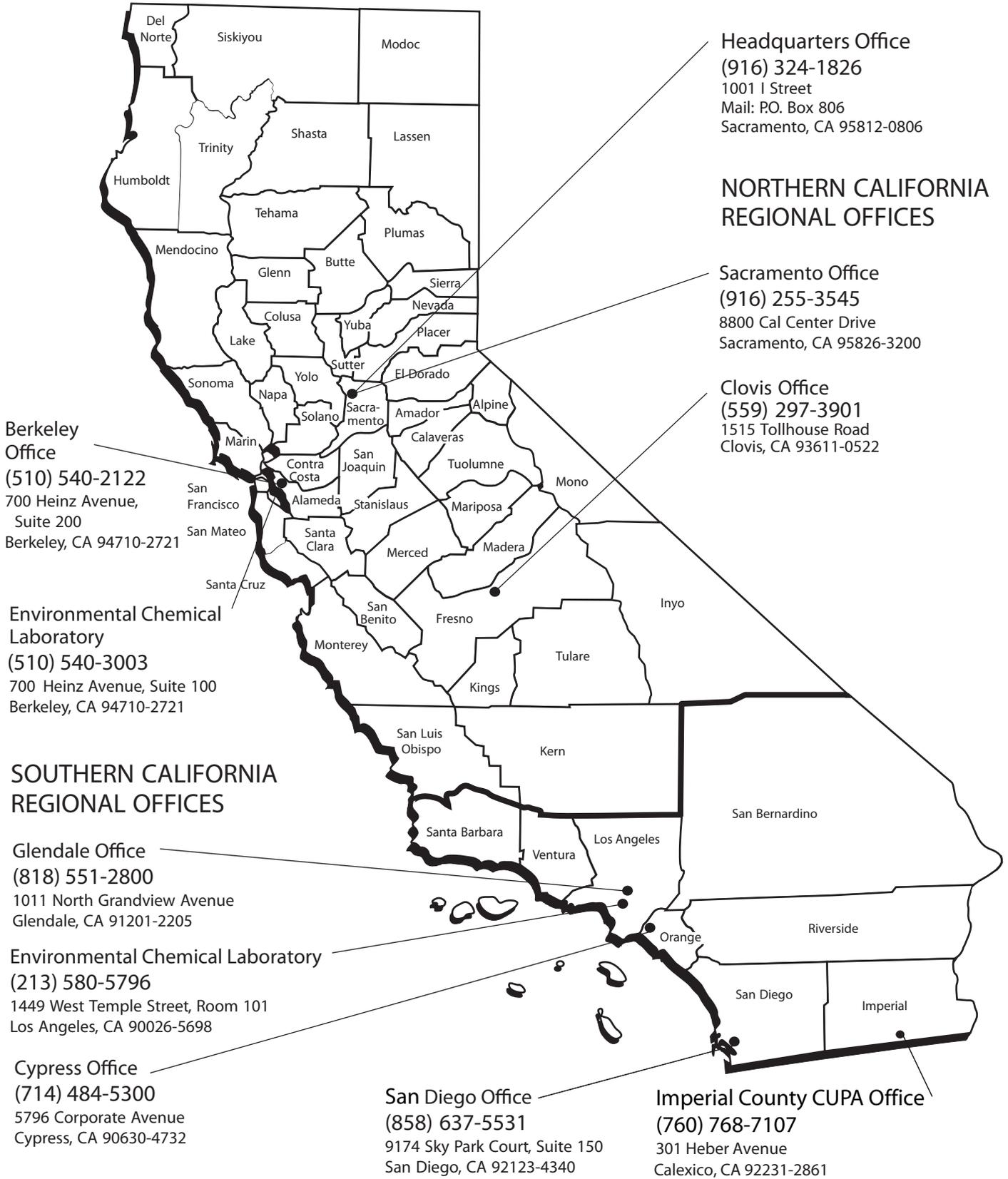
Agency	Guidance Document	Year	Activity	Description	Web Address and/or Document Identifier
US EPA	The Hazard Ranking System	1996	Hazard Ranking	The Hazard Ranking System is the scoring system used by the USEPA's Superfund program to assess the relative threat associated with actual or potential releases for hazardous substances.	<a href="http://www.epa.gov/superfund/sites/npl/hrsres/">http://www.epa.gov/superfund/sites/npl/hrsres/</a>
US EPA	Contaminated Sediments in Superfund	Various		A source of documents and fact sheets pertaining to contaminated sediments	<a href="http://www.epa.gov/superfund/resources/sediment/documents.htm">http://www.epa.gov/superfund/resources/sediment/documents.htm</a>
US EPA	Contaminated Sediment Remediation Guidance for Hazardous Waste Sites	2005	Risk Management		<a href="http://www.epa.gov/superfund/resources/sediment/guidance.htm">http://www.epa.gov/superfund/resources/sediment/guidance.htm</a>
US EPA	Establishing an Observed Release	1995	Assessments		<a href="http://www.epa.gov/superfund/sites/npl/hrsres/fact/release.pdf">http://www.epa.gov/superfund/sites/npl/hrsres/fact/release.pdf</a> (OSWER Directive 9285.7-19FS)
US EPA	Establishing Background Levels	1995	Assessments		<a href="http://www.epa.gov/superfund/sites/npl/hrsres/fact/bglevels.pdf">http://www.epa.gov/superfund/sites/npl/hrsres/fact/bglevels.pdf</a> (EPA/540/F-94/030)
US EPA	Expedited Site Assessment Tools for Underground Storage Tank Sites, A Guide for Regulators	1997	Assessments	Description of geophysical methods, soil gas surveys, direct push technology, and field methods for TPH analysis.	<a href="http://www.epa.gov/OUST/pubs/sam.htm">http://www.epa.gov/OUST/pubs/sam.htm</a> (EPA 510-B-97-001)
US EPA	Guidance for Comparing Background and Chemical in Soil for CERCLA Sites	2002	Assessments	To assist CERCLA Remedial Project Managers and human health and ecological risk assessors during the remedial investigation process to evaluate background concentrations at CERCLA sites.	<a href="http://www.epa.gov/swerrims/riskassessment/pdf/background.pdf">http://www.epa.gov/swerrims/riskassessment/pdf/background.pdf</a> (EPA 540-R-01-003)

Agency	Guidance Document	Year	Activity	Description	Web Address and/or Document Identifier
US EPA	Guidance for Establishing the National Priorities List	1982	NPL		<a href="http://www.epa.gov/superfund/sites/npl/npl_hrs.htm">http://www.epa.gov/superfund/sites/npl/npl_hrs.htm</a> <a href="http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=5068054">http://www.osti.gov/energycitations/product.biblio.jsp?osti_id=5068054</a> (OSWER Directive # 9320.1-01, 02/02/82)
US EPA	Guidance for Performing Preliminary Assessments Under CERCLA	1991	Assessments	Discusses the information required to evaluate a site and how to obtain it, how to score a site, and reporting requirements. Also provides guidelines and instruction on PA evaluation, scoring, and the use of standard PA scoresheets. Phase I Assessment.	<a href="http://www.hanford.gov/dqo/project/level5/passess.pdf">http://www.hanford.gov/dqo/project/level5/passess.pdf</a> (EPA / 540 / G-91 / 013)
US EPA	Guidance for Performing Site Inspections Under CERCLA	1992	Assessments	Phase II assessment that leads to the Hazard Ranking System.	<a href="http://www.epa.gov/superfund/sites/npl/hrsres/index.htm">http://www.epa.gov/superfund/sites/npl/hrsres/index.htm</a> (EPA 540-R-92-021)
US EPA	Guide to Community Involvement for Site Assessment Managers	1993	Assessments	Fact Sheet	<a href="http://www.epa.gov/oerrpage/superfund/sites/npl/hrsres/fact/sacomm.pdf">http://www.epa.gov/oerrpage/superfund/sites/npl/hrsres/fact/sacomm.pdf</a>
US EPA	Hazard Ranking System Guidance Manual	1992	Hazard Ranking		<a href="http://www.epa.gov/superfund/sites/npl/hrsres/index.htm">http://www.epa.gov/superfund/sites/npl/hrsres/index.htm</a> (EPA/540/R-92/026, OSWER-9345.1-07)
US EPA	How to Evaluate Alternative Cleanup Alternatives for UST Sites: A Guide for CAP Reviewers	2004	Remediation	Review of numerous technologies to treat fuel pollution	<a href="http://www.epa.gov/OUST/pubs/tums.htm">http://www.epa.gov/OUST/pubs/tums.htm</a> (EPA 510-R-04-002)
US EPA	Improving Site Assessment: Abbreviated Preliminary Assessments	2000	Assessments	A shortcut relying on professional judgment.	Not available on-line. (EPA 540-F-98-037) <a href="http://www.epa.gov/superfund/pubs/ipubs.htm">http://www.epa.gov/superfund/pubs/ipubs.htm</a>
US EPA	Improving Site Assessment: Combined PA/SI Assessments	2000	Assessments	Combines Phase I and II resulting in one continuous site investigation.	Not available on-line. (EPA 540-F-98-038) <a href="http://www.epa.gov/superfund/pubs/ipubs.htm">http://www.epa.gov/superfund/pubs/ipubs.htm</a>

Agency	Guidance Document	Year	Activity	Description	Web Address and/or Document Identifier
US EPA	Improving Site Assessment: Integrating Removal and Remedial Site Evaluations	2000	Assessments	May merge features of the removal and the remedial programs to reduce duplication of effort.	Not available on-line. (EPA 540-F-99-006) <a href="http://www.epa.gov/superfund/pubs/ipubs.htm">http://www.epa.gov/superfund/pubs/ipubs.htm</a>
US EPA	Improving Site Assessment: Pre-CERCLIS Screening Assessments	2000	Assessments	Phase I screening tool to determine if site is CERCLIS.	Not available on-line. (EPA 540-F-98-039) <a href="http://www.epa.gov/superfund/pubs/ipubs.htm">http://www.epa.gov/superfund/pubs/ipubs.htm</a>
US EPA	Integrating Removal and Remedial Site Assessment Investigations	1993	Assessments		Not available on-line. (EPA 540-F-93-038) <a href="http://www.epa.gov/superfund/pubs/ipubs.htm">http://www.epa.gov/superfund/pubs/ipubs.htm</a>
US EPA	Risk Assessment Guidance for Superfund (RAGS)	1989 1992	Assessments	Provides a framework for developing the risk information necessary to assist decision making at remedial sites.	<a href="http://www.epa.gov/oswer/riskassessment/ragsa/">http://www.epa.gov/oswer/riskassessment/ragsa/</a> (EPA 540-1-89-002) <a href="http://www.epa.gov/oswer/riskassessment/ragsb/">http://www.epa.gov/oswer/riskassessment/ragsb/</a> (EPA 540-R-92-003) <a href="http://www.epa.gov/oswer/riskassessment/ragsc/">http://www.epa.gov/oswer/riskassessment/ragsc/</a> (Publication 9285.7-01C) <a href="http://www.epa.gov/oswer/riskassessment/ragsd/">http://www.epa.gov/oswer/riskassessment/ragsd/</a> (Publication 9285.7-47)
US EPA	Soil Screening Guidance	1996	Assessments	A framework for developing risk-based, soil screening levels (SSLs) for protection of human health.	<a href="http://www.epa.gov/superfund/resources/soil/index.htm">http://www.epa.gov/superfund/resources/soil/index.htm</a> (Publication 9355.4-23)
US EPA	Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites	2002	Assessments	A companion to "Soil Screening Guidance"	<a href="http://www.epa.gov/superfund/resources/soil/index.htm">http://www.epa.gov/superfund/resources/soil/index.htm</a> (OSWER Publication 9355.4-24)
US EPA	Technical Guide to Ground-Water Model Selection at Sites Contaminated with Radioactive Substances	1996	Model	This report describes methods for selecting ground-water flow and contaminant transport models.	<a href="http://www.epa.gov/rpdweb00/cleanup/pubs.htm">http://www.epa.gov/rpdweb00/cleanup/pubs.htm</a> (EPA 402-R-94-012)



# California Environmental Protection Agency DEPARTMENT OF TOXIC SUBSTANCES CONTROL



Internet Address: [www.dtsc.ca.gov](http://www.dtsc.ca.gov)



STATE WATER RESOURCES CONTROL BOARD  
REGIONAL WATER QUALITY CONTROL BOARDS

Office of Public Affairs: (916) 341-5254  
Office of Legislative Affairs: (916) 341-5251

Financial Assistance information: (916) 341-5700  
Water Quality information: (916) 341-5455  
Water Rights information: (916) 341-5300

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

**NORTH COAST REGION (1)**

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5550 Skylane Blvd., Suite A  
Santa Rosa, CA 95403  
info1@waterboards.ca.gov  
(707) 576-2220 TEL • (707) 523-0135 FAX

**CENTRAL COAST REGION (3)**

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895 Aerovista Place, Suite 101  
San Luis Obispo, CA 93401  
info3@waterboards.ca.gov  
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**LAHONTAN REGION (6)**

www.waterboards.ca.gov/lahontan  
2501 Lake Tahoe Blvd.  
South Lake Tahoe, CA 96150  
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(530) 542-5400 TEL • (530) 544-2271 FAX

**SAN FRANCISCO BAY REGION (2)**

www.waterboards.ca.gov/sanfranciscobay  
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**LOS ANGELES REGION (4)**

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**COLORADO RIVER BASIN REGION (7)**

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**SANTA ANA REGION (8)**

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California Tower  
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**SAN DIEGO REGION (9)**

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9174 Sky Park Court, Suite 100  
San Diego, CA 92123  
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**CENTRAL VALLEY REGION (5)**

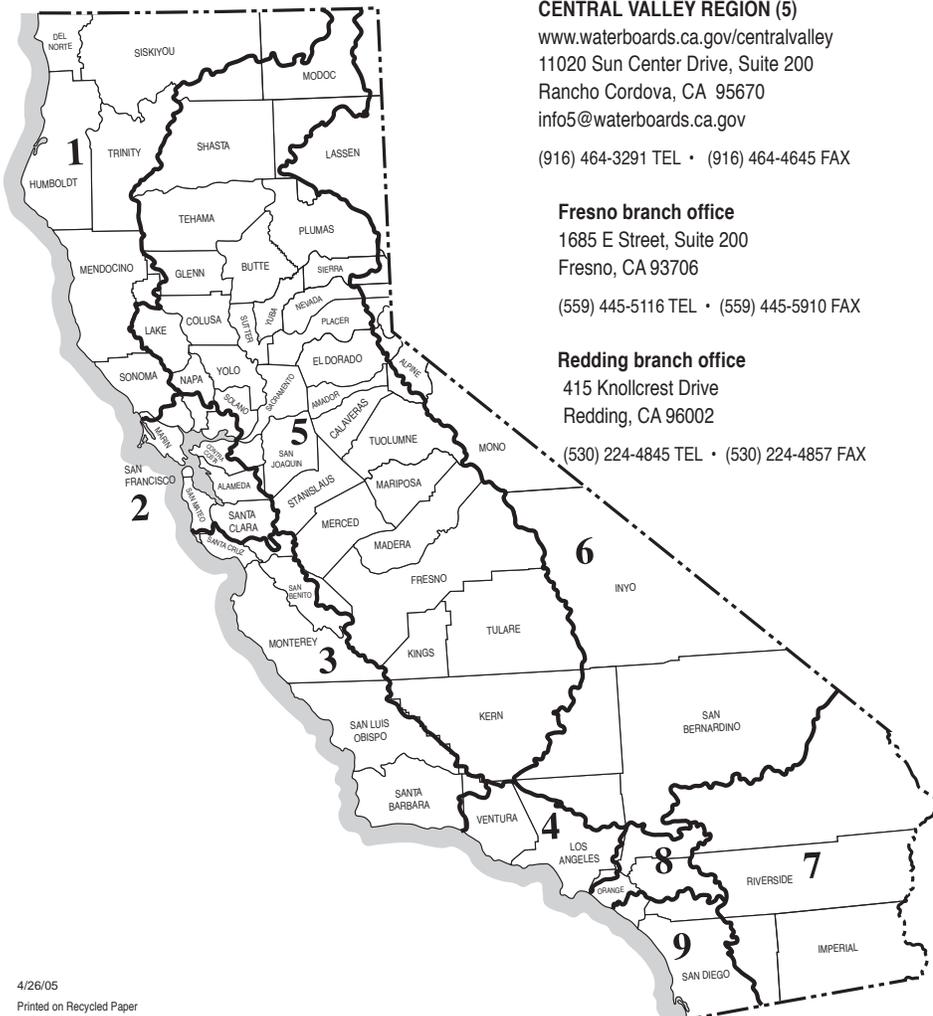
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