Alameda County Site Characterization Matrix – Making the SCM Approach More Than Just a Concept

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Environmental site characterization at LUST sites has traditionally been performed following standardized or "cookbook" scopes of work

Why has this happened?

Why have "cookbook" approaches been so widely applied?

- Some say that the huge number of LUST sites in the 1970s & 1980s necessitated a "cookbook" approach
- Nobody really knew what to do. Contaminant hydrogeology was a brand new field!
- Regulatory guidance was based on an assumption that contaminant plumes were simpler than they really are, so cookbook approaches were thought to be sufficient
- There was (and still is!) an assumption that LUST sites are less complex than other types of contaminant release sites (they are not) and therefore don't need such detailed characterization.
- We could get away with it! (at least until MTBE arrived). No consequences for poor site characterization.

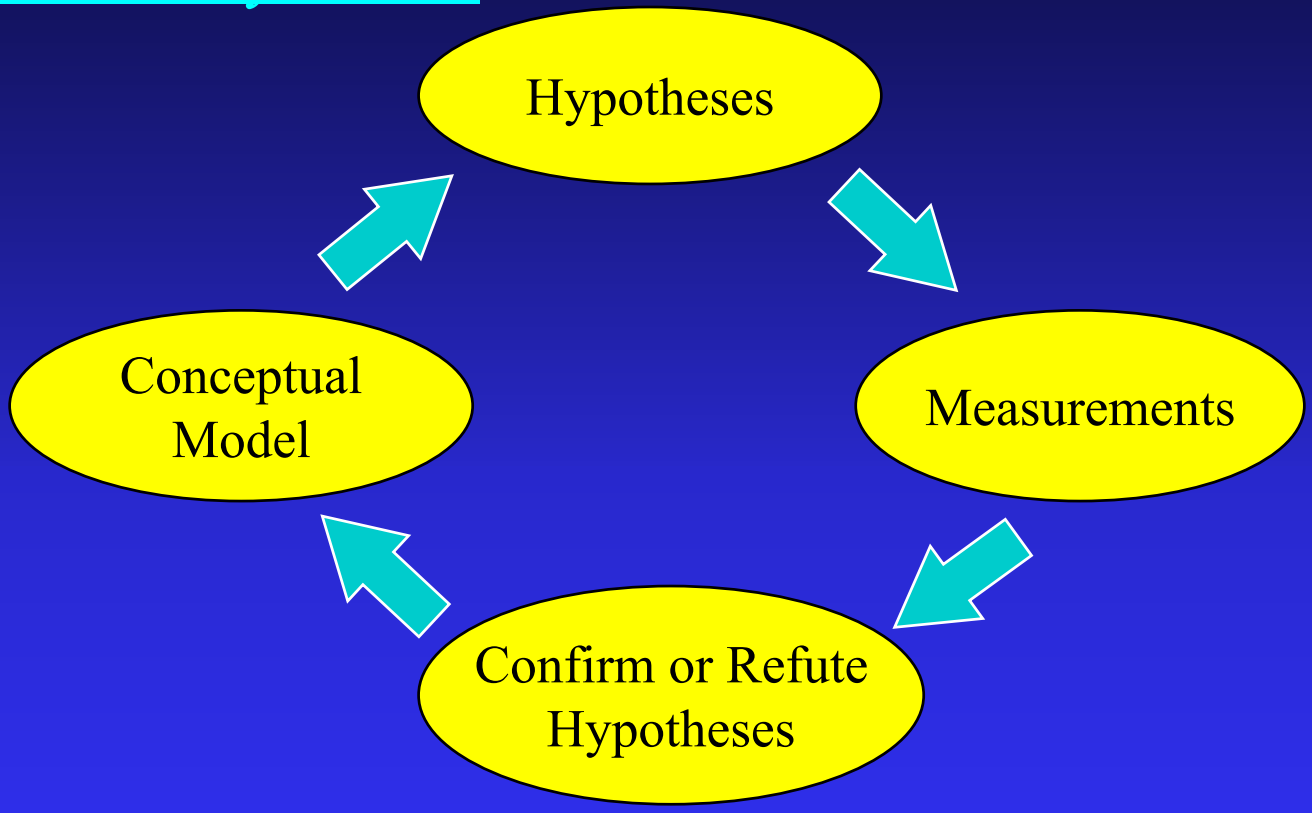
The result of these "standard" site investigations

- Typically a poor understanding of the nature, extent, and movement of subsurface contaminants
- Stacks of "boilerplate" reports that really don't answer even basic questions about the site conditions
- Use of conventional monitoring technologies (e.g. long-screened monitoring wells) result in systematic negative biases. Many sites therefore deemed to be "no problem" when they probably were
- Poorly-designed or inappropriate remediation systems
- Millions of dollars wasted on perfunctory site investigations and ineffective remediation

1990s

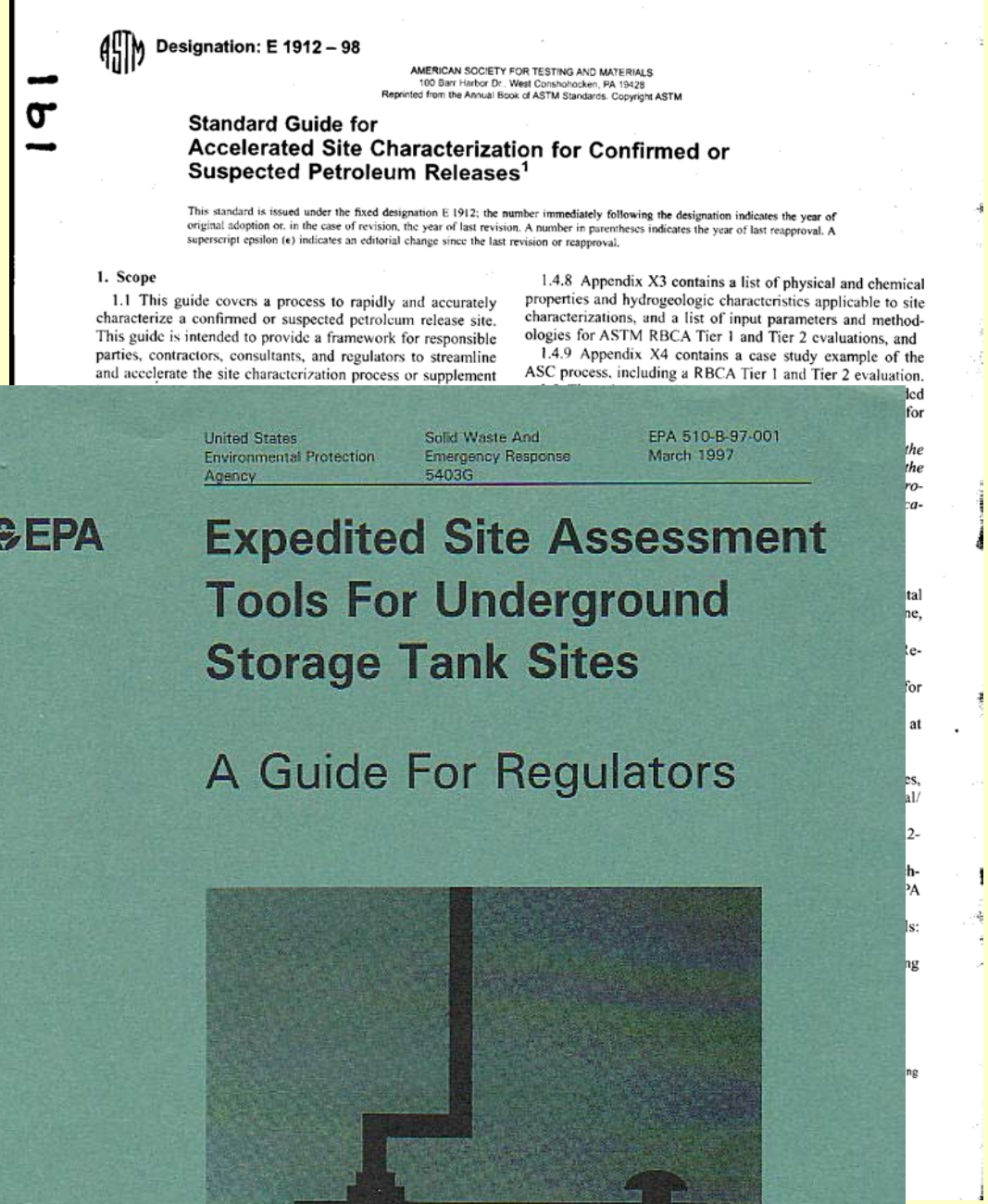
Efforts to apply a more scientific approach to environmental site characterization

*Development and refinement of a site **conceptual model** has been standard practice in geologic investigations for the last 100 years!*



Source: T. Chamberlain, 1897 Journal of Geology

EPA and many State agencies have embraced the idea of using *Site Conceptual Models* to guide environmental site characterization



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Standard Guide for Accelerated Site Characterization for Confirmed or Suspected Petroleum Releases[1]

This standard is issued under the fixed designation E 1912; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers a process to rapidly and accurately characterize a confirmed or suspected petroleum release site. This guide is intended to provide a framework for responsible parties, contractors, consultants, and regulators to streamline and accelerate the site characterization process or supplement

1.4.8 Appendix X3 contains a list of physical and chemical properties and hydrogeologic characteristics applicable to site characterizations, and a list of input parameters and methodologies for ASTM RBCA Tier 1 and Tier 2 evaluations, and

1.4.9 Appendix X4 contains a case study example of the ASC process, including a RBCA Tier 1 and Tier 2 evaluation.

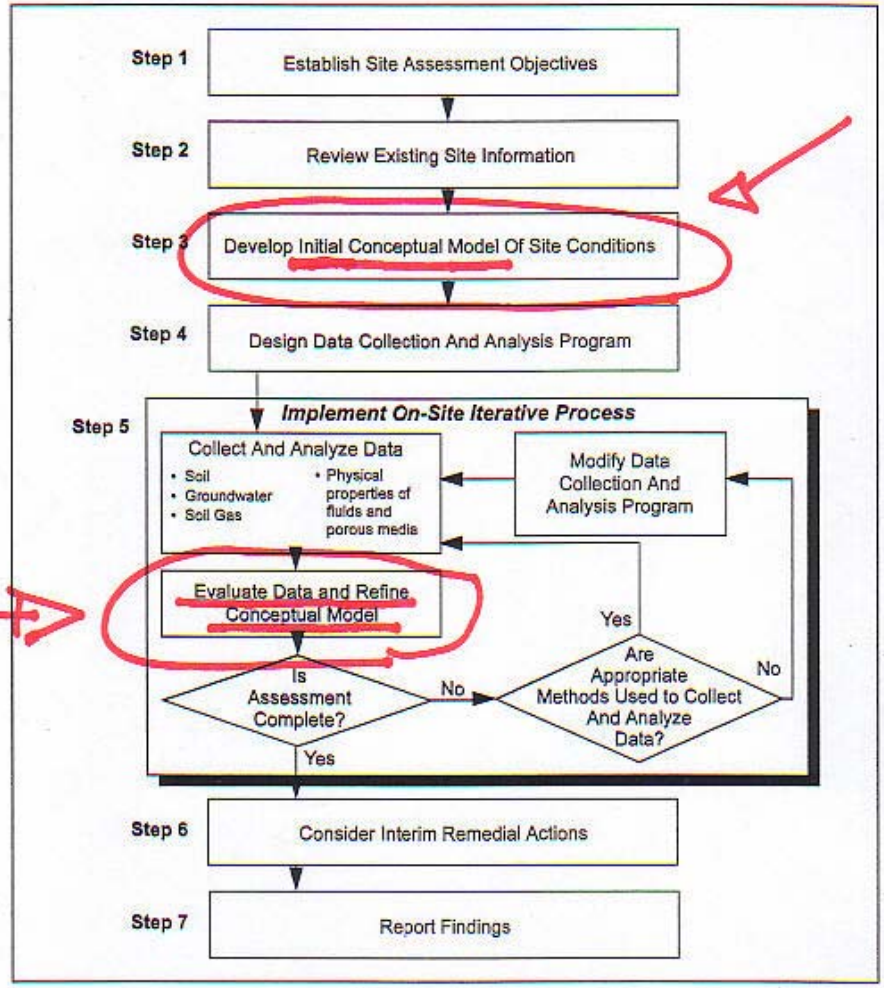
United States Environmental Protection Agency | Solid Waste And Emergency Response 5403G | EPA 510-B-97-001 March 1997

EPA

Expedited Site Assessment Tools For Underground Storage Tank Sites

A Guide For Regulators

Exhibit II-2
Expedited Site Assessment Process



Source: Modified from ASTM, 1995c.

Keys to success

- Thorough review of all data before beginning any field work
- Compilation of a reasonable initial SCM that incorporates all existing site data, the regional setting, and principles of contaminant hydrogeology
- Identification of data gaps requiring further investigation
- Thoughtful interpretation of the new data by an experienced professional & refinement of the SCM

Why is the SCM approach slow to catch on?

- Practices & protocol in the environmental industry are pretty well entrenched
- Few successful case studies exist where the SCM approach was used
- Clear guidance regarding the content, form, and communication of the SCM is lacking. "The devil is in the details"

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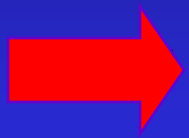

Clear guidance regarding the content, form, and communication of the SCM is lacking. "The devil is in the details"

Our goals

- Develop a “living electronic document” or interface for compiling and conveying the SCM to all project participants
- It should constitute a concise written and graphical summary of the SCM as it evolves before, during, and after the site investigation
- Eliminate superfluous reporting of nonessential “boilerplate” text
- To be developed and modified by the project professional overseeing the work while allowing direct feedback from the regulator
- Becomes an archive of the SCM that can be stored and communicated electronically

Our plan

- Develop a “living electronic document” for compiling and conveying the SCM to all project participants – introduced here today
- “Test drive” the matrix at a site in Alameda County (B&C/Desert Petroleum Livermore site)
- Modify as needed
- Seek peer review on approach & technical content
- Encourage wider use in Alameda County
- Convert to internet-based system

Presentation of Desert Petroleum Livermore Initial SCM

(See accompanying MS Word table having the same title)