

Phase II ASTM E 1903

Webinar

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Phase II Standard Guide E1903-97

- Published 1997; reissued 2002
- Linked to “all appropriate inquiry” criterion of CERCLA “innocent purchaser” defense
- “Good commercial and customary practices”
- “Objective” to evaluate “recognized environmental conditions” identified in Phase I assessment



CERCLA “Innocent Purchaser”

- Before 2002 amendments: 42 USC 9601(35)(B)

“To establish that the defendant had no reason to know ... the defendant must have undertaken, at the time of acquisition, **all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice** in an effort to minimize liability.”



Defense After 2002 Amendments

“To establish that the defendant had no reason to know ... the defendant must demonstrate to a court that—

- (I) on or before the date on which the defendant acquired the facility, the defendant carried out **all appropriate inquiries, as provided in clauses (ii) and (iv), into the previous ownership and uses of the facility in accordance with generally accepted good commercial and customary standards and practices; and**
- (II) the defendant took **reasonable steps** to—
 - (aa) stop any continuing release;
 - (bb) prevent any threatened future release; and
 - (cc) prevent or limit any human, environmental, or natural resource exposure to any previously released hazardous substance.”



Whither Phase II?

- ASTM review/revision cycle
- Changed regulatory framework
 - Former “objectives” no longer applicable
 - Phase II decoupled from Phase I, AAI
- Need to rethink standard
 - What purposes can it serve?
 - Can Phase II assessment be standardized?
 - What is analytical framework for Phase II assessment?



Phase II Revision Process

- **Task Group Composition**
 - “Users”
 - “Producers”
- **Process**
 - Meetings and drafting
 - Preliminary ballots
 - Final ballot
 - Resolution of negatives
 - Final publication



General Concepts re Assessment

- Responsibilities of User and Assessor
- “Conceptual Model” and “Target Analytes”
- Scientific Method



Responsibilities of User and Assessor

- Gathering information and framing objectives
- Information
 - Assessor: educate user about process
 - User: provide pertinent information “known to, and reasonably and practicably available to” user
 - Assessor: review “*reasonably ascertainable* information relevant to objectives”
- Framing objectives
 - Collaborative - iterative



Responsibilities of User and Assessor

- Exercise of professional judgment by assessor
- Beyond existing release reports, known conditions, Phase I RECs or data gaps ...
 - *Consider* “manner in which releases commonly occur in connection with commercial or industrial activities similar to” those at subject property
 - *Infer* areas to be assessed



Fact - E 1903 has transitioned from a “Guide” to a “Practice”

E 1903-97

- A **Standard Guide** provides an organized collection of information or series of options that does not recommend a specific course of action.

E 1903-11

- A **Standard Practice** defines a sequence of operations that that must be followed (*i.e.*, “shall” vs. “should”).



What Substances are Covered?

Scope (1.1) – Those including but not limited to:

- Those within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (*i.e.*, hazardous substances)
- Pollutants, contaminants, petroleum and petroleum products, and controlled substances and constituents thereof.



Basis and Goals of Procedures Used

Scope (1.1) - It specifies procedures based on the “**Scientific Method**” to characterize property conditions with the goal of being:

- Objective;
- Representative;
- Reproducible and;
- Defensible.



Relevant factors to Scope (1.1)

Scope (1.2) - The User and the Phase II Assessor **must consult each other** to define the scope and objectives of the Phase II considering factors such as:

- **the substances** released or possibly released at the property;
- the nature of **the concerns** presented by their presence or “likely” presence;
- the portion of the property to be investigated;
- **the information** already available;
- the degree of confidence needed or desired in the results;
- the “*degree*” of investigatory sampling and chemical testing needed to achieve such confidence; and
- any applicable **time and resource constraints**.



Relationship to E 1527/AAI

Phase II – The “Next Step” (1.1.2)

- A Phase II ESA in accordance with this practice may follow site assessment activities in accordance with Practice **E1527** for Phase I Environmental Site Assessments
- Practice **E2247** for Environmental Site Assessments: for Forestland or Rural Property
- EPA’s All Appropriate Inquiries (**AAI**) Rule, 40 C.F.R. Part 312, or
- Practice **E1528** for Limited Environmental Due Diligence: Transaction Screen Process.



Phase II not always “Tied” to the Phase I

Stand Alone Product (1.1.2) – Previous decisions to classify property conditions or areas as RECs, or to refrain from doing so, **are not** determinative as to whether investigation of the same conditions or areas is appropriate to meet the objectives of the *Phase II ESA*.

- Can be used **in any** situation in which a User desires to obtain sound, scientifically valid data concerning actual property conditions, **whether or not** such data relate to property conditions previously identified as RECs or data gaps in Phase I ESAs **(1.2)**.



Objectives of E1903 Phase II

- **Legal Hooks (AAI)**

- **1.2.1** Data Gaps/REC's (*i.e.*, confirm or refute releases)
- **1.2.2** BFPP Continuing Obligations (*i.e.*, reasonable steps to prevent or limit exposure to previous releases of H.S.) – **E 2790-11**
- **1.2.4** Human Health/Injury Risk or Potential Liability in Tort
- **1.2.5** Business Environmental Risk or Additional Appropriate Investigation

- **Regulatory Hooks**

- **1.2.3** Qualify for Brownfield Funding
- **1.2.6** Financial Disclosure Responsibilities with respect to Environmental Liabilities required for compliance with the Sarbanes Oxley Act of 2002



Scope on Relation to Objectives

- An “Iterative” Process

- Is the available information sufficient to meet the objectives of the investigation? (1.3.1)
- Do the objectives need to be refined or redefined – **A User Decision** (1.3.2).
 - Sampling is often an iterative sequence that concludes when the available data are sufficient.
 - Full site characterization in every instance **is not** required
- **Goal** = An investigation that meets the user’s objectives (1.3.3).



Needs of the User (1.4)

- What are the specific questions to be answered or problems to be resolved by the Phase II ESA?
- What is the **degree of confidence** desired by the user? (1.4.1)
 - **High Degree** may = More extensive testing and more iterations of sampling and analysis.
 - **“Yes”/”No”** may = Less testing and fewer iterations of sampling and analysis may be needed if the objectives of the assessment include only general conclusions.



Organization of Practice (1.6)

- **Section 1** - Scope of the practice.
- **Section 2** - Referenced Documents, Related Standards and other guidance
- **Section 3** - Terminology, contains definitions/acronyms
- **Section 4** - Significance and Use, including the legal context
- **Section 5** - Development and documentation of scope of the Phase II ESA
- **Section 6** - Phase II ESA Overview, with purpose and goal descriptions.
- **Section 7** - Comprises the main body of Performing the Phase II ESA
- **Section 8** - Discusses Interpretation of results
- **Section 9** - Preparing the Phase II ESA Report
 - **Appendix X1** – Legal Considerations Pertaining to Phase II Environmental Site Assessments
 - **Appendix X2** Contracting Considerations Between The Environmental Investigator and User
 - **Appendix X3** Optional Report Formats
 - **Appendix X4** Standards that may be relevant in Phase II Environmental Site Assessment



Terminology (3.)

Conceptual Model (3.1.11) - A representation of hypothesized current site conditions, which describes the physical setting characteristics of a site and the likely distribution of target analytes that might have resulted from a known or likely release, based on:

- All **reasonably ascertainable information** relevant to the objectives of the investigation; and
- The **professional judgment** of the Phase II Assessor.



Terminology (3.)

Likely Release Area (3.1.28) – A place where a Phase II Assessor judges it likely that target analytes were **first introduced** into environmental media as a result of a release such that the target analytes may now be present in environmental media at the property.

- Likely release areas can include, but need not be limited to, **recognized environmental conditions** identified in a Phase I ESA



Terminology (3.)

Phase II Assessor (3.1.33) – A person meeting

- the definition of an Environmental Professional as provided in Section 3.2.29 of E1527, **and**
- possessing sufficient education, professional training, and **relevant experience** to conduct or be in responsible charge of environmental investigations, and to **interpret the resulting data** to develop opinions and conclusions regarding the presence of target analytes in environmental media in connection with the property in question.
- The Phase II Assessor may be an independent contractor or an employee of the User. Some jurisdictions may have **licensing requirements** for individuals who perform certain environmental investigation activities



Terminology (3.)

E 1527 Environmental Professional (X2.1) –

- Hold a current **Professional Engineer's or Professional Geologist's license** or registration from a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) and have the equivalent of **three (3) years of full-time relevant experience**; or
- be **licensed or certified by the federal government**, a state, tribe, or U.S. territory (or the Commonwealth of Puerto Rico) to perform environmental inquiries as defined in §312.21 and have the equivalent of **three (3) years of full-time relevant experience**; or
- hold a **Baccalaureate or higher degree** from an accredited institution of higher education in a discipline of engineering or science and the equivalent of **five (5) years of full-time relevant experience**; or
- hold the equivalent of **ten (10) years of full-time relevant experience**.



Terminology (3.)

E 1527 Relevant Experience (X.2.2) –

- Participation in the performance of assessments or other site investigations that **may include** environmental analyses, investigations, and remediation which involve the understanding of surface and subsurface environmental conditions and the processes used to evaluate these conditions and for which **professional judgment was used to develop opinions** regarding conditions indicative of releases or threatened releases to the subject Property.
- A person who **does not** qualify as an environmental professional may assist in the conduct of all appropriate inquiries if such person is under the supervision or responsible charge of a an EP.



Terminology (3.)

Experience (3.1.33) – Overall, a Phase II Assessor should understand and be experienced in pertinent aspects of:

- The “**Scientific Method**”
- Hydrogeology
- Geochemistry
- Environmental investigation/exploration techniques
- Interpretation of chemical testing data, and commercial and industrial operations pertaining to the use and handling of site-specific target analytes and production and handling of associated wastes.



E 1903 Scientific Method (3.1.51)

- What is the question? (*i.e.*, Objective)
- Research (Phase I or Similar Effort)
- Hypothesis (What do you expect from the data?)
- Experimental Strategy (Scope of Work)
- Sample/Test (Implement Site Assessment Plan)
- Analyze Results (QA/QC, Did you answer the question?)
- Conclusion (The Answer is X. Now What?)
- Report (*i.e.*, = Phase II)



Significance and Use (4.1)

- Intended for use on a **voluntary basis** by parties who wish to evaluate known releases or likely release areas identified by the user or Phase II Assessor (4.1.1)
- Intended to meet the business community's need for a written, practical reference describing a **scientifically sound approach to investigating a property** to evaluate the presence or likely presence of a substance (4.1.2)
- The user must evaluate legal, business and environmental risks in light of known data relating to the particular site and transaction, and **in consultation** with legal and business advisors as well as the Phase II Assessor (4.1.2.1)



Significance and Use (4.1)

- Practice **does not** define the threshold levels at which target analytes pose a concern of significance to the User (4.1.2.2).
- Once ESA (conducted consistent with the scientific method) concludes that the question to be addressed has been answered, then further assessment **is not** warranted (4.1.2.3).
- Use **not Limited** to CERCLA – The Phase II has utility for a wide range of target analytes (including diffuse anthropogenic contamination and naturally occurring substances) (4.1.3).
- Scope of a Phase II ESA is site-specific and context-specific (4.1.4)
- Use by Other Parties okay, but must understand the assumptions and objectives & independently evaluate whether the earlier assessment **meets the needs** of other party (4.1.5)

Principles (4.2)

- Elimination of Uncertainty
- Failure to Detect
- Limitations of Information
- Chemical Analysis Error
- Level of Assessment
- Comparison with Subsequent Inquiry
- Data Usability
- Phase II Assessor Does Not Provide Legal Advice



Statement of Objectives (5.1.1)

The Assessor Must Identify in Writing (5.1.2)

- Schedule, cost or budget limitations applicable to the Phase II ESA;
- The number of iterations of sampling, or other activities that bear on the scope, schedule or cost;
- Limitations that will compromise the ability to conduct the Phase II ESA.



User Responsibilities (5.1.3)

The User **Should Provide** all pertinent documentation and information regarding the property's environmental conditions that are known to, and reasonably and practicably available to, the User, including:

- Previous ESAs, other environmental studies, and technical reports or documents pertinent to an understanding of the known or potential presence of target analytes at the property;
- oral histories concerning releases or disposal affecting the property; and
- the User's detailed knowledge of the nature of any specialized activities and operations conducted at the property that inherently pose the potential for the presence of substances on the property.



Phase II ESA Overview (6.)

Formulate the Question (6.4.1)

- What are the User's particular objectives(s)?
- The Phase II Assessor must formulate the hypothesis or hypotheses to be confirmed or refuted by the investigation.

Identify the areas warranting Phase II investigation (6.4.2)

- What sampling and chemical testing is appropriate to achieve the stated objective(s) of the assessment?
- Identify the areas to be investigated in light of all reasonably ascertainable information.



Phase II ESA Overview (6.)

Develop a Conceptual Model (6.4.3)

- **Consider** each area where target analytes are present or are likely present and that is to be investigated and
- Where the target analytes are **likely to be located now**, in light of the environmental behavior, fate, and transport characteristics of the particular target analytes.
- **Identify** target analytes based both on reported substance usage, generation or presence.
- **Determine** how the target analytes likely would have first entered the environment
- **Infer** the environmental media and locations currently most likely to have the highest concentrations of the target analytes given the possible mechanisms of first entry into the environment, the site's physical conditions, and the behavior, fate, and transport characteristics of the target analytes, based on both known site-specific information



Sampling and Testing (6)

- Plan the sampling and chemical testing to achieve **reproducible** chemical testing results for target analytes in samples of environmental media collected from locations **relevant to the objectives** of the assessment likely to have the **highest concentration** of target analytes (6.4.4)
- Carry out the sampling and chemical testing in accordance with the plan, making observations and **note of actual physical conditions** revealed by the investigation (e.g., subsurface soil and groundwater characteristics), and of any physical or logistical impediments to accomplishing the sampling and chemical testing as planned (e.g., physical barriers barring sampling at specified locations, insufficient sample volume recovered, etc.) (6.4.5).



Conceptual Model Validation (6)

- **Validate the conceptual model to determine:**
 - whether the available information is **consistent with the conceptual model** and sufficient to support sound conclusions regarding the presence and significance of target analytes
 - If the results are consistent with and **support the assumptions** of the conceptual model, and if the Phase II Assessor can draw sound conclusions regarding the presence of target analytes.
 - If the results of the latest round of investigation **are not** consistent with any conceptual model and the Phase II Assessor cannot draw sound conclusions regarding the presence of target analytes, then the Phase II Assessor and the user may consult to determine whether to conduct additional investigation.



Conclusions and Report (6)

Developing Conclusions (6.4.7)

- Base conclusions on an interpretation of **all results and findings**, and consistent with the **validated** conceptual model. The conclusions must specifically answer the question(s) the Phase II ESA set out to address or clearly state why those questions cannot be answered and what conclusions, if any, can be drawn.

Preparing the Report (6.4.8)

- The report should include the Phase II ESA objectives, findings, interpretations, and conclusions, along with
 - descriptions of the conceptual model
 - the investigation(s) performed,
 - observations made, and data obtained
- **in sufficient detail to allow another Phase II Assessor to reproduce the assessment and obtain consistent results.**



Performing the Phase II ESA (7.)

Initiating Scientific Inquiry by Formulating the Question to be Answered (7.1)

Collecting and Evaluating Information (7.2)

Identify Areas for Investigation (7.3)

Consider Past Activities and Operations, including any data gaps (7.3.2)

Developing the Conceptual Model (7.4)



Performing the Phase II ESA (7.)

Developing the Conceptual Model (7.4)

- **Determine the target analytes** – Composition of substances known or likely to have been present, used, handled, or released in connection with past activities at the property (7.4.1). Consider:
 - **the physical state** in which a target analyte was likely released or might otherwise be present (7.4.1.1)
 - the **potential transformations** of primary target analytes to secondary target analytes (7.4.1.2)
 - the **mechanism** by which the target analytes first enter into the environment (7.4.2)



Performing the Phase II ESA (7.)

Developing the Conceptual Model (7.4)

- **Behavior, fate, and transport characteristics** – The conceptual model must hypothesize where target analytes would likely occur now, given what is known about the release or likely presence, and considering physical, chemical and environmental factors that influence the persistence and migration of target analytes subsequent to their entry into the environment (7.4.3). Consider:
 - **the point of entry into the environmental media** (7.4.3.1)
 - a **3-D expansion** of the impacted zone (7.4.3.2)
 - factors affecting the behavior, fate, and transport (7.4.3.3)
 - the presence of **potential receptors, exposure points, and mechanisms of exposure** (when applicable) (7.4.3.4)



Performing the Phase II ESA (7.)

Developing a Sampling Plan (7.5)

- The chemical testing program must be designed, at a minimum, to seek target analytes **specific to the area under investigation**, in accordance with the conceptual model.
- the sampling plan should include the likely highest impacted (i.e., concentrations) areas (7.5.1)
- the sampling plan may broaden to determine the **distribution of target analytes** (i.e., not just presence/absence) (7.5.2)
- Sampling Strategies are left to professional judgment (7.5.3)
- the sampling plan should include personnel **health and safety precautions** to be followed in accordance with applicable federal law or state or local equivalents and any requirements imposed on the Phase II Assessor by the owner or occupant of the property, or by the user. (7.5.4)



Performing the Phase II ESA (7.)

Sampling (7.5)

- **Field Screening** to detect subsurface physical anomalies, potential migration pathways, and possible groundwater VOC plumes (7.5.6)
- **QA/QC** must be devised and followed (does not have to be separately written) to ensure representativeness of sample collection and integrity (7.5.7)
- **List Deviations** and **Reconcile** with the conceptual model (7.6)
- **Validate Assumptions** (*i.e.*, were samples collected of the appropriate environmental media, at the right depth and location, at the likely release area, etc.) (7.7.1)
- **Validate Chemical Testing Data** (7.7.2)



Interpretation of Results (8)

- **Naturally Occurring Target Analytes** to detect subsurface physical anomalies, potential migration pathways, and possible groundwater VOC plumes (8.1.1)
- **Comparisons to Numeric Criteria** must be devised and followed (does not have to be separately written) to ensure representativeness of sample collection and integrity (8.1.2)
- **Rendering an Opinion of No Impact** actual model (8.1.3)
- **Opinions Limited to releases and likely release areas** **only** where samples collected of the appropriate environmental media, at the right depth and location, at the likely release area, etc.) (8.1.4)



Interpretation of Results (8)

Failing to Meet the Objectives (8.1.5)

- If the Phase II ESA **fails to achieve the objectives** articulated in the “Statement of Objectives” for any reason, the results must be interpreted in relation to the objectives and any difference between objectives and results must be described and evaluated.
- The Phase II Assessor should determine the need for and scope of additional Phase II activities that may achieve the stated objectives unless the user redefines the objectives so that they can be met with the data available.



Phase II ESA Report Preparation (9)

Content

- Introduction - Statement of Objectives
- Summary of Relevant Background Information
- Scope of Work and Rationale
- Sampling Activities and Methods (including their relationship to the Conceptual Model)
- Analytical Data and Test Results
- Interpretation and Evaluation of Data
- Consistency Analysis in light of Conceptual Model
- Figures, Tables and Diagrams
- Phase II Assessor Signature



Optional Report Formats (X3)

Option A and B (A is Shorter)

- Statement of Objectives
- Scope of Work
- Sampling Activities (including their relationship to the Conceptual Model)
- Analytical Data and Test Results
- Interpretation and Evaluation of Data and Test Results in light of the Conceptual Model, leading to conclusions in relation to the objectives and questions to be answered.
- Figures, Tables and Diagrams
- Phase II Assessor Signature



Contracting Considerations (X2)

Consider

- Reporting Obligations
- Production of Written reports and Documentation
- Confidentiality
- Subcontractor Selection
- Limitation of Scope of Work, Data, Information, or Time
- Third party Reliance
- Generation of Waste
- Damages Caused by Exploration
- User Responsibilities (*e.g.*, Access)



Using the New Phase II Standard

- A way of *thinking systematically* about intrusive environmental investigation
- Requires “hands on” user involvement
 - Not just “get me a Phase II”
 - Purposeful definition of objective
- Provides user with control over assessment
- Improves utility of result



Using the New Phase II Standard

- **If you're a lender or insurance carrier ...**
 - **What do you want to know in reviewing a property or a risk?**
 - **Draft your own guidelines or default scope**
 - Couple to Phase I RECs?
 - **Look at “objectives” carefully**
 - Does this assessment prove “property is clean” – or are conclusions more limited?
 - **Educate your loan officers or underwriters**
 - Do “objectives” answer our questions?



Using the New Phase II Standard

- If you're a real estate developer ...
 - Develop your own default scope?
 - Involve relevant audiences
 - What does your lender or investor want?
 - What does your environmental insurer want?
 - Define “objectives” so they have what they need



Using the New Phase II Standard

- If you're a federal brownfields grant applicant ...
 - Need investigation per standard





Questions and Further Discussion

