

YEP MEETING

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DEEP's SITE CHARACTERIZATION GUIDANCE DOCUMENT (SCGD)

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ENVIRONMENTAL SITE ASSESSMENTS (ESAS)

- **ASTM International**
- **State of Connecticut**
- **Site-Specific**

ASTM INTERNATIONAL

Transaction Screen (TS) Process

**Phase I Environmental Site Assessment
(ESA)**

**Phase II Environmental Site Assessment
(ESA)**

ASTM PHASE I ESA

ASTM E-1527-13: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process

**Satisfies CERCLA “All Appropriate Inquiry” (AAI) rule.
(Innocent landowner)**

ASTM PHASE I ESA

Does not Meet all State of Connecticut Phase I Guidelines:

- Section 1.1.4: “Users are cautioned that federal, state, and local laws may impose environmental assessment obligations beyond the scope of this assessment.”
- Not inclusive of Phase I requirements in CT DEEP Site Characterization Guidance Document (SCGD)
- Recognized Environmental Conditions (RECs) are not same as Areas of Environmental Concern (AOCs)
- ASTM accepts de minimus conditions, which may be AOCs in SCGD

ASTM PHASE I ESA

AOCs that are not RECs, includes but not limited to:

- **Dumpsters;**
- **Loading docks;**
- **Septic systems; and**
- **Transformers.**

CONNECTICUT ESA GUIDELINES

**Transfer Act Site Assessment (TASA)
guidance document (1991)**

**Site Characterization Guidance
Document (SCGD)**

SCGD

Preamble of SCGD states “The TASA guidance document is superseded by this SCGD, except for limited use of TASA pursuant to CGS Section 22a-133w (voluntary site remediation in GB or GC areas). At such sites, TASA may be used in conjunction with this SCGD.”

SCGD

Published 2007, revised 2010

Standard of care for site characterization

Prevailing standards and guidelines

Acceptable to DEEP

Supplemental guidance

Phased approach to site assessments

CONCEPTUAL SITE MODELING

Phased approach of site characterization or assessment is CSM based

Prepare and modify CSM throughout site characterization

Use CSM to guide investigation and evaluate existing conditions

CONCEPTUAL SITE MODELING

An environmental story of the property that tells what the site is contaminated with and at what levels, how and when it was contaminated, how the contamination moves, and who or what is at risk.....TNW

CONCEPTUAL SITE MODELING

CSM summarizes nature and distribution of contamination needed to evaluate potential impacts to human health and the environment

Serves as basis and rationale for site investigation

Based on scientific inquiry

CONCEPTUAL SITE MODELING

Define purpose of investigation

Develop preliminary CSM

Identify and resolve data gaps

Refine CSM with new data

CONCEPTUAL SITE MODELING

Identify and resolve new data gaps

Continue CSM processes until a final CSM can be validated, all DQOs have been met, and final CSM is consistent with findings.

Document CSM at each phase

ESA PHASES

Phase I: Identify AOCs that have potential of release

Phase II: determine whether a release occurred at each AOC

Phase III: delineate three-dimensional extent of each release. Also characterize site hydrogeology, distribution of contaminants, and fate and transport of contaminants.

Combination of Phases

ESA PHASES

Expedited Site Assessments (ExSA)

Rapid Response Site Assessments (RRSA) for sites with potential of immediate or severe threat to human health or the environment (emergency response)

CT PHASE I ESA

Identify Areas of Environmental Concern (AOCs)

AOCs are areas where hazardous waste and/or hazardous substances have been or may have been used, stored, treated, handled, disposed, spilled and/or released to the environment.

Evaluate historic and current site uses and operations

CT PHASE I ESA

Identify substances of Concern

Identify constituents of concern (COCs)

Identify release mechanisms and potential migration pathways

Enough detail in Phase I to prepare a work scope for a Phase II ESA (as warranted)

PARTS OF A PHASE I ESA

Site description

Site History

File Reviews – state, federal, and local

SCGD lists specific files to search

Review of previous reports

Environmental setting

Physical—geology, hydrology, topography, ecology

Cultural—land and water use, site changes

PHASE I ESA

Site Walkover Survey – document observations

Description of site layout and operations

Prepare Phase I ESA report

Summary of factual information – site description, site history, file review findings, environmental setting, and walkover survey results

Develop preliminary CSM

CT PHASE II ESA

Purpose to assess if release occurred at AOCs shown in Phase I ESA

Release is COC concentration > reporting limits in analytical procedure

Not a release if representative of background

Use CSM approach

Prepare detailed work scope

CSM APPROACH TO PHASE II INVESTIGATIONS

Sampling and analysis program with Data Quality Objectives (DQOs)

Release information needed for sample collection – soil vapor, soil, groundwater and surface water and sediment

Substances released to determine COCs

Contaminants fate and transport characteristics and pathways

DESIGN AND IMPLEMENT PHASE II INVESTIGATION

Some sampling needed to assess potential release

Much rationale needed to justify no sampling

Bias sampling to where release may be

Multiple lines of evidence may be needed to demonstrate a release did not occur

DESIGN AND IMPLEMENT PHASE II INVESTIGATION

Field screening to determine sampling locations

Analytical data are needed to confirm a release occurred or not

Consider all potential release mechanisms at each AOCs

FATE AND TRANSPORT AND MIGRATION PATHWAYS

Characteristics of COC

Migration path and preferential pathways

Chemical and physical changes to COCs

How COCs interact with the environment

Temporal considerations

Preferential pathways

SAMPLE COLLECTION AND ANALYSES

Sampling and analysis plan with rationale

Use standard of care and prevailing methods

QA/QC

Selected methods should be sufficient to detect release

DQOs

EVALUATION OF PHASE II INVESTIGATION RESULTS

Determine if DQOs have been met

Update CSM and identify data gaps

Phase II significant data gaps are those that prohibit making conclusions regarding releases

Make conclusions whether a release occurred for each AOC

EVALUATION OF PHASE II INVESTIGATION RESULTS

Detections from release or background

**Not appropriate to compare Phase II
detections to RSRs to assess whether a
release occurred**

**Compare Phase II detections to SEH
thresholds**

CT PHASE III ESA

A Phase III ESA:

- **Provides information that control migration of contaminants via transport through environmental media and subsurface structures;**
- **Defines 3-dimensional extent of contaminants;**
- **Evaluates dynamics of distribution and concentrations of contaminants; and**
- **Identifies receptors.**

DESIGN AND IMPLEMENTATION

Should be designed and implemented to provide information about:

- **Geologic and hydrogeologic setting**
- **Data gaps from previous investigations;**
- **Three-dimensional extent of release to soil, ground water, or other media);**
- **Rationale for selection of sampling locations, analytical methods parameters and methodologies based on CSM, DQOs, and professional judgement.**

NON-AQUEOUS PHASE LIQUIDS (NAPL)

Present as mobile, separate-phase, immobile, or sorbed onto soil grains.

Consider site soil and bedrock characteristics.

Identify source and evaluate spatial distribution.

OTHER MEDIA

May need to assess for extent and possible impacts to receptors.

Surface Water

Sediment

Soil Vapor – vapor intrusion

Indoor Air

MODELING

Represent an environmental system and fate and transport.

Can be used to select well placement and remedial design.

EVALUATION OF RESULTS

In context of CSM and DQOs

CSM validated when all significant data gaps are filled and only one CSM is supported by existing data

More data needed if can't support above

EVALUATION OF RESULTS

Site investigation sufficient when:

Refined CSM consistent with data.

No remaining significant data gaps.

QA/QC defensible.

Able to evaluate risk and need for remedial action.

ECOLOGICAL CONSIDERATIONS

More investigation may be needed to assess potential impact to ecological receptor.

Per RSRs, ecological risk assessment (ERA) may be needed in accordance with EPA (1992) guidelines.

DEEP has no guidelines.

Consult DEEP.