Introduction to the Conceptual Site Model (CSM)

A CSM is a written and illustrative description of the release site (based on all known environmental and site information) and is the primary communication tool utilized between all release stakeholders. An updated CSM is required in all reports submitted to ADEQ. CSM development is a dynamic process that continually incorporates new site information, beginning from release discovery through release closure.

A thoroughly developed CSM should identify the following:

- The risk associated with a release
- The remedial objectives
- Next steps to be taken
- Data gaps

ADEQ strongly recommends incorporating the Triad Approach early into the CSM development process (see Section 5.0 of the Site Investigation Guidance Manual for more information, which can be found on ADEQ's website here: https://www.azdeq.gov/environ/waste/download/SI_Guidance_Manual_Final.pdf). This approach identifies systematic project planning, real-time measurement technologies and dynamic work strategies as pillars that lead to reducing project uncertainty.

Site characterization efforts lead to the development of an initial CSM. The CSM is continuously refined as corrective action efforts are implemented and new project data is gathered. It is important to know where your project is within the CSM, but it is also important to understand that this dynamic process is not linear and that new information may lead to reassessing work that has already been completed. Developing, refining and understanding the CSM will lead to targeted risk reduction and reduced project time and costs.

The following table depicts the components of a CSM.

Components of a Conceptual Site Model	
Data Gathering	
• Release discovery • Triad approach • Source definition • Site/release understanding	• Plume delineation • Hydrogeological testing • Point of exposure identification
Data Evaluation	
• Point of exposure pathway evaluation • Site-specific target level calculations • Mass calculation	• Identify data gaps • Active remediation determination
Remedial Method Implementation	
• Clearly define remedial objectives • Determine treatment area • Identify critical data needs for the selected remedy	• Identify performance metrics • Establish performance milestones • Identify environmental data needs
Remedial Method Evaluation	
• Incorporate new data • Determine whether performance metrics were met	• Determine whether release objectives were met • Identify data gaps
LUST Closure	

The following pages contain instructions and guidance for the standardized electronic CSM that will be required for the UST Revolving Fund Preapproval Program.

Electronic CSM Instructions and Guidance

A standardized electronic CSM has been developed that is designed to record comprehensive site information in a cumulative fashion to allow the preparer to efficiently add site information as the project progresses; as such, data and information should not be removed from the report except for items being replaced with updated information (e.g. groundwater sample data, groundwater contour maps, O&M data, etc.).

All collected environmental and remediation data must be included in this report in the appropriate tabs. It is important that the existing format and/or formulas included in cells are not altered. Excel sheets with no data must not be deleted from the workbook or macros embedded in the file may no longer work properly. Further, tabs must not be renamed, added or moved.

Many of the cells requiring data entry include drop-down lists to allow for consistent responses. All cells that require data or information must be populated. Cells that perform calculations or summations are shaded gray and should not be accessed.

Additional instructions are included throughout the CSM. These are provided as comments in cells that have the red triangle in the upper right hand corner.

Where to Find Information to Fill Out the CSM

If this is a new release, there may not be much more information available to fill in other than soil sample data collected during release confirmation activities.

If the person filling out the CSM is not familiar with the site, Facility and LUST files are available by contacting the Records Center at 602-771-4380 or email to RecordsCenter@azdeq.gov.

The following reports/documents in the files are the most useful to find the data necessary to populate the CSM:

1. Site Characterization Report or Corrective Action Plan
2. Most recent Periodic Site Status Report
3. Any report with comprehensive soil/groundwater tables
4. Soil boring logs
5. Lab reports

What to Look For When Reviewing Data/Files for the CSM

Below are some examples of site conditions that sometimes occur that may influence future corrective actions:

Cause	Possible Effects
Increasing or decreasing groundwater elevation trends or significant groundwater elevation fluctuations	Dry wells
	Submerged screens
	Changes in COC concentrations
	Changes in free product thickness
	Displaced source
	Submerged source
	Seasonal contamination (due to seasonal groundwater elevation fluctuation)
	High groundwater – Influent VOCs into SVE system is low, but groundwater COC concentrations high
	Low groundwater – Influent VOCs into SVE system is high, but groundwater COC concentrations low
Hydrogeological conditions	Inconsistent groundwater contours
	Changes in flow direction
	Plume axis not in line with groundwater flow direction
	Vertical groundwater gradient
Active UST system leaking (onsite or offsite upgradient source)	Shift in COC concentrations in soil, soil vapor, or groundwater (old vs. new)
	Unexplained spike of influent VOCs into SVE system
	Unexplained spike of groundwater COC concentrations
Improper well construction/placement of wells	Well may not allow representative samples to be collected
	Need to abandon wells
	Need to install new wells