Printed from: Interstate Technology & Regulatory Council (ITRC). 2019. *Implementing Advanced Site Characterization Tools*. ASCT-1. Washington, D.C.: Interstate Technology & Regulatory Council, Advanced Site Characterization Tools Team. https://asct-1.itrcweb.org.

2 ASCT Implementation

The implementation of ASCTs involves selecting the appropriate tool, applying the tool in an appropriate location, and performing basic data interpretation. Considerations for use of an ASCT may include but are not limited to:

- Does it fill data gaps and meet data quality needs?
- Is it technically feasible? (for example, are there constraints on use of the ASCT such as limitations due to area and depth of coverage or availability of the tool)
- Will it be approved by the regulator? (for example, use may vary by purpose such as screening versus investigation)
- Are trained and qualified contractors available within the geographic area?
- Is it sensitive to the contaminant of concern?
- Does it provide additional value or potential value to the investigation?
- Does it support existing data for multiple lines of evidence?
- What is the data collection objective? (for example, screening, delineation, pilot testing, monitoring, remediation)
- What is the form of data output? (for example, real-time data, electronic usability)
- Is it a dynamic or static tool? (for example, is it supplemental to an existing investigation?)
- What is the urgency? (for example, is it a public or ecological risk? Is the affected public demanding action?)
- How much time will it take to complete?
- Will it help evaluate site concerns and achieve end goals?

2.1 Tool Selection

Selection and proper use of any investigative tool is fundamental to a successful project and is the responsibility of the project team. The use of an ASCT should be considered at the onset of an investigation. Final selection of appropriate investigation tools and techniques occurs once a CSM is developed, data gaps are identified, and data collection planning is complete.

2.1.1 Data Needs

Often, several different tools can be used to meet a specific data collection objective. In addition, many ASCTs provide qualitative rather than quantitative data which is important to consider. Selecting the optimum tool or combination of tools relies on several factors, including:

- ability of the tool to effectively provide data given site conditions
- availability and cost of the tool
- reliability of the tool
- familiarity with the tool
- expertise required to use the tool
- expertise required to interpret data from the tool
- acceptability of data generated to stakeholders

2.1.2 Cost and Value Considerations

ASCTs are generally perceived as expensive to use; however, the amount, precision, and accuracy of data generated using ASCTs are often greater than traditional sampling techniques (for example, soil borings, monitoring wells) and can result in cost savings over the life of the project. The value of an approach is not always monetary, but may also be measured based on time, convenience, social impact, or other qualitative impacts. During the tool selection process, it is important to consider the monetary costs, the value added by the investigation, and whether the technology is appropriate for the site.

2.1.3 Cost Benefit Comparison of Traditional Tools vs. ASCTs

A cost-benefit analysis using the following approach allows the merits of advanced and traditional tools at a particular site to be evaluated:

- Outline all potential costs that will be incurred using a particular tool or approach.
- Compare to the total expected benefit to determine whether the proposed action is advisable. (Note: The overall benefit associated with a proposed action should outweigh the incurred costs.)
- Compare to alternatives for which all potential costs are also outlined.
- Record all anticipated benefits associated with the potential action.
- Weigh all identified costs relative to the expected benefits to determine whether the positive benefits outweigh the negative costs.

2.2 Tool Application

Advanced site characterization tools (ASCTs) can be used to identify locations and depths where quantitative data should be collected, to support the characterization of subsurface geology and hydrogeology, and to improve or complete a CSM. Applying ASCTs is particularly effective:

- at sites where conventional tools are incapable of providing data of sufficient density or quality
- in complex hydrogeological conditions (for example, fractured bedrock, karst, intricate alluvial channel systems)
- at sites where existing remedial strategies have not been effective or where remedial strategy effectiveness is sensitive to the precise distribution of a contaminant in the subsurface
- during emergency response situations when timely decision making is required

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