



U. S. Environmental Protection Agency’s Environmental Sampling & Analytical Methods Program

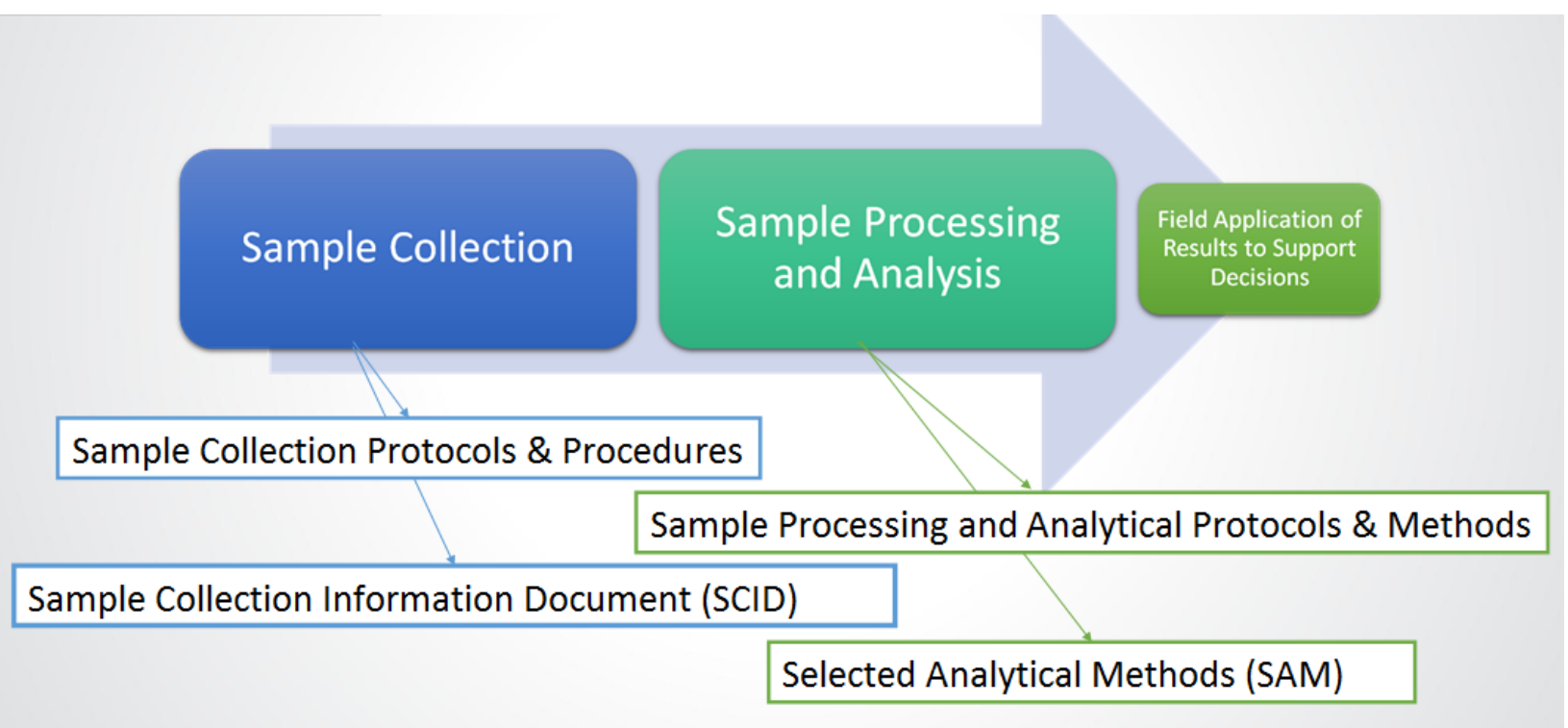
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<https://www.epa.gov/homeland-security-research/environmental-sampling-analytical-methods-esam-program-home>

Introduction

The Environmental Protection Agency (EPA) developed a comprehensive Environmental Sampling & Analytical Methods (ESAM) program to facilitate a coordinated response to a chemical, radiochemical, biotoxin, or pathogen contamination incident. The program supports EPA’s Environmental Response Laboratory Network (ERLN), including the Water Laboratory Alliance (WLA), and the response community. ESAM is composed of field and laboratory ready documents and web based tools focusing on sample collection, processing and analysis to facilitate site characterization, remediation, and release. The Sample Collection Information Document (SCID), within ESAM, provides general information for use by EPA, and its contractors, when collecting samples during contamination incidents and environmental remediation efforts. Sampling procedures will be used to guide collection of post incident environmental and urban matrices samples specifically intended for analysis using the selected methods. Sampling strategies provide a framework to assist decision-makers in developing and implementing an approach for post incident sample collection. Working with EPA and other federal, state, and local experts, the Selected Analytical Methods (SAM) document, a compendium of analytical methods to be used when responding to contamination incidents within ESAM, was developed. Multiple laboratories may be used to conduct sample analysis during an incident. Ensuring that all laboratories use the same analytical method provides comparable data and eliminates the need to convert or extrapolate data generated from different methods; thus, allowing stakeholders to assess the situation and make decisions in a timely manner. SAM methods and information in the SCID are available as an online document and via a searchable database to provide quick access during an incident.

ESAM Features



- Sampling: Readily available sampling procedures and strategies for use in the field by sample collectors
- SCID: Online resource to facilitate field sample collection and laboratory requirements for large numbers of samples
- SAM: Readily available analytical methods for laboratory use
- Query Tool: Online resource identifying best available analytical method to be used by multiple laboratories during a large homeland security incident

Sample Collection Information Document (SCID)



Figure 2. Covers of SCID Documents

SCID: Developed to facilitate transfer of field samples to the analytical laboratory by indicating specific requirements for:

- Sample size collected
- Sample container
- Holding time
- Sample preservation
- Packaging
- Shipping labels

ESAM Website

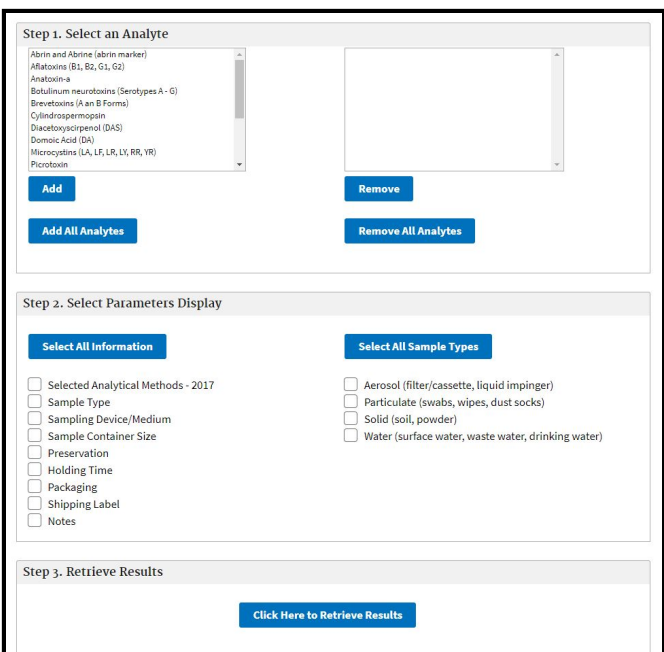


Figure 3. SCID Search Tool Parameters

SAM Webpage: In addition to providing access to the SAM 2017 document, the SAM web page hosts a SAM 2017 query tool that permits searches for methods based on analyte of concern, sample matrix type, or the capabilities of laboratories. The site also has full documentation of publicly available laboratory methods, links to the companion documents and sample collection procedures, and links to technical contacts and key collaborators. The SAM webpage can be accessed via the ESAM website at <https://www.epa.gov/homeland-security-research/sam>

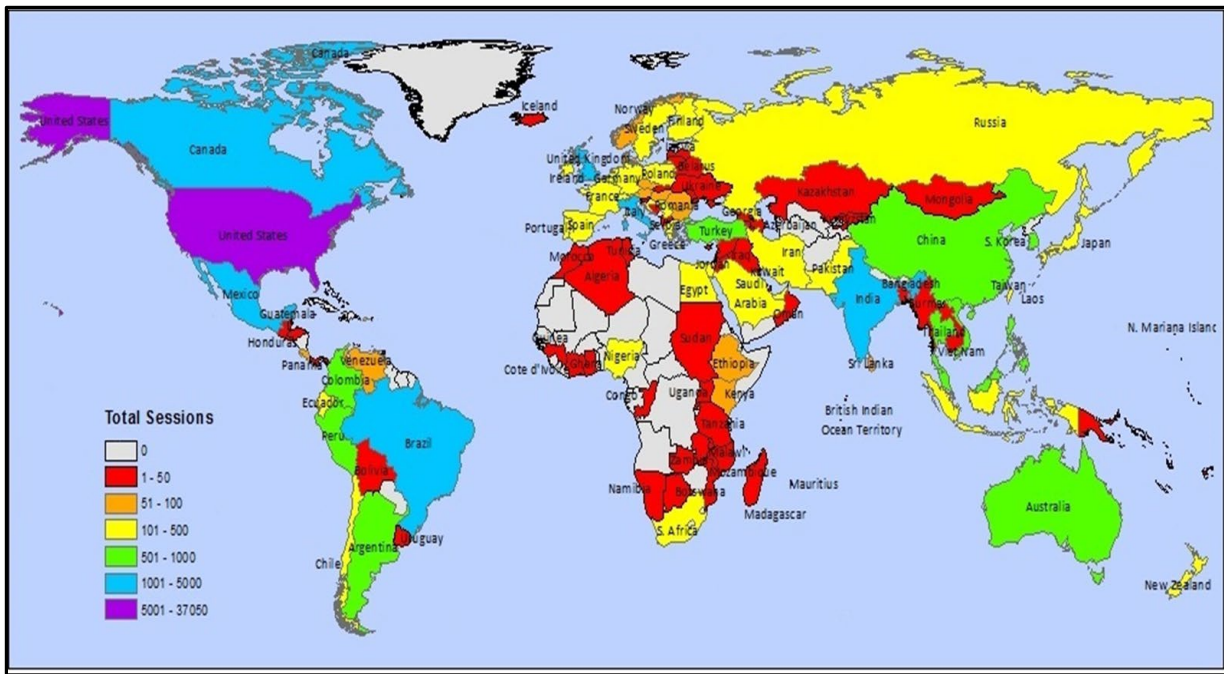


Figure 5. SAM 2012 World Access

Selected Analytical Methods (SAM)



Figure 6. SAM 2017 Cover

SAM: EPA’s Selected Analytical Methods for Environmental Remediation and Recovery (SAM) 2017 document represents a balance between providing existing, documented techniques and providing consistent and valid analytical results, and serves the critical need for fast and accurate laboratory analyses during environmental remediation and recovery following an incident.

SAM is unique in that it identifies a single selected method for each analyte/sample type pairing (e.g. soil, water, air). Using the same set of methods:

- Permits sharing of sample load between laboratories
- Increases the speed of analysis
- Improves data comparability
- Simplifies potential outsourcing for analytical support

Chemicals	Radiochemicals	Pathogens	Biotoxins
• 145 analytes • 5 sample types: – Solids – Non-drinking water – Drinking water – Air – Wipes	• 36 analytes • 10 sample types: – Drinking water – Aqueous & liquid phase – Soil & sediment – Surface wipes – Air filters – Vegetation – Brick – Concrete – Asphalt matrices – Asphalt shingles	• 33 analytes • 5 sample types: – Aerosol – Particulate – Soil – Drinking water – Post decontaminati on waste water	• 17 analytes • 5 sample types: – Aerosol – Solid – Particulate – Non-drinking water – Drinking water

Table 2. SAM 2017 Overview

Selected Analytical Methods (SAM 2017) Updates:

- Added outdoor building and infrastructure material sample types for radiochemistry analytes
- Added soil sample type for pathogens
- Assigned applicability tiers to pathogen and biotoxin methods
- Added analytes to chemistry, radiochemistry, pathogen and biotoxin sections
- Added considerations regarding the potential impacts of decontamination agents on the analytical performance of selected radiochemical methods
- Changed the names of “aqueous liquid” (chemistry methods sample type) and “liquid water” (biotoxin methods sample type) to “non-drinking water” to clarify that the sample type applied to all non-drinking water aqueous sample matrices.

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