

Onsite Laboratory Services

THE RIGHT ANSWERS, THE FIRST TIME

Onsite Labs Aren't Just for Screening Anymore

Stone Environmental, Inc. generates, manages, and presents fully defensible analytical chemistry data onsite, offering the subsurface investigation and remediation community a timely and extremely reliable product.

Our services are essential for today's expedited site characterization methods (most notably the Triad approach) that streamline site investigations and remedial decision making. These methods employ dynamic work plans and real-time analytical data to ensure that

the right decisions are made in the field and that a comprehensive understanding of the site is gained during the investigation.

Our onsite labs are NELAC accredited and offer the following:

- High-quality, defensible data
- Low detection limits that meet project objectives
- Rapid turnaround times
- High sample throughput
- Mass spectrometer compound identification
- Membrane Interface Probe (MIP) analyses

In addition to our mobile laboratory trailers, we can establish long-term onsite labs to meet client needs during large-scale remediation projects.

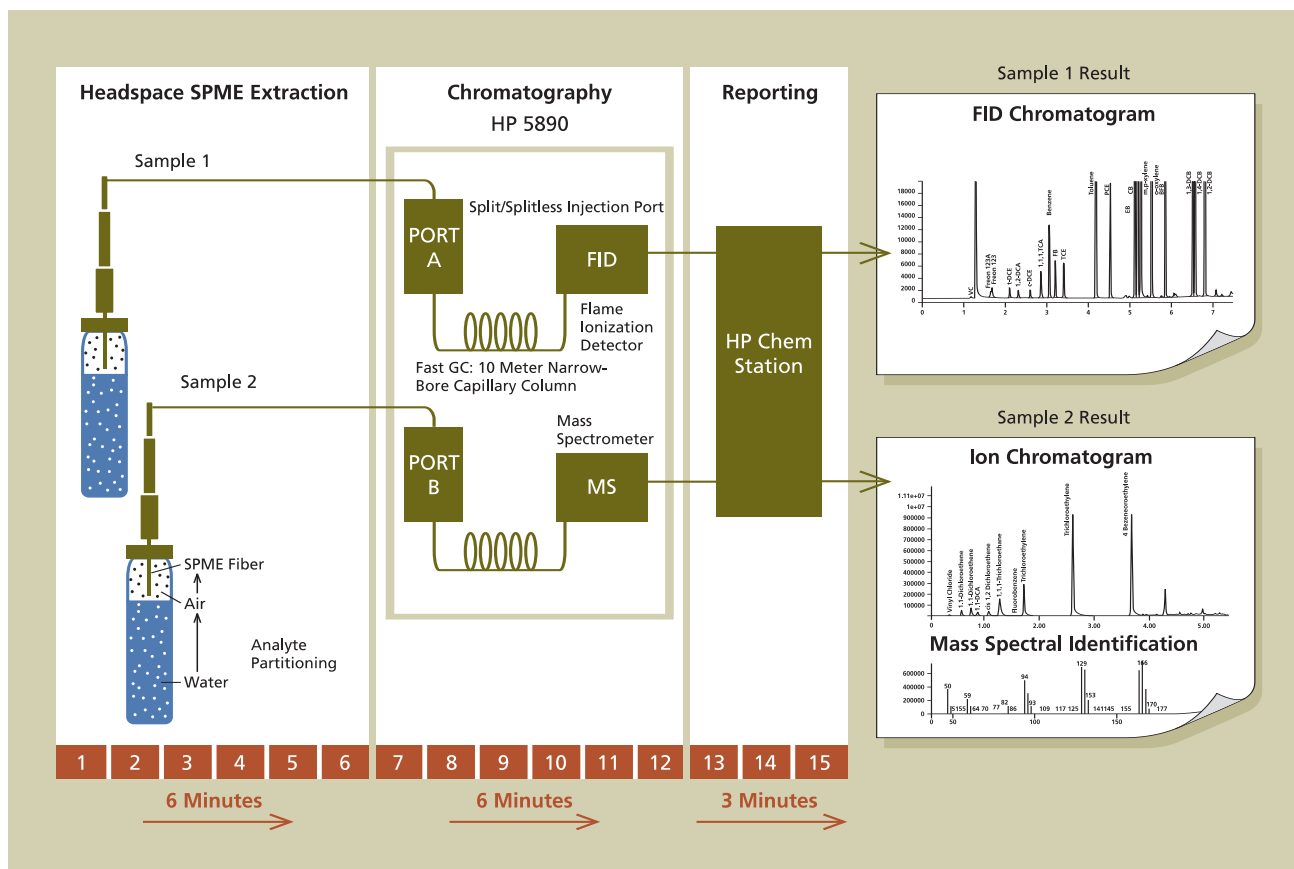
Solid Phase Microextraction: A Technological Advancement

Solid Phase Microextraction (SPME) allows us to provide an unmatched combination of quality, speed, and economy to our clients. SPME is a relatively new sample concentration technique for air, water, and soil matrices. We use both available SPME configurations—headspace and immersion—in our labs depending on the volatility of the compounds of interest. SPME requires no solvents and is performed using fast, inexpensive, and easy-to-use equipment that is designed for field applications. A typical sample extraction using SPME for chlorinated solvents and petroleum-related compounds takes us only 6 minutes. As a result, our labs not only offer faster turnaround times, they have less downtime than onsite labs using more complicated extraction systems, such as Purge and Trap.



Our onsite labs bring high-quality, cost-effective laboratory capability to your site to support critical decision making.

**Typical Onsite Lab Analytical Sequence and Timeline:
Maximized Throughput, Minimized Turnaround**



In 15 minutes or less, our clients have access to the data they need, so they can make immediate field decisions to expedite their investigations.

SPME Outperforms Other Extraction Techniques

	Purge and Trap	Heated Headspace	SPME
Startup costs¹	\$10,000–\$20,000	\$1,000–\$3,000	\$1,000
Field sample throughput per 10-hour day²	20 samples	20 samples	>50 samples
Cost per sample	\$60	\$60	\$20
Detection limits	Single ppb	Tens of ppb	Single ppb
Precision and accuracy³	Adequate	Adequate	Excellent
Maintenance requirements	Extensive	Moderate	Minimal

¹ Assumes two full setups for SPME, one 16-port purge and trap unit, and one temperature-controlled water bath and circulator for heated headspace.

² Throughput in addition to 20% QA/QC runs.

³ "... according to the statistics for comparison of an alternative method to a reference method, the accuracy of the two SPME approaches was significantly better than that of P&T and HS [heated headspace] in a number of cases, especially for HS-SPME . . ." (T. Nilsson, R. Ferrari, and S. Facchetti. *Analytica Chimica Acta*, 356 [1997], 113-123.)



SPME equipment is extremely user friendly and requires very little space. As shown in this photo, a single bench top (2'x 6') accommodates 5 simultaneous sample extractions.

We coordinate with our clients to provide the most suitable analytical techniques to meet project objectives based on the compounds present and the detection limits required. For VOC and SVOC analyses, we combine gas chromatography with:

- MS
- FID
- PID
- ECD

We also offer spectrophotometric and ion-selective electrode analyses of groundwater samples for metals and inorganic ions associated with natural attenuation.

Near-Real-Time Data for a Fraction of the Cost

A dynamic field investigation is only as fast as its slowest component. In addition to the shortened extraction times of SPME, our chromatographic system uses dual components—two injectors, 10-meter narrow-bore capillary columns, and detectors—configured in parallel to double the sample throughput normally achieved with a GC.

We can analyze two samples for chlorinated solvents and BTEX compounds simultaneously in less than 15 minutes. With a throughput of as many as 50 samples per instrument per 10-hour day, we provide more data—faster—than other onsite labs.

Defensible and Accurate Data: VOCs, SVOCs, and Inorganics

Stone's onsite laboratory is capable of analyzing all VOCs and SVOCs included on EPA's 8260 and 8270 target analyte lists. Our QA/QC program strictly adheres to EPA SW846 800 Series QA/QC guidelines, ensuring results that are as accurate, precise, and defensible as those of fixed labs.



Our onsite laboratories handle a full suite of analytes faster and for a fraction of the cost—but just as accurately—as a traditional fixed lab. Our near-real-time data helps the field team modify the sampling plan to home in on the contaminant plume more quickly.

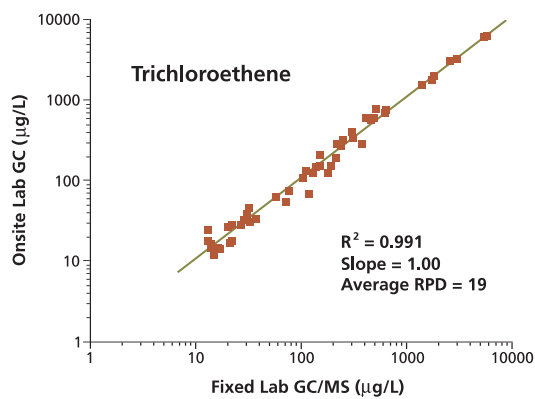
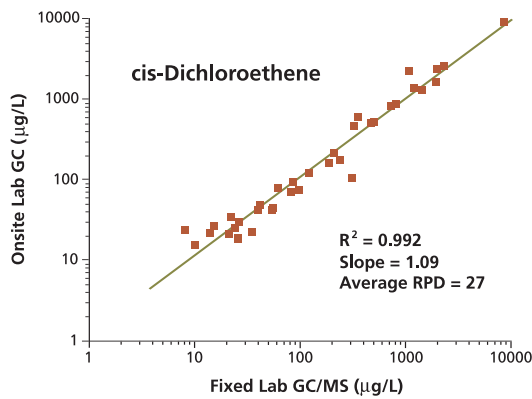
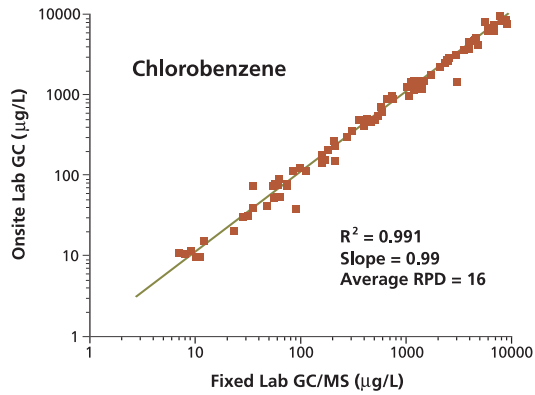
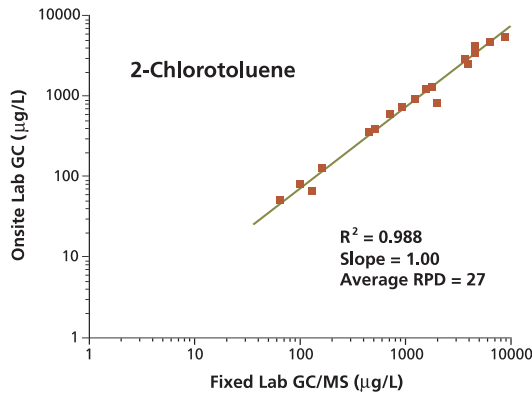
Performance Evaluation

In Tom's River, New Jersey, we collected and analyzed over 500 groundwater samples as part of a large site investigation. Approximately 25% of the samples underwent confirmation analyses by conventional GC/MS fixed-lab techniques. The predominant contaminant at the site was chlorobenzene, and as shown on the next page, the correlation between the fixed lab and our field lab was outstanding. One standard measure of the accuracy of a new technique is the Relative Percent Difference (RPD) between that technique and an established, standard technique. EPA acceptance criterion for RPD is 30%. We achieved an average of 22%. A second measure is the correlation coefficient values for the two analyses. The weighted average of 0.96 clearly demonstrates the reliability of our onsite laboratories. A third accepted measure is a paired t-test. The results of this test determined that there is no difference between our data and those of a fixed lab.

Project Experience

We have been helping clients with investigation and remediation projects at sites with DNAPLs, petroleum releases, metals, biomarkers, and PCBs for the last 10

Comparison of Onsite vs. Fixed-Lab Data



By any measure, our onsite lab data are as valid as those of any fixed lab.



Rapid in-field speciation and quantitation of inorganic biomarkers supports natural attenuation investigations and remedies, and helps to determine the fate and transport of a range of contaminants.

years. We've analyzed the usual suspects and identified unexpected compounds with our mass spectrometer. We've worked extensively in the northeast, and mobilized our labs for projects in the south and midwest. We have the capacity and data management tools to support large, multi-year projects (we just finished analyzing our ten-thousandth sample at a large remediation site in New York) and can deploy quickly for smaller, short-term engagements.



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