

Trials and Tribulations of Being a Mobile Laboratory – Methodologies and Accreditations

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NEMC 2014-NEMC Operational and Advocacy Issues
Impacting the Environmental Laboratory Industry



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Overview of the Trials and Tribulations of Being a Mobile Laboratory

- What is a mobile laboratory?
 - By definition and In pictures
- Why use a mobile laboratory?
- High Resolution Site Characterization – Innovative Tools for the 21st century
- Laboratory Methodologies – Solid Phase Micro Extraction
- Accreditations for Sampling and Analysis
- Proving Data Quality across State Borders





Mobile Laboratory by Definition

- **Mobile Laboratory:** A portable enclosed structure with necessary and appropriate accommodation and environmental conditions for a laboratory, within which testing is performed by analysts. Examples include but are not limited to trailers, vans, and skid-mounted structures configured to house testing equipment and personnel.





Mobile Laboratory by Definition

- Mobile laboratory From Wikipedia: A mobile laboratory is a laboratory that is either fully housed within or transported by a vehicle such as a converted bus, RV, or tractor-trailer.[1][2] Such vehicles can serve a variety of functions, including:
- Science education
- Science research
- Air, water, and soil analysis and monitoring
- Biosafety





Mobile Laboratory by Definition

- 2009 TNI Standard, DOD 4.2, Section 4.0
- 4.1.3 The management system shall cover work carried out in the laboratory's permanent facilities, at sites away from its permanent facilities, or in associated temporary or mobile facilities.



ENVIRONMENTAL LABORATORY SECTOR VOLUME 1 Management and Technical Requirements for Laboratories Performing Environmental Analysis EL-V1-2009-ISO



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Mobile Laboratory in Pictures



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Mobile Laboratory in Pictures (courtesy of Doug Berg – PJLA)



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Mobile Laboratory in Pictures



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Mobile Laboratory in Pictures





Mobile Laboratory in Pictures



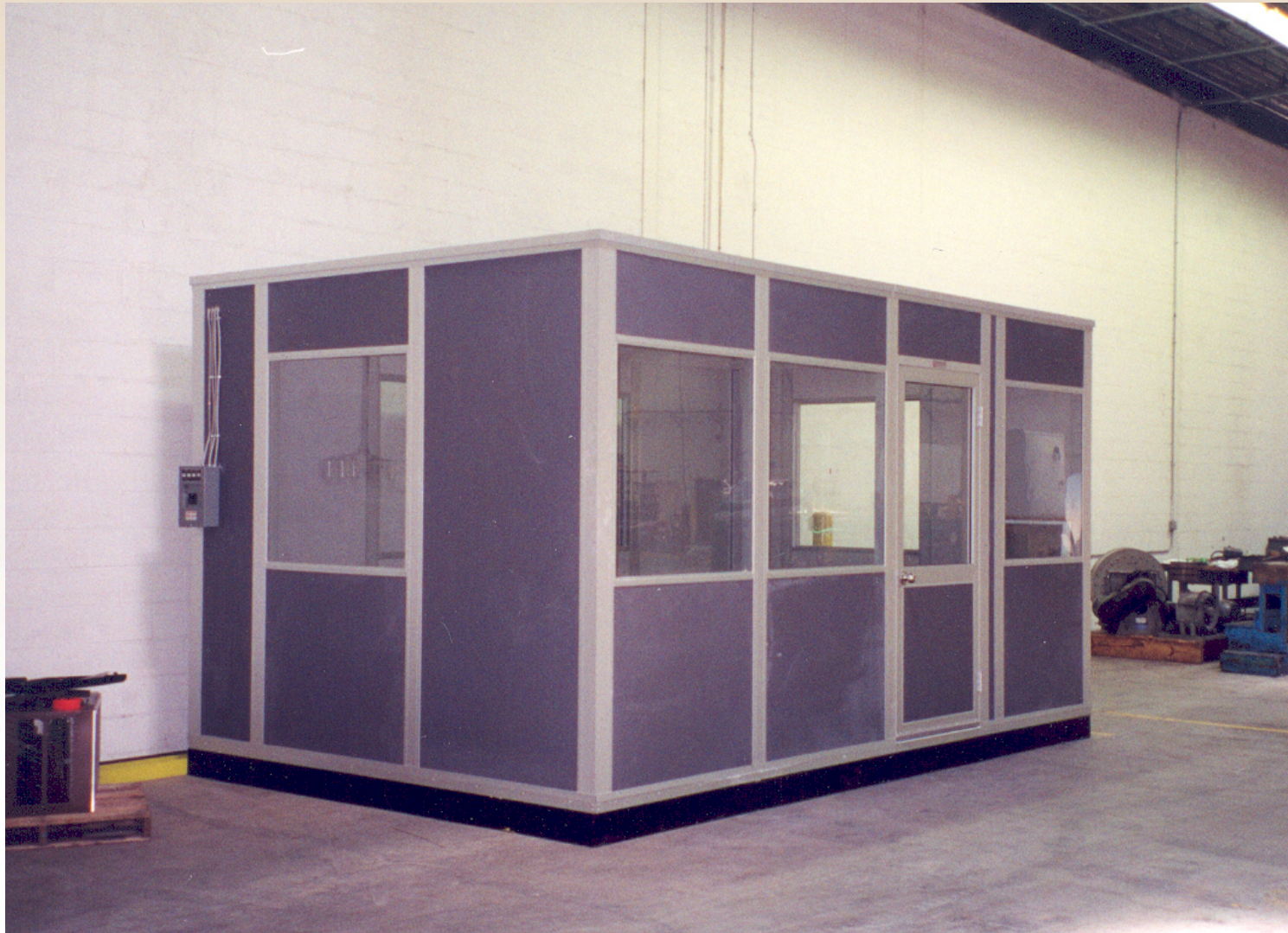


Mobile Laboratory in Pictures





Mobile Laboratory in Pictures



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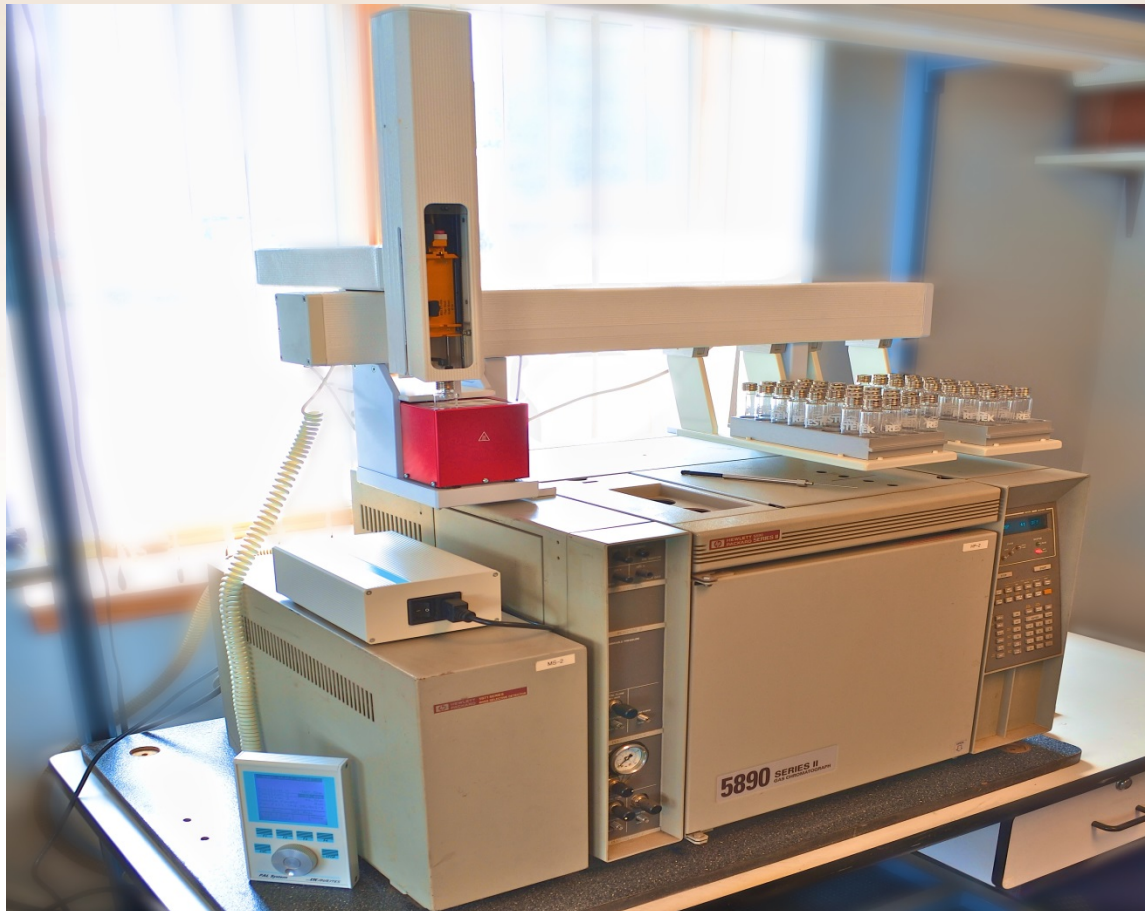
Mobile Laboratory in Pictures





Mobile Laboratory in Picture

- What is mobile in field measurement system is the field measurement equipment and/or device.
- GCs and GCMS





Mobile Laboratory in Picture

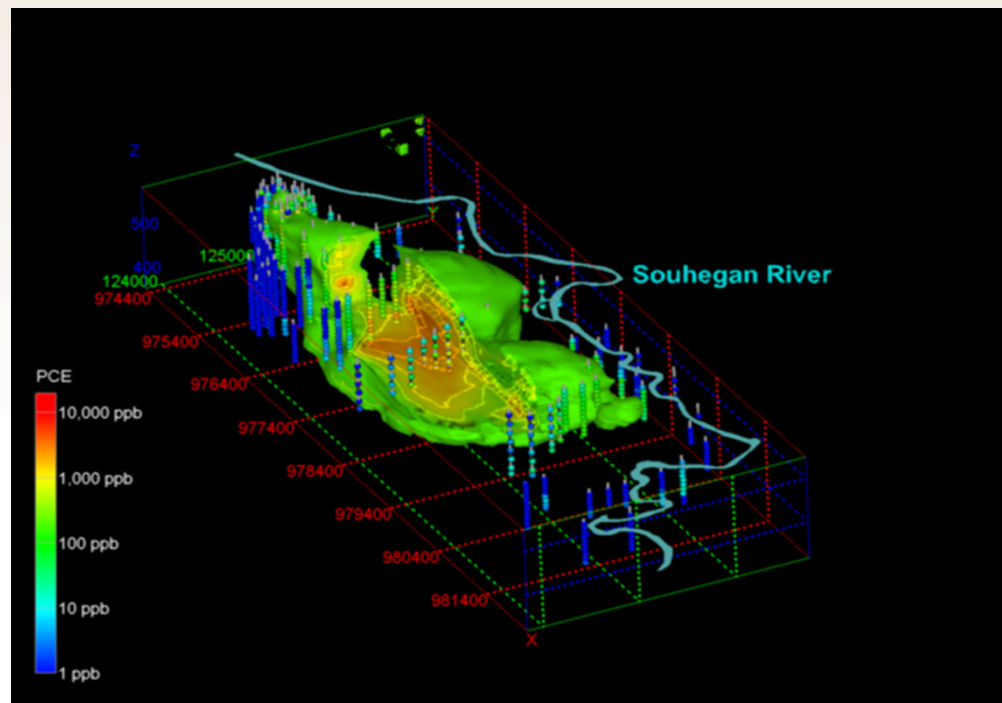
- The mobile unit..





Why use a Mobile Laboratory?

- Real-Time Data and Rapid On-site Sample Turnaround, Ongoing Data Analysis and Conceptual Model Revisions
- Homeland Security
- Conducting High Resolution Site Characterizations





High Resolution Site Characterization

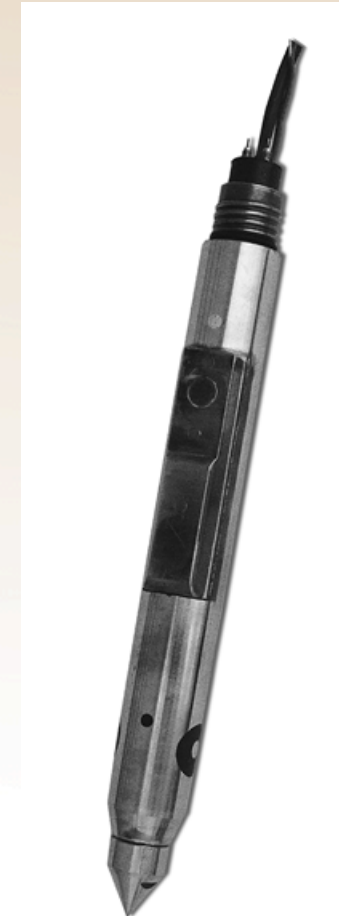
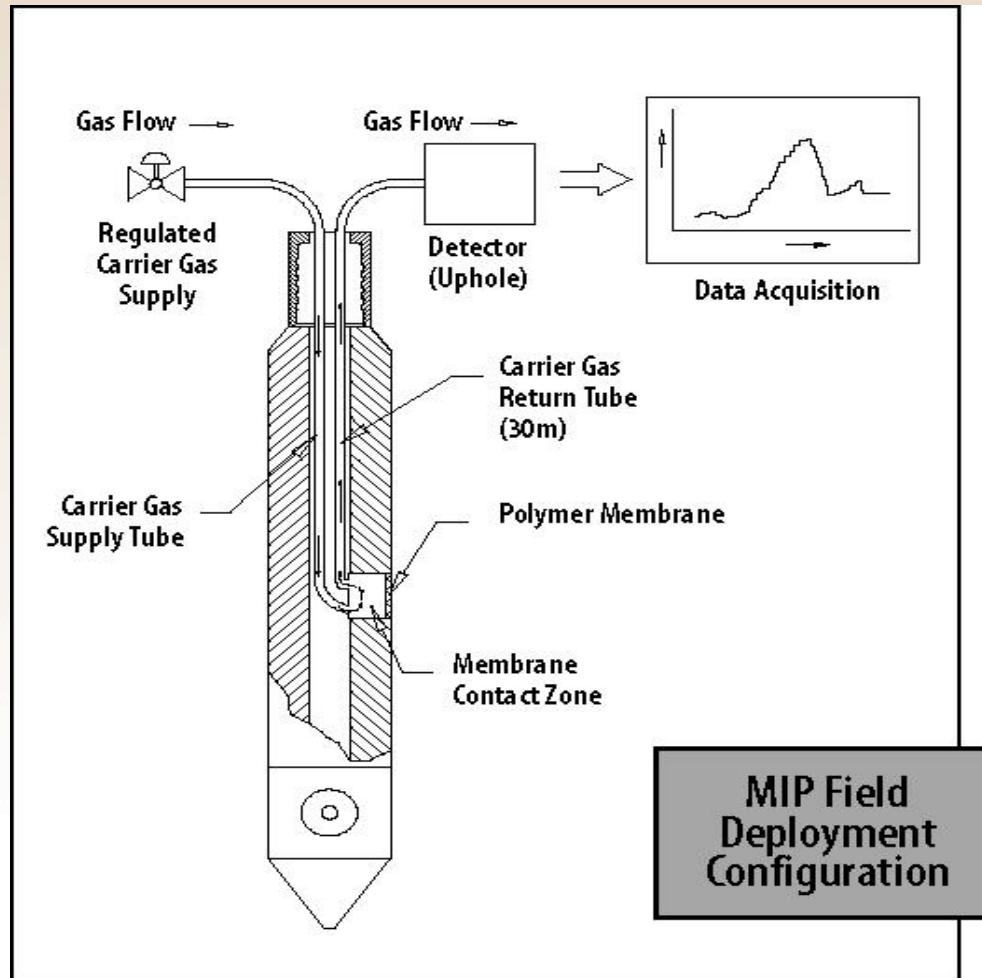
- Geoprobe – Drill Anywhere, Any time.
- Membrane Interface Probe





High Resolution Site Characterization

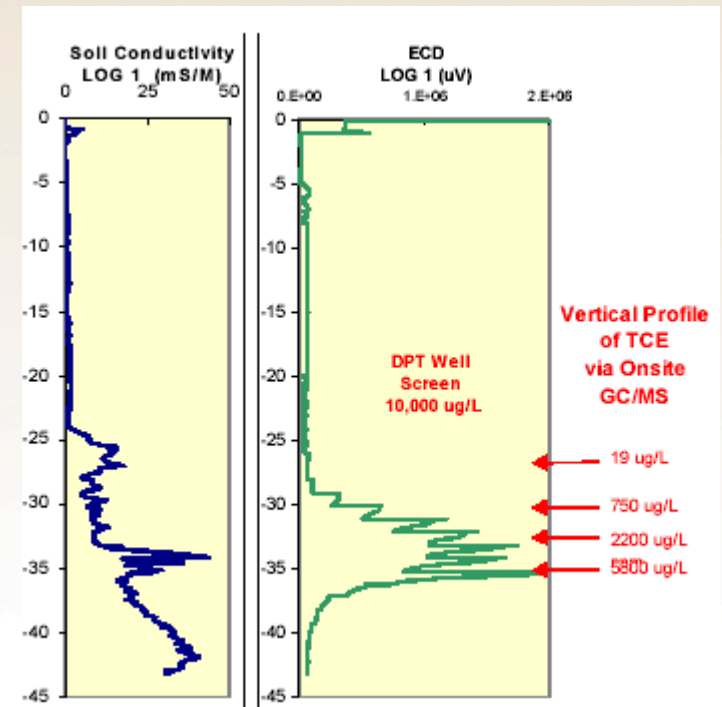
■ Membrane Interface Probe



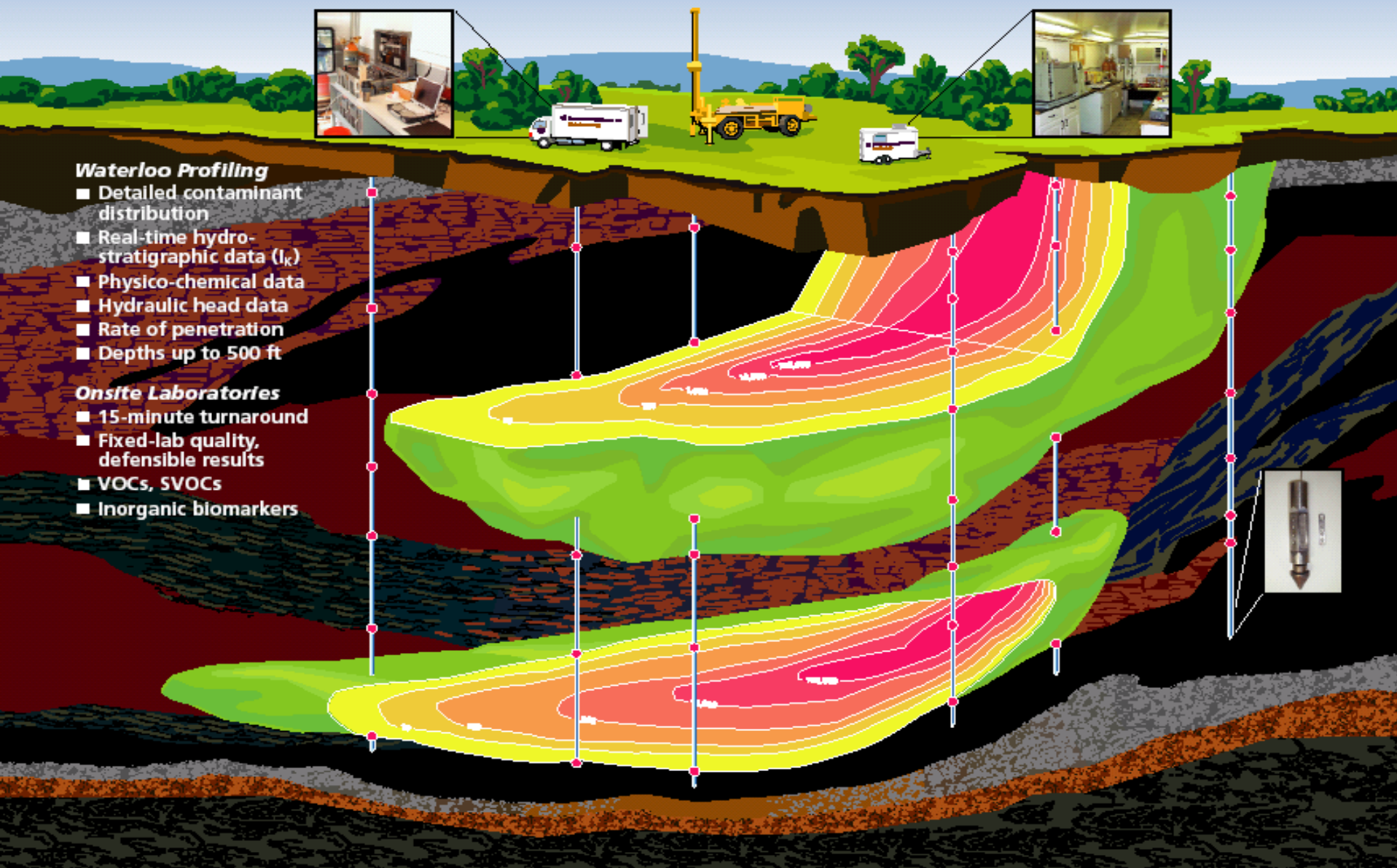


High Resolution Site Characterization

- Pro
- Real-time data
- Variety of detectors possible
- Nearly continuous data
- Chemical data and limited stratigraphic data in a single push
- Con
- Sensitive instrumentation/Limited depth penetration
- Generally does not distinguish between analytes
- Units of concentration not correlative with soil or water concentration



Waterloo Profiling and Onsite Labs





High Resolution Site Characterization

- The Waterloo Profiler - The Waterloo Profiler a direct push, continuous, point sample profiling tool.





High Resolution Site Characterization

■ Waterloo Profiling and Analytical Services





High Resolution Site Characterization

- Waterloo Profiling and Analytical Services

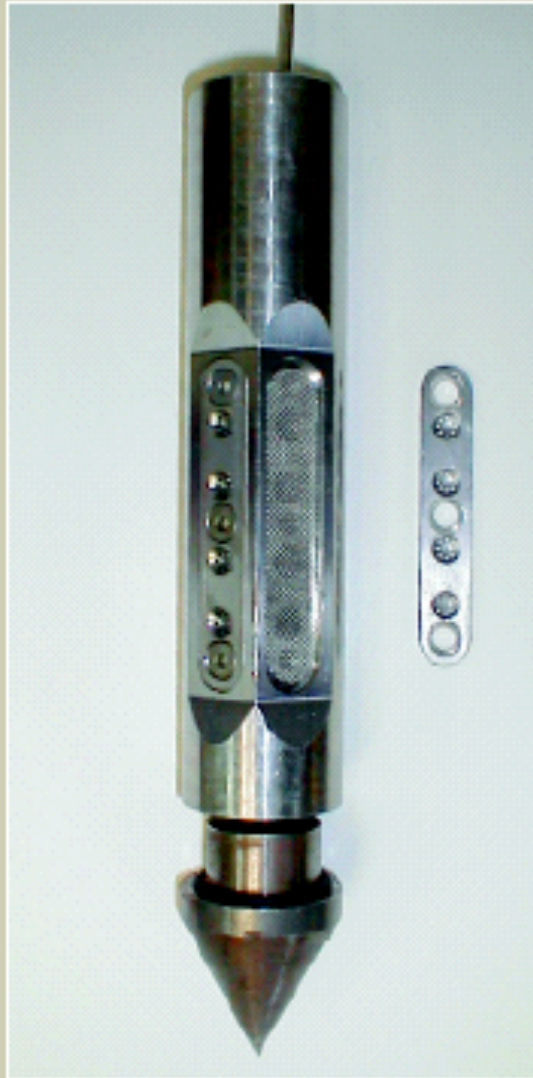




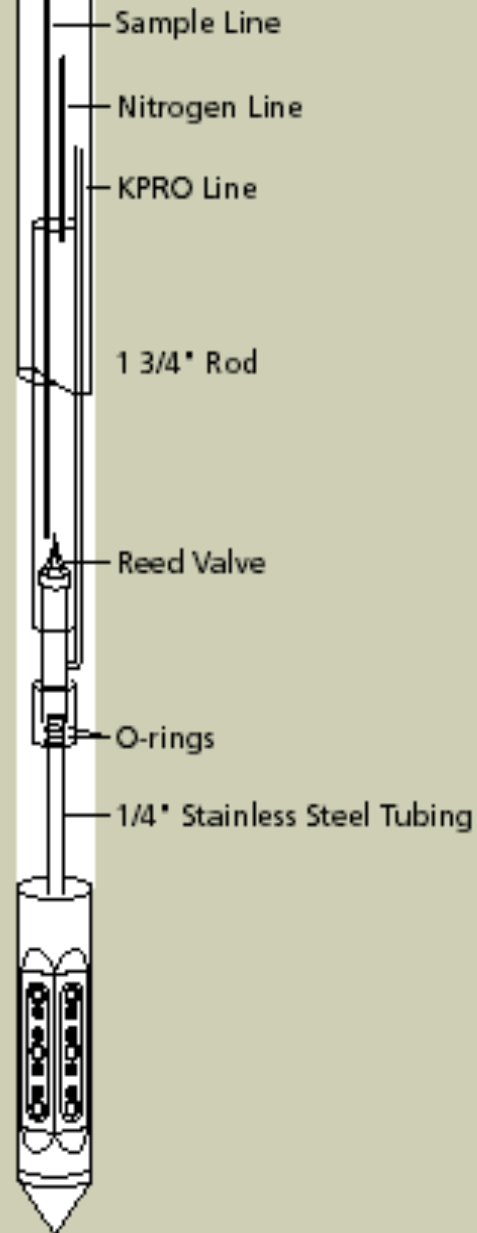
High Resolution Site Characterization

- Waterloo Profiling and Analytical Services

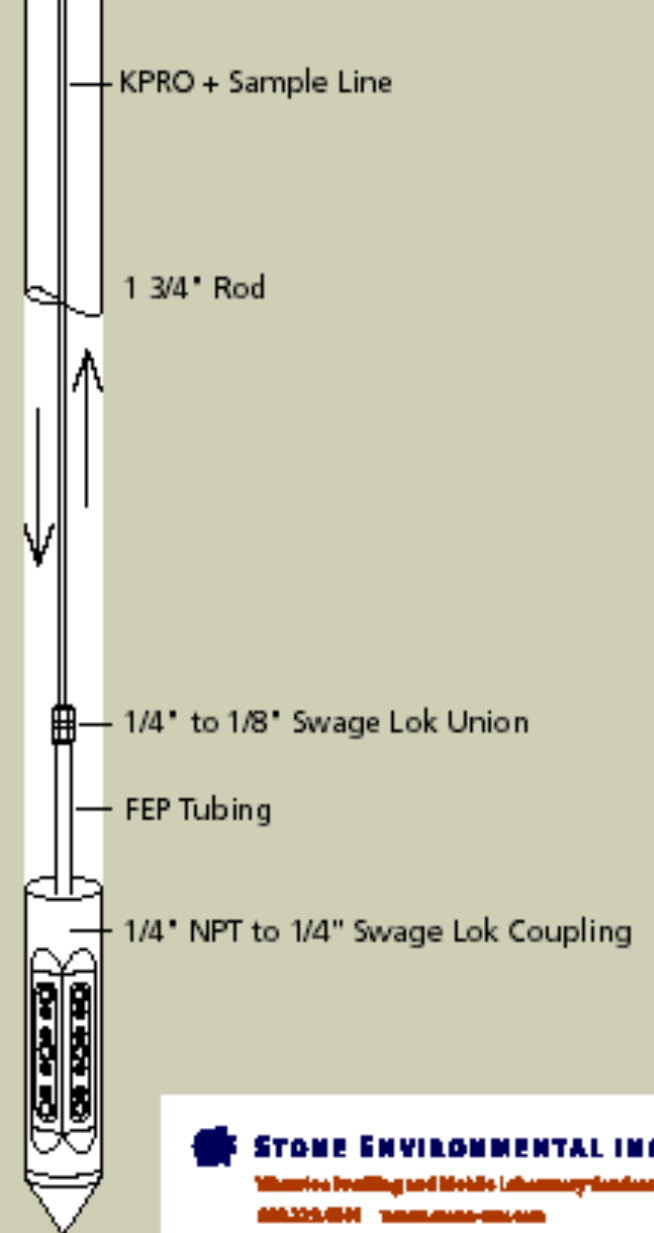




Gas-Drive Pump Sample Retrieval

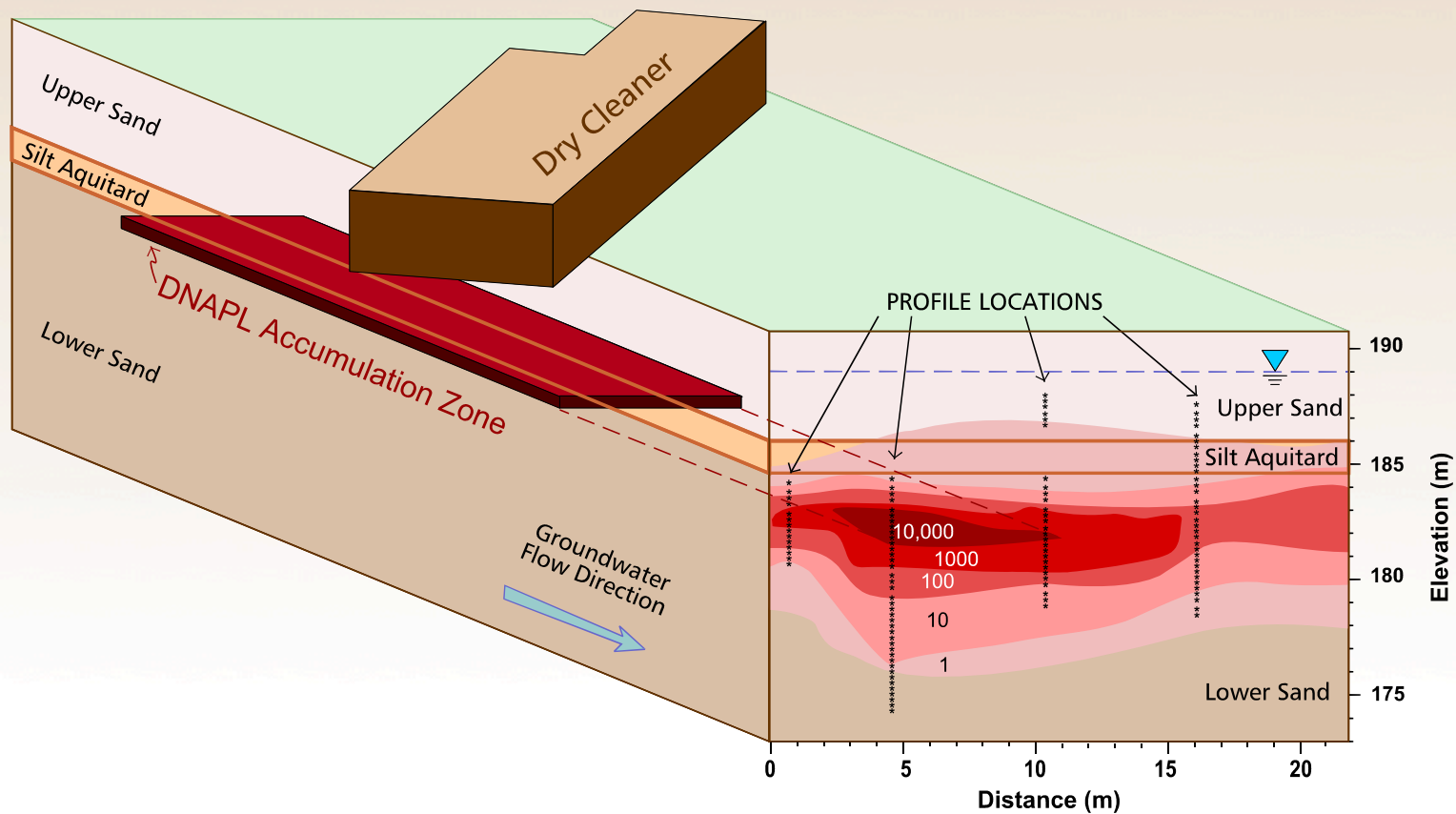


Peristaltic Sample Retrieval





Angus Ontario PCE Plume Locating the DNAPL Source



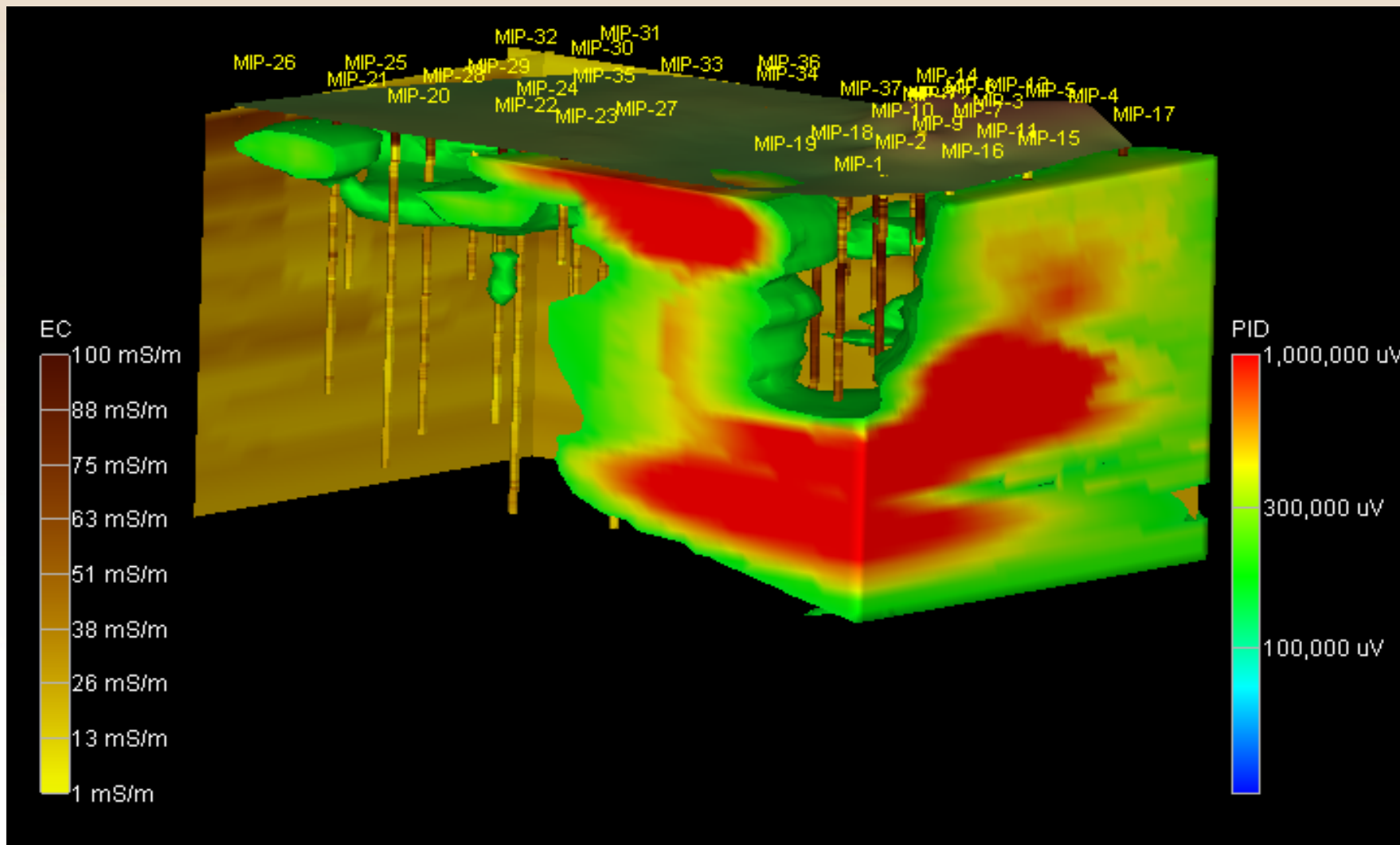
Pitkin et. al., 1994
See also Broholm, et. al., 1999



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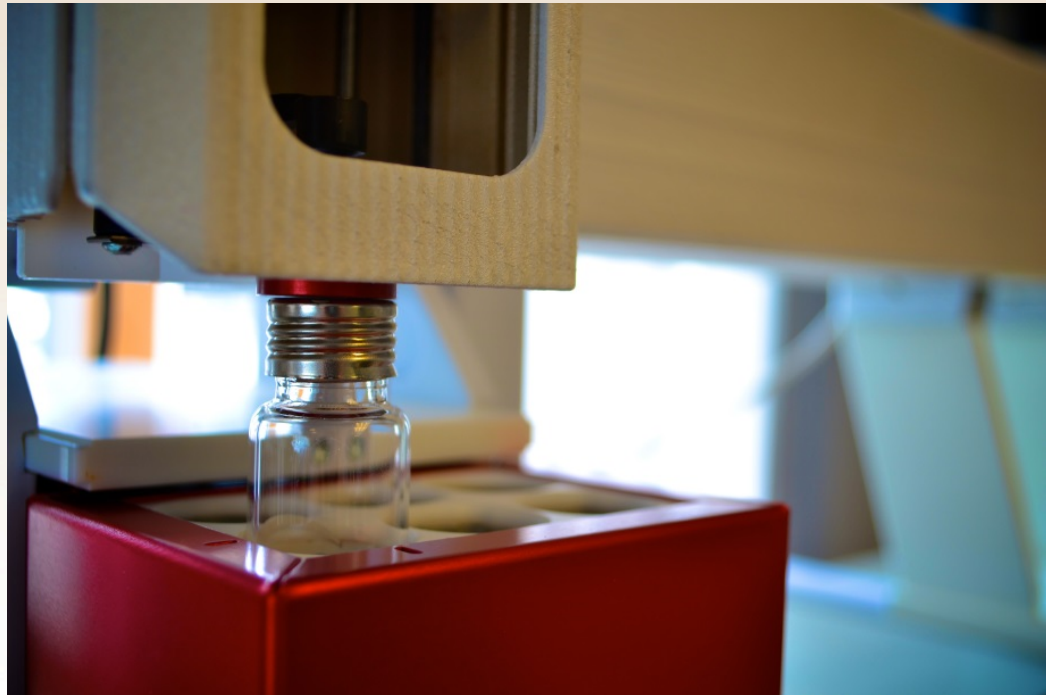
Data Management, Interpretation & Visualization





Laboratory Methodologies

- Laboratory Methodologies
 - SW846 8260C
 - ASTM D6520
- Accreditations
 - Fields of Testing
 - Limitations





Accreditations for a Mobile Laboratory

- NELAP – By State
 - Mobile Unit – VIN#
 - Method, Matrix, Technology
- NEFAP – Voluntary by third Party Assessor – Field Measurement, Matrix Technology
- DOD – Third Party Assessor
 - Method, Matrix, Technology





Quality System Requirements

- ISO17025, 2009 TNI Standard, DOD 4.2, Section 4.0
- 4.1.3 The management system shall cover work carried out in the laboratory's permanent facilities, at sites away from its permanent facilities, or in associated temporary or mobile facilities.





Quality System Inspections

- Field Inspections





Field Measurement Laboratory

- NEFAP Standard
- 3.4 Field Measurement:
The quantitative determination of physical, chemical, biological, or radiological properties of a matrix by measurements made in the field.





Field Measurement Laboratory

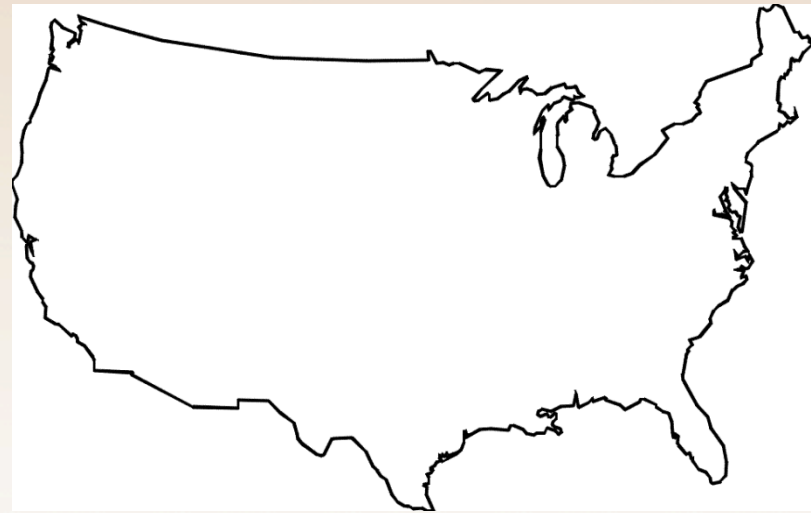
- Volume 2, (2007, Revision 0.1), Section 7.1.1.2.c: The accreditation body shall determine whether a FSMO qualifies for an umbrella accreditation or for an individual accreditation, taking into account the presence or absence of a common management system, ownership/management, technical oversight, and scope of accreditation as detailed in the FSMO accreditation application.
- NOTE 1: FSMO activities, whether from a fixed or mobile base, that encompass multiple field sampling and measurement locations, do not require separate accreditations.
- NOTE 2: A mobile sampling and measurement unit, operating under the FSMO management system, does not require a separate accreditation.





Future of Field Measurements

- Proficiency Testing
- Accreditations by State
- Understanding the requirements across state lines
- Costs - Accreditations
- Future of Field Investigations
- Costs of Field Investigations





Future of Field Measurements

- Quality Systems Management
- Definitive Data can come from field measurements
- Data Deliverables
 - Full data packages
- Moving Forward
- Questions?





The Future of Field Measurements

