

**EDGEWOOD CHEMICAL BIOLOGICAL CENTER'S  
CBRNE MOBILE LABORATORIES TEAM**



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## **CBRNE MOBILE LABORATORIES TEAM**

The CBRNE Mobile Laboratories Team partners with lead Federal agencies and selected customers to design, fabricate, integrate, and validate modular, mobile, and semi-permanent analytical capabilities to meet the customers' needs. These platforms are developed under the stringent requirements of ISO 9001:2008 Registration. The development of transportable laboratories requires the evaluation of state-of-the-art, highly technical, emerging technological trends and the selection of appropriate novel technologies based on a variety of criteria such as engineering controls, technical risk assessments, and logistical burdens. The Mobile Labs Team has developed several comprehensive (chemistry, biology, radiology, and high-explosive residue) transportable laboratories for customers with national and international missions that include the verification of the Chemical Weapons Convention (CWC) and Weapons of Mass Destruction (WMD) countermeasures. We provide field hardware, field methodology, and customer training, providing an analytical process that integrates disparate disciplines into comprehensive, turn key packages that can be deployed to remote regions with little or no logistical support and that produce data that withstands the most intensive and critical review. We have specialized on the development of robust engineering controls for chemical and biological threat materials; and as a team, we hold four patents in this area for novel developments that meet our customers' needs. Examples of our projects in chronological progression are depicted in the following pages:

### **Sample Collection and Sample Preparation Kits —**

One of our early achievements, the sample collection kits that we designed have become the “de facto” collection kits of choice among several lead Federal agencies. We approach sample collection kit design in a variety of configurations; however, the constant in this design remains in that all design and manufacturing has and will be performed in accordance with our ISO certification. The processes that we have put in place help to ensure the mitigation of cross contamination and the maintainability of the credibility of samples.

In addition, we develop, in close collaboration with our clients, sample preparation kits and a variety of crime scene investigation kits that again safeguard samples, labeling, chain-of-custody, global positioning, communications, and other factors associated with preserving evidentiary materials.



## Modular Laboratory Prototype —

The modular laboratory was originally designed to support the multilateral Chemical Weapons Convention (CWC) and the Wyoming Memorandum of Understanding. These treaties included provisions for sampling and analysis to verify compliance with the CWC. The verification of compliance with these agreements created a need for on-site analytical capability during Chemical Weapons Inspections.



Effective on-site analysis required that analytical instruments be rapidly transported to the inspection site, which could be anywhere in the world. Once on site, the laboratory had to be fully operable and self-sufficient and maintain the same quality assurance and quality control as a fixed-site laboratory. Our series of transportable modules, which were thoroughly tested in field trials, proved functional, effective, and reliable. The principles used in the development of the first modular laboratory were soon transitioned into other customer applications and are still in use today. This modular laboratory design has been expanded to address technologies for the analyses of chemical, biological, mid-spectrum, and explosive residue materials.

## FBI's Hazardous Materials Response Unit —

In 1997, based on the Modular Laboratory development, ECBC was sought after by the FBI's Hazardous Materials Response Unit (HMRU) to develop a comprehensive, transportable laboratory that addressed field requirements for the analysis of materials of chemical, biological, and high explosive residue origin. Via a wide-ranging Memorandum of Agreement, we developed what has become the FBI's "*Fly Away Laboratory*." This variant of the modular laboratory can analyze a broad spectrum of WMD materials, expanding the existing capability from chemical warfare materials to biological and mid-spectrum materials. Once assembled, this system of integrated, interconnected modules provides forensic information in the field. It is easily transportable by air, land, or sea.

## Federal Bureau of Investigation (FBI) Explosives Trailers —

As a direct result of a laboratory development for the FBI's Hazardous Material Response Unit, the Mobile Labs Team was funded to develop a three-tiered explosives detection capability named the "*Explosives Laboratory System (EXLAB)*" for the Explosives Unit within the FBI's Laboratory Division. Phase 1 of this system, which included suit-case sized Hardigg® cases for quick and easy sample collection, was used on September 11<sup>th</sup>, 2001, responding to terrorist attacks at both the Pentagon and the United Airlines' crash site in Somerset, PA. Since 2001, the FBI has used the EXLAB assets on over 75 deployments both in the United States and around the globe. These missions ranged from major crime scenes, small bombings, fugitive hunts and training exercises. The equipment was used to measure, photograph, document, transport and analyze evidence world-wide. A portion of the Phase I was dispatched to support FBI personnel deployed to Iraq and has helped to facilitate the transfer of over 3,000 submissions of evidence on improvised explosive device attacks in Iraq.

As the EXLAB enters its ??? (or do away with date) year, our customer recently told us that while the three-phase approach was a dynamic concept, subject to change and modification as situations dictate, the designation of Phases I, II, and III corresponds to the frequency and likelihood of their use. As future assets are allocated, priority shall be given to keeping Phase I and II equipment in a daily deployment state, while Phase III equipment will be stored for a more measured response.



## Joint Services Installation Pilot Project (JSIPP) —

The intent of JSIPP was to provide “*New BioDetection Laboratories and Capabilities at DOD Installations.*” Based on the Mobile Labs Team’s knowledge and expertise in fielding mobile laboratories, we were contacted directly by a representative of the Joint Program Executive Office for Chemical Biological Defense (JPEO-BD) to design, integrate, and build six high throughput biological analysis laboratories to be placed at strategic DOD installations. This very ambitious program was completed with the emplacement of the laboratories in less than one year. The laboratories were designed to BL2+ criteria, have withstood the most severe third-party peer review and Department of the Army review. These laboratories demonstrate our ability to bring state-of-the-art technologies into products under stringent timelines. All aspects of these laboratories were fully validated both at the integration site (ECBC) and at their eventual deployment sites.



## Food and Drug Administration (FDA) Laboratory System —

Through an Interagency Agreement (IAA) signed in late 2002, the Food and Drug Administration (FDA) and the Mobile Labs Team partnered to build one chemical and one microbiological mobile laboratory system. Both laboratory systems (chem and bio) are comprised of three platforms: one sample receipt/preparation (BL2+); one analytical; and an RV (recreation vehicle) for administrative functions, data reduction, and R&R (rest & relaxation). Our process helped FDA to define their requirements from a Weapons of Mass Destruction response to a substantial presence at our U.S. Ports of Entry to screen suspect imports/commodities so that they meet U.S. regulatory standards.

The FDA mobile biological analytical laboratory was deployed to Thibodaux, Louisiana, following Hurricane Katrina to assist the State of Louisiana in testing water samples to determine the quality of the water in which shellfish are grown and from which they are harvested. During the summer of 2006, the chemical analytical laboratory was at Fort Sam Houston, TX, for a joint exercise with the Department of the Army. Using established chemical analysis methods, the analysts screened fresh leafy green veggies, bottled water, and fruit juices.





*FDA Laboratory and Administrative Platforms*



## **Chemical Biological Laboratory Suite for the U.S. Army Forces Command (FORSCOM) —**

During 2004, we designed, fabricated, and delivered a mobile chemical biological laboratory suite to FORSCOM's 20<sup>th</sup> Support Command (CBRNE). This laboratory suite consisted of two platforms (one for chemical agents and one for biological materials) that included scientific equipment for sample preparation and sample analysis with the necessary engineering controls to protect operators, the mobile facilities, and the environment from contamination by unknowns. As part of a follow-on agreement, members of the Mobile Labs Team have developed training materials and are working with members of the 20<sup>th</sup> Support Command (CBRNE) to train their analysis team and to put in place applicable Standing Operating Procedures (SOP) and quality standards.

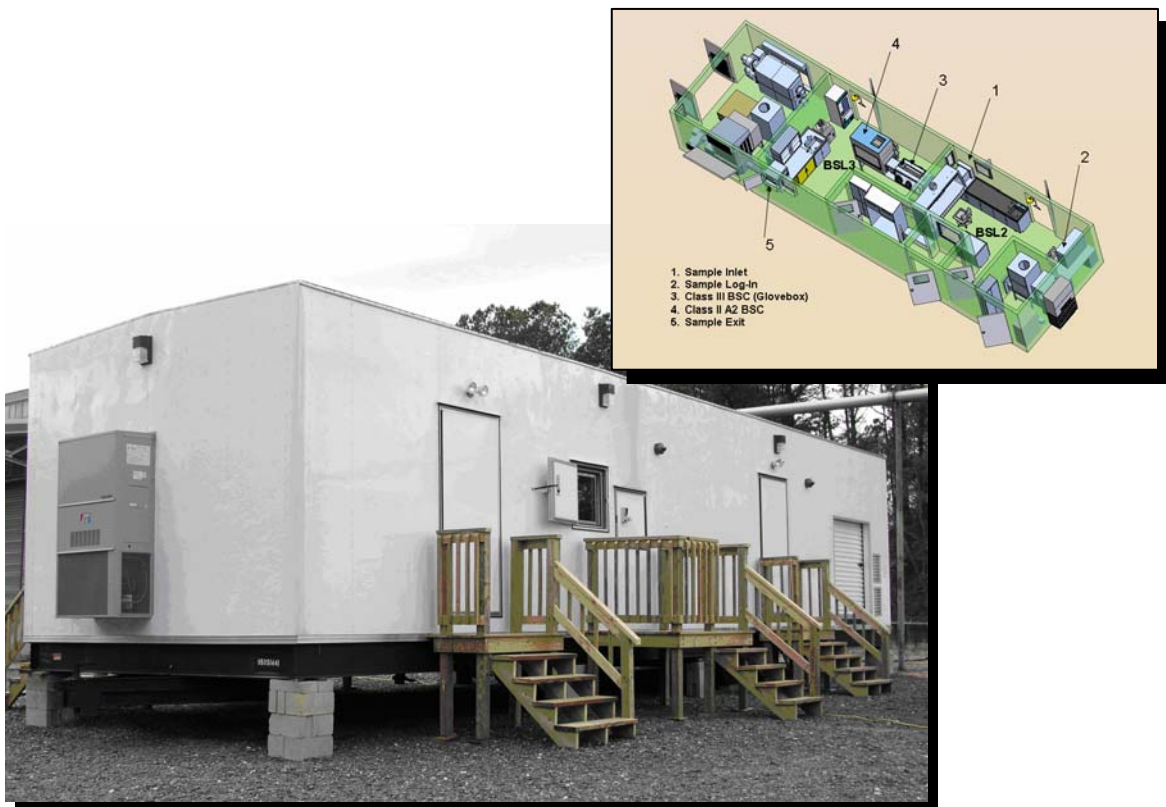




## All Hazards Receipt Facility —

During 2005, the Department of Homeland Security funded ECBC's Mobile Labs Team to develop, validate, and deploy two prototypes, known as the All Hazardous Receipt Facilities (AHRF). These AHRFs were developed under the auspices of an interagency working group. The design of these AHRF prototypes will ensure the safe in-processing and prescreening and the accurate and decisive assessment of samples of unknown or dubious origin that may contain chemical, biological, radiological, highly-explosive residue, or toxic industrial materials [(hence the name, "all hazards receipt facility (AHRF)].

There are no established standards that regulate building mobile biocontainment facilities. The "Biosafety in Microbiological and Biomedical Laboratories (BMBL)," 4<sup>th</sup> edition,\* which was published in 1999, is the only nationally accepted guidelines on biosafety and biocontainment principles and practices. The AHRF prototypes were built using BSL-3 design criteria according to the BMBL and to meet Department of Defense regulations and industrial standards concerning chemical warfare materials. The facilities have primary and secondary containment with highly technical state-of-the-art analytical instrumentation and with robust engineering controls that ensure a fail-safe system in a mobile design. Although the intent is for these facilities to be semi-permanent and located near a public health laboratory, they are built into wheeled 48-ft trailers. These prototype chemical and biocontainment facilities are a significant achievement in providing materially to our Nation's welfare.



\*Biosafety in Microbiological and Biomedical Laboratories; 4<sup>th</sup> ed.; Richmond, J.Y. and McKinney, R.W., Eds; Washington, DC: U.S. Government Printing Office; 1999.

## Portable Glovebox and Filtration System —

This glovebox resulted from the need to develop improved technology in support of homeland defense against incidents posing a credible threat that chemical or biological warfare agents may be used against the general population or others. This self-contained, transportable system is used for the receipt of unknown materials that are possibly toxic or of a harmful nature. The system was developed with redundant carbon/ HEPA filtration with break-through monitoring. It can contain some of the most toxic chemical agents, toxins, and infectious biological materials. The physical examination and classification of the unknown material is conducted in this glovebox. The system has achieved DA Safety approval for the use of neat chemical warfare agents and BL3/BL4 unknown materials. Further analyses can be conducted with a wide range of protocols, assay kits, or analytical instruments. This technology has been instituted into the laboratory applications of the National Guard's Civil Support Teams, several NATO partners, and many lead Federal Agencies. [*The Portable Glovebox and Filtration System is patented by the Army and licensed to GERMFREE (formerly Purified microEnvironments)*].



## Doing Business with Us —

Finally, ECBC and its partners from private industry continue to refine existing designs and develop new ones to meet the needs of defense, other government agencies, and industry for field analyses of chemical and biological samples. This equipment is designed and validated under the Edgewood Chemical Biological Forensic Analytical Center's quality system registration to ISO 9001:2008. There are several ways that organizations can partner with us; these include:

- Patent Licensing Agreements (PLA)
- Cooperative Research and Development Agreements (CRADA)
- Test Services Agreements (TSA)
- Memorandums of Agreement (MOA)
- Memorandums of Understanding (MOU)
- Support Agreements (Interagency Agreements)

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