PEO ACWA

A Partnership for Safe Chemical Weapons Destruction






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Program Executive Office
Assembled Chemical Weapons Alternatives

Laboratory Startup Process
4 June 2015

Presented to:

The 18th Annual International Chemical Weapons Demilitarisation Conference

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Agenda

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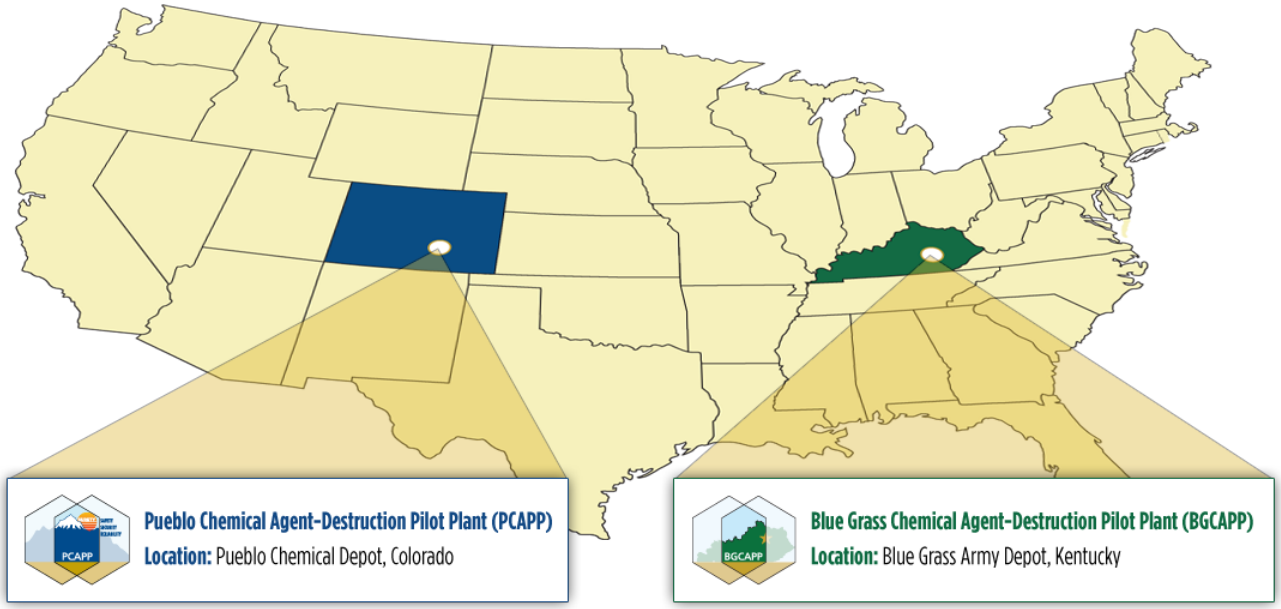
- Laboratory Construction and Design
- Laboratory Ventilation
- Laboratory Readiness
- Monitoring



Program Executive Office, Assembled Chemical Weapons Alternatives Laboratory

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- During operations at the Blue Grass Chemical Agent Destruction Pilot Plant and the Pueblo Chemical Agent Destruction Pilot Plant (PCAPP), the laboratory will support:
  - All worker protection air monitoring efforts
  - Analysis of the process liquids the plant will generate
    - Process liquids include hydrolysate by-product of the destruction process from both plants and biotreament effluent from PCAPP process
- Laboratory verifies that the chemical agents destroyed in accordance with standards set by local environmental permits
- Battelle Memorial Institute operates the laboratory as part of team of contractors led by the prime Systems Contractor, Becthel National Inc.

Laboratory Construction

- Laboratory contains space for the following functions:
  - Agent Standards Room:
    - Dedicated to the receipt, storage, and preparation of chemical agent standards and calibration solutions
  - Sample Receipt Room:
    - Sample receipt, storage, and preparation
  - Analytical Chemistry Rooms:
    - Air monitoring, process sample, environmental, and energetics or biotreatment analysis
  - Administrative and logistical support areas

Blue Grass Chemical Agent-Destruction Pilot Plant Laboratory Layout With Air Exchange and Flow Patterns

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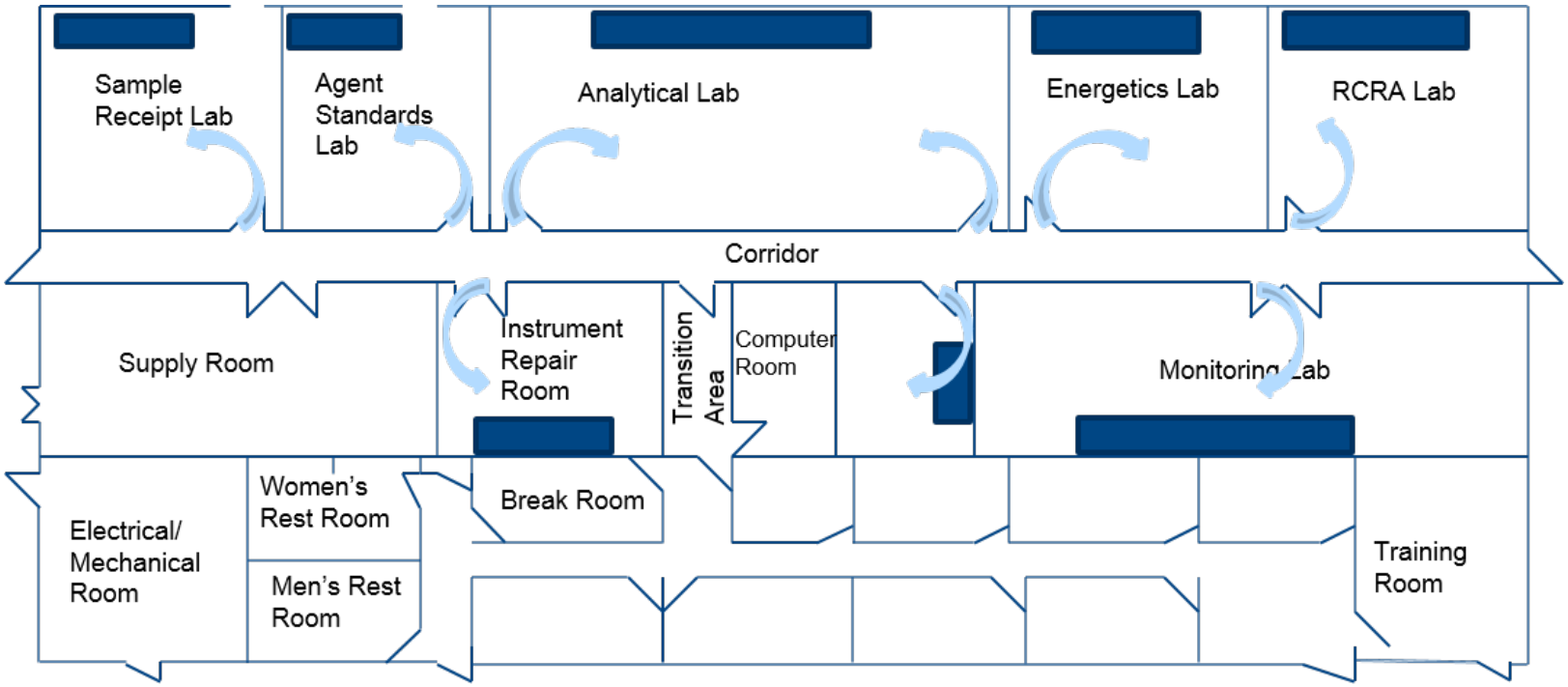

Fume Hood

Direction of Air Flow

- Every room smoke-tested and penetrations sealed
- Average of 21 air exchanges per hour, per laboratory room

Construction

- Laboratories designed as modular sections built, assembled, tested, dissembled, and sent to the site for assembly
- Once on site, components are reconnected, anchored, weatherproofed, and assembled into the lab complex
- Laboratory designed with separate carbon filtration system to preclude any release of chemical agent to the environment
  - Laboratories chose different designs for their carbon filtration systems
  - Pueblo Chemical Agent-Destruction Pilot Plant laboratory chose the traditional design of one system for the entire laboratory
  - Blue Grass Chemical Agent-Destruction Pilot Plant chose design with individual filtration system for each laboratory hood

Modular Design

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Modular Design

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Blue Grass Chemical Agent-Destruction Pilot Plant Laboratory Interior View

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Blue Grass Chemical Agent-Destruction Pilot Plant Laboratory Ventilation

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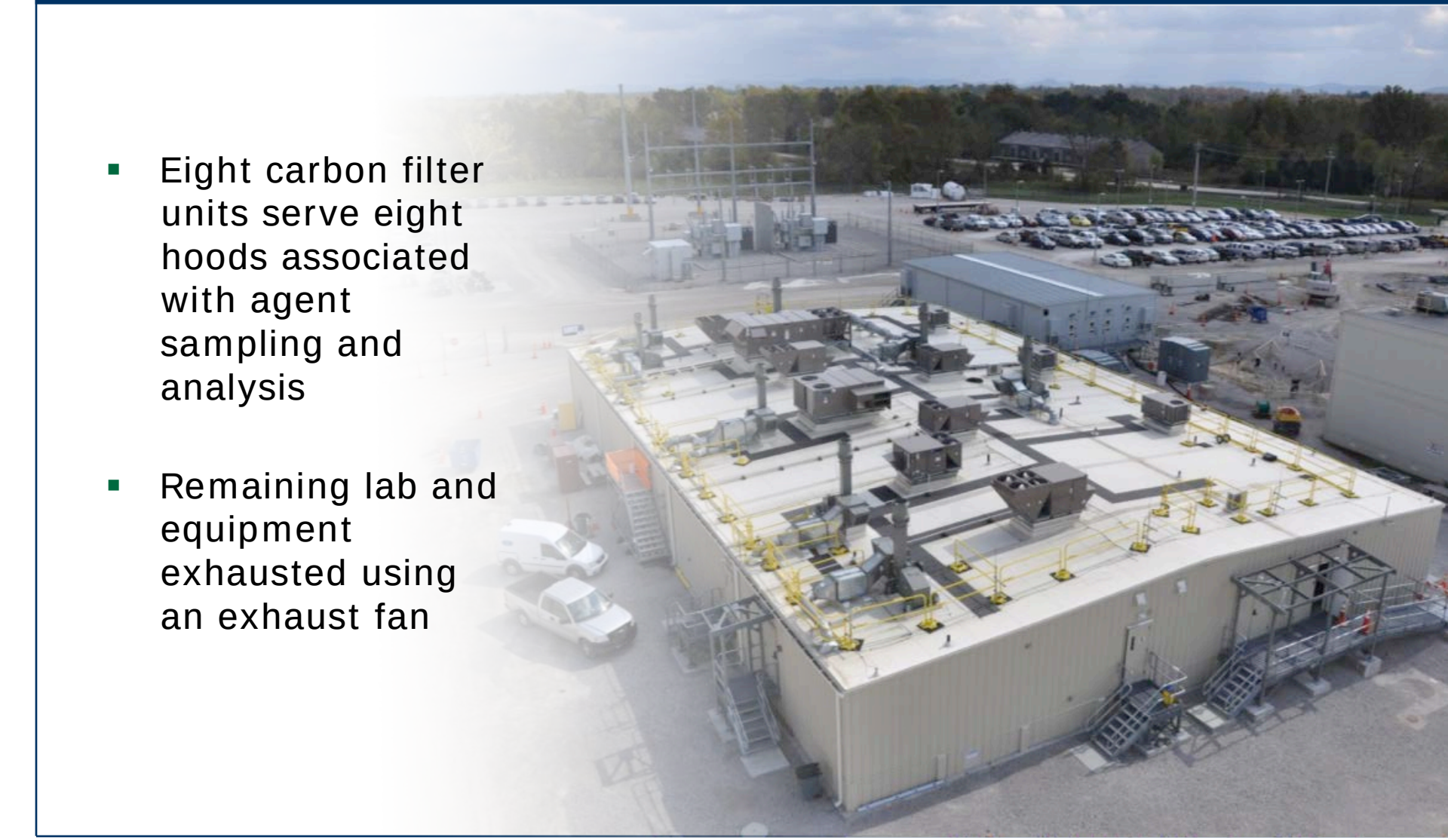
- Eight carbon filter units serve eight hoods associated with agent sampling and analysis
- Remaining lab and equipment exhausted using an exhaust fan



Pueblo Chemical Agent-Destruction Pilot Plant Laboratory Ventilation

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- Two carbon filter units serve five hoods associated with agent sampling and analysis
- Remaining hoods, lab, and equipment exhausted using an exhaust fan

Readiness Evaluation

- For the laboratories to become operational, the Systems Contractor used a process to certify lab readiness
- Provides documented basis for management to accept that the Laboratory, supporting documentation, and personnel ready for Stock A dilute agent operations
  - Provides valuable experience for execution of readiness assessment process for future plant operations
- To declare readiness the Systems Contractor must meet all criteria and successfully complete Demonstrations
  - Systems Contractor then declares readiness to operate to the government

Readiness Evaluation

- Government oversaw process and conducted independent validation to support the Systems Contractor's declaration of readiness
- Readiness evaluations encompassed all area of lab operations to ensure the lab established safe, secure, and consistent processes for storing, accessing, and using agent standards
- Laboratories must test and operate the heating, ventilation and air conditioning, and carbon filtration systems to ensure they work properly
- Laboratory personnel fully trained on use of respirators, protective clothing and safety equipment
- Laboratory contingency procedures in place and exercised to ensure worker safety

Readiness Demonstrations

- Demonstrations conducted include:
  - Receipt, inventory, and storage of Chemical Agent Standard Reference Material Research Development Test and Evaluation (RDT&E) Stock A dilute agent standards
  - Simulation of working standard (water) preparation
  - Waste handling
  - RDT&E Stock A monthly accountability
  - Industrial chemical (simulated) spill, including injury
  - RDT&E (simulated) spill, including injury
  - Partial or total impairment of Laboratory Heating, Ventilation and Air Conditioning System

Process Monitoring Systems

- Instrumentation
  - Gas Chromatograph, Mass Selective Detector, Flame Photometric Detector (FPD), Electron Capture Detector, Flame Ionization Detector, Thermal Conductivity Detector)
    - On Column
    - Hot Injector
    - Purge and Trap
    - Markes Unity

C- FPD with MARKES Unity

Process Monitoring Systems

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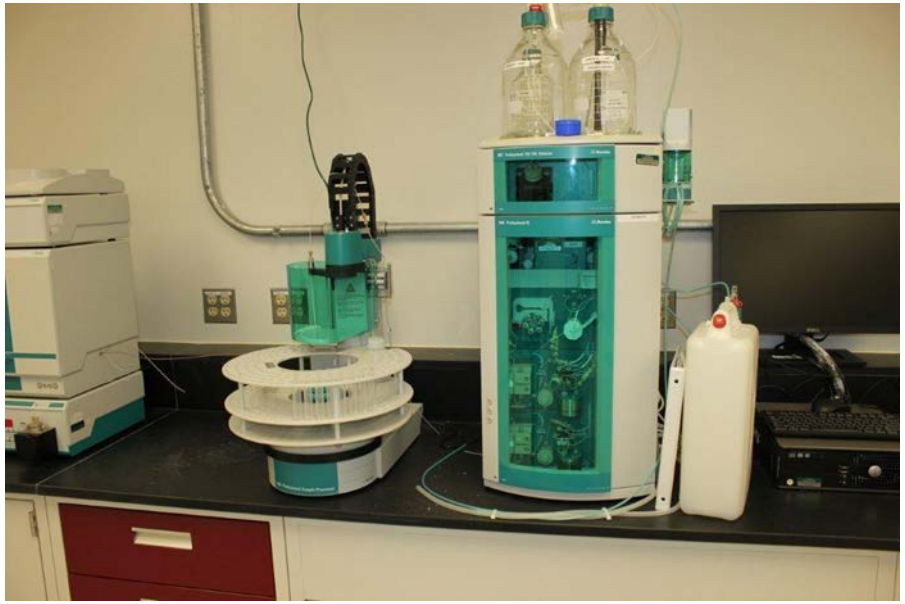

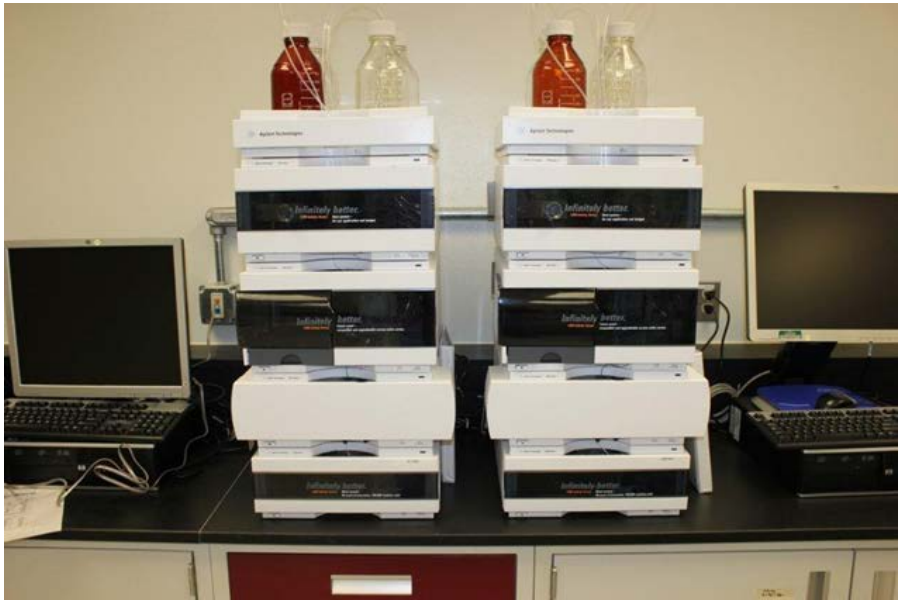

- Inductively Coupled Plasma Mass Spectrometry
- Total Organic Carbon
- Differential Scanning Calorimeter

- High-Performance Liquid Chromatograph

Conclusion

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- Both laboratories successfully started operations
- Both laboratories currently doing method development of MINICAMS® and Depot Area Air Monitoring System sorbent tubes in order to support plant operations and interference testing
- Pueblo Chemical Agent-Destruction Pilot Plant is in method development for hydrolysate analytical method and biotreatment system

Questions?

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