



Testing of COL PRO as Part of an Operational System

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U. S. Army Dugway Proving Ground



Topics

- DPG Overview
 - Mission
 - DPG Overview
 - Command Structure
 - Organization
- DPG Test Mission
- Vehicle System COL PRO Tests
 - Vehicle Test Ca. 1990
 - Vehicle Test 2000
 - Vehicle Test 2004
- Support for COL PRO System Testing



Mission

- To test U.S. & Allied chemical & biological defense systems & perform NBC survivability testing of defense materiel
- To provide support to the chemical & biological weapons conventions
- To test environmental characterization & remediation technologies
- To safeguard the environment
- To operate & maintain an installation to support the test mission providing a high quality of life for our employees & residents
- Manage Developmental Test Command Meteorology Program



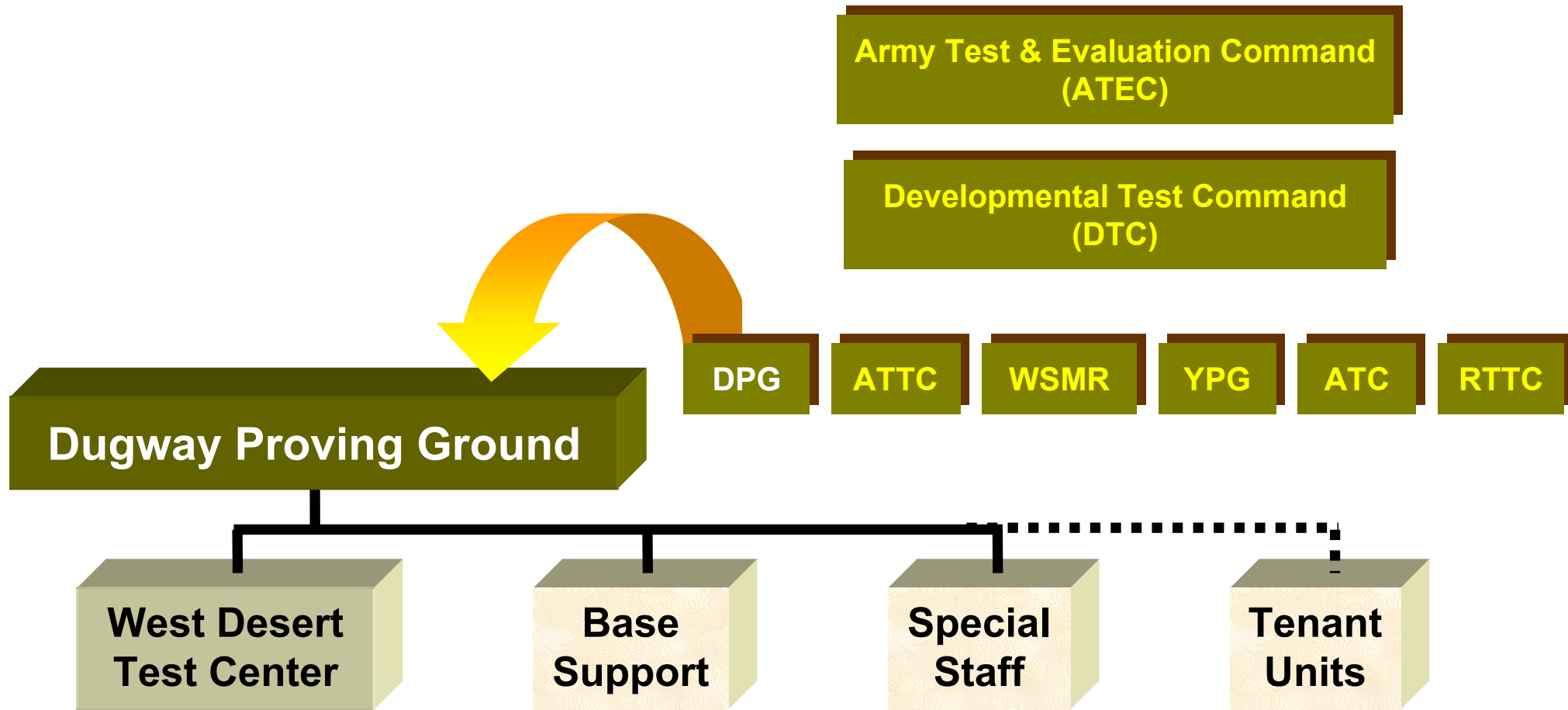
Resources

- Area: 1,300 sq. miles
- Workforce: 1,481
- Residents: 940
- Test Facilities/Capabilities: 673 buildings (chambers, test grids, laboratories, etc.)
- Annual Budget: \$114.5M (Projected FY-04)
- Dugway is part of the Utah Test & Training Range.
Largest training area within the continental U.S.





Command Structure





Organization

Office Of The Commander

Technical Director

SGM

Garrison

- Resource Management Division
- Environmental Programs
- Office Of Equal Employment Opportunity
- Internal Review & Audit Compliance Office
- Chaplain Activities Office
- Law Enforcement & Security Division
- Community Activities Division
- Division Of Installation Support
- Information Technology Office

Special Staff

- Plans & Operations Office
- Resource Management Office
- Public Affairs Office
- Protocol Office
- Surety Office
- Command Judge Advocate
- Compliance/Safety Office
- Counterintelligence Office

West Desert Test Center

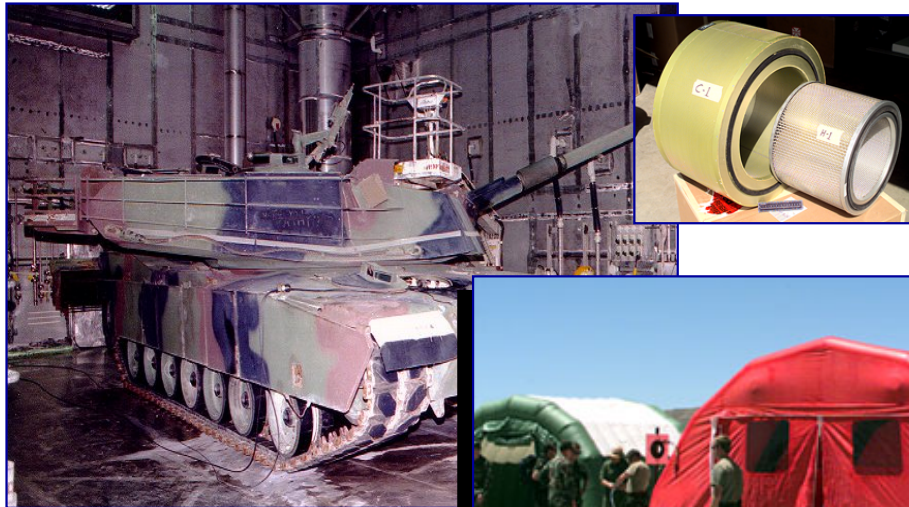
- Chemical Test Division
- Life Sciences Division
- Special Programs
- COR Office
- Meteorological Division
- Munitions & Obscurants Division
- Program Analysis Office
- Test Operations Division
- Test Technology Division



Mission: Shield CB Testing

Individual

- Protective Masks (M40, M45 and JSGPM)
- Protective Suits (JSLIST, JPACE, STEPO, ITAP)
- Protective Boots (MULO, IFS, AFS)
- Protective Gloves (JB1GU, JB2GU)



Collective

- C/B Filter Systems (ACPE, AICPS, OBOGS, MSOGS)
- Whole Shelters (SCPE, Temper Tent, AF Fixed Site Shelters)
- Combat Vehicles (FOX NBCRS, JSLNBCRS, STRYKER)





COL PRO PROGRAMS



Test Programs

- **Southern Breeze**
 - Cargo ship decontamination for the U.S. Navy
- **Collective Protection aboard Ships**





Test Programs



- **RESTOPS**
 - Restoration Operations
 - Agent Fate Testing
 - **Collective Protection Shelter**



Test Programs

- **Aircraft DECON**
 - Large aircraft decontamination for the U.S. Air Force
 - **Aircrew Survivability**

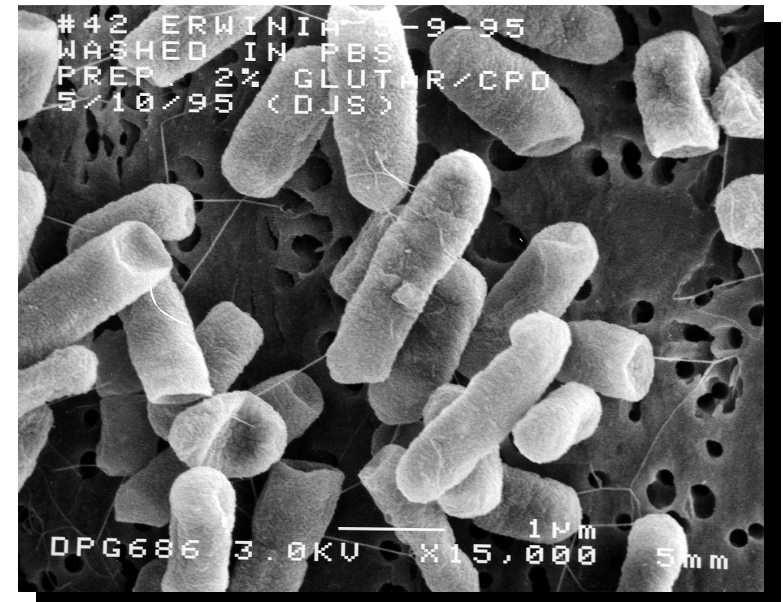




Test Programs



- **BDAP**
 - **Bioforensics
Demonstration &
Application Program**





Test Programs

- Vehicle COL PRO System Testing
- Review of Three Programs
 - ca. 1990
 - 2000
 - 2004



System Testing

- Ca. 1990 Vehicle Test
 - Nuclear Biological Chemical Reconnaissance System
 - Collective Protection System Testing Subtest





Test Protocol

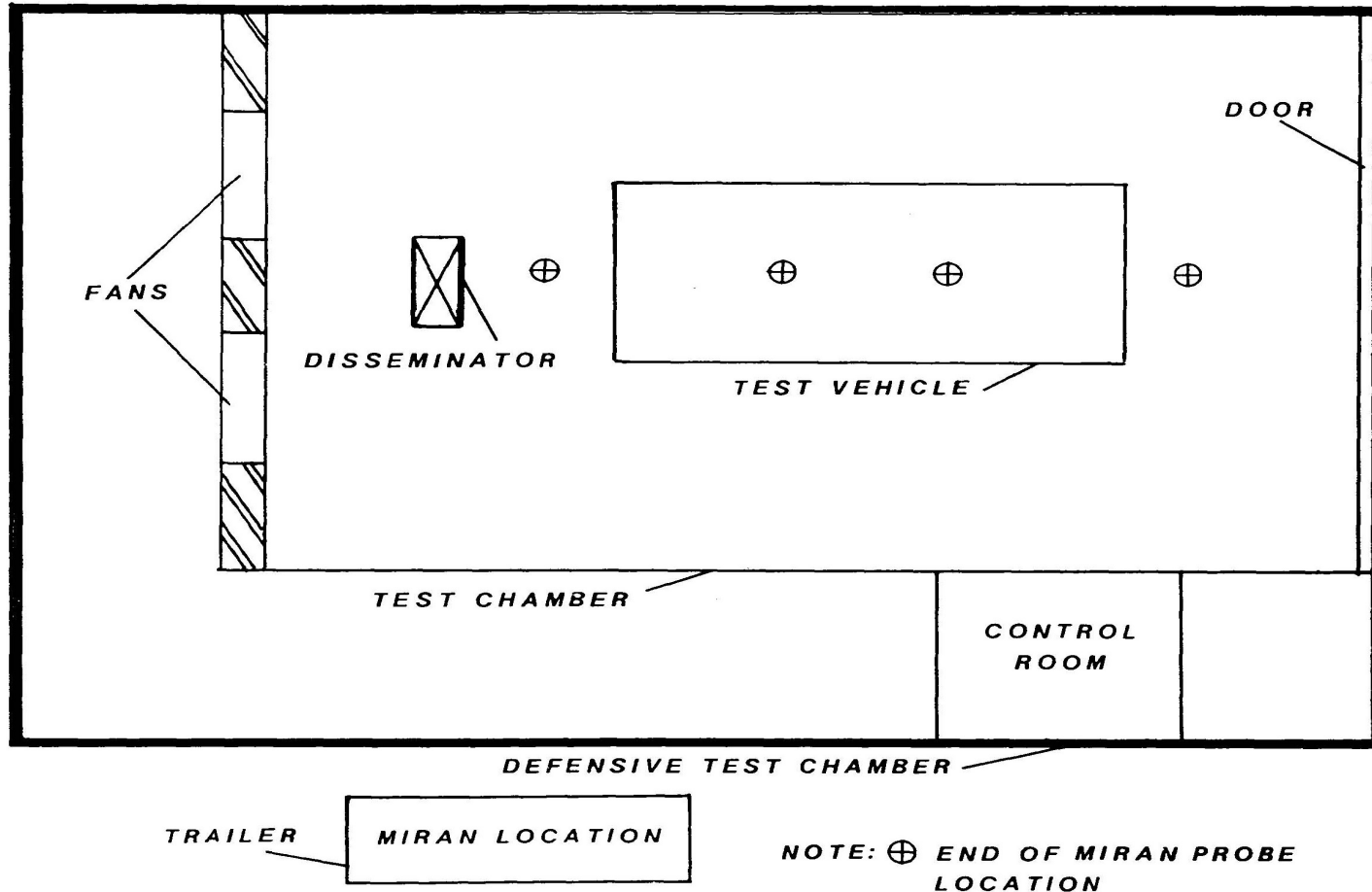
Ca. 1990

- **Several Different Trial Sets Conducted**
 - 5 Trials Each: Moderate Temp, After Rain Exposure, After Dust Exposure, High Temp, Ramp to 600 mg/m³, allow to Decay to 20 mg/m³
 - 4 Trials Ramp to ~250 mg/m³, Hold Until 21,000 mg-min/m³ Reached.
 - 4 Trials at 20 mg/m³ for 660 Minutes
- Vehicle Operated at Fast Idle (< 1000 RPM)
- MIRANS Used to Measure Challenge Concentration
- MINICAMS Used to Measure Inside Concentration
- Target was to Provide >6667:1 PF



Test Protocol

Ca. 1990

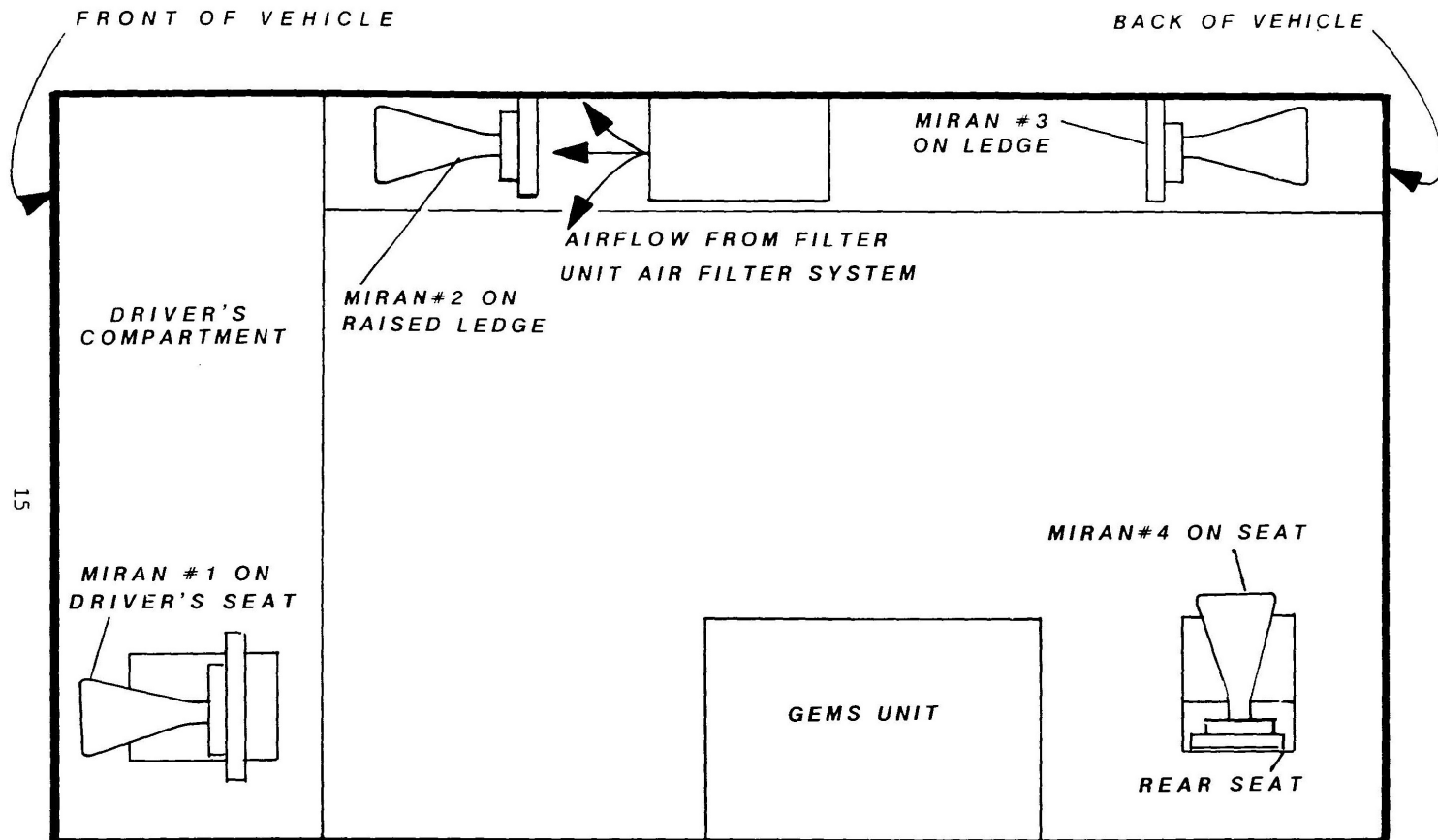


Test Setup in the Defensive Test Chamber



Test Protocol

Ca. 1990



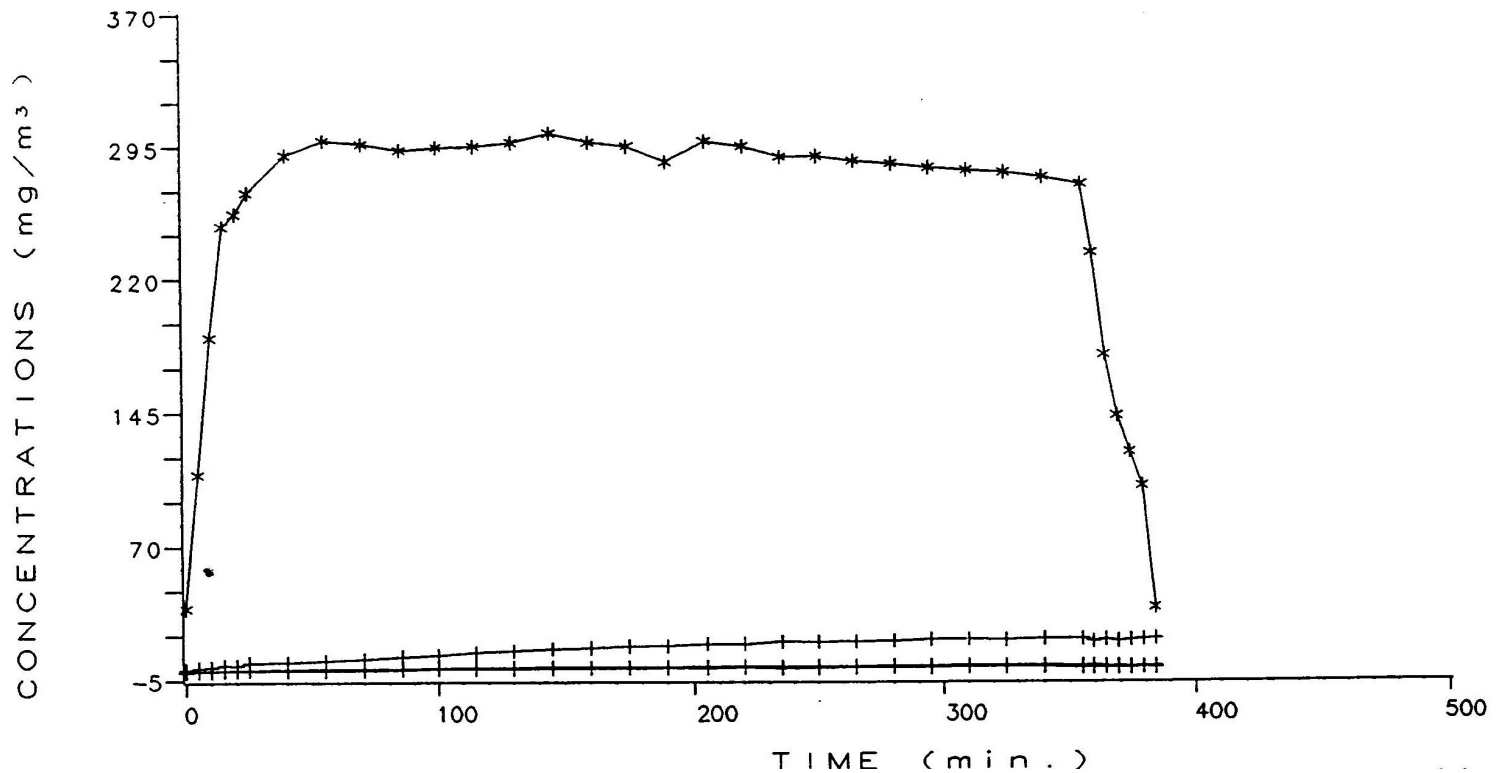
Sampling Positions for COL PRO Testing



Test Data

Ca. 1990

DATA FROM ALL MIRANS * = MIRANS IN CHAMBER
+ = MIRANS IN VEHICLE

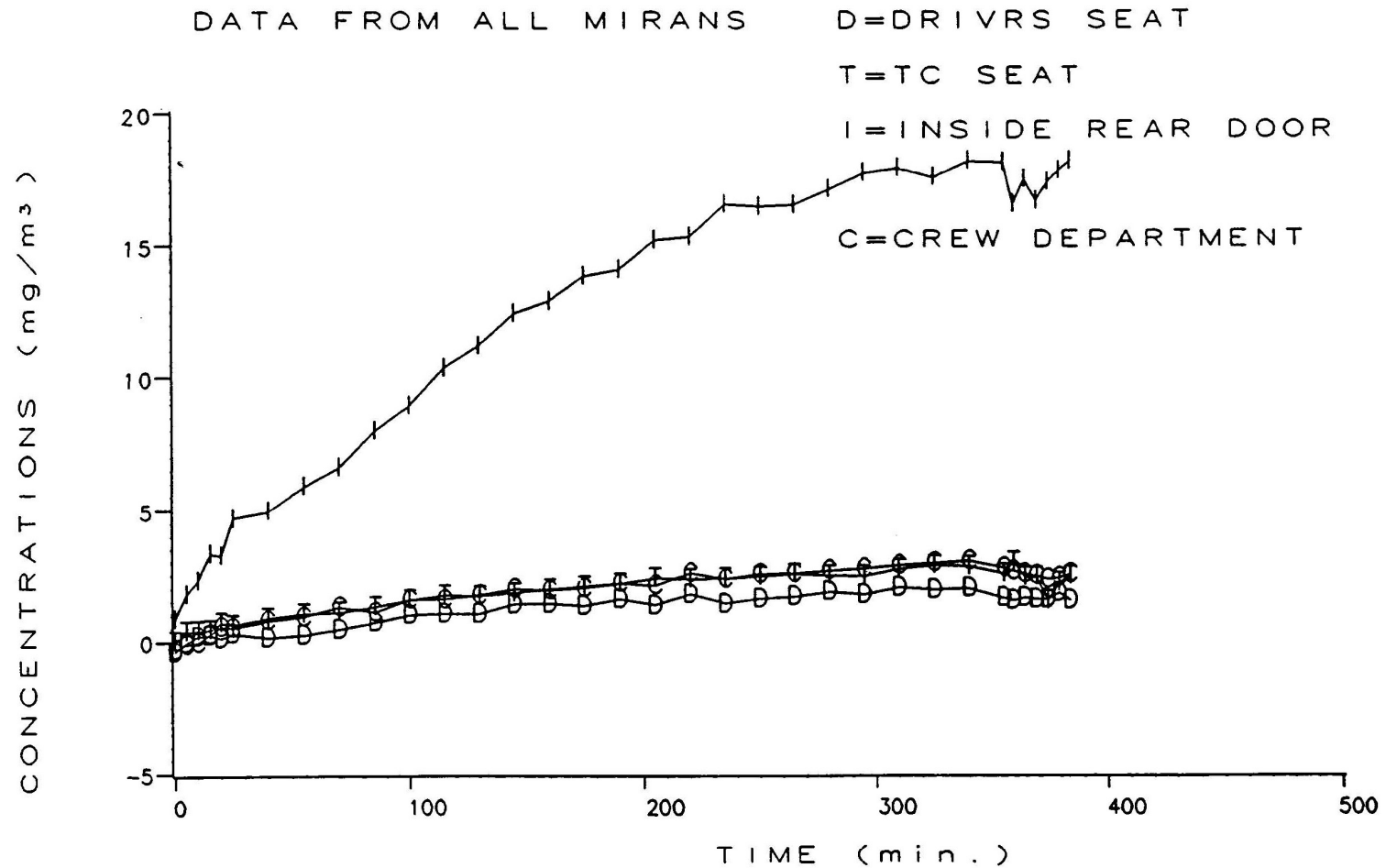


Average MIRAN Data for the Chamber
and Inside Vehicle



Test Data

Ca. 1990



MIRAN Concentrations Measured at Individual Positions Inside the Vehicle



System Test

2000

- Shelter System on a High Mobility Vehicle Frame
- Collective Protection System Testing Subtest





Test Protocol

2000

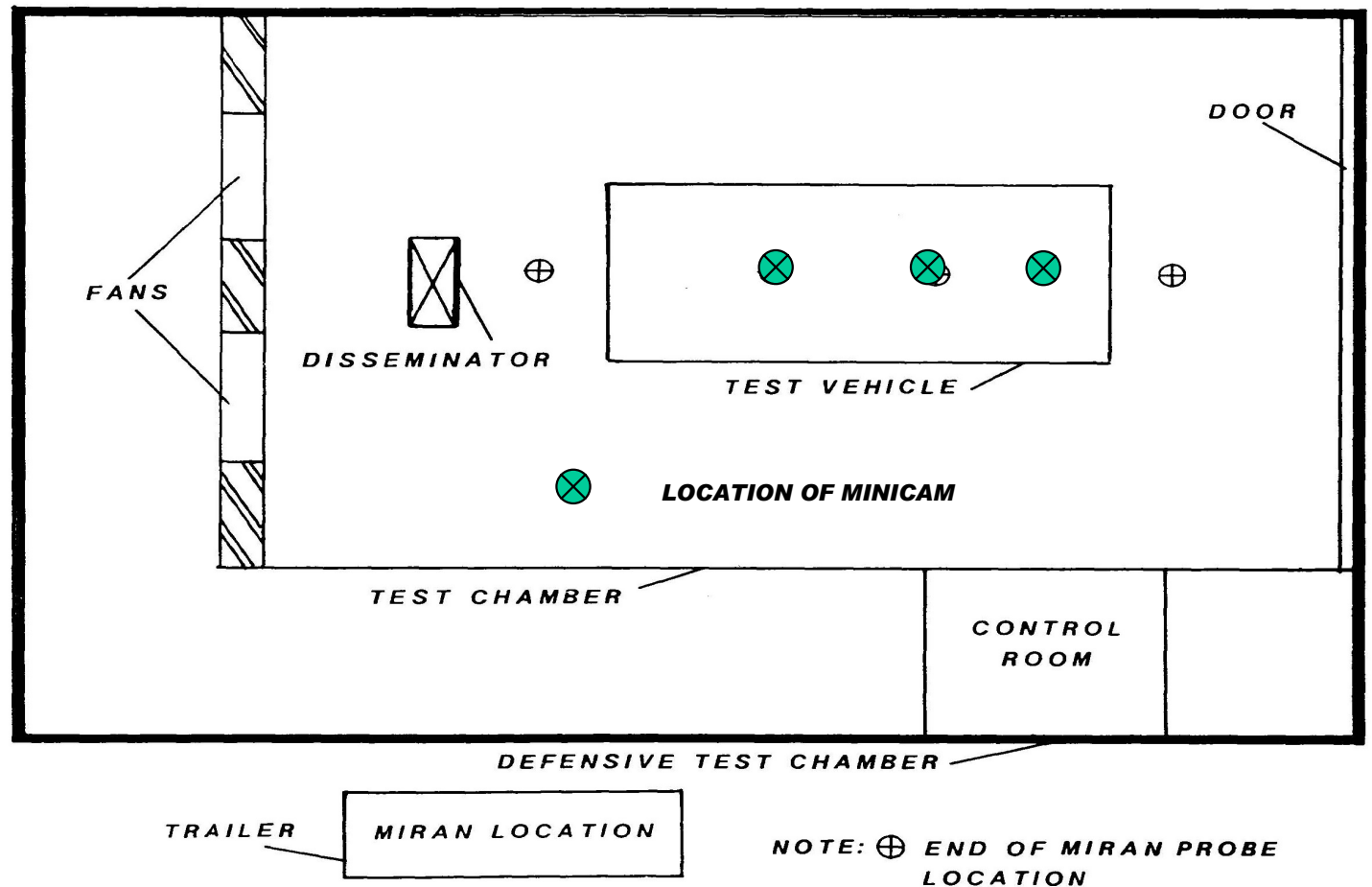
- Vehicle Sited in the DTC and Instrumented with MIRANS Outside the Vehicle and MINICAMS Inside the Vehicle
 - MINICAMS Located inside the Cab and at the Operator Station Inside the Rigid Wall Shelter for Trials 1-4.
 - Third MINICAM Sited Near the Marker Release Door for Trial 5.
- System Operated on Shore Power with all Systems Functioning to Provide Load
- System Challenged with 100 mg/m³ of MeS for 8 hours (24,000 mg-min/m³ CT) for Trials 1-4.
- Trial 5 Chamber was brought to 100 mg/m³, a Marker was Released through the Rear Door when Concentration Reached and 4 More Released 5 Minutes Apart. System Operated for 30 Minutes



Test Setup

2000

Test Setup for
the COL PRO
System Test of
a High
Mobility
Shelter.



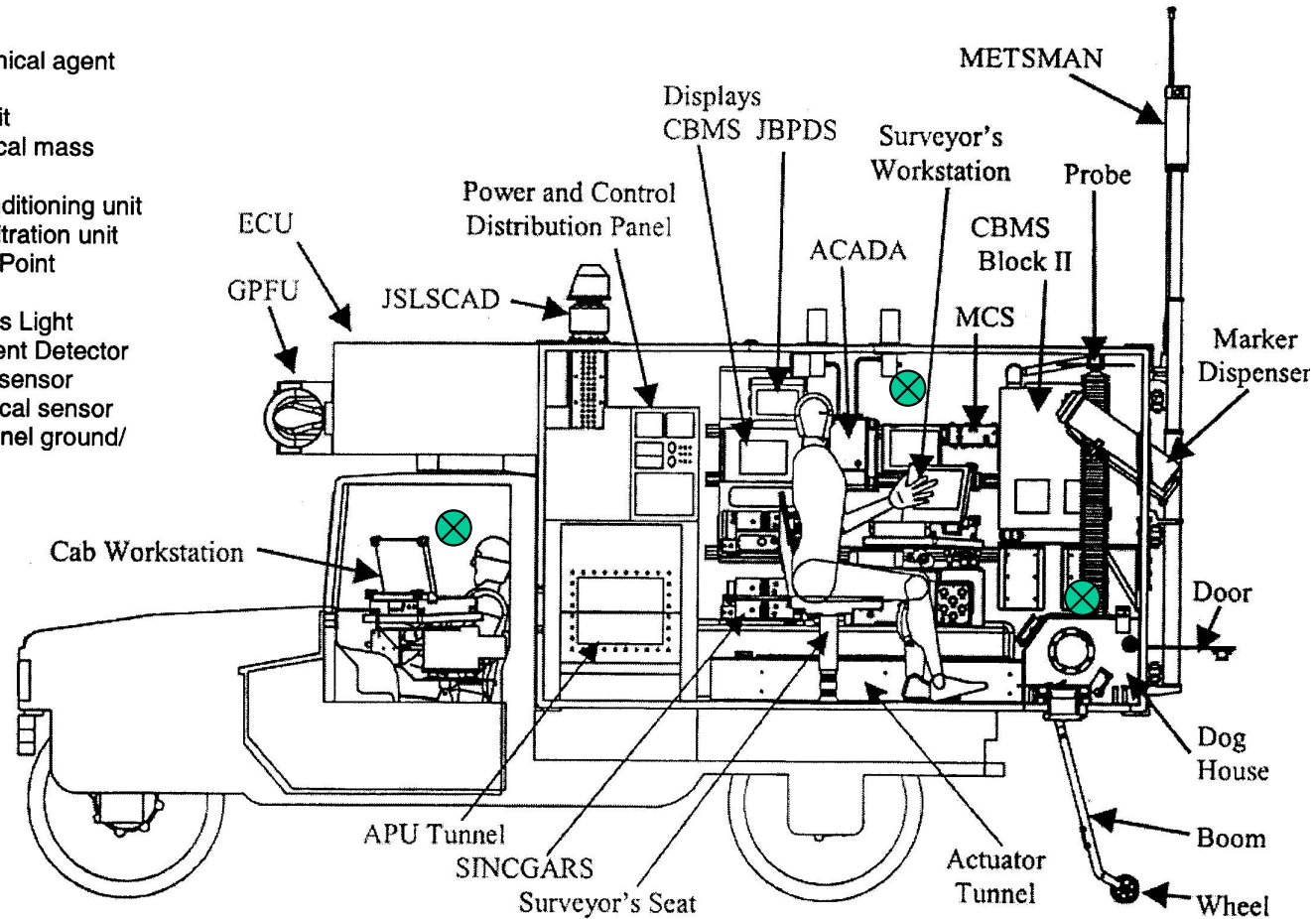


Test Setup

2000

Legend

- ACADA – automatic chemical agent detector system
- APU – auxiliary power unit
- CBMS – chemical/biological mass spectrometer
- ECU – environmental conditioning unit
- GPFU – gas/particulate filtration unit
- JBPDS – Joint Biological Point Detection System
- JSLSCAD – Joint Services Light Standoff Chemical Agent Detector
- MCS – multiple chemical sensor
- METSMAN – meteorological sensor
- SINGGARS – single channel ground/airborne radio system



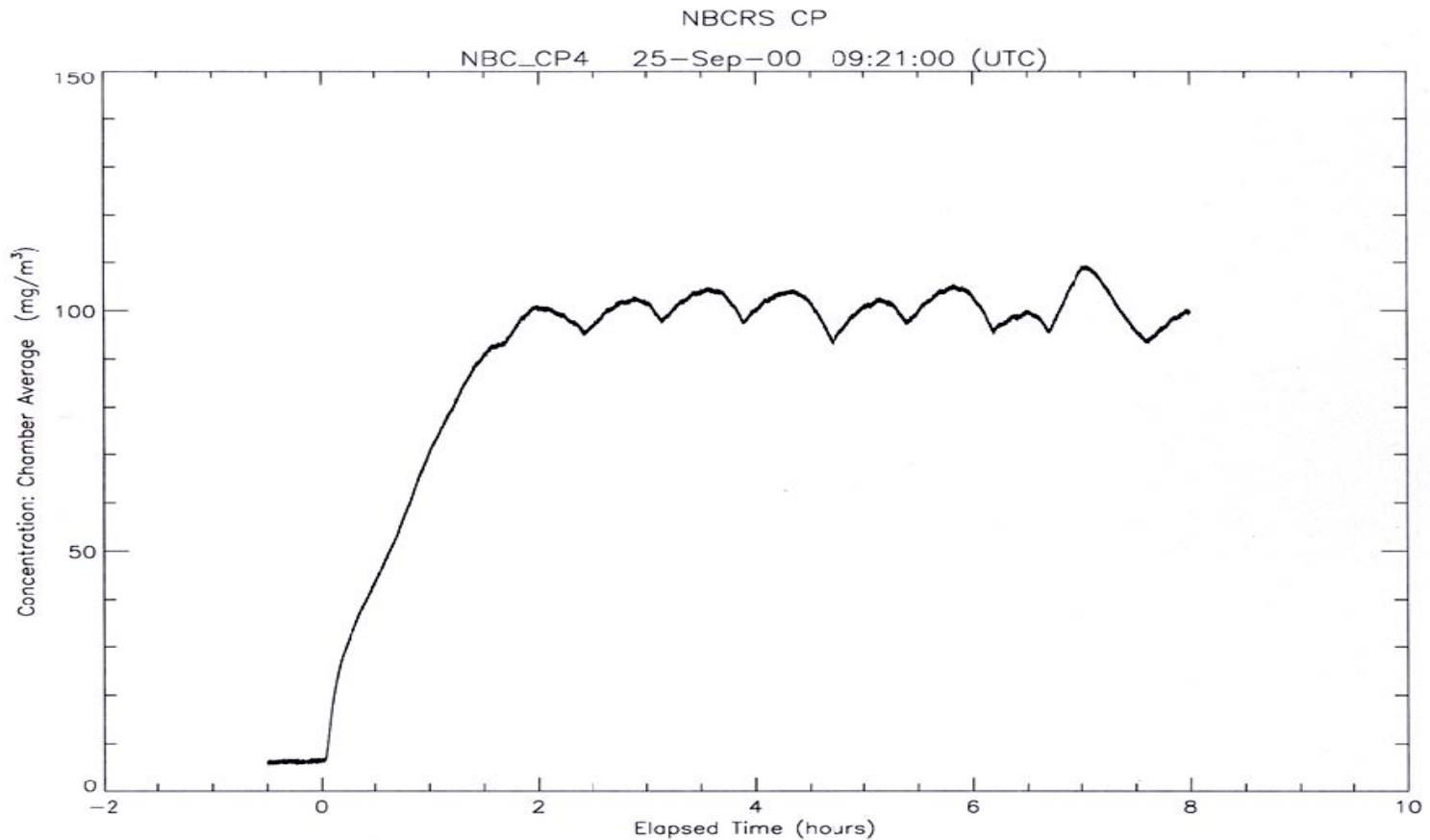
 **LOCATION OF MINICAM PROBES**

HP 120016



Test Data

2000

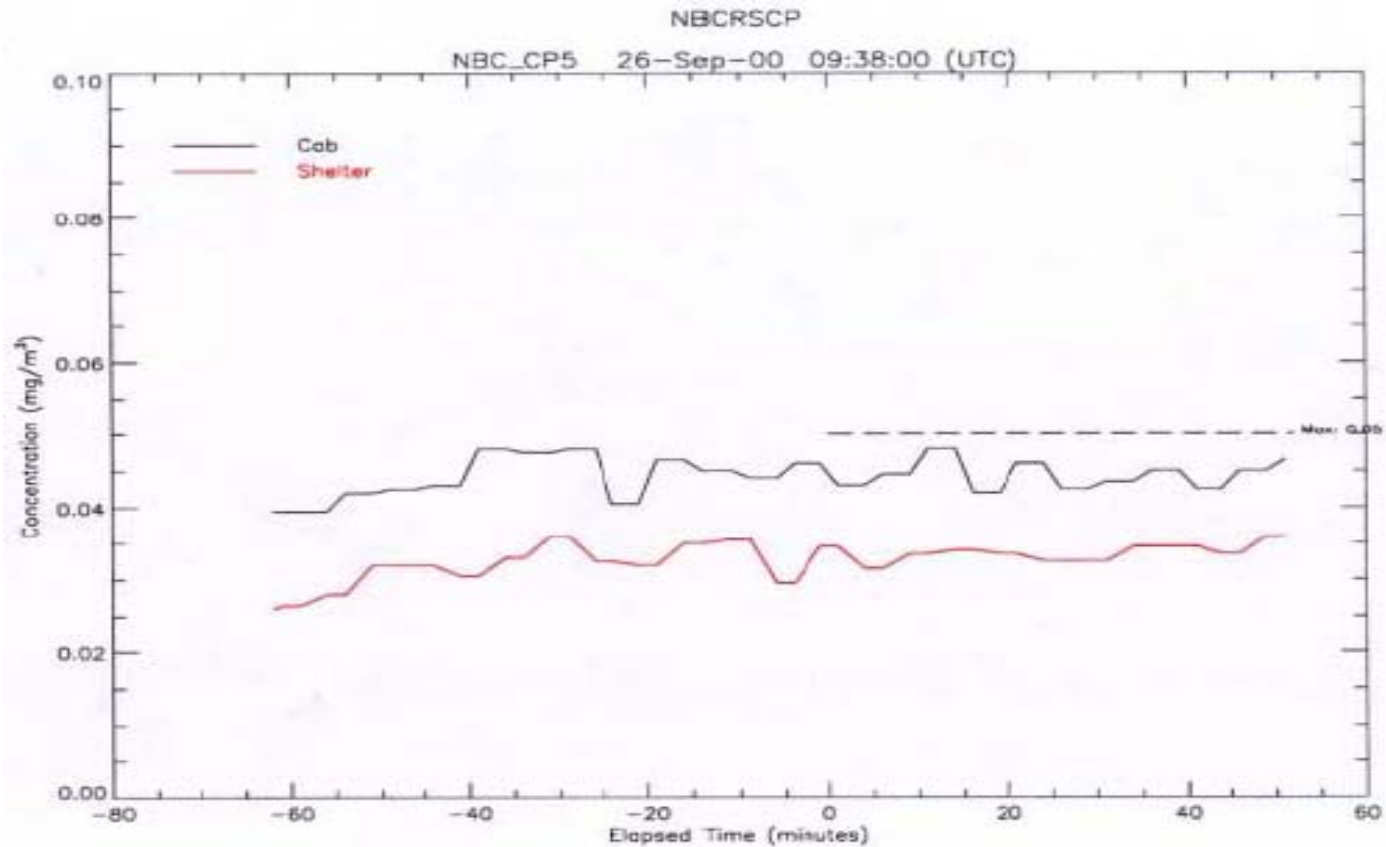


Typical Concentration Curves - 2000



Test Data

2000



Typical Inside the Vehicle Measurements -
2000



System Test

2004



- **New Family of Light-Weight Tactical Vehicles**
- **Collective Protection System Testing**



Test Protocol

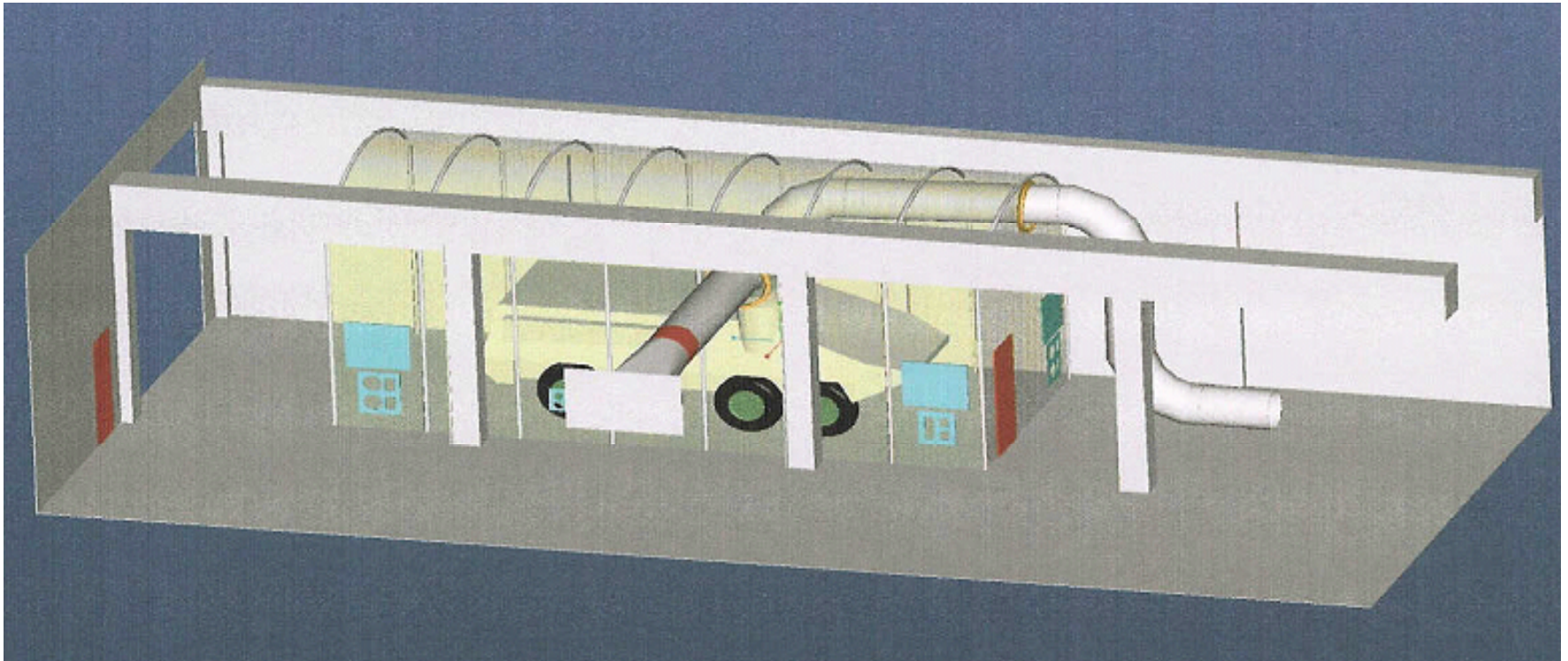
2004

- Vehicle Placed in Shelter Constructed Inside Building 3445
- Samplers:
 - 3 MIRANS Measure Challenge Concentration
 - 3 MINICAMs will be set up to Sample at Three Locations Each at the Driver, Commander and Surveyor's Positions
 - Nine Solid Sorbent Tubes were Located Throughout the Vehicle
 - Eight PADS Samplers were Located in Key Crew Locations
- Vehicle was Challenged at 100 mg/m³ for 6 Hours
- 18 Trials were Conducted:
 - 9 were Conducted with the Vehicle in Idle Only – Static
 - 9 were Conducted with All Sensors Operating and the Marker Dispersing Markers at 5 Minute Intervals



Test Setup

2004



COL PRO Test Setup in Building 3445



Test Setup

2004



Test Setup in Building 3445 Prior to
Emplacement of the Vehicle



Test Setup

2004



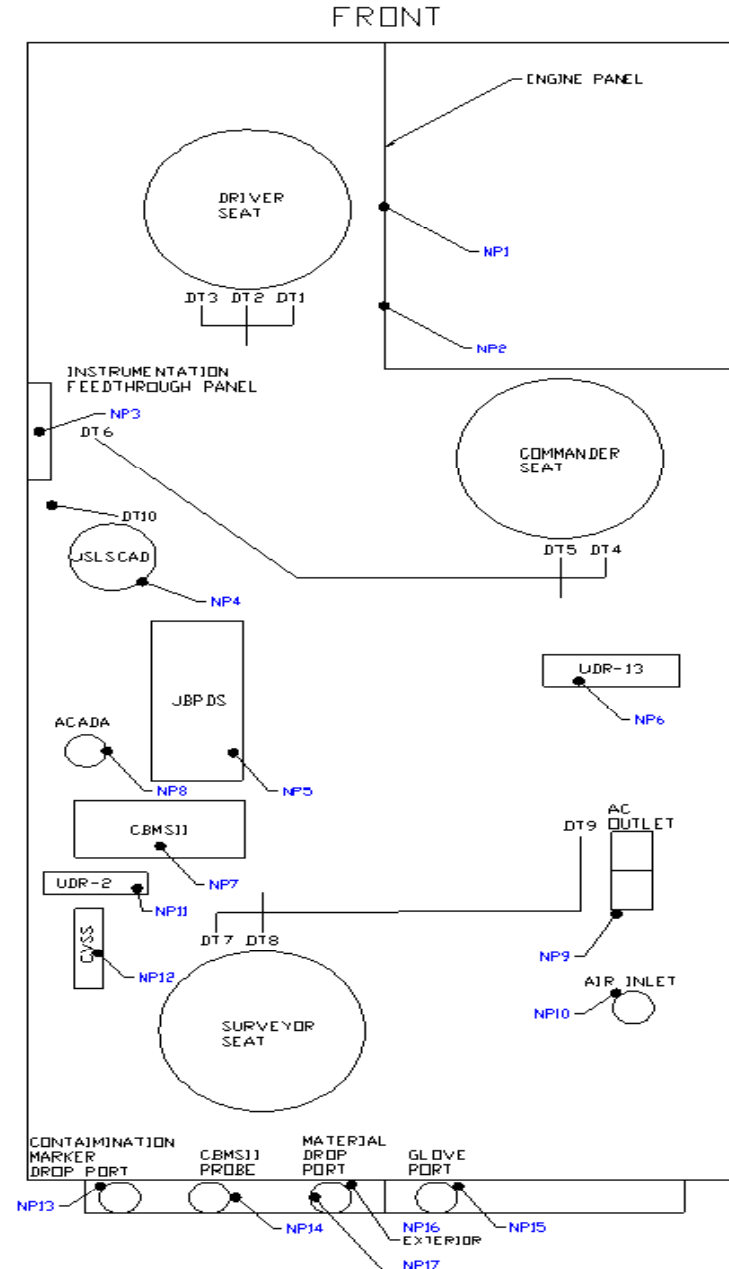
Test Setup in Building
3445



Test Setup

2004

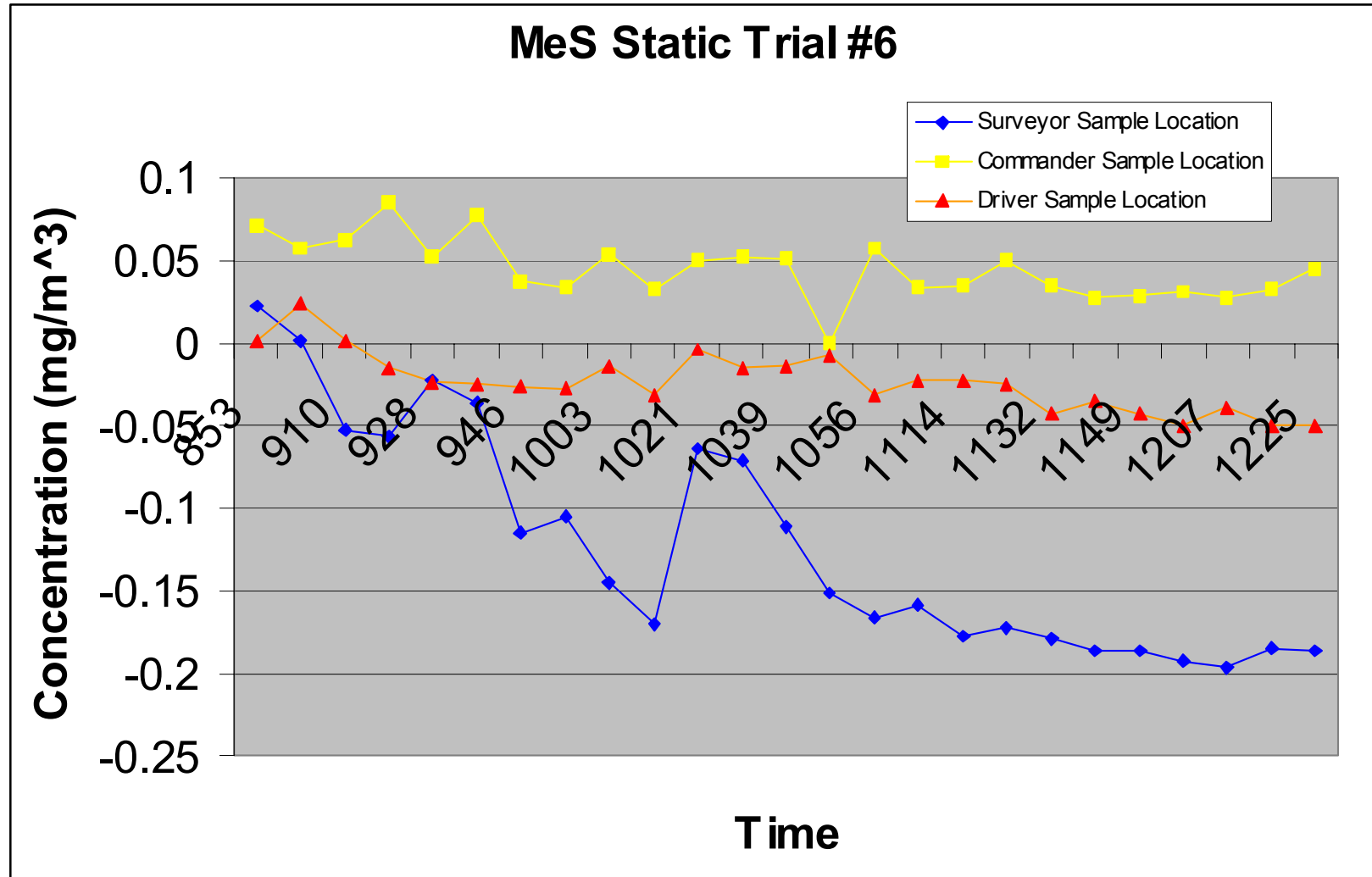
Sampler Layout for COL PRO Testing





Test Data

2004

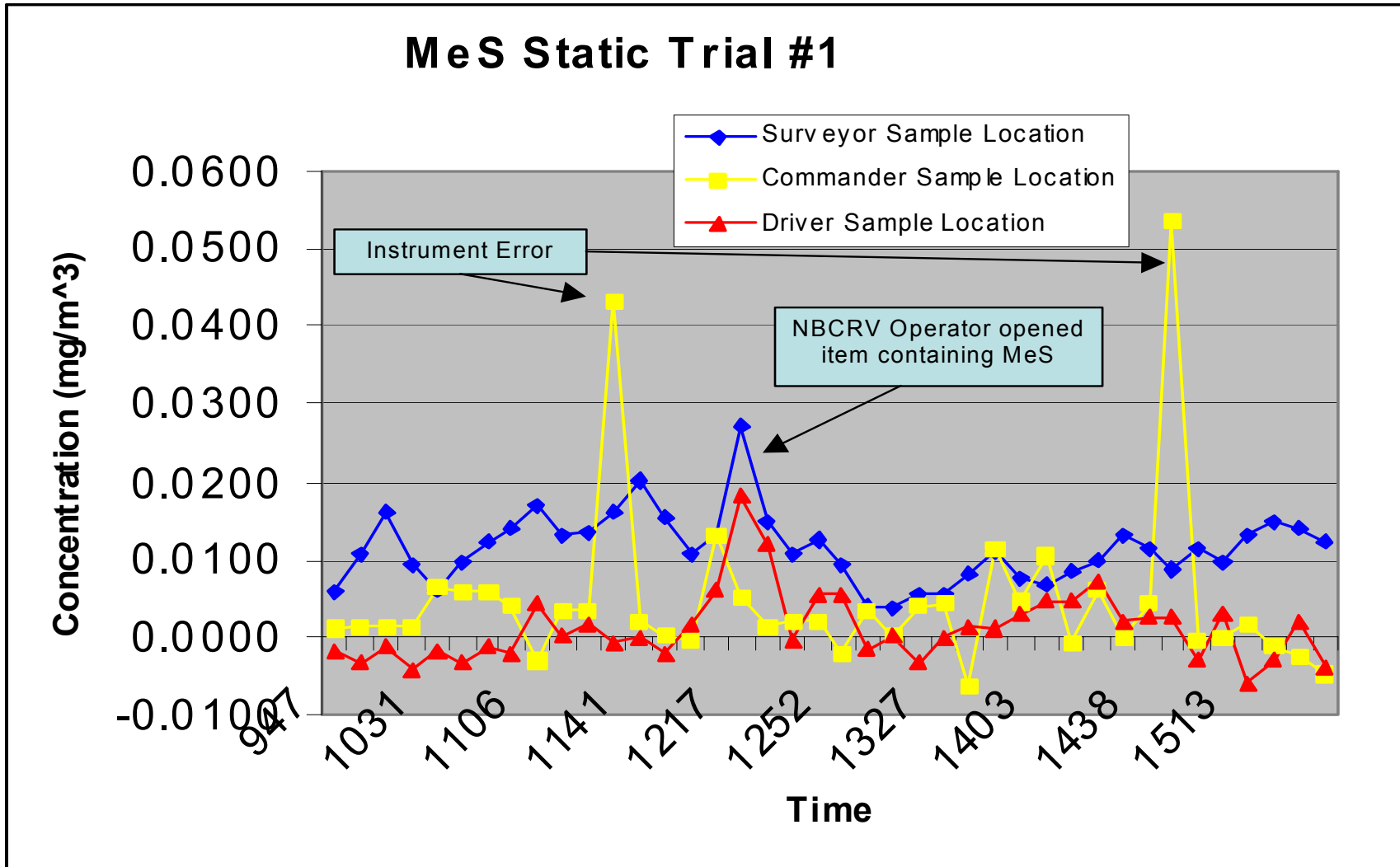


Data from One of Eight Static COL PRO Tests



Test Data

2004

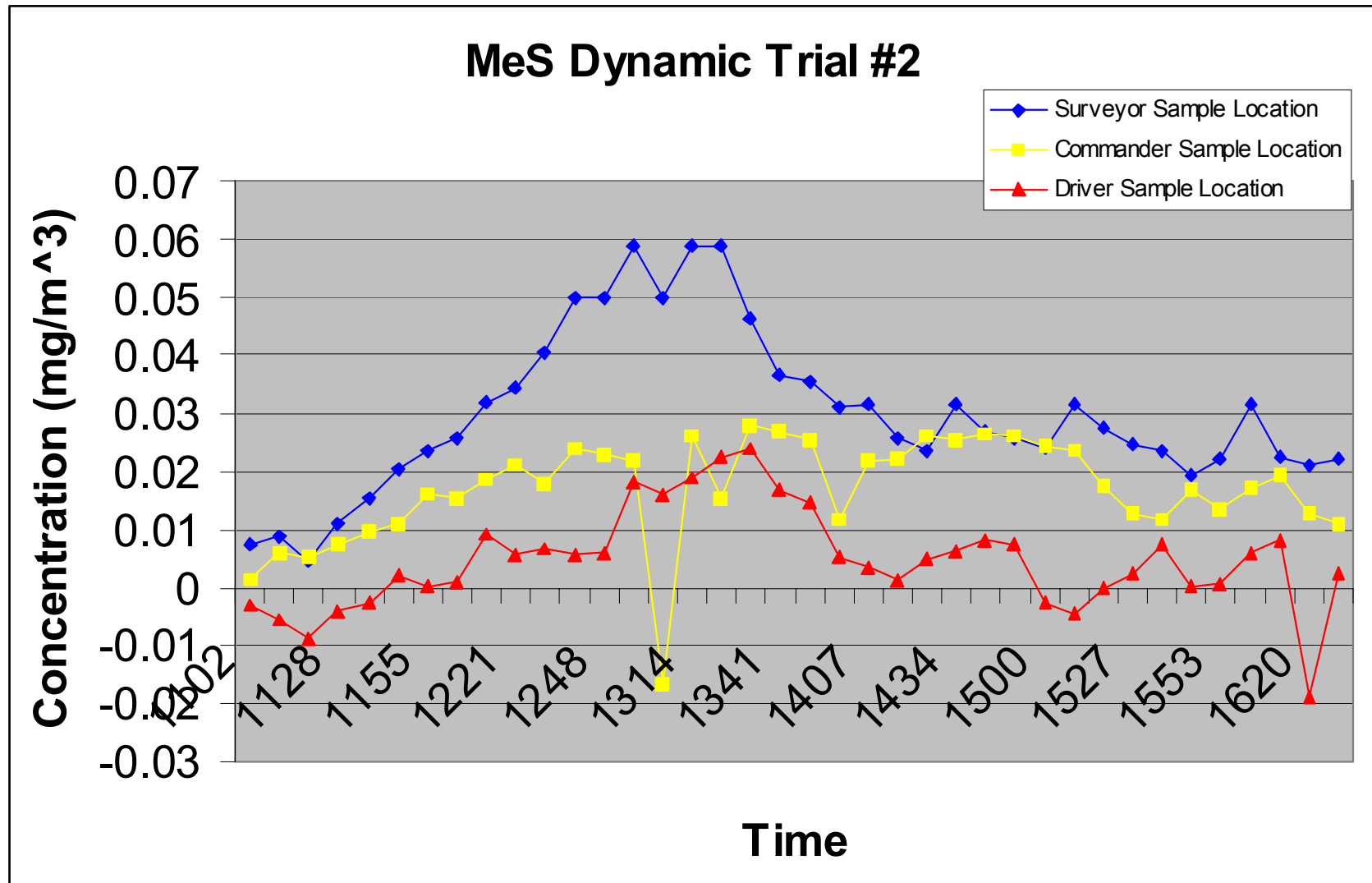


Data from One of Eight Static COL PRO Tests



Test Data

2004

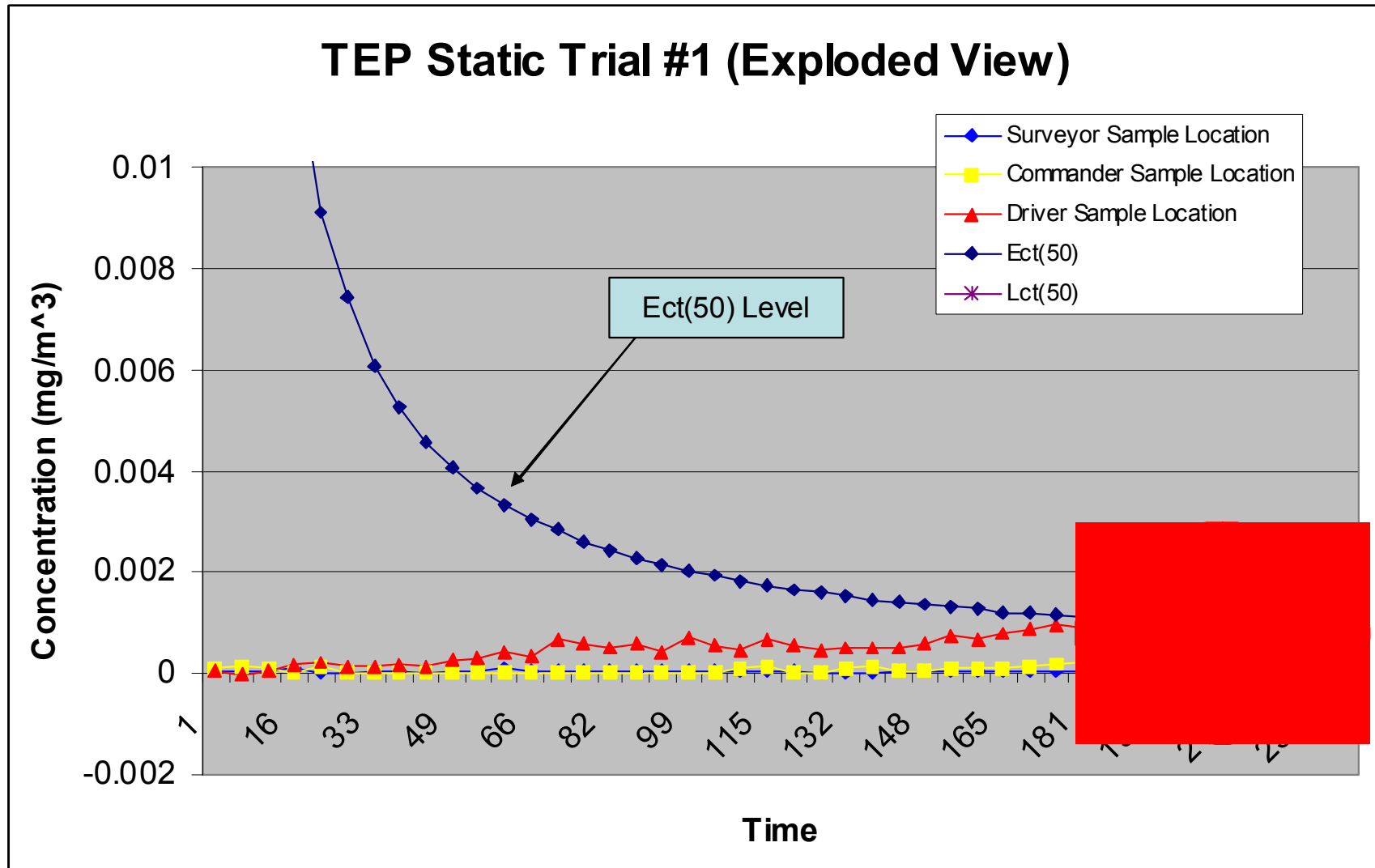


Data from One of Eight Dynamic COL PRO Tests



Test Data

2004



Graphical Test Results from Static Vehicle Test



COL PRO Test Additional Support



Life Sciences Test Facility



Capabilities

- **32,000 square feet of multifunctional biology laboratories**
- **Only U.S. facility equipped to test with aerosolized BSL-3 agents**
- **3,500 sq. Biosafety Level 3 (BSL-3) containment suites**
- **Aerosol testing with simulants, pathogens and toxins**



Combined Chemical Test Facility



Capabilities

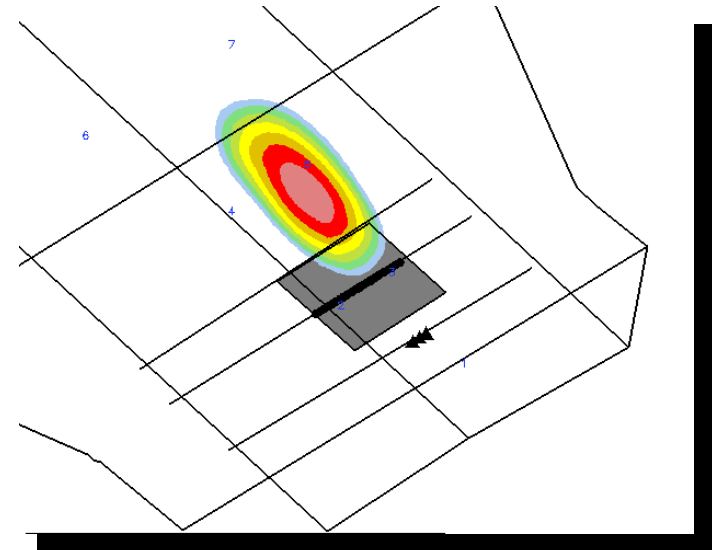
- **35,000 square feet of multifunctional chemistry laboratories**
- **57 fume hoods, 35 surety-capable test suites**
- **Supports chamber & field testing of C/B defense systems**
- **Proposed FBI C/B weapons forensic lab**



Meteorology Division

Capabilities

- Program Manager for the Army RDT&E Meteorology
- Meteorological and atmospheric dispersion modeling support for DPG and its customers
- Project Management for CB defense model development/validation tests
- Weather forecasts and field observations in support of the test mission





Material Test Facility

Capabilities

- Stainless steel chamber 30'x50'x50'
- C/B vapors & aerosols
- Full range of chemical/biological agents & simulants
- Full environmental control chemical agent training

Operational Uses

- Perform real-world decontamination operations
- Allows Agent and Simulant Exposure of whole systems.
- Chemical agent training facility
- C/B defense equipment testing under realistic conditions





Test & Training Ranges

- 1,300 square miles of controlled access, multipurpose grids & facilities
- Certified to test with C/B simulants
- Independently evaluate & test C/B detection, protection, decontamination equipment
- Validate tactics, techniques, & procedures



Test & Training Ranges

- Facilities



Granite Mountain



German Village



Wig Mountain



Test & Training Ranges

- Test Grids





Why Dugway?

- C/B experts in testing, 1,300 sq. miles of remote, controlled access real-estate



Infrastructure in place with state-of-the-art equipment



Meteorology & Obscurants



Airfield On-Site



Areas of Live Fire/Simulant Training



Expert Work Force



Remote C/B Testing Since 1940's



Environmental Permits



Working Relationships other DoD Agencies

