

Army Test and Evaluation Command

ATEC



**DUGWAY
PROVING
GROUND**

Dugway Proving Ground

Mission & Capabilities Overview

**Army Proven
Battle Ready**

Approved for Public Release—Distribution Unlimited

Agenda

- Dugway Overview
- Installation Support Activities
- WDTC Capabilities
- Current Initiatives
- Questions

BLUF: Test Tube to Battlefield

Dugway Proving Ground is the Nation's designated Major Range and Test Facility Base for Chemical and Biological Defense Testing and Training



Chem Testing



Bio Testing



Training



DPG Mission

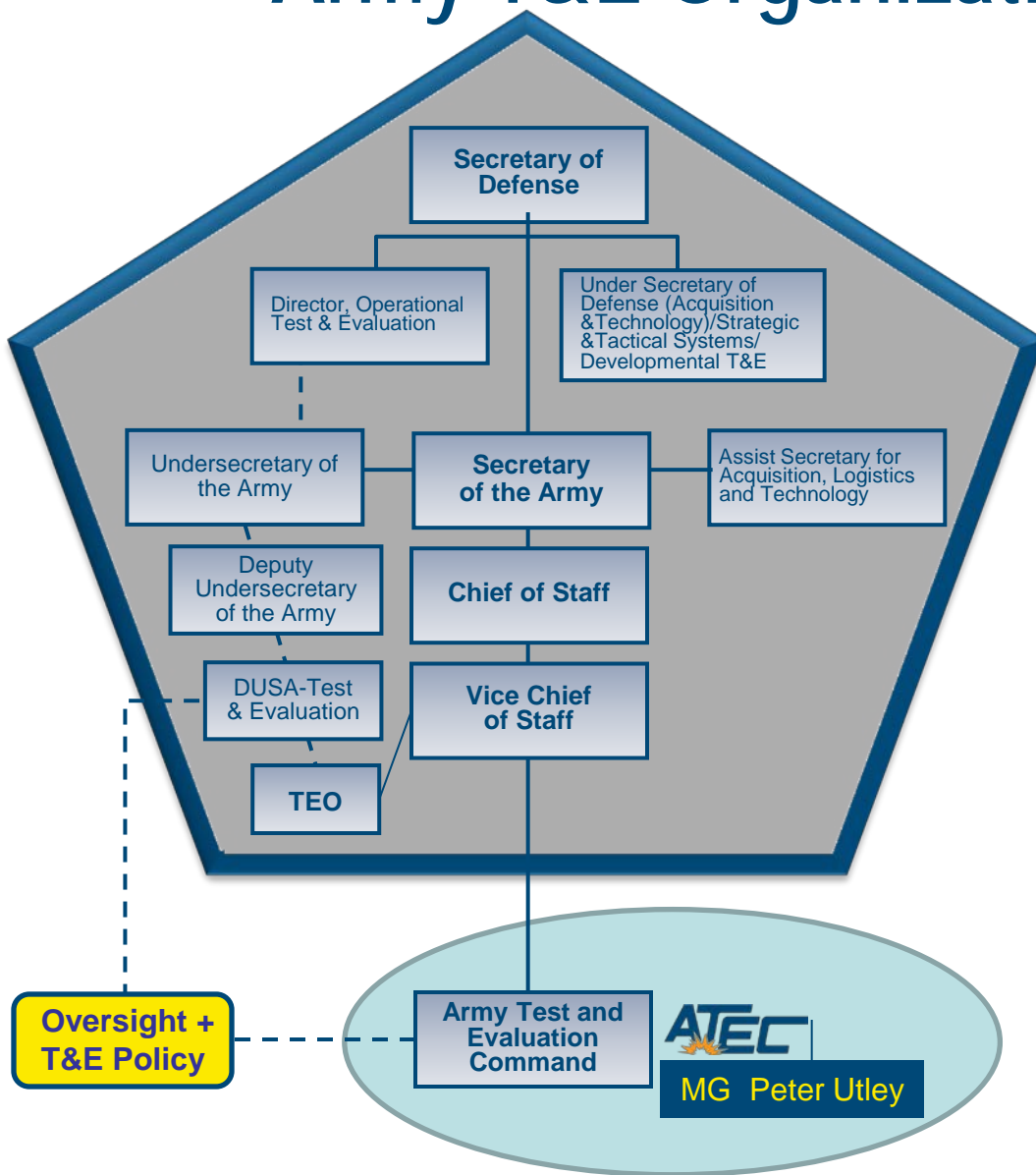
To safely test our Warfighters' equipment to the highest standards within cost and schedule.

DPG Vision

To be recognized as the nation's premier chemical and biological test center enabling the delivery of reliable defense products to our forces through rigorous developmental and operational testing.



Army T&E Organizational Structure



Mission:

Facilitate equipment procurement/ fielding decisions through testing and analysis to ensure our Army's Warfighters have the right capabilities for success across the entire spectrum of operations.

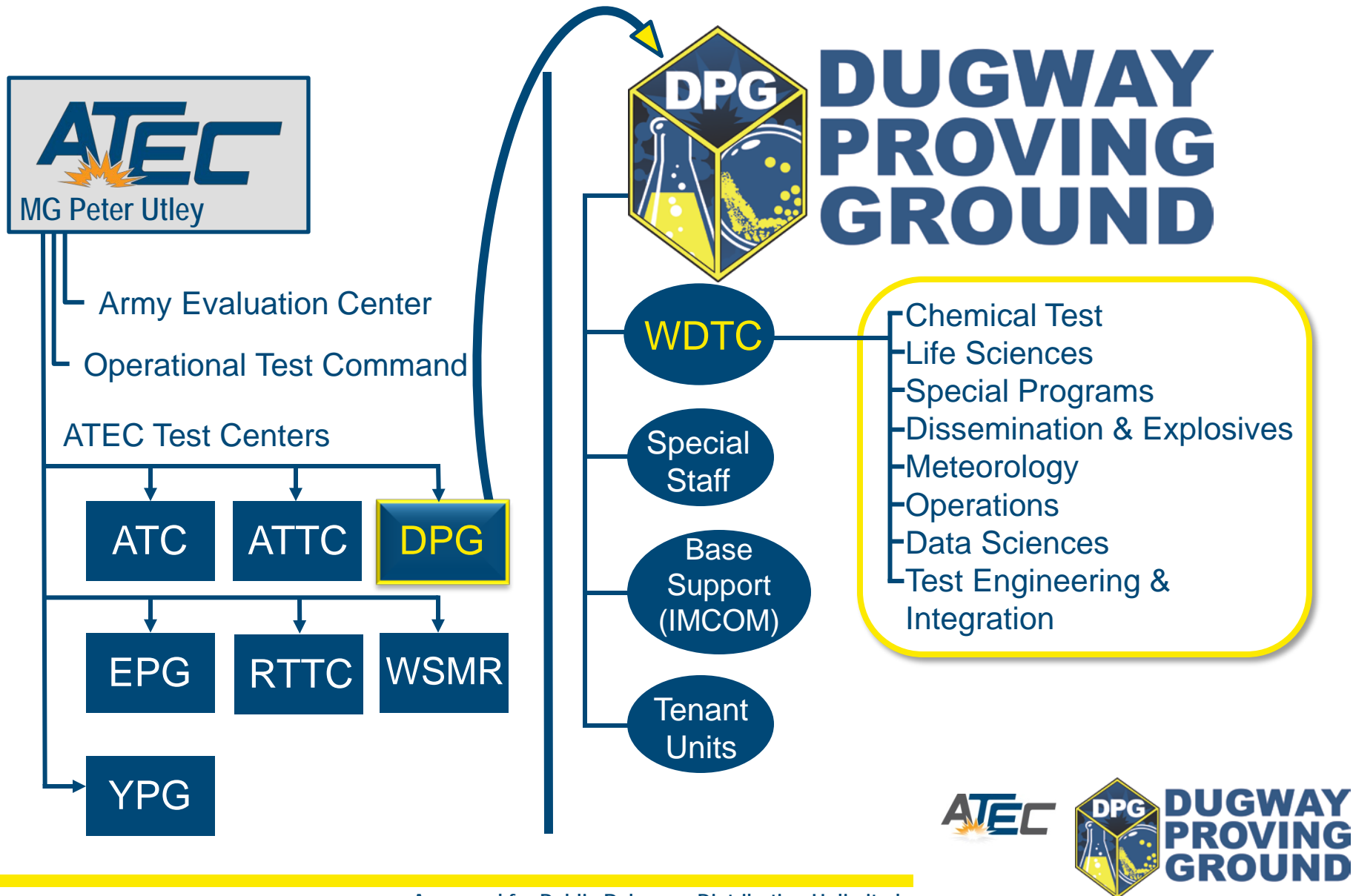
Conduct rapid testing in direct support of the Global War on Terror Warfighter, providing capabilities and limitations analyses of weapon systems to enable employment decisions for rapid fielding to the Combat Soldier.

Army T&E:
Required by OMB
& OSD to be
Independent



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ATEC Command Structure



Dugway's Direct Economic Impact

Installation Support (IMCOM)	\$46.4 M
Chem-Bio Test Center	\$74.8 M
Customer-paid Testing	\$21.3 M
Construction	\$30.2 M
*Unmanned Systems (RIAC)	\$ 1.8 M
Total	\$174.5 M

* Does not include contractor activities

Dugway Partners



TOOELE COUNTY UTAH



DPG Quality of Life Assets



Installation – English Village



- On-base housing for families and individuals
- Army Community Service center
- Visitor lodging
- Health clinic
- Commissary, gas station and Shoppette
- Schools (K-12)
 - Elementary – 118 students
 - High school – 79 students
- Child development center
- Library



Installation – Recreation

- Theater
- Fitness center
- Outdoor swimming pool
- Bowling center
- Golf course
- Skill development center
- Auto craft shop
- Photo studio/gift shop
- Outdoor recreation
- Tours and travel
- Organized sports and fitness programs
- Leisure programs



MRTFB

"The DA MRFTB is an aggregation of T&E activities...designed to provide support capabilities based on DOD component requirements without unnecessary duplication. DA MRTFB activities are available to all users with valid hardware testing and test support requirements."

-Army Reg. 70-69, 1-6, a

"Capabilities....shall not be unnecessarily duplicated."

-DoDD 3200.11

Public Law 103-160, 30 Nov. 93: Directed consolidation of all CBDP funding; DPG MRTFB operating costs became responsibility of CBDP. Sec. Def. designated Army as Executive Agent to coordinate and integrate chemical/biological defense RDT&E



Ideal Testing Environment

- Environmental permits
- Pristine air quality
- No encroachment (physical or electronic)
- No endangered species
- Low precipitation (<8 in./year)

Granite Mountain
7,080 ft. elev.

Total Area

1,252 miles²

Mountain Terrain

59,078 acres

Mixed Desert Terrain

279,768 acres

Playa (flats)

462,180 acres

Salt Flats 4,230
ft. elev.

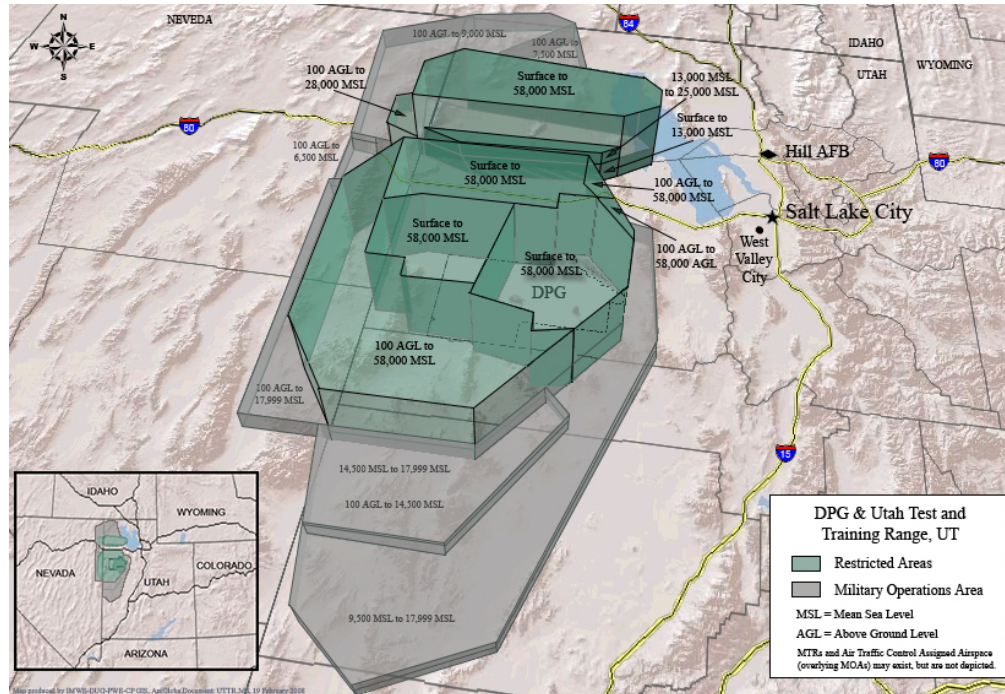


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Location & Airspace

DPG is partnered with Utah Training & Test Range

Freedom to Test and Train

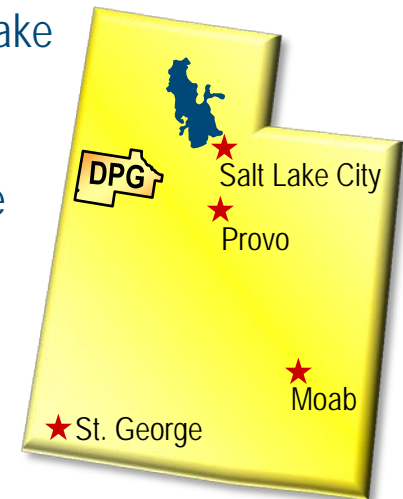


Dugway is Remote:

- ✓ Free from urban encroachment
- ✓ Acoustically & electronically quiet
- ✓ Salt flats for 90 miles north
- ✓ Light pollution-free
- ✓ Surrounded on three sides by mountains and desert terrain

Dugway is Accessible:

- ✓ 85 miles from Salt Lake City (I-80)
- ✓ 85 miles from Provo
- ✓ 40 miles from Tooele



Total Airspace Footprint

16,797 miles²

Restricted Airspace

7,954 miles²

Military Operations Area

10,004 miles²

DoD Exclusive-use Land

3,078 miles²

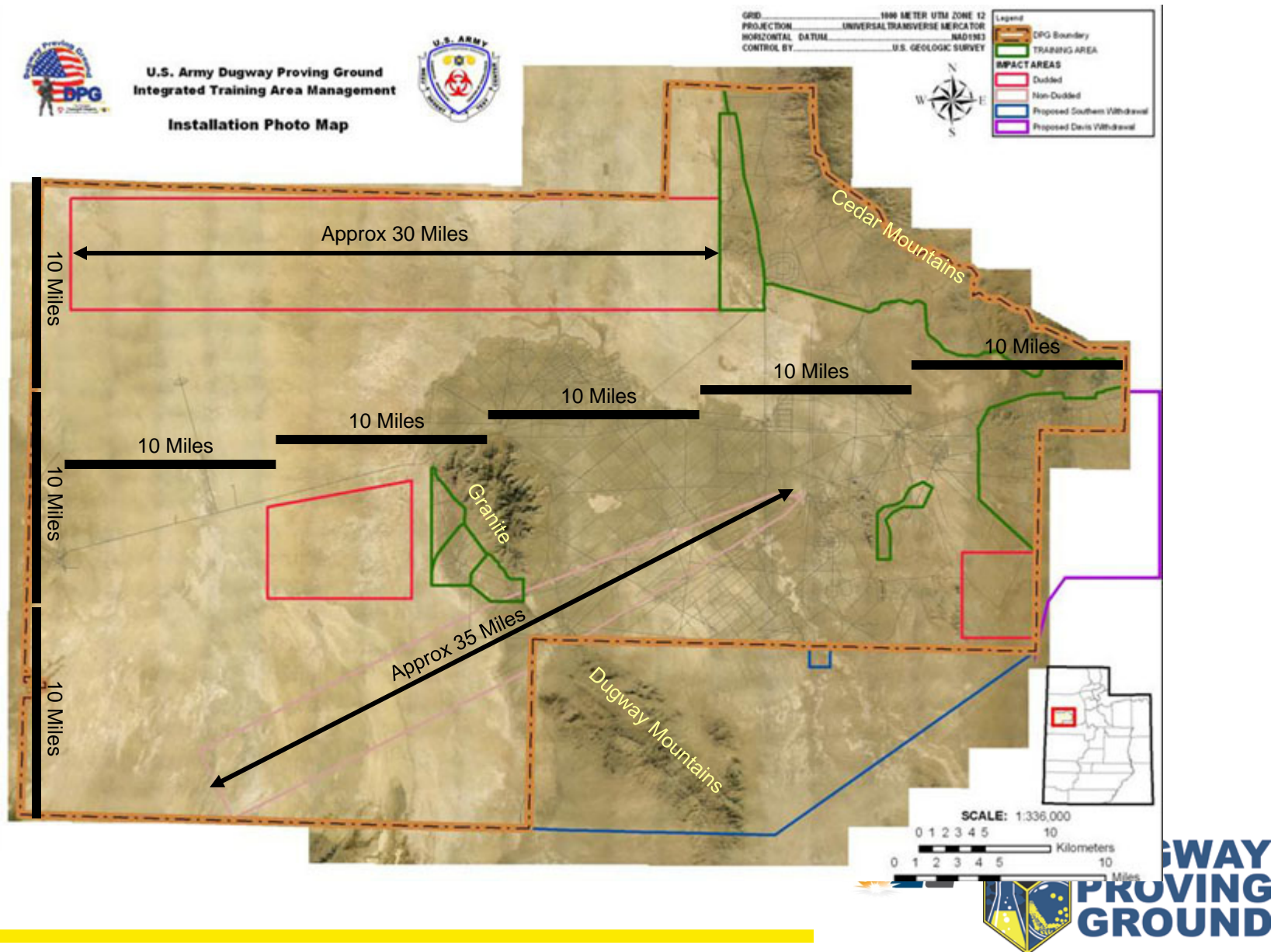
Government-owned Land

16,686 miles²



**DUGWAY
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DPG – 50 mi x 30 mi



Key DPG Locations



Michael Army Airfield

**Fully lighted 11,000-ft runway
capable of handling any
aircraft in DOD inventory**

- Emergency landing site for distressed aircraft
- Aircraft decon pad
- 20,000 ft² hangar
- Support to National Capitol Response Mission (NCR)

Operational Use:

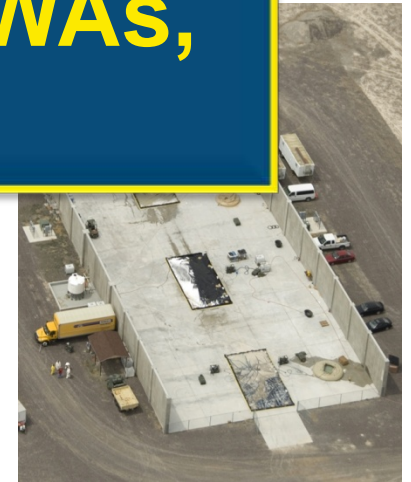
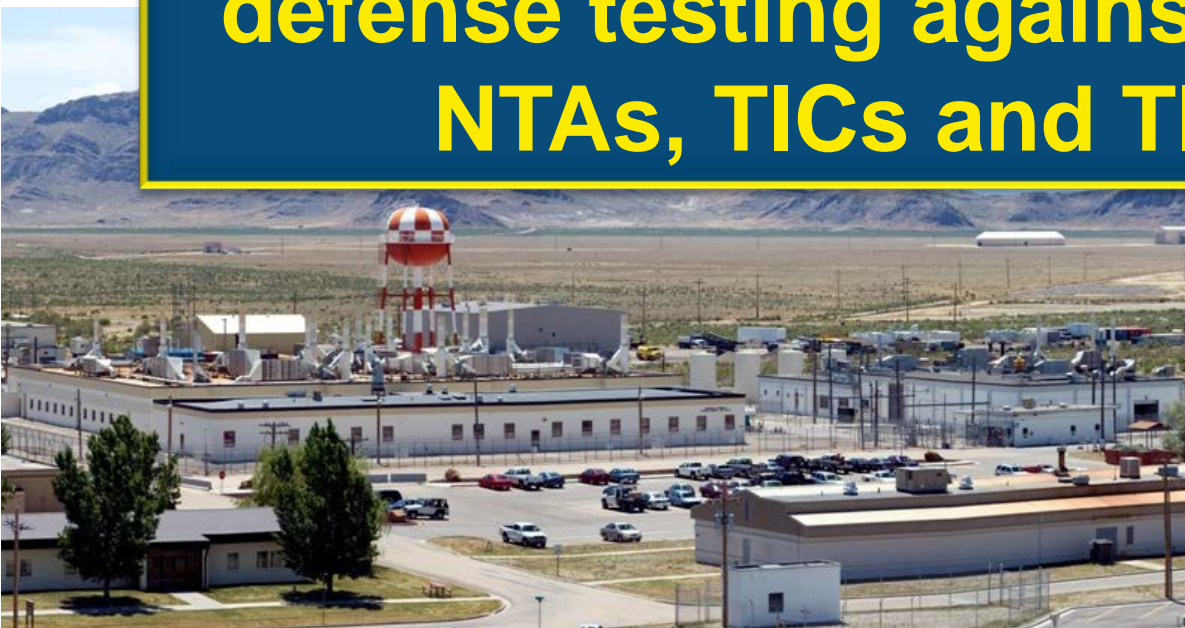
- Unmanned Aerial Systems testing
- Shipment of surety materials
- Chem-bio decontamination of aircraft
- Tactical air operations
- Air re-supply and logistics
- USAF emergency airfield



Chemical & Emerging Threat Agent Test Complex



Surety facilities for chemical defense testing against CWAs, NTAs, TICs and TIMs



Combined Chemical Test Facility (CCTF)



Live agent & simulant testing

Agents

- G Agents
- VX
- H-Series
- Lewisite
- Emerging threats

Simulants

- Army licensed simulants

Capabilities

- 35,000 ft² of multifunctional laboratories
- 47 agent-certified fume hoods in 27 surety-capable test suites
- Supports chamber and field testing of chem-bio defense systems
- Aerosol, vapor, and droplet testing with CWA, TIC/TIM, & emerging threats
- Developmental and operational testing



Material Test Facility (MTF)

DOD's largest CWA-certified test chamber

- Stainless steel multi-purpose test chamber (30'x50'x50')
 - Temperature: -40° to 60° C
 - Humidity: 10 to 90%
 - Rated for bio agent testing up to BSL-2
- Two (30'x25'x25) environmentally-controlled stainless steel test chambers
- Chemical vapors & aerosols
- Use full range of chemical agents and chem/bio simulants

Operational Use

- Operationally relevant developmental and operational testing of chem/bio defense equipment
- Perform real decontamination operations
- Full-scale testing of large military hardware

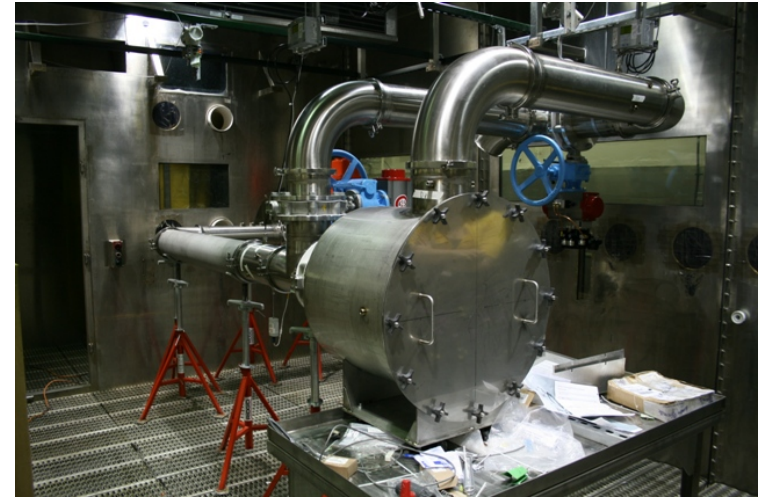


Building 3445 Chemical Test Facility

Large-scale live-agent testing

- Two 2,210-ft² custom-tailored test chambers allow high concentrations of chemical warfare agents or chemical and biological simulants
- Chambers currently house ColPro test fixtures:
 - Advanced Air Purification Test Fixture ● →
 - Novel Closures Test Fixture ● →

Live agent filter testing



Simulant testing of closures and seams

Decontamination Facilities

Full-scale decontamination testing

- All DPG permitted simulants and decontaminants allowed
- Steel-reinforced concrete pad (200' x 100')
 - 20-foot walls for overspray mitigation
 - 8 feet above grade
 - Can handle weight of armored vehicles
 - Sump, pump system, and holding tank for waste disposal
 - Multiple power ratings
 - Multiple water options

Operational Use

- Test effectiveness of contamination/decontamination cycles
- Decon operating procedure training
- Test accuracy of chem/bio point detectors
- Environmentally friendly



Test Materiel Conditioning Complex

MIL STD 810G testing support and special environmental testing

Climatic & Dynamic Test Chambers & Fixtures

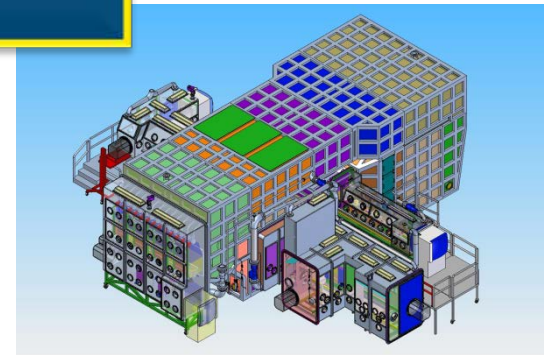
- Instrumented mobile and fixed conditioning chambers
 - Temperature & humidity
 - Altitude & precipitation
 - Salt fog, sand & dust
 - Physical & thermal shock
 - Vibration
 - Shock & bounce
 - 60-foot drop tower



Biological Warfare Agent Test Complex

Surety facilities for biological defense testing against BWAs and unconventional threats

The Nation's ISO-certified source and repository for standardized BWAs and select toxins



Life Sciences Test Facility (LSTF)

Only US facility equipped to test with aerosolized biosafety level 3 (BSL-3) agents

Capabilities

- 32,000 ft² of multifunctional biological laboratories
- Biosurveillance testing
- Six BSL-3 containment suites
- Aerosol testing with pathogens, toxins and simulants
- ISO 10725 Certified Critical Reagents Program support

Test Agents & Simulants

Agents

- Up to BSL-3
 - Bacteria
 - Viruses
 - Ricettsia
- Biological toxins

Simulants

- 8 licensed simulants
- Agent-like Organisms (ALOs)

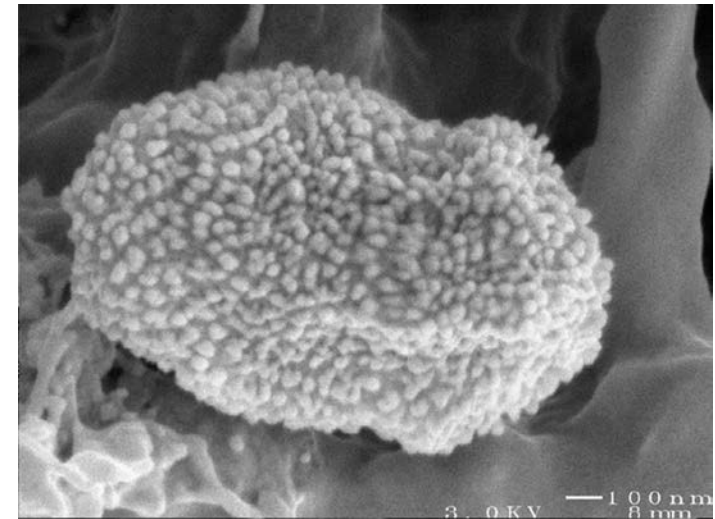
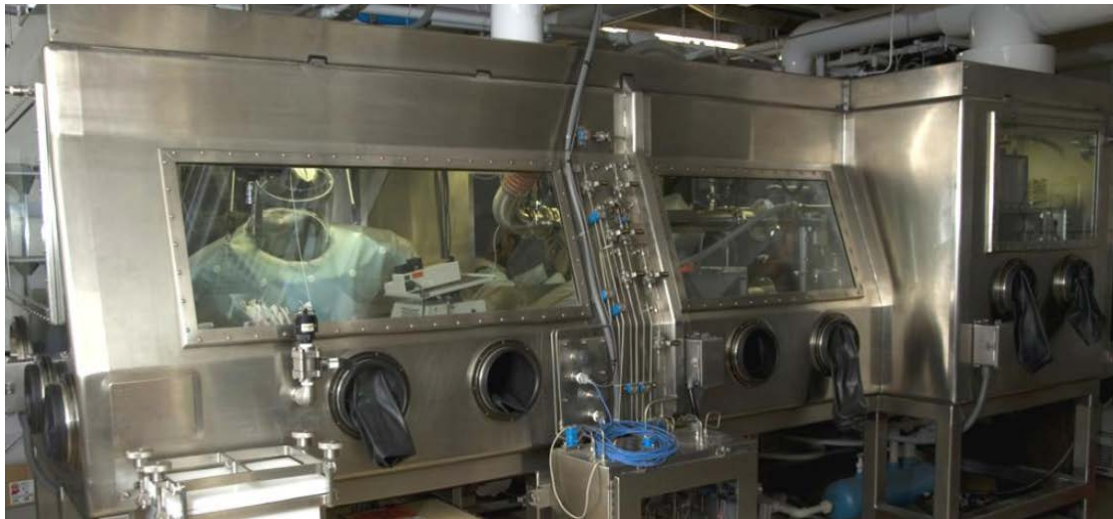


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Containment Aerosol Chamber (CAC)

Nation's only acquisition-certified BSL-3 aerosol test chamber

- Engineered for aerosolization of BSL-3 organisms
- Full control of temperature (37°F to 105°F) and humidity



Aerosol Simulant Exposure Chamber (ASEC)

Multi-purpose aerosol test chamber with static or dynamic airflow

- Aerosolization of live or killed biological simulants and inactivated agent-like organisms
- Biological point detector testing
- Contamination/decontamination survivability assessments
- Computer-controlled temperature and humidity



Baker Laboratory – Whole System Live Agent Test (WSLAT) Chamber

Whole-system testing with aerosolized BSL-3 agents

- Newly renovated 10,000-ft² surety laboratory
- Largest BSL-3 chamber of its type (4,000 ft³)
- Sized to handle two whole PDS units and a full complement of referee instrumentation for side-by-side comparative testing
- Scheduled for completion in 2014



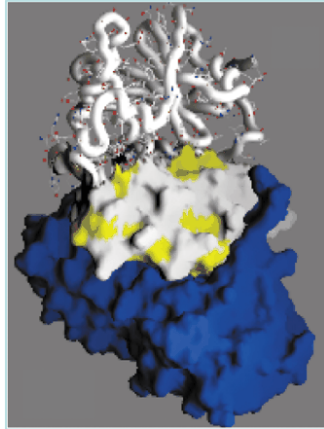
Biological Agent/Simulant Growth & Irradiation Facility

- Newly-renovated laboratory production facility
- Large-scale simulant production (up to 1,000 L)
- Gamma irradiation capability renders simulant & agent up to BSL-3 inactive for shipping & testing

**On-site biological test
material production
saves time & money**



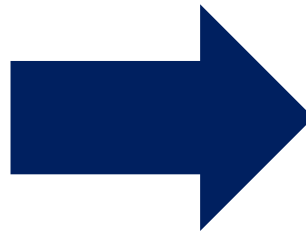
Biological Agent Simulant Development



IED and HME
Threat Assessment



Ricin Toxin



- Non-toxic simulants for use in training, standoff chamber and field, and decontamination testing.

Critical Reagents Program (CRP)

Standardized Antigen Repository

- Stewardship of CRP's antigen repository established in 2004
- DoD producer of certified reference materials (bacteria, viruses, interferents, and toxins)
- Developed production protocols, conformance tests & batch records for antigen standardization
- Unified Culture Collection Cell Line Pedigree

Certification: ISO 10725



Simulant Challenge Test Complex

**Standoff detector testing with
static and controlled dynamic
simulant clouds**



Joint Ambient Breeze Tunnel (JABT)

Dynamic simulant cloud

- Produces a controlled, *moveable* simulant cloud with user-defined size and concentration for detection system testing
- Variable-pitch fans create airflow up to 6 m/s and 900,000 cfm
- 170-meter permanent tent structure on an epoxy coated slab



Active Standoff Chamber (ASC)

Stationary simulant cloud

- Produces *stationary* aerosol or vapor simulant clouds that can be suspended for detection system testing
- Stainless steel chamber built to agent containment levels for chemical simulants
- Environmentally controlled chamber uses air curtains to hold CB simulant cloud in place



Outdoor Range Multi-use Test Grid Complex

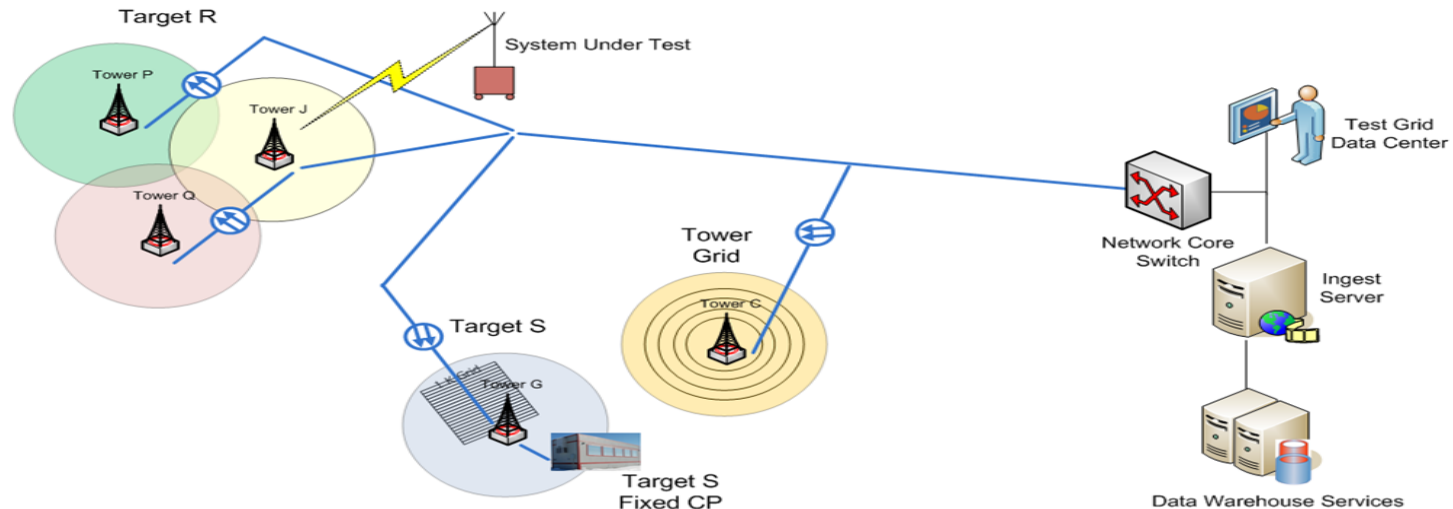
Most heavily-instrumented test range in the world

- Complex of 27 instrumented ranges, grids, test sites & impact areas
- CB, munitions, smoke & obscurants, and illumination testing
- Outfitted with dissemination, referee & meteorological sensors and communication technology
- Environmental permits for outdoor open air testing with all appropriate CB simulants
- 4 major impact areas, 9 drop zones & 91 artillery firing points



Test Grid Capability Upgrade

Secure, wireless, real-time, data management to reduce test cost and schedule



ITT

EMC² federal
where information lives



MESH, Inc.
Micro Engineering Software & Hardware



NCAR



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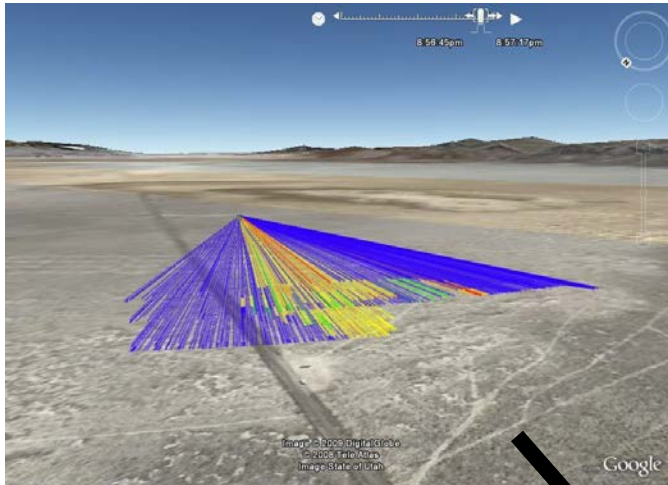
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Chemical Cloud Tracking System (CCTS)



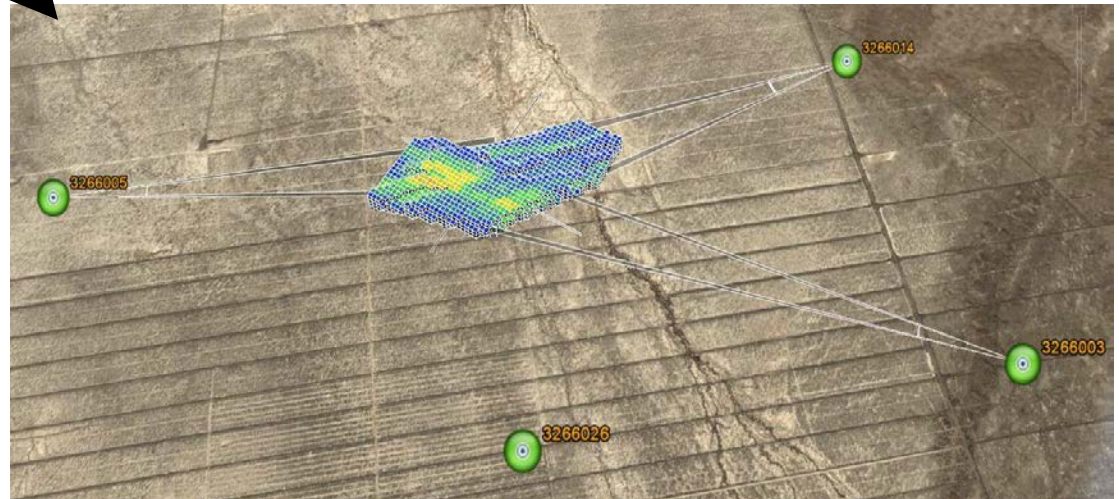
- Scanning FTIR spectrometer
- Each unit locates itself using GPS and self-orientes using a digital compass
- Networked CCTS units create a 3D-concentration maps of the cloud

CCTS



Single sensor- raster scan pattern showing concentration pathlengths at given scan angle and elevation

Networked CCTS sensors-
3D cloud concentration maps
via real-time tomographic
data processing at command
post



Toxic Industrial Chemical (TIC) Field Testing

Large-scale outdoor TIC releases (up to 2 tons)

- Multiple TIC dissemination methods, including explosive
- State of the art laboratory for post-test analysis, including cloud concentration measurements
- Meteorological forecasting and modeling of conditions and dispersion characteristics prior to and during test events



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JR1 PILOT TRIALS



Pilot Ammonia Dissemination
07 April 2010

Pilot Chlorine Dissemination
08 April 2010

0.31 m/s (0.69 mph)

Wind Speed

0.64 m/s (1.43 mph)

-0.09° C (31.8° F)

Temperature

-0.35° C (31.4° F)

81%

Relative Humidity

74%

-3.51° C

Dew Point

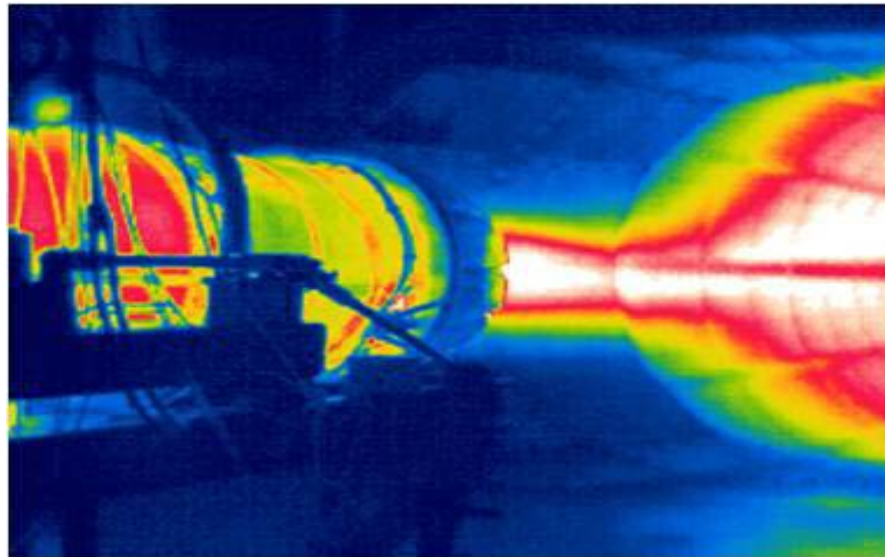
-4.36° C

Explosives & Dissemination

Experts in field, chamber & laboratory dissemination



- Dissemination of chemical and biological simulants for all tests
- MIL STD 810G facilities for environmental conditioning and chem/bio testing
- Explosive and munitions handling and retrograde functions for all Dugway testing



Smoke & Obscurants Testing



Weapon delivery systems for testing by direct fire, indirect fire or fog generation

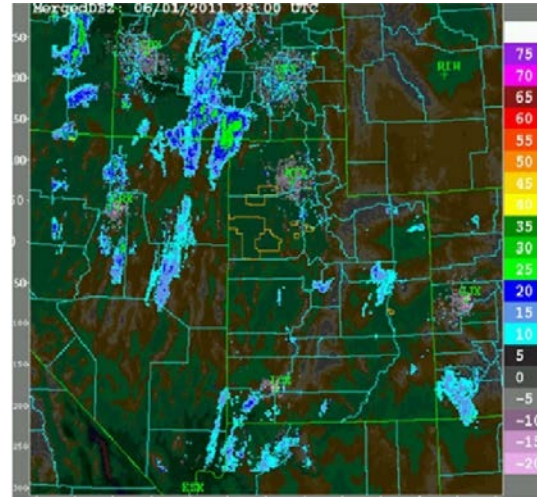
- Radiometer data acquisition and complete suite of R&D analysis tools
- Open test ranges for full perspective of smoke characteristics



Meteorological Test Support Complex

Program Manager for Army RDT&E Meteorology

- Real-time wind prediction for testing and in-theater operations
- Supports all field testing at Dugway
- Remote sensing and dispersion modeling
- Developed Four-Dimensional Weather (4DWX) System
- R&D and test management
 - Defense Threat Reduction Agency (DTRA) Urban Modeling Program



Data Sciences & Distributed Test Control Center (DTCC)

Safari and distributed test event support

Capabilities

- Two test control centers for local and safari test events & training exercises
- Independent operation
- 7 projector and 2 LED displays
- Advanced communications and data analysis
- Accredited for open storage and periods processing – classified or unclassified
- Shared server room
- Separated VIP viewing area

Operational Use

- Testing and/or training:
 - Local
 - Distributed
- High performance computing development
- Modeling and simulation development
- Meetings, telecons, VTC
- Static and dynamic software analysis



Unmanned Aerial Systems (UAS)

Onsite airfield facilitates UAS testing programs

- *1,300 miles² of restricted airspace up to 58,000 feet*
- Testing for all UAS
- Rapid Integration and Acceptance Center for PM-UAS
 - Hunter
 - Shadow
 - Warrior
 - Gray Eagle
- Adjustable IR, Laser and EO targets
- High-speed optical data imaging
- Cloud data for CBRN
- Hellfire range support
- Fabrication shops



Elite Training

DPG offers an extensive menu of elite training courses for military & civilian first responders and other government customers. Concepts and techniques are taught at a graduate level.



Curriculum	Chem	Bio	HME
Signature recognition of chem/bio synthesis	X	X	X
Detection & identification of chem/bio agents	X	X	X
Sampling	X	X	X
Threat mitigation	X	X	X
Hazards & properties associated with chem/bio agents	X	X	X
Dissemination techniques	X	X	X
Evaluative application to realistic threat scenarios	X	X	X



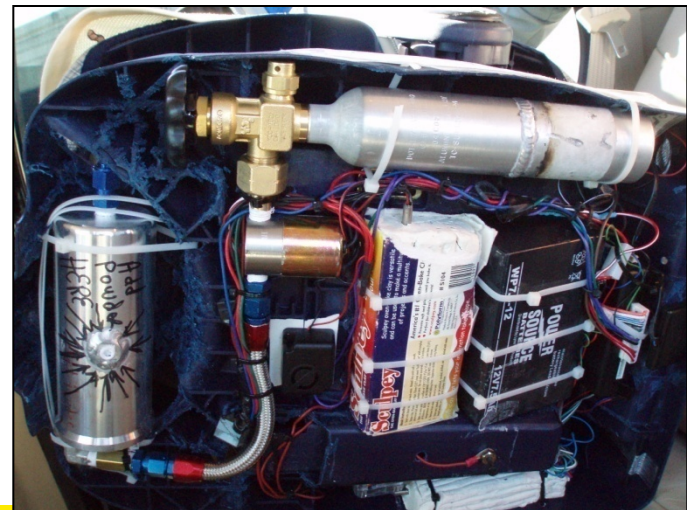
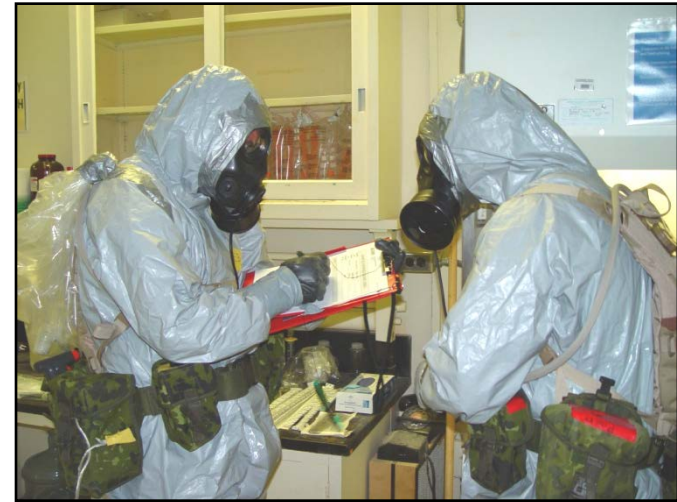
Special Programs

- Combatant Command Support
 - Advanced Concept Technology Demonstration
 - Testing for Joint Services
 - Responses to Commanders in the Field
- Homeland Defense/Homeland Security
 - Civil Support Teams
 - Special Operations Forces
 - Emergency First Responders:
 - Firefighters
 - Police
 - Field Exercises



Staff Capabilities

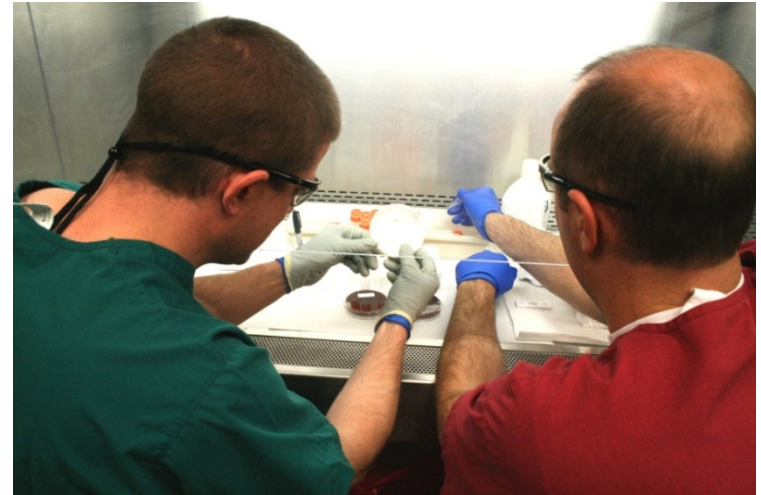
- Unique mix of operational and technical personnel
 - PhD. Microbiologists
 - PhD. Chemists
 - PhD. Engineers
 - Former CBRNE Operators
- Extensive cross-training.
- Focus on customer interface (End user)
- Specialize in advanced training, exercises and operational testing



Laboratory Training Programs

Hands-on training with agents in laboratories

- Detection of actual agents using units capabilities
- Decontamination of actual agents using unit procedures
- Confidence in working with hazardous materials



Field Training Activities

- Tailored to unit objectives
- Realistic scenarios with role players
- Use of simulated CBW agents with unique disseminations
- Immediate feedback from SME's (Ph.D. Level)
- Interim After Action Reviews (AAR's)
- Formal After Action Reviews
 - Exercise video
 - SME input
- Confidential results



SOF/Conventional Training Support

- Conduct Air/Ground Deployment of Unit
- Conduct full SOF mission profiles
- Desert Warfare and live-fire ranges
- Land Navigation and Off-road Vehicle Mobility
- Unique Weapons Training Sites
- High Angle / Long Or Short Range Marksmanship
- Immediate Action Drills, React to IEDs
- HAHO, HALO jumps (9 drop zones)
- Close Air Support (CAS) ranges



Chemical Energetics (IED) Defense Support Facility

DoD's recognized experts in improvised and homemade explosives

"Bang Boxes"

- Twin, hemisphere-shaped, 1,000-m³ facilities
- Constructed of PVC-coated polyester fabric anchored to a concrete pad and kept rigid by low-pressure fresh-air injection



Capabilities

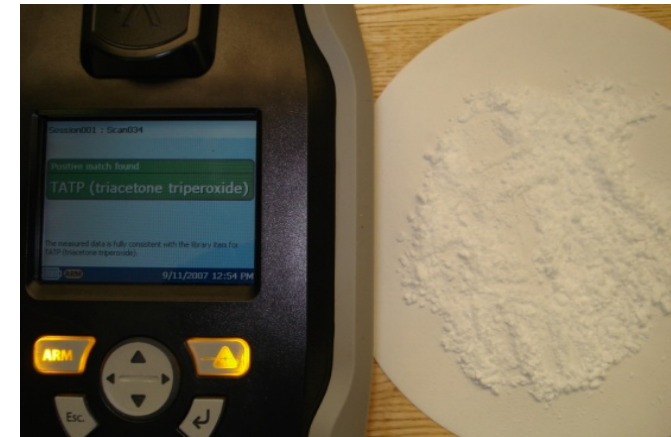
- Explosive material synthesis and testing
- Characterization of homemade explosives
- Peroxide explosives properties
- Peroxide explosives as initiators
- HMTD, TATP, DADP
- TATP synthesis
- HMTD synthesis
- RDX synthesis
- ANFO mixtures



Hazardous Material Facility

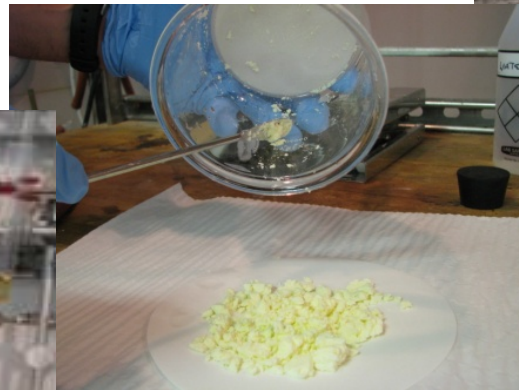
Improvised TIC/TIM threat production & assessment

- Non-surety, improvised toxic industrial threat production & assessment facility
- Production, characterization, testing and assessment of threat-representative chemical materials
- End user performance assessment of current detection & mitigation methods
- Supports EOD and SOF organizations
- Fully-operational hoods, detectors, and blast chamber



Home-Made Explosives (HME) Effects Testing

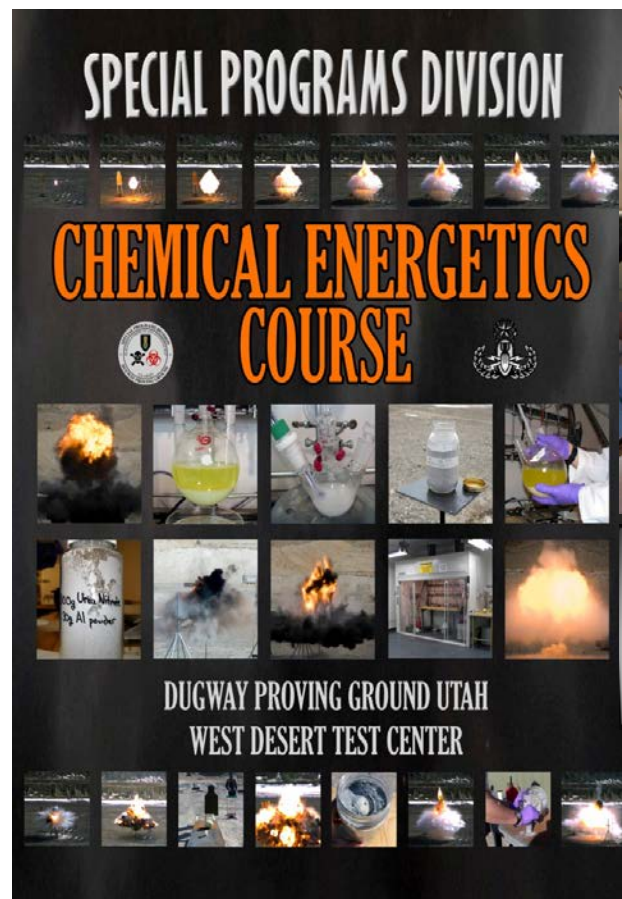
- Explosive Material Evaluation
- Chemical Analysis/Mitigation
- Threat Assessments/Elimination
- Counter IED



Chemical Energetics Course "CEC"

Theater-relative Terrorist Explosives
synthesis, detection, identification,
testing & mitigation

- Peroxide Explosives TATP, HMTD
- Peroxide Explosives as Initiators
- Urea Nitrate
- Ammonium Nitrate Fuel Oil
- R-Salt
- RDX and C-4
- Picric Acid
- Silver Nitrate
- Silver Fulminate
- K9 Explosives Detection



Mobile Training Teams

- Multi-day chemical and biological exercises executed at teams' home station or location of own choosing
- Exercise scenarios presented in a variety of settings intended to challenge teams' Mission Essential Task List (METL)



WMD-CST Program

- Chem/Bio Level 1
- Chem/Bio Level 2
- Field Training Exercise (FTX)
- Mobile Training Team (MTT)
- Combination Courses (Multi week/CB L1 & FTX)



Mustang Village

- Hotel, Post Office, Warehouse, Strip Mall, Office Building
- Remote Terrorist Encampment
- Validate Tactics, Techniques, and Procedures
- Combat Maneuver Area
- Full use of C/B Simulants
- Escape & Evasion Scenarios
- Live Fire Authorized

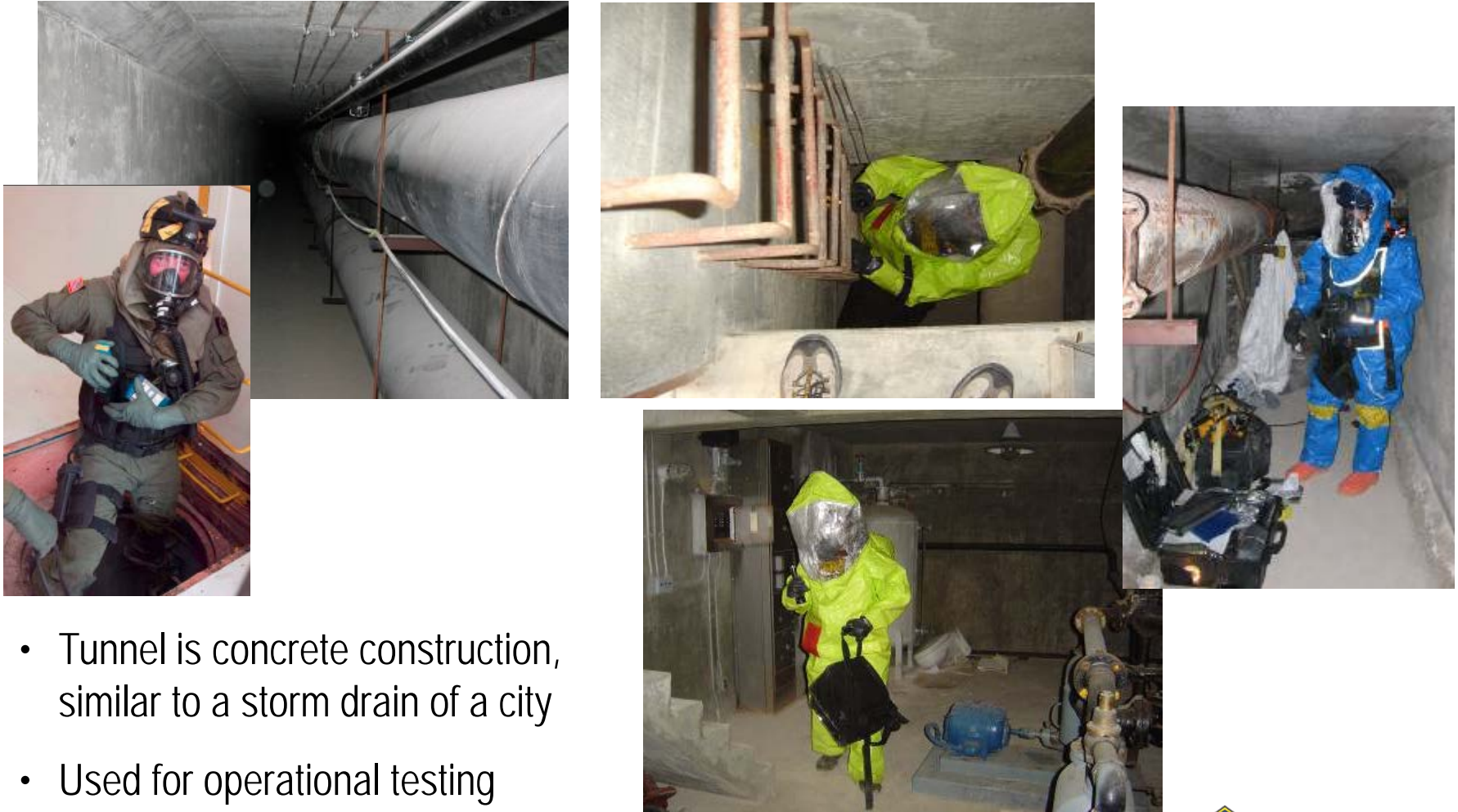


GWOT Facility

- Third world target
- Breaching walls
- Tunnel complex
- Heavily fortified
- Operational testing
- TTP development



Avery Tunnel Confined Space Training Area



- Tunnel is concrete construction, similar to a storm drain of a city
- Used for operational testing
- TTP development and verification



Summary

- From test tube to battlefield test & evaluation
- Experts in Chem/Bio testing & training
- 1,300 miles² of encroachment-free terrain



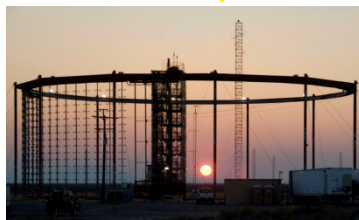
Supporting the Soldier



Vast remote areas for testing and training



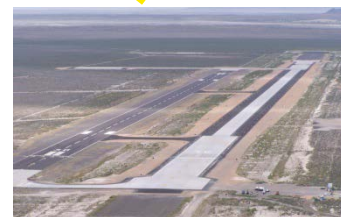
Expert, Army Acquisition-certified work force



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



Environmental permits



On-site airfield



Quality of life



Positioned for future growth



Capability to support DoD transformation

