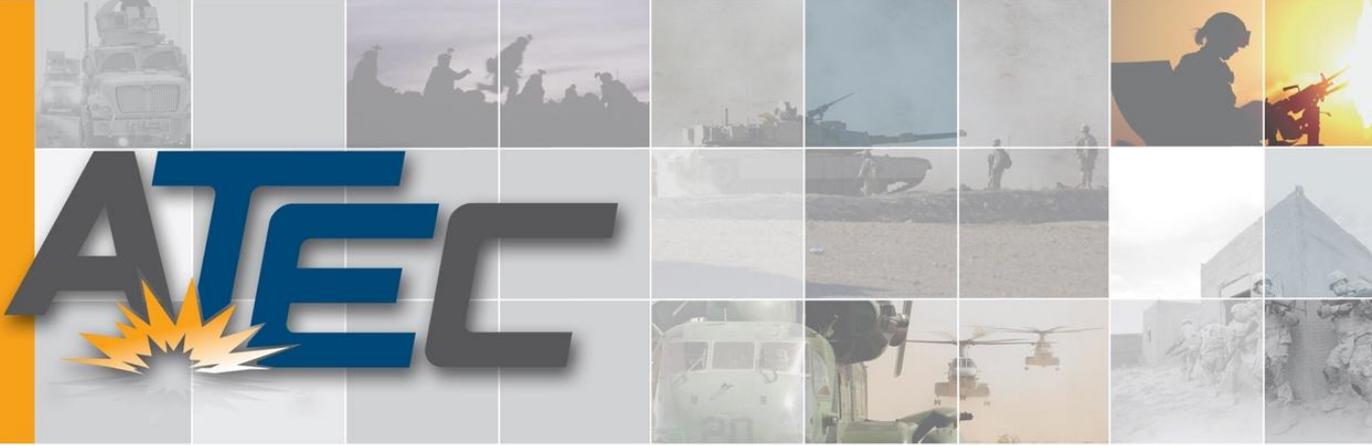


Army Test and Evaluation Command



**DUGWAY
PROVING
GROUND**

Dugway Proving Ground

Mission & Capabilities Overview

*Army Proven
Battle Ready*

BLUF

Test Tube to Battlefield: Dugway Proving Ground is the DoD-designated Major Range and Test Facility Base for Chemical and Biological Testing and Training



Chem Testing



Bio Testing



Training



BLUF

- DPG supports the Soldier with test tube to battlefield test & evaluation
- Residents and workforce experience quality of life
- DPG employees and contractors are experts in Chem/Bio testing & training
- Testing facilities encompass 1,300 miles² of encroachment-free terrain
- Environmental permits already in place
- Permanent infrastructure and state of the art equipment
- Positioned for future growth and support of DoD transformation
- On-site airfield



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



**DUGWAY
PROVING
GROUND**

Dugway's Economic Impact



Payroll	\$46.4 M
Contracts	\$83.9 M
Construction	\$30.2 M
Utilities	\$0.6 M
Total	\$161.1 M

DPG Mission

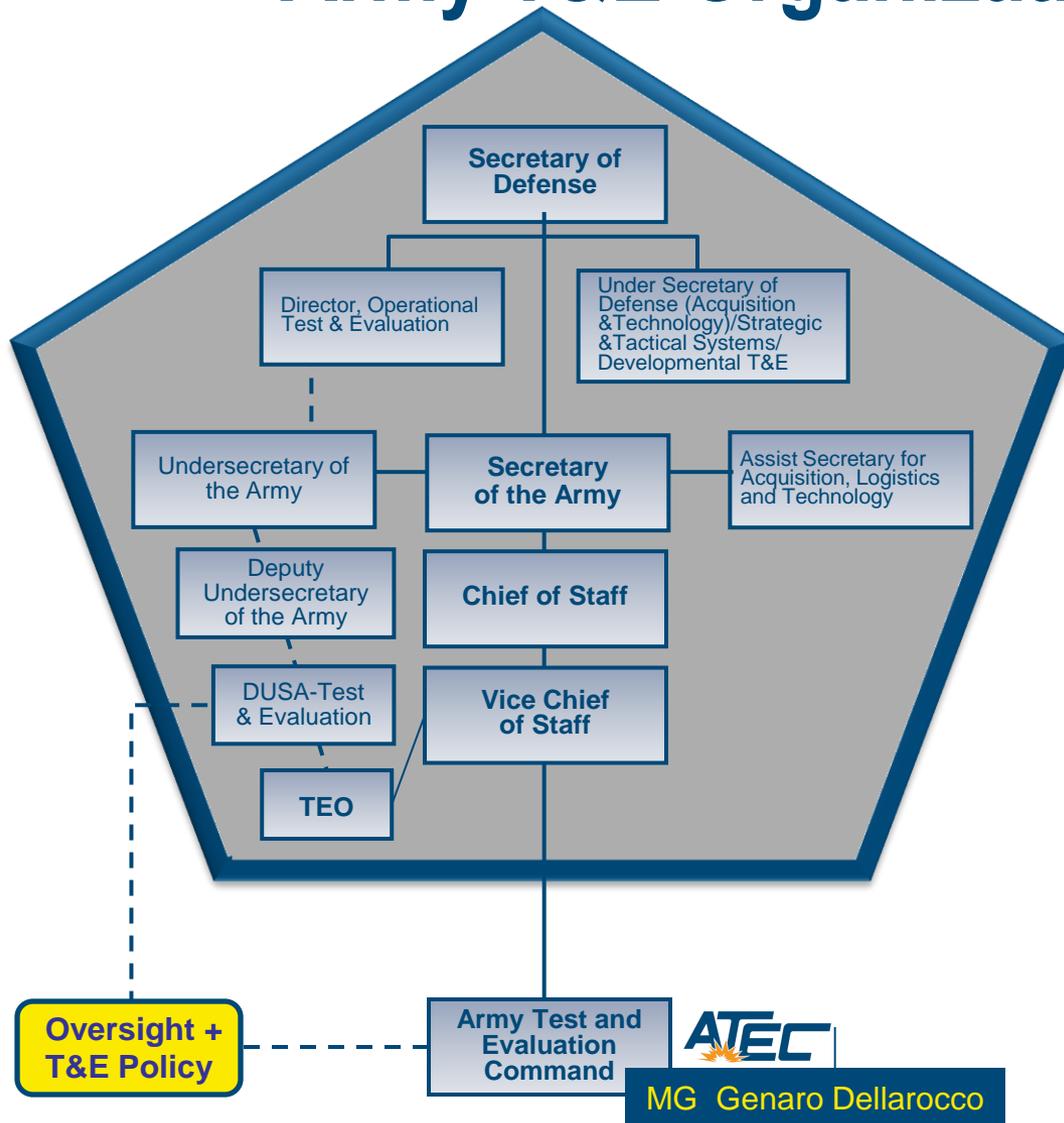
To safely test our Warfighters' equipment to the highest standards within cost and schedule.

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.

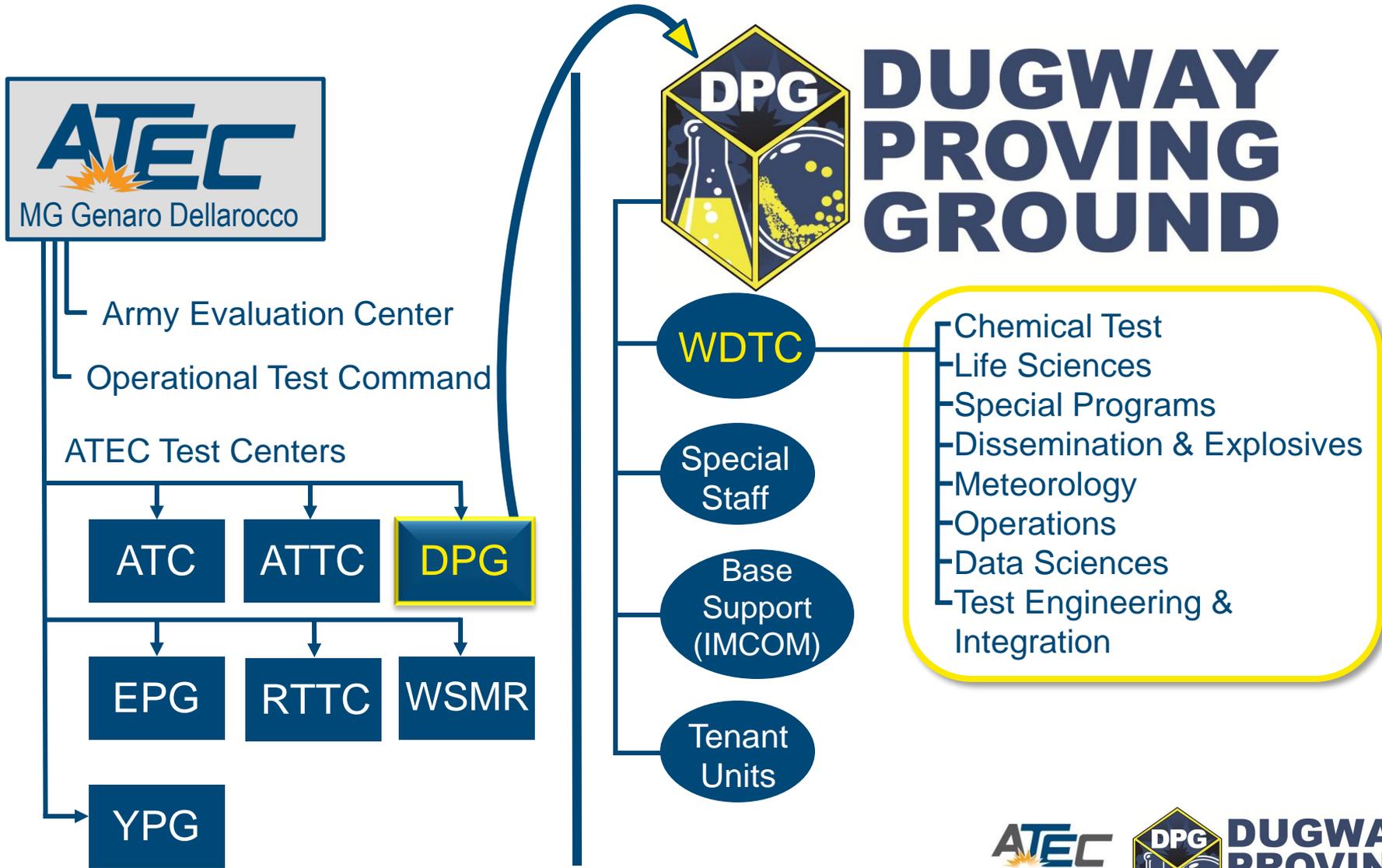
Conduct rapid testing in direct support of the Global War on Terror Warfighter, providing capabilities and limitations analyses of weapon systems to enable employment decisions for rapid fielding to the Combat Soldier.

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



**DUGWAY
PROVING
GROUND**

ATEC Command Structure



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

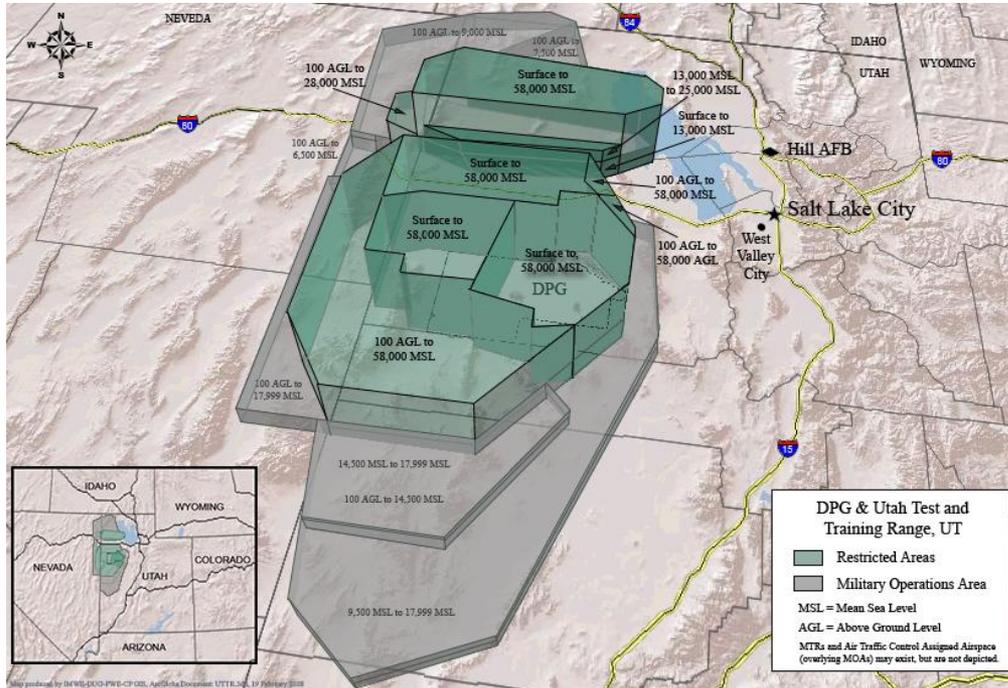
Public Law 103-160, 30 Nov. 93: Directed consolidation of all CBDP funding; DPG MRTFB operating costs became responsibility of CBDP. Sec. Def. designated Army as Executive Agent to coordinate and integrate chemical/biological defense RDT&E



Location & Airspace

DPG is partnered with Utah Training & Test Range

Freedom to Test and Train

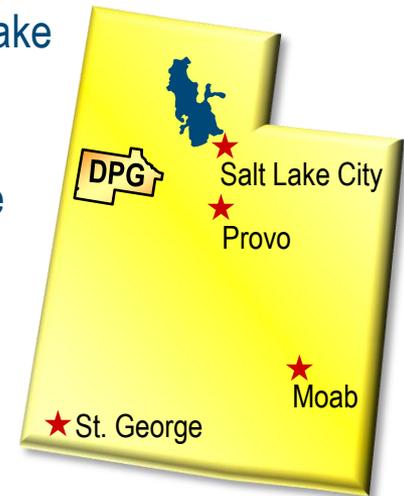


Dugway is Remote:

- ✓ 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 PROVING GROUND

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



Ideal Testing Environment

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

Granite Mountain
7,080 ft. elev.

Total Area	1,252 miles ²
Mountain Terrain	59,078 acres
Mixed Desert Terrain	279,768 acres
Playa (flats)	462,180 acres

Salt Flats 4,230
ft. elev.

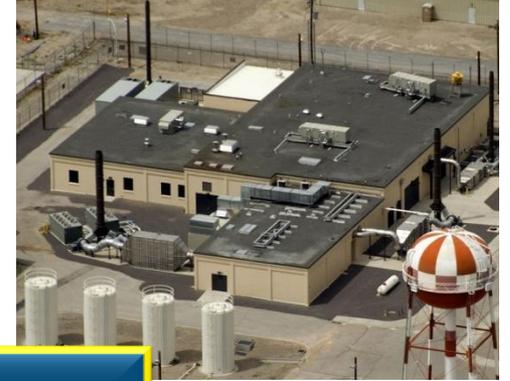


**DUGWAY
PROVING
GROUND**

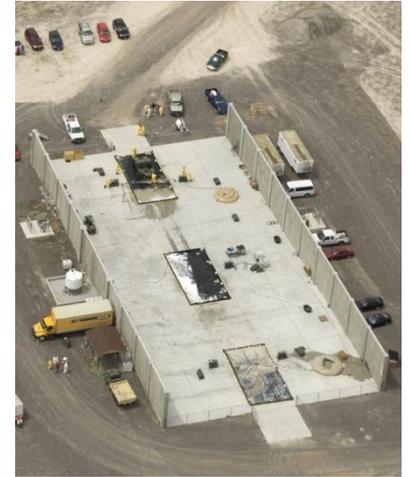
Key DPG Locations



Chemical & Emerging Threat Agent Test Complex

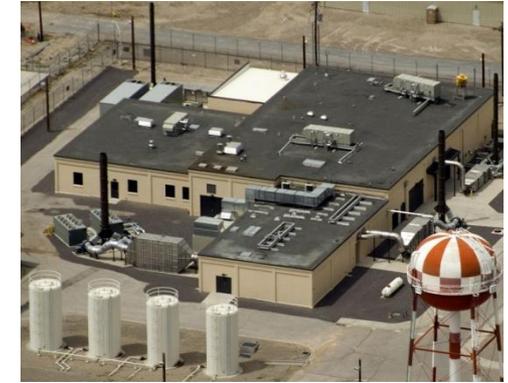


Surety facilities for chemical defense testing against CWAs, NTAs, TICs and TIMs



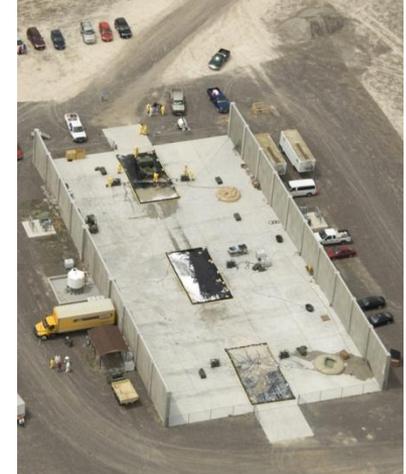
**DUGWAY
PROVING
GROUND**

Chemical & Emerging Threat Agent Test Complex



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

- Combined Chemical Test Facility
- Materiel Test Facility
- Building 3445 Chemical Test Facility
- Decontamination Facility
- Chemical Energetics Support Facility
- Test Materiel Conditioning Complex
- Hazardous Material Facility
- Wig Chemical Test Facility



**DUGWAY
PROVING
GROUND**

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



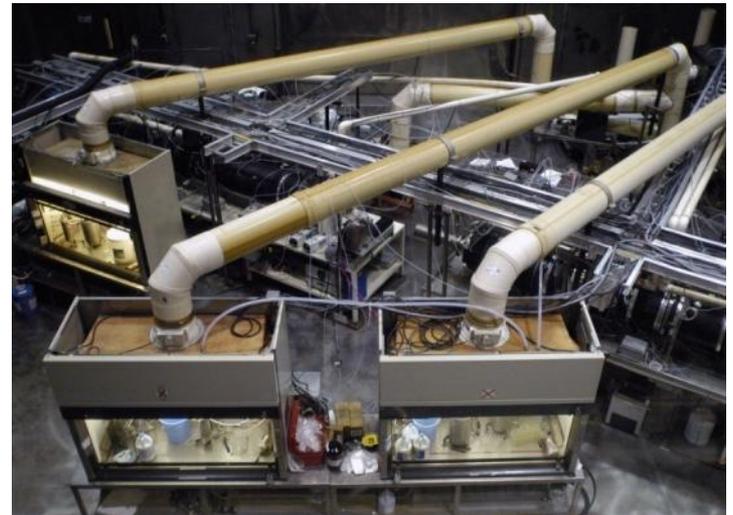
Material Test Facility (MTF)

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

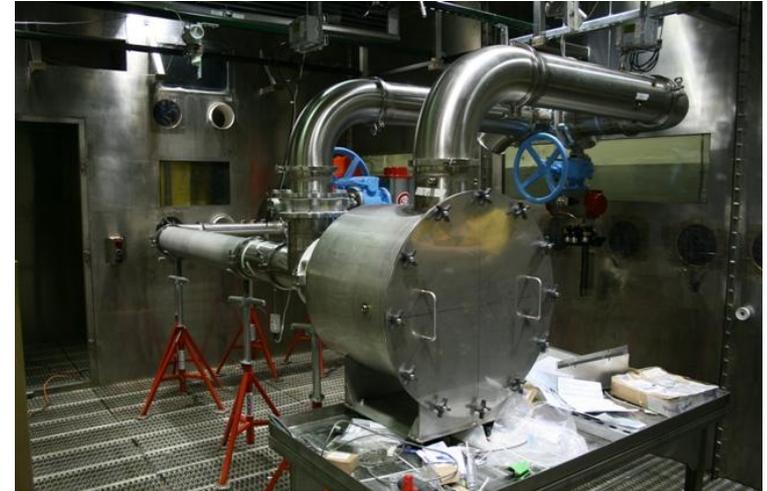


Building 3445 Chemical Test Facility

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



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



Test Materiel Conditioning Complex

MIL STD 810G testing support and special environmental testing

Climatic & Dynamic Test Chambers & Fixtures

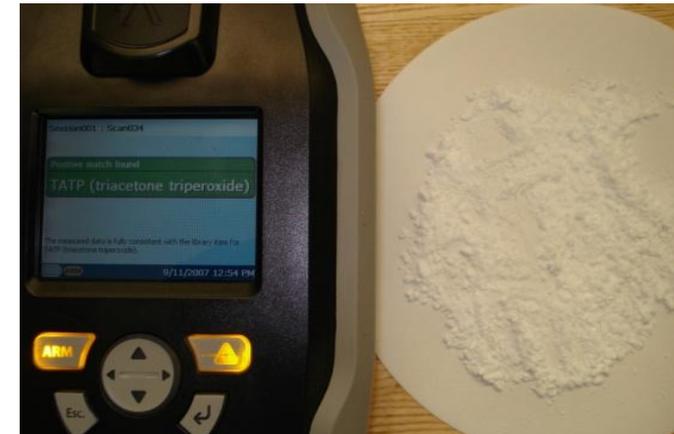
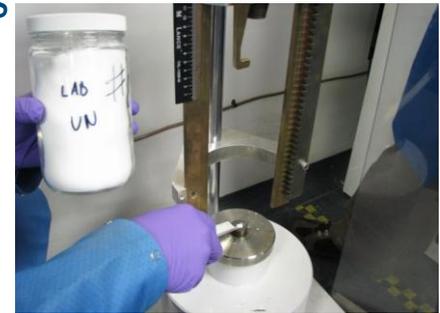
- Instrumented mobile and fixed conditioning chambers
 - Temperature & humidity
 - Altitude & precipitation
 - Salt fog, sand & dust
 - Physical & thermal shock
 - Vibration
 - Shock & bounce
 - 60-foot drop tower



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



**DUGWAY
PROVING
GROUND**

Wig Chemical Test Facility

Testing real-world, non-materiel solutions for chemical defense against threat-representative targets

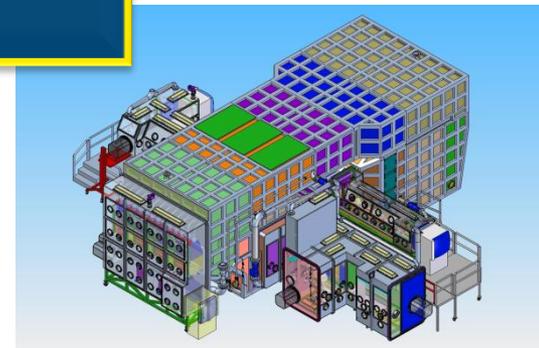
Test capability information available upon request



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

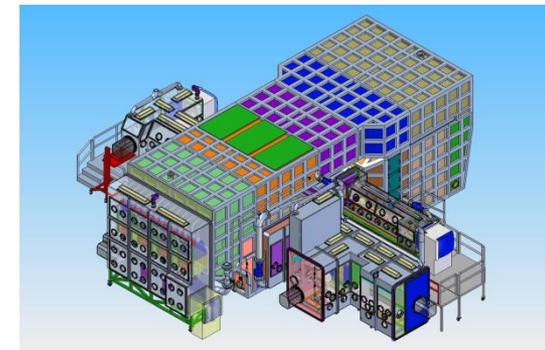


**DUGWAY
PROVING
GROUND**

Biological Warfare Agent Test Complex

Surety facilities for biological defense testing against BWAs and unconventional threats

- Life Sciences Test Facility
 - Containment Aerosol Chamber
 - Aerosol Simulant Exposure Chamber
- Baker Laboratory- Whole System Live Agent Test Chamber
- Biological Agent/Simulant Growth & Irradiation Facility
- Wig Biological Test Facility
- Granite Biological Test Facility
- CRP Program – The Nation’s ISO-certified source and repository for standardized BWAs and select toxins



**DUGWAY
PROVING
GROUND**

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

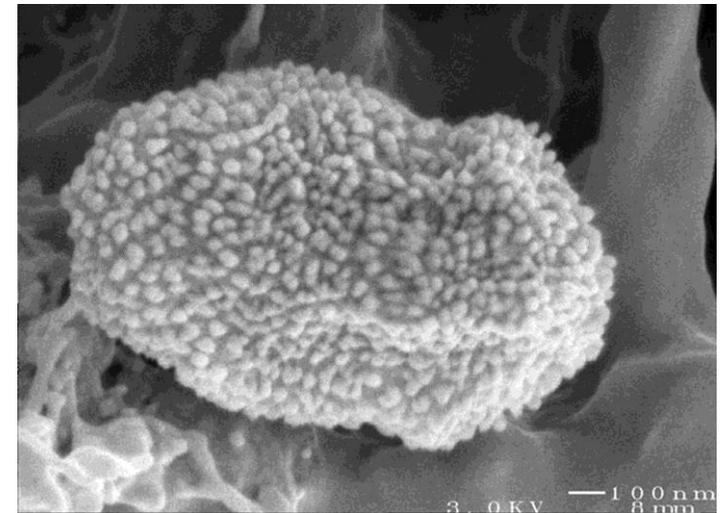
- 8 licensed simulants
- Agent-like Organisms (ALOs)



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

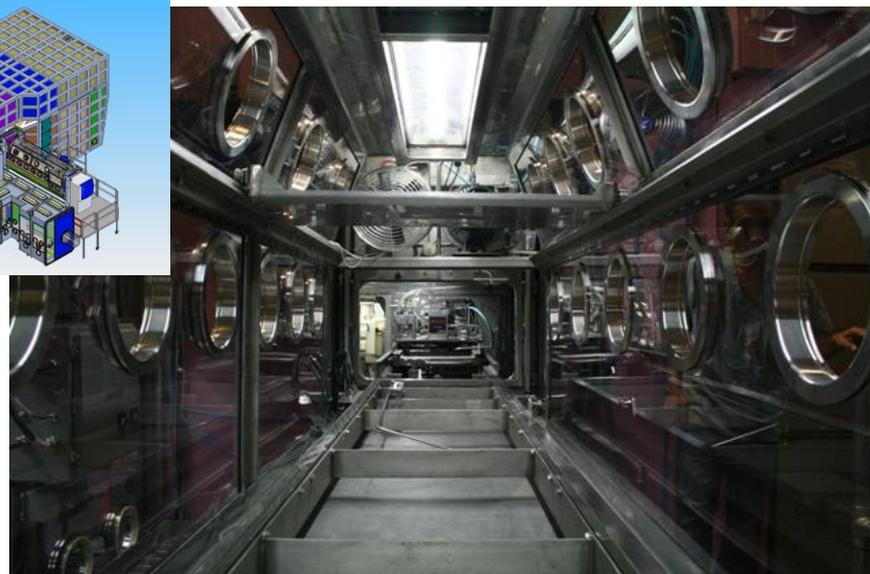
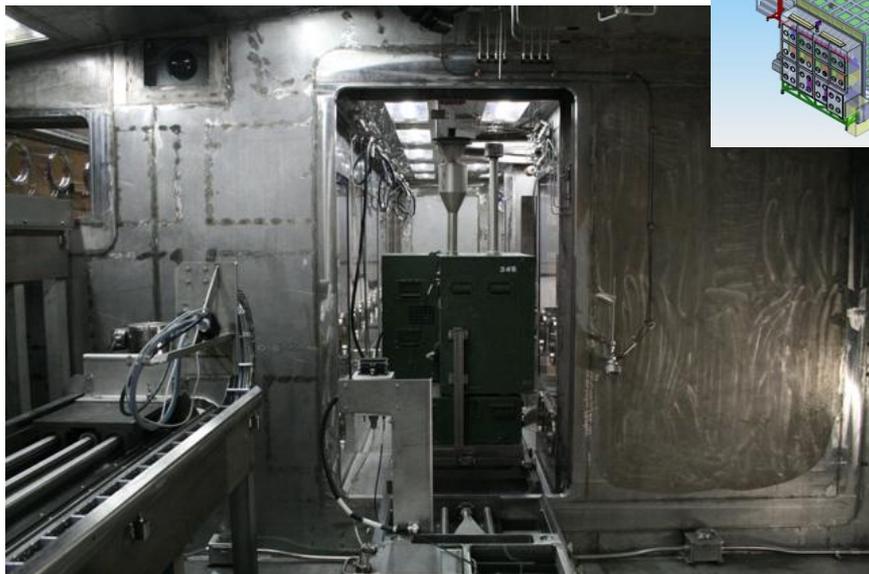
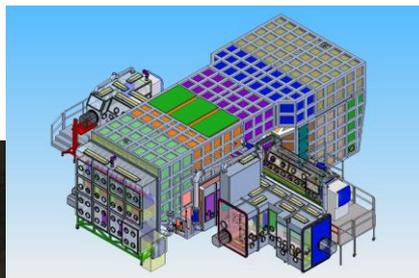
- Aerosolization of live or killed biological simulants and inactivated agent-like organisms
- Biological point detector testing
- Contamination/decontamination survivability assessments
- Computer-controlled temperature and humidity



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 2013



**DUGWAY
PROVING
GROUND**

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



Wig Biological Test Facility

Testing real-world, non-material solutions for biological defense against threat-representative targets

- Onsite warehouse/storage
- Classroom/planning area
- Isolation facility
- Additional test capability information available upon request



Granite Biological Test Facility

Testing of upstream defeat technologies & techniques

- Capability evaluation of biological sample collection, standoff & point detection, agent defeat and decontamination technologies
- Test against bacteria, toxins & viruses
- Production of simulants for bacteria, toxins & viruses
- Full functionality online in June 2013



**DUGWAY
PROVING
GROUND**

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



**DUGWAY
PROVING
GROUND**

Simulant Challenge Test Complex

Standoff detector testing with static and controlled dynamic simulant clouds

- Joint Ambient Breeze Tunnel (JABT)
- Active Standoff Chamber (ASC)
- Ambient Breeze Tunnel (ABT)
- Standoff Detection Facility



**DUGWAY
PROVING
GROUND**

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



**DUGWAY
PROVING
GROUND**

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



**DUGWAY
PROVING
GROUND**

Ambient Breeze Tunnel (ABT)

- Used primarily for biological point and standoff detector systems and referee equipment
- Airflow up to 150,000 cfm
- Separate control rooms



**DUGWAY
PROVING
GROUND**

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



ATEC



**DUGWAY
PROVING
GROUND**

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



[Play Movie](#) 



Emerging Threat Flexible Field Simulant Test Capability

NTA /Simulant correlation for developmental and operational testing



NTA /Simulant Correlation: Provides field simulant capability when combined with Test Grid upgrades to provide state-of-the-art non-traditional threat field testing

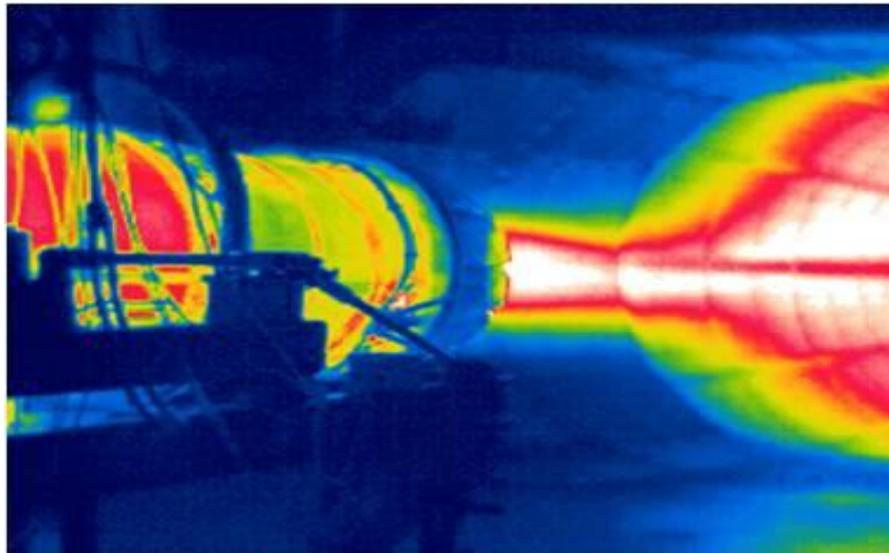


Explosives & Dissemination

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

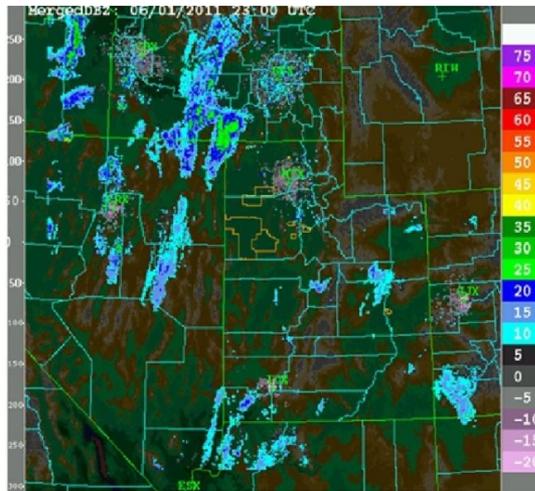


**DUGWAY
PROVING
GROUND**

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



**DUGWAY
PROVING
GROUND**

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



**DUGWAY
PROVING
GROUND**

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



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



**DUGWAY
PROVING
GROUND**

Elite First Responder Training

**Civilian Chemical / Biological
Incident Response Course
(Advanced)**

**Weapons of Mass Destruction
(WMD) Civil Support Team (CST)
Training**

- Graduate level, hands-on training with real agents and simulants in threat-representative scenarios
- Courses focus on chemical and biological detection, signature recognition and sampling
- Enhance students' readiness to respond to domestic chemical or biological terrorist attack
- Provide realistic, practical exercises to test tactical skills in the detection, forensic sampling, and packaging of chemical/biological agents



ATEC



**DUGWAY
PROVING
GROUND**

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

