

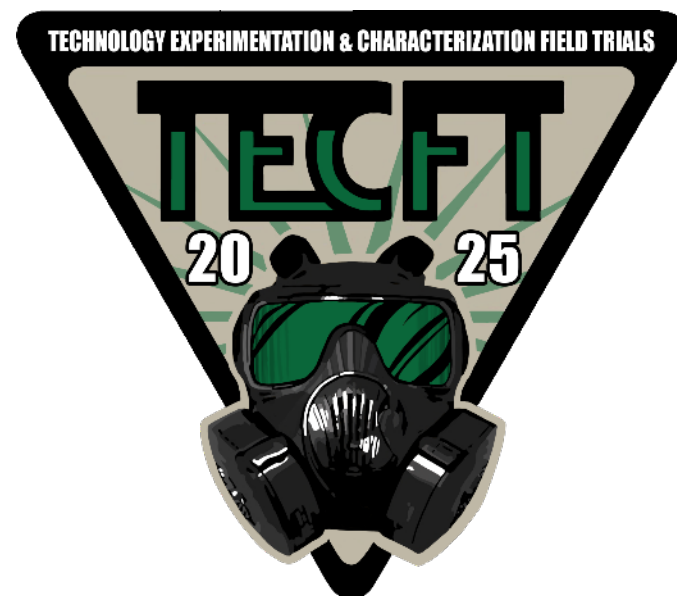


Technology Experimentation and Characterization Field Trials (TECFT) 2025 Dugway

July 20 – August 1, 2025

“Technology Fit for the Warfighter”

Customer Briefing
TECFT Kickoff Calls
October 1 and 15, 2024





Presentation Outline



- TECFT Introduction and Benefits
- TECFT Events Summary
- Testing Environment
- Test Event and Daily Schedules
- Simulants Planned
- Technology types anticipated
- Participation Cost
- Important Dates



TECFT Introduction

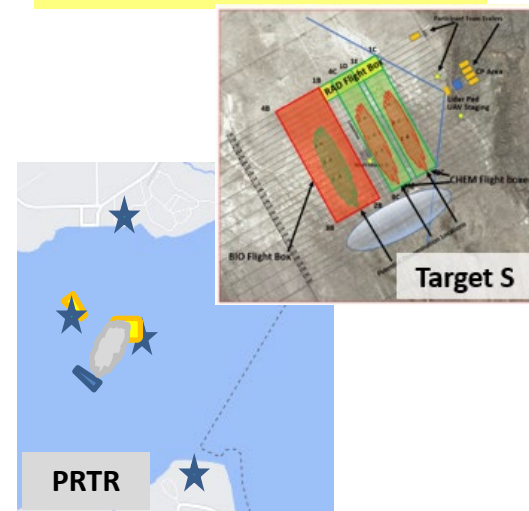
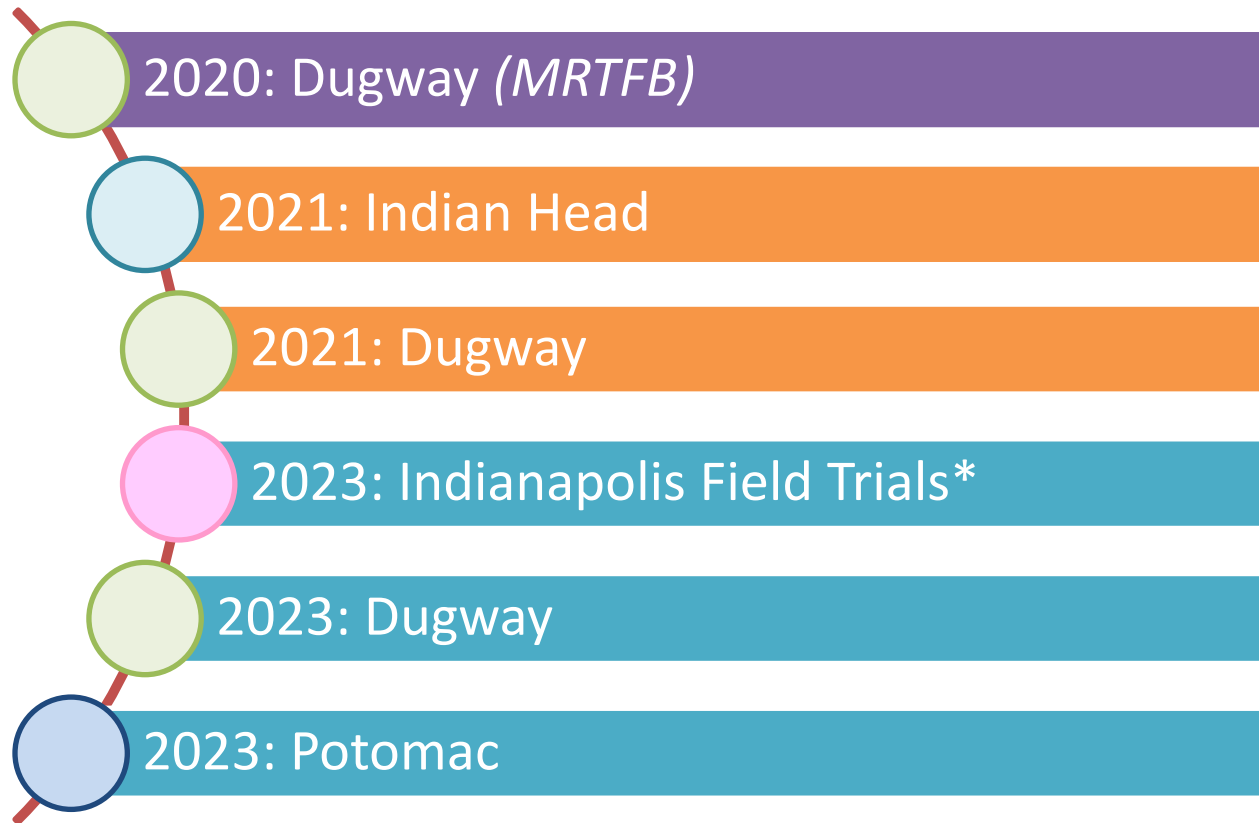
- An enhancement to previous test events allowing expanded testing capabilities
- Conduct annually at alternating test environments (e.g., littoral, desert) providing a variety of operational conditions
- Support additional test protocols for other Chem, Bio and Rad domains, such as Protection and Decontamination
- Multiple-week field test event with several threat-relevant chemical and biological simulant releases and radiation scenarios to fulfill end-user needs

Benefits:

- Facilitate progression of technologies to fielded systems by generating critical test data
- Ability to use referee data to better understand and characterize their technology/system performance
- Enable cost sharing, earlier testing, faster development, and increased awareness of new and emerging technologies
- Provide opportunities for validating Tactics, Techniques and Procedures as part of technology deployment concept and requirements development



TECFT Events-to-Date



Operationally-relevant environments:

- Dry, dusty (Dugway)
- Urban (confined spaces) with operators (Indian Head)
- Littoral/maritime-representative (Potomac)
- Urban-representative (Indianapolis); *joint activity with DARPA



Simulants and Sources Used

Location	Test Materials													
	Chemical Simulants				Biological Simulants				Radiation Sources (sealed)					
	MeS	TEP	IPA	NH3	B.g.	Btk	E.h.	OV	Cs-137	Co-60	Co-57	Ba-133	Cf-252	
2020 DPG	X	X	X		X		X	X	X		X		X	
2021 IHD	X			X						X		X		
2021 DPG	X	X		X	X	X	X	X		X		X		X
2023 IFT						X			X				X	
2023 DPG	X	X	X		X	X	X	X		X		X		
2023 PRTR	X	X			X	X								

Chemical simulants/TIC

- Methyl salicylate (MeS)
- Triethyl phosphate (TEP)
- Isopropanol (IPA)
- Ammonia (liquid or anhydrous)

Biological simulants

- *Bacillus subtilis* var *niger* (Bg)*
- *Bacillus thuringiensis kurstaki* (Btk)
- *Erwinia herbicola* (Eh)
- Ovalbumin (OV)

Radiation sources (sealed)**

- Cobalt-60
- Cesium-137
- Cobalt-57
- Barium-133
- Californium-252

Interferents

- Burning brush, diesel, rubber

Background Collection

*Stock unavailable outside of lab environment

**Collaborated with DTRA for radiation sources



Simulant Release Examples



Simulant type	Examples of Dissemination Release Rates & Instrumentation Detection Limits (MIN - MAX)		
	Target S	ASC	JABT
Chemical			
Methyl Salicylate (MeS) <i>Vapor</i>	500 mL/min (0.5 mg/m ³) - 6 L/min (10000 mg/m ³)	4 mL/min (0.5 mg/m ³) – 30 mL/min (60 mg/m ³)	4 mL/min (0.5 mg/m ³) – 30 mL/min (100 mg/m ³)
Triethyl Phosphate (TEP) <i>Vapor</i>	500 mL/min (0.5 mg/m ³) – 6 L/min (5000 mg/m ³)	4 mL/min (0.1 mg/m ³) – 30 mL/min (60 mg/m ³)	4 mL/min (0.5 mg/m ³) – 30 mL/min (100 mg/m ³)
TEP/Syloid 244 compound <i>Vapor/Droplet</i>	1 Lb C4/1 gal	N/A	N/A
Biological			
<i>Erwinia herbicola</i> (EH) Wet	750 mL/min (2,000 ppl) – 4 L/min (5,000 ppl)	5 mL/min (300 ppl) – 2 L/min (10,000 ppl)	5 mL/min (300 ppl) – 2 L/min (10,000 ppl)
<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> Dry/Wet	Dry BTK 1 g/min (1,000 ppl) – 150 g/min (150,000 ppl) Wet BTK 750 mL/min (1,000 ppl) – 6 L/min (50,000 ppl)	Dry BTK 0.1 g/min (300 ppl) – 5 g/min (50,000 ppl)	Dry BTK 0.5 g/min (300 ppl) – 5 g/min (12,000 ppl)
Ovalbumin (OV) Dry	1 g/min (1,000 ppl) – 150 g/min (100,000 ppl)	0.1 g/min (500 ppl) – 5 g/min (40,000 ppl)	0.5 g/min (600 ppl) – 10 g/min (10,000 ppl)



TECFT 2025 Plans



TECFT 2025 Dugway:

- Dugway Proving Ground will host:
July 20 – August 1, 2025
- Two weeks: Tunnels (JABT/ASC) and Target S
- Focus: Chem and Bio sensor tests using aerosol and vapor simulant releases during nighttime testing
- Exploring the possibility of including radiological scenario(s)
- Will continue to implement a test-fix-test paradigm that characterizes performance of technology solutions to ensure operationally-relevant capabilities are delivered
- Open to government/interagency/international partners; U.S. industry & academia



Testing Environment



Freedom to Test and Train

Dugway is Remote:

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

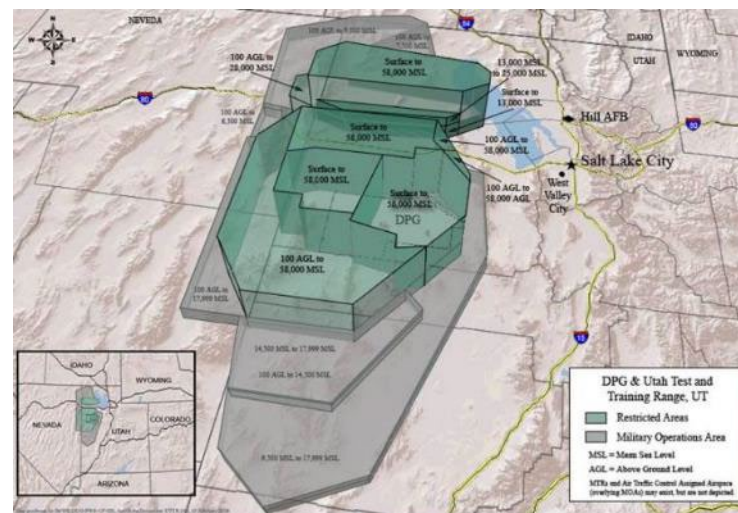
Dugway is Accessible:

- 78 miles from Salt Lake International Airport (I-80)
- 38 miles from Tooele
- 82 miles from Provo



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

DPG is partnered with Utah Test & Training Range



Total Airspace Footprint	16,797 miles ²
Restricted Airspace	7,954 miles ²
Military Operations Area	10,004 miles ²
DOD Exclusive-use Land	3,078 miles ²
Government-owned Land	16,686 miles ²



Dugway: Multi-use Test Range



- Complex of 27 instrumented ranges, grids, test sites & impact areas
- Chemical and Biological, 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 Chemical and Biological simulants
- Four major impact areas, nine drop zones, 91 artillery firing point





TECFT 2025 Dugway Significant Dates



Planning activities

- Customer web/teleconference calls:
Monthly/biweekly starting Tuesday, November 12, 2024
Logistics calls with customer teams as needed
- Site Visit: *optional (a few months ahead of time)*

Onsite activities

- Customer Setup Week 1 (Breeze Tunnel): **July 20, 2025**
- Execution Week 1: **July 21 – 25, 2025**
- Customer Setup Week 2 (In the field): **July 27, 2025**
- Execution Week 2: **July 28 – August 1, 2025**
- Customer Teardown: **August 1, 2025**



Sunday Setup Day schedule



Sunday, July 20 and 27, 2025

1200-1230	Meet at the Holiday Inn Express lodge on Dugway
1230-1330	Safety/UXO Brief. Depart English Village enroute to test location
1330-TBD	Customer equipment set up
TBD-2300	Conduct Chem/Bio/Rad trials (If time allows)
2300-2330	Collect data
2330	Depart test location

*For those without a DoD CAC, we can prearrange to have personnel at the main gate to help participants with visitor passes and for those showing up outside designated times.

** May attempt to do a dry run on July 27 to test comms frequencies for field location



Anticipated Daily Schedule:

Monday, Tuesday, Wednesday and Thursday



TIME	EVENT
NLT 1800 hrs	Mustering point (English Village)/Drive to Range
1830-1900 hrs	Show up at Range, Sign for Radios
1900-1930 hrs	Safety Brief and Operational Brief (Command Post)
1930-2100 hrs	Daily Setup and Checks
2100-2130 hrs	Final Checks and Corrections
2130-0400 hrs	Test Operations
0400-0500 hrs	Data Collection and Daily Retrograde
0400-0500 hrs	Turn in Radios
0500-0530 hrs	All Personnel Off the Range No Later Than

NOTE: All times are Mountain Time (MT) and subject to change



Proposed Trials (Week One)



- **Breeze Tunnel and Chamber Releases (JABT & ASC)**

- Up to 40 Chemical Simulant Trials
 - Methyl Salicylate (MES)
 - Triethyl Phosphate (TEP)
 - Syloid/TEP
 - *Isopropanol (IPA)* – end of night/optional
- Up to 40 Biological Simulant Trials
 - *Bacillus thuringiensis* subsp *kurstaki* (Btk)
 - *Erwinia herbicola* (EH)
 - Ovalbumin (OV1)
- Interferents/Contaminants
 - Burning rubber
 - Burning diesel
 - Burning brush
 - Road dust



NOTE: Weather Dependent



Release Types



- **Breeze Tunnel and Chamber Releases (JABT & ASC)**
 - Up to 40 Chemical Simulant Trials
 - Wet Chemical Simulants
 - Dry Chemical Simulants
 - Vapor Chemical Simulants
 - Up to 40 Biological Simulant Trials
 - Wet Biological Simulants
 - Dry Biological Simulants



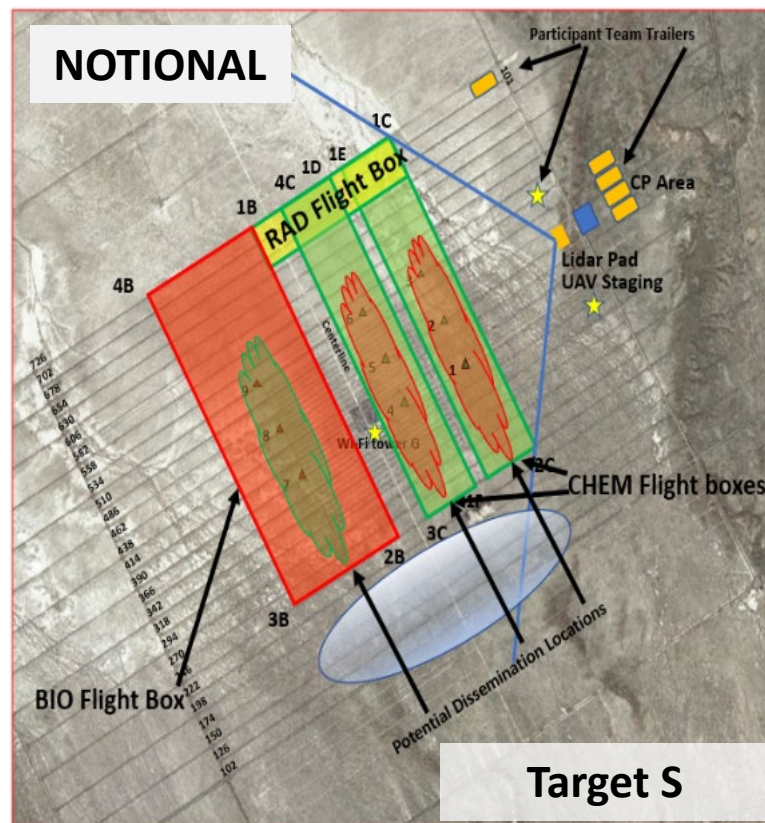


Proposed Trials (Week Two)



- **Outdoor Field Releases (Target S; two-grid configuration)**

- Up to 10 Chemical Simulant Trials
 - Methyl Salicylate (MES)
 - Triethyl Phosphate (TEP)
 - Syloid/TEP
 - *Isopropanol (IPA)* – end of night/optional
- Up to 10 Biological Simulant Trials
 - *Bacillus thuringiensis* subsp *kurstaki* (Btk)
 - *Erwinia herbicola* (EH)
 - Ovalbumin (OV1)
- Interferents/Contaminants
 - Burning rubber
 - Burning diesel
 - Burning brush
 - Road dust



NOTE: Weather Dependent



Release Types

- **Outdoor Field Releases (Target S)**

- Up to 10 Chemical Simulant Trials

- Wet Chemical Simulants
- Dry Chemical Simulants
- Vapor Chemical Simulants
- Explosive* Chemical Simulants

- Up to 10 Biological Simulant Trials

- Wet Biological Simulants
- Dry Biological Simulants
- Explosive* Biological Simulants

NOTE: Releases are Weather Dependent.

**Participating teams will need to request explosive releases NLT February 20, 2025*





Referee Instrumentation



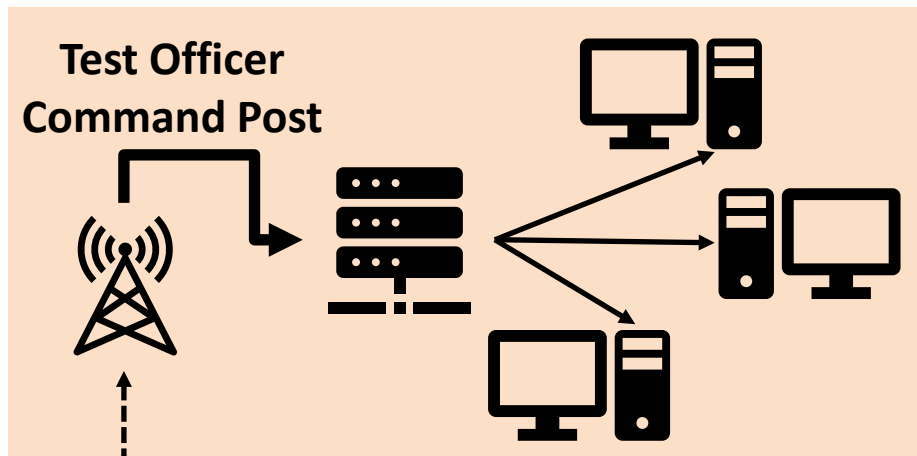
- Bio Simulant Releases (Aerosol)
 - Aerodynamic Particle Sizer (APS)
 - Wideband Integrated Bioaerosol Sensor (WIBS)
 - Light Detection And Ranging (LiDAR) System
 - West Desert LiDAR
- Chem Simulant/TIC Releases (Vapor and Liquid)
 - Gasmet Gas Analyzer System
- Meteorological
 - Portable Weather Information Display System (PWIDS)
 - Meteorological Towers
- Dugway standard referee data from OADMS provided to all participant teams via DOD SAFE



Open Architecture Data Management System (OADMS)



- Real-time referee, dissemination equipment and field personnel status
- Real-time referee data capture and visualization
- Data automatically time- and GPS-synced
- Real-time met stations and data tools to support best-in-class simulant releases
- Referee data provided to customer teams nightly at the end of trials
- Supports test-fix-test
- Troubleshooting more easily achieved during trials



Referee site including met and comms devices



OADMS View: Chem Simulant Field Trial

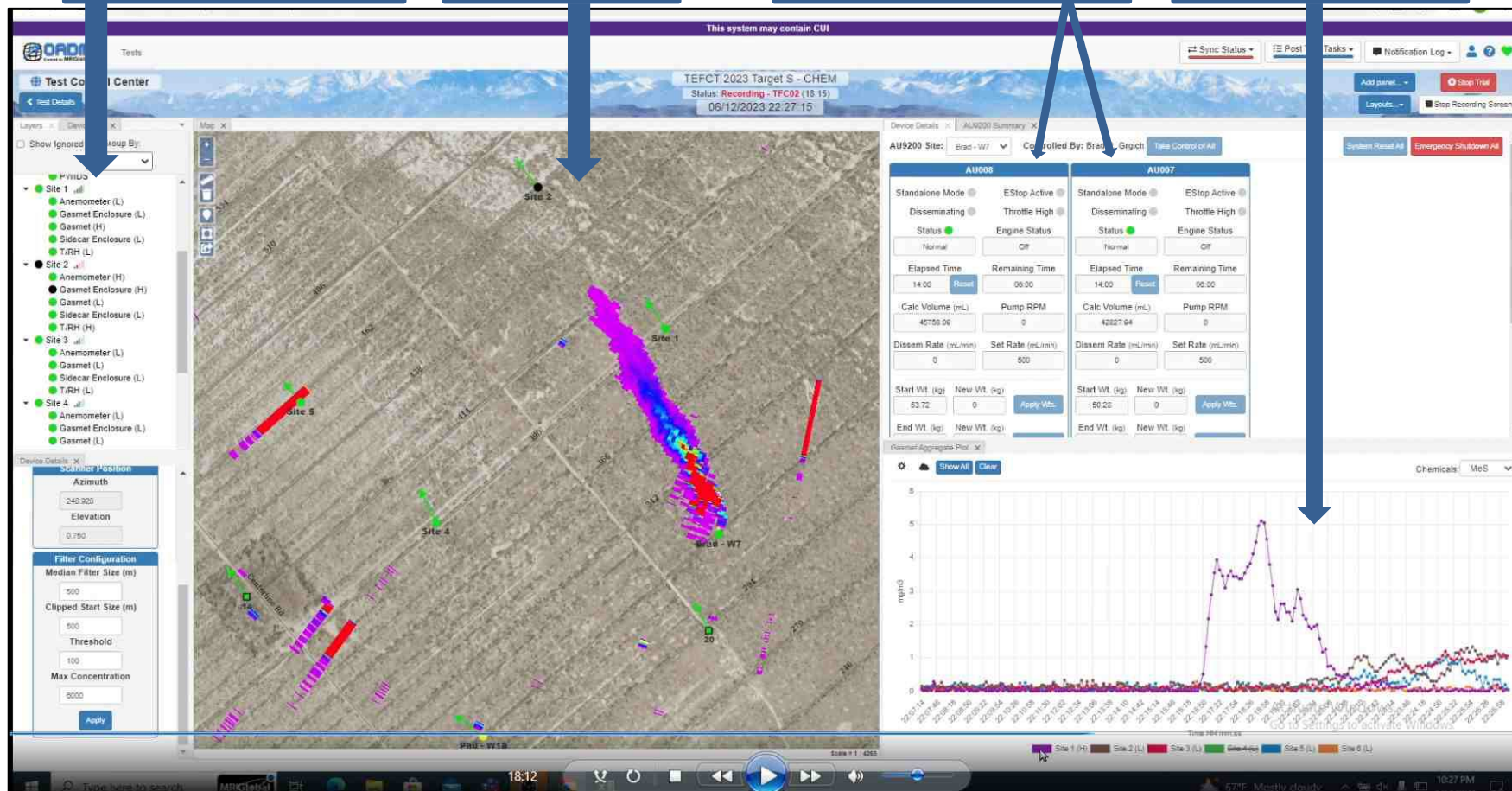


Equipment/personnel
status visualization

LiDAR data
visualization

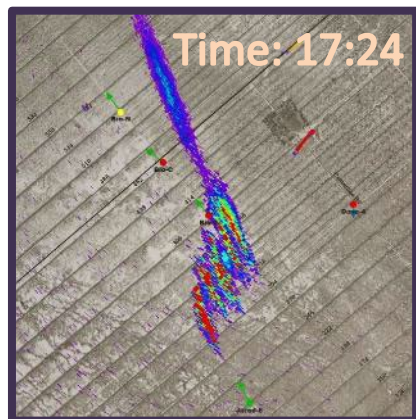
Dissemination
equipment information

Gasmet data/graph
for 6 locations

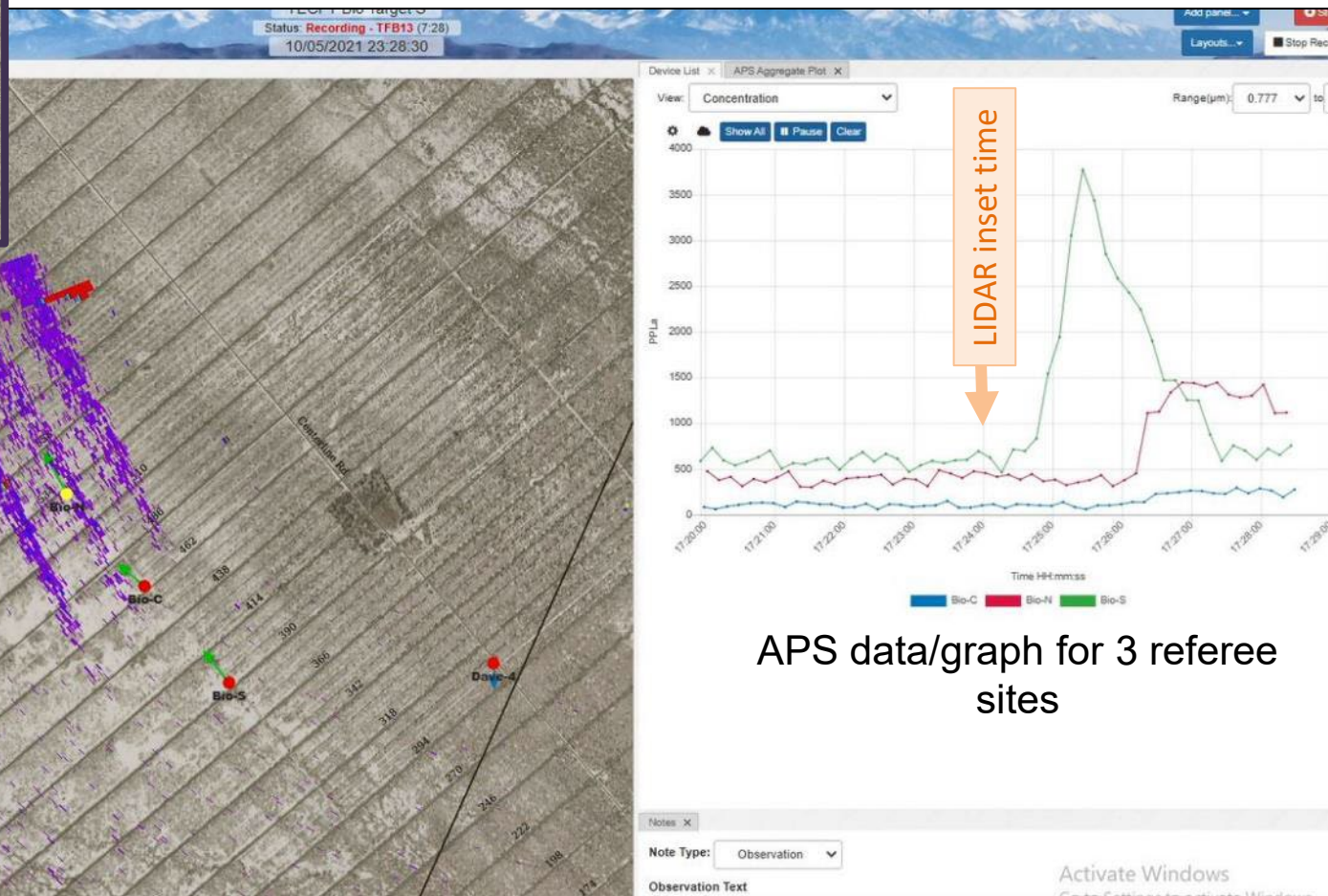




Referee Data Example - Bio



- Dry *Bg* using air cannon (5 shots) to simulate artillery rounds
- OADMS screen showing LIDAR views and APS data



APS data/graph for 3 referee sites



Scenarios & Technologies Anticipated



Scenarios

- Tailored Chemical, Biological and Radiological scenarios
- Possibility of characterizing Tactics, Techniques, and Procedures (TTPs) with operators

Examples of Technologies:

- Point and/or handheld detectors
- Wearables
 - Pending IRB approval, if required (*customer team responsibility*)
- Standoff detectors
- Unmanned Ground Vehicles (UGV)
- Unmanned Aerial Systems (UAS)
 - Waiver-to-fly will be required (*customer team responsibility*)
- Contamination Mitigation or Protection technologies
- Other suggestions, requests, etc.



Who are our Customers?



- U.S. Department of Defense
 - Chemical Biological (CB) Defense Programs/JPEO
 - Combat Capability Developers, DEVCOM, JRO, Army CBRN School, IWTSD
 - Defense Agencies/DARPA, DTRA
- Other Federal agencies
 - Department of Energy/National Labs
 - Department of Homeland Security
 - Environmental Protection Agency
- U.S. Academia
- U.S. Industry
- International partners with DOT&E Test & Evaluation Program (TEP) Agreements

Organization	Technology Type
2020 Dugway	
DARPA	Point detectors/Array/Chem
DARPA	Point detectors/Array/Bio
JPEO/JBTDS	Point detectors/Bio
DEVCOM/BTD	Point detectors/Bio
JPEO/NBCRV SSU	UAS/Bio
JPEO/CSIRP	UAS/Chem
ASG Inc	UAS/Chem
2021 Indian Head	
JPEO/CVCAD	Handheld detectors/Chem
JPEO/Wearables	Wearable personal device
JPEO/RFID	Asset tracking
DTRA	Portable Rad detectors
CWMD	UGV/Chem, UGV/Rad
2021 Dugway	
JPEO/EAM	Point detectors/Array/Chem, Bio & Rad
JPEO/CSIRP 1	UAS/Chem
JPEO/CSIRP 2	UAS/Chem, UAS/Bio
JPEO/CSIRP 3	UAS/Chem, UAS/Rad
JPEO/NBCRV SSU	Standoff detector/Bio
JPEO/IEW	Standoff detector/Bio & Chem
JPEO/JPM-P	Protective Covers
S&T Directorate	Standoff detector/Chem
LBNL	UAS/Rad
PSI	Standoff detector/Chem
Indianapolis Field Trials	
JPEO/CSIRP	UAS/Chem
DHS/CWMD	Point detectors/Bio
2023 Dugway	
JPEO/NBCRV SSU	Standoff detector/Bio
JPEO/CSIRP/SkyRaider	UAS/Bio & Rad
JPEO/CSIRP/Theiss	UAS/Chem & Rad
JHU-APL	UAS/Bio & Chem
Australia	Point & UGV/Bio & Chem
Canada	Standoff & UAS/Bio
2023 Potomac	
DEVCOM	Point detectors/Bio & Chem
DHS Team 1	Point detectors/Bio
DHS Team 2	Handheld & Point/Bio & Chem



Participant Expectations



- **Participation fees:**
 - Estimate (2 weeks) ~ \$35K/team for DoD teams
 - Estimate (2 weeks) ~ \$40K/team for interagency, international, and U.S. industry/academia
 - One technology and up to 7 team members; limit teams to mission essential personnel only
 - Cost is dependent on number of technologies and logistics footprint
- **TEO Registration form** (updated): Team version, others attendees
- **CB Release Request sheet:** Simulants, target concentrations/ release rates, and objectives – February 20, 2025
- **DPG Logistics form:** information from customer teams regarding support needs onsite; NLT than February 27, 2025 (*earlier is better*)
- **WDTC Spectrum Request form:** NLT than April 17, 2025
- **Payment:** made to Dugway Proving Ground as early as May 19, 2025 and NLT June 18, 2025
 - Invoice and payment process will be presented later



Important Dates: Information Sessions



- **Kickoff calls:**

Tuesday, October 1 and 15, 2024

- 1100 ET/0900 MT (U.S.)
- Date/time TBD upon request (International Partners)

- **Customer Planning calls:**

- Monthly (2024) or every other week (2025) starting **Tuesday, November 12, 2024**
- 1400 ET/1200 MT (U.S.)
- Time TBD upon request (International Partners)
- Will also have logistics planning calls with individual teams as needed



Important Dates: Other Details



Registration Dates:

- **International Participant Teams register NLT January 17, 2025**
 - Foreign Visit requests must be received at Dugway NLT June 16, 2025
- **U.S. Participant Teams register NLT February 14, 2025**
 - All participants must submit a Dugway visit request NLT June 16, 2025, *except DoD CAC holders*
- **Who registers?**
 - Team Registration: Each team lead including their list of expected team members
 - Individual Registration:
 - Team member substitutions after original team registration date
 - Observers, VIPs, other attendees

Other Deadlines:

- Payment must be received by Dugway by Thursday, May 19, and NLT June 18, 2025
- **If any team is bringing an UAS, a copy of the approved waiver-to-fly must be submitted to TEO NLT June 18, 2025**
- Any customer technology must be onsite at Dugway by NLT Thursday, July 17, 2025
- Have technology packaged/ready to ship from Dugway NLT Friday, August 1, 2025



TECFT

Points-of-Contact



- **U.S. Government**

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- **Contractor Support**

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Questions?





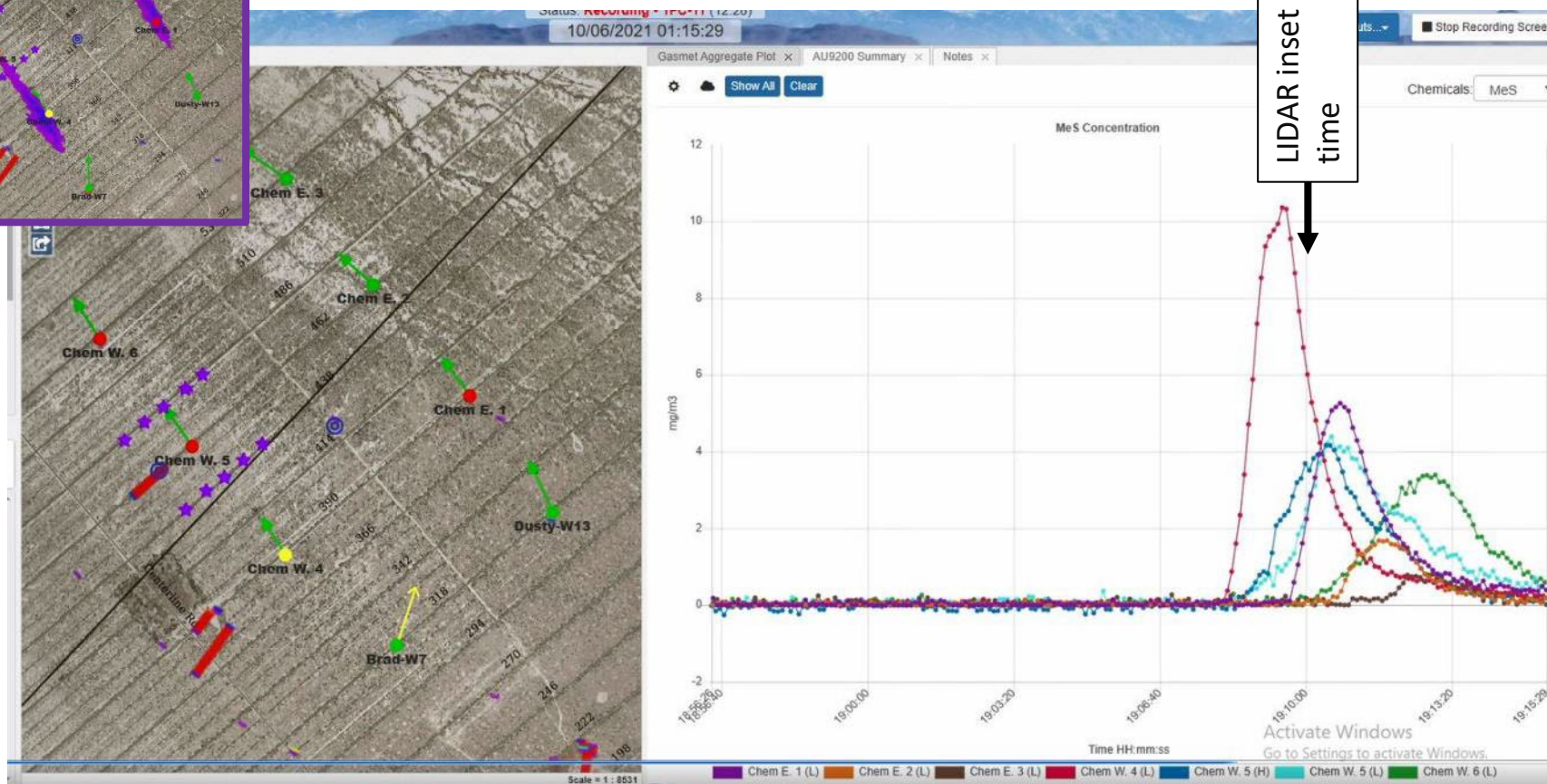
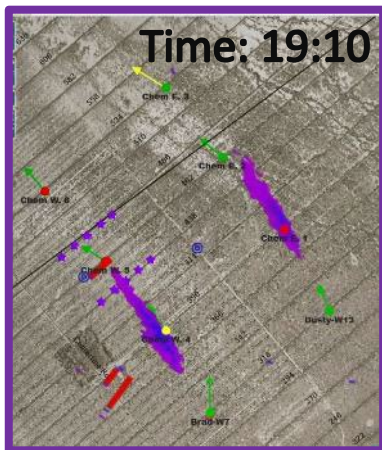
Backup Slides



Referee Data Example - Chem



- Two MeS releases – West chem grid, then East chem grid
- OADMS screen showing LIDAR views and Gasmet data
- 7 sampling points at 6 referee locations





Example of Bio Referee Data



- Scenario: Moored choke point
- Simulant: Dry *Bg* powder, point release
- Referee Systems: LiDAR view and APS data shown in OADMS
- Location: Middle of Machodoc Creek

