Federal Remediation Technologies Roundtable

UXO Wide Area Assessment Technologies

6 December 2006
IN THE BLEACHERS

“Maybe we shouldn’t play here.”
The Problem?

• DoD Munitions Response Program
  – more than 3300 munitions response sites
  – in excess of 15 million acres
  – $8 - $35 billion to clean up
  – >75 years to complete
UXO Technologies

• **Detection** – finding discrete metal objects

• **Discrimination** – is it UXO or not?

• Current research - SERDP/ESTCP
Detection

• How do you find it?

• All highly-successful munitions detectors currently use one of the two following sensor types:
  – Electromagnetic Induction
  – Magnetometry
Detection Platforms

• Hand-held
• Man-portable
• Wide Area Assessment tools
  – Vehicle-towed arrays
  – Airborne
  – Underwater
ESTCP Wide Area Assessment Pilot Project

- Defense Science Board Recommendations
- Evaluate wide area assessment (WAA) to improve the current practice of UXO cleanup
  - delineate target areas,
  - eliminate uncontaminated land from the inventory
  - collect quality data to: enhance planning, prioritization and support future contracting
- Advisory Group – EPA, States, FLM, DoD services
WAA General Approach

• Three sites (originally)
  – About 5000 acres at each
    • Well known target areas
    • Suspected target areas
    • Presumed clear areas

• Layered Technology approach
  – Well characterized individual technologies
    • High altitude airborne to detect ordnance features
    • Low altitude airborne magnetics
    • Ground-based magnetic and EMI transect sampling
  – Explore processes to combine for different site characteristics or objectives

• Extensive Validation
WAA Layered Concept

“High Airborne”
1,000’s acres per day
Ordnance-Related Features
Orthophotography
LiDAR
(SAR/HSI)

“Low Airborne”
100’s acres per day
Ordnance Detection
MAG

Ground Systems
10’s acres per day
Statistically Guided Transects
Ordnance Detection & Characterization
MAG and EMI
Pueblo Precision Bombing Range #2

WAA Demonstration Area
7,400 acres

Pueblo Precision Bombing Range #2

FFID: CO89799F058600
FUDS Site: B08CO071501
Pueblo PBR 2

• Initial Information
  – Two known bomb targets
    • Aiming circles visible in aerial photography
    • Locations known
    • Boundaries and characteristics uncertain
  – Suspected 75 mm target
  – No other areas of interest identified in the ASR
Pueblo – BT4
Better Characterizing a Known Target Area
Pueblo BT4 SW Corner LIDAR

- Ship Target
- Craters
PBR BT4 SW Corner Ortho

Craters

Ship Target
Pueblo BT4 SW Corner Helicopter Mag
Pueblo BT 4 Aiming Circle LIDAR
Pueblo BT4 Aiming Circle Helo Mag
New sites for WAA Pilots

• More challenging sites:
  – Camp Beale
  – Toussaint River
  – Spring Valley
  – Looking for more sites
Underwater
Advisory Group

• What conclusions can be supported about difference parcels within the sites?
  – Found a target – EASY
  – Characterizing contamination – DEFINING DATA NEEDS
  – All data shows no munitions present – HARD (NFA)
Questions?

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http://www.epa.gov/fedfac/documents/munitions.htm