

A person wearing a backpack and a metal detector is walking through a dense forest with many trees and large rocks. The person is in the middle ground, facing away from the camera.

PARSONS

Innovation. Solutions. Results.

PDM8 Geophysical Services



Parsons PLUS creating a safer world

Parsons Digital Mapper Model 8 (PDM8): A Safe, Efficient, Proven Solution for MEC-Related Projects in Challenging Environments

PDM8 Takes on the Challenges of Tough Terrain

Easy Portability on Steep or Rugged Terrain

In areas with steep, rocky, rugged, or otherwise challenging terrain, advanced geophysical equipment and methods are not efficient. Most digital geophysical mapping (DGM) equipment is carried in stretcher-mode, which increases safety risks to field workers. Thus, traditional approaches to ordnance detection and investigation have been used to mitigate munitions and explosives of concern (MEC)-related hazards in difficult terrain. PDM8 offers single-operator, portable DGM.

Less Sensitivity to Geologic Interference

Volcanic rocks and soils have intrinsic magnetic properties, which may limit the detection methods available for use. Even for industry-standard tools such as the EM61-MK2, magnetic “hot” rock can increase the false anomaly rate and decrease the depth of detection. On some sites, hot rocks can represent up to 50 percent of the digs for mag and dig operations and can make anomaly selection impractical for EM61 surveys. PDM8 reduces the geologic noise and presents a clear anomaly picture.

Maneuverability in Sensitive Areas or Heavy Vegetation

DGM may require significant property disturbance such as mowing or shrub and brush removal. Homeowners may not want their landscaping disturbed. Also, property owners with open land may desire less brush clearance/vegetation removal in ecologically sensitive areas. PDM8’s small size eliminates the need for significant brush removal.

With No Sacrifice to Production Rates, Data Quality, or Safety

PDM8 can be used on any project at any location, but is especially designed for MEC-related projects in challenging terrain where brush, rocks, steep slopes, and other obstacles may hinder more traditional MEC-investigation methods. PDM8 uses proven electromagnetic induction (EMI) DGM technology that greatly reduces and attenuates magnetic interference from volcanic rocks and other magnetic sources. PDM8 is a fully comprehensive MEC-detection service performed in the field and in the office by skilled Parsons engineers, geoscientists, and certified UXO technicians.

Increased Production Rates

- Single operator means field staff is half that required for stretcher-type sensors
- Increased DGM production rates in challenging terrain
- Reduces need for vegetation removal at some sites
- Ideal for both grid-based and transect-based field operations
- Time for data processing and target identification equivalent to traditional methods

High-Quality Digital Data

- Successfully tested against traditional DGM methods in mountainous volcanic terrain with USACE oversight
- Decreased false positive rate compared with traditional EMI methods in geologically magnetic environments
- Automatically measures and compensates for background magnetic interference
- Depth of detection similar to EM61 and G858-based operations
- Field-tested and USACE-approved measurement quality objectives and SOPs already developed and adaptable to any project site

Enhanced Safety

- Eliminates safety hazards related to stretcher-mode DGM operations
- Improved ground surface visibility means fewer tripping hazards
- Lightweight, ergonomic equipment compared with traditional DGM methods and tools





Proven Effectiveness

Client-supported and recommended technology

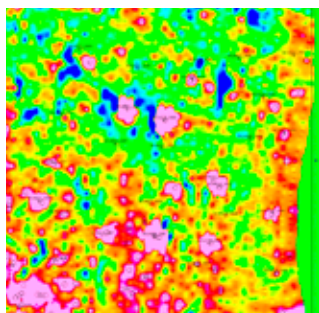
Since 2014, PDM8 services have been successfully used at a number of MEC remediation and investigation sites, including:

- Camp Williams, UT
- Marpi Point Field, Saipan
- Fort Leonard Wood, MO
- Waikoloa Maneuver Area, HI
- Culebra, Puerto Rico

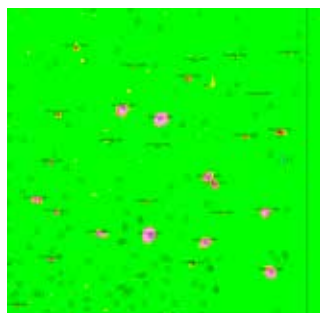
Regulatory-Approved

Provides a digital record that satisfies stakeholders

Parsons' PDM8 services were evaluated and approved for use at these sites by our DoD customers and by state environmental regulatory agencies. The PDM8 service has been used for both RI and for MEC RA.



EM-61 Data



PDM8 Data

Improved Data Quality. The left image shows geophysical data collected over a 100-ft x 100-ft grid in rugged volcanic terrain at Camp Williams, Utah, using traditional, stretcher-based EM61 methods. The right image is a result of PDM8 ordnance-detection methods at the same grid. The difference in resolution and number of targets between the two images is related to magnetic interference, although the EM61-MK2 sensor is historically thought to be the best digital sensor for detecting MEC in magnetic environments. PDM8 data collection methods and related ground-balancing adjustments, with our proprietary data processing procedures, show that this methodology is significantly more effective than the EM61-MK2 in these types of volcanic terrains.

Camp Williams RA, Utah

Over a 3-year period at the Camp Williams MEC remedial actions (RA) project in Utah, PDM8 services were used to remediate more than 360 acres of steep and rugged terrain contaminated with 37mm and 75mm artillery projectiles. The grid-based MEC RA was completed on schedule and under budget with no recordable safety incidents. An additional 1,600 acres of similar terrain were then investigated using the PDM8 service in a transect-based approach.



Results:

- More than 125,000 man hours completed with no recordable injuries
- Geophysical prove-out (GPO) showed comparable detection depth to EM61; PDM8 was superior in limiting geologic interference in hot rock areas; USACE Omaha independent testing confirmed results
- Detection and excavation of more than 140,000 targets, resulting in the recovery of 78 MEC items and more than 84,000 munitions debris (MD) items
- Demonstrated cost savings of more than \$1,000 per acre compared to two-man EM61 surveys

Waikoloa Maneuver Area RI, Hawaii

PDM8 has been used to investigate more than 29,000 acres for the Waikoloa Maneuver Area remedial investigations (RI) since mid-2016. The entire area consists of volcanic rock that interferes with traditional EMI technologies. A wide variety of MEC items has been detected at the site, the most common being: 37mm and 75mm artillery projectiles, 60mm mortars, 2.36-inch rockets, and hand grenades.



Results:

- Instrument Selection Survey (ISS) testing confirmed that the detection depth of PDM8 and signal-to-noise ratio over inert items were both better than the EM-61
- PDM8 correctly identified all 21 seeds and 47 anomalies during a side-by-side demonstration of PDM8 and EM-61
- Identifying all the seed items in the EM-61 dataset would have required investigating 93 anomalies

Contacts

Craig Murray
Geophysics Technical Lead

P: +1 303.764.8868
M: +1 720.219.3749
E: craig.murray@parsons.com

Christina Vail
Vice President

P: +1 210.805.6223
M: +1 210.347.8345
E: christina.vail@parsons.com

James Salisbury
SME-Munitions Response

P: +1 512.719.6028
M: +1 512.961.0091
E: james.salisbury@parsons.com

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