



Geophysical System Verification in Complex Geology Waikoloa Removal Action (H09HI035902)

U.S. ARMY CORPS OF ENGINEERS

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Objective:

Help transition the GSV process by demonstrating its use in a difficult geologic environment.

Problem being solved:

The geologic conditions that exist at Waikoloa, Hawaii make MEC detection extremely difficult. Magnetic data collected at the site is unusable and even electromagnetic technologies are challenged by the geologic site specific conditions. The Geophysical System Verification (GSV) approach has not been demonstrated at such a site with iron-rich soil and rocks.

Technology Description:

The Geophysical Prove-Out (GPO) has historically been used to provide proof that geophysical data would meet project objectives. There is now a significant body of knowledge to document the performance of standard technologies and it has also been recognized that magnetic and EM responses of munitions may be predicted reliably using physical models. Based on this knowledge, a new concept called Geophysical System Verification (GSV) has been developed, which is viewed as a replacement of the traditional GPO with a simplified verification of the geophysical system. An Instrument Verification Strip (IVS) containing a few Industry Standard Objects (ISOs) is installed at the project site. The ISO responses observed in the data must have signals that are consistent with both historical measurements and physics-based model predictions to demonstrate that the system is functioning properly. (GEOPHYSICAL SYSTEM VERIFICATION (GSV): A PHYSICS-BASED ALTERNATIVE TO GEOPHYSICAL PROVE-OUTS FOR MUNITIONS RESPONSE, ESTCP Program Office, July 2009)

Technical approach:

An IVS will be installed at a suitable site, most likely adjacent to an existing GPO site by adding ISOs in areas with varying levels of geologic noise. The responses to the items will then be compared to the predicted response curves to determine in which conditions it is feasible to use the approach. In order to first demonstrate that the instrument is functioning correctly, a minimum of two EM61-MK2s will be tested. A report will be written to document the results.

Expected DoD Benefit:

This project will determine if the GSV approach is feasible at sites such as Waikoloa with extreme geologic conditions. The capabilities and limitations of the approach will be documented and can be applied to future efforts at Waikoloa and those with similar conditions.

U.S. ARMY CORPS OF ENGINEERS – ENGINEERING AND SUPPORT CENTER, HUNTSVILLE

P.O. BOX 1600, HUNTSVILLE, AL 35807

Public Affairs Office 256-895-1694

<http://www.hnd.usace.army.mil>

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