Case Studies in Data Management from Two Large-Scale Munitions Response Project Sites

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Background/Objectives. Digital geophysical mapping (DGM) of large Munitions Response Sites (MRSs) with challenging conditions (e.g., significant variations in terrain, vegetation, soil conditions, etc.) can involve escalating costs and schedule delays. Such issues can be minimized by implementing appropriate QA/QC process for data collection and data management. Here we will describe challenges and lesson learned from two dynamic detection surveys at large MRS project sites. Additionally, we will demonstrate our perspective on tackling key issues associated with data collection, processing, and management.

Approach/Activities. A dynamic detection survey in support of a Munitions Response Remedial Action was performed from May to November 2017 using two five-sensor EM61-MK2 vehicle towed arrays (VTA) and three person-portable EM61-MK2 sensors. Prior to data acquisition, a site-wide grid system of 30m x 30m grids was established across the MRS. Grid corners were not staked prior to dynamic data collection; instead global positioning systems (GPS) in conjunction with geographical information system (GIS) mapping technology were used in real time to establish the location of the sensors for dynamic surveying. The CH2M-developed Munitions Response Site Information Management System (MRSIMS) was used to track all geophysical operations and incorporated all client data requirements. Approximately 900 acres of dynamic data were collected within the project boundary. Major areas of dynamic survey inaccessibility existed due to terrain, and minor coverage gaps were related to the removal of unacceptable data associated with VTA sensor platforms. An anomalous-response amplitude-based target selection approach was used to identify anomalies for investigation either by cued advanced geophysical classification (AGC), or direct intrusive methods. MATLAB-based scripts were used to automate generating the list of targets.

Results/Lessons Learned. From the 900 ac of data, there were over 36,000 data amplitude picks, however through the identification and removal of geophysical noise related targets, the number of targets to investigate was reduced to approximately 29,000. Several lessons were learned from the project, such as improving data coverage and data quality by improving communications and tracking among field teams and data processors. To this end, a Web Map Application was developed to be used at a current large-scale Munitions Response Remedial Action. This online and freely accessible map is currently facilitating communications between multiple field teams performing multiple tasks by showing an updated visual coverage of all field activities. A case study from this on-going project that demonstrates the usability of the online map will be presented.