

3D Visualization Techniques For UXO Risk Evaluation

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The Netherlands Currently there is a very unique UXO clearance project on-going at a former WWII era mock German airport that was setup to support munitions training during the war. The site is one of several former airfields in The Netherlands that contain UXO from previous training exercises.

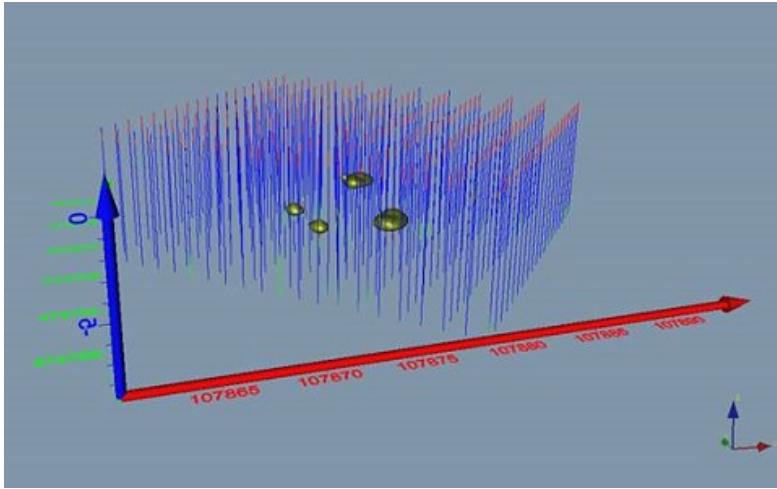
A magnetometer survey was completed at the site to identify buried UXO including a magnetometer survey conducted from the ground surface as well as magnetometer probing to get an accurate picture of the number, size and locations of UXO at the site. Magnetometer probing is a process by which a specialized magnetometer based probe is pushed through the ground to gather readings in real time along the z-axis.

This process provides for a more accurate picture of the subsurface anomalies at the site. The image to the right shows the implementation of magnetometer probing at a UXO site.



For the mock German airfield site, a grid size was 2.5 meters by 2.5 meters was selected for the magnetometer probing with the maximum average depth of each probe reading ranging between 8 to 10 meters or until the probes reached a sand layer with a density less than 10 MPa.

The survey team developed a 3D visualization based upon the magnetometer data using Voxler software to plot the calculated size, depth, and location of UXOs buried at the site. A sample of a 3D plot from the site is shown below. The 3D visualization is useful for developing safety and risk profiles for the site as it shows where the spatial relationship between UXOs at the site.



The 3D map of the UXOs is also a useful tool for the recovery team as they have an accurate map of the locations of targets which need to be investigated including information on size and depths of targets. To date, 40 bombs have been cleared from the site including a variety of German bombs ranging from the SC-50 (50 kg) to SC-500 (500 kg) bombs.

Pictures of two of the finds are shown below including an image of an electric German fuze in the side of one of the bombs. The types and concentrations of UXO at the site make the operation unique as well as an interesting challenge to clear.



