

A NEW HELICOPTER TIME DOMAIN AEM SYSTEM FOR SHALLOW SEAWATER GEOPHYSICAL SURVEYING – STATIC TRIALS

Graham Boyd¹, Julian Vrbancich²*

¹Geololutions Pty Ltd, gwb@senet.com.au

²Defence Science & Technology Organisation, julian.vrbancich@dsto.defence.gov.au

A new helicopter time domain AEM system (SeaTEM) is under development for bathymetric surveying in shallow waters. Commercial helicopter AEM systems are often operated in areas of rugged terrain and may not be fitted with bird attitude sensors, and altimetry sensors that operate over seawater. SeaTEM is being designed for surveying at lower altitudes than that typical of AEM systems used for mineral exploration and will incorporate inertial navigation and marine-altimetry sensors. SeaTEM is being developed over three years. The first phase involved a series of static (i.e. *non-airborne*) investigations over highly resistive ground followed by a series of static trials over seawater - using a stable non-metallic floating platform ~ 20 m diameter that permits full scale AEM transmitter-receiver loop systems to be deployed at simulated flight heights of about 20 m above sea level. The static ground investigations involved experimentation to determine the system self response (with and without navigation and altimetry sensors) using different loop conductors and transmitter-receiver coil configurations. AEM hardware was then suspended 20 m above sea level using the floating platform located in calm waters. We present results of the static seawater tests. This approach provides a full-scale AEM system to be “flight” tested in selected areas of known water depth and sediment type (without the expense of helicopter hire and fuel costs) avoiding electronic interference with helicopter instrumentation and noise caused by bird motion. We believe that this thorough approach will determine an AEM system optimized for bathymetric surveying in shallow coastal waters.