AEM Go-Map for the Paterson Region, WA and Pine Creek, NT.

D.K. Hutchinson, I.C. Roach and M.T. Costelloe

AEM Project, Onshore Energy and Minerals Division, Geoscience Australia

Geoscience Australia (GA) has recently completed two regional-scale Airborne Electromagnetic (AEM) surveys: one in the Paterson Region, WA; and the other in the Pine Creek region, NT. These surveys provide AEM data at line spacings of 200 m to 6 km covering an area greater than 110 000 km^2. The surveys were designed to promote more detailed investigations by the mineral exploration industry. An inherent risk in using AEM surveys is that the depth of penetration of the primary electromagnetic field is highly variable. Although forward modelling is undertaken before the AEM campaign, the depth to which we can reliably invert the AEM signal to generate conductivity models is not known until after the survey is flown. In order to estimate the penetration depth of the AEM surveys, we calculate the depth of investigation (DOI) based on the GA layered-earth inversion algorithm, which is influenced by both conductivity measurements and reference model assumptions. We define the DOI as the maximum depth at which the inversion is influenced more by the conductivity data than the reference model. We present the DOI as a 2D grid across both the Paterson and Pine Creek AEM surveys. Labelled the “AEM go-map”, the DOI grid helps to promote AEM exploration by decreasing risk when industry undertakes follow-up surveys within these regions.