

YILGARN

AUSTRALIA

Probing the Depths of Tertiary Palaeochannels



FIGURE 1 Palaeodrainage systems and channels of the Yilgarn Block.

The Yilgarn block is located in Western Australia and is host to numerous uranium and secondary placer gold deposits. These deposits are associated with highly saline brines in the deepest parts of the tertiary paleochannels that once drained this part of the continent.

Palaeochannels can be located from satellite imagery and in more detail by ground gravity surveying, but locating the deepest part of the channel could only be accomplished by drilling a profile perpendicular to the channel.

Two dimensional modeling of gravity profiles taken over palaeochannels allowed the construction of a bedrock profile, showing the deepest parts of the ancient channels.

Disagreement between the model and drill-hole data was less than 20%.

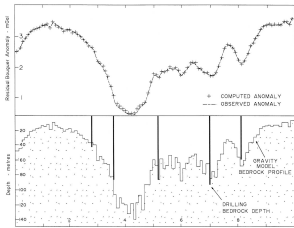


FIGURE 6 Comparison between the interpreted depth profile of a channel, as determined from iterative inversion of the residual gravity data, and depths found from drilling. Kapi Bay traverse.

Time Domain EM techniques were used to map the contact of the conductive brines and the resistive, Archean bedrock.

Seismic reflection and refraction surveys were also conducted and were found to be useful in locating the centres of the channels and in lithological interpretation.

