Vector Research Pty Ltd
ABN 80 086 727 273

EXPLORATION GEOPHYSICS

7 Robinson Street
Nedlands WA 6009
PO Box 1133
Nedlands WA 6909
Australia

Phone/Fax: + 61 8 9386-8894
Email: info@vecresearch.com
Web: www.vecresearch.com

vch12.doc

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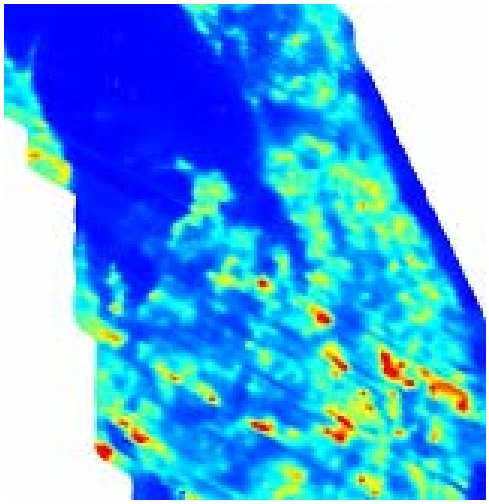
CASE HISTORY

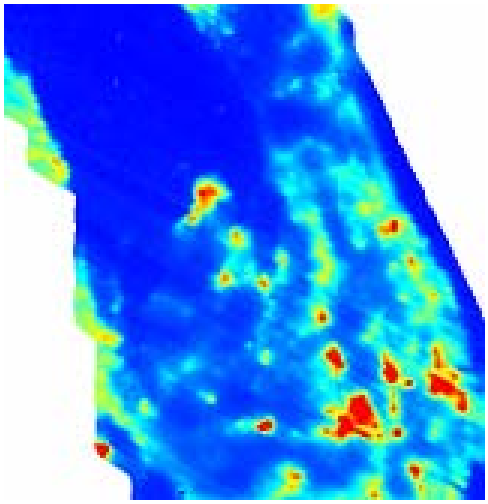
Subject: TargetTEM™ – Manganese (HOISTEM)

East Pilbara Craton, Western Australia

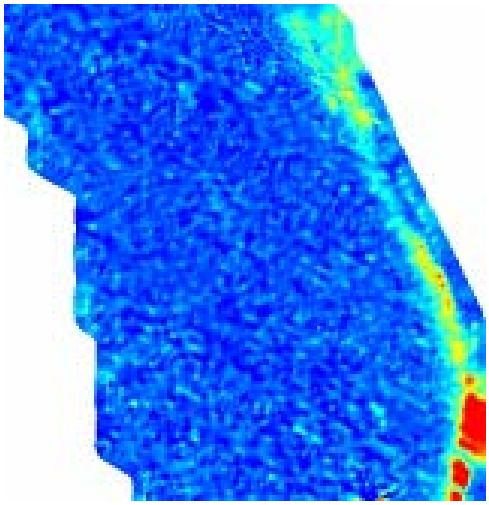
HOISTEM survey (flown 2002) with survey lines oriented 120-200 degrees and spaced 80 metres apart over dolomite. A sandstone unit overlies the dolomite in the north-west of the survey area. The dolomite hosts a large number of small (~100m diameter) near-surface massive manganese bodies, a number of which are being mined. Area is 4.9kms x 5.6kms, north to top of page. Data shown are the HOISTEM dB/dt vertical (Z) component, 27 channels. See Vector Research Technical Note No. 9 for details of TargetTEM™.



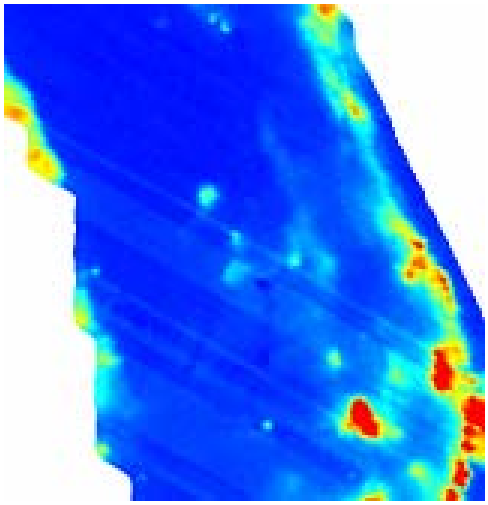
HOISTEM channel 3



HOISTEM channel 10



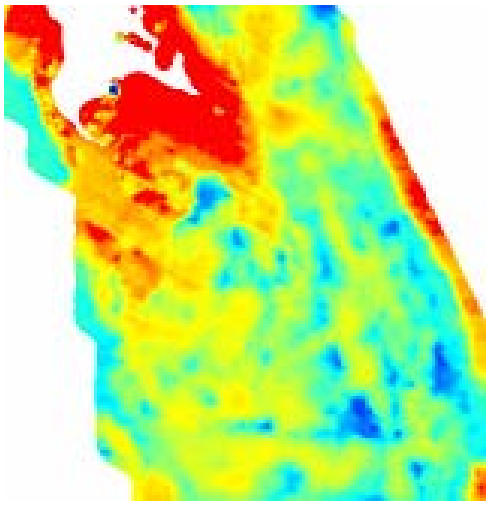
HOISTEM channel 24



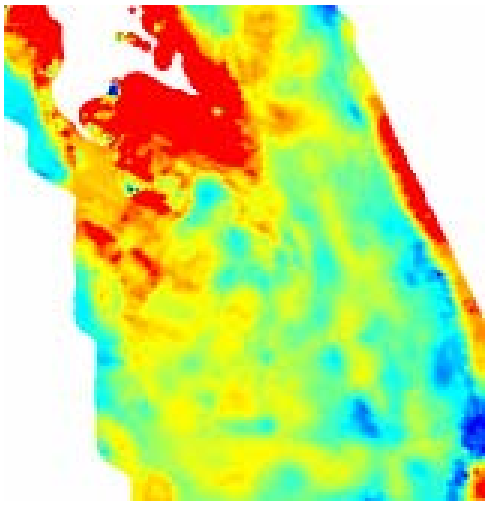
HOISTEM channel 17

Compare these raw channel images with the detail resolved in the TargetTEM™ SPATIAL and TEMPORAL responses.

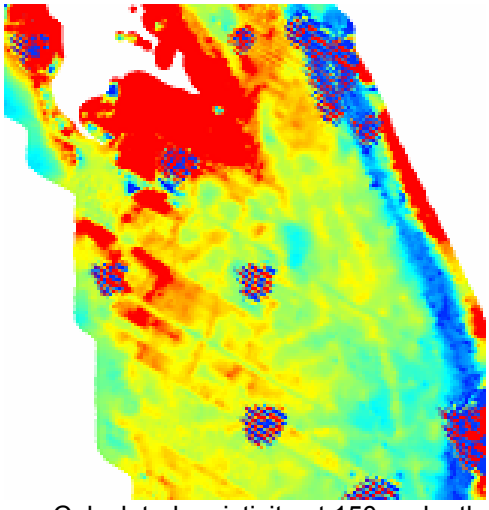
East Pilbara manganese field, Western Australia (continued).



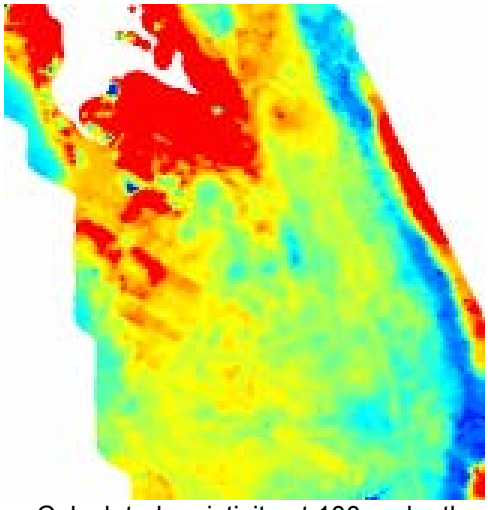
Calculated resistivity at 20 m depth



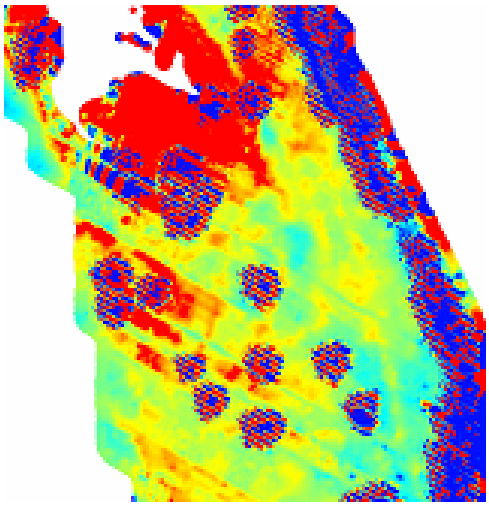
Calculated resistivity at 50 m depth



Calculated resistivity at 150 m depth



Calculated resistivity at 100 m depth

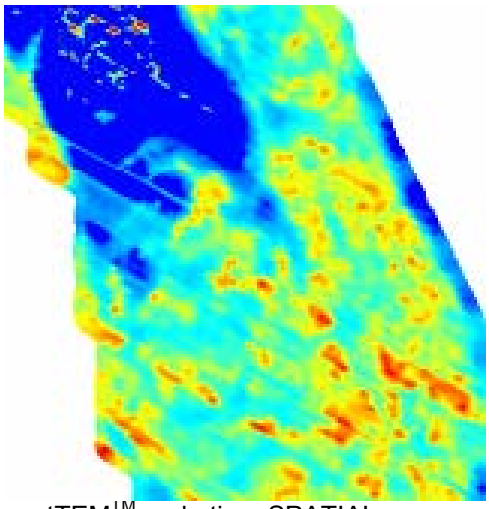


Calculated resistivity at 200 m depth

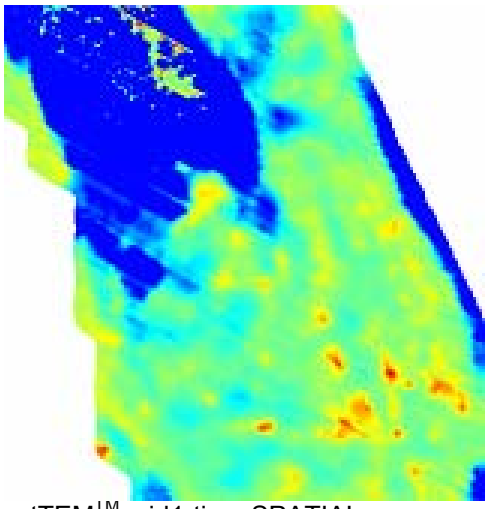
These resistivity-depth images were calculated from the HOISTEM data using a conductivity-depth imaging algorithm and attempt to show the resistivity at particular depths. They show the large electrical contrasts of the prominent geological features, but lack important detail necessary for drill-targeting. The dolomite is fractured and cavernous and contains large volumes of water, and is therefore more conductive than the overlying sandstone in the north-west. Compare these with the detail resolved in the TargetTEM^{TM} SPATIAL and TEMPORAL responses.

The 'noisy spots' seen in the 150 m and 200 m depth resistivity images are due to noise in the survey data.

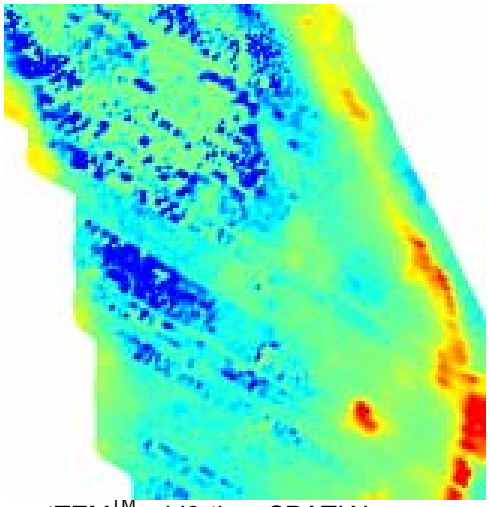
East Pilbara manganese field, Western Australia (continued).



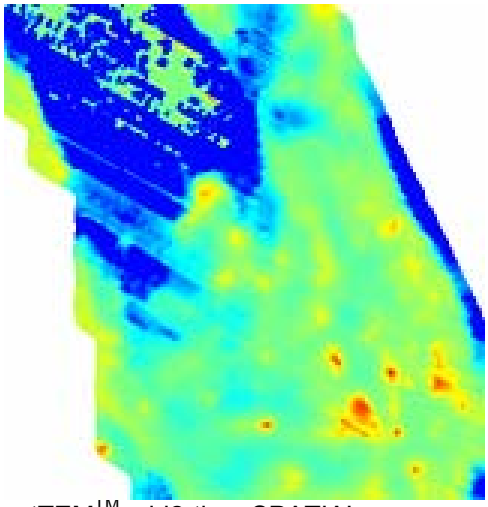
TargetTEM^{IM} early-time SPATIAL response



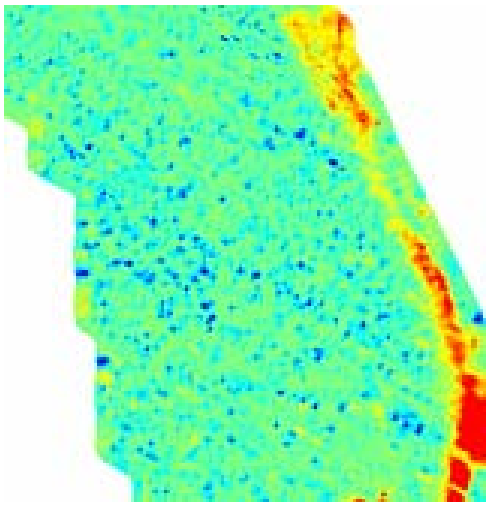
TargetTEM^{IM} mid1-time SPATIAL response



TargetTEM^{IM} mid3-time SPATIAL response



TargetTEM^{IM} mid2-time SPATIAL response

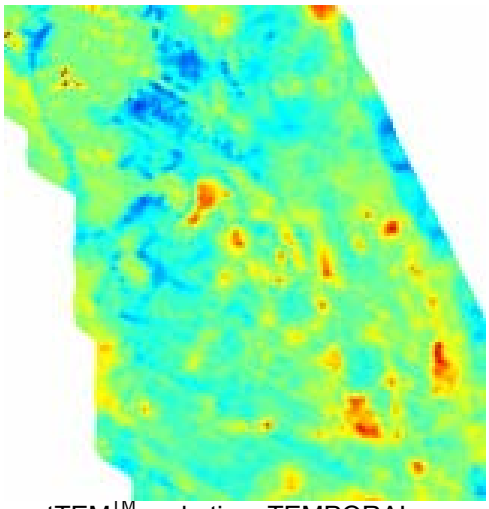


TargetTEM^{TM} late-time SPATIAL response

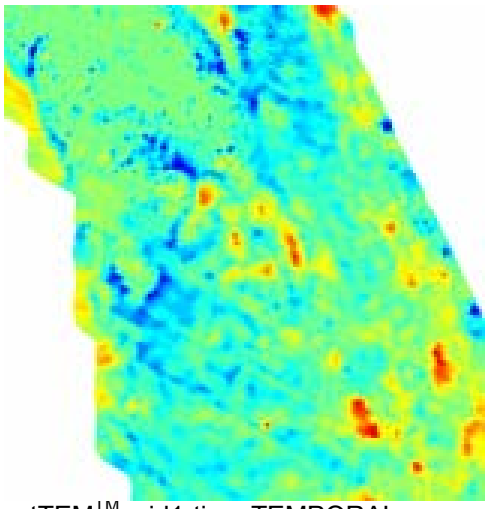
TargetTEM^{TM} SPATIAL responses for each channel are calculated from the measured response. The background response for each channel, which includes the response of the host rocks and any conductive overburden present, is removed to reveal changes in the response along the survey lines. The depth, size and orientation of conductors strongly affect the amplitude of the measured responses. Early times depict the electrical response of shallow depths whilst later times depict deeper regions. Poor conductors are resolved at early times whilst the response of good conductors extends to later times.

Note the significant improvement in resolution of detail compared to the resistivity-depth images. The SPATIAL responses also resolve the affects of variations in survey height. Areas producing stronger responses than the background are shown in red whilst those producing weaker responses than the background are shown in blue.

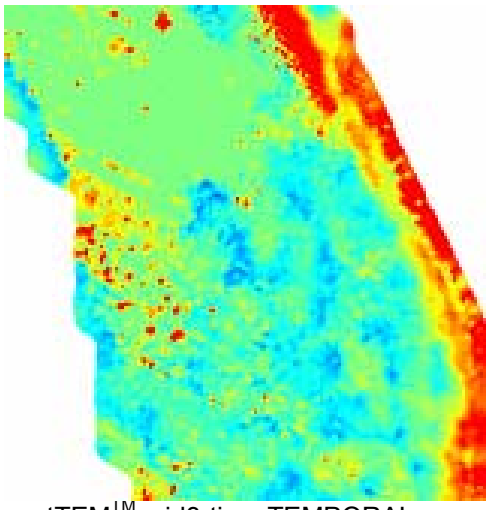
East Pilbara manganese field, Western Australia (continued).



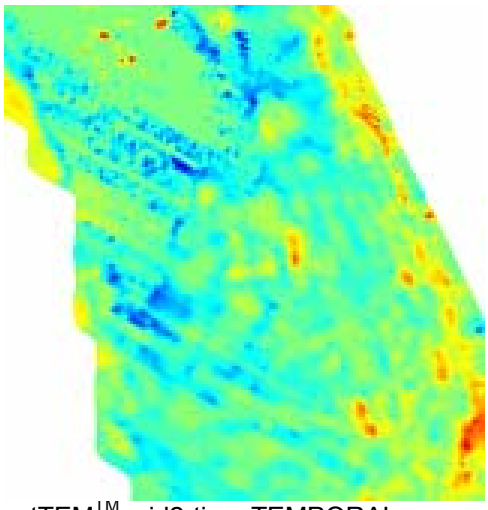
TargetTEM^{IM} early-time TEMPORAL response



TargetTEM^{IM} mid1-time TEMPORAL response

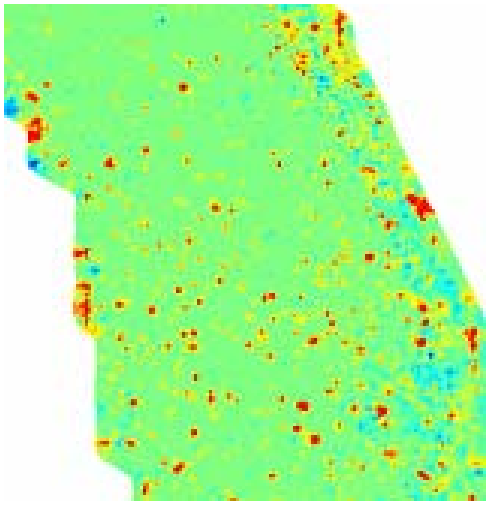


TargetTEM^{IM} mid3-time TEMPORAL response



TargetTEM^{IM} mid2-time TEMPORAL response

TargetTEM^{TM} TEMPORAL responses for each channel are calculated from the time-varying transient decay. The background transient decay for each channel, which includes the response of the host rocks and any conductive overburden present, is removed to reveal changes in the decay along the survey lines. Early times depict the electrical response of shallow depths whilst later times depict deeper regions. Poor conductors are resolved at early times (they exhibit fast decays, ie short decay times) whilst the response of good conductors extends to later times (they exhibit slow decays, ie long decay times).



TargetTEM^{TM} late-time TEMPORAL response

Note the significant improvement in resolution of detail compared to the resistivity-depth images. The TEMPORAL responses are relatively immune to the affects of variations in survey height and are therefore more reliable than the SPATIAL responses for exploration targeting Areas having higher conductivity than the background are shown in red whilst those with lower conductivity than the background are shown in blue.

A number of known near-surface, conductive, massive manganese bodies are resolved, particularly in the early- and mid-time images, which are either not apparent or not clear in the resistivity-depth images.