

5 CONCLUSIONS/ RECOMMENDATIONS

In conclusion to this project we would like to reiterate that the aeromagnetic data has been successful in:

- a) Enabling the identification of structures that significantly improve the geological knowledge of the study area. Consequently the enclosures 1, 2 and 3 are the main results of this study, with enclosure 4 summarising the key elements.
- b) From the structural interpretation and litho-magnetic associations it is possible to divide the area into 5 domains. The most prospective domains are likely to be domain 3A and 2A, as they clearly contain zoned igneous units and are cross-cut by major (E – W and NW – SE trending) regional structures. Domain 3B could contain similar structures to domain 3A, with prospective units at depth, buried by Triassic-Jurassic volcano-sedimentary units.
- c) The predominantly E-W trending structural domain 2, possibly provides evidence of thrusting having been active in the region which could be beneficial for the development of large porphyry deposits.
- d) Even though structures with an E – W strike appear to be the dominant regional structures (such as the Vitim Suture Zone) this study proposes that the NW trending structures are equally if not more significant for focusing large porphyry mineral deposits.
- e) Normal faulting affects the area to create several large basins and our preference is to infer that these structures represent a relatively 'late' event and has occurred with relatively in-situ dip-slip displacement.
- f) Recognition of multiple phases and/ or zonation of igneous related litho-magnetic units may also assist the identification of porphyry mineralisation. It is not possible to definitively say whether areas of relative magnetic low or high response is the most prospective as magnetic signatures vary depending on the depth of weathering across porphyries. A good litho-magnetic study may help to resolve some of the apparent complexity within the igneous units.
- g) All the data is compiled as an active project (1495_Mongolia.apr) in a geographic system (ArcView™) ready for verification and addition of further complimentary information.
- h) Fourteen prospective sites that occur around areas of known mineralisation, major structures or zoned intrusive bodies are described in terms of their geophysical response. Possible explanations for the mineral occurrence and further potential are discussed.

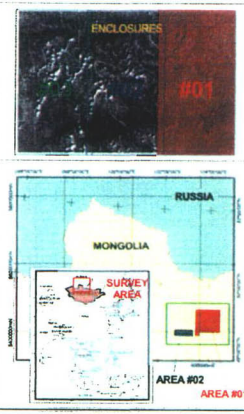
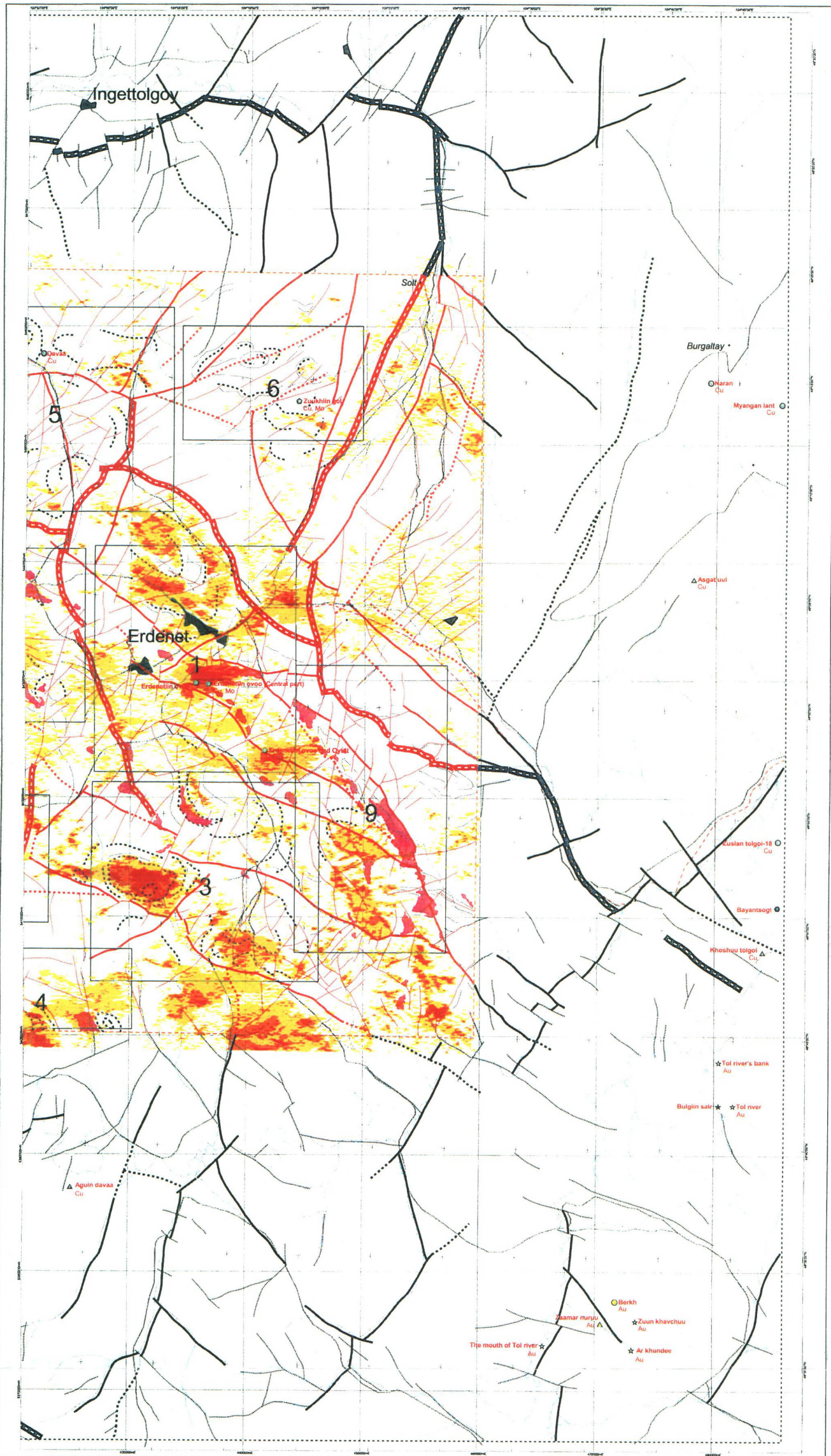
Recommendations that result from this study are:

- a) The contract for this interpretation stipulates that the interpretation focuses on the structures within the area. However, much of the potentially useful information on litho-magnetic units, and in particular the identification of igneous zonation and multiple intrusive bodies has not been rigorously interpreted and correlated with published mapping. In order for the data to be used to its full potential we strongly recommend that a more detailed litho-magnetic interpretation be undertaken. To correlate litho-magnetic signatures with mappable units and areas of alteration, interpretation should preferably be made in conjunction with field verification.
- b) It is now possible to develop a regional interpretation or synthesis based on the remote sensing imagery and constrained by the detail available from the airborne geophysical data. However, the validity of the regional interpretation or synthesis decreases the further you go from the geophysical data. To rapidly develop an improved regional overview for the structure, tectonics and intrusive history of Central - Northern Mongolia it would be beneficial to undertake other surveys with a similar coverage and data resolution and strategically placed throughout the region. Following this approach would provide the necessary control to accurately develop a true regional synthesis.
- c) The possible explanations for the numerous mineralised areas highlighted in this study require verification. Use of any information such as company reports, geochemistry, drill hole logs and field mapping should be assessed using the new data available from this work. During the course of the verification process it may be necessary to review and amend this interpretation.
- d) Once the correlation between structures and litho-magnetic units from airborne geophysical data and significant mineralised areas are verified, it may be desirable to review specific target areas. Due to the current 250 m line spacing of the airborne surveys much of the fine detail and information for fault geometries (offsets, jogs and splays, radial fractures) are missing. By undertaking an infill survey using 50 m line spacing over a series of areas such as key targets and mines would enable a far more detailed assessment of the area to be made.

Bibliography

- Australian Mineral Foundation, 1996, "Porphyry related copper and gold deposits of the Asia Pacific region", AMF Conference Proceedings, Cairns.
- Australian Mineral Foundation, 1998, "Porphyry and hydrothermal copper and gold deposits", AMF Conference Proceedings, Perth.
- Brant, A. A., 1966, "Geophysics in the exploration for Arizona porphyry coppers", In: Titley, S. R. and Hicks, C. L., (eds) *Geology of the porphyry copper deposits: southwestern North America*, University of Arizona Press, Tucson, p87-110.
- Clark, D. A., French, D. H., Lackie, M. A., and Schmidt, P. W., 1992, "Magnetic petrology: application of integrated magnetic and petrological techniques to geological interpretation of magnetic surveys", *Exploration Geophysics*, v23, p 65-68.
- Corbett, G., and Leach, T., 1995, "Southwest Pacific Rim Gold-Copper Systems: structure, alteration and mineralisation", Workshop manual.
- Gunn, P. J., and Dentith, M. C., 1997, "Magnetic responses associated with mineral deposits", *AGSO Journal of Australian Geology and Geophysics*, v 17, No 2, p 145-158.
- Japan International Cooperation Agency and Metal Mining Agency Japan, 2001, (eds) "Report on Geological Survey in the Central North Area Mongolia", Final Report, Internal MMAJ report.
- Jargalsaihan, D., Kazmer, M., Baras, Z., and Sanjaadorj, D., 1996 (eds), "Guide to the geology and mineral resources of Mongolia", Geological Exploration Consulting and Services (GCS) Co. Ltd., p 329.
- Sawkins, F. J., 1990, "Metal deposits in relation to plate tectonics", Springer-Verlag, Berlin, pp461
- Sengor, A. M. C., and Natal'in, B. A., 1996, "Palaeotectonics of Asia: fragments of a synthesis", in Yin, A., and Harrison, M., (eds) *the Tectonic Evolution of Asia*, Cambridge University press, p. 486-640.
- Sillitoe, R., 1998, "Porphyry related copper-gold systems - Field recognition and interpretation", Australian Mineral Foundation, Manual for Workshop Course No 185A/98.

Plates



EXPLANATION OF INTERPRETATION SYMBOLS

CULTURAL FEATURES	SURVEY BOUNDARIES	MINERALISATION	ANOMALOUS GEOPHYSICAL SYMBOLS	REMOTE SENSING SYMBOLS
<ul style="list-style-type: none"> ○ CULTURAL sites or towns — Major road or track — Railway — Major rivers and lakes 	<ul style="list-style-type: none"> --- Regional overview from remote sensing data --- Area #01 Airborne Geophysical Survey --- Area #02 Airborne Geophysical Survey 3 Areas of interest containing structural and/or apparent intrusive features possibly relating to mineralisation and discussed in the accompanying report 	<ul style="list-style-type: none"> ○ Cu-Mo, W, REE-Metamorphic, Hydrothermal, Alteration △ Cu-Mo, W, Vm □ Cu-Mo, W, Sulfur, Dyke ■ Cu-Mo, W, Sulfur ○ Cu-Mo, W, Metamorphic, Lenticular (zone) ● Cu-Au-Metamorphic, Hydrothermal, Alteration △ Cu-Au-Vm ■ Cu-Au-Sulfur, Dyke ○ Au-Metamorphic, Hydrothermal, Alteration △ Au-Vm ■ Au-Sedimentary, Placer ○ W, Al, REE-Metamorphic, Hydrothermal, Alteration △ W, Al, REE-Sulfur, Dyke ■ W, Al, REE-Metamorphic, Lenticular (zone) ○ W, Al, REE-Sedimentary, Placer 	<ul style="list-style-type: none"> ○ Trends of relative high magnetic intensity, sub-linear units ○ Magnetic structural features - possible trace of inferred boundaries and/or zones of magnetic destruction related to multiple mineralisation ○ Domain boundary - boundaries or separate zones that contain significantly different structural trends or lithological units ○ Major Fault (conformable, informal) - truncates or separates litho-magnetic units with an apparent significant displacement and is also well-defined on remote sensing imagery ○ Minor Fault - truncates or separates litho-magnetic units with apparent minor displacement and/or coincides with a remote sensing lineament ○ Pseudomagnetic (PM) anomalies that occur clipped to 95% and 95% values. The 95% value probably maps lithological or geomorphic units when the 95% to 95% values possibly reduces zones of S-Cl alteration or areas with a relatively thin surficial cover over a potassium-rich lithological or geomorphic unit ○ Observed magnetic anomaly (extreme high or low) - may infer a zone of intense magnetite destruction (due to alteration (low) or late intrusive stocks (high)) 	<ul style="list-style-type: none"> ○ Domain boundary - boundaries or separate zones containing significantly different structural trends or lithological units ○ Major Fault (conformable, informal) - truncates or separates lithological units with an apparent significant displacement ○ Minor Fault - truncates or separates lithological units with apparent minor displacement

WESTERN ERDENET AREA MONGOLIA

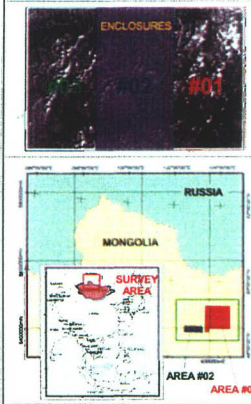
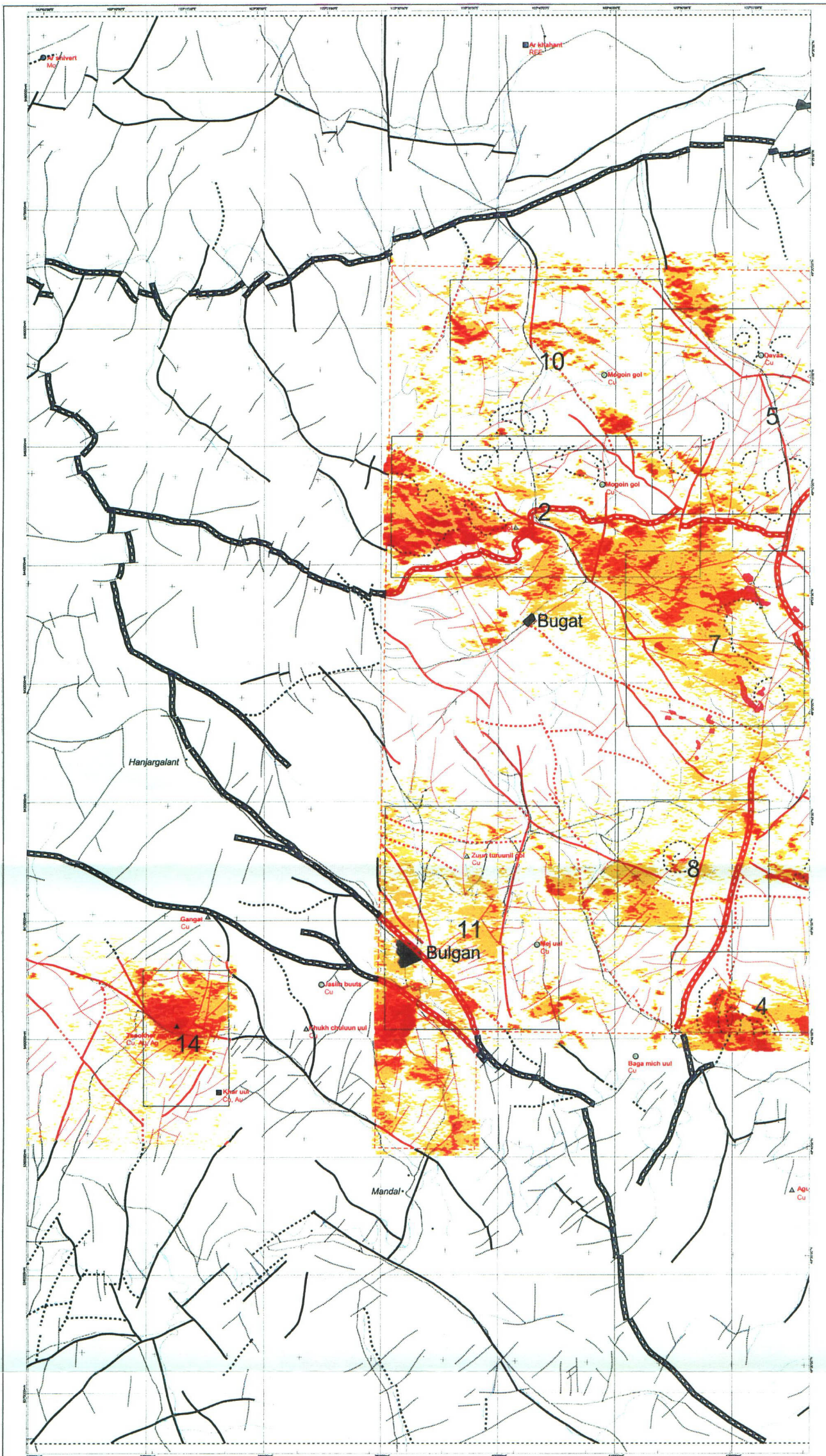
REGIONAL STRUCTURAL INTERPRETATION FROM AIRBORNE GEOPHYSICAL DATA AND REMOTE SENSING IMAGERY

JAPAN INTERNATIONAL CO-OPERATION AGENCY,
METAL MINING AGENCY OF JAPAN,
MITSUBISHI MATERIAL NATURAL RESOURCES DEVELOPMENT CORPORATION

Approximate Scale 1:100,000

Produced By: Dr Steven D. Baily
Consulting: February 2002
Date: 14/02/2002
Document Number: 1402/Erdenet_01
Map Details: World Geospatial System 84 Universal Transverse Mercator Projection Northern Hemisphere, Zone 48

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EXPLANATION OF INTERPRETATION SYMBOLS

<p>CULTURAL FEATURES (based on 1:50,000 scale topographic map, March 2001) (symbols to 1:100,000 scale have been removed where appropriate)</p> <ul style="list-style-type: none"> ▲ CULTURAL - cities or towns — Major road or track — Railway — Major rivers and lakes 	<p>SURVEY BOUNDARIES</p> <ul style="list-style-type: none"> --- Regional overview from remote sensing data --- Area 001 Airborne Geophysical Survey --- Area 002 Airborne Geophysical Survey 3 Area of interest containing structural and/or apparent intrusive features possibly relating to mineralisation and discussed in the accompanying report
<p>MINERALISATION (based on 1:50,000 scale topographic map, March 2001)</p> <ul style="list-style-type: none"> ○ Cu-Mo, W-Mesozoic, Hydrothermal, Alteration △ Cu-Mo, W-Yan □ Cu-Mo, W-Stockwork, Dyke □ Cu-Mo, W-Diagen ○ Cu-Mo, W-Mesozoic, Lenticular(zone) ● Cu-Au-Mesozoic, Hydrothermal, Alteration ● Cu-Au-Yan ■ Cu-Au-Stockwork, Dyke ● Au-Mesozoic, Hydrothermal, Alteration ★ Au-Stockwork, Phase ● W, Al, REE-Mesozoic, Hydrothermal, Alteration ● W, Al, REE-Stockwork, Dyke ● W, Al, REE-Mesozoic, Lenticular(zone) ★ W, Al, REE-Subvolcanic, Phase 	<p>AIRBORNE GEOPHYSICAL SYMBOLS (from 1:50,000 scale remote sensing imagery)</p> <ul style="list-style-type: none"> — Trends of relative high magnetic intensity, sub-linear units — Magnetic structure - possible trace of intrusive boundaries and/or zones of magmatic destruction related to multiple intrusions — Domain boundary - structures or separation zones that contain significantly different structural trends or litho-magnetic units — Major Fault (parallel, vertical) - truncates or separates litho-magnetic units with an apparent significant displacement and is also well defined on remote sensing imagery — Minor Fault - truncates or separates litho-magnetic units with apparent minor displacement and/or coincides with a remote sensing trend — Potassium (K) isohemalms (total count clipped to 85, 95 and 99% values - the 80% value probably maps lithological or geomorphic units while the 95 to 99% values possibly indicate zones of high alteration or areas with a relatively thin surficial cover over a potassium-rich lithological or geomorphic unit — Discrete magnetic anomaly (positive high or low) - may infer a zone of intense magnetic destruction due to alteration (low) or late intrusive stocks (high)
<p>REMOTE SENSING SYMBOLS (from 1:100,000 scale remote sensing imagery)</p> <ul style="list-style-type: none"> — Domain boundary - structures or separation zones containing significantly different structural trends or lithological units — Major Fault (parallel, vertical) - truncates or separates lithological units with an apparent significant displacement — Minor Fault - truncates or separates lithological units with apparent minor displacement 	

WESTERN ERDENET AREA MONGOLIA

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Approximate Scale 1:100,000

Produced By: Dr Steven D. Bony
Fugro Division
Date: February 2002
Document Number: 1495/Enclosure_002
Map Details: World Coordinate System: UTM Universal Transverse Mercator Projection Northern Hemisphere, Zone 48

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