TANAMI GOLD NL

CENTRAL TANAMI PROJECT

This compilation contains a selection of magnetic images and final 10m cell size magnetics grid derived from a merge of various reprocessed open file, government and Tanami-supplied airborne magnetics datasets over CTP. Optional Geoscience Australia radiometric images and magnetic contours are also included in the compilation. Final products are all delivered in MapInfo compatible format in GDA94 datum / MGA52 projection.

Below is a summary of all datasets used in the magnetics merge:

SURVEY NAME	SURVEY YEAR	FLIGHT LINE SPACING (meters)	MEAN TERRAIN CLEARANCE (meters)
Pendragon	1997	25	20
Groundrush HMAG	2000	30	10
Supplejack 96	1996	50	20
Supplejack Infill	1996	50	20
Groundrush AMAG	2000	50	25
Tanami Mine Lease	1995	50	25
Calamari	1996	50	30
Legend	1997	50	30
Jims Area	1995	50	40
Apertawonga	1996	50	40
Carthage	1996	50	40
South Tanami Lakes	1997	50	40
Flores	1996	50	40
Kuwait	1996	50	40
Mount Charles	2000	50	60
Supplejack	2003	75	20
Birrindudu	2003	75	20
Ware Range	1997	100	20
Talbot Wells	1993	100	20
Talbot South	1995	100	20
Pargee	1999	100	60
Challenger	1995	100	60

North Tanami Lakes	1997	100	60
Homestead	1995	100	60
West Camel	1997	100	-
Tanami Area C	2000	150	60
Tanami Area F	2000	150	60
Tanami Area I	2000	150	60
Schist Hills	-	150	-
Supplejack 95 North	1995	200	60
Supplejack 95	1995	200	60
Black Hills	1993	200	60
Geoscience Australia National TMI Merge	*80m cell size*		

Image Files (GeoTiffs/ECWs)...

These are typically imaged as greyscale, pseudocolour or microbrian (rainbow spectrum with purple/blue values being low and red/white values being high).

X *refers to the sun-shade angle (SE, E, NE or N)*

Geotiffs/ECWs

RADIOMETRICS *(Geoscience Australia only)*

- _K_*X*shade_L — Potassium channel (Lin) Shaded with 50% *X* Gradient
- _TC_*X*shade_L — Total Count channel (Lin) Shaded with 50% *X* Gradient
- _Tern_L — Ternary Image (Lin, K-red, Th-green, U-blue)
- _Tern_NL — Ternary Image (NL, K-red, Th-green, U-blue)
- _Tern_TC_*X*shade_L — Ternary Image (Lin, K-red, Th-green, U-blue) Shaded with 50% *X* gradient of Total Count
- _Tern_TC_*X*shade_NL — Ternary Image (NL, K-red, Th-green, U-blue) Shaded with 50% *X* gradient of Total Count
- _Th_*X*shade_L — Thorium channel (Lin) Shaded with 50% *X* Gradient
- _U_*X*shade_L — Uranium channel (Lin) Shaded with 50% *X* Gradient

MAGNETICS *(Merged detailed surveys with Geoscience Australia background)*

TMI

- _ANSIG_Xshade_L — Analytic Signal (Lin) shaded with 50% X Gradient
- _ANSIG_Xshade_NL — Analytic Signal (NL) shaded with 50% X Gradient
- _ASVI_Xshade_L — ASVI (Lin) shaded with 50% X Gradient
- _ASVI_Xshade_NL — ASVI (NL) shaded with 50% X Gradient
- _TMI_pseudo_L — TMI (Lin) Pseudocolour Image

- _TMI_pseudo_NL — TMI (NL) Pseudocolour Image
- _TMI_X — TMI (NL) X Gradient Greyscale
- _TMI_Xagcs_L — TMI (Lin) shaded with 50% AGC Enhanced X Gradient
- _TMI_Xagcs_NL — TMI (NL) shaded with 50% AGC Enhanced X Gradient
- _TMI_Xshade_NL — TMI (NL) shaded with 50% X Gradient
- _TMI1VD_NL — First Vertical Derivative of TMI (NL) Greyscale
- _TMI1VD_Xagcs_L — First Vertical Derivative of TMI (Lin) shaded with 50% AGC Enhanced X Gradient
- _TMI1VD_Xagcs_NL — First Vertical Derivative of TMI (NL) shaded with 50% AGC Enhanced X Gradient
- _TMI1VD_*X*shade_NL — First Vertical Derivative of TMI (NL) shaded with 50% *X* Gradient
- _TMI2VD_NL — Second Vertical Derivative of TMI (NL) Greyscale
- _TMI2VD_AGC_NL — AGC Enhanced Second Vertical Derivative of TMI (NL) Greyscale
- _TMI_TILT_*X*agcs_L — Tilt Angle of TMI (Lin) shaded with 50% AGC Enhanced X Gradient
- _VIAS_Xshade_L — VIAS (Lin) shaded with 50% X Gradient
- _VIAS_Xshade_NL — VIAS (NL) shaded with 50% X Gradient

RTP

- _RTP_X — Reduced To Pole TMI (NL) X Gradient Greyscale
- _RTP_Xagcs_NL — Reduced to Pole TMI (NL) shaded with 50% AGC Enhanced X Gradient
- _RTP_Xagcs_L — Reduced to Pole TMI (Lin) shaded with 50% AGC Enhanced X Gradient
- _RTP_Xshade_NL — Reduced to Pole TMI (NL) shaded with 50% X Gradient
- _RTP1VD_Xagcs_NL — First Vertical Derivative of Reduced to Pole TMI (NL) shaded with 50% AGC Enhanced X Gradient
- _RTP1VD_Xagcs_L — First Vertical Derivative of Reduced to Pole TMI (Lin) shaded with 50% AGC Enhanced X Gradient
- _RTP1VD_Xshade_NL — First Vertical Derivative of Reduced to Pole TMI (NL) shaded with 50% X Gradient

Vector Files (ArcGIS and MapInfo Compatible)...

Contours @ 1:25,000

MAGNETICS – TMI

- _TMI_25k_cont — Total Magnetic Intensity (interval @ 20, 100, 500, 2500 nT)
- _TMI1VD_25k_cont — First Vertical Derivative of TMI (interval @ 0.2, 1, 5 nT/m)

MAGNETICS – RTP

- _RTP_25k_cont — Reduced to Pole TMI (interval @ 20, 100, 500, 2500 nT)

Gridded Data (ER Mapper format)...

MAGNETICS

- _TMI_Regional_Merge_10m — Final TMI regional merge grid with 10m cell size – to use for future subset and reimaging of detailed areas

Abbreviations: TMI - Total Magnetic Intensity, RTP - Reduced to Pole,
AGC - Automatic Gain Control, ANSIG - Analytic Signal,
1VD - First vertical derivative , 2VD - Second vertical derivative,
ASVI – Analytic Signal of the Vertical Integral, VIAS – Vertical Integral of Analytic Signal,
TC - Total Count, K - Potassium, U - Uranium, Th - Thorium,
Lin - Linear colour stretch, NL - Non-linear colour stretch

Coordinate System...

GDA94 Datum
UTM Zone 52 Projection
Southern Hemisphere

Grid Details...

MAGNETICS
Top Left Coordinate = 493247mE, 7950926mN
Cell Size = 10 m
Lines = 24129
Pixels = 16025

Image Details...

MAGNETICS
Top Left Coordinate = 495442mE, 7946831mN
Cell Size = 20 m *(Image cell size increased from original grid cell size of 10m to keep file size of images manageable)*
Lines = 11542
Pixels = 7720

RADIOMETRICS
Top Left Coordinate = 495425mE, 7946842mN
Cell Size = 50 m *(Image cell size decreased from original grid cell size of 100m to smooth images)*
Lines = 2309
Pixels = 1545

FILTER AND IMAGE DESCRIPTIONS

Abbreviation	Name	Definition and Use
TMI	Total Magnetic Intensity	'Raw' data as measured in field, at a specific time and location (including height), in the presence of the Earth's local magnetic field. Provides an overview of the magnetic signature of a particular area before any enhancement filtering.
RTP	Reduced to Pole	The reduction-to-the-pole process recalculates the observed magnetic field to what it would look like at the north or south magnetic pole, where the Earth's magnetic inclination is vertical. It theoretically removes the asymmetry of the TMI anomaly and places the peak response directly over the magnetic bodies. In practice it can result in artefacts, particularly if remanence is present. It can also be misleading / unstable for N-S striking bodies in low-latitude environments.
N,NE,E,SE	Direction of Horizontal Gradient	Ratio of magnetic response to horizontal distance. Used to emphasize the change in amplitude of an anomaly, which can be useful for detecting edges, faults and/or contacts. Maximum values are recorded over the largest changes in amplitude relative to distance, while a zero response is recorded directly over anomaly highs or lows. North (N) will tend to highlight E-W trending features; East (E) will tend to highlight N-S trending features.
1VD	1st Vertical Derivative	Enhances shallower anomalies and improves the resolution of closely spaced sources by sharpening and separating magnetic anomalies. Equivalent to measuring the magnetic field simultaneously at two points vertically above each other and dividing the result by the distance between the points.
2VD	2nd Vertical Derivative	Enhances shallow anomalies even further but needs high quality data as noise levels are also amplified. Equivalent to the rate of change of the 1st vertical derivative relative to height.
N,NE,E,SE SHADE	Shadowing direction, or direction of sun-angle illumination	A mixture of a colour image (eg. TMI) with a greyscale horizontal gradient, normally 50:50. Typical colour/sun-angle illumination image.
AGC	Automatic Gain Control	Process whereby anomalies or features in an image are all reduced to similar amplitudes. This is very useful for extracting fine detail from images that are otherwise dominated by one or two high amplitude features. The amplitude of the original response is lost during the process so the relative amplitudes of anomalies from an AGC image cannot be compared directly.
AS or ANSIG	Analytic Signal	A combination of the vertical and horizontal derivatives. Generates a maximum directly over a discrete body, or alternatively maxima over the edges of wider bodies, regardless of the presence of any remanent magnetisation or the Earth's local magnetic inclination. It can therefore be a useful tool in reducing the difficulties associated with interpreting the location of bodies with remanent magnetisation and/or in low-latitude environments where the RTP is unstable. However, contrary to popular belief, the ANSIG is NOT totally independent of the inclination field or remanent magnetisation, with the size, shape and location of the calculated anomalies still affected by both of these factors.

TILT	Tilt Angle	Uses a ratio of the vertical and total horizontal derivatives to enhance magnetic bodies and their edges. Maximum values are detected directly over the centre of the magnetic body, while the zero value corresponds to the edge of the source. Provides a sharper indication of magnetic contacts than the ANSIG. It is independent of the magnitude of the magnetic response, and is therefore useful for mapping stratigraphy in low amplitude areas. Like the AGC filter, the TILT cannot be used to directly compare anomaly amplitudes.
ASVI	Analytic Signal of Vertical Integral	Process aimed at reducing the effects of remanent magnetisation, but done more for the purposes of 3D modelling than imaging. Smoother version of ANSIG.
VIAS	Vertical Integral of Analytic Signal	Similar process to ASVI but done in reverse order (ANSIG calculated first). Smoother version of ANSIG, but longer wavelength anomalies associated with deeper bodies are removed/reduced.
LIN or L	Linear	Refers to the colour scaling of the image being an even (linear) distribution from the lowest through to the highest response. Useful for comparing strength/amplitude of anomalies directly, but can sometimes show little information other than the very high or very low anomalies.
NL	Non Linear	Colour scaling which gives more detail to low amplitude, background areas. A Non Linear colour stretch modifies the image so that there is an equal amount of all colours. Useful for datasets with a large dynamic range, but the relative amplitudes of anomalies cannot be compared directly.
RADIOMETRICS		
TC	Total Count Radiometric	Surface mapping - combination of all radiometric channels. Useful as a general overview image of the total radiometric spectrum, but does not discriminate individual elements.
K	Potassium	Surface mapping - highlights K-feldspar granitoids, clays, alteration, pegmatite, siltstones, etc.
U	Uranium	Surface mapping and uranium anomaly detection. Uranium mineralisation is not normally associated with coincident potassium or thorium highs.
Th	Thorium	Surface mapping - highlights granitoids, laterite and monazite.
TERN	Ternary	Combination of all 3 radiometric channels (K, U & Th) and coloured by red, blue & green respectively. Colours are additive and zero in any channel is black (e.g. high in potassium and uranium and low in thorium = red+blue+black = purple). High in all channels is white.

SOUTHERN GEOSCIENCE
CONSULTANTS