OM Manganese Ltd

Title holder (s): OM (Manganese) Ltd (100%)

Operator: As above

Tenement Manager: Australian Mining & Exploration Titles Services (AMETS)

EL10412
Bootu Creek Manganese Project

Final Technical Report

21st September 2001 – 20th September 2011

Authors: Reddell, C.T. - Exploration Manager, OM (Manganese) Ltd

Target Commodity: Manganese

Date of report: 21/11/2011

Datum/zone: GDA94 MGAz53

250k mapsheet: Helen Springs SE 53-10
100k mapsheet: Brunchilly 5760

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Abstract

Exploration Activity for EL10412 has included an airborne aeromagnetic/radiometric survey, a helicopter-borne EM survey, two rounds of aerial photography and associated digital terrain modelling, Aster multispectral data acquisition and interpretation, annual satellite imagery (Ikonos, Quickbird and Worldview-2) since commencement of Bootu Creek mining operations, reconnaissance prospecting, a ground gravity survey, Gradient Array IP surveys, geophysical interpretation, open-hole percussion drilling (BCPC) and reverse circulation percussion drilling (BCRC), assess track maintenance and drill collar rehabilitation.

Feasibility studies carried out on EL10412 prior to the excision of ML24031 at the end of year 3 (September 2004) included heritage clearances, diamond drilling (BCDD), costeaning and trenching, mill process testing, hydrological assessment, mineral resource and ore reserve estimation, mining and logistic studies.

EL10412 replaced by EL28662.

All areas covered by EL28662 should remain on CLOSED FILE.

Electronic File List

File Name	File type	Content
EL10412_final_technical_ report	pdf	This report
EL10412_201111_02_collars	txt	Tab delimitated drillhole collar data
EL10412_201111_03_assays	txt	Tab delimitated drillhole assay data
EL10412_201111_04_geol_logs	txt	Tab delimitated drillhole geology data
EL10412_201111_05_DHSurvey	txt	Tab delimitated drillhole downhole survey data
EL10412_201111_06_logging_codes	pdf	Drillhole geology logging codes
Appendix 1 - Haines Gravity Survey Data	cd	Trimble real-time kinetic data
Appendix 2 - Hoist EM Data	tif & ers	MapInfo compatible image file and grid data
Appendix 3 - ASTER Multispectral Data	tif & ers	MapInfo compatible image file and grid data
Appendix 4 - Aeromag-Radio Data	tif & ers	MapInfo compatible image file and grid data
Plate 1 - QuickBird Sat Image	pdf	Plan of satellite image
Plate 2 - Aerial Orthophoto Image	pdf	Plan of aerial photo image
Plate 3 - Worldview Sat Image	pdf	Plan of satellite image

Location and Tenure Details

1:250,000: SE 53-10 HELEN SPRINGS
1:100,000: 5760 Brunchilly

The south-west corner of EL10412 is less than 2km from the Stuart Highway and 120km north of Tennant Creek. EL10412 is located predominately within Banka Banka pastoral station..

EL10412 granted 21/09/2001 70 blocks

EL10412 was initially granted for a period of six years from grant and renewed without reduction for a two year period in 2007 and again in 2009 for a further period of two years.

ML24031 hosting the Bootu Creek Manganese Project was excised from EL10412 at the end of year 3 (September 2004).

MLA27445 was applied for in July 2009 to extend the original area covered by ML24031. The area of the ML application was located entirely within EL10412 and enclosed by the subsequent EL28662 grant area.

EL10412 expired after a ten year period ending 20/09/2011 and was replaced by substitute EL28662.

EL28662 consolidated several exploration licences in the immediate Bootu Creek Project area including EL10412, EL22428, EL22940, EL25593 and EL28046, see Figure 1

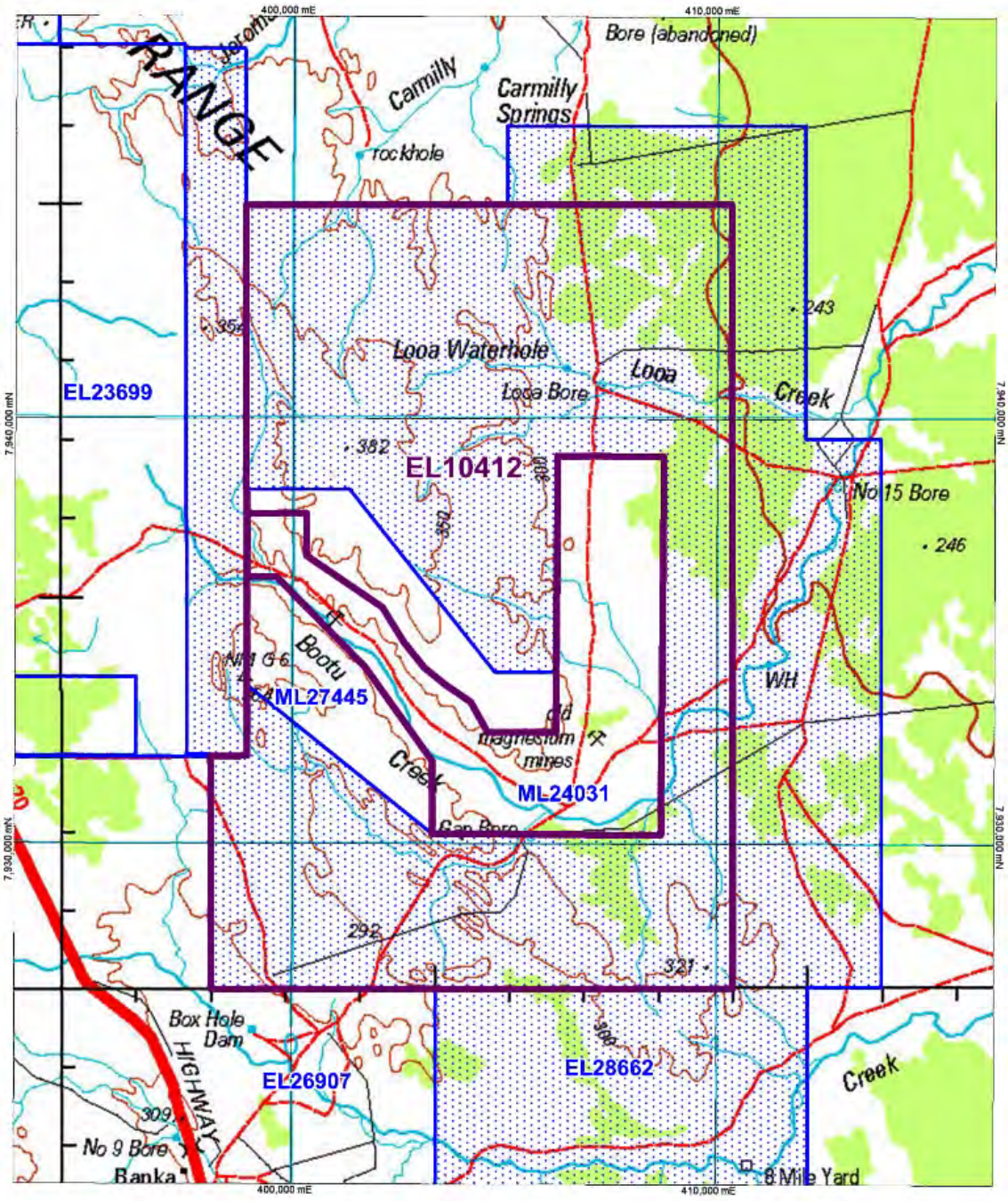

Figure 1. Plan shows the location of EL10412 in relation to the other OMM tenements, the Stuart Highway and local pastoral stations. The stipule area shows the extent of the replacement licence EL28662 (excluding ML24031 and MLA27445).

1 Geology

EL10412 is located entirely within the Tomkinson Creek Group in the Ashburton Province of the Tennant Creek Inlier. The favourable manganese bearing horizon is located on the contact between the dolostone and siltstone units of the Attack Creek Formation (Pta) and the overlying sandstone of the Bootu Formation (Ptb).

A number of manganese deposits occur around the eastern and western limbs of the Bootu Syncline, with current economic interest focused on deposits along the both the eastern and western limbs within ML24031. Bedding dips in this area are typically around 30°, with local variations ranging from 15° to 45°.

The principal manganese mineralisation consists of strata-bound layers contained within dolomitic siltstone and medium grained sandstone. There is a marked increase in manganese grade towards the base of the layers. True thickness of the layers is typically 5-8m, but varies from 3-4m up to 15m.

The immediate foot-wall is formed by altered siltstone and often hematitic. The immediate hanging-wall consists of a variable sequence of siltstones and sandstones, usually with hematite and minor manganese mineralisation. The sedimentary sequence generally coarsens upwards.

The mineralised horizon and hanging wall rocks are typically strongly weathered while the dolomitic units which comprise the footwall below the hematitic siltstone become fresh within only 5-10 metres of the mineralisation.

A significant portion of EL10412 hosts an elevated platform composed of Bootu Formation sandstone in the northwest, while the south west comprises rocks of the ridge-forming Short Range Formation and recessive Morphett Creek Formation.

Large areas of the licence are covered by recent aeolian deposits as well as alluvial deposits derived from the Bootu Creek Formation.

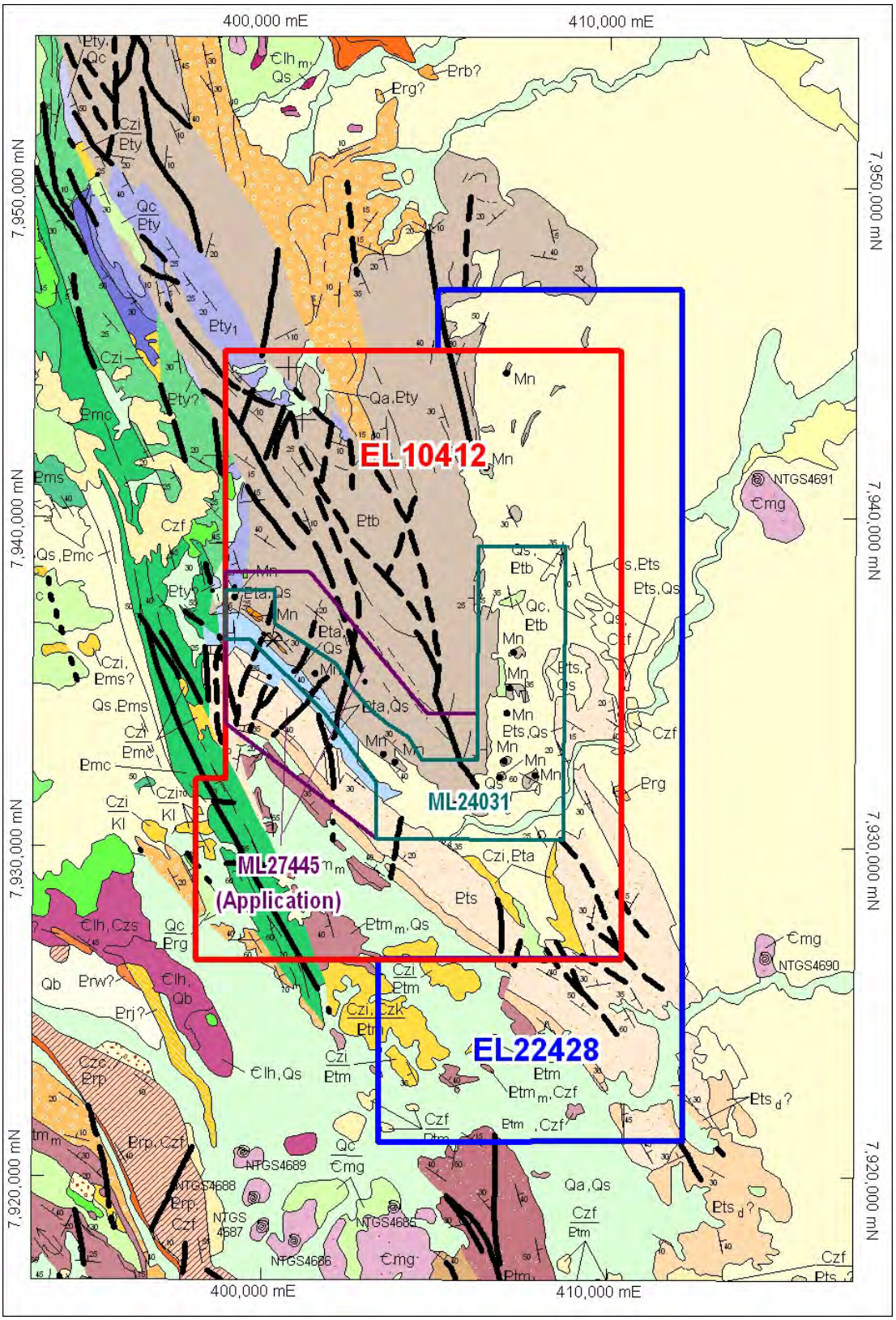

Figure 2. Geological map of EL10412 and EL22428 showing the various members of the Tomkinson Creek Group. Geological data is taken from the published Helen Springs 1:250,000 geology map sheet (*Hussey et al, 2001*)

2 Exploration Activity

2.1 Exploration Activity in Years 1-3 (to Sept. 2004)

Work carried out on EL10412 by Bootu Creek Resources Pty Ltd prior to the excision of ML24031 at the end of year 3 (September 2004) comprised

- Re-evaluation of existing geology, drilling and geophysical data
- Progress of heritage surveys, mining and land access agreements
- Open-hole and RC percussion, and diamond drill programs
- Gravity survey
- Aerial photography and digital terrain modelling
- Hydrological investigations
- Metallurgical test work
- Mineral Resource and Ore Reserve estimation
- Geotechnical and mining studies
- Environmental and logistical studies, culminating in the
- Bootu Creek Manganese Project feasibility study (reported October 2004).

Drilling by Bootu Creek Resources Pty Ltd between grant of EL10412 in 2001 and September 2004 included,

Drill type	number	metres
Open hole percussion	512	15,491
RC percussion holes	114	5,955
Diamond holes	37	1,521
Combined	663	22,967

Early work on EL10412 focussed on exploration and delineation of outcropping manganese mineralisation on the eastern limb of the Bootu Creek syncline. In 2001/2002 Open-hole percussion drilling was used to target EM anomalies generated by BHP geophysical survey from an earlier period.

2002-2004 activity focussed on resource delineation and the Bootu Creek Manganese Project feasibility study in preparation for the proposed mining operations. Only 8 open percussion holes totalling 303m (BCPC0371-BCPC0378) were drilled beyond the area later excised for ML24031.

2.2 Exploration Activity in Years 4-10 (to Sept. 2010)

Work carried out on EL10412 by Bootu Creek Resources Pty Ltd and later by OM (Manganese) Ltd for the above period, post the excision of ML24031, comprise

- A helicopter borne Hoist-EM survey
- Acquisition and interpretation of Aster multi-spectral data
- Ikonos, Quickbird and Worldview-2 satellite imagery
- Combined aeromagnetic/radiometric airborne survey and data processing
- Aerial photography
- RC exploration drill programs

2.2.1 Helicopter-borne Hoist-EM Survey

2006 saw the acquisition of 1,525 line kilometres of Hoist-EM data over ML24031 and the strike extensions of the known mineralisation on EL10412 and EL22428. The detailed geophysical survey, conducted by GPX Airborne Pty Ltd, was subsequently used to generate drill targets for ongoing exploration programs (Figure 3).

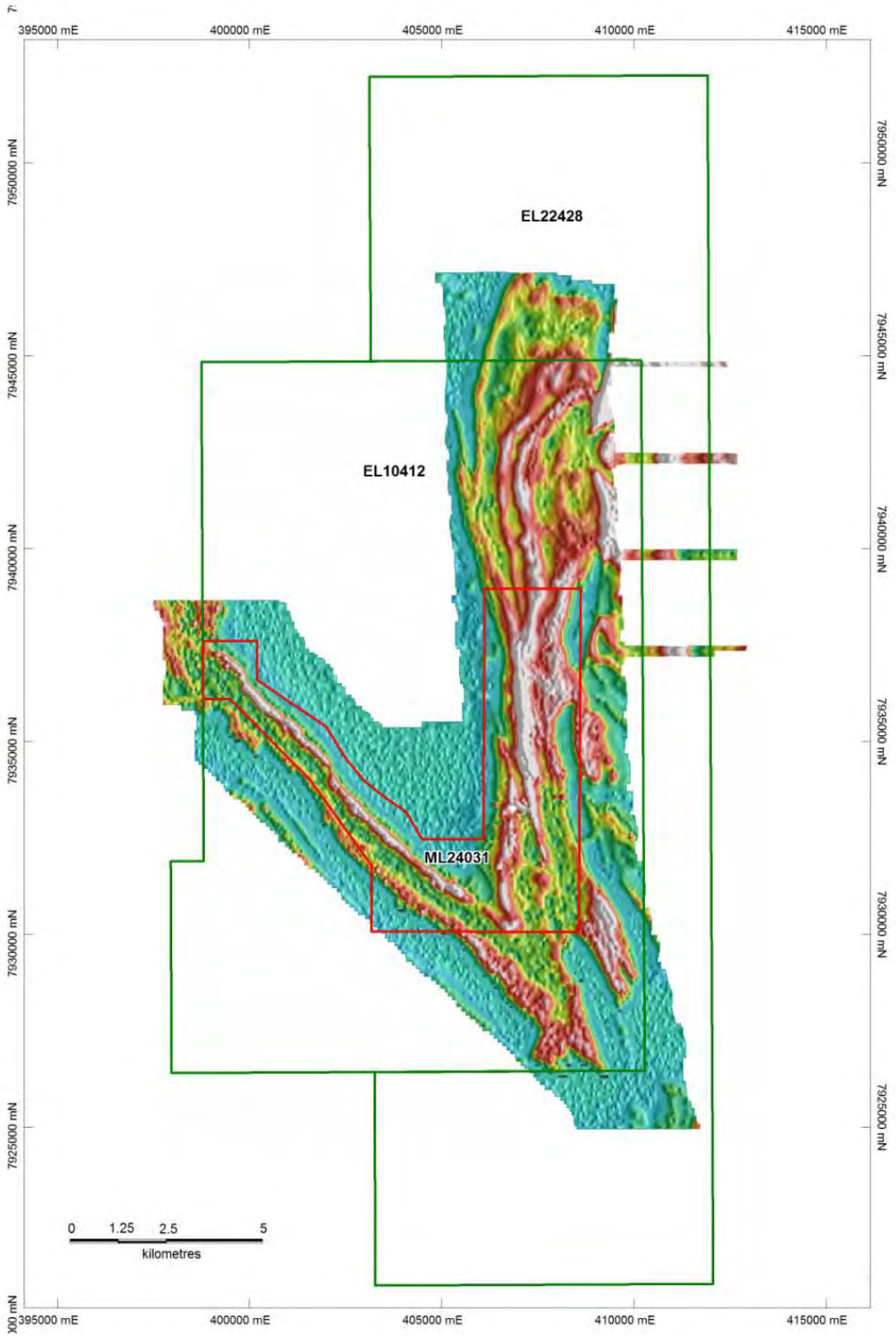

Figure 3 Hoist EM Survey (EM35m) and Tenure at time of survey.

2.2.2 Aster Multi-Spectral Data Acquisition

The 2006 saw the purchase of ASTER multi-spectral remote sensed data, followed by interpretation and report by Amit Eliyahu, attached as Appendix 1. Field check sampling points are shown on the figure below.

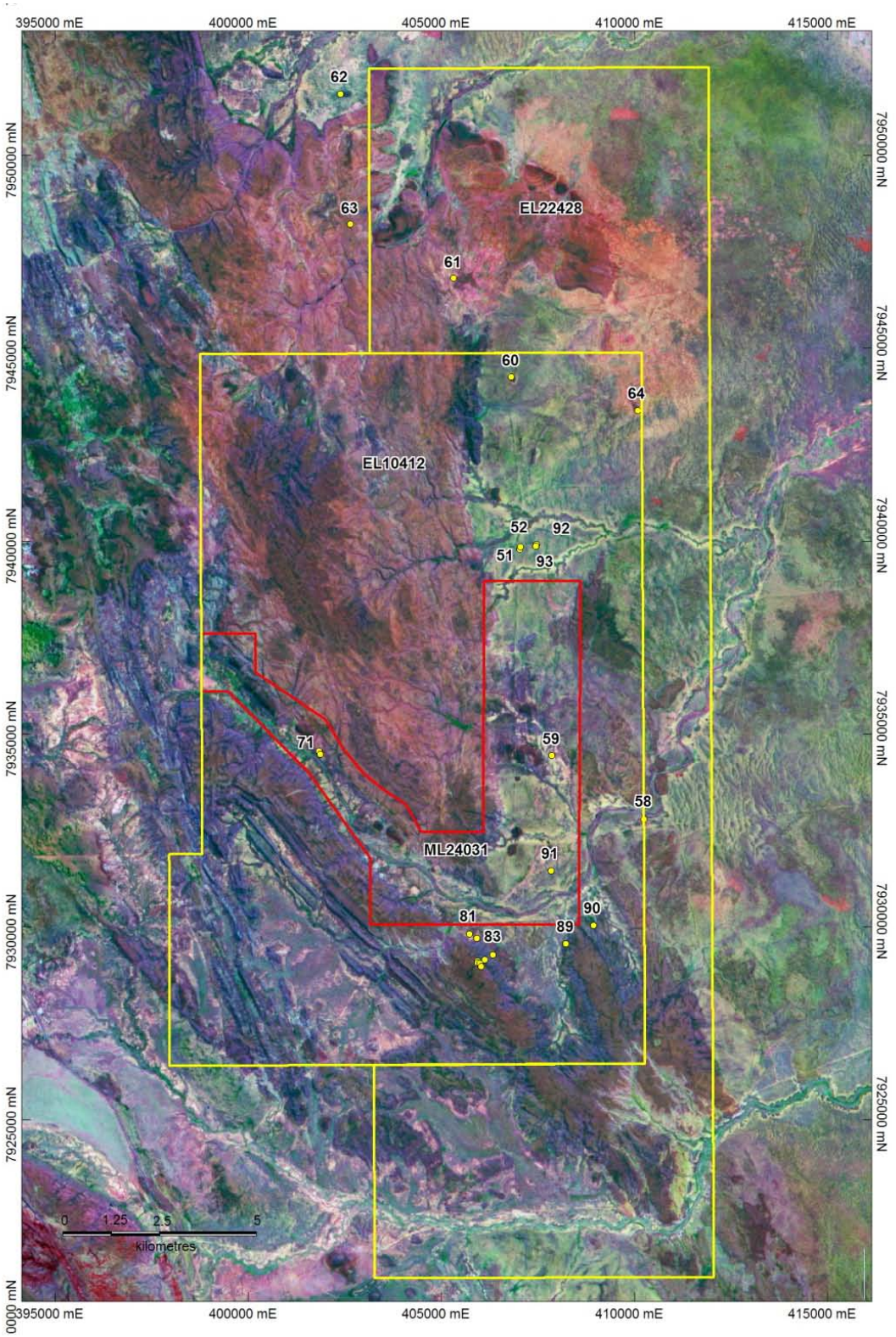

Figure 4 Aster image with reconnaissance sample points.

2.2.3 Detailed Satellite Imagery

Satellite imagery over the Bootu Creek mine site and adjacent exploration licences has been acquired annually since 2008. The initial high resolution Ikonos image (figure 5) was acquired in 2006. Subsequent satellite images have been sourced from Quickbird and Worldview-2 imagery via Geo-image Pty Ltd.

Spectral Resolution

Band	1-m PAN	4-m MS & 1-m PS
1 (Blue)	0.45-0.90 µm	0.445-0.516 µm
2 (Green)	*	0.506-0.595 µm
3 (Red)	*	0.632-0.698 µm
4 (Near IR)	*	0.757-0.853 µm

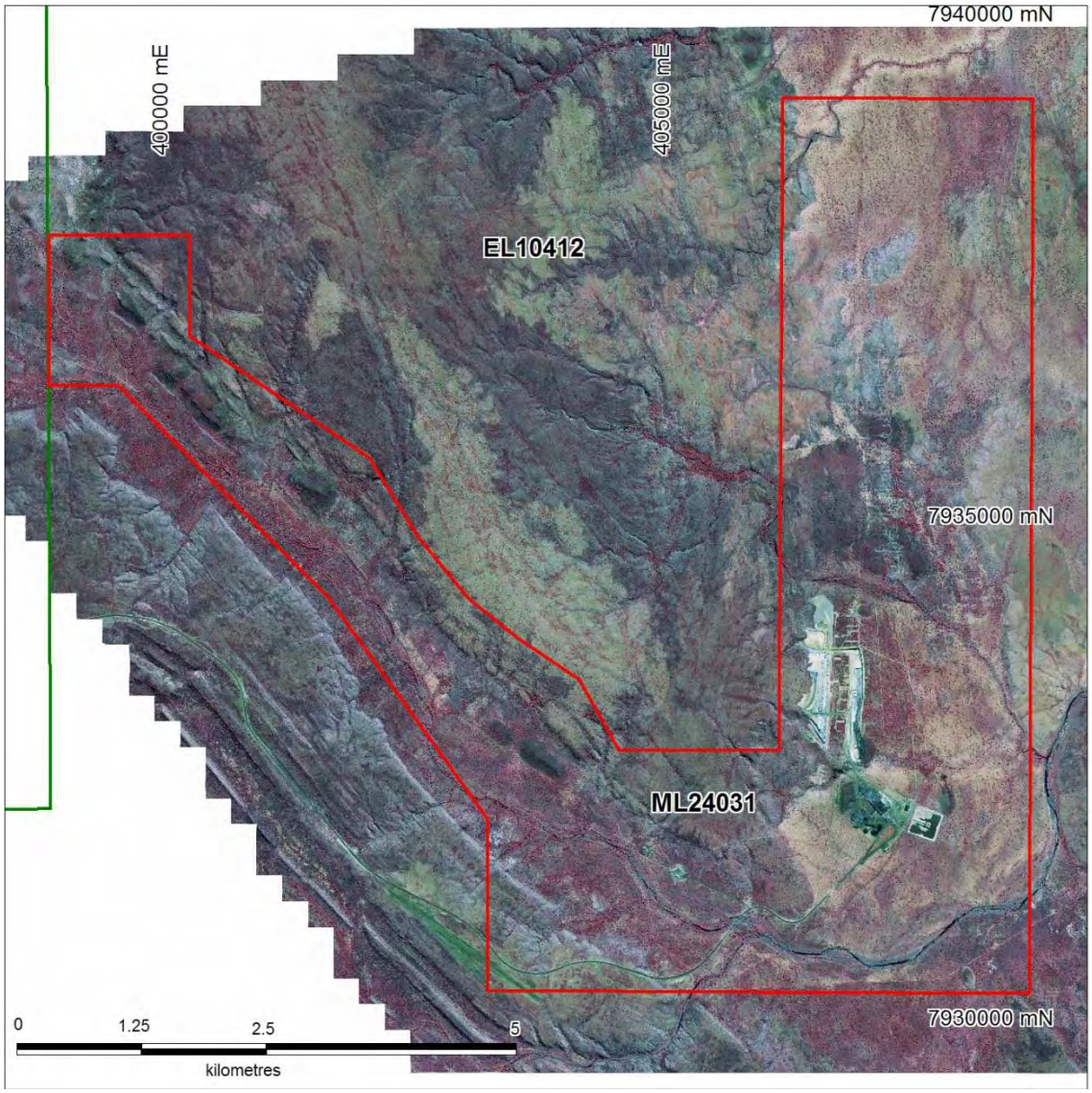

Figure 5 Ikonos high resolution satellite imagery from 2006.

In an effort to gain more detailed information about the location of tracks, fences, outcrop, other physical features of use to exploration, as well provide a more recent snap-shot of the current mine layout, a high resolution Quickbird satellite image.

The satellite was tasked to acquire data over the entire area (598 km^2) of EL10412, EL22428, and EL25593 as shown in Figure 6.

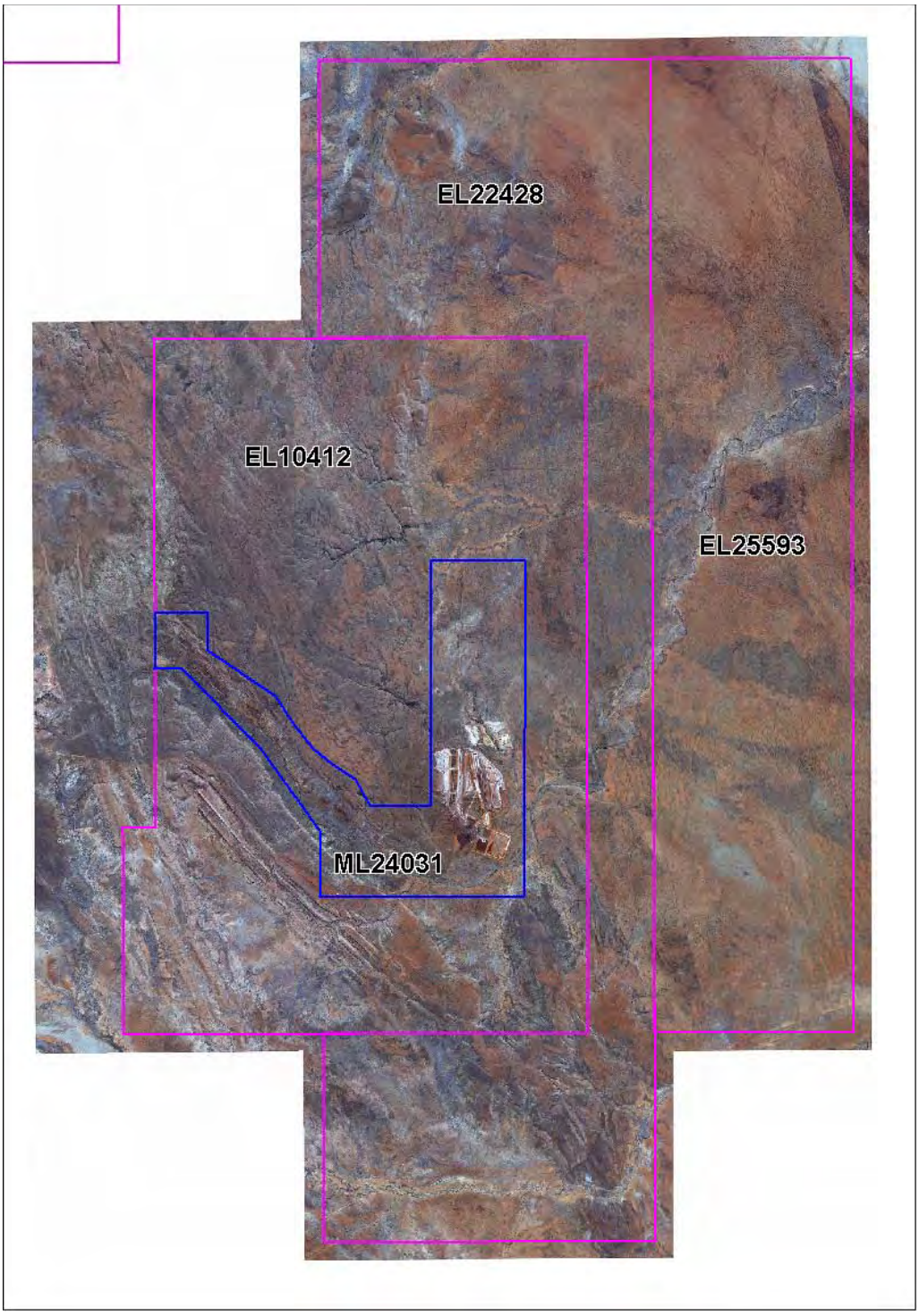

Figure 6. Quickbird satellite imagery captured over EL 10412, 22428 and 25593 and ML24031 in 2008.

2.2.4 Combined Aeromagnetic/radiometric Airborne Survey

In October 2008 GPX Geophysical Exploration Services were contracted to acquire both aeromagnetic and aeromagnetic data across all of OMM's tenement holdings. The total survey parameters are shown in Table 1 and images in Figures 7 and 8.

Type of Data	Aeromagnetics and Radiometrics
Survey datum	GDA94, MGA Zone 53
Survey line spacing	150 metres
Survey line direction	090-270 degrees
Tie line spacing	1,500 metres
Tie line direction	0-180 degrees
Mean terrain clearance	53 metres
Survey distance	10,605 km
Survey Date	October 2008
Survey by	GPX Geophysical Exploration Services

Table 1. OMM 2008 Geophysical survey parameters

The survey consisted of a northern block located over the Renner Springs and Helen Springs project areas and a southern block located over the Bootu Creek project area. The following images are from the southern block.

The aeromagnetic data was supplied as a located data files and with located images for TMI, TMI1VD, TMI2VD, TMIRTP, and RTP1VD.

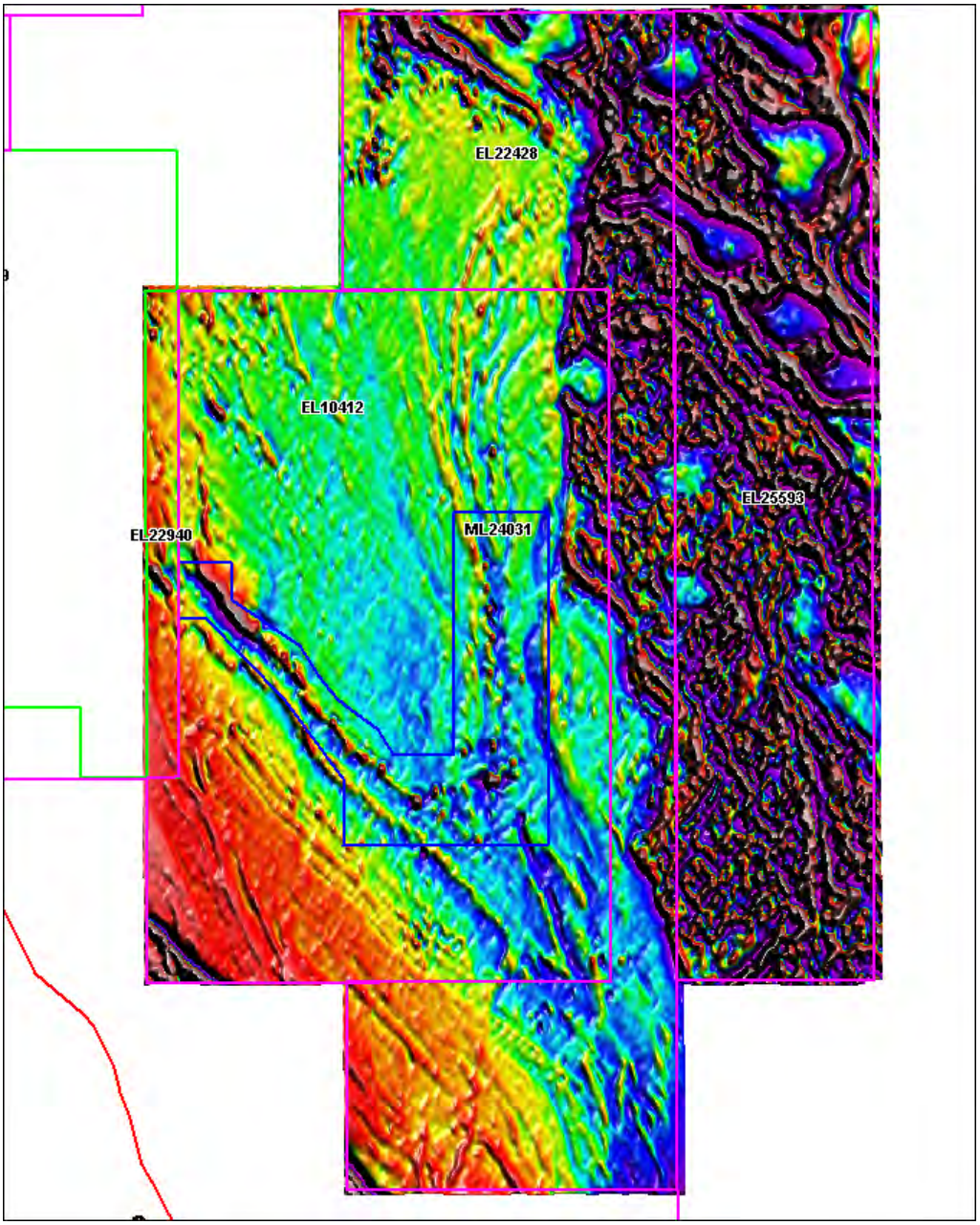

Figure 7. 1VDRTP magnetic image of EL10412, EL22428 and EL25593

The most interesting feature observed in the aeromagnetic imagery is a narrow anomaly running along the contact between the Attack Creek Formation and the Short Range Formation. This feature is coincident with an EM anomaly and was drill tested during the reporting period. No positive results were obtained from that work.

The image above shows the extent of the Helen Springs Volcanics in both EL10412 and EL22428 as well as the boundaries of units buried by Quaternary sand in the northern part of EL22428.

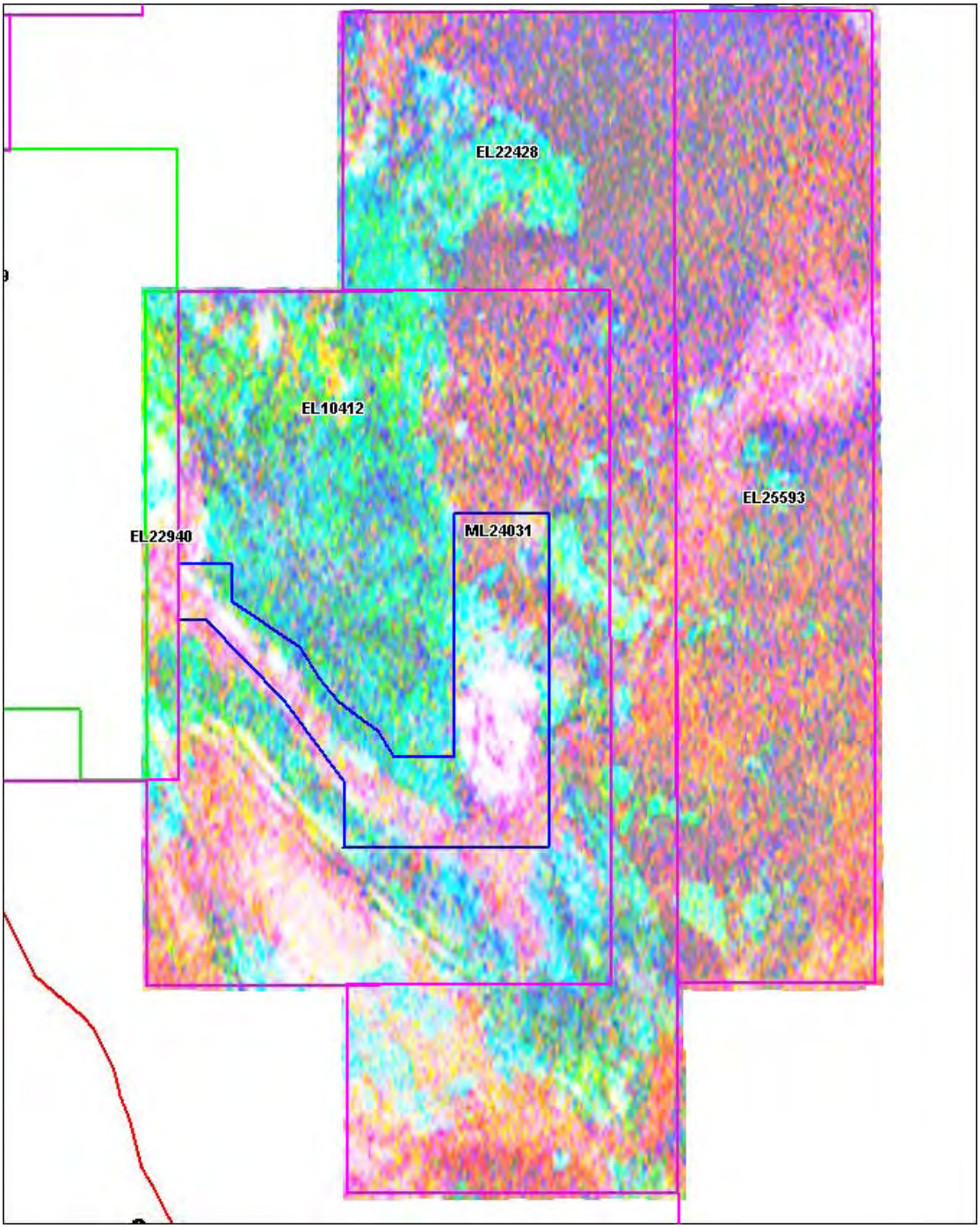

Figure 8. Ternary radiometric data across EL10412, EL22428 and EL25593. The bright patch in the centre of the image is the Bootu Creek manganese mine.

The Ternary radiometric image above highlights areas of outcropping sandstone (light blue), general extent of alluvium covered siltstone/dolomite (pink-white) and the extent of aeolian sand cover (red-orange).

The above aeromagnetic/radiometric data and previous Hoist-EM data was reprocessed using Vector Research's (a Perth-based geophysical consultancy) TargetMap software in early March 2009.

2.2.5 Aerial Photography

In April 2009 United Photo and Graphic services collected aerial photography over selected OMM tenement areas at a nominal scale of 1:20,000 (approximately 0.5m pixel size). The image shown in Figure 9 is for aerial photography over the Bootu Creek project area.

The data was passed on to Survey Graphics in Perth for processing. Alternative frames were orthorectified using 50 metre DEM and the frames were colour balanced and mosaicked seamlessly. The imagery is intended for proposed mapping projects.

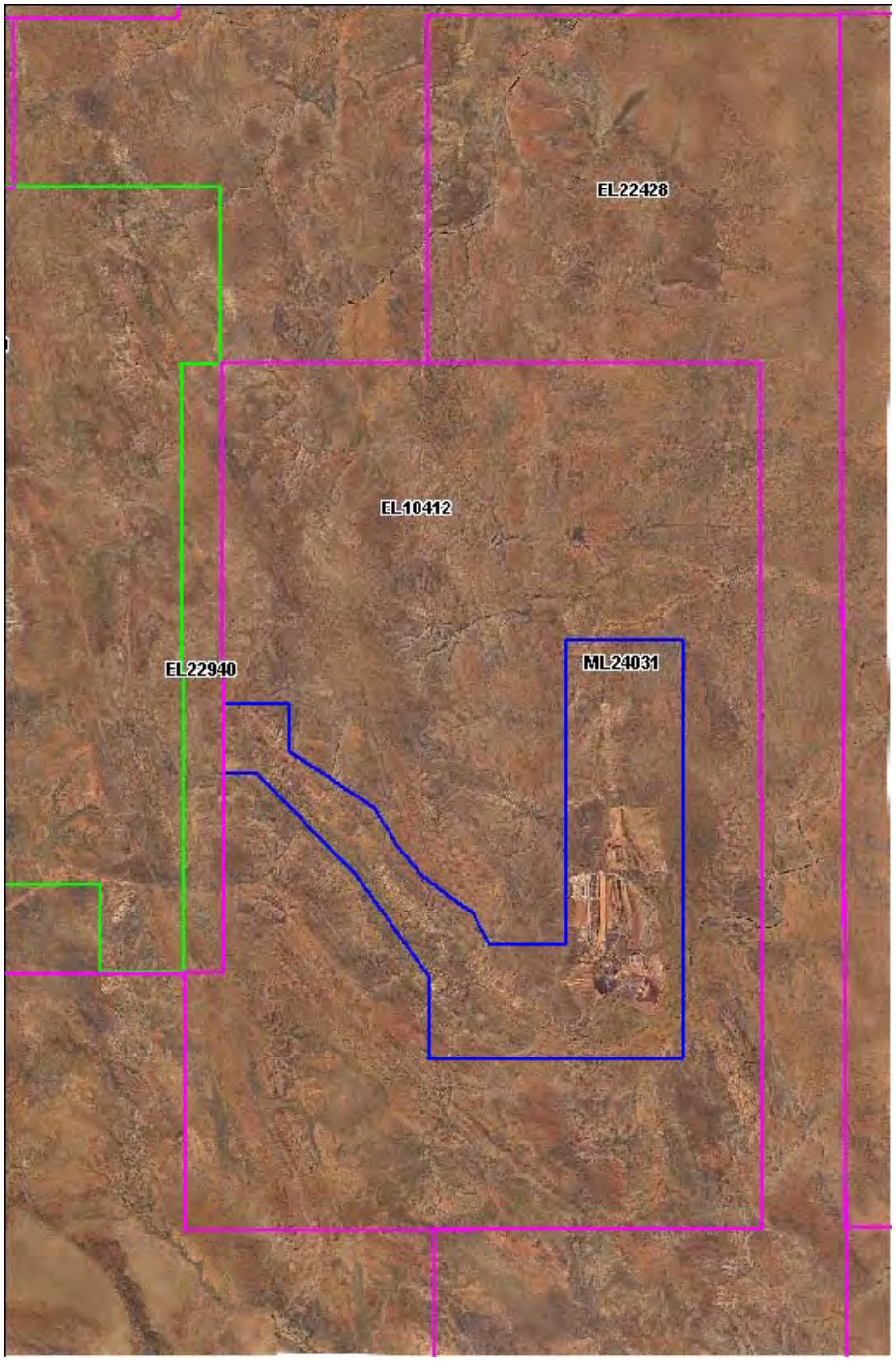

Figure 9. Image showing the extent of detailed photography over EL10412 and EL22428.

2.2.6 RC Exploration Drill Programs

8 open-hole percussion holes totalling 303m (BCPC0371-BCPC0378) were drilled within the current EL10412 area, prior to the excision of ML24031.

A total of 92 RC percussion holes (5,587m) have been drilled since the excision of ML24031, including 86 holes drilled in the project area now referred to as Looa Bore (located to the north of the east limb of ML24031) and 6 holes drilled to the south-west of the west limb of ML24031. 80 of these drill collars have been rehabilitated.

Exploration drilling at Looa Bore has failed to discover economic manganese mineralisation below the prevalent aeolian sand cover to date, but anomalous mineralisation has been returned from several areas and ongoing ground geophysics and follow up drilling is planned.

The 6 holes drilled to the southwest of the west limb tested a Hoist-EM anomaly co-incident with the footwall contact of the Attack Creek Formation. No significant manganese values were returned from this drilling.

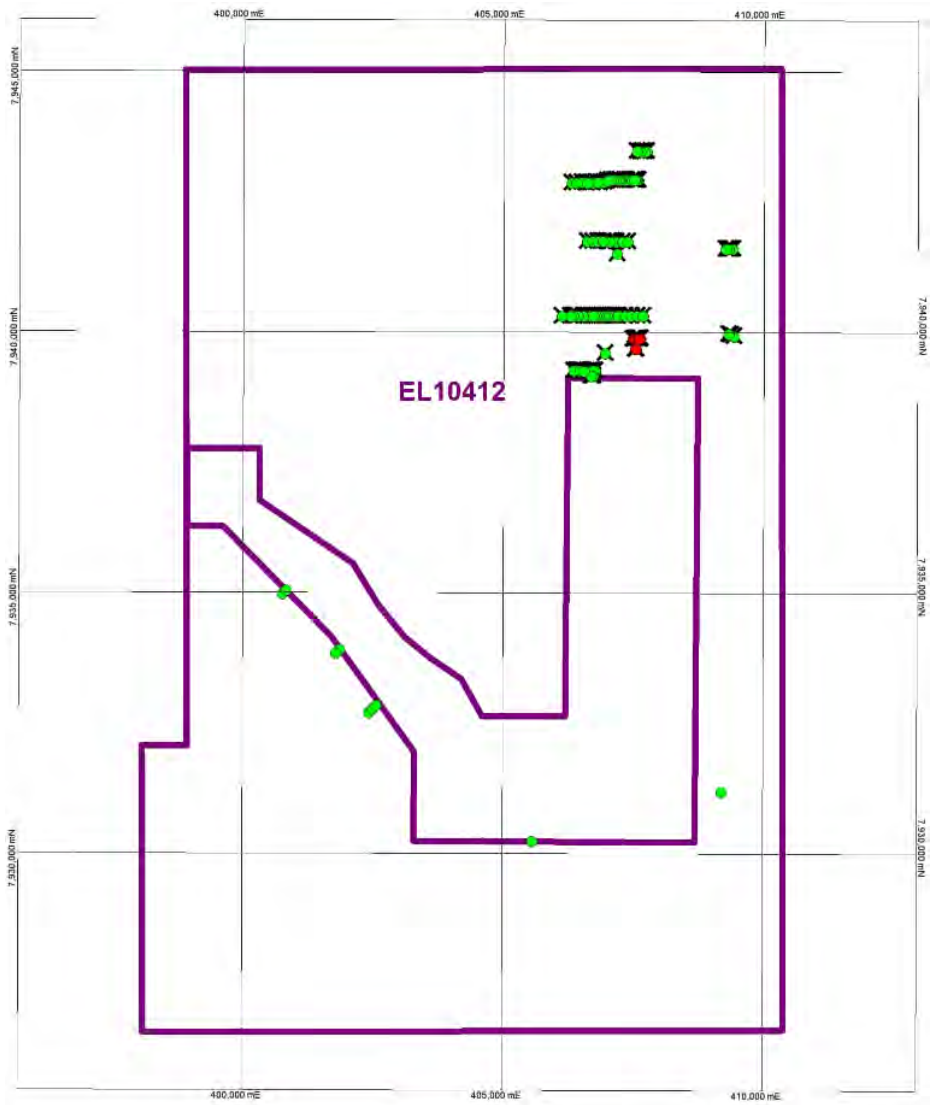

Figure 10 Percussion drill collar plan (PC red, RC green, rehabilitated x)

3 References

Hussey, K.J., Beier, P.R., Crispe, A.J., Donnellan, N., and Kruse, P.D., (2001) Helen Springs, Northern Territory. 1:250,000 geological map series and explanatory notes, SE53-10 (Second Edition) *Northern Territory Geological Survey*