Moina Gold Pty Ltd

Moina Gold Pty Ltd
Annual Report on Exploration
EL 29/2009 – "Cethana"
September 2015 to September 2016

Grant MacDonald - B.Sc. (Hons)
Moina Gold Pty Ltd
PO Box 3110, South Burnie.
September 2016

Abstract

No fieldwork or exploration activity was carried out on the licence in the reporting year and there are no new results to report.

There has been a substantial body of regional exploration work carried out over the licence to date.

This regional work included a large scale soil sampling programme and ambitious 3D IP survey.

Soil sampling defined zones of anomalous Mo, Bi, and W and Nb and Y around the margins of the Dolcoath Granite and All Nations mine area, and anomalous Sn and Au at Tin Spur, whilst the 3D IP survey was highly successful in recognising numerous geophysical look-alikes to the geophysical signatures correspondent with both Higgs and Stormont style mineralisation as well as defining strong stand alone chargeability anomalies.

Moina Gold Pty. Ltd. has recently acquired the licence and intends drilling a number of the targets defined by this work over the next two years.

Drilling is specifically proposed for:

- Bell Mount goldfield where strong broadly coincident chargeability and conductivity anomalies may relate to the source of the gold in the goldfield.
- Tin Spur where a large chargeability anomaly at depth beneath the extent of limited historic drilling and old workings may represent a disseminated gold deposit within the Cambrian porphyry.
- Round Hill, Cockatoo Road and Tin Spur Creek where linear conductivity anomalies may represent Round Hill style high grade base metal mineralisation.
- Ti Tree Creek area where linear magnetic highs with associated soil anomalism may represent gold skarn orebodies.
- Sayers where a chargeability anomaly corresponds with the Sayers workings and anomalous W, M and Bi and Nb and Y in an area of more fractionated(?) pegmatitic granite

Table of Contents

Page No.

Figures

1.0 Introduction

1.1 Exploration Rationale

Torque Mining Ltd is aware of the polymetallic potential of the Moina area, largely a product of the highly fertile Dolcoath Granite, and is exploring for any and all commodities.

In particular the area has proven potential for Au, Ag, Cu, Pb, Zn, Sn, W, Bi, Mo, F and Fe. More conceptually the area may have potential for Y, Nb and rare earths (La, Ce, Nd, Pr and Sm).

Torque has recently completed mining the Stormont gold deposit and also holds a small but Indicated Status Au+Zn+Pb+Ag resource at Narrawa Creek centred on the old Higgs workings.

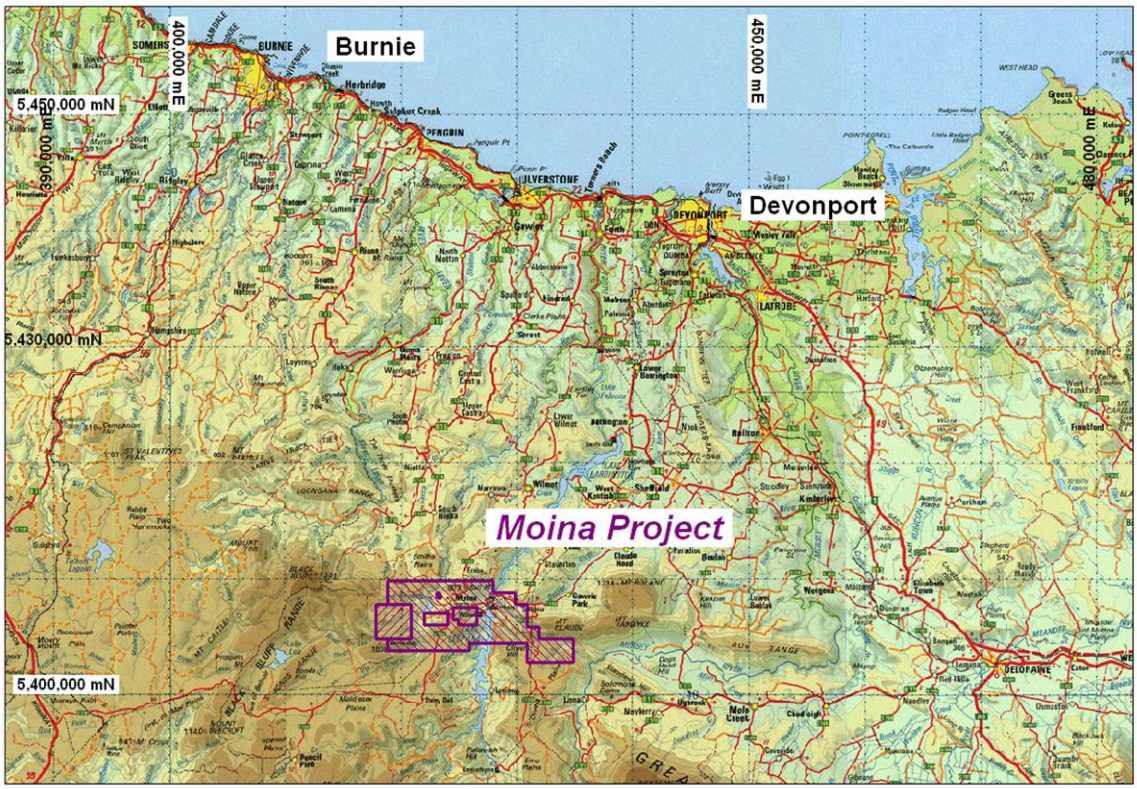


Figure 1.1: Moina Project location in Tasmania's central north.

1.2 Geology

Cambrian quartz+feldspar+biotite porphyry of the Mt. Read Volcanics, Ordovician siliciclastic sediments of the Denison Group and the Devonian Dolcoath Granite form the basement geology to the licence area and are the host and/or source of all potential (hard-rock) mineralisation. A veneer of Tertiary basalt covers this basement geology over much of the licence area.

In the central south of the licence the Cambrian rocks consist of quartz+feldspar+biotite porphyry and felsic volcaniclastics of the Bull Creek Formation. In the northern part of the licence, i.e. north of Machinery Creek Fault and near Mt Jacob, the Cambrian volcanics are from the upper part of the CVC and lowermost Tyndall Group and consist of felsic (commonly quartz phyric) volcanics and volcaniclastics with minor mafic volcanics.

These volcanics are unconformably(?) overlain by the lowermost unit of the Ordovician sequence, the Roland Conglomerate, a siliciclastic quartz pebble conglomerate of 10-20m thickness. The Roland conglomerate is conformably overlain by the quartzose Moina Sandstone which is up to 250m thick. The uppermost (approximately 40m thick) part of the Moina Sandstone is a sequence of interbedded

calcareous siltstones with lesser calcareous sandstones and limestone and is known informally as the “Transition Beds”. These two units constitute the upper units of the Denison Group. The “Transition Beds” are conformably overlain by the Gordon Limestone which is approximately 400m thick.

The Cambrian-Ordovician sequence has been intruded by the Middle-Devonian Dolcoath I-type Granite with formation of a number of discrete skarn type ore bodies within the "Transition Beds". The granite outcrops on either side of Lake Cethana. Subsurface the granite is known to extend as a spine extending westerly from the area of outcrop as far at least as Stormont.

The Cambrian-Ordovician sequence lies in a broad (~10km wavelength) open east-west trending F1 syncline. This folding occurred early in the Middle Devonian Tabberabberan Orogeny. Superimposed on this F1 fold are west-northwest trending shorter wavelength F2 folds with wavelengths. These folds formed later in the orogeny and are associated with southwest verging thrust faulting. The folded sequence is faulted by a number of known faults also of Middle Devonian age. The recent 3D IP has also suggested the presence of further brittle faults. Late in the orogeny the Dolcoath Granite intruded into this faulted and folded terrain.

Mineralisation in the district occurs in a range of forms and settings with the Higgs workings chasing disseminated to semi-massive Au+Ag+Pb+Zn with commonly a pyrrhotite gangue in biotite hornfelsed sediments and/or gold+pyrite in sandstone. The Round Hill workings targeted Au+Ag+Pb mineralisation reportedly in anticlinal fold hinges. On Tin Spur mining of surface concentrations of Sn and Au occurred at a small scale. Discrete quartz+/-W+/-Mo+/-Bi+/-Sn northwest to west-northwest striking veins have been exploited in old workings (e.g. All Nations, Shepard and Murphy) and have potential in both the discrete form or as a zone of smaller veinlets. Elsewhere in the district the Transition Beds have been shown to host skarns with concentrations of F (Shepard and Murphy), Au+Bi (Stormont, Fletchers Adit) and Au+Zn+Sn (Hugo Skarn).

1.3 Location and access

EL 29/2009 "Cethana" lies in Tasmania's central north and is accessed by a number of bitumen roads including the Cradle Mountain Link Road, Claude Road and Olivers Road (see figure 1.1).

The current licence extends from Mt Claude in the east to Stormont in the west (see figure 1.2).

Access within the licence is by a number of bitumen and gravel roads.

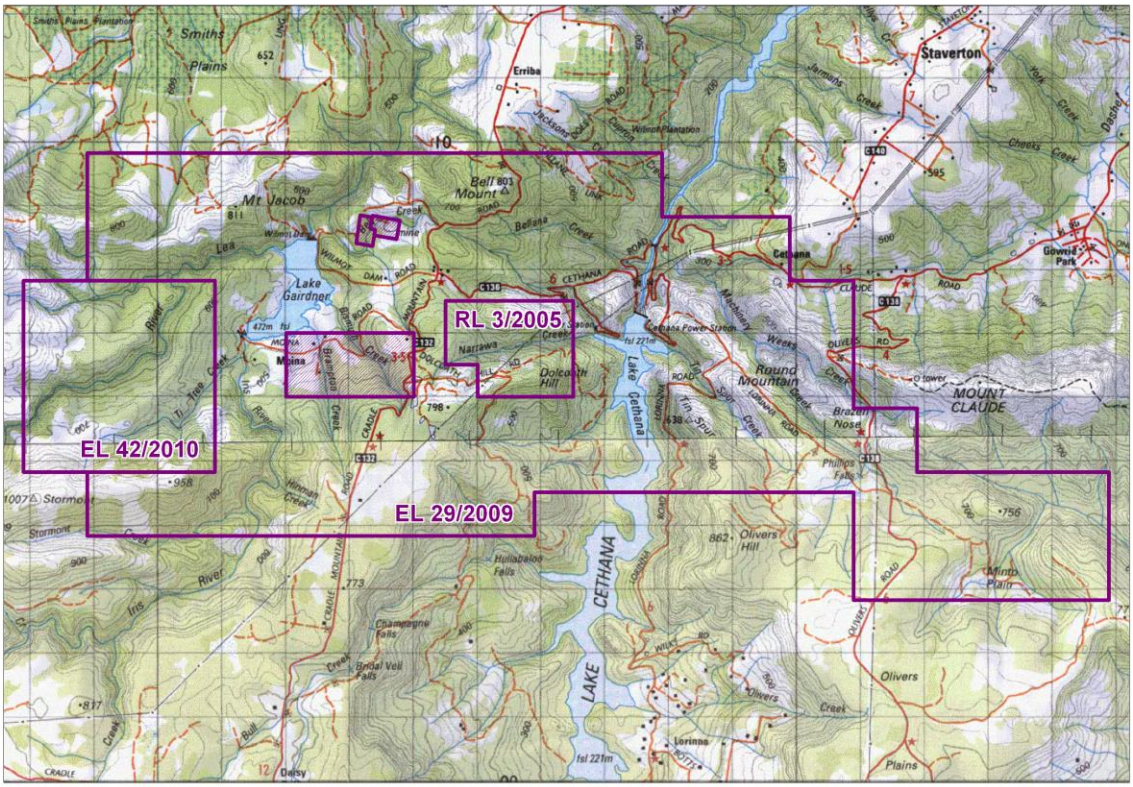


Figure 1.2: EL 29/2009 location plan. Background is Tasmap 1:100,000 mapsheet, datum AGD66.

1.4 Land status and usage

The licence area is used for a range of purposes. Much of the area is Crown Land with forestry activities in part and some land around the lakes vested to the H.E.C. The remaining land is privately owned bushland with limited farming around Lake Gairdner.

1.5 Tenure

EL 29/2009 was won by tender by Frontier Resources Ltd. and was granted on 13th September, 2009. In early 2012 the licence was transferred to Torque Mining Ltd., a spin-off from Frontier Resources Ltd.

The licence was reduced in size in September 2012 with the relinquishment of the eastern end of the licence over Mt Roland.

In early 2016 the licence was transferred to Moina Gold Pty. Ltd..

2.0 Review of Previous Work

2.1 Prior to current tenement

The area covered by EL 29/2009 was explored like the rest of western and northern Tasmania in the latter part of the 19th century but with more significant flourishes in the early and mid 20th centuries. The Stormont deposit was found in the mid 1920's, the Higgs deposit was discovered inthe mid 1930's, the Shepard and Murphy mine was working into the 1950's and the All Nations mine until the 1960's.

The western, prospective and retained portion of the tenement has been held under a range of exploration licences since the 1960's with principal companies CRAE, Comalco, Mt Lyell M&R Co/Renison Goldfields/Goldfields Exploration, Mincor, Billiton/Shell, Noranda, Jervois, Titan, Goldstream, Tasgold, Frontier and now Torque Mining Ltd.

Previous work has consisted of regional geochemical and geophysical surveys with grids established over essentially all prospective rocks (other than the Dolcoath Granite itself). That work has led to the discovery and definition of the Shepard and Murphy fluorine deposit.

Historical drilling has been carried out at the Stormont, Fletchers Adit, Ti Tree Creek, Mt Jacob, All Nations, Hugo Skarn, Shepard and Murphy skarn/lodes, Higgs, West Higgs, Narrawa Reward, Three Sisters, Round Mountain and Tin Spur.

2.2 During current tenement

The Moina Project was a principal focus of exploration by Torque Mining Ltd with much of the project area within EL 29/2009 “Cethana”.

In the 2010/2011 reporting period exploration consisted of two bodies of work.

- Existing high resolution geophysics, aeromagnetics, gravity and radiometrics was processed and imaged. Magnetics is of particular use given the association between mineralisation and magnetite.
- 1057 soil samples were collected on a nominally 100m x 50m grid (1271 samples in total including sampling on adjacent RL 3/2005) around the Dolcoath Granite margin on both sides of Lake Cethana.
  The compiled soil geochemical data set (including this data) reveals a number of coherent zones of anomalous Au, Sn, W, Mo and Bi around the margin of the Dolcoath Granite and extending into EL 29/2009. Within EL 29/2009 anomalies are also defined at Tin Spur, Round Hill, Ti Tree Creek and Mt. Jacob (Pb). Figures 2.1 to 2.5 show results for Au, Bi, W, Sn and Mo in the area of the 2010/2011 survey respectively.

In the 2011/2012 reporting period exploration consisted of

- Inclusion in an ambitious regional scale 3D IP survey over ~24 square kilometres of Frontier's Moina Project, extending from Round Mountain east of Lake Cethana to Stormont, west of Lake Gairdner.
  The survey was highly successful in defining a number of anomalous features with both discrete chargeability highs in a number of favourable locations and discrete conductivity anomalies either representing mineralisation or indicating the presence of favourable rocks in favourable structural settings. Figures 2.6 to 2.12 summarise the extent and results of this survey.
- Drilling two holes at the Bulls chargeability anomaly on the western slopes of Lake Cethana. BSD1 (117m) and BSD2 (66.85m) intersected a quartz+feldspar+biotite+/-hornblende porphyry with narrow zones of pyrite alteration with weakly anomalous Cu, Pb and Zn associated.
- Soil sampling around the Bell Mount alluvial field and the Bulls IP anomaly

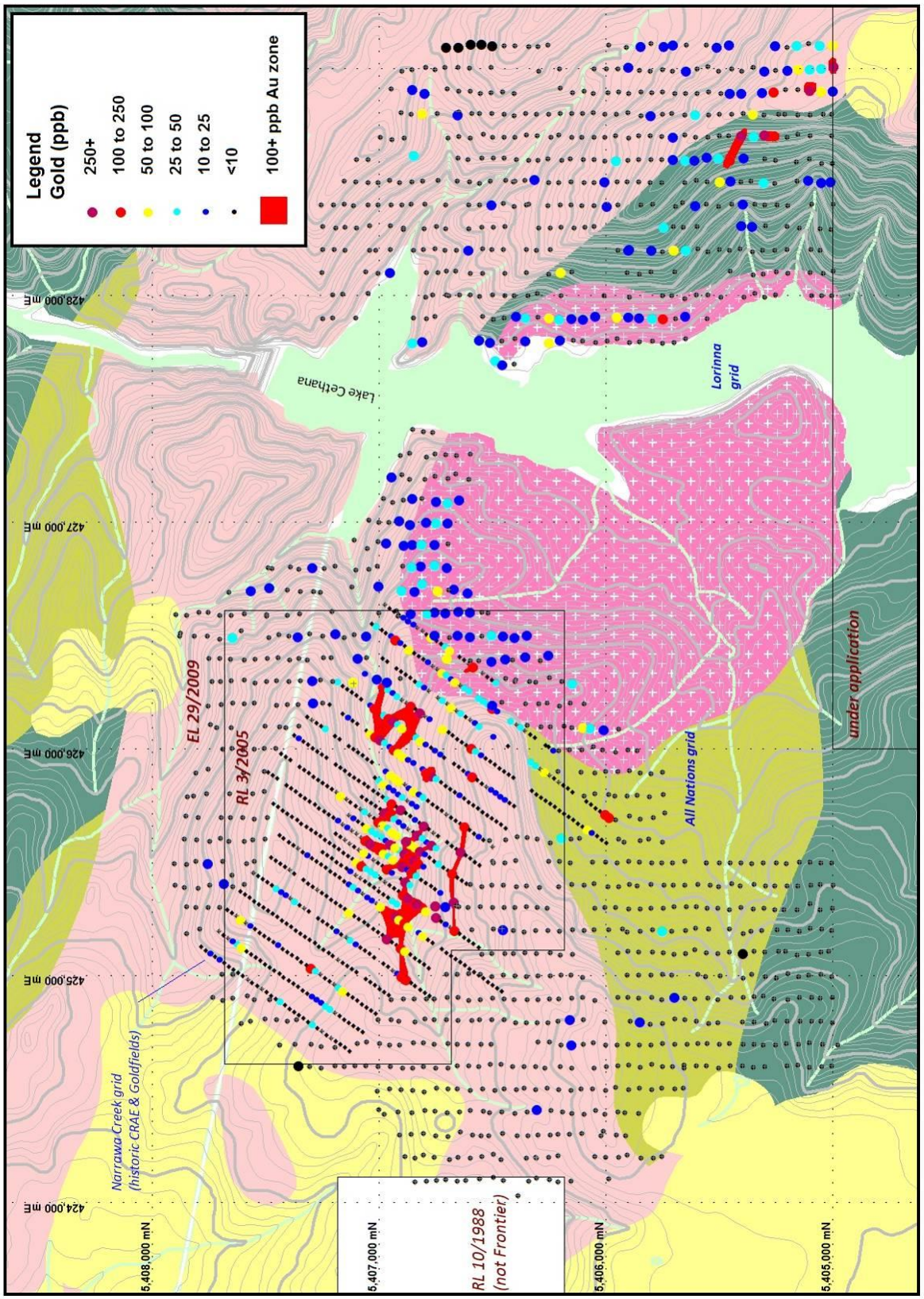


Figure 2.1. Au soil results, 1987 GFEL survey and 2010/2011 Frontier sampling.

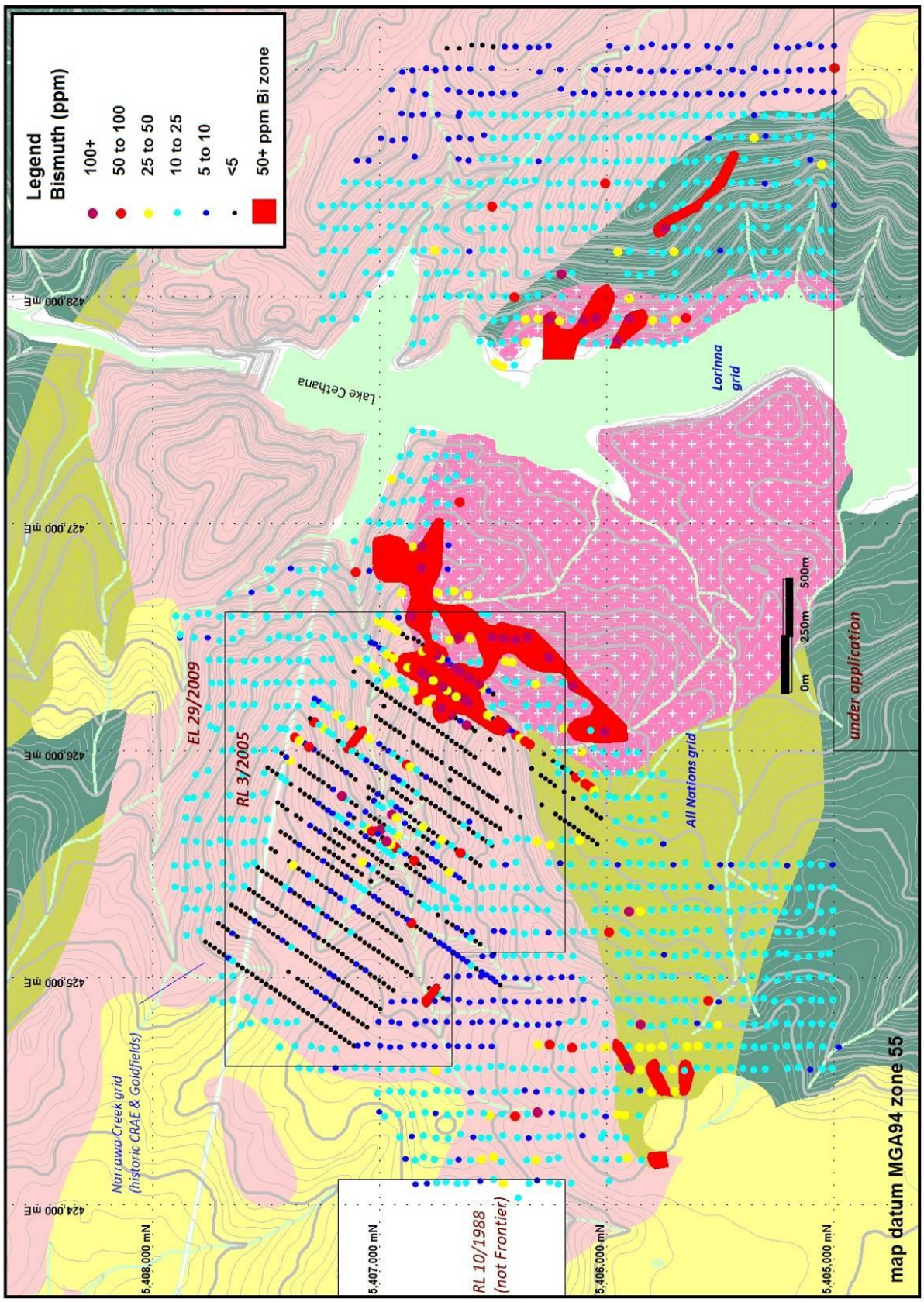


Figure 2.2. Bi soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

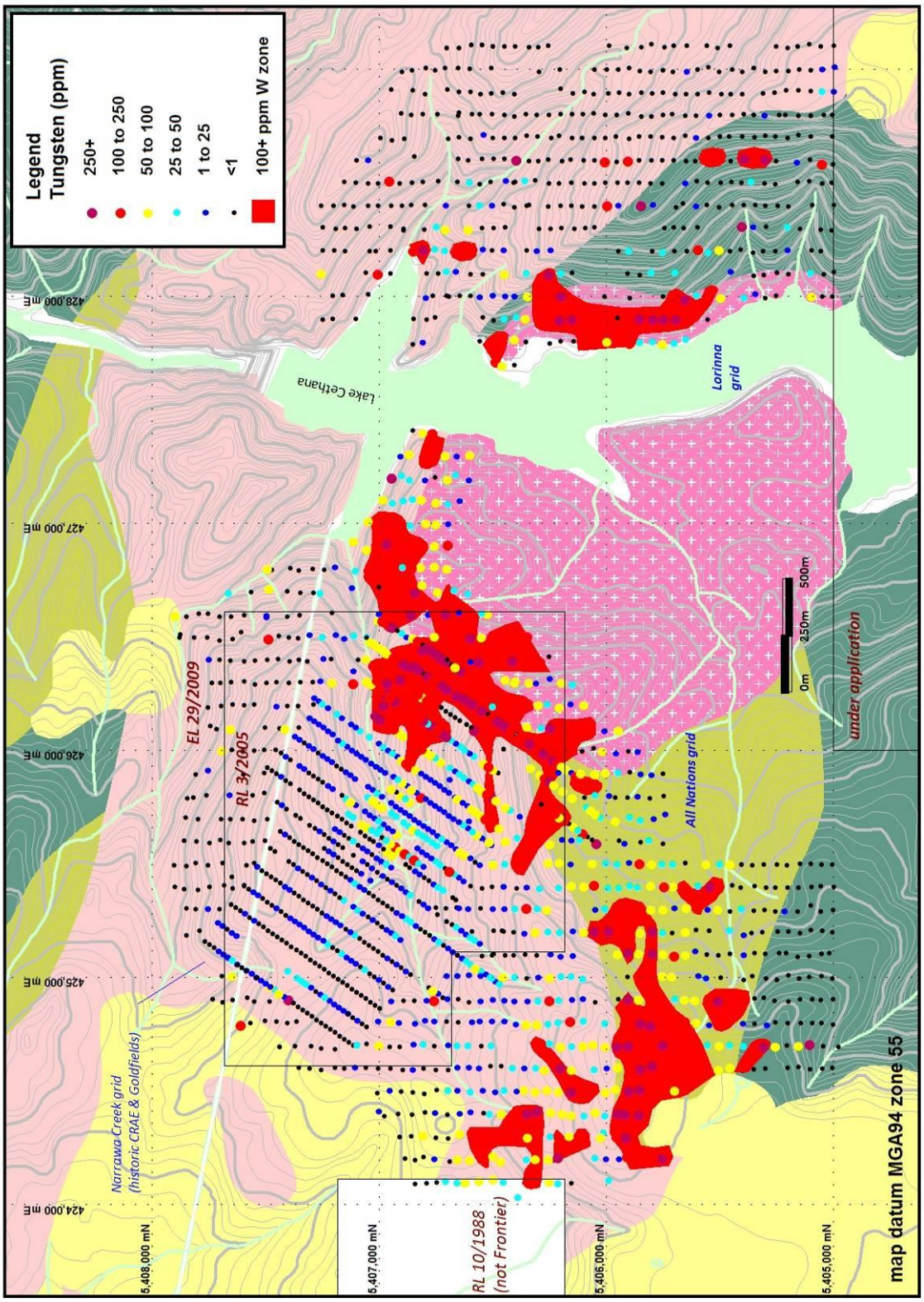


Figure 2.3. W soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

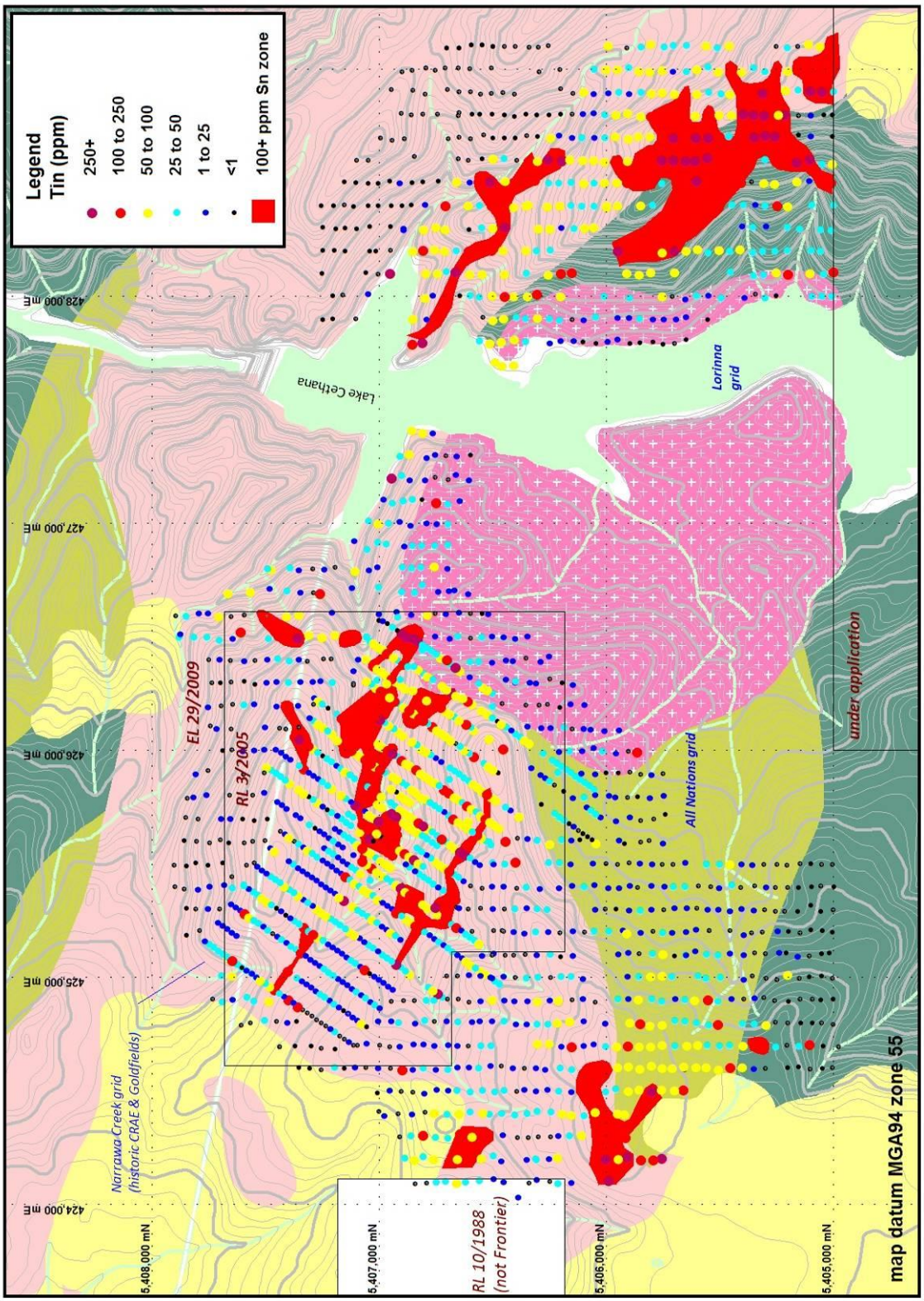


Figure 2.4. Sn soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

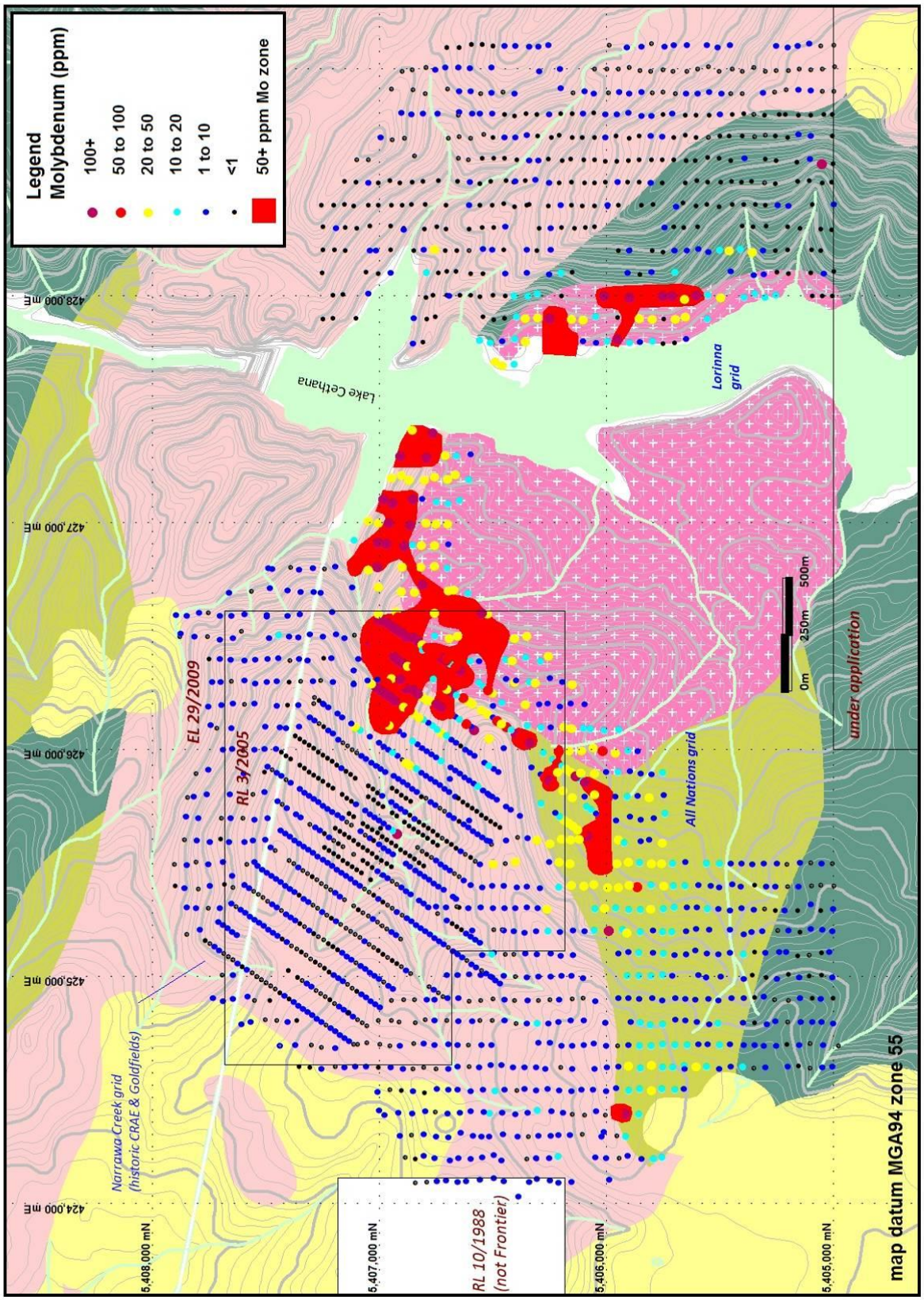
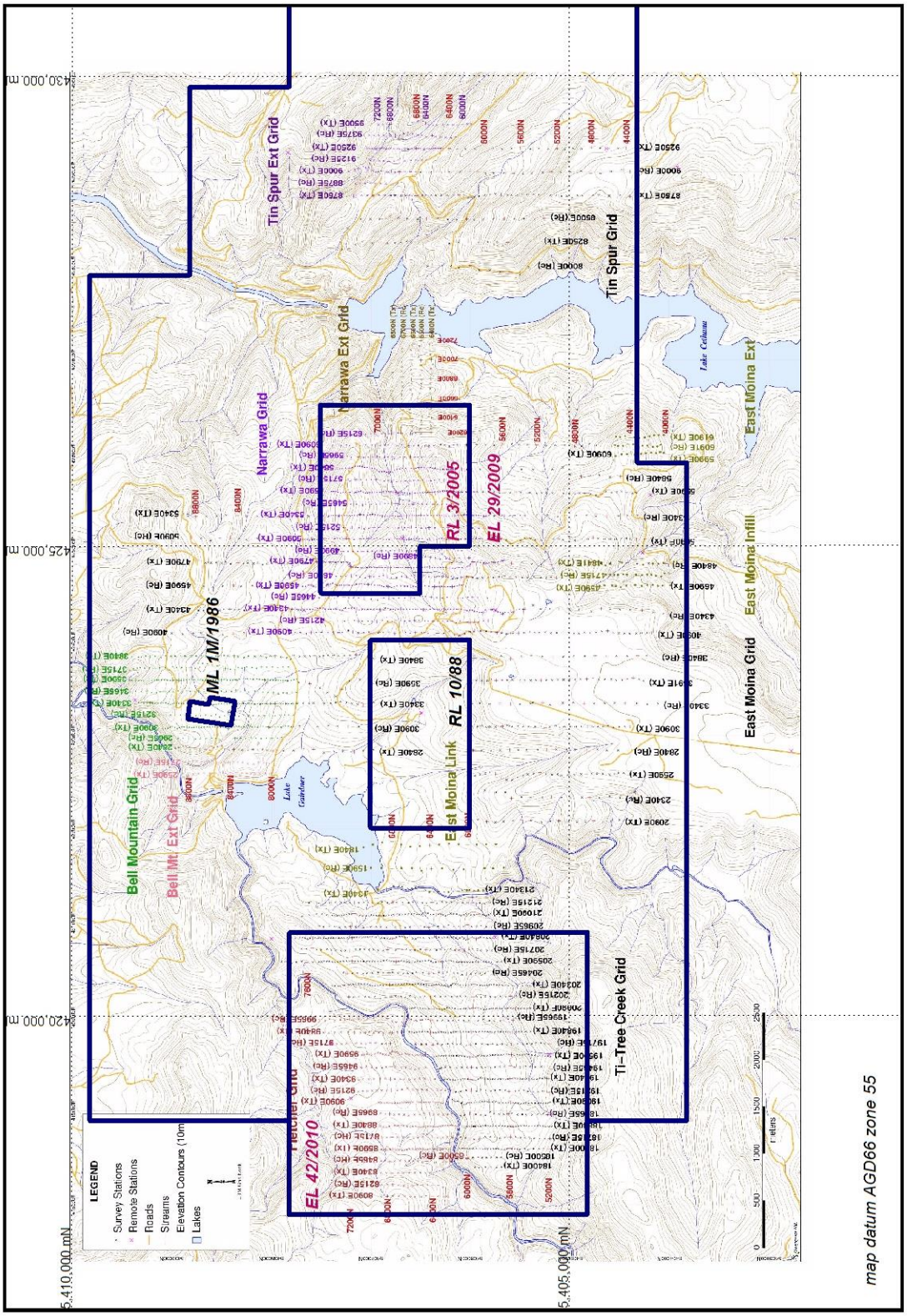


Figure 2.5. Mo soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling



.

Figure 2.6: Moina Project 3D IP survey grids and tenements

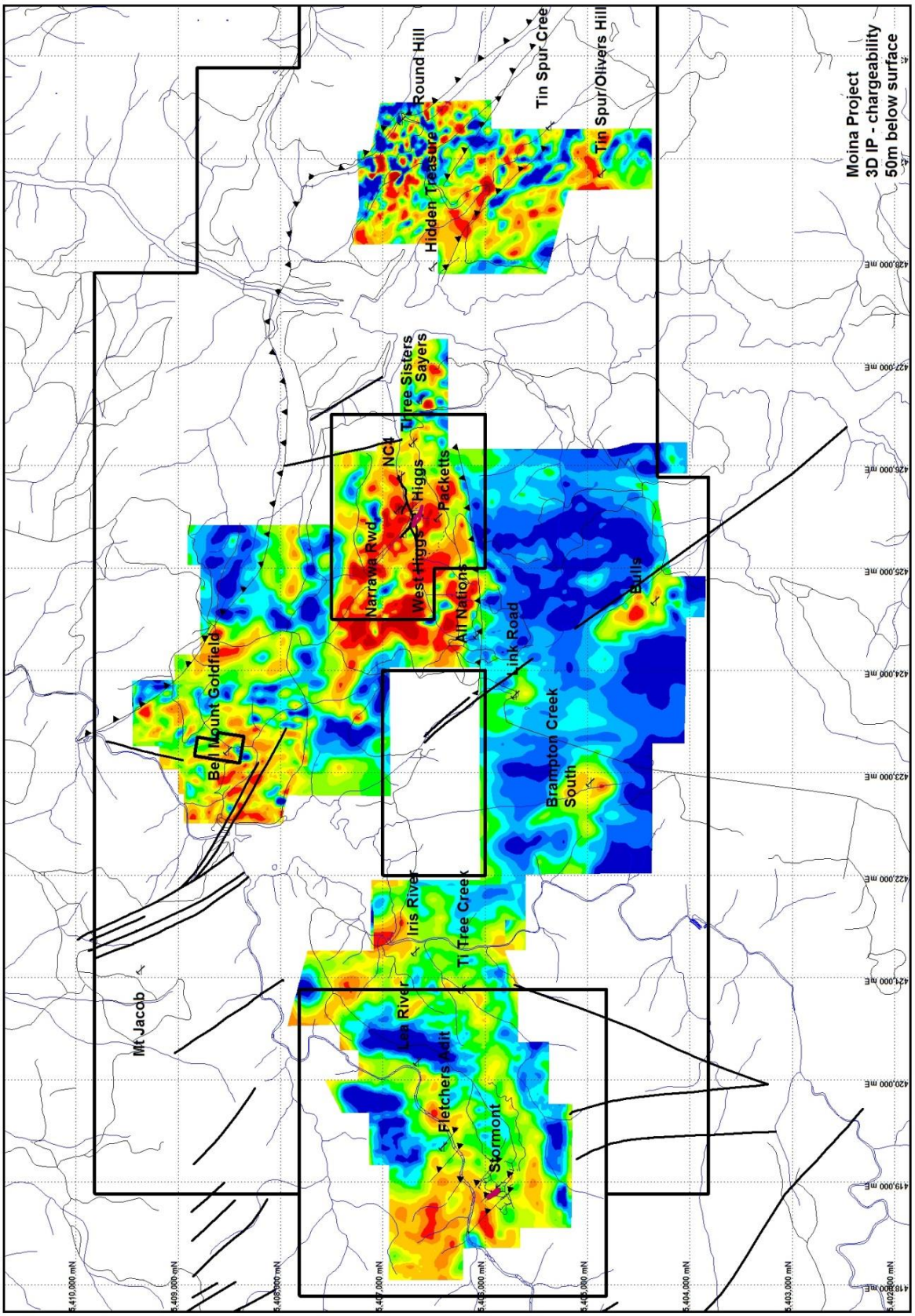


Figure 2.7: Regional 3D IP chargeability at 50m depth

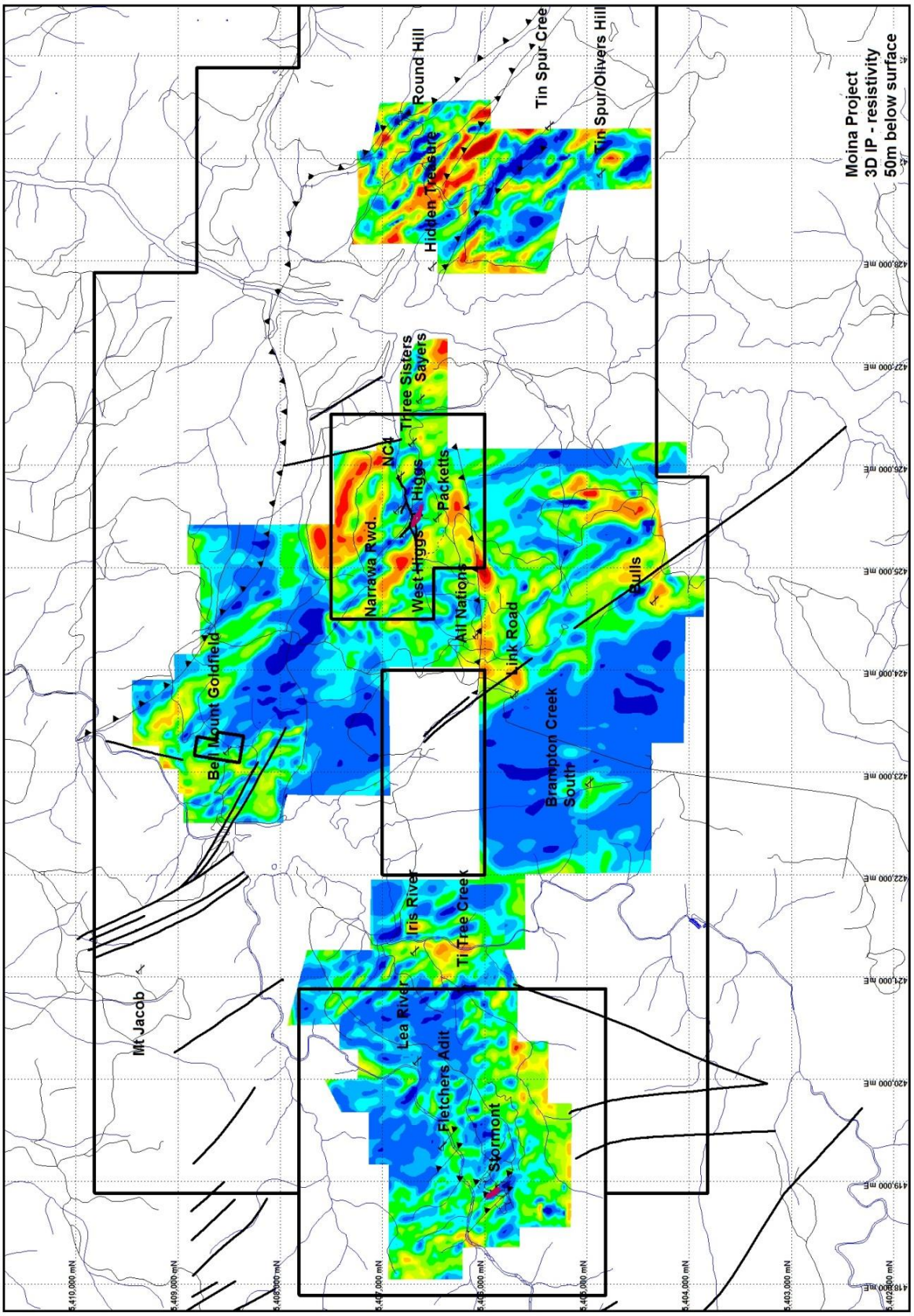


Figure 2.8: Regional 3D IP resistivity at 50m depth

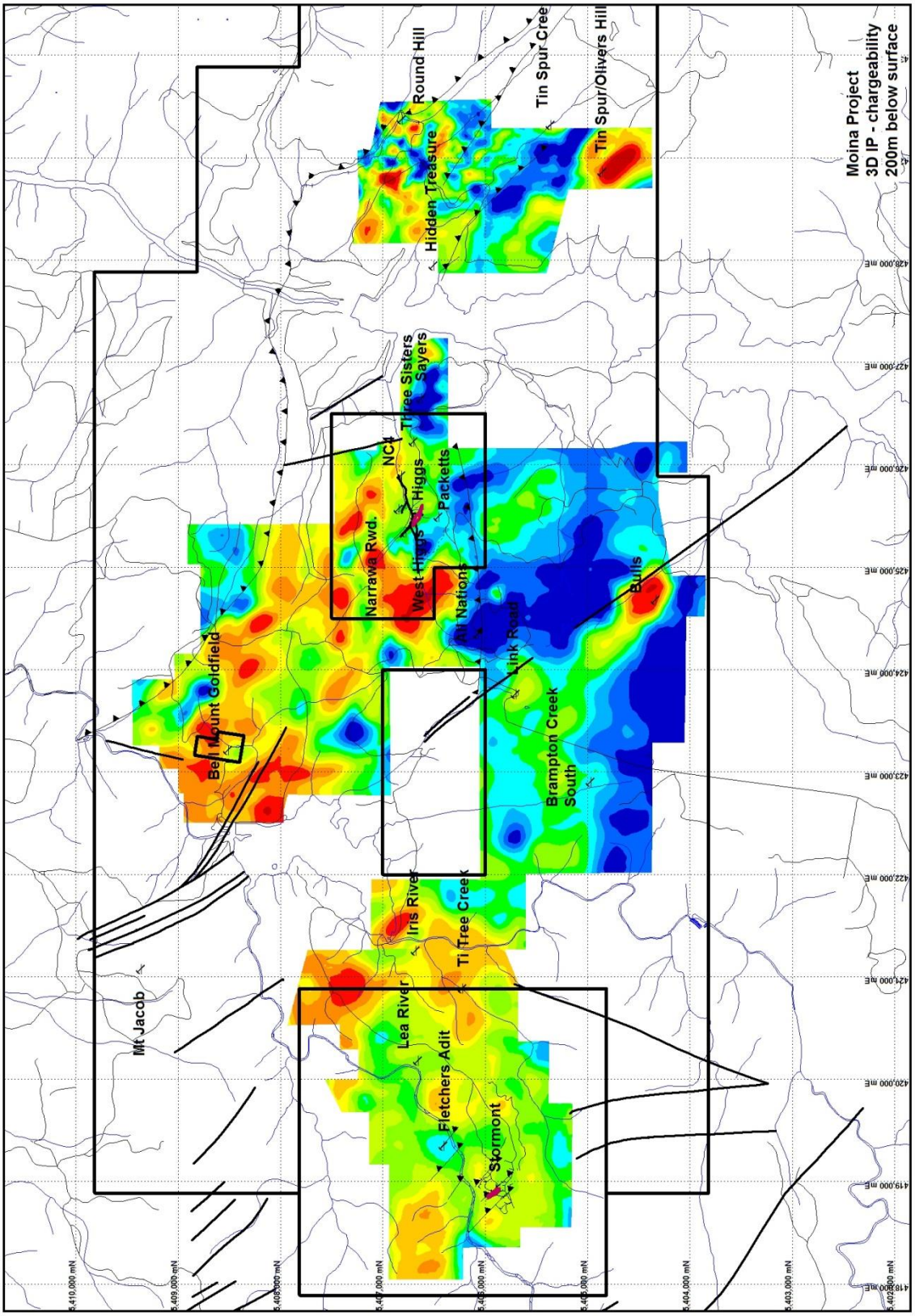


Figure 2.9: Regional 3D IP chargeability at 200m depth

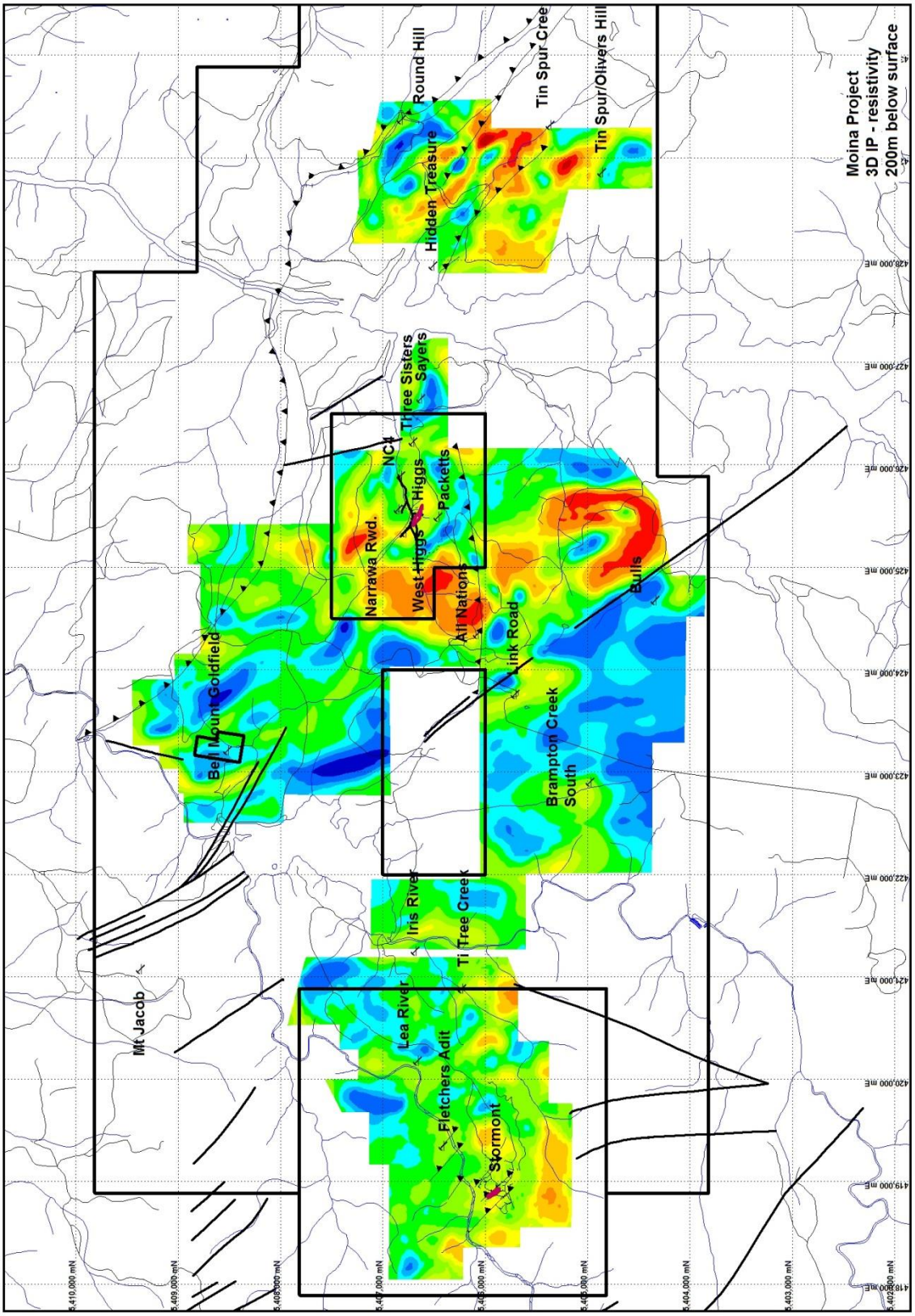


Figure 2.10: Regional 3D IP resistivity at 200m depth

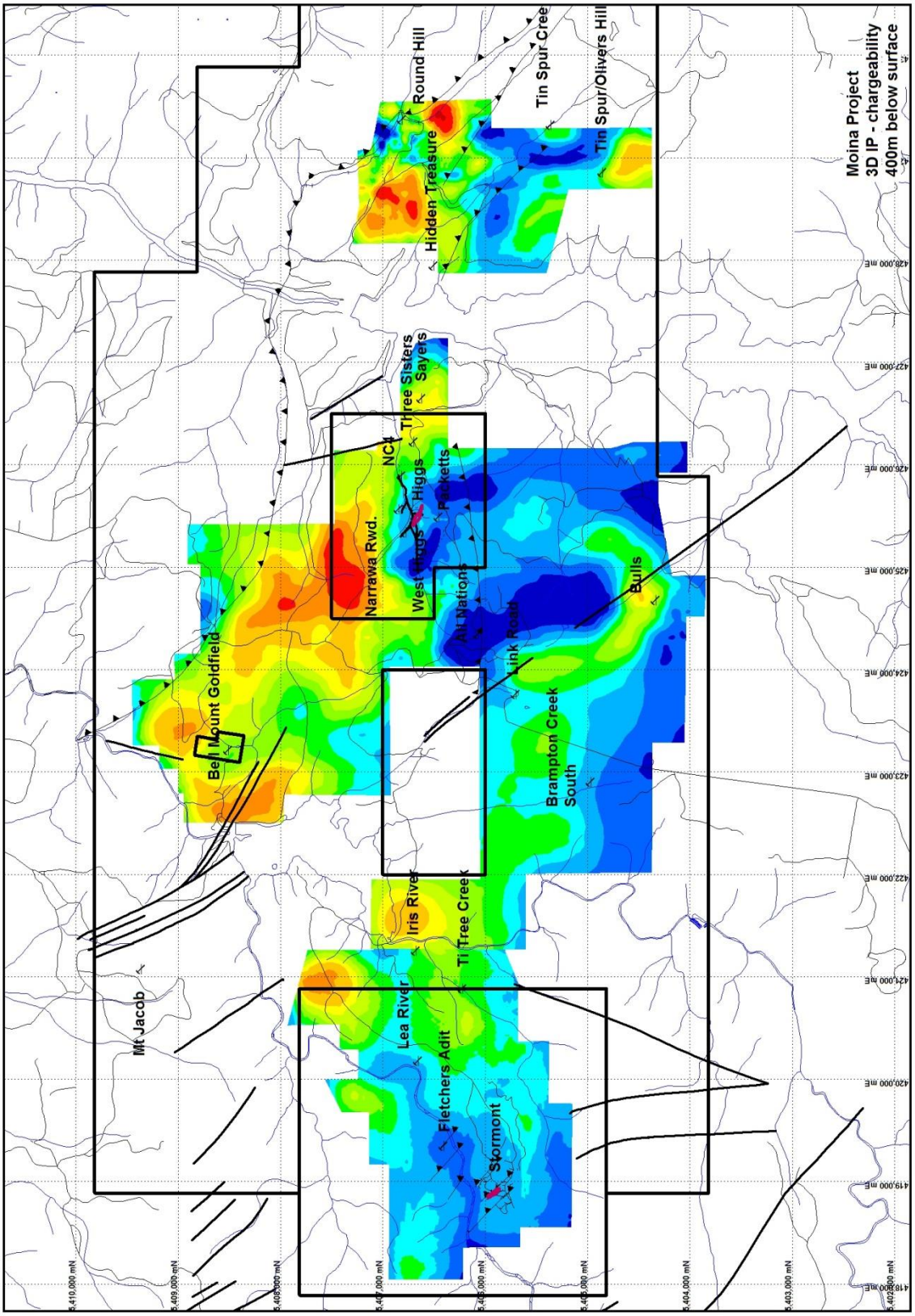


Figure 2.11: Regional 3D IP chargeability at 400m depth

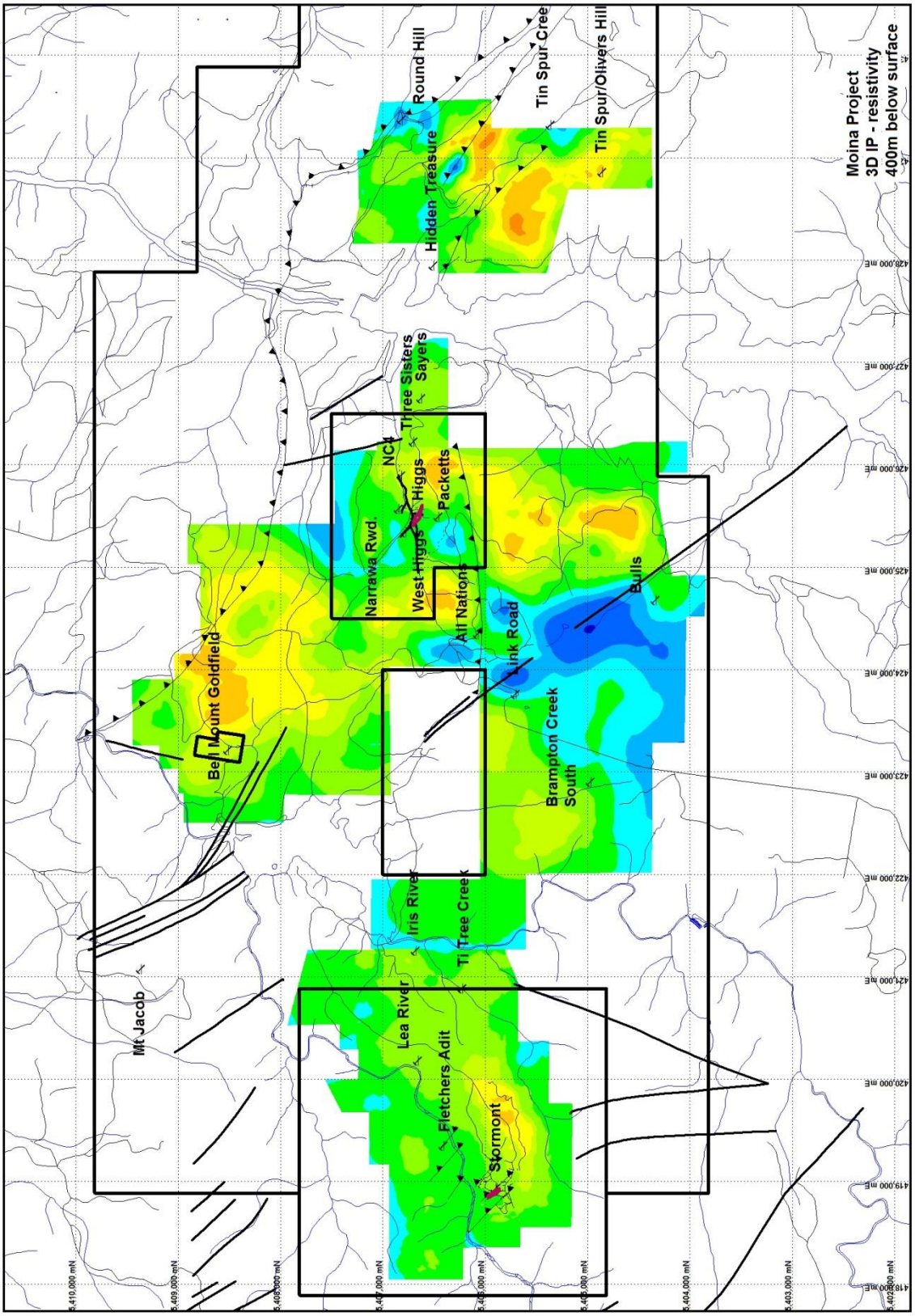


Figure 2.12: Regional 3D IP resistivity at 400m depth

In the 2012/2014 reporting period exploration consisted of

- the submission of a number of samples of galena from prospects in the Moina region for lead isotope dating as part of a CSIRO project.

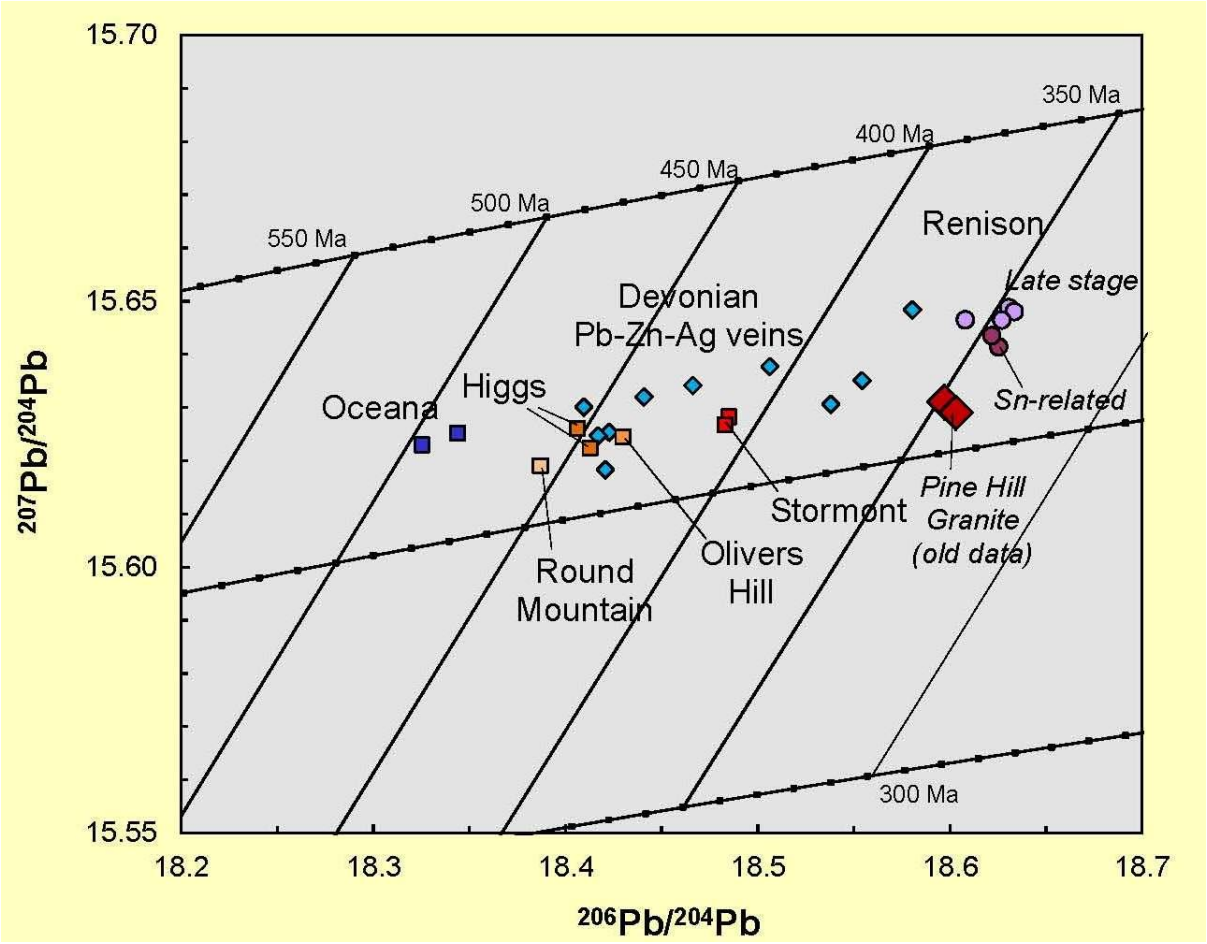


Figure 2.13: Age and lead isotope ratios for Moina project samples.

3.0 Exploration completed during the report period

EL 29/2009 was transferred to Moina Gold Pty Ltd in early January 2016. Both prior to the transfer and subsequent reconnaissance field visits were made to a number of prospects within the tenement.

Some desktop research has also been undertaken and a preliminary field visit to the Squib and Sayers Mines conducted in preparation for a programme of rock sampling.

A search of lithium bearing minerals in the state in the catalogue of Tasmanian (Bottrill and Baker, 2008) refers to Reid (1919) and Petterd in Twelvetrees (1908) reporting occurrences of spodumene and lepidolite (and possibly Zinnwaldite) in a number of workings on the Moina field i.e. Squib, Shepard and Murphy, Sayers/Blacks, Dolcoath, Princess, Hidden Treasure and Premier.

4.0 Results

There are no results to report.

5.0 Conclusions and Recommendations

Improved understanding of the nature and setting of mineralisation in the Moina area, added to an extensive regional 3D IP, high resolution helimagnetics and a large soil geochemical database has defined a number of highly prospective drill targets at Sayers, Round Hill, Tin Spur and Bell Mt. goldfield. Detailed recommendations were made in MacDonald (2014) for further drilling at the Bell Mount goldfield, Tin Spur, Round Mountain and Ti Tree Creek. Further work has enhanced Sayers and other griesens on the granite margin as drill targets.

5.1 Bell Mt. Goldfield

The Bell Mount goldfield has produced over 3000oz's from alluvial workings with large nuggets not uncommon. It continues to produce nuggets up to 3oz in size.

The alluvial (?) gold is found in the base of a thin layer (generally <1m) of Tertiary aged scree and gravel which covers the slopes of the hills which surround and define the basin. The source of the gold has long been a subject of conjecture though Reid (1919) ultimately favoured the conclusion that "the bulk of the gold has been concentrated from pyritic veins contained in sandstone near the present workings" (the concentration taking place in a palaeo-lake environment with carbonaceous muds creating a reducing environment – see below).

3D IP conductivity anomalies can be seen extending from Higgs/West Higgs in a west-northwesterly direction beneath basalt cover until they re-appear paralleling mapped faults which meet the Bismuth Creek Fault in the vicinity of the Bell Mount alluvial goldfield.

By analogy with West Higgs/Higgs these conductivity anomalies must be due to sulphides (pyrite/pyrrhotite+/-base metals) in biotite hornfels.

Similarly strong chargeability anomalies also underlie the goldfield. Pyritic sandstone which may be the source of the chargeability anomalism outcrops along the Lake Gairdner dam road and in a quarry just north of Bell Creek.

The location of this goldfield, source of gold uncertain, at the northwestern end of a structural/geophysical corridor with the Higgs and West Higgs deposits/prospects at the southeastern end suggests a genetic relationship between the two, certainly a relationship worth investigating.

Exploration at Higgs and West Higgs in the Narrawa Creek valley has intersected sulphidic mineralisation in two associations or facies. Discrete, stratabound/stratiform, biotite hornfels with variable Pb+Zn+/-gold facies is surrounded by a broader halo of pyritic+/-gold sandstone facies where it has had grades in excess of 20g/t Au. 3D IP indicates both rock types are present beneath the Bell Mount alluvial goldfield.

Underpinning the interpretation of the source of the Bell Mount gold is the morphology of the gold and to some degree the shape of the natural basin in which the goldfield lies. Many nuggets had a flat base suggesting that gold may perhaps have been dissolved by groundwater from bedrock and re-precipitated on carbonaceous muds in a Tertiary aged lake. Either of the two facies of sulphide may have been the source of the gold.

Limited sampling in the old quarry returned up to 0.14g/t Au in pyritic sandstone with elevated lead and zinc but gold grades are also quite variable at Higgs/West Higgs.

If the chargeability anomalies are due to economic mineralisation they would contain collectively over 60Mt.

An alternative proposition is that the gold shed from a discrete quartz reef which outcropped on the hills west of the goldfield. Certainly there are a number of mapped faults and as a junction between first (Bismuth Creek Fault) and second order structures is in a favourable structural setting. This might also explain the flat surface on some nuggets with the gold from the margins of the vein with the flat surface representing the vein wall.

A series of 6 or 7 holes is justified in testing the various anomalies and structural settings (see figure 5.1).

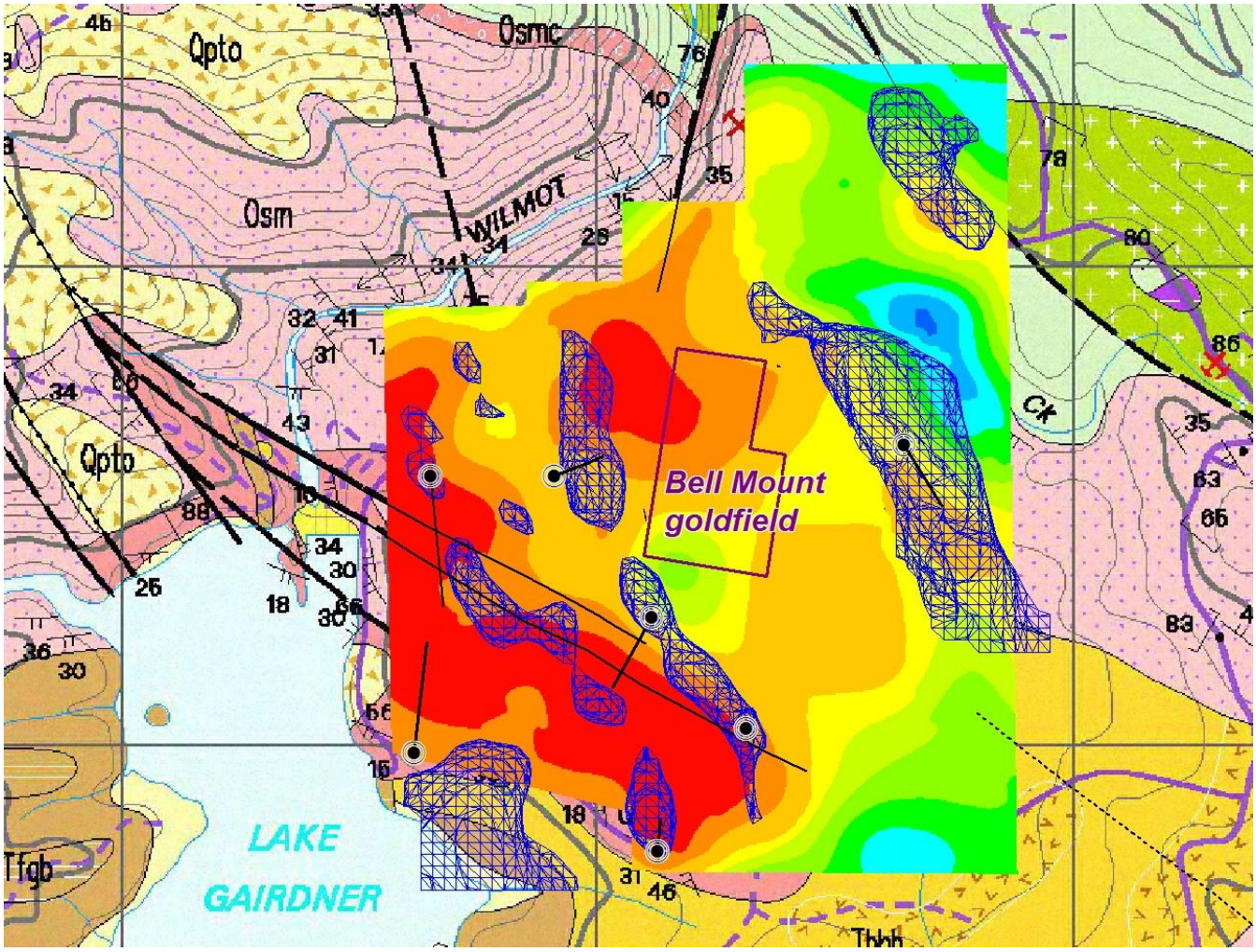


Figure 5.1: Bell Mount goldfield chargeability anomalies at 200m depth (red blotches) and conductivity anomalies (blue hatch) with nominally proposed drillholes. Background is MRT 1:25,000 Cethana and Lea sheets.

5.2 Round Hill

3D IP resistivity also maps out conductivity (the converse). In the Round Hill through to Tin Spur area are a series of three parallel linear conductivity anomalies striking consistently with the regional strike (see figure 4.4).

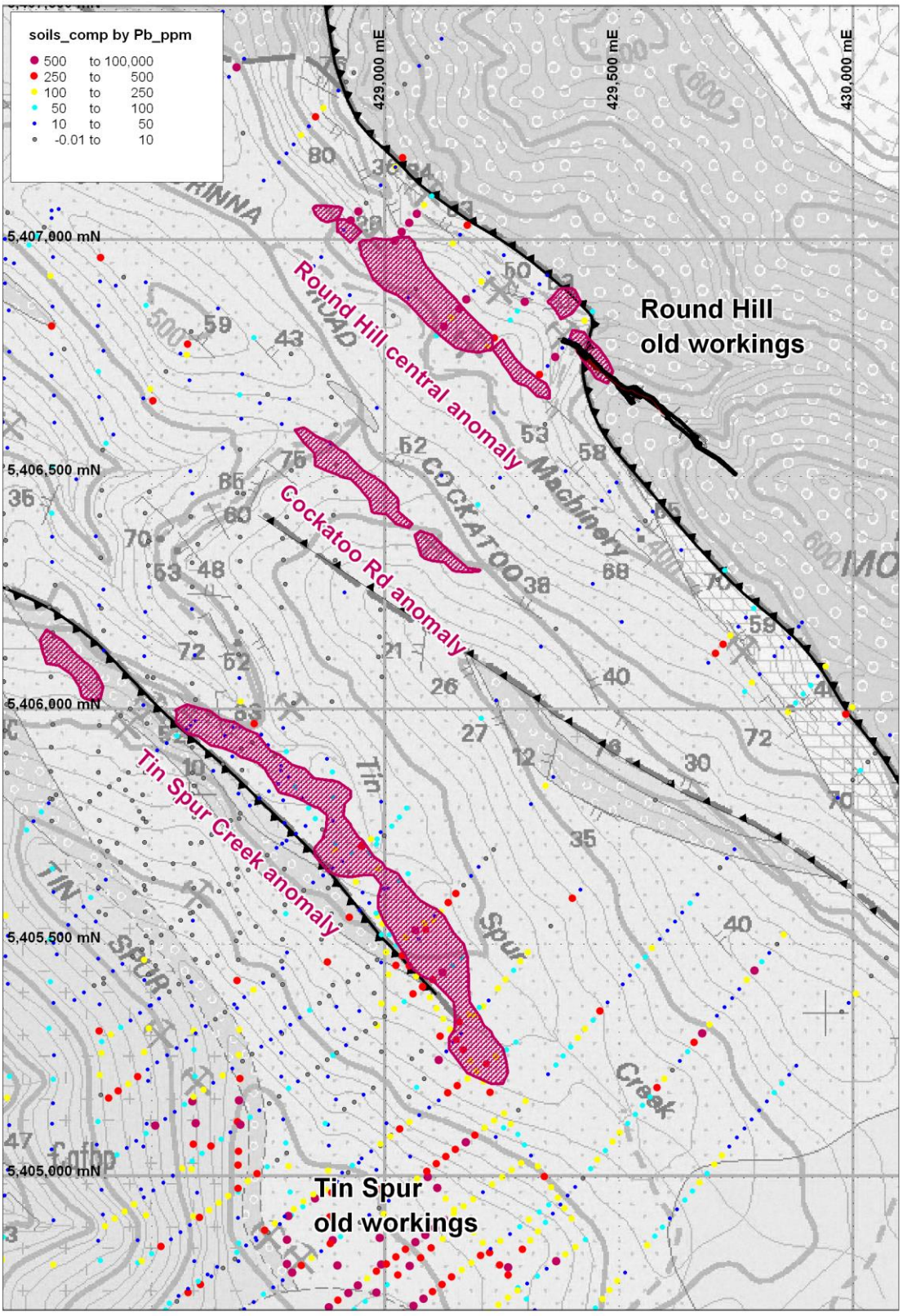


Figure 5.2: Round Hill to Tin Spur showing Round Hill and Tin Spur old workings, conductivity anomalies at the 100 ohm contour and compiled Pb in soils. Background is MRT 1:25,000 Cethana sheet geology.

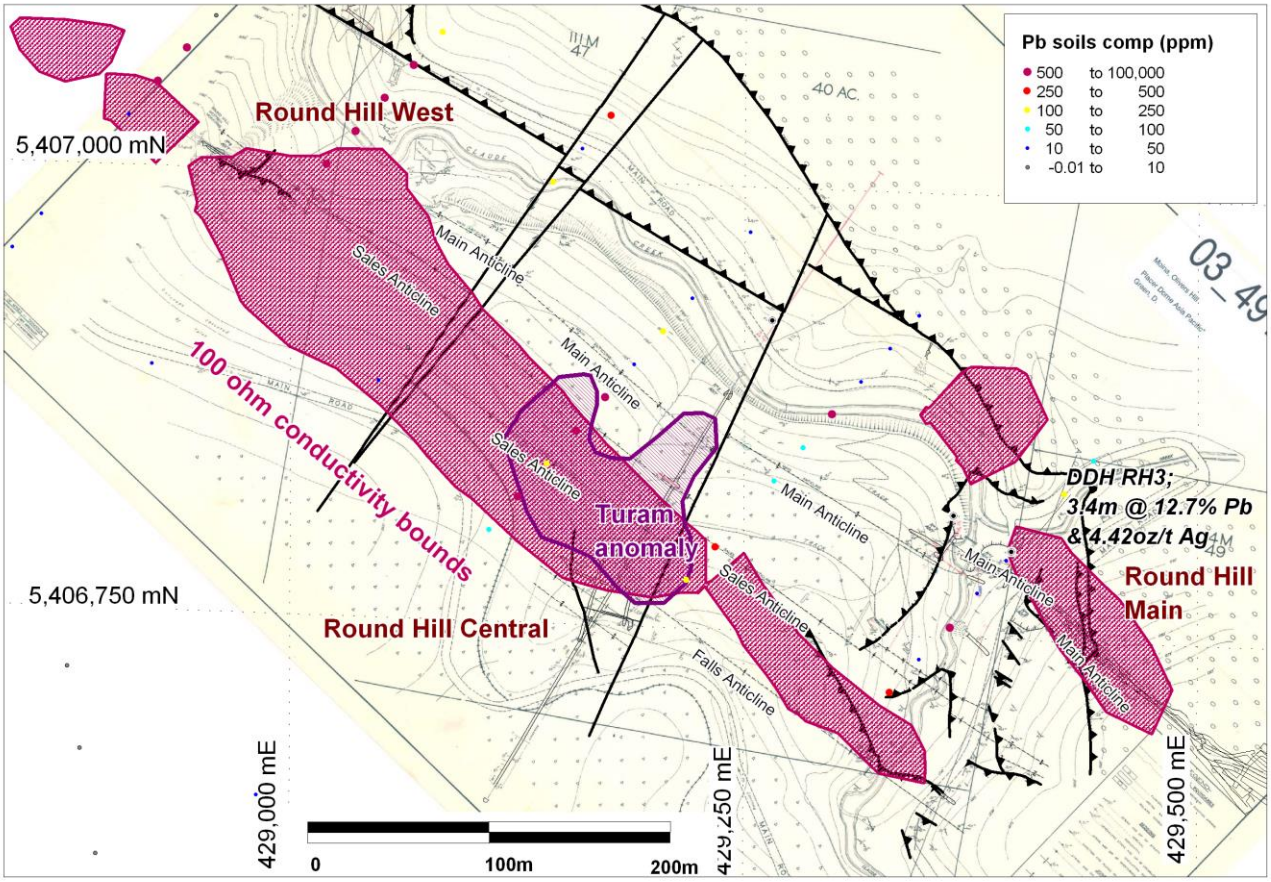


Figure 5.3: Plan view of Round Hill Main workings showing 3D IP conductivity anomalies at the 100 ohm contour, also location of historic Turam conductivity anomaly, old workings, faults and Pb in soils.

The northernmost anomaly corresponds with Sales Anticline (see figure 4.5), the anticline immediately adjacent to the Main Anticline on which are the Round Hill Main workings. It lies beneath the Round Hill Central and Round Hill West workings and its central part corresponds with a Turam anomaly defined in a survey conducted by a local mining syndicate (McCoy) and reported on by Jones (1990).

The anomalies surface projection corresponds with anomalous Pb in soils, which together with the relatively minor Pb+Ag occurrences in the West and Central workings support the potential for the Sales Anticline.

The anomaly is linear and 350m long at the 100 ohm contour and lies at a depth of 100-200m. It is relatively narrow being torpedo shaped. It is truncated and offset vertically towards its southeastern end corresponding neatly with an interpreted fault (Jennings, 1958), and again at the southeast end, here corresponding with the Machinery Creek.

A similar tenor anomaly lies beneath the Round Hill main workings themselves. A historical drillhole (RH3, Jennings, 1958) near this anomaly intersected 3.4m @ 12.7% Pb and 4.4oz Ag with Zn and Au not assayed.

It is difficult to conceive of an alternative explanation for the anomaly besides it being due to Pb+Ag+Au+/-Zn sulphides. Two holes are proposed to test this anomaly. Just to the south, beneath the Cockatoo Road is a similar anomaly lying ~50-100m below the surface, which has all the appearances of the Round Hill Main anomaly but without the support of old workings etc. A single hole is warranted to explain this blind conductivity anomaly.

The Tin Spur Creek anomaly is the third and largest of the anomalies, being 1km long and lies beneath the valley floor at a ~50m. Structurally it lies in Moina Sandstone in the footwall to a north verging thrust.

Here anomalous Pb and Bi in soils is partly coincident with the anomaly providing support. This anomaly is the largest and appears the most stratigraphic of the three. A single hole is proposed to explain the source of the conductivity anomaly.

5.3 Tin Spur

At Tin Spur the 3D IP has defined a very strong chargeability between 100m and 300m beneath the surface. At the 40mvv contour the anomaly would contain 30Mt. Geologically the anomaly must lie within the upper part of the Cambrian porphyry unit.

Tin Spur has historically been a tin+gold prospect with old workings chasing either. Comalco defined an inferred on surface resource resource of 1MT @ 1% Sn and 0.1g/t Au.

Trenching in 1990 showed gold to 7.1g/t & 6.8g/t Au. Historical drillholes DDH TSD2 intersected 1m @ 5g/t Au and TSD3 1m @ 1.7g/t Au but pulled up short of the anomaly. Drillholes show increasing sericite+pyrite alteration towards the anomaly.

A single 400m hole is proposed to test the anomaly.

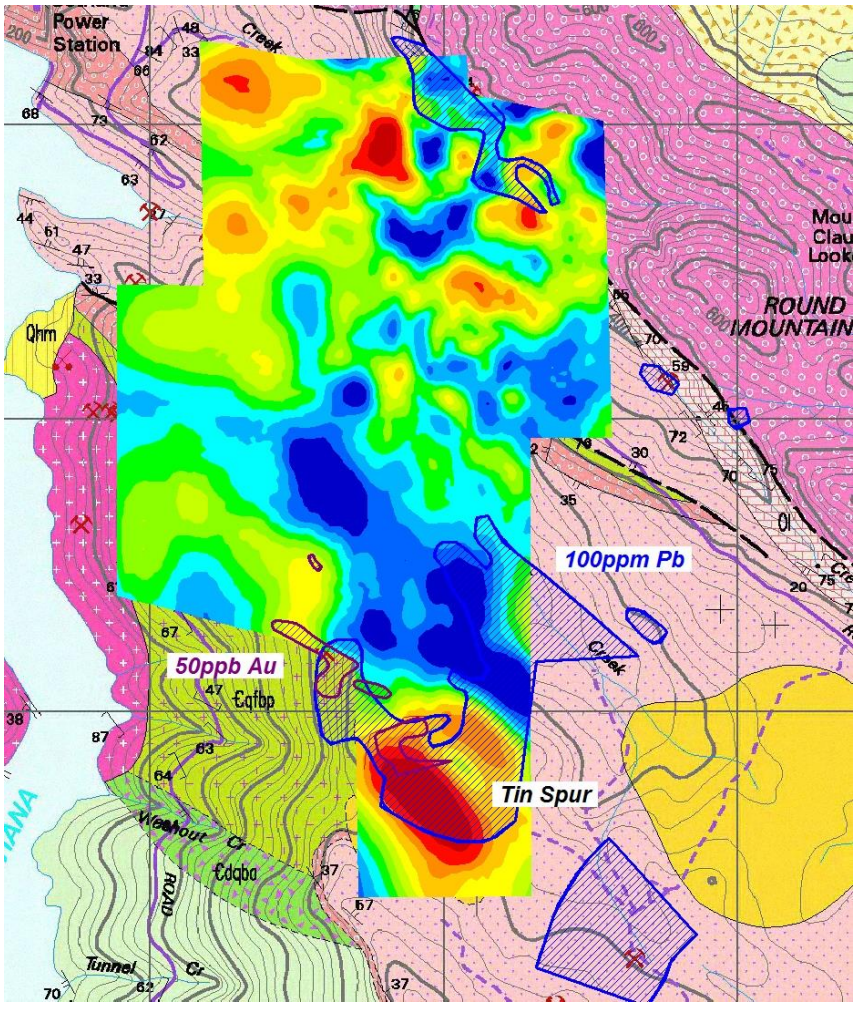


Figure 5.4: Tin Spur chargeability anomaly at 200m depth (lower central) with Pb and Au soil anomalies shown as blue hatch (200ppm Pb contour) and maroon hatch (50ppb Au contour) respectively. Background is MRT 1:25,000 Cethana geology.

5.4 Ti Tree Creek

The Ti Tree Creek area is a window outcropping skarn and other calc-silicate rocks around the Iris River and Ti Tree Creek just upstream from the Iris River bridge. 3D IP defines a number of strong linear conductivity anomalies, helimagnetics defines a number of strong linear magnetic highs and soils define coherent zones of anomalous Pb and Bi (see figures 4.8 and 4.9).

Drilling to date has intersected grades up to 1m @ 1.32 *glt* Au & 0.1B% Bi in TC04, and 1m @ 1.2 *glt* Au in TC05.

No drilling is proposed at Ti Tree Creek on EL 29/2009 at present pending results of drilling the Ti Tree Creek central trend magnetic high in EL 42/2010. Potential drill targets include the Link trend and the Iris River Fracture Zone where obscured by alluvials.

Figure 5.5: Legend for Comalco geology in figure 4.9

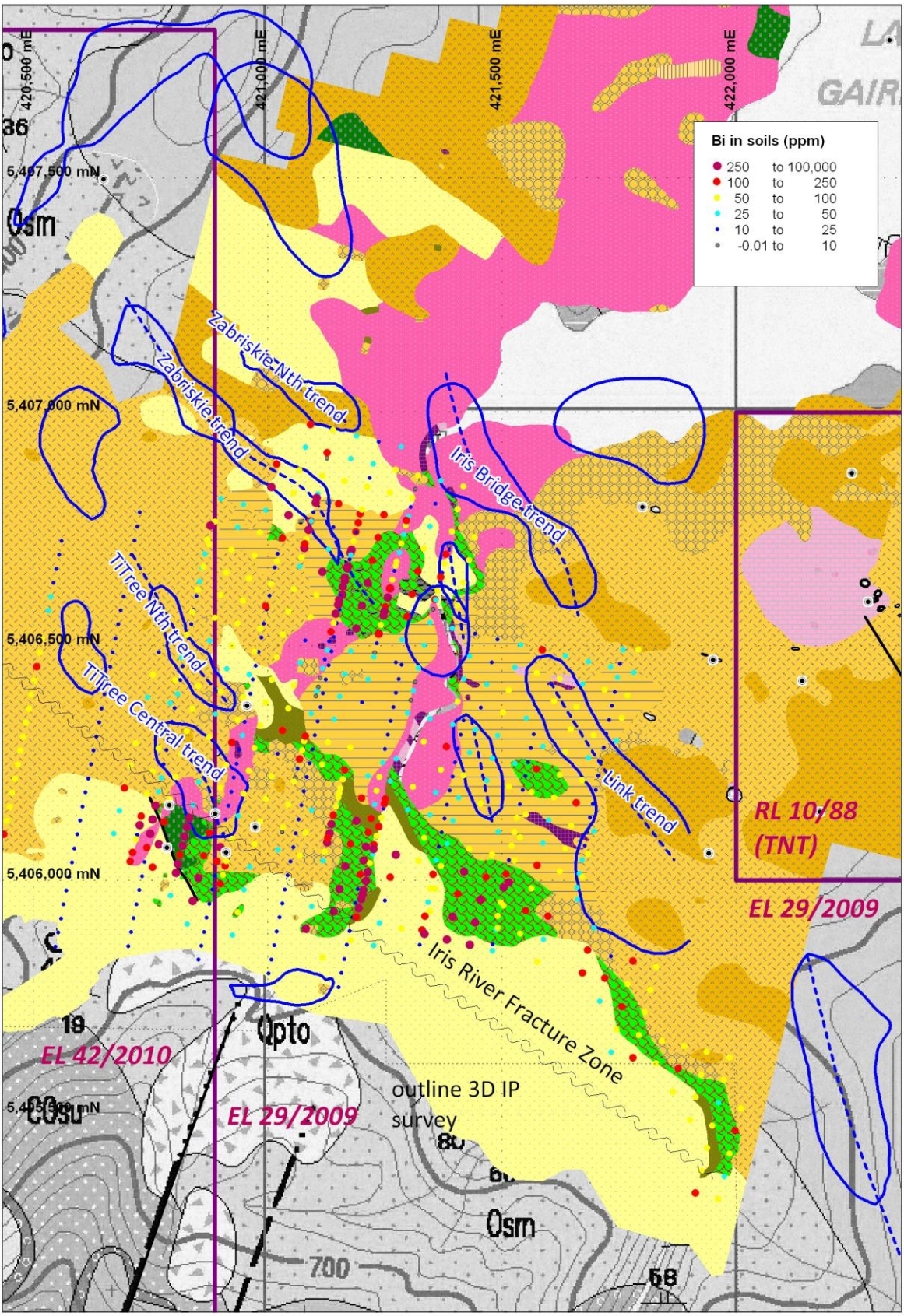


Figure 5.6: Ti Tree Creek prospect showing Bi in soils and conductivity anomalies in blue on background of Comalco geology superimposed on Mineral Resources Tasmania 1:25,000 Cethana and Lea sheets.

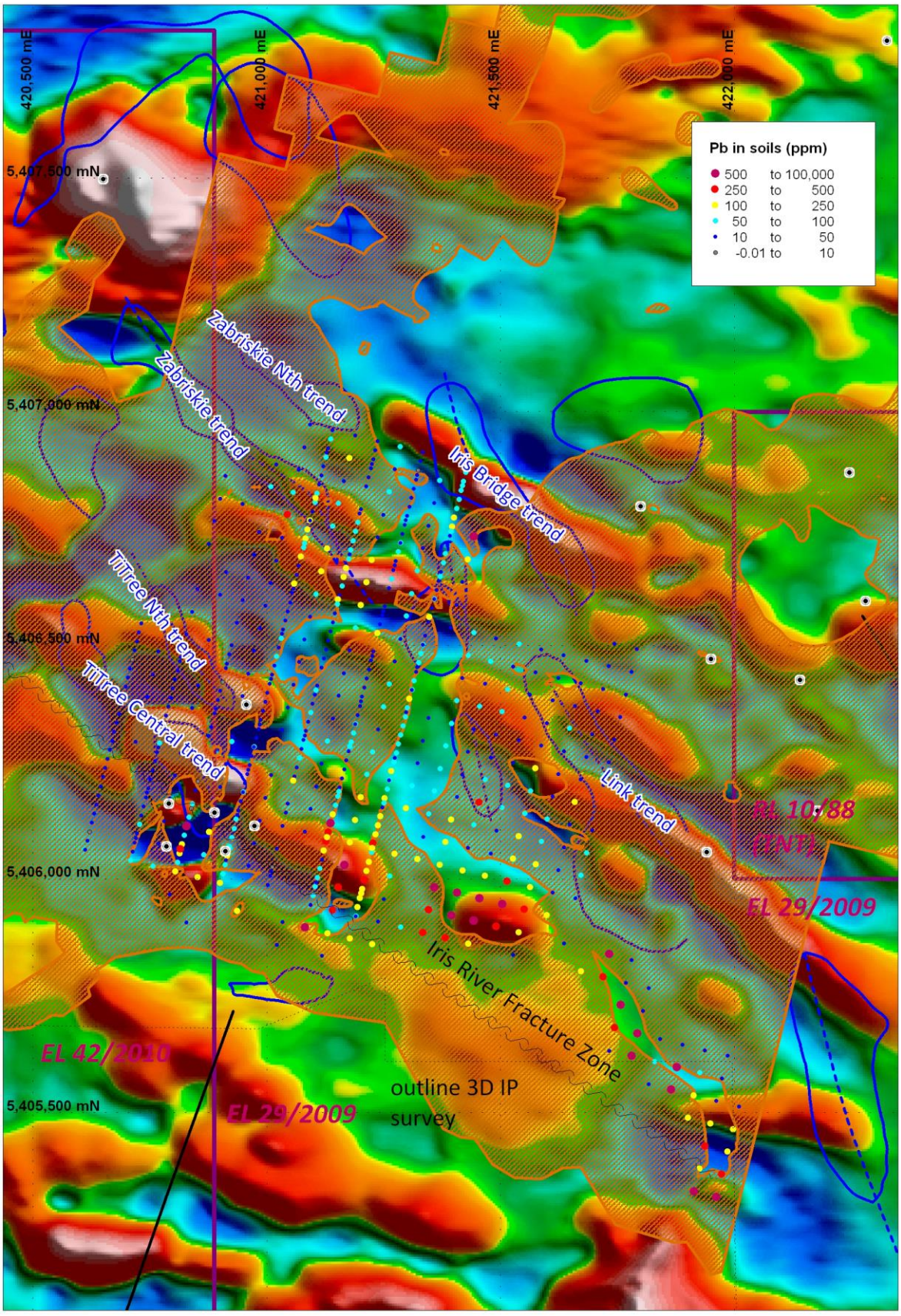


Figure 5.7: Ti Tree Creek prospect showing Pb in soils, extent of Tertiary cover (orange hatch) and historical DDH's (black spots) superimposed on regional aeromagnetics 2VD RTP image.

5.5 Sayers and associated workings on greisens

3D IP chargeability at 25m to 75m depth defines a zone of elevated chargeability coincident with the Sayers workings within the northern margin of the granite. The area is also anomalous in Nb and Y.

Two holes are proposed, one to test the anomaly beneath the Main Shaft/Beryl Trench area and the other 200m east to test the anomaly beneath the No.1 Trench.

This area is prospective for a range of granophile elements associated with pegmatites and/or greisens.

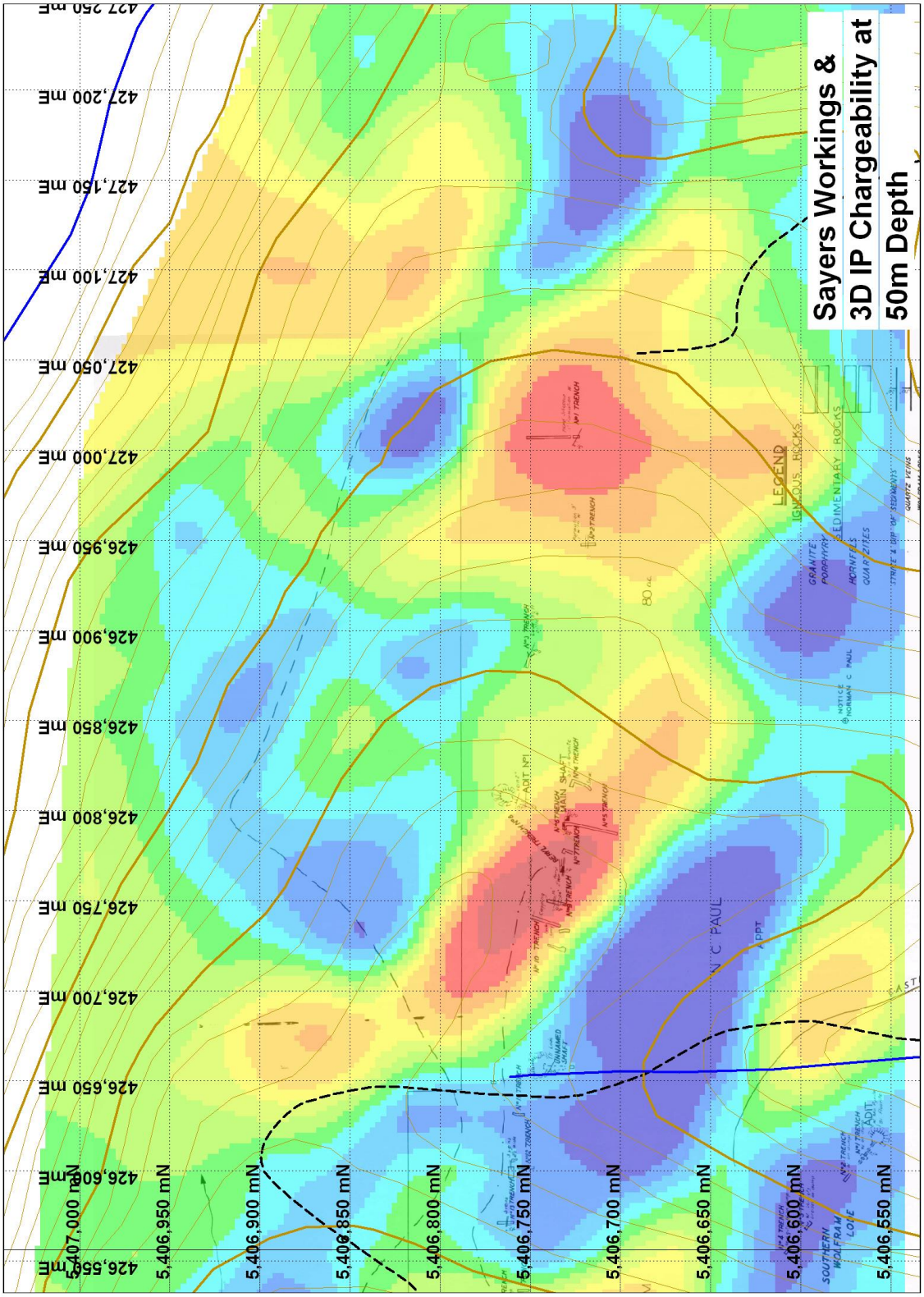


Figure 5.8: Sayers prospect showing old workings superimposed on 3D IP chargeability at 50m depth image.

6.0 Environment

No field work was undertaken in this reporting year and thus there has been no environmental impact on the licence area. A report accompanying the last field programme was provided in MacDonald (2012).

7.0 References

Askins, P. W. (1980) E.L. 7/74 Tasmania, Report on All Investigations, Tin Spur-Olivers Hill-Devonian Areas; Commonwealth Aluminium Corporation Ltd (**TCR 80_1430**)

Bottrill, R.S.; Bakker, W.E. (2008). A Catalogue of the Minerals of Tasmania Bulletin *Geological Survey* 73

Jennings, I.B. (1958) The Round Mount District; Geological Survey Bulletin 45 (**GSB45**)

Jones, P.A. (1992) Exploration Licence No. 36/90 - Round Mountain Progress Report on Exploration Activity June 1991 to November 1991 (**TCR92_3322**)

Keid, H.G.W. (1947) The Sunrise Mine. Narrawa Creek, Moina, Tas. Geol. Survey; typewritten reports, 1947 (unpublished) (**UR1947/125-135**)

MacDonald, G.I. (2011) Annual Report on Exploration EL 29/2009 – "Cethana" September 2010 to September 2011 - Torque Mining Ltd

MacDonald, G.I. (2012) Annual Report on Exploration EL 29/2009 – "Cethana" September 2011 to September 2012 - Torque Mining Ltd

MacDonald, G.I. (2014) Annual Report on Exploration EL 29/2009 – "Cethana" September 2012 to September 2014 - Torque Mining Ltd

Reid, A.M. (1919) The mining fields of Moina, Mt Claude, and Lorinna Geological Survey Bulletin 29 (**GSB29**)