EL 12/2015 “Lindsay River”
Partial Relinquishment Report
Nov. 2019 to Nov. 2020
- Zebs Minerals Pty Ltd

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Abstract

Work on EL 12/2015 “Lindsay River” during the reporting year has focused on further appraisal of previous exploration data.

That work has led to a prioritisation of work on certain parts of the tenement and a decision to relinquish some areas determined to have a lower prospectivity.

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1.0 Introduction

1.1 Exploration Rationale

Zebs Minerals Pty Ltd is exploring the Balfour Copper Belt for copper, gold and tin as well as any other commodities of value.

Zebs Minerals Pty Ltd holds three exploration licences and a mining lease centred on the historical mining district of Balfour.

Zebs Minerals Pty Ltd is actively exploring for copper and tin as well as any other rock of commercial value.

1.2 Location and access

EL 12/2015 “Lindsay River” lies in Tasmania’s west coast south of Smithton in the Balfour area (see figure 1.1).

Access to the tenement is via the Bass Highway to Smithton from Burnie and then on to Balfour via the Western Explorer Highway and the Balfour track. Access within the tenement is achieved via a number of gravel tracks.

1.3 Land status and usage

All of the land within the licence is owned by the crown.

The majority of the licence area is part of the Arthur-Pieman Conservation area with the Donaldson River Nature Recreation Reserve running down the eastern side of the tenement.

1.4 Tenure

The tenement, EL 12/2015 was granted to Zebs Minerals Pty Ltd on 15th November 2016 for a period of five years and applies to all Category 1 minerals. The licence originally covered 246.5 square kilometres (as shown in figure 1.1)**.**

A decision has been made to relinquish an area of 36 km2 and retain the remaining 210.5 km2 as shown on figure 1.2.

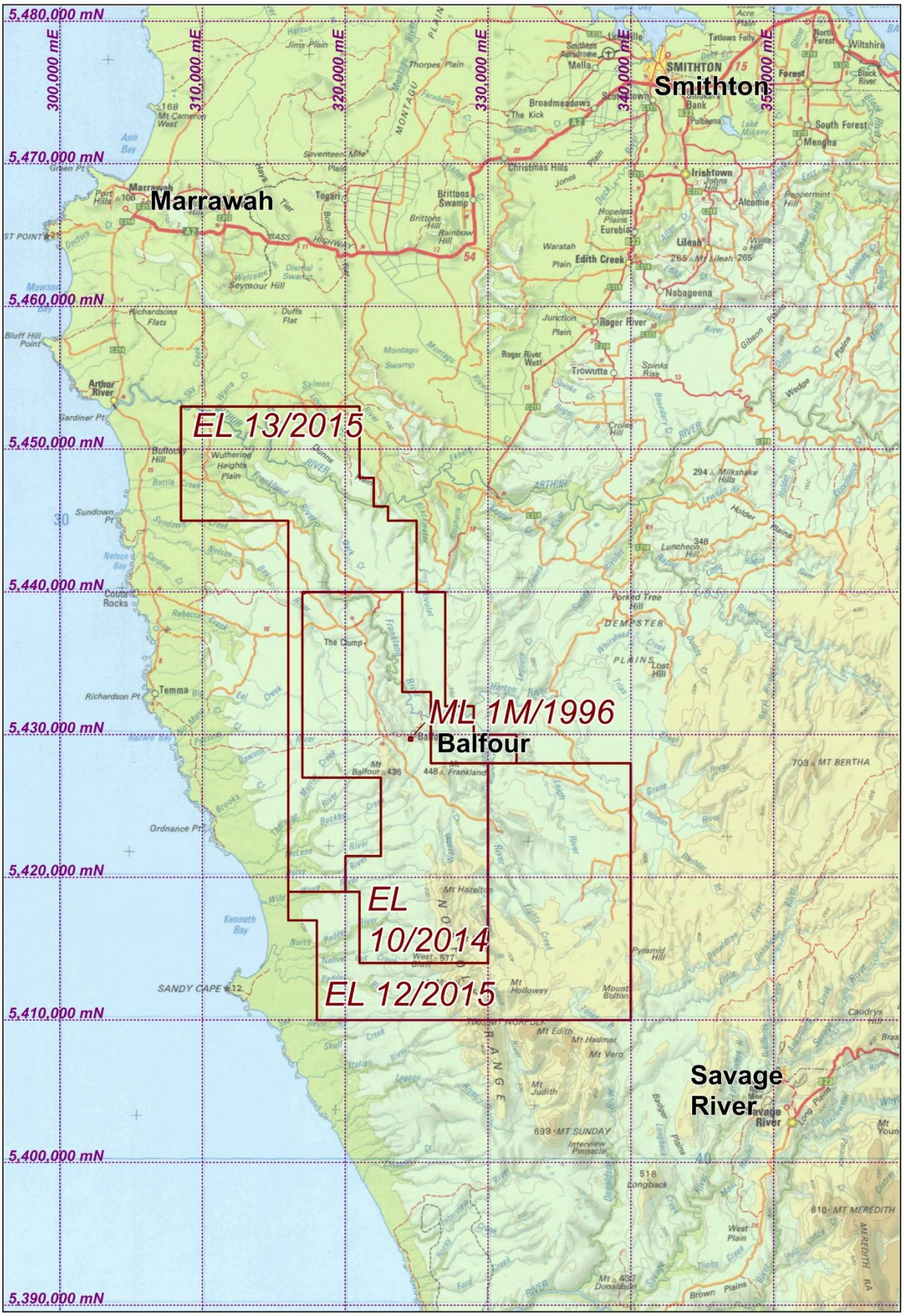

figure 1.1: Location of EL 12/2015 "Lindsay River".

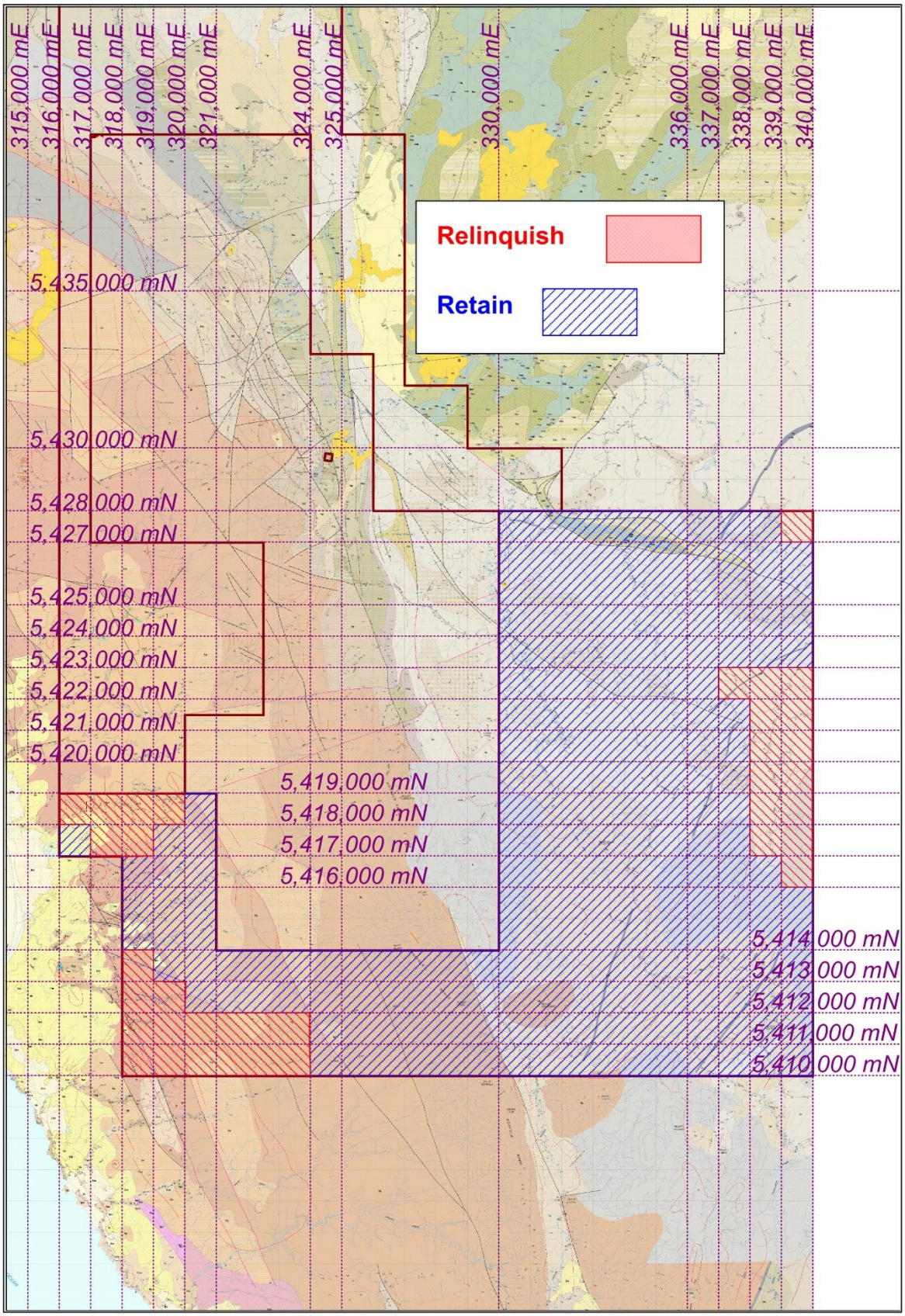

figure 1.2: Areas of EL 12/2015 for relinquishment (red hatch) and retention.

1.5 Geology

The geology of EL 12/2015 consists of early Neoproterozoic-late Mesoproterozoic metasediments (and dolerite dykes) of the Rocky Cape Group, with a thin fault bound wedge of the disconformably/unconformably overlying Cryogenian Togari Group near to the northern boundary of the licence). In the southwest of the licence elevated aeolian sands and dunes obscure the underlying Proterozoic rocks. The Proterozoic geology is summarised neatly in figure 1.3.

Structurally the folded Proterozoic rocks are folded are transected by north-northwest trending west-southwest dipping faults which have been shown in a number of instances to be east verging thrusts. The fault which hosts the copper mineralisation at Balfour (on EL 10/2014) is an example of such a thrust.

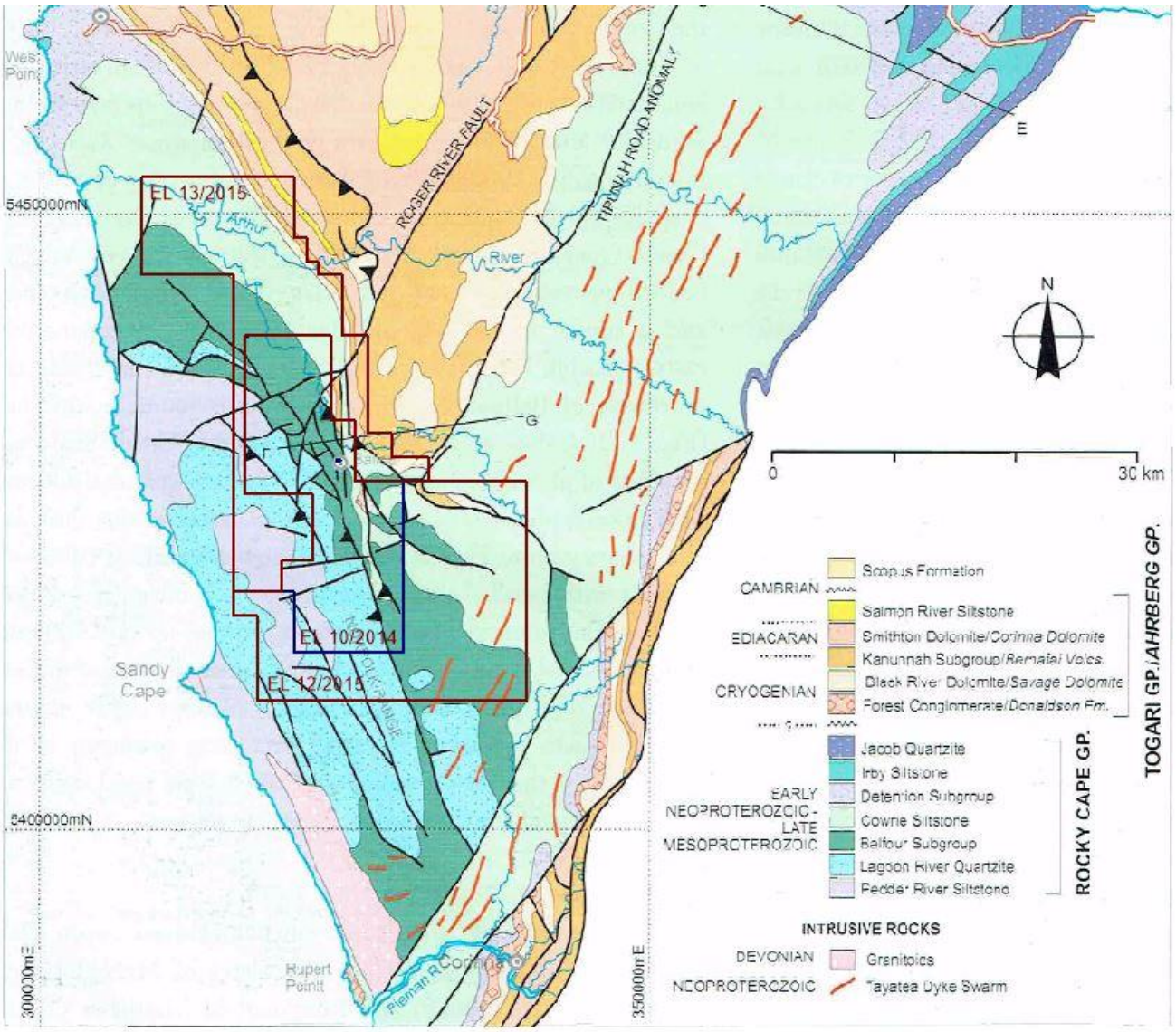

figure 1.3: Geology of EL 12/2015 (as originally granted) and associated Zeb's Minerals Pty Ltd tenements (geology after figure 3.8 in Calver et. al. 2014).

The Rocky Cape Group is a sequence of moderately folded silty to sandy shelf facies metasediments, intruded in part by north-northeast trending dolerite dykes.

The Togari Group is a sequence of shelf facies clastics and carbonates with intercalated rift tholeiites which unconformably or disconformably overlies the Rocky Cape Group.

The stratigraphy of both of these Groups is illustrated in figures 1.4 and 1.5.

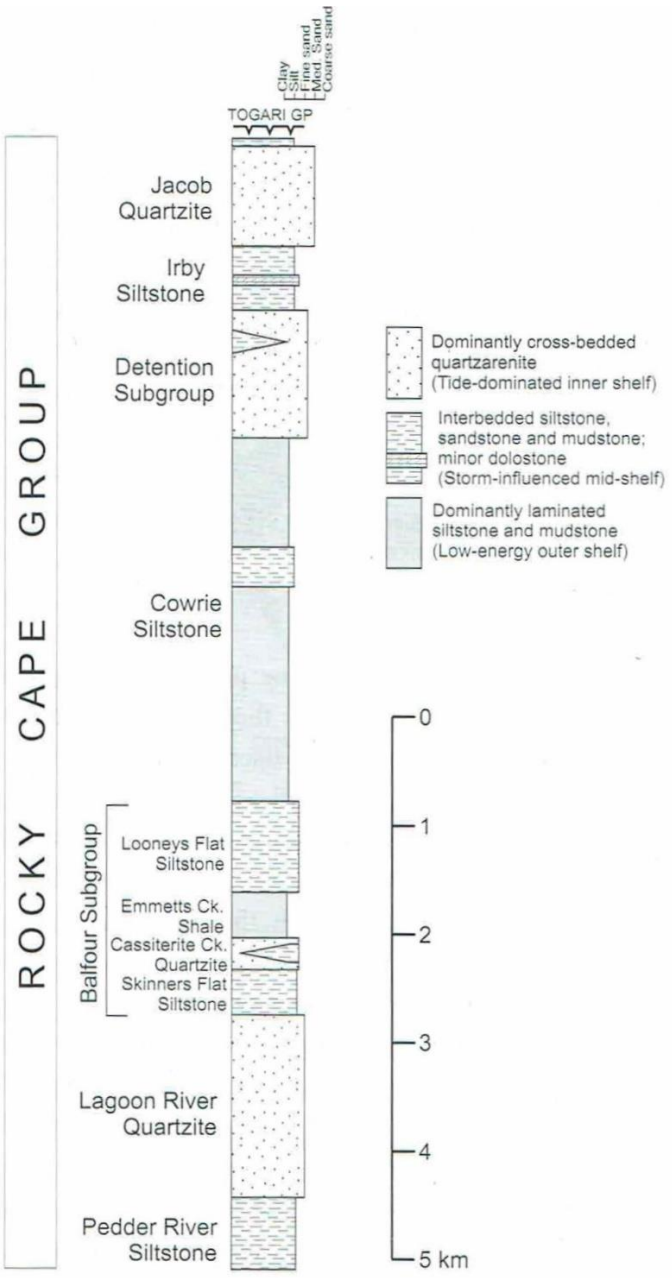

figure 1.4: Rocky Cape Group stratigraphic column (after figure 3.7 in Calver et. al. 2014)

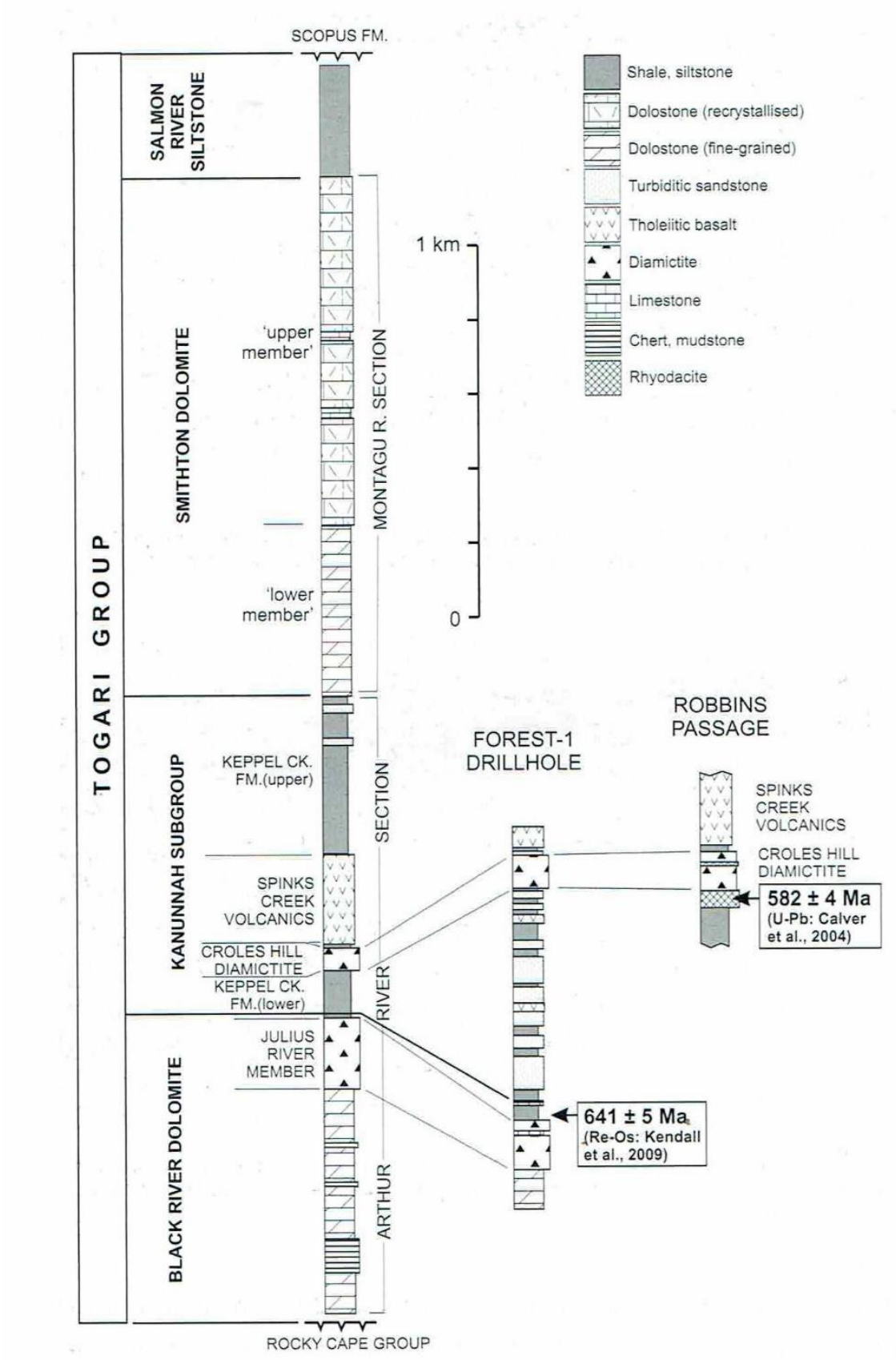

figure 1.5: Togari Group stratigraphic column (after figure 3.29 in Calver et. al. 2014). Note significantly different vertical scale to figure 1.4. The Togari Group is of the order of 3km thick whilst the Rocky Cape Group is of the order of 10km thick.

Gravity data shows that the Middle Devonian Interview River Granite, which outcrops to the southwest of the tenements, also underlies the Balfour area to a depth <1km (as modelled).

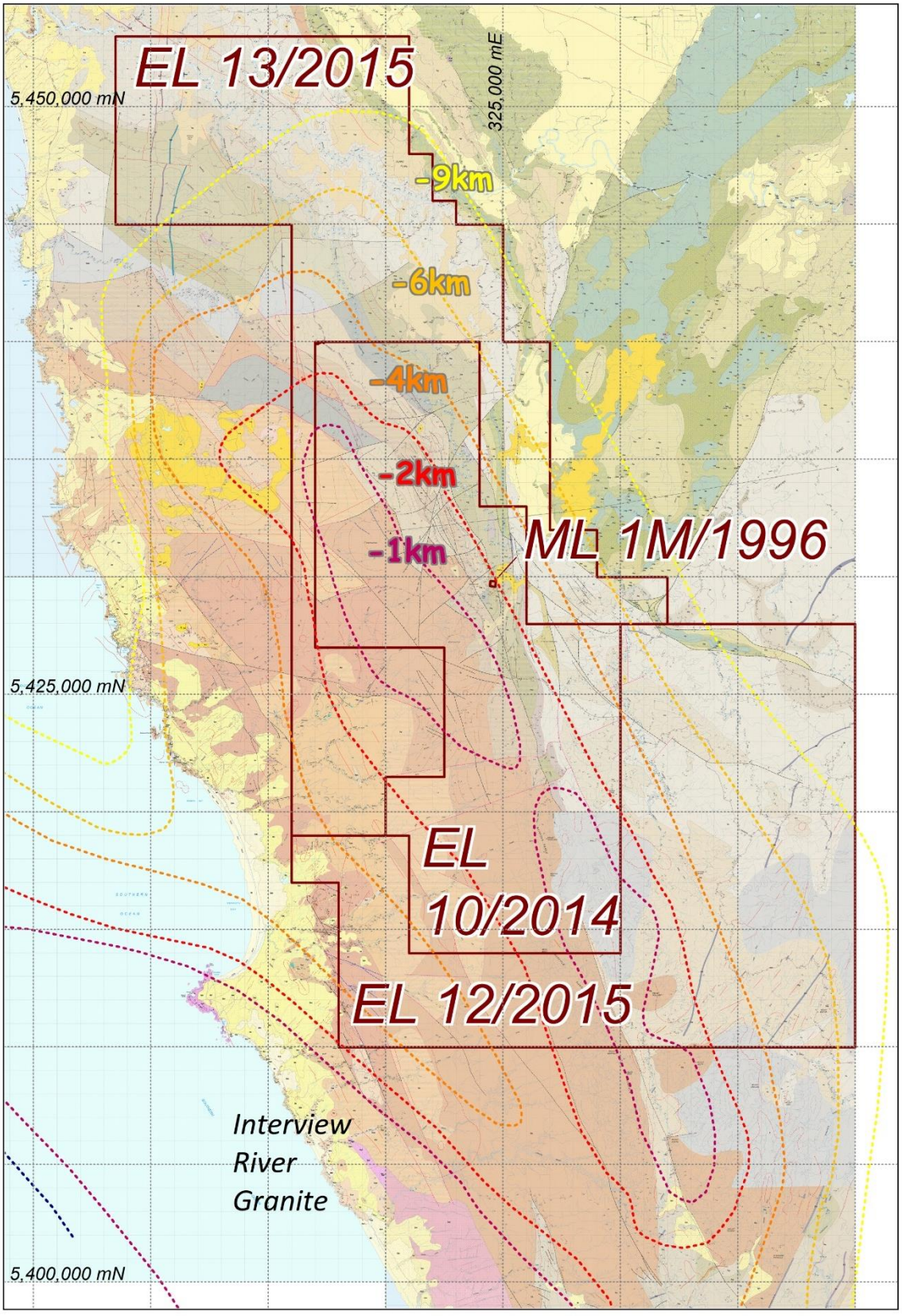

figure 1.6: Mineral Resources Tasmania 1:25,000 sheet series geology with modelled granite depth contours after Everard et. al. 2007.

In the very southwesternmost part of EL 12/2015 the basement geology is obscured by Quaternary aeolian sands.

Taheri and Bottrill (2005), citing Reed in Everard *et. al.* (2002) summarise the structural history of the Balfour region as follows. "Two early phases of syndepositional extension were followed by at least four compressional phases of deformation within the area. The first two phase of deformation (D1, D2) are possibly of Cambrian age whereas D3 and D4 are considered to be Devonian in age. D3 is the main deformation phase and is characterised mainly by northwest-trending folding, some cleavage development and major northeast-directed low and high angle thrusts, one of which hosts the copper mineralisation at Murrays Reward mine along the copper belt. East of Balfour east-northeast to northeast trending strike slip faults pre-date late northwest-trending reverse faults. One of these faults hosts vein style Sn-W mineralisation at Specimen Hill."

The Interview River Granite has intruded late in the Middle Devonian, likely syn- or post-D4.

For a comprehensive understanding of the current understanding of the geology of the region refer to Everard *et. al.* (2007) with Taheri and Bottrill (2005) providing additional information regarding the copper and tin mineralisation in the region.

2.0 Summary of Previous Work

2.1 Prior to Current Tenement

The early history of exploration can be seen in old workings along the southern end of the Balfour copper trend between Mt Lily and Mt Mabel, southeast of Dohertys Pimple, and at the Toner River field.

At the time of Ward's visit in 1911 the extent of small lease holdings in the immediate Balfour area was as shown in the following figure.

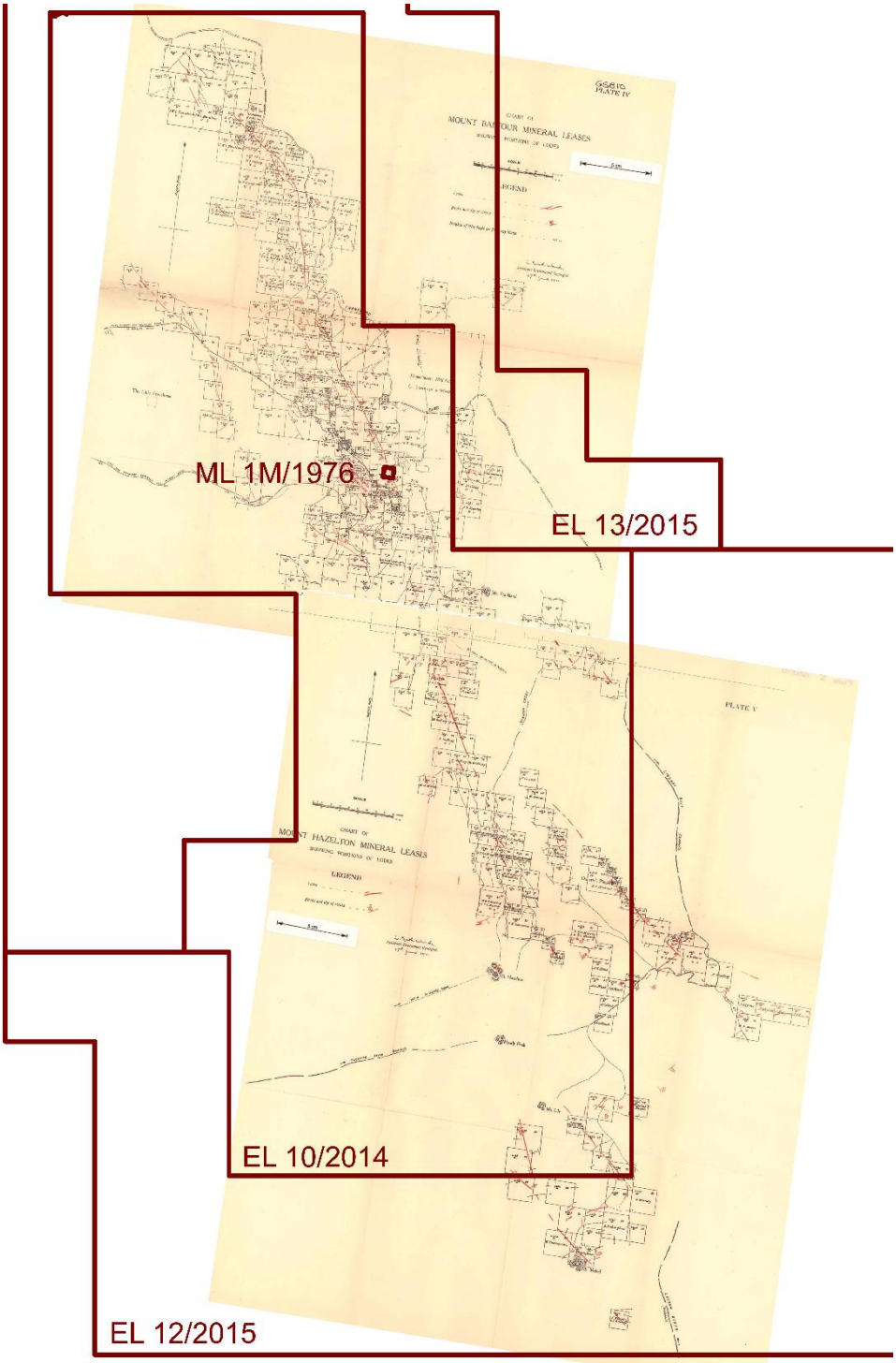

figure 2.1: Tenement position as at the time of Ward's visit in 1911 (Ward, 1911)

Thomas and Henderson (1943) chart tin and copper production from the Balfour field and provide a brief summary of work in the years between Ward (1911) and 1943.

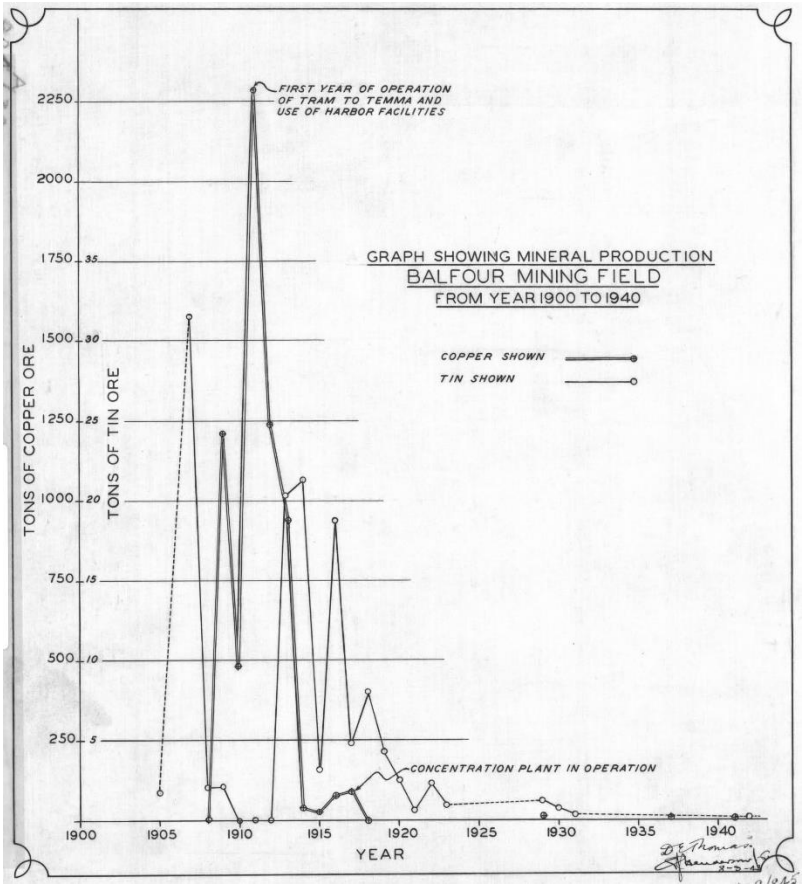

figure 2.2: Reported production of copper and tin from the Balfour field from 1900 (prior to discovery) to 1940 (after Thomas and Henderson, 1943)

Figure 2.3 to 2.8 display by decade the exploration tenements granted during that decade. The shapes were obtained from Mineral Resources Tasmania's database downloadable as a .shp file. In a number of instances tenements were partially surrendered and original shapes of tenements are not always accurate, however, it provides an excellent start point.

BHP were the first 'modern' explorers (Chesnut, 1964 & 1965) on the Balfour field. BHP drilled holes targeting tin on Specimen Hill (not on EL 12/2015) but also appear to have produced the mine compilation plans for the Murrays Reward and Central Mt Balfour plans in TCR 65_0411 (not on EL 12/2015).

In the mid 1960's Pickands Mather carried out a regional stream sediment geochemical programme on their EL 12/1965 but did not follow up any of the anomalies defined in this work (all outside of EL 12/2015 and 13/2015 though anomalous lead values were obtained from the Blackwater River just east of EL 13/2015). (Anon., 1966).

ACI pegged EL 16/1968 over the northern part of the Balfour field carrying out some stream sediment sampling to the west of Balfour but were primarily focusing on the copper and tin workings at Balfour (outside of EL 12/2015).

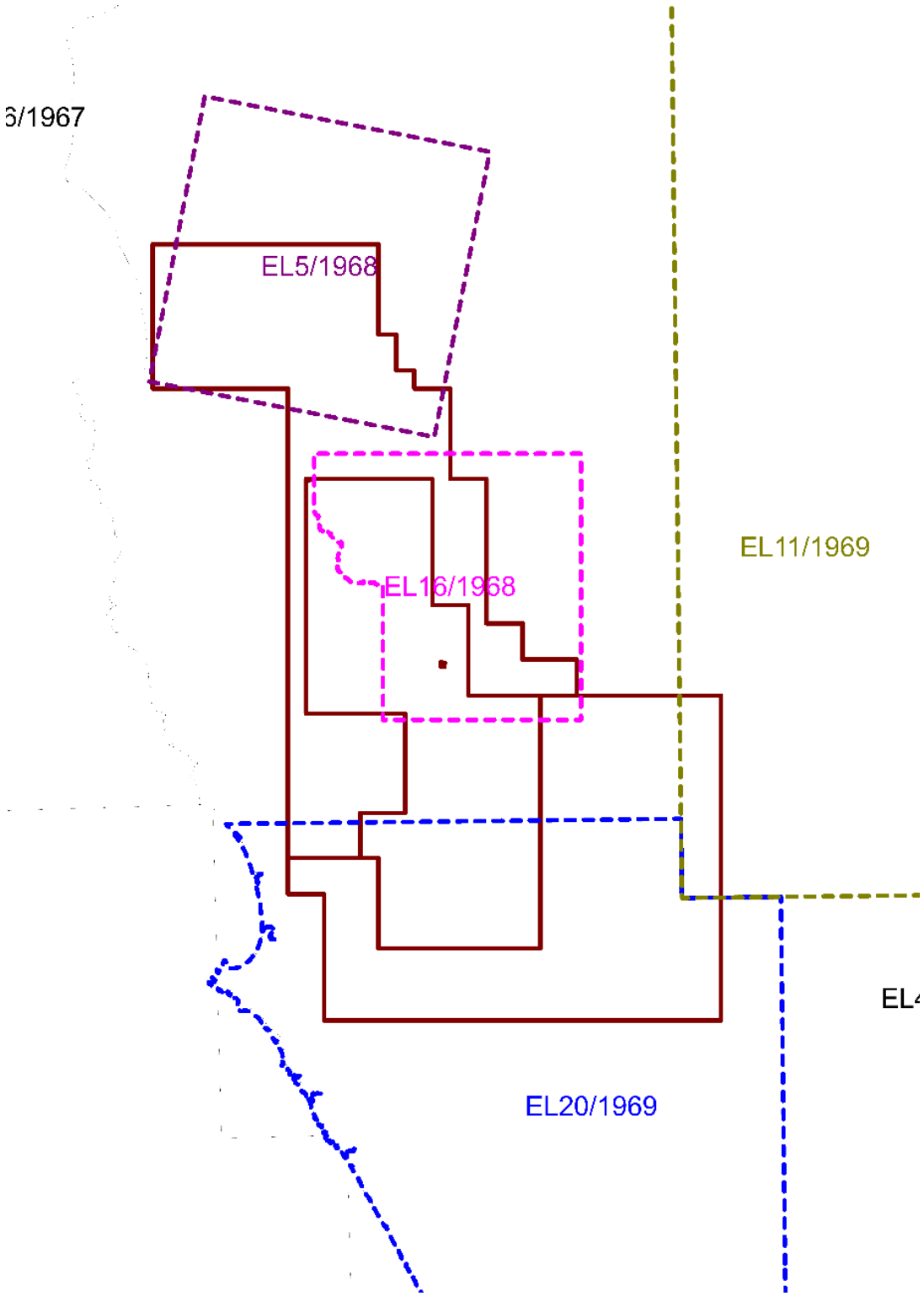

figure 2.3: Tenement position from 1959 to 1969. Zebs Minerals tenements are in maroon solid outline. This plan is not complete with Pickands Mathers EL 12/65 not shown.

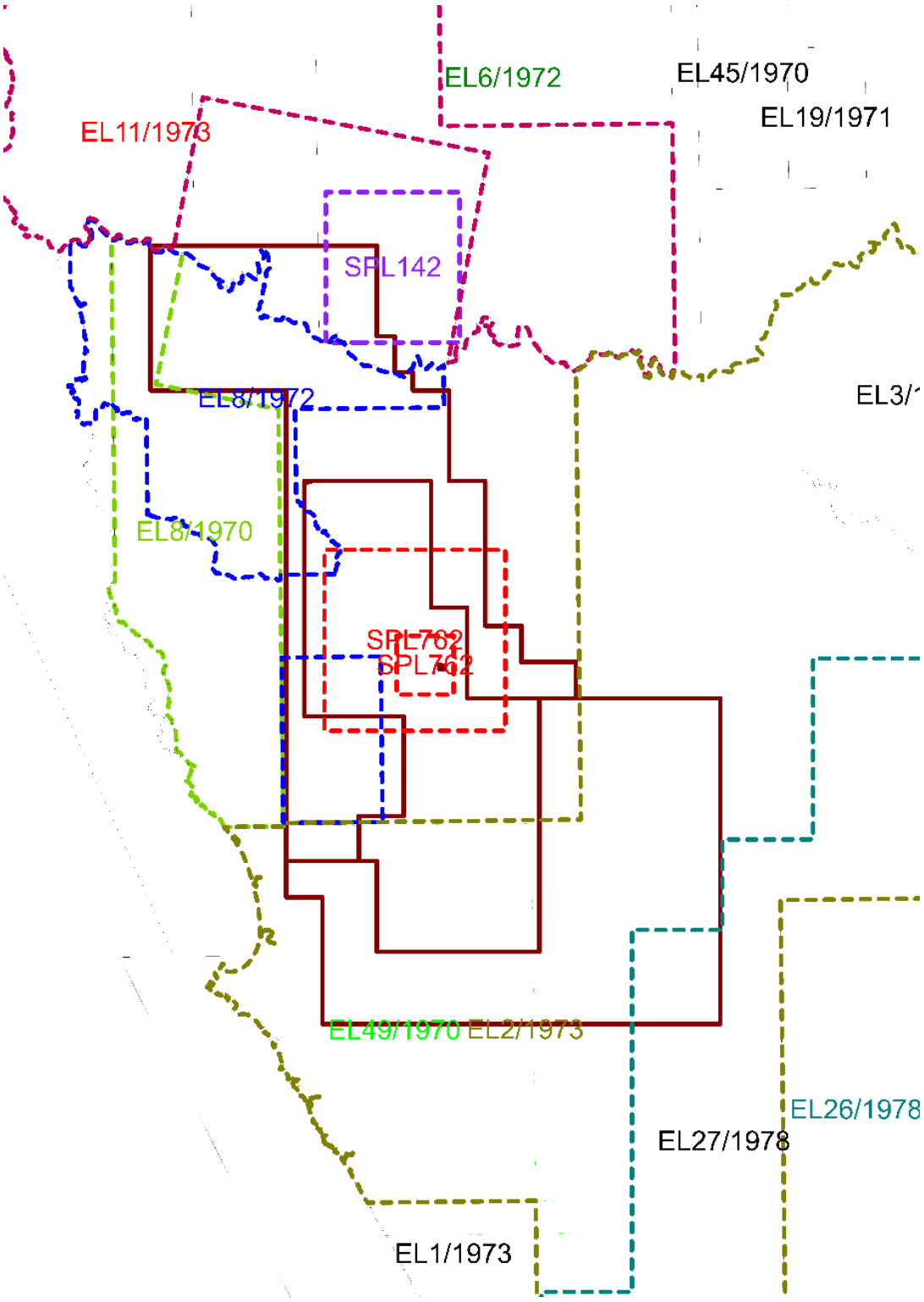

figure 2.4: Tenement position from 1970 to 1979. Zebs Minerals tenements are in maroon solid outline. This plan is not complete with CRA's EL 1/77 not shown.

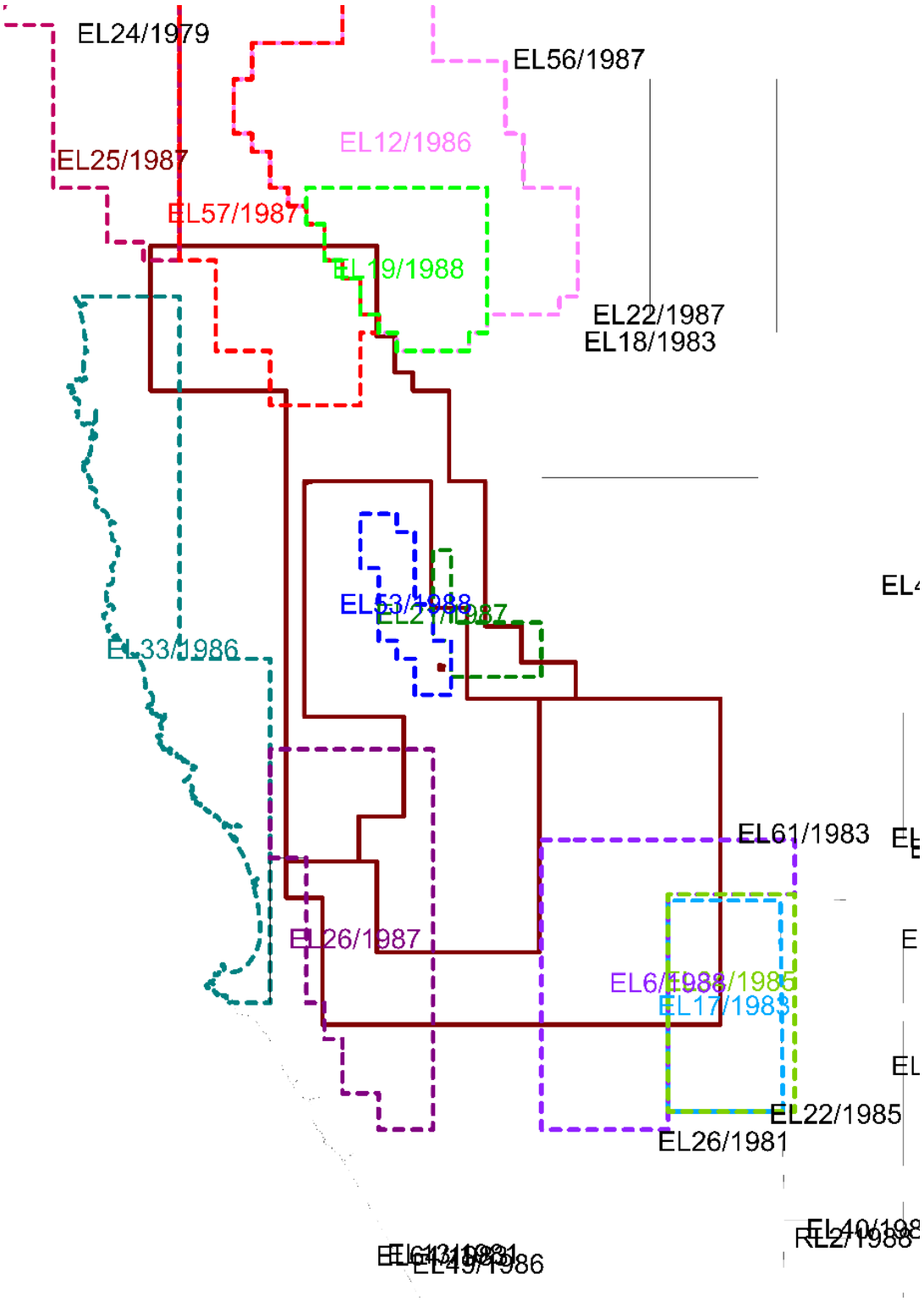

figure 2.5: Tenement position from 1980 to 1989. Zebs Minerals tenements are in maroon solid outline.

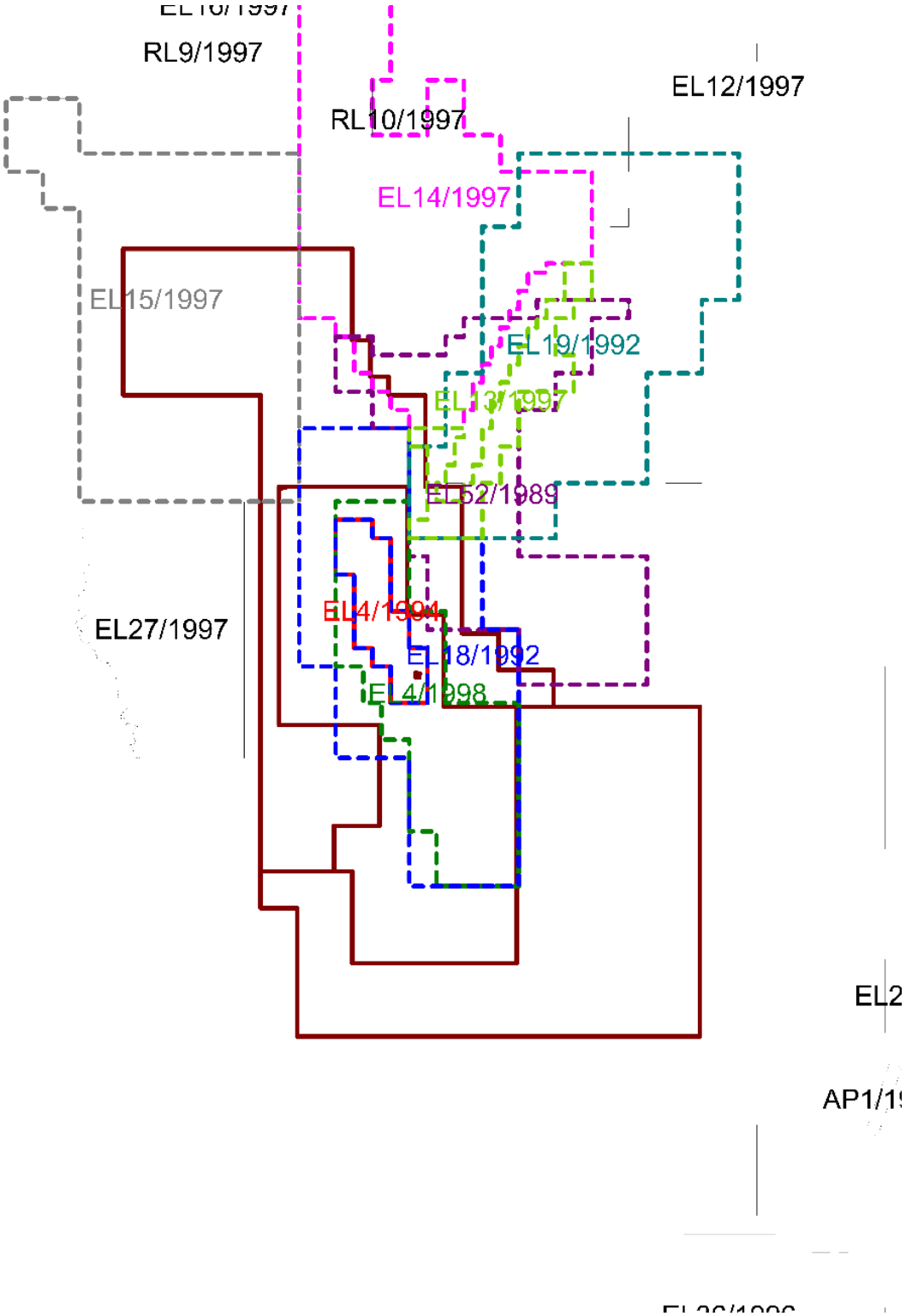

figure 2.6: Tenement position from 1990 to 1999. Zebs Minerals tenements are in maroon solid outline.

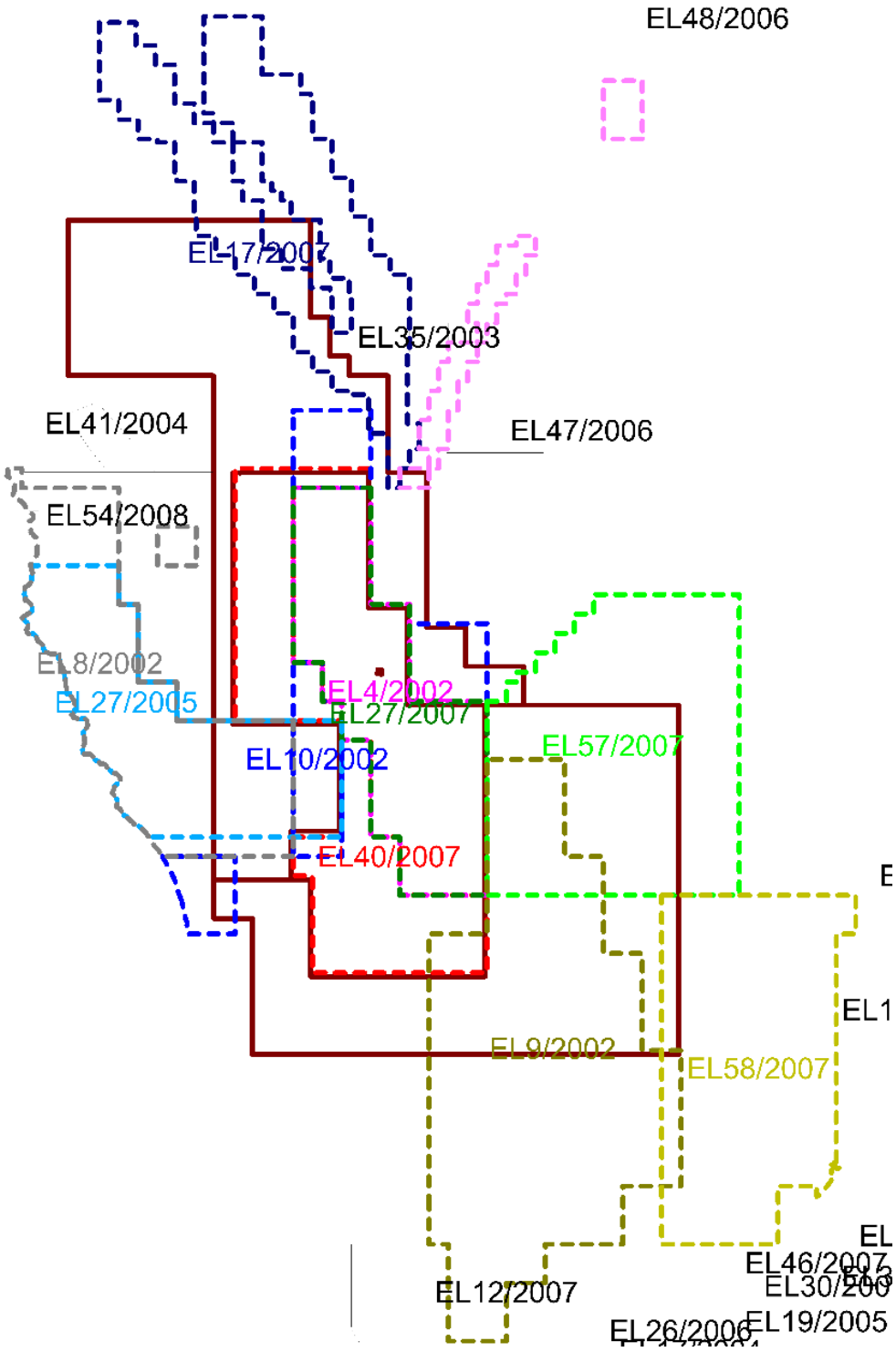

figure 2.7: Tenement position from 2000 to 2009. Zebs Minerals tenements are in maroon solid outline.

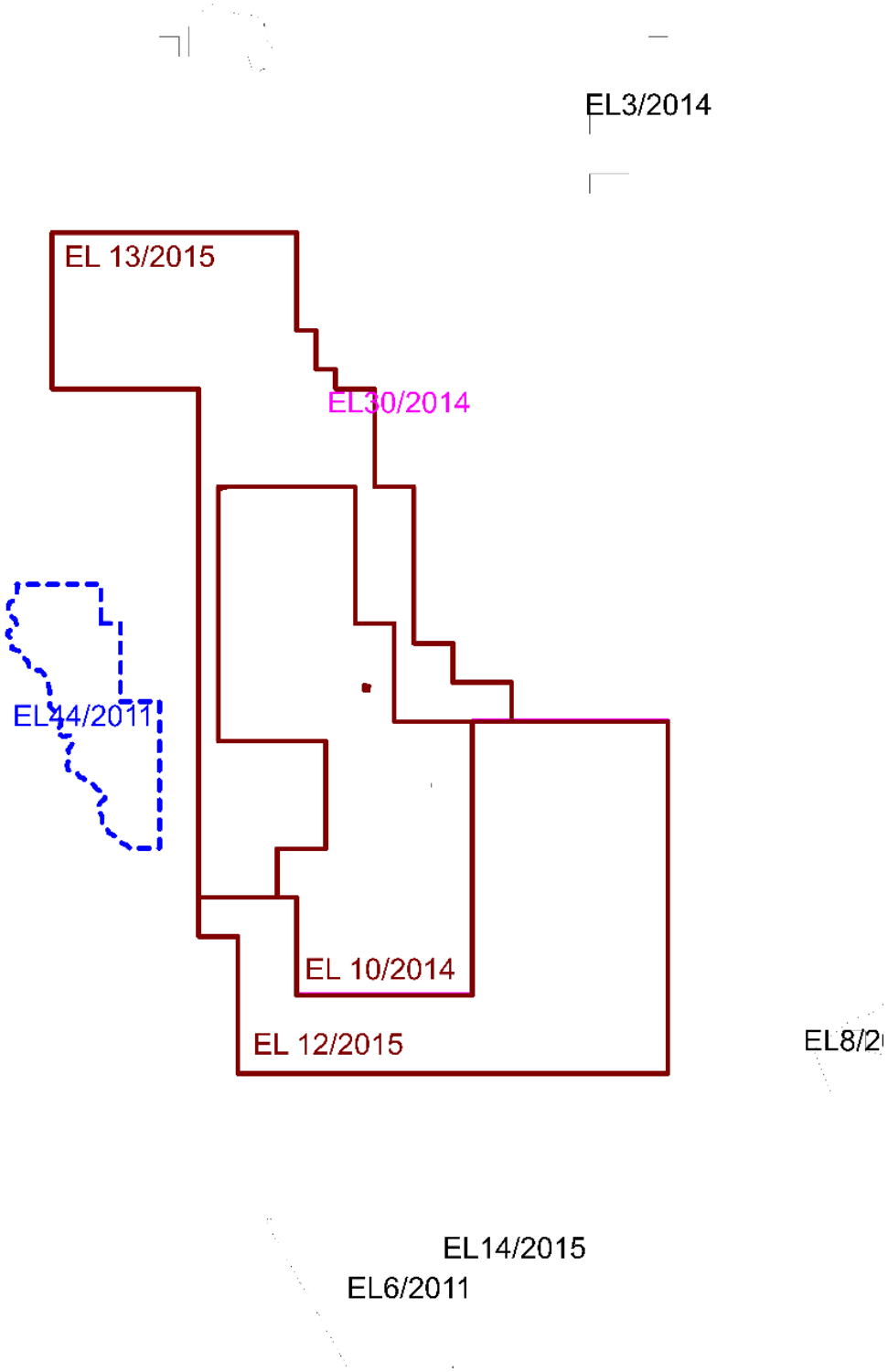

figure 2.8: Tenement position from 2010 to 2017. Zebs Minerals tenements are in maroon solid outline.

The southern portion of EL 12/2015 was then held under EL 20/1969 by Hoods Pty Ltd but there is no report on this tenement available on MRT database. The far northeastern corner of EL 12/2015 was also held by Hoods Pty Ltd under EL 11/1969 but no work was done on the part of that licence within EL 12/2015 (Anon., 1969).

In the early 1970's the western part of EL 12/2015 was explored by a JV between Australian Consolidated Industries Ltd., Consolidated Goldfields Australia Ltd., Mt Lyell Mining and Railway Co. Ltd., and Renison Limited. They flew an aeromagnetic survey and carried out some sampling of the Interview River tungsten workings (south of EL 12/2015) (Newnham, 1971) before relinquishing the area covered by EL 12/2015 and retaining the area around the Pieman Heads (to the south of EL 12/2015) (Newnham, 1973).

Esso Exploration then explored the area as part of their larger EL 2/1973. Initial work consisted of an airborne INPUT EM survey with magnetics and radiometrics also read (Neale 1973 & 1974). INPUT EM anomalies were defined within EL 12/2015 with anomalies X3, X4, X5 and X24 in the southwestern corner of the licence, and anomaly X50 in the northern part. Anomalies X4, X5 and X24 were followed up with a helicopter borne field visit but no outcrop was noted (Neale, 1973) and the licence was dropped (Neale, 1974).

Anomalies to the west nearer Sandy Cape were shown to be due to black shales.

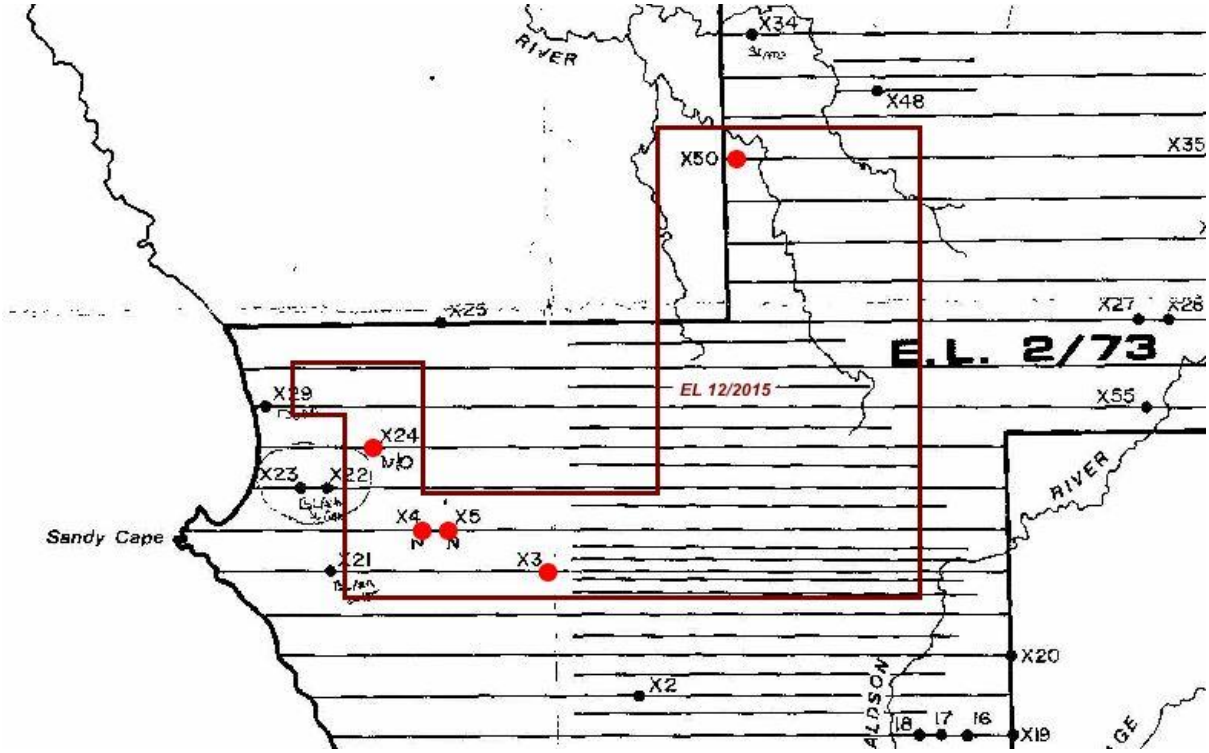

figure 2.9: INPUT EM survey grid lines and anomalies, EL 2/1973 Esso (Neale, 1973)

CRA Exploration held the area covered by EL 12/2015 as part of their large EL 1/77 which included all of the Balfour copper project tenements held by Zebs Minerals Pty Ltd. They followed up regional aeromagnetics and stream sediment panned concentrate tin anomalies with further ground magnetics, geological mapping and stream sediment sampling. They relinquished much of the area of EL 12/2015 but retained a portion running along strike from the Balfour copper trend (Porter, 1980; Weir, 1982).

CRA carried out helicopter supported reconnaissance stream geochemistry sampling in the Dohertys Pimple/Mt Holloway area in 1984/85 (Weir, 1985). Anomalous base metals and/or gold led to the locating of old mine workings which were sampled with the workings near Dohertys Pimple assaying best 3.98% Cu and 0.45g/t Au, and those northwest of Mt Holloway assaying best 12.5% Cu and 0.1g/t Au (Weir, 1985).

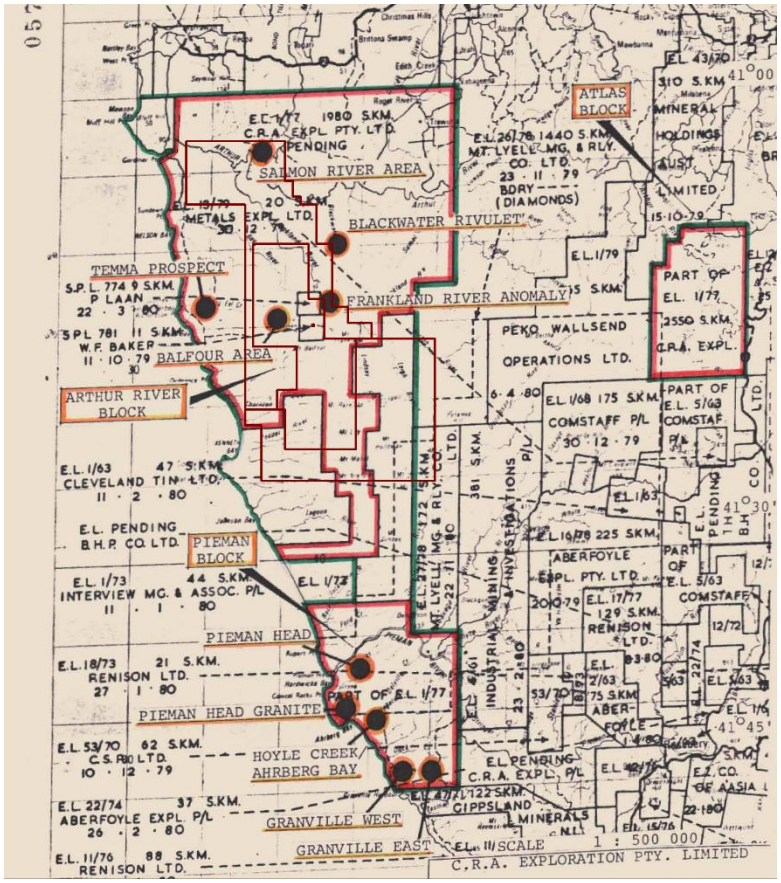

figure 2.10: EL 1/77 CRA Exploration.

The Mt Lyell Mining and Railway Co. pegged EL 27/1978 which included the southeastern corner of the licence including the Toner River area. Their only fieldwork consisted of stream sediment sampling with analysis for Cu, Pb, Zn, Co, Mn, Ag, Fe, Sn, W03, Mo, Au and S (Hutton, 1981a & 1981b). No anomalies were detected.

EL 26/1981 was pegged over the same area as EL 27/1978 by J.R. Stephens but there is no report in MRT's database.

The EZ Company pegged the eastern part of the licence as EL 56/1980 and joint ventured with Tennaco Oils and Minerals Pty Ltd to explore for skarn style tin after the Mines Department flew a new aeromagnetics survey. Grids were surveyed over two anomalies and Geoterrex PEM surveys conducted over both grids with augered soil geochemical sampling over the anomaly 1 grid. Only anomaly 2 lies partly on the area of EL 12/2015 in its far southwestern corner, however, no anomalous PEM responses were obtained over the anomaly 2 grid.

Geopeko held the southeastern corner as part of their EL 17/1983 carrying out reconnaissance stream and soil sediment sampling over magnetic anomalies defined by the 1981 Mines Department aeromagnetics survey (Pemberton, 1984a & 1984b). The target model was tin skarn associated with magnetite and/or pyrrhotite. Anomalies Bolt 5, 6, 7, 8 and 9 lie within EL 12/2015 and all were attributed to syngenetic pyrrhotite in siltstone.

Essentially the same area as EL 17/1983 was pegged by Wolston Developments Pty Ltd as EL 34/1985 who appear to have been exploring for silica (Harrison, 1987). Samples collected were considered suitable for metallurgical silicon metal. In addition a pyrite vein in quartzite from just west of the licence assayed 4.7% Cu and 0.27g/t Au. (Harrison, 1987).

There must have been a sale of EL 34/1985 as the following years report (Anon., 1988) by Longworth and McKenzie Pty. Limited was on behalf of Monier Limited. Now the focus was on any mineralisation with a reconnaissance stream sediment programme and limited rock sampling. Samples were analysed for Cu, Au, Ag, Pb, Zn, Sn, Ni, Cd, W, Bi, Ce and La. Much of the sampling was done outside of the EL. This work located three outcropping gossans (outside of EL 34/1985 but inside EL 12/2015), two of which had previously relocated by CRA.

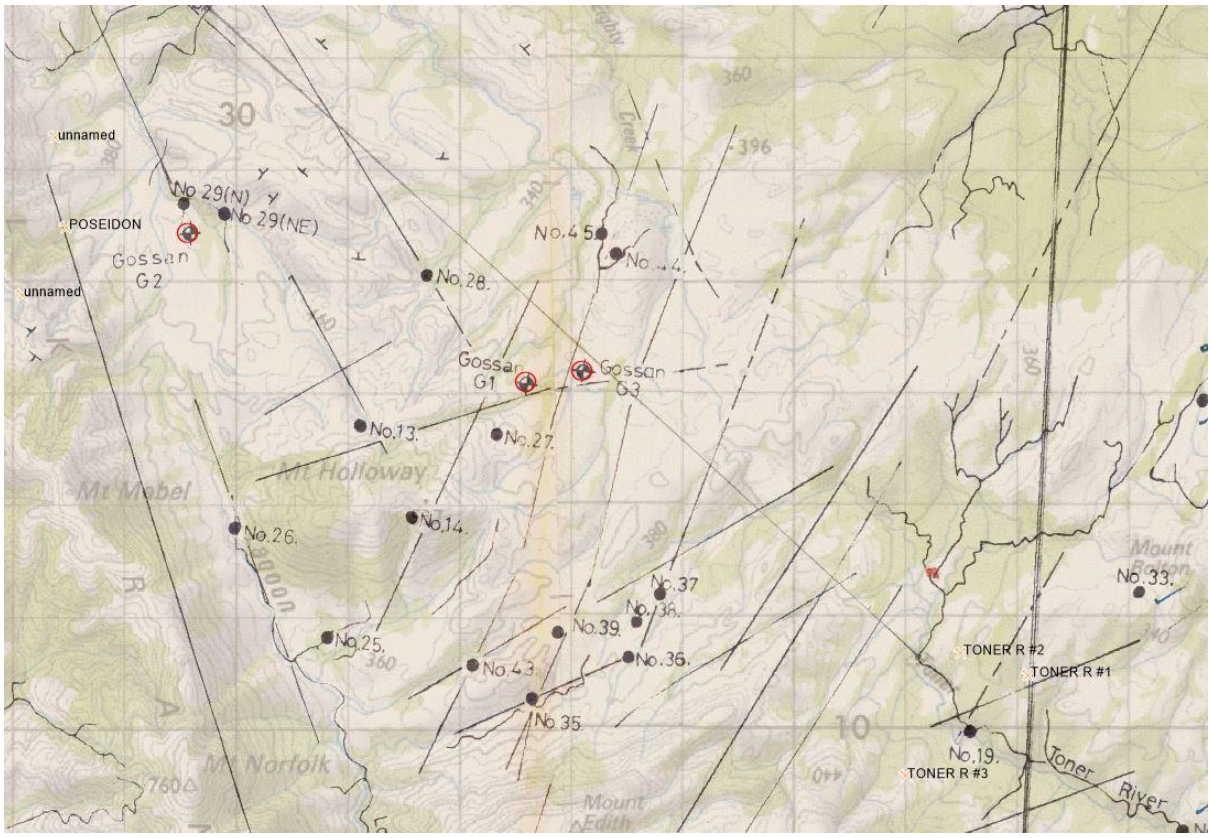

figure 2.11: Location gossan samples G1, G2 and G3 EL34/1985 (Anon., 1988).

Gossan G1 assayed 1.68g/t Au, 22g/t Ag, 12.6% Cu, 34ppm Pb, 164ppm Zn and 165ppm Ni. Gossan G2 assayed 0.26g/t Au, 0.8g/t Ag, 0.267% Cu, 10ppm Pb, 9ppm Zn and 12ppm Ni. Gossan G3 assayed 0.043g/t Au, BDL Ag, 0.0152% Cu, 25ppm Pb, 125ppm Zn and 15ppm Ni.

Gossan G1 is most extensive with 2 shafts 5m to 10m deep and a trench across strike 10m long x 1.5m wide x 3m deep adjacent to a fault and an anticlinal fold in the host siltstones. Within the trench a 5cm to 8cm wide vein occurs within a 1m wide zone of limonitic bedrock with pyrite, chalcopyrite, malachite and limonite striking 080° magnetic.

Gossan G2 was reportedly previously located by CRA Exploration with the gossan workings a trench 10m long x 1.5m wide and 1m deep. The mineralisation occurs as a sulphidic vein.

Gossan G3 is worked by a 5m adit into the hill which was not accessed but which contained siltstones with quartz veining and “metalliferous” (pyritic?) mullock (Anon., 1988).

In early March a grid was established over the Copper Reward workings to the north of the Toner River straddling EL 34/1985 and EL 6/1988. Soil, rock and stream sediment sampling was carried out on the grid and ground magnetics, self-potential and VLF-EM geophysical surveys conducted. Samples were assayed for Au, Cu and As with some also analysed for Ba, Sn, Pb and Zn. Best Au was 1.65g/t in a rock

sample from the No1 adit with copper from the No1 adit up to 35.5%, 9.2%, 8.2% and 6.3%. Best soil was 175ppb with three coherently anomalous zones over 100m strike at the 10ppb Au contour.

Recommendations were made for three shallow drill holes but these were not carried out and the licences (EL 6/1988 & EL 34/1985) were relinquished in 1990.

New Holland Mining NL pegged EL 26/1987 (Cromer, 1988). Their appraisal of existing geophysical data led to a recommendation for further gravity data acquisition and some limited lithogeochemical sampling in the southern part of the tenement. It appears this work was not carried out.

Pacific Nevada Pty Limited included the western part of EL 12/2015 in their EL 27/97, one of a number of tenements they pegged over Tasmania's far northwest. Their focus was the magnetite bearing bodies at Strickland, Possum Creek and Little Eel Creek, all to the west of EL 12/2015. They relinquished the part of the licence coincident with EL 12/2015 in 2000 (Newnham, 2000).

Ausvaal Projects Pty Ltd pegged ELs 8/2002 and 10/2002 over parts of ELs 12/2015 and 13/2015 and appraised the recently completed WTRMP heli EM survey results defining a number of conductive anomalies and/or magnetic anomalies worthy of further investigation (Jenke, 2004; Anon., 2004). Only anomaly T18 lies partly within EL 12/2015 at its southwestern corner. This anomaly was attributed to a topographic effect but field checking was recommended (Anon., 2004).

The most recent exploration licence which covered part of EL 12/2015 are Els 57/2007 and 58/2007 over the northeastern and far southeastern parts of EL 12/2015 which were pegged by Regalpoint Exploration Ltd to explore for structurally controlled sediment hosted uranium deposits (Gauci, 2010). Best rock sample collected was 25.4ppm U. Regalpoint dropped the ground immediately following this report.

2.2 During Current Tenement - Zebs Minerals Pty Ltd (2015 – 2020)

There has been no active field work on the tenement with work to date consisting of a desktop compilation of historic exploration work and appraisal of existing geological and geophysical data (magnetics, radiometrics, gravity and a number of airborne EM surveys).

Plans were made for a VTEM survey over the Balfour copper belt which had to be postponed. It is hoped that this survey can be completed in the 2020/21 summer.

3.0 Exploration completed during the reporting period

There was no active field work on the tenement during the reporting period.

Work has consisted of (1) advancing the desktop compilation of historic exploration work and appraisal of existing geological and geophysical data (magnetics, radiometrics, gravity and a number of airborne EM surveys), and (2) planning for a VTEM survey over the Balfour copper belt which extends into the licence area.

4.0 Discussion of Results

The data appraisal work has led to the recognition of areas of higher and lower prospectivity. The lower prospectivity areas are to be relinquished and the higher prospectivity areas retained and made the focus of the coming years exploration activity.

5.0 Conclusions

The areas to be retained and relinquished are shown on figure 1.2 on page 3.

6.0 Environment

There has been no environmental impact to date.

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