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EL 3242 / 4368

CALTOWIE

FOURTH PARTIAL SURRENDER REPORT, FOR THE PERIOD 10/9/2004 TO 9/11/2014

Submitted by
Flinders Mines Limited
2016

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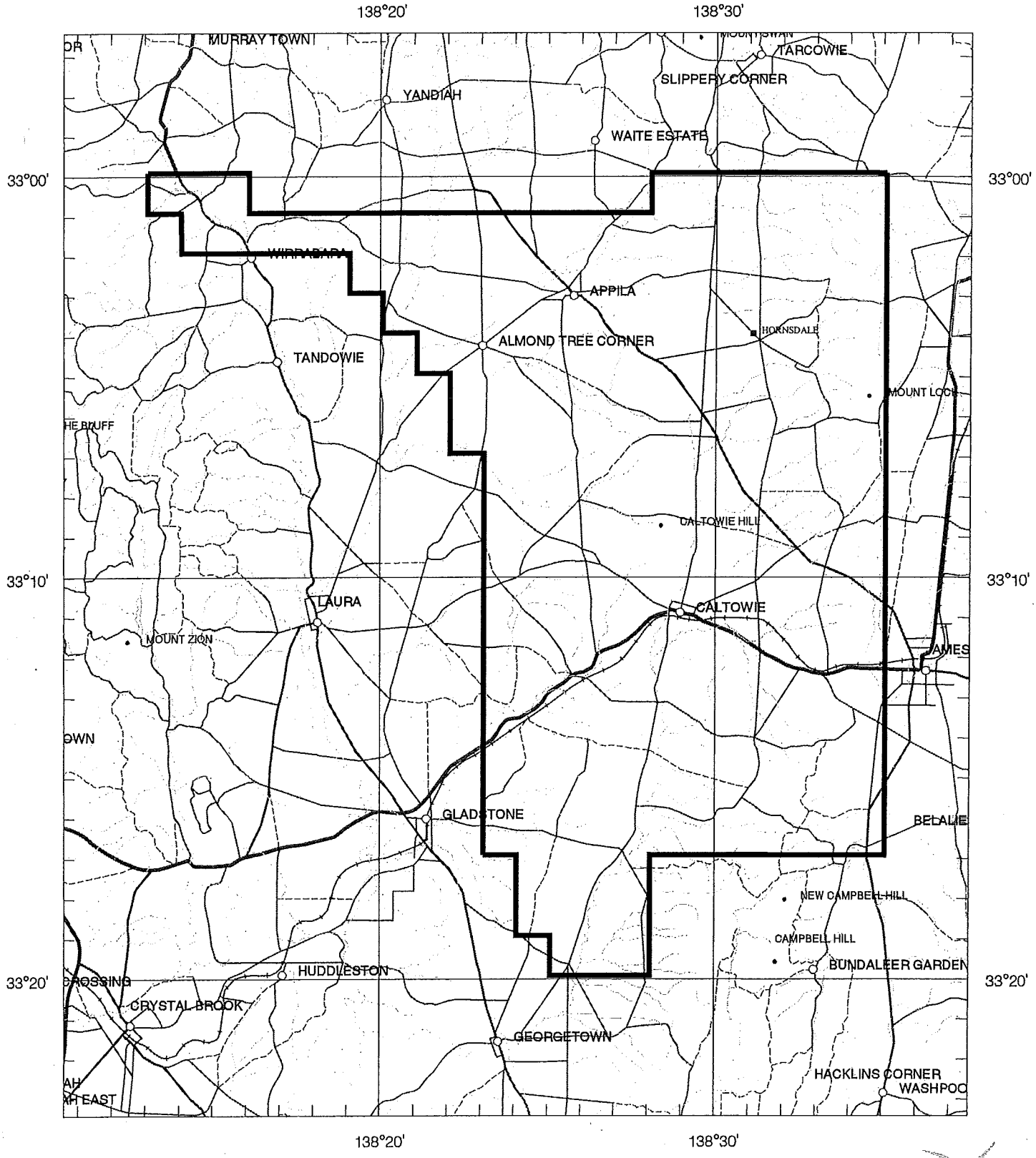
Government of South Australia
Department of State Development

SCHEDULE A



SCALE 1 : 250 000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

LICENCE GRANTED IN : DATUM AGD66

GDA
GEOCENTRIC DATUM OF AUSTRALIA

APPLICANT : **FLINDERS MINES LIMITED**

FILE REF : **202/09** TYPE : **MINERAL ONLY** AREA : **670** km² (approx.)

1:250000 MAPSHEETS : **ORROROO BURRA**

LOCALITY : **CALTOWIE AREA - Approximately 95 km southeast of Port Augusta**

DATE GRANTED : **10-Nov-2009** DATE EXPIRED : **09-Nov-2010** EL NO : **4368**

Flinders Mines Limited

ABN 46 091 118 044

Partial Surrender Report

For the Period 01 January 2011
To
09 November 2014

EL4368

June 2016

Prepared by: K.Brown

Report Number: FMS_1516

DISTRIBUTION:
Department of State Development, Adelaide
Flinders Mines Limited – Adelaide

TENEMENT REPORT INDEX

OPERATOR:	FLINDERS MINES LTD
PROJECT:	Caltowie
TENEMENTS:	EL4368
REPORT PERIOD:	1st January 2011 to 9th November 2014
DUE DATE:	16th June 2016
AUTHOR:	Flinders Mines Ltd
STATE:	South Australia
1 : 250,000 SHEET:	Burra (SI54-05)
1 : 100,000 SHEET:	Pirie 6531; Jamestown 6631
Area km2	670
COMMODITY:	Fe

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SUMMARY

EL 4368 – Caltowie lies approximately 190km to the north of Adelaide. The area was being explored for iron ore mineralisation. A historic iron occurrence and two identified magnetic anomalies considered to have similar characteristics to the Hicks Quarry target have been investigated.
Outcrop is limited with most of the tenement being covered with Tertiary and Quaternary sediments. Basement lithologies are Neoproterozoic units of the Burra Group and are composed of sandstone, siltstone, dolomite and other sediments.

Location and Access

The Caltowie tenement (EL 4368) is located approximately 190km north of Adelaide (Figure 1). The tenement is accessed via the Main North road which passes through Gladstone located to the west of the tenement. Numerous formed roads traverse the tenement.

The Caltowie EL is covered by the Burra 1:250,000 sheet (SI 54-05). No National Parks or restricted areas are noted over the tenements, according to the DSD state GIS dataset.

The Caltowie EL is covered by the Nukunnu Native Title Claim (No. SC96/5). No other claims are known in the area at this time.

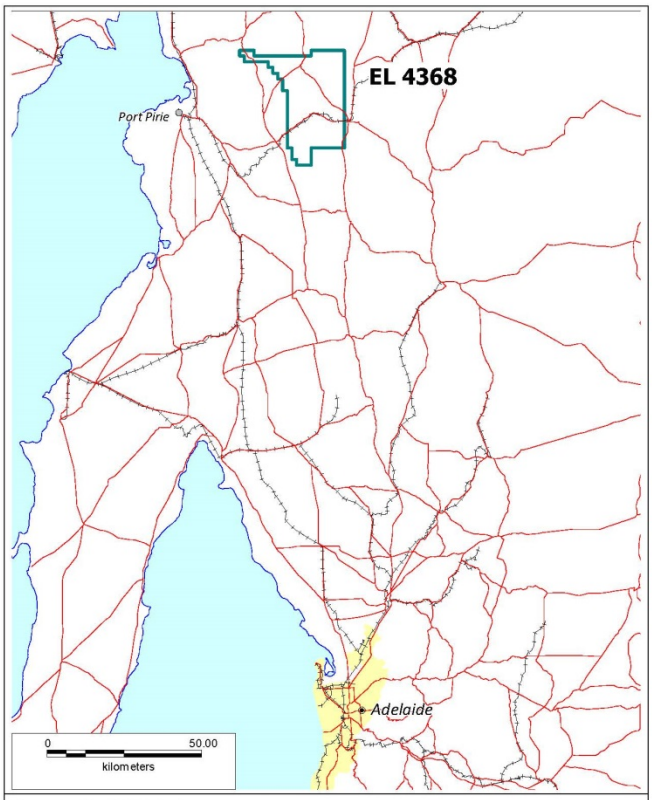

Figure 2 – EL 4368 Caltowie

Tenements

The Caltowie tenement EL4368 was part of a Joint Venture between Flinders Mines Ltd and Copper Range (SA) Pty Ltd (Copper Range), a wholly-owned South Australian subsidiary of Coppers Range Ltd that was floated on the ASX in December 2006.

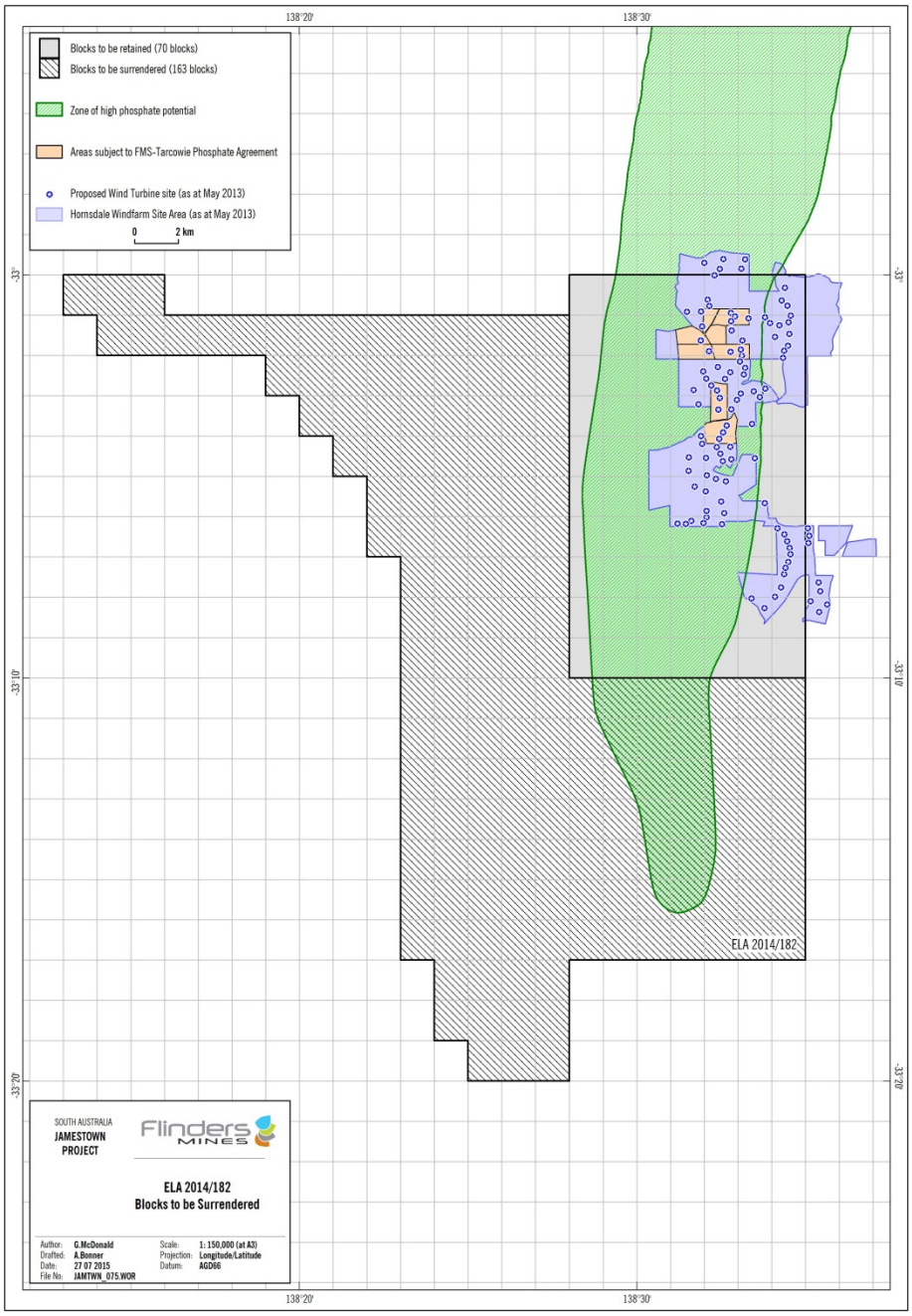

Figure 1: Location of the sub blocks surrendered and retained within the EL4368 tenement, Caltowie Project

Tenement details which form the basis for this Partial Surrender Report is listed in Table 1.

Table 1: Tenement Details of EL4368

Tenement Number	Tenement name	Grant Date	Partial Surrender Date	Area (km2) Surrendered	Area (km2) Retained	Registered Holder/ Applicant
EL4368	Caltowie	10/11/2009	09/11/2014	469	201	Flinders Mines Limited

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Regional Geology

Regionally, the area lies within the Adelaide Fold and Thrust Belt, which contains Proterozoic to late Cambrian sedimentary sequences. Rock types recognised within this Precambrian, fault-bounded intracratonic trough are Neoproterozoic in age (1400 to 570 Ma) with terrestrial and marine clastic, chemical and glaciogenic sediments (Preiss 1987). These formations have been deformed and metamorphosed (generally to greenschist facies) by at least two major orogenic episodes: the Proterozoic Adelaide Fold Belt orogenic event and the later Early Palaeozoic Delamerian Orogeny (Preiss 1987). Following uplift caused by these deformations, erosion of the exposed older formations has taken place and younger Palaeozoic and Cainozoic sediments unconformably overly the Adelaidean sequences in places. The Caltowie project area predominantly covers Adelaidean sediments of the Burra and Wilpena Groups, as well as the Yudnamutana subgroup of the Umberatana Group. These sediments generally strike northwest and have been folded into a series of tight synclines and domes. Other structural complexities are associated with areas of outcropping diapiric breccia (correlated with the Willouran Callana Group evaporitic sediments) at points of structural weakness or in anticlinal cores.

Previous Exploration

- CRA
  After an unsuccessful search for kimberlitic material in the area, CRA undertook a geophysics and drilling program near the old Charlton Copper Mine. CRA was following up on previous aeromag, E.M. and radiometric surveys carried out by Westchester Mining Corporation. CRA ran an IP survey of 3000m on 3 different lines (50m reading spacing), which showed an anomaly they thought might be related to carbonaceous shale and sulfide in the Tapley Hill Formation. To test the anomaly, thought to be around 50m depth, CRA drilled 4 percussion holes but failed to hit the anomaly due to poor drilling conditions and hole collapse; however, trace chalcopyrite was noted in one hole (18m depth). They then completed ground magnetic surveys in the anomalous area that picked out a mag anomaly of unusual and undefined shape, which they concluded was either creek debris or a buried man-made object. They persisted in drilling the original IP anomaly with a diamond drill hole. The 150m hole intersected only stringers of pyrite and graphite with trace chalcopyrite and galena between 16 and 114 meters. CRA concluded that the stringers were the source of the IP anomaly.

- Cultus Pacific
  Cultus Pacific undertook preliminary reconnaissance and sampling of the CRJ area near the Charlton Mine and to the east of the Hick's Ironstone Mine. They noted several aeromagnetic anomalies from Westchester Mining's previous work; however, the relevant pages are missing from the Cultus Pacific envelope and the Westchester SML is not available for download. Cultus did little substantial work, but identified the Yanga Prospect as an area of possible interest.

- Jingellic Minerals
  Jingellic Minerals took up their exploration over part of what is now the Caltowie tenement in search of kimberlitic material. They undertook a fracture study and focused on areas of lineament intersection. One of these intersections (D) is on CRJ ground. 258 ground magnetic readings were taken over a 2.7km2 area. Four magnetic anomalies were discovered and sampled for kimberlitic indicator minerals. No anomalous copper values were present in this area, but geochemical evidence points to a small buried mafic intrusion, possibly dolerite.

- Inca Resources (JV with Craton Resources)
  Inca Resources re-examined old aeromagnetic and ground magnetic data from CRA and Westchester Mining previous work. They drilled the two prominent magnetic anomalies (apparent on the regional TMI map) with an RC rig to test them. In the northern anomaly, they placed two drillholes: LRC-1 and LRC-3. LRC-1 collapsed, but from >15-37m they recorded massive to clay-banded black hematite ironstone underlain by silicified siltstone/silcrete with ochre-yellow hematite veinlets. In hole LRC-3 from 20-43m, Inca reported siltstone clay with quartzite-ironstone-dolomitic siltstone gravel. From 42-169m dolomitic siltstone interbedded with dolomitic limestone underlain by massive to bedded pale green to reddish gray siltstone with hm alteration and scattered pyrite were recorded. At the southern mag anomaly, Inca and Craton Resources drilled hole LRC-2 which passed through dolomitic siltstone interbedded with dolomitic limestone with locally abundant pyrite in calcite veins and disseminated throughout the rock (depth of 86m). No significant base metal intersections were noted.

Work Completed by Copper Range (S.A) PTY LTD

- Gravity

  A gravity survey at the Hicks Prospect defined a robust 2mgal gravity anomaly adjacent to the Hicks Quarry mine. Also, an outcrop of brecciated ironstone was identified to the north of the quarry and was considered to be the strike equivalent of the unit mined at Hicks Quarry. This gravity anomaly defined from the survey was considered a high priority target and required drill testing. Copper Range also identified that drilling for copper and gold in 1998 by a previous explorer in the vicinity of Magnetic Anomaly “A” (Mag A) had intersected what they described as “massive haematitic ironstone”. Analysis of drill chips from drill hole LRC1 for iron produced a significant drill intersection - 25m @ 46.4% Fe from 24 to 49m (end of the hole). Gravity results from Mag A confirm that vertical drillhole LRC1 drilled a small, discrete gravity high. Drillhole LRC3 which failed to intersect significant mineralisation has no associated gravity signature. Approximately 1km north of these drillholes, a +500m long 1mgal gravity target was defined but it was considered too small to be worth drill testing. Field inspection of this gravity anomaly revealed that it occurs in an area of no outcrop. Results of gravity station recordings are attached as Appendix 2 and a logistics report is included as Appendix 3. 6.2 RC Drilling A program of Reverse Circulation (RC) percussion drilling was completed on the Hicks gravity target. Twelve holes were drilled for a total of 1,144m. Holes were located with a GPS using average mode. Drilling was conducted by Budd Drilling using an Explorer 300 drilling rig. The program was completed between the 22ndJuly and 4th August. Samples were collected from the cyclone in large plastic bags with a sub sample for assay collected from the cyclone by either a riffle or cone splitter. Selected samples were submitted to AMDEL for XRF analysis for Fe, SiO2, K2O, MgO, P, BaO, Al2O3, MnO, CaO, S, V2O5, Co, Cu, Pb, Cr, Ni, Zn and LOI. All holes were plugged after drilling and have subsequently been rehabilitated.

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P, BaO, Al2O3, MnO, CaO, S, V2O5, Co, Cu, Pb, Cr, Ni, Zn and LOI. All holes were plugged after drilling and have subsequently been rehabilitated. Low grade iron ore mineralisation was identified from logging of reverse circulation percussion (RC) chips in four holes drilled along strike of the Hicks Quarry iron mine. These holes targeted brecciated ironstone outcrops. Assay results, however, were disappointing - no significant mineralisation was encountered. No significant mineralisation was encountered associated with the gravity anomaly and it was considered that the RC drilling had not conclusively tested the target. A diamond drillhole was proposed to test the gravity target at depth.

- Diamond Drilling

  One diamond drillhole was completed on the Hicks gravity target for 399m. The hole was located with a GPS using average mode. Drilling was conducted by Budd Drilling using an Explorer 300 drilling rig. Selected samples were submitted to AMDEL for XRF analysis for Fe, SiO2, K2O, MgO, P, BaO, Al2O3, MnO, CaO, S, V2O5, Co, Cu, Pb, Cr, Ni, Zn and LOI. The hole was plugged after drilling and has been left open pending a decision to conduct downhole EM. The diamond drillhole intersected black shale horizons at 79.5m, 85m and 103.5m which contained pyrite bands between 0.25 and 2.5cm thick. Fine grained disseminated sulphide (thought to be galena and/or chalcopyrite) was also identified within these pyrite bands. Assaying of these sulphidic intersections however did not intersect any significant mineralisation.

Work Completed During the Reporting Period

No field work was completed during the reporting period.

Conclusions

As per the tenement schedule, it is recommended that Flinders Mines reduces it tenement requirements.