EXPLORATION LICENCE 27625

ILLOGWA CREEK, N.T.

ANNUAL AND FINAL REPORT

TO 19 February 2016

I.R. PLIMER

For

Pierrepont Mining Pty Ltd

April 2016
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<th><strong>Titleholder</strong></th>
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<td><strong>Operator (if different from above)</strong></td>
<td>As above</td>
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<td><strong>Titles/Tenements</strong></td>
<td>EL 27625</td>
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<td><strong>Mine/Project Name</strong></td>
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<td><strong>Target Commodity or Commodities</strong></td>
<td>Copper, lead, zinc, diamonds</td>
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<td><strong>Date of report</strong></td>
<td>April 2016</td>
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LOCATION MAP

Illogwa Creek, Northern Territory: 1:250,000 sheet SF5315

Location of EL 27625 and EL 27663
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Executive Summary

Exploration Licences 27625 and 27663 located approximately 300km east of Alice Springs were granted in July 2010 initially targeting copper and zinc mineralization which was identified by Australian Geophysical in the 1960’s. Additional work was carried out in the area by Poseidon Exploration, Normandy Poseidon and later by Rio Tinto Exploration Pty Ltd. Examination of available data, including drill core for BMR Illogwa Creek No. 6, and field mapping and sampling failed to reveal further mineralization in the Bitter Springs formation overlying the Heavitree Quartzite. ELs 27663 and 27625 are centred on the SE-plunging Limbla Syncline in the eastern Amadeus Basin. The syncline has a distinct topographic and magnetic expression. The central area of the syncline was sampled for heavy minerals to determine if there was any surface indication of mineralization at depth, or indications of kimberlitic intrusions. Further sampling of drainage and trap sites around the around the centre of the syncline, and analysis of the heavy mineral concentrates revealed significant number of garnets and magnetite, but no indicator minerals for kimberlites. No further work will be undertaken and the area will be relinquished.
Tenure

Application was made for the area following relinquishment by Sammy Resources in 2009. Tenure was granted to Robert and Shelagh Krummel on 27th July 2010. The title holder had worked in the area with Australian Geophysical in the 1960s. A number of other companies had subsequently held title, with very little work undertaken. The most recent title holder, Sammy Resources had relinquished part of the area, without undertaking any significant work. The titles were transferred to Pierrepoint Mining Pty Ltd in 2014.

Current tenure:  
EL 27625 12 blocks  
EL 27663 33 blocks

A waiver of tenement reduction has been approved until July 2016. Both Licence areas are being worked as a contiguous project.

Location

The tenements are located approximately 300 km east of Alice Springs, on the Illogwa Creek 1:250,000 map sheet, Limbla 1:100,000 map sheet, accessed via the Ross River road (well graded and maintained) to Ringwood Station, then north from Numery Station to Limbla outstation, on a narrower 4WD road. Access roads throughout the area are well maintained. The Hale River is located on the western side of the tenements, with Bronco Bore providing access to water. Illogwa Creek is located to the east of the tenements.

Aboriginal Land

The titles are both located on the Love's Creek Pastoral Lease, which on 19 July 2012 was transferred to Aboriginal Land. Negotiations on an Exploration Agreement on EL 27625 and EL 27663 have been undertaken with the Central Land Council acting on behalf of the Traditional Landowners, and a draft Agreement was submitted to the CLC.

Previous work

The area had previously been held under exploration licences 6997 (422 blocks, Pulya Pulya Creek) and 6988 (56 blocks, Bullhole Bore) by Poseidon Exploration Ltd starting 9th September 1990 with licence surrender on 15th October 1993. The target was SEDEX Pb-Zn and known Cu-Co mineralization that had been identified in the 1960s in an IP survey followed by drilling by Australian Geophysical Pty Ltd. Regional stream and lag soil sampling, rock chip sampling and an aeromagnetic survey were undertaken. Minor Cu occurrences were noted in altered basalt and Pb-Zn occurrences were restricted to dolomites. Later exploration by the Normandy Poseidon group on ELs 6997 and 7392 Collings Range) undertook gravity surveys that showed thickening of the sedimentary rock sequence.
From 1996 to 1998, Rio Tinto Exploration Pty Ltd undertook rock chip sampling, soil sampling, gravel sampling, ground magnetics, aerial magnetic and radiometric surveys and RAB and RC drilling on ELs9330 (Cleary Creek), 9332 (Loves Creek), 9335 (Moonlight Bore), 9337 (Salt Hole) and 9340 (Albarta Dam). The targets were base metals mineralisation and unconformity-type uranium deposits at the unconformable contact between the Arunta Block and the eastern Amadeus Basin. Although 9 discrete dipolar aerial magnetic anomalies and 33 ground magnetic samples were identified with 15 anomalies having ground magnetic responses similar to a pipe-like source, 113 gravel samples showed no diamonds, no indicator minerals and non-kimberlitic chromite. Australian diamond deposits occur at the margin of the North Australian Craton hence the search for diamond and indicator minerals was logical. Commonly associated with kimberlites are carbonatities and Rio did not explore for carbonatite or associated mineralized alkaline rocks. There were 6 base metals anomalies along the NE margin of the Amadeus Basin, no mineralisation was detected and it was concluded that these anomalies resulted from the scavenging of Fe and Mn in surficial ferricrete. The Bureau of Mineral Resources drilled a stratigraphic hole (BMR Illogwa Creek No 6) in the current EL27663. (BMR Record 1982/37)

Regional geology

The Amadeus Basin of 170,000 km² is a Neoproterozoic-Devonian sedimentary basin that has undergone intracratonic orogenic events in the Neoproterozoic-Cambrian (Petermann Orogeny, 580-530 Ma; SW-NE compression) and Palaeozoic (450-300 Ma). The Basin is part of the larger Centralian Superbasin (Officer, Amadeus, Inindia, Georgina) with Palaeoproterozoic inliers (Musgrave Province, Arunta Complex). The 14 km thick basin is relatively underexplored. Some key sections have been mapped by the BMR (now GA) and the NTGS as part of understanding the Basin architecture through lithology, depositional environment facies analysis, biostratigraphy, geochronology and stable isotopes. In the west of the Amadeus Basin, the uppermost Neoproterozoic sequence and the Cambrian contain the Dingo, Orange and Ooraminna oil and gas fields and the overlying Ordovician sedimentary rocks contain oil and gas (e.g. Mereenie, Palm Valley, West Walker). The Amadeus Basin is clearly prospective for unconventional oil and gas, especially in source rock beds (e.g. Gillen Member, Loves Creek Member, Johnnys Creek Member, Aralka Formation and the Pertatatataka Formation). Zircon ages show that the major provenance has a Musgravian (~1,200 Ma; Camacho et al. 2002; Buick et al. 2005) signature with Palaeoproterozoic (1,500-2,000 Ma; 1750 Ma Arunta; Maidment et al. 2007) and Archean zircons (Camacho et al. 2002).

In the NE of the Amadeus Basin, metabasalt (spilite) crops out in the upper part of the Johnnys Creek Beds (Bitter Springs Formation) and the metabasalt has a strong spatial association with minor surface occurrences of copper. Destruction of pyroxene in basalt releases Cu into diagenetic fluids, one of the model mechanisms for the formation of Zambian Copperbelt-type deposits. However, in the Copperbelt, there are very thick sequences of metabasalt, multiple marine transgressions and regressions with the resultant redox barriers overlying the altered basalts.
Sandstone-type uranium deposits at Angela and Pamela and gold at White Range in the Arltunga Nappe Complex have attracted previous exploration interest. Minor base metal occurrences in carbonate rocks have been investigated. Pervious geochemistry by Australian Geophysics showed that there were no significant stream sediment anomalies downstream from malachite- and azurite-coated outcrops. This is a feature that is not uncommon in arid central Australia.

ELs 27663 and 27625 are in the eastern part of the Amadeus Basin and comprises Neoproterozoic dolostone, limestone, shale, sandstone, siltstone, quartzite, evaporite, diamictite and conglomerate with a shallow regolith (in situ soils, aeolian sediments, and alluvial sediments from the Hale River and associated ephemeral watercourses). The sequence of shallow marine sedimentary rocks with stromatolite fossils (e.g. Ringwood Member of Aralka Formation) and a glaciogene sequence (Areyonga Formation) is typical of the Neoproterozoic in other parts of Australia (e.g. Barrier Ranges, NSW; Flinders Ranges, SA). To the north of the EL, the gently folded Neoproterozoic sedimentary rock sequence unconformably overlaps the amphibolite facies multideformed Palaeoproterozoic Arunta Block.

Geology of ELs 27625 and 27663

The exploration licences are on the eastern section of the Limbla 1:100,000 5950 geological sheet. Thin Cenozoic cover, subcrop and outcrop characterize the area. The Cenozoic cover comprises Aeolian sands, dissected alluvium along the watercourses, scree, colluvium and weathered rock. The west of EL27663 contains the Bitter Springs Formation, a sequence of carbonates, fine grained clastic rocks and rare spilitised basalt. As with many similar Neoproterozoic sequences elsewhere, red siltstones contain cream or green reduction spots. In other places native copper is common in such spots and, although no native copper was recognized in the licences, minor malachite staining was common in the Bitter Springs Formation. The Bitter Springs Formation is the oldest of the Neoproterozoic basement rocks and the Formation is overlain by the Areyonga Formation in the NW of EL27663. It contains characteristic Neoproterozoic glacial, fluvio-glacial and clastic rocks comprising siltstone with erratics (ice-rafted drop boulders), sandstones, conglomerate and a diamictite partially covered by a cap carbonate. The Areyonga Formation is equivalent to the Sturtian. Towards the centre of the Limbla Syncline the Aralka Formation is exposed. It comprises clastic sedimentary rocks (shales, siltstones, sandstones) and carbonate rocks (limestone and dolomites [rarely oolitic and stromatolitic] and calcarenite).

No cupriferous veins, mineralised faults, breccias, diatremes or mineralised laminations were observed. There were no costeans pits or old mines in the exploration licences. Elsewhere in the world (Namibia; Flinders Ranges, SA), the stratigraphy equivalent to the Sturtian contains minor copper staining yet no known copper mine occurs in this part of the Neoproterozoic sequence elsewhere in the world.
Exploration concept

ELs 27663 and 27625 are centred on the SE-plunging Limbla Syncline in the eastern Amadeus Basin. The syncline has a distinct topographic and magnetic expression (Figures 1 and 2).

**Figure 1:** Google Earth map of the tenement area showing prominent topography of the plunging Limbla Syncline.
Figure 2: Magnetic image of the tenement area showing Limbla Syncline and transgressive magnetic features.

Processed magnetic data shows the syncline and a single magnetic high along a NW-trending magnetic high (Figure 3) that was coincidental with a circular 300 metre-diameter vegetation and soil anomaly on a topographic low with a slight central topographic high (Figures 4 and 5).

Although basaltic sequences within the Neoproterozoic could result in the discrete magnetic anomalies, the strike of the anomaly suggests that it is transgressive to bedding and hence could be a result of an intrusion at depth.

An investigation was undertaken to ascertain whether this circular surface anomaly 14 km NW of Numery Station (24°00’840”S and 135°25’617”E) with an underlying magnetic anomaly at 23°50’291”S and 135°18’337” represented an apophysis of an intrusion at depth.
**Figure 3:** Processed first derivative magnetic image of the tenement area showing Limbla Syncline and transgressive magnetic features.

**Figure 4:** Topographic low and unvegetated anomaly in the axis of the Limbla Syncline.
Figure 5: Central high in the unvegetated topographic low in the axis of the Limbla Syncline coincidental with a magnetic anomaly.

Figure 6: Compilation of previous Cu stream sediment geochemistry in the tenement area. Values too low for follow up.
Rio Tinto Exploration Pty Ltd undertook exploration for diamonds. Gravel samples yielded no diamond or indicator minerals (pyrope garnet, picroilmenite, chrome diopside etc) and chromite collected from gravels was a low-pressure chromite, presumably derived from metabasalts. There was no discussion of other heavy minerals in stream sediments.

Recent work by the Geological Survey of Queensland postulated a Silurian-Devonian plume track that extends from SE NSW (e.g. Cadia-Ridgeway) through SE Queensland into the Northern Territory (Figure 8; Collerson, 2014). Granitic and alkaline intrusions were emplaced when the proto-Australian lithosphere traversed the Pacific Superplume (Maruyama et al. 2007; Torsvik et al. 2010) and hence a new metallogenic province could have been created (Diamantina alkaline province). Because most of this area is covered by later sedimentary rocks and aeolian soils, a program of sampling spinifex was undertaken by the Queensland Geological Survey and this biogeochemical work indicated three styles of mineralization (Au, Cu and Ni in mafic and ultramafic igneous rocks at the terrane boundary, (2) Au, Ag and Cu epithermal mineralization associated with calc-alkaline granitoids, and (3) Sc, Cu, PGE and REE in alkaline intrusives such as carbonatite with associated phosphorite.
The Queensland Geological Survey took more than 3,000 samples of spinifex at the terrane boundary between the eastern Arunta Block and the north Australian Craton/southern Mount Isa Block. Traverses were undertaken normal to the magnetic grain. Covered alkaline intrusions dated at 386 Ma were identified in SE Queensland at Mulligan and Lake Machattie. The carbonatite intrusions and associated alkaline rocks in SW Queensland are characterised by coincidental gravity and magnetic anomalies. The Silurian-Devonian Diamantina Plume Track

Figure 8: The Silurian-Devonian Diamantina Plume Track (from Collerson, 2015)
Track has decreasing age from Fifield/Owendale (NSW) (444 Ma; Glen et al. 2007), Gilgai (NSW) (442 Ma, Fraser et al. 2014), Mulligan and Lake Machattie (Qld) (386 Ma, Carson et al. 2011) to the Merlin kimberlite field (NT) (McInnes et al. 2009).

The Diamantina Plume Track is at least 2000 km long and 200 km wide. If it was wider than 200 km, it is possible that it could have extended into ELs 27663 and 27625. Because the axis of the Limbla Syncline contains a coincidental vegetation, topographic and magnetic anomaly with a grain parallel to the proposed Diamantina Plume Track, it was decided to ascertain from geochemistry whether this anomaly represented an alteration zone above a Silurian-Devonian intrusion related to the Diamantina Plume Track. Although granitic and gneissic rocks have not been recorded in the exploration licence area, there is a possibility that the magnetic anomaly at depth is due to an unroofed granite.

As with many highly fractioned alkali-rich I-type, S-type and A-type granites, the plutons can be flat sill-like intrusions rather than inverted tear drop shape (e.g. Mole Granite, NSW). Furthermore, the roof zone is characterized by rocks through which fluids passed as the granite was cooling and degassing. These hydrothermal fluids transport Cu, As, Sn, W, U, Th, LREE and F, have a distinct REE pattern with high La and Lu and a negative Eu anomaly and roof rocks are commonly weakly metamorphosed, hydrated and veined. Carbonate rocks are the ideal reactive cover rocks because they produce rapid and large pH and Eh changes in hydrothermal fluids thereby stimulating precipitation of ore and indicator minerals.

In ELs 27663 and 27625 spinifex is absent on the Neoproterozoic sequences yet it characterises the Palaeoproterozoic Arunta Block. Sampling of in situ soils rather than spinifex sampling was undertaken.

Work undertaken

Regional Geophysics

An overview of the available regional geophysical data reveals increased magnetic intensities, probably associated with the intrusives located on the western flank of the syncline. A magnetic high of similar intensity is located to the south of the axis of the syncline. However the soil cover in the area is thick, and there are no outcrops.

Further study of the magnetic data suggests that there may have been two phases of activity influencing the emplacement of intrusives, and that what has been previously interpreted as the southern limb of the syncline may be a later intrusive body or a structural influence.
Air Photo Interpretation and Google Earth Image Analysis

Air photo interpretation and Google Earth Image Analysis of the central area of the syncline has revealed moderate variations in the topography, with the appearance of several dome-like structures which have influenced the direction of drainage channels. The edges of these features are marked by very subtle changes in soil cover and colour, and changes in the distribution and type of vegetation.

Regional Geochemistry

Results from the NTGS Regional Stream Sediment Sampling project were reviewed briefly. Cu, Zn and Pb observations confirm results from the Australian Geophysical report. There do not appear to be any additional significant reported anomalies occurring in this area.

Field Mapping & Sampling

Stream sediment samples were taken from drainages to the north of the Limbla- Bullhole Bore access road. (SS 001-SS004) Analyses were quite low, but this is to be expected in carbonate sediments in a low-rainfall regime. However, as these ephemeral streams drain the area of higher magnetic response to the west, it is worth noting the results. Sample results were in the same range as those obtained by Normandy and Rio Tinto Exploration during the 1990’s. (CR 1992/0007, CR 1993/0121, CR 1994/0136, CR 1995-0067)

Work undertaken from July 2015 to January 2016

A field visit was undertaken to the area from 21st September to 2nd October to confirm findings from previous visits. The area around the centre of the syncline was examined, and close inspection of drainages was undertaken. No further geochemical sampling was undertaken, as observations confirmed the presence of small garnets and magnetite close to the centre of the magnetic high in EL 27663. These were not observed further downstream in EL 27625.

All findings were reviewed, and as no other kimberlitic indicator minerals were identified in the samples the decision to relinquish the tenements was made.

Results

Stream sediment and soil geochemistry showed no geochemical anomalies for base metals. However, as noted by Australian Geophysics, stream sediment may be unreliable. Drainages in the area were few, and the Ringwood limestones outcrops in the east of the tenement were limited. Magnetite was ubiquitous in heavy mineral samples from EL27663. The aeromagnetic data (Figure 2) defines the synformal structure and especially the magnetite-bearing basal
Neoproterozoic Heavitree Quartzite. This was probably the source of the magnetite in heavy mineral samples. After magnetic removal of abundant magnetite from heavy mineral samples, the heavy minerals comprising almandine, amphibole, epidote, sillimanite, staurolite and tourmaline suggest derivation from the high metamorphic grade rocks of the Arunta Complex with the epidote, calc-silicate rocks and amphibole possibly derived from dolerite, metamorphosed gabbro or amphibolite. The almandine garnet is typical of high metamorphic grade rocks. Magnetite may also have derived from amphibolite with minor associated quartz-magnetite rocks in the Arunta Complex. Gahnite, phosphates or diamond indicator minerals were not present in heavy mineral separates.

Results are shown in the Appendices.

Conclusions

There was no evidence that base metal mineralisation was present in the carbonate rocks of the Ringwood Member. There was no evidence that the circular structure was geochemically anomalous or was the surface expression of an unexposed alkaline apophysis or diatreme at depth. The Diamantina Plume Track probably occurs well to the east of the exploration licences. The structure may result from a karst, bittern spring or a deeply weathered pyritic carbonate rock. The magnetic anomaly may be real (e.g. dyke or intrusion at depth) or be a processing error.

No further work will be undertaken and the area will be relinquished.
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Sample results from ALS for 310743 to 310751

Sample Locations 2015