Exploration Licence 10383, 10385, 10386, 10387

Mount Liebig SF5216
Mount Rennie SF5215

Annual Group Report

2nd September 2009 – 1st September 2010

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Kajeena Mining Company Pty Ltd
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Executive Summary

Heritage clearances were completed over prospective areas of EL’s 10386 and 10387, resulting in large areas of prospective ground being excluded from exploration. Reconnaissance sampling was completed over the remaining areas with soil (231), rockchip (19), leaf (215) and termite (1) samples collected. No additional sampling was completed over EL’s 10383 and 10385. Areas excluded from exploration were later relinquished.

In collaboration with the Northern Territory Geological Survey, Teck Australia funded a regional gravity sampling program infilling 4km spaced sampling with 1 and 2km spaced sampling. Due to inclement weather delaying the sampling program, the data was not received until the 29th of October 2010. The purpose of acquiring the data was to support regional targeting, particularly for IOCG and other intrusive related systems. Whilst the data was being collected, prospect scale exploration was advanced at the “Glam Rock” prospect.

Detailed prospect scale exploration was completed at “Glam Rock” (EL10386), following up the presence of trace copper in meta-sedimentary rocks previously encountered during regional sampling. The program comprised 100m spaced ground magnetic traverses and 200*200m grid sampling of soil (317) and leaf data (274) and collection of rockchips (55) supporting detailed mapping and petrography. Typical grades of copper mineralisation from prospective units range 0.15 to 0.25 % Cu with elevated gold values to 132 ppb and associated As, Bi, Ag, and Sb. Total strike length of prospective stratigraphy, interpreted from ground magnetics and from soil geochemistry is 2.5 x 0.5 km. Mineralisation is limited to discrete horizons of metasediment interleaved with barren calc-silicate/amphibolites lithologies.

The potential for a large intrusive related system at Glam Rock has been downgraded with no significant mineralization identified and the elevated magnetic response being attributed to magnetite-rich stratigraphy, resulting from metamorphism of Fe-rich protoliths. The nature of copper and gold anomalism remains in question.

Two other geochemical anomalies were identified from regional sampling. “Glam West” is a multi-element base metal and gold anomaly interpreted from leaf geochemistry. “Arrow” is a multi-element base metal anomaly interpreted from soil geochemistry. No further work was completed during this period.
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Appendix 1: Data Submissions

Appendix 2: References

Appendix 3: Metadata Report
1. Introduction

An agreement with Kajeena Mining was established in 2002 to explore for base metals (Zn, Cu, Pb) and nickel over numerous tenements in the Warumpi Province of the Arunta. A Deed with the Central Land Council was executed in 2008 following successful negotiation with Traditional Owners to explore tenements 10383, 10385, 10386 and 10387. This annual group report details the work undertaken for the period September 2, 2009 to September 1, 2010 and follows the previously reported desktop targeting and regional sampling undertaken in the previous year. This report describes work completed in the second year of exploration.

2. Location & Environment

The tenements are located approximately 270km W-NW of Alice Springs and extend non-contiguously to the Western Australian border, a further 220km as shown in Figure 1. The area is semi-arid with variable vegetation, casuarina, wattle and eucalypts. Significant outcrop is generally limited to resistive Heavitree Quartzite and soils are Aeolian with occasional areas of lag and calcrete. Termite mounds are infrequent.

Figure 1: Tenement Location
3. Tenure, Land Access and Heritage Clearances

Negotiations with Traditional Owners to grant the tenements were successful with the tenement granted on the 2nd of September 2008 following execution of an Access Deed with the Central Land Council.

Following preparation and submission of a work plan, a heritage survey was coordinated with the assistance of the Central Land Council over EL’s 10386 and 10387. The resulting report excluded areas from exploration approximating the relinquished areas A..F in Figure 2 and areas A..E in Figure 3. Without the possibility of accessing the areas, the ground was relinquished.

Figure 2: EL 10386 and areas relinquished.

Figure 3: EL 10387 and areas relinquished.
4. Work Completed

a. Reconnaissance Sampling

i. Targeting

Exploration targeting involved the integration of expert weighted layers of geology, structural data, magnetic and spectral anomalies resulted in the delineation and prioritization of exploration targets. This process is described in detail in the previous year’s annual report. Figures 4 & 5 show the targets delineated and the areas relinquished as a result of heritage exclusion. Remaining areas form the basis for reconnaissance sampling.

Figure 4: Exploration targets on EL 10387.

Figure 5: Exploration targets on EL 10386.
ii. Sampling Methodology

The effectiveness of soil sampling in the semi-arid aeolian environment is difficult to assess given the likely transported material and lack of complementing or alternative mediums (calcrete, residual laterite, outcrop and streams). The only other wide spread and consistent medium is vegetation. Given the cost of access and potential for vegetation to highlight buried mineralization through the cover it was decided to obtain both soil and vegetation samples at all locations.

All samples were collected in MGA, Zone52. Sampling was undertaken between the 22nd and 29th of November using 2 field parties based in the community of Mt Liebig.

Soils

Soil sampling involved removing loose surficial material to a depth of 1 to 2 inches and digging a 1m by 1m area to a depth of up to 20cm. A representative sample was sieved to remove course material with the remaining ~550gm stored in plastic zip tie bags. In some places a slightly darkened and ‘clay-rich’ horizon was noted below the typical lighter soils near surface and an additional sample was collected at the same location for later comparison. The traditional lighter samples were suffixed with an “N” with the darker soils retaining the standard ID.

Soil samples were taken as close as possible to vegetation samples and typically no further than 10m away.

Leaf

Generally, a 200 gram sample of vegetation is considered an adequate sample size. This sample was collected by systematically circling the tree, stripping fresh phyllodes from stems in a band between waist and head height. To limit contamination of samples, sterile, powder less gloves were worn on the hand making direct contact with the sample. The other hand is left holding the bag and never comes into contact with the sampled plant tissue. Samples were placed in a pre-numbered calico bag, tied and immediately placed into a poly-weave bag for bulk storage. Gloves were changed at every sample location. The vegetation species was noted and whilst the dominant forms were Acacia, in some cases other species were collected where Acacia was absent. This included Wattle, Casuarina and Eucalypts.
Vegetation provides the other consistent sampling media throughout the region and was collected in most cases to complement the soil data. Trees were sampled evenly in circumference with the outer leaves being collected on the basis that these would be most likely repository for toxins/metals. The trees species and height was noted.

**Rock Chip**

Rock chip samples were taken for purposes of classification and assay where of interest. Detailed notes on mineralogy, grainsize and textural setting were captured. Some samples were also collected with the objective of undertaking petrology, particularly where alteration and or mineralization was noted.

**Sample Locations & Anomalies**

Anomalies are identified as groupings of samples which are spatially adjacent and have multiple elements ranked greater than the 93rd percentile.

Figure 6. November 2009 Reconnaissance. Sample location and sample type. Areas in red identifying areas with anomalous results.
iii. Results

Three areas were identified as anomalous and worthy of further investigation.

Trace malachite was visually identified in meta-sedimentary rocks at “Glam Rock”. The best result was a single rock chip assay at 6107ppm with several other samples returning values in excess of 1000ppm. A subsequent petrology report (Purvis C., 9649) confirms likely high amphibolites facies metamorphism and evidence of trace primary mineralization (bornite, chalcocite) in a mafic sample, suggestive of an original mafic intrusive host.

“Glam West” 10km to the west of Glam Rock is a base metal and gold anomaly. Leaf samples show proximal and anomalous Cu, Pb, Zn, Ag and Au responses. No correlating soil anomalies are observed.

Figure 7: Glam West and Glam Rock anomalous geochemistry.
Glam West Leaf Geochemistry

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Figure 8: “Arrow” a coincident soil zinc, lead and copper anomaly.

### Arrow – Significant Soil Assays

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iv. Discussion

In 2008, 323 vegetation samples were collected and assayed from the westernmost tenements EL’s 10383 and 10385. The data serves as a useful comparison with regard to establishing background values for elements and provides insight as to the geology and associated prospectivity for certain metals. In comparing the 2008 survey data with 2009, copper and zinc have similar background levels and lead has a much higher (4 fold) background (2008). Gold and silver are both difficult to assess given the significant number of samples below detection and the “nuggety” results. For all the above mentioned elements, outliers/anomalies are more significant in the 2008 survey, particularly for lead, gold and silver.

Of all the elevated responses, for all the leaf data, “Glam West” is spatially larger and has more coincident anomaly than any other area.

Comparison of leaf and soil results are inconsistent. At “Glam West” where the multi-element anomalistism is evident in the leaf samples, there is no supporting soil anomalism. Conversely, at “Arrow” the multi-element soil anomalism is not supported by leaf analysis. The transported nature of soils, local geology and affects of surface and ground water could in combination explain the variation. The results do not take into account variation in vegetation type, health or size.

“Glam Rock” is identified as a copper anomaly described in both the soils and rock chips. Anomalous gold is also returned in rock chips. The anomaly is located on an outcropping rise trending NW and is one of three similarly orientated hills.

All three anomalous areas (Glam West, Glam Rock and Arrow) are worthy of further field examination, possibly with the collection of more soil and vegetation samples, ground geophysics and if warranted basement drill sampling.
b. Prospect Sampling “Glam Rock”

i. Introduction

Of the three anomalies identified, Glam Rock was rated most highly given the greater likelihood of mappable outcrop and visible trace copper. The prospect is located on the northern edge of EL10386 in an area identified as the West Arunta.

Field work was completed between the 24th of May and 16th of June 2010.

![Figure 9: Expanded diagram showing Mt Leibig and the Glam Rock prospect in relation to Teck project area. The red polygon outlines the area cleared of cultural heritage issues and approved for ground disturbing activities. Main access route from Mt. Leibig to Glam Rock is shown by the black polyline with the May/June field camp location shown in blue.](image)

ii. Methodology

Geological Mapping

The geological mapping component of the field work was completed examining (1) structural and lithological mapping of Palaeoproterozoic ‘basement’ and (2) Regolith-Landform mapping of the surficial environment. Lithological polygons and symbols were mapped to a series of printed and laminated Quickbird images at a scale of 1:1,500 cm. Mapping symbology
was adopted from McClay, (1987). Surficial geology was also mapped according to the Australian Standard developed by CRCLEME (Pain et al., 2000). Soil classification conforms to the method defined by Isbell (2002).

**Field Portable X-ray Fluorescence Analyser - Niton.**

All users were trained in the use of the machine and users were observed to adhere to strict safety protocol during use and storage of the device. Measurements were taken on rocks along 400 m long traverses, spaced 100 m apart. Traverses were oriented perpendicular to the foliation in the outcropping part of the clearance area see figure 10 below.

![Teck West Arunta Project Niton Traverses and Quickbird Imagery](image)

**Figure 10:** Glam Rock Prospect showing planned Niton traverses over outcrop.
Soil and Vegetation sampling

Soil and vegetation sampling was completed over the cleared area with a 200 x 200 m spaced grid sampling program shown in figure 11 below.

![Figure 11: Soil and vegetation sampling grid. Grid spacing is 200 x 200 m.](image)

Sampling protocol required site selection on two primary parameters: 1) proximity to planned sample site and 2) target Acacia species. Sampling methods are similar to that described above (XX) with the added requirement that only Acacia’s within 50m of a sample could be sampled. If none were present, no leaf samples were collected.
Figure 12: Niton survey showing copper values, n=369.

Figure 12 above shows transect lines and Niton XRF analysis results over the Glam Rock area. Note the mineralised responses in the two low hills to the south and east of the central Glam rock prospect.

iii. Geological Mapping

Mapping focussed on delineating major stratigraphic packages of the Palaeoproterozoic stratigraphy. Considerable effort was undertaken to accurately describe significant structural features and define the overall architecture of the deformed stratigraphy. Presented below (fig. X) is a composite fact map showing exposed geology and regolith-landform geology for the Glam Rock Prospect.
Figure 13: Geological map of the Glam Rock area completed during the 2010 field program.

Stratigraphy

Stratigraphic Sequence, for Glam Rock as interpreted from field mapping, May-June 2010.

- Strongly epidosed metagreywackes or possible volcanoclastics (?)
- Coarse grained garnet-rich metapsammite (=q-pl+sill+q-emt) with lense/squares of mafic calc-silicate (cpx+hbl+scap+epi). Contact relationship poorly defined.
- Faulted contact (?) inferred from ground magnetics.

Interbedded quartzite and metapelites. Metapelites characterised by biotite and garnet-rich mineralogy with cal+sill+pl+q-emt+hem. Often containing banded to mafic calc-silicates/amphibolites.

- Banded or finely layered calc-silicates. Possibly boudinaged during tectonism. hbl+cpx+pl+scap+epi.

- Interbedded quartzite and metapelites. Metapelites characterised by biotite and garnet-rich mineralogy with cal+sill+pl+q-emt+hem. Minor disseminated mullite, also staining cleaved surfaces.

- Migmatic bi+q+pl+sill gneiss. Trace to minor mullite with distinctive weathered plts on exposed surface.

Dominant lithologies are shown in the following interpreted stratigraphy based on field mapping, contact relationships and interpreted structures from ground magnetics.
iv. Interpretation

Copper mineralisation at Glam Rock is low level and widespread and probably represents geochemical smoke. It is readily identifiable in hand specimen usually confined to two distinct stratigraphic units – interbedded metapelites and migmatitic biotite gneiss. Mineralisation rarely occurs in retrogressively altered shear zones however, the disseminated malachite mineralisation is generally not structurally controlled. There is no obvious link to a large alteration system and the mineralised units are generally thin and interrupted by barren calc-silicate units. Total strike length is interpreted to be up to 2.5 km, however, total thickness of the prospective stratigraphy is interpreted to be thin <500 m, interleaved with barren lithologies and mineralisation is generally intermittent. It is unlikely that this prospect hosts an ore body that would meet the economic thresholds that Teck requires.

Despite the generally low level mineralisation at Glam Rock, the prospect indicates that there is potential for economic copper-gold and base metal mineralisation in the West Arunta Province. The work program completed over this small area is also very encouraging because it demonstrates that the field methods applied in this area are effective at discovering and delineating mineralisation.

v. Petrology

Two detailed reports have been completed for the Glam Rock prospect (Purvis, 2010a; Purvis, 2010b). The petrographic studies have confirmed field notes of Teck geologists of the dominant stratigraphic units and intrusive bodies. The NTGS currently has the metasediments at Glam Rock assigned the metasediments into the Yaya Metamorphic Complex. However, based on re-interpreted aerial magnetics, ground magnetics, metamorphic grade interpretation, empirical lithological association and empirical mineralisation styles, Teck recognises that the rocks could also be assigned to the Madderns Yard metamorphic complex. More detailed findings of the petrographic study of the samples taken from Glam Rock suggest that the rocks of Glam Rock concur with field groupings of the metasedimentary sequence. The study also found that malachite in metapelites and semipelites is partly fine granular and may have replaced in-situ sulphide as well as extending into microfissures within quartz and biotite.
vi. Conclusion (Glam Rock)

Glam Rock is a small exposure of tightly folded and locally migmatised metasediments composed of interbedded metapelites, quartzites, calc-silicates, altered mafic lithologies, including minor ultramafics and minor granite and pegmatitic intrusives. It is possible that the metasediments belong to the Yaya Metamorphics, as suggested by NTGS mapping or to the Madderns Yard metamorphic complex, as suggested by petrological interpretation (Purvis, 2010b). There is widespread geochemical smoke with anomalous Cu, Au, Ag, As, Bi, Sb and locally, Zn. While Glam Rock is unlikely to host economic mineralisation, widespread malachite and bornite occurrences suggest that mineralising processes have been active during the long and protracted tectonic history of the area.

5. Expenditure

<table>
<thead>
<tr>
<th>Tenement</th>
<th>Amount</th>
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<tbody>
<tr>
<td>EL10383</td>
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<tr>
<td>EL10385</td>
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<td>$121085.80</td>
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<td>EL10387</td>
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</table>
6. Conclusion

The 2009-2010 exploration objectives were largely fulfilled resulting in;

- Heritage clearances over tenements 10386 and 10387.
- Regional targeting and sample collection (leaf, soil & rockchips) over tenements 10386 and 10387.
- Acquisition of regional (1km to 4km) spaced gravity data, in collaboration with the NTGS.
- Reduction in tenement holdings over areas excluded from exploration due to cultural heritage.
- Identification of several new leaf and soil geochemical anomalies.
- Completion of prospect scale exploration over Glam Rock.

The late arrival of gravity data did not allow additional target review to be completed during the period and as a result prospect scale exploration was limited to Glam Rock. This also delayed the completion of heritage clearances over EL’s 10383 and 10385.
## Appendix 1: Data Submissions

<table>
<thead>
<tr>
<th>Data File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GR117-09_2010_GA_02_SurfaceGeochem</td>
<td>Leaf, Soil and rockchip geochemistry collected from regional and prospect scale sampling (including “Glam Rock”).</td>
</tr>
<tr>
<td>GR117-09_2010_GA_03_GroundMag.XYZ</td>
<td>Ground magnetic data collected at 100m line spacing over Glam Rock.</td>
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<tr>
<td>GR117-09_2010_GA_04_Petrology.pdf</td>
<td>Glam Rock Petrology</td>
</tr>
</tbody>
</table>
Appendix 2: References


Frater in prep 2006, Mineral Potential of the 1690-1600 Ma Warumpi Province.


NTGS 1:250K Explanatory Notes, Mount Leibig, Mount Rennie, NTGS (various)


Scrimgeour et al 2006, High-T granulites and poly metamorphism in the southern Arunta Region, central Australia: Evidence for a 1.64Ga accretional event.

Appendix 3: Metadata Report

Titleholder Kajeena Mining Company Pty Ltd
Operator (if different from above) Teck Australia Pty Ltd
Tenement Manager/Agent McColl Tenement Services
Titles/Tenements EL 10383, 10385, 10386, 10387
Mine/Project Name West Arunta
Report title including type of report and reporting period including a date
Group Annual Report Sept 2, 2009 to Sept 1 2010
Personal author(s) Kalma AJ, King, R
Corporate author(s) Teck Australia Pty Ltd
Company reference number
Target Commodity or Commodities Zinc, Copper, Gold
Date of report 23rd December 2010
Datum/Zone GDA94/Zone 52
250 000 K mapsheet, Mount Liebig, Mount Rennie
100 000 K mapsheet
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