EXPLORATION LICENCE 25671

ANNUAL REPORT

for the period

7th August 2009 - 6th August 2010

Tenement Number : EL 25671
Tenement Holder  : Suplejack Pty. Ltd. (ACN 109 034 228)
Tenement Name    : Kirkimbie
Project Name     : Copper Flats
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Report Submission : 20th October 2010
DOIR BIBLIOGRAPHIC DATA SHEET

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Tenement Number : Exploration Licence 25671
Tenement Operator : Ord River Resources Limited
Tenement Holder : Suplejack Pty. Ltd. (a wholly owned subsidiary of Ord River Resources Ltd.)
Report Type : Annual Report
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Abstract

Location : Exploration Licence 25671 is located approximately 150 km Northeast of Halls Creek (W.A.) and 580 km southwest of Darwin (N.T).

Geology : The Copper Flats project extends across the Hardman Syncline which contains a sequence of Cambrian to Devonian volcanic and shallow marine sediments, dominated by basalts, limestones and carbonate siltstones.

Work Done : Exploration activities conducted during the period were curtailed to some degree due to the GFC, and a complete internal restructuring of Ord River Resources Ltd. (ORD). The new ORD Board commissioned an independent geological review of the Copper Flats Project.

Conclusions : EL 25671 is considered prospective for copper and silver mineralization. Reconnaissance geological mapping is planned, prior to determination of subsequent geochemical and geophysical programs.
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1. **INTRODUCTION**

Exploration Licence (EL) 25671 was granted to Suplejack Pty. Ltd. (a wholly owned subsidiary of Ord River Resources Ltd.) on August 7, 2007, for a period of 6 years.

EL 25671 is located approximately 610 km south-southwest of the Northern Territory Capital, Darwin, and 310 km south-southeast of the rural Western Australian township of Kununurra. Access to the tenement is via the Duncan Highway from Kununurra (W.A.) or the Buchanan Highway from Kalkaringi (N.T.) or Halls Creek (W.A.), and then via poorly maintained pastoral tracks. Access is limited to those months outside the northern Australian ‘wet season’ (typified as November to April). Intermittent rainfall subsequent to this period further reduces the period in which access to the tenement is possible. Refer Figure 1.

Annual Rainfall for the region is stated as 600 mm per year, with approximately 80% of this falling in the October to March period (Bureau of Meteorology).

Peak temperatures vary from 27C in July to 40+C in the December to March period. Overnight low temperatures range from 10C to 12C in July to 22C to 25C in December to March.

2. **TENURE**

Exploration Licence (EL) 25671 was granted to Suplejack Pty. Ltd. (a wholly owned subsidiary of Ord River Resources Ltd.) on August 7, 2007, for a period of 6 years. The tenement comprises a total of 181 contiguous sub-blocks, totaling 561 sq. km.

The Expenditure Commitment for the period was A$123,000.

3. **REGIONAL and LOCAL GEOLOGICAL ENVIRONMENT**

EL 25671 covers a portion of the Ord Basin sediments and volcanics within the southeastern limb of the asymmetric Hardman Syncline. Deposition of post orogenic sequences in the region began with the continental Lower to Middle Proterozoic Birrindudu Group, commencing probably about 1.7Ga and composed of coarse clastic sediments with minor felsic volcanics, shale and limestone. This sequence is overlain unconformably by the Victoria Basin succession, commencing with siliciclastic sequences with minor tuff and carbonates. Carbonates and evaporates become more dominant towards the middle of the succession and are succeeded by siliciclastic sequences and a final carbonate shelf sequence. Refer Figure 2.

Regional uplift terminated deposition prior to the Cryogenian (Neoproterozoic) period which commenced at 850 Ma. Remnants of several thousand metres of Cryogenian-age glacial and periglacial sediments overlie parts of the Victoria Basin in the Wolfe Creek Basin.

Cambrian sequences, now preserved in the Hardman Syncline, commenced with the very widespread Kalkarindji Continental Flood Basalt, with the Antrim Plateau Volcanics being a major unit in the Northern Territory and Western Australia. Correlatives to the Antrim Plateau Volcanics are known in Queensland and South Australia, and possibly in New South Wales, and as such, indicate the continental scale of the Kalkarindji Continental Flood Basalt Province.

The Cambrian period is characterized by a series of major turns in the APWP (Apparent Polar Wander Path) for Australia and is thought to be the time for assembly of Gondwana Land. Major turns in the Gondwanaland APWP at about 530, 510, and 490-480 Ma represent periods when stress fields within Australia and other Gondwanan continents would have been significantly changed. The APWP bend at about 510 Ma could have been the trigger for the extrusion of the Antrim Plateau Volcanics and correlatives and stratigraphic equivalents in Queensland, western NSW, South Australia and the Northern Territory. Recent age dating of basalt from the Kalkarindji Continental Flood Basalt Province relatively
close to the Copper Flats area gave ages of 504±2 Ma and similar basalts east of the Copper flats area close to the Stuart Highway gave ages of 508±2 Ma. These dates are Middle Cambrian, the same as the palaeontologically dated Headleys Limestone that is now considered to conformably overlie the Antrim Plateau Volcanics. Dated equivalents in NSW and SA are Botomian or late Early Cambrian, the same age as a 250 km long dyke in the west Kimberley (513±12Ma) that is considered to be an Antrim Plateau Volcanics equivalent.

The Antrim Plateau Volcanics in the Northern Territory and Western Australia are succeeded by limestone deposits dated at early Middle Cambrian. The Middle Cambrian extends from about 509 - 500Ma. The interpretation is that there is only a short time lapse between the extrusion of the Antrim Plateau Volcanics in a continental scale event and crustal sag with sedimentation of the limestones and overlying formations.

Overlying the Antrim Plateau Volcanics is the Goose Hole Group, consisting successively of the massive micritic Headleys Limestone with minor stromatolitic units, particularly near the base, the Nelson Shale which consists of carbonatic siltstones and mudstones and thin gypsum beds at numerous intervals, the richly fossiliferous Linnekar Limestone and the Panton Formation, consisting of siltstone and lesser arkosic sandstones and mudstones and minor limestones. These units form the Negri Subgroup of the Goose Hole Group and are overlain by the Elder Subgroup that consists of the Eaglehawk Sandstone, a marginal marine to fluvial fine feldspathic sandstone and minor siltstone, overlain by the Overland Sandstone, a clayey lithic arkose unit.

4. CONCEPTUAL GEOLOGICAL and MINERALIZATION MODEL

The Michigan Copper Belt on the Keweenaw Peninsula, Michigan, U.S.A., has produced approximately 7 million tonnes of copper and significant silver. Copper mineralization consists of structurally controlled native copper-dominated mineralization, in fragmented and amygdaloidal basaltic rocks and interbedded coarse grained sediments of the Portage Lake Volcanics, as well as stratabound mineralization in the overlying Nonesuch Shale.

Mineralisation is a basin wide phenomenon, with the major deposits of native copper hosted by the Portage Lake Volcanics in the Calumet area (over 5 million tonnes Cu metal) separated by about 100 km from the lesser native copper deposits and the sulphidic White Pine Deposit (approx 1.9 million tonnes Cu metal) in the Nonesuch Shale at White Pine.

The origin of the Cu-Ag mineralization is thought to be the basalts that were heated and leached by either circulating water within the sequence, driven up dip from the axis of the Lake Superior Syncline, or from recharged water fed from local highlands through the deeply buried parts of the sequence.

Fluids appear to have been generated at low temperatures, with estimates of between 180±40 degrees and 0.5 kbar, or about 2 km depth, for the zeolite-pumpellyite metamorphism, to 280±40 degrees for the deepest epidotised basalts seen.

Fluid inclusions from cements coeval with mineralization at the Spar Lake Cu-Ag Deposit in Montana, U.S.A., show a zonation from 60 degrees at the fringes of the deposit to 170 degrees in the centre.

Fluid migration up dip along permeable channelways proceeded to about the epidote facies to prehnite-
pumpellyite and chlorite facies transition boundary, around which deposition of the predominantly native copper mineralization took place in structurally controlled sites.

Mineralization in the overlying Nonesuch Shale does not show strong structural control but appears to have permeated into the porous shales at a low temperature and in the primary zone deposited a mineralogical sequence of pyrite-chalcopyrite-bornite-chalcocite-greenockite, similar to the zonation seen in the Zambian Copper Belt and the Kupferschiefer in Western Europe. Haematized zones are associated
with the base of the Kupferschiefer and with the native copper lodes in the Portage Lake Volcanics (Temby et al., 2007).

Mineralization found within the Copper Flats Project area, consists of stratabound layers of chalcopyrite and chalcocite in the Nelson Shale, and stratabound replacements of chalcocite with lesser pyrite and chalcopyrite and secondary malachite at the base of the Headleys Limestone and at the top of the Antrim Plateau Volcanics. Vein style mineralization is also present in the contact zone and below the contact between the Headleys Limestone and the Antrim Plateau Volcanics, as well as disseminated veinlets in possibly stratabound zones within the upper parts of the Antrim Plateau Volcanics. Refer Figure 3.

The model suggested for mineralization is basin dewatering with copper rich fluids derived from the Antrim Plateau Volcanics at depth rising along permeable zones within the Antrim Plateau Volcanics or along fault zones. Permeable zones include stratabound breccia zones that may have been flow front or lateral breccias associated with individual lava flows. Eruption into water may have enhanced the development of breccias. A large volume of basalts would be available for leaching between the synclinal axis of the Hardman Syncline and the known sites of deposition of mineralization. A similar separation between the axis of the Lake Superior Syncline and the Keweenaw District Copper Deposits in the U.S.A. Potential for significant deposits would appear to be present.

Mineralisation precipitates in the fault zones, infills permeable zones in the volcanics, reacts with and replaces the basal limestone zone and also continues up faults that penetrate the limestones. Dolomitisation or siderite replacement of the basal limestone may be a precursor to mineralization.

Dewatering has been focused in part by the impermeable micritic Headleys Limestone that may have formed an aquaclude except where pierced by faults. Along these faults, the outflow of water has formed sand and mud volcanoes, many of which were seen within our tenements. The sand and mud were derived in the main from the Antrim Plateau Volcanics and gave rise to the dark colour of the volcanic facies material seen both underlying and interfingering with and intruding the limestone. The water is presumed to have intermittently been under some considerable pressure as the limestone around a number of the sand volcanoes appears to have been brecciated by phreatic explosions.

A result of the model is that dewatering may well precipitate mineralization in stratigraphic units higher than the Headleys Limestone such as in the Nelson Shale and the Linnekar Limestone. Possible examples would be the widespread stratabound chalcopyrite and chalcocite mineralization (3 x 2 km) reported by Valdera Resources in the Nelson Shale to the northeast of the Hardman Range. Potential may also lie in the Linnekar Limestone which overlies the Nelson Shale.

The source of the metals is seen as the Antrim Plateau Volcanics that may be up to 5 km thick within the Osmand Range, east and northeast of the tenement areas. Overlying the Antrim Plateau Volcanics are the Cambrian sequences that host some of the known copper occurrences and a mid Palaeozoic sequence of shallow water clastic and carbonate sediments. Sequence thickness in the centre of the Hardman Syncline is thought to exceed 1.5 km and compilation of a composite section of the Antrim Plateau Volcanics and the Goose Hole Group, both of Cambrian age, would suggest a thickness of up to 1.8 km.

An analogy to the mineralized Headleys Limestone is the regionally extensive network of mud volcanoes that is present at the top of the Kuna Formation in Northern Alaska, U.S.A. The Kuna Formation contains giant lead zinc and barite deposits that are located at the top of the Kuna Formation, such as Red Dog and Anarraaq. Regional dewatering is seen as the mechanism for metals transport into the stratiform and stratabound positions of those deposits.

Regional dewatering or sea water circulation and leaching of the volcanic pile at moderate temperatures of less than 200 degrees is seen as the most probable origin for the mineralizing fluids. Temperatures in the volcanic pile may be due as much to residual heat from the time of extrusion as to a probable higher geothermal gradient due to underlying magma chambers. Gradients in excess of 100 degrees C/km could
be possible under these conditions and effective leaching temperatures reached at shallow depths (Temby et al., 2007).

5. PREVIOUS EXPLORATION

Previous precious metal exploration throughout the area defined by EL 25671 has been limited.

CRA Exploration conducted very broad space geochemical sampling of drainages between 1995 and 1997. CRA noted that results were disappointing and no areas of outcropping copper mineralization similar to that found within nearby tenements in Western Australia were located. The tenement was relinquished.

Freeport Australia Inc. and Metals Exploration N.L. (1968 – 1970) and Pickhands Mather International (late 1960s) conducted limited regional exploration across the region

6. EXPLORATION ACTIVITIES COMPLETED

The newly instated Ord River Resources Ltd. (ORD) Board commissioned an independent assessment of the Copper Flats project to better define the Project’s prospectivity, and subsequent required exploration focus and financial commitments.

The highly reputed firm of BDA (Behre Dolbear Australia) undertook the Technical Review. The scope of the Review was all encompassing with DBA required to evaluate all historical exploration undertaken by ORD and it’s subsidiary companies throughout the entirety of the Copper Flats Project. Inclusive of this was all geological mapping, stream sediment and rock chip sampling, drilling, and geophysical surveying. The Review required 30 days for completion.

Other previously planned exploration activities were placed on hold pending the findings of the BDA review of the Copper Flats Project. The ‘Global Financial Crisis’ also contributed to significant delays in implementing exploration activities.

7. CONCLUSIONS

The BDA Review of the Copper Flats Project, of which EL 25671 is located in the eastern portion, concluded with a suite of findings and recommendations. These are summarized below:

- Copper Flats Project appears to have geological features in common with the White Pine region in Michigan, U.S.A.
- ORD’s current exploration model based on the Michigan Model appears to be realistic and appropriate at the current stage of exploration activities
- ORD geochemical threshold values for stream sediment results are reasonable and appropriate
- Copper mineralization occurs within a variety of different hosts including basalt, limestone and ‘sand volcanoes’
- Copper mineralization located at the contact of the Antrim Plateau Volcanics and the overlying Headley Limestone occurs both as stratabound and vein-style mineralization
- Previous ORD drilling was suitably designed to cut across north-northwest trending copper mineralization
- The use of airborne electromagnetic surveying may not be an appropriate exploration tool to discover flat to semi flat lying copper mineralized lode systems
• Previous ORD drilling, limited to 60m (downhole), most likely were too shallow to intersect the base of oxidation, and as such, reported copper intercepts may represent remobilized mineralization, and not the primary source
• Detailed geological mapping is required to better define the relationship(s) between identified copper in outcrop and drill intercepts, with host sequence, structure and alteration
• Trial surface electromagnetic and induced polarization programs may be required

8. RECOMMENDATIONS

Suplejack Pty. Ltd. and Ord River Resources Ltd. are proposing the following exploration activities for the next tenure year. Exploration initiatives are designed to locate and delineate copper-silver mineralization within EL 25671 with similarities to the geological environment of the White Pine region of Michigan, U.S.A.

Potential styles of mineralization include:

• Stratabound copper-silver mineralization in breccias, possibly flat-lying at depth, or more steeply dipping near surface
• Steeply dipping, structurally controlled copper-silver mineralization in dewatering faults
• Relatively flat-dipping stratabound replacement bodies of copper-silver mineralization at shallower depth, formed by precipitation from metal-rich dewatering fluids

Exploration activities to be undertaken include:

• Reconnaissance geological mapping
• Rock chip sampling and assaying
• IP geophysical surveying
• Reverse circulation percussion drilling of all prioritized targets
9. REFERENCES


