

Annual Report 2013 – 2014 for EL36/2010

APPENDIX 2

Report on the Geology and Gold Exploration Potential – EL36/2010

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Geology and Gold Exploration Potential - EL 36/2010

Within EL 36/2010 there are three aspects of the geology which support a worthwhile green-fields gold play.

- Several alluvial and elluvial/regolith hosted detrital gold occurrences, some of which have been successfully mined on a small scale, but no primary source has been located to date.
- A major structure (Brookside Fault) which appears to control the location of the Middleton Creek detrital gold occurrences.
- A carbonate unit (Late Proterozoic Savage Dolomite) which is partially silicified and spatially correlates with several gold occurrences. The origin of the silicification, and any potential links to gold mineralisation, has not been determined to date.

Prospective Geology

The EL covers part of the Arthur Metamorphic Complex (Geological Survey of Tasmania Geological Atlas 1:50,000 Series Corinna Sheet, **Ron, do you have the relevant 25K digital sheet to reference as well?**). An association of Late Proterozoic metamorphosed volcanics, clastic sedimentary rocks and dolomitic carbonates, and several major faults, is strongly aligned in a northeast-southwest tectonic scale fabric. The Proterozoic rocks and derived Cenozoic surficial sediments comprise the entire outcropping geology in the EL.

Exploration potential is focused on the 3km northeast-southwest segment of the Brookside Fault which forms the contact between the Bernafai Volcanics to the northwest and the Savage Dolomite to the southeast. Deeply weathered silicified dolomite, known locally as “silica flour”, is mined as a source of high grade ceramic silica at Brookside, just outside the northeastern limit of EL 36/2010. The deposit sits on an offset segment of the Brookside Fault and persistent traces of detrital gold have been reported from prospecting by the mine operator. Anecdotal evidence suggests this gold is often associated with organic material in the surficial sediments and exhibits particle shapes compatible with in-situ growth rather than alluvial transport.

In Middleton Creek and some tributary creeks and gutters, placer gold workings commenced in 1879 but most production occurred during the 1930s. Chalcedonic quartz “black cement” were recorded as common components of the gold bearing gravels but no primary source of the gold has been recorded. Most of the abandoned workings are within the area covered by EL 36/2010 and amateur prospecting continues today in the shallow gravels and regolith sediments along Middleton Creek.

From the perspective of modern exploration an important aim is to establish the origin of the microcrystalline chalcedonic/lace agate textures in the host quartz gravels, which continue to be noted by current era prospectors. If formation temperatures, trace element signatures and microscopic textures can indicate an epithermal origin, rather than a low temperature near surface silicification event, then the concept of an ultra fine primary

gold source controlled by the Brookside Fault and juxtaposed rock types is upgraded, and the Brookside Fault-Middleton Creek gold play deserves to be rated as a mainstream carbonate hosted epithermal gold exploration target.

Recommended Work Program for the Following Year

- Ground check, map and sample any hard rock workings identified by literature searches of historic mining records and modern company exploration reports.
- Collect coarse detrital gold specimens and investigate their origin by scanning electron microscopy.
- Collect specimens of chalcedonic and cherty quartz associated with placer gold and investigate their origin by fluid inclusion formation temperature studies, trace element concentrations and reflected light microscopy.
- Run three northwesterly trending 500 metre long soil sampling traverses, with 20 metre sample spacing, across the Middleton Creek-Brookside Fault-Elizabeth Ridge terrain. The soil lines would be spaced approximately 1000 metres apart and would span the area of known gold workings in Middleton Creek.

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