## The discovery and mining of the ultra-high-grade Edna Beryl Gold Mine – the trials and tribulations

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## Summary

The discovery of the greater Edna Beryl mineralisation marks a successful journey of systematic, science-based exploration over a nine-year period. It is as much about the tenacity of the Emmerson exploration team and the quest for unlocking the geological code, as about the capability of the Board to secure funding to support this aggressive exploration during the usual peaks and troughs of the capital markets. Like most successful endeavours, the journey has always been with a clear business focus around effective and efficient exploration, taking into account the probabilities of discovery whilst using the failures as the fertiliser for improvement.

The Tennant Creek Mineral Field is famous for hosting some of the highest grade gold and copper deposits in Australia, the majority of which were discovered either by surface prospecting or by innovative modelling of the various magnetic geophysics – the obvious 'tool of choice' considering that the host to the gold and copper mineralisation is predominantly hydrothermal magnetite (locally termed ironstone).

In 2008 when Emmerson commenced exploration in Tennant Creek, it was recognised that most, if not all, of

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the obvious magnetic anomalies had been tested, thus leading Emmerson on a very different journey that was predicated on refining the exploration models with a more holistic view of the entire mineral system across all geological scales. Emanating from this was the hypothesis that oxidised fluid sources played a far more important role in the genesis of these deposit types, and that these fluids were in fact instrumental in the deposition of ultra-high grades of gold and copper. Therefore, much of the research and data collection was specifically aimed at trying to better understand the role of these fluids, their possible connection to the Tennant Event and their pathways via refining the 3D structural framework.

Ultimately this approach has been successful in discovery of the Goanna and Monitor copper-gold systems, the Mauretania gold, and the more recent, ultra-high-grade Edna Beryl gold mineralisation (**Figure 1**). All of these discoveries display the common theme of an association with highly oxidised, hematite-rich fluids and an association typically with little or at best, very weak magnetic signatures (**Figure 2**).

Mining at Edna Beryl is now underway with the first parcel of  $\sim$ 3000 t of ore averaging between 25 to 70 g/t Au – making it one of the highest grade gold mines in Australia, but also presenting some challenges in reconciling of these high ore grades against the surrounding drillholes and projecting them forward into a Life of Mine plan.

Figure 1. Edna Beryl Gold Mine. Note the existing Tribute Area (red outlined insert), plus exploration drive with proposed fan drilling (background colours = gold gram/metre from surface drilling).

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**Figure 2**. Visible gold from the 80 m level at Emmerson's Edna Beryl Gold Mine. Note the association with hematite (steely grey).

## Acknowledgements

We acknowledge the Emmerson exploration team and numerous joint venture partners, the contribution to the geophysics by Jeremy Cook, geochemistry by Ned Howard, and structural geology by Roric Smith.