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**The Origin and Formation of the Albitite Marker,
Otjikoto Gold Mine, Central Namibia**

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The Otjikoto gold mine is situated approximately 310 km north of the capital city, Windhoek, between the towns of Otjiwarongo and Otavi. The Otjikoto gold deposit occurs within the northern stratigraphic zone of the Damara Orogeny, and the deposit is located a few kilometres to the northwest of the lower contact of the “Main Marble Maker” of the Karibib Formation [1]. Gold mineralization is associated with a fabric-parallel sheeted vein system hosted within a package of albitites, marbles, and biotite schists of the Karibib Formation [1]. The deposit is believed to be a structurally and lithologically controlled orogenic gold deposit with several atypical characteristics such as mineralization which consists of thin sheeted veins that are oriented parallel to the regional metamorphic foliation [2]. Mineralisation post-dates regional metamorphism [4] and has been linked by previous workers to magmatic fluids associated with a skarn system [3] and with regional metamorphic fluids [4]. There is a positive correlation between vein density and grade, with individual veins ranging from 1 cm to 10 cm in width [1]. The veins consist of varying proportions of pyrrhotite, magnetite, and pyrite with large rounded almandine garnets, amphibole, and free gold [1]. Previous stable isotope work reported $\delta^{18}\text{O}$ values between 14.6 and 18.3‰ for whole rock material and 16.8 — 19.5‰ for quartz separates [4]. $\delta^{13}\text{C}$ values ranged from -3.8 to +5.4‰ and whole rock δD values are between -46 and -58‰ [4]. Values of the mineralising fluid are comparable to metamorphic fluids in the area of $\delta^{18}\text{O}$ 3—20‰ and δD 0—70‰[4].

This study aims to investigate the geochemical link between gold mineralisation and the so-called Otjikoto Albitite Marker. This marker unit is believed to be associated with propylitic alteration during late stage gold formation along NE trending structures. The unit is duplicated during thrusting and can be traced out in core logs and sections for roughly 300 meters along strike.

References:

[1] Wilton J et al. (2002) Discovery of the Otjikoto gold deposit. Windhoek: Proceedings of the 11th Quadrennial IAGOD Symposium and Geocongress 2002 Anglovaal Namibia (Pty) Ltd: 3-4

[2] Pesce E et al. (2010) The Otjikoto Gold Deposit, Northern Namibia, and the Exploration Potential it Represents. Colorado: Colorado School of Mines: 1-2

[3] Woolfe J et al. (2000) Exploration carried out on the Otavi Project – July 1997 to June 1999. Internal Report. Avdale Namibia (Pty) Ltd: 2-3

[4] Curtis C (2006) Honours thesis, UCT. 33pp.

