

SEG 2024 Conference: Sustainable Mineral Exploration and Development

The Highbury Lithium Deposit, KwaZulu - Natal, South Africa

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The Highbury Lithium Deposit comprises a series of pegmatites within a granulite facies klippe of the Margate Terrane in the south of the Mzumbwe Terrane of the Natal Sector of the 1200-1000Ma Namaqua – Natal Orogeny, South Africa. They are interpreted to have intruded ~1,060Ma making them broadly contemporaneous with the pegmatites of the Namaquan Orange River Pegmatite Belt (ORPB) and those of the Kibaran Belt.

Highbury is the subject of ongoing exploration by SA Lithium after being largely overlooked since its discovery in the late 1980's and described by Thomas et al (1994).

Recent exploration culminating in a total of ~21,000m of drilling and ~800kt of bulk sampling has revealed a significant lithium resource hosted by poorly zoned albite – spodumene type pegmatites of Lithium Caesium Tantalum (LCT) affinity. The Highbury pegmatites are currently the only known occurrence of LCT type pegmatites within the Natal Sector.

Lithium at Highbury is hosted primarily within a symplectic intergrowth of Spodumene and Quartz (SQI) which is interpreted to have formed after petalite because of near isobaric cooling during the waning phases of the Orogeny. Gangue consists of albite- K-feldspar and quartz with minor muscovite, garnet, graphite, and chlorite.

Highbury is unique in context of the Namaqua – Natal Orogeny in that the LCT pegmatites of the ORPB are small, complexly zoned with abundant micas and various Li bearing minerals and undergone late-stage hydrothermal alteration and lithium depletion. The Highbury pegmatites in contrast are un-zoned, with minor mica, and spodumene being the primary Li mineral. Exploration has shown the pegmatites to be continuous along strike (~1.5km) and >500m down dip with drilled pegmatite thicknesses of up to 60m. Current Resource estimates are >75Mt at <1.4% Li₂O (cut-off grade dependent). Deposits of this size have yet to be discovered in the Namaqua-Natal Belt.