

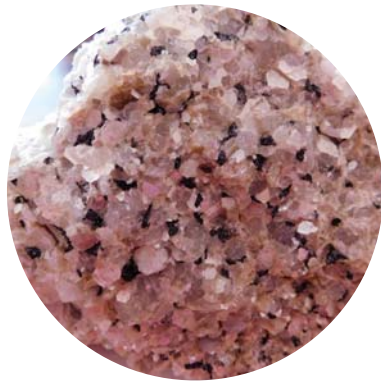


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Value addition in Namibia

At present, only tin and tantalite concentrates are produced in the processing plants at Uis Tin Mine and Tantalite Valley Mine, which are subsequently shipped abroad for further beneficiation.



GEOLOGICAL SURVEY OF NAMIBIA

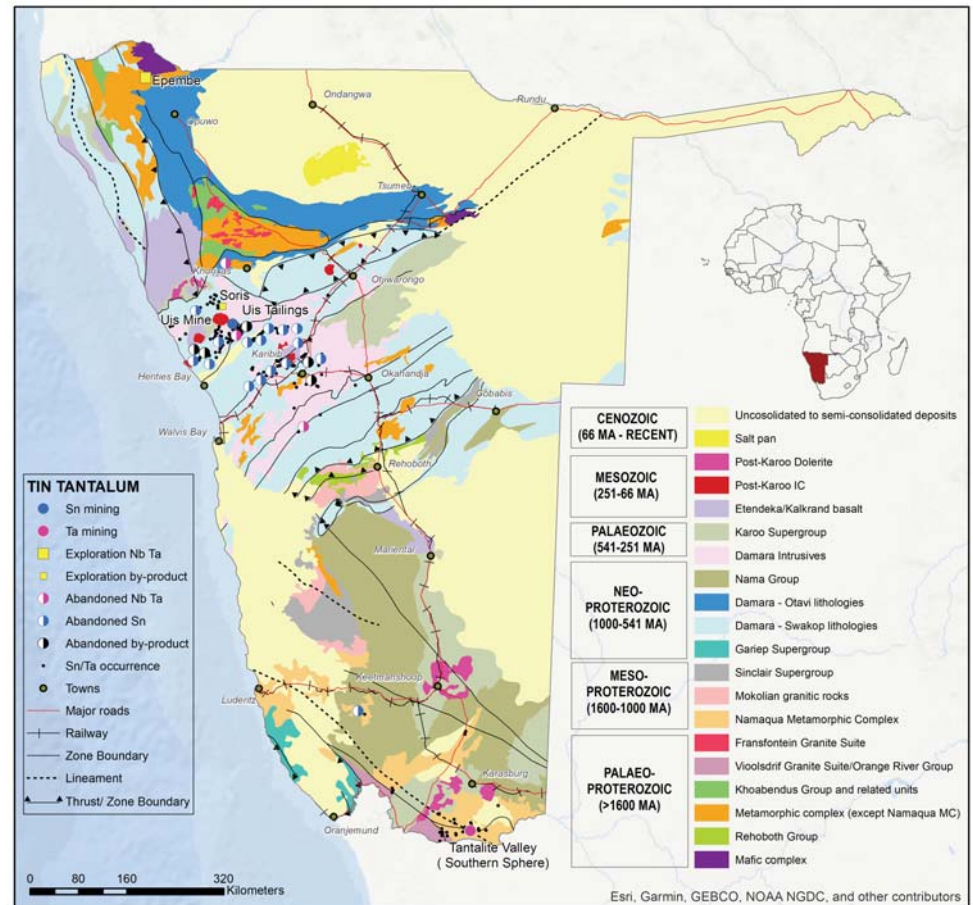


NAMIBIA'S TIN & TANTALUM POTENTIAL



Commodity & Host Geology

Tin and niobium-tantalum mineralisations in Namibia are often associated with one another, but may also occur independently. Cassiterite (tin) as well as columbite-tantalite (niob-tantal) deposits are predominantly hosted within rare-metal pegmatites that occur in two different areas in Namibia (Fig. 1), namely the Namaqua Metamorphic province in southern Namibia (e.g. Tantalite Valley) as well as northeast-trending pegmatite belts in the central portion of the Damara Orogen (e.g. Uis Tin Mine). Disseminated cassiterite and tantalite mineralisation are hosted within both zoned and unzoned pegmatites, oftentimes related to replacement or so-called greisen zones. Other minerals of economic interest that may be associated within the rare-metal pegmatites are lithium- and bismuth-minerals, beryl, tourmaline and to a lesser extent feldspar.



Subordinately, cassiterite is also found in hydrothermal vein systems and replacement units associated with granites of the Damara (e.g. Brandberg West mine). These tin- and tungsten-bearing quartz veins occur in fracture systems and breccia zones. Niob-Tantal in the form of pyrochlore minerals may also be hosted in carbonatite and granite complexes of the Damara Alkaline Province in north-central Namibia (e.g. Epembe Exploration Project).



Historic mining in Namibia

Tin

Between 1919 and 1991 cassiterite was mined in various pegmatites in central Namibia, with (the then biggest tin mine in the world) Uis Tin Mine (1924-90) being by far the biggest contributor. Per year up to 1770 t of tin concentrate were produced. The shutdown of operations was linked to low commodity prices. Besides Uis Tin Mine, tin concentrate was also produced at Brandberg West Mine (1946-1980), Nainais (-1945 and 1979-86 as “TinTan”), Otjimbojo (1912-45) and on a smaller scale from De Rust pegmatite (1960-1990) and Molopo Mine (1966-1971).

Tantalite

Tantalite concentrates were only recovered in small amounts or as a by-product, e.g. in Uis Tin Mine (Namibia's largest columbite-tantalite producer at the time) and from De Rust pegmatite. In central Namibia tantalite was also mined at Strathmore pegmatites (1961-72 and 1980-83), Karlowa Pegmatite (1987), Etiro and Helikon Pegmatite (minor by-product). In the Namaqua Metamorphic Province, historic tantalite mining only took place at Whitkop/Tantalite Valley Pegmatites (1946-1990?).

Current exploration and mining projects

Apart from the mining and exploration projects listed on the stock exchange (see table), there is considerable exploration potential targeting tin mineralisations within the so-called tin-belts of Namibia (Damara Orogen).

Project	Host geology	Status	Ore minerals	Reserves	Resources
Uis	Pegmatite	Active production/ Operating Pilot Plant	cassiterite, tantalite, spodumene		Measured and indicated 34.59Mt @ 0.138% Sn, Inferred 108.49Mt @ 0.044% Sn, 0.006% Ta, 0.415%LiO ₂ (estimate of 2019, S&P Global)
Uis Tailings	Pegmatite tailings	Reserves Development	cassiterite, tantalite, spodumene		Inferred 17.1Mt @ 0.31% LiO ₂ , 0.04% SnO ₂ (estimate of 2018, S&P Global)
Soris/De Rust	Pegmatite	Exploration	spodumene, cassiterite, tantalite, amblygonite, lepidolite	To be evaluated	Targeting 10Mt @ 1% LiO ₂ with tin and tantalum as by-product (source: Montero Mining and Exploration Ltd)
Tantalite Valley	pegmatite	Reserves Development	tantalite, spodumene, lepidolite	Proven & Probable 338kt @ 0.043% Ta (estimate of 2002, S&P Global)	Measured & Indicated 104.8kt @ 0.042% Ta, 0.653% LiO ₂ Inferred 517.4kt @ 0.018% Ta, 0.14% LiO ₂ (estimate of 2019, S&P Global)
Epembe	Carbonatite dyke	Exploration	pyrochlore, xenotime		Drilling anomalies of Ta and Nb (source: Namibia critical Metals Inc)
Helikon/Rubicon	Pegmatite	Feasibility started	amblygonite, lepidolite, petalite, spodumene, tantalite		Measured & indicated 3Mt @ 0.637% LiO ₂ , 0.007% Ta Inferred 5.8Mt @ 0.53% LiO ₂ , 0.005% Ta (estimate of 2018, S&P Global)