

DEPOSIT SUMMARY

Nkana-Rokhana Cu-Co Ore Field - Kitwe, Zambia

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**DATA
METALLOGENICA**

The Nkana mine exploits mineralisation within the Lower Roan Group Ore Formation, more or less continuously over a strike length of 14 km on the SW margin of the Kafue Anticline. In 1988 Freeman estimated the total production + resource was 690 mt @ 2.5% Cu. In 1999 the proven+probable reserve was estimated at 117 mt @ 2.3% Cu, 0.11% Co. Mineralisation at Nkana was first shown to Europeans in 1899, although mining did not commence until 1927, and has continued to the present.

The Lower Roan at Nkana commences with the Footwall Formation which is up to 170 m thick, subdivided into an intermittently developed 0 to 24 m thick Basal Conglomerate; a more extensive 0 to 150 m thick Footwall Quartzite; Footwall Transition, a 20 m thick mixture of alternating arenites, grits & conglomerates; the 10 to 14 m thick Lower Conglomerate; the 15 to 20 m thick Footwall Sandstone comprising almost black interbedded arenites and argillites, with abundant anhydrite, including one local 3 m thick seam; and the impersistent 1 to 4 m thick Footwall Conglomerate.

The Ore Formation is variable along strike. From Mindola in the north, the Mindola Succession passes rapidly into a 600 m wide Barren Gap of 50% thicker massive siliceous dolomite, then back into the Mindola Succession, which persists for another 2 km before gradually grading into the Southern Orebody Succession. The Mindola succession is up to 25 m thick and comprises a basal dolomitic schist, followed by interbedded dolomitic mudstones, dolomitic argillite and siltstones, cherty ore, leached and silicified anhydrite-dolomitic rock, capped by a grey dolomitic argillite to siltstone. The Southern Orebody Succession is composed of a 0 to 4 m thick band of laminated to massive tremolitic dolomite and argillites, followed by the 5 to 20 m thick Orebody Member of black carbonaceous shale to mudstone with lesser dolomite veins and sulphides, which is in turn capped by the 5 to 10 m Hangingwall Argillite as in the Mindola Succession. The ore is primarily chalcocite and bornite with only minor chalcocite. Extensive zones have associated pyrite and little bornite. In the structurally simpler Mindola ores the sulphides are present as disseminations, commonly aggregated into clots and blebs, while in the more structurally complex areas it occurs as large streaks, lenses and cross-cutting veins.

The Ore Formation is followed by the approximately 60 m thick Hangingwall Formation of alternating quartzites, argillite and dolomitic argillite. These are in turn overlain by the Upper Roan carbonates and the Mwashia carbonaceous argillites.

The orebodies have been folded into a steep asymmetrical syncline, with a complex series of *en echelon* drag folds and decollement faults between lithologies of varying competency.

The mine is operated by Mopani Copper Mines plc.

This description is based on information available at the time of writing in 2001. It is a summary of published sources, the chief of which are listed below.

Selected references:

- Fleischer V D, Garlick W G, Haldane R 1976 - Geology of the Zambian Copperbelt (Excerpt covering Nkana): in Wolf K H, (ed), Handbook of Strata-bound and Stratiform Deposits; II. Regional Studies and Specific Deposits *Elsevier, Amsterdam* v6, Cu, Zn, Pb and Ag Deposits pp 275-285
- Jordaan J 1961 - Nkana: in Mendelsohn F (ed), Geology of the Northern Rhodesian Copperbelt *McDonald, London* pp 297-328

References and further information may be obtained from Porter Geoconsultancy www.portergeo.com.au