

Review of Kumba's mineral resources and ore reserves

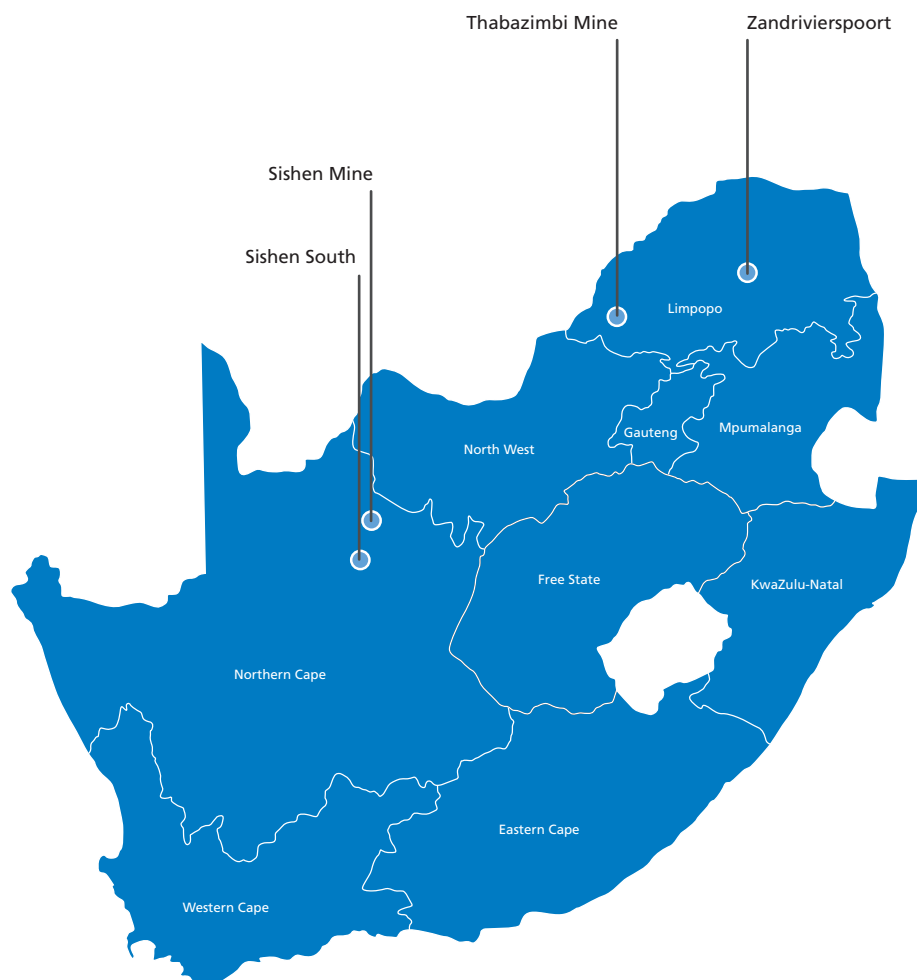


Figure 1: Locality map of Kumba's operations and projects

Mines and projects

Sishen Mine

The bulk of Kumba's iron ore production comes from Sishen Mine, located in the Northern Cape Province near the town of Kathu (*Figure 1*). High-grade hematite iron ore is found in the upper parts of a Lake Superior-type, banded iron formation succession of the Griqualand West Supergroup; the Transvaal Supergroup as it is known where it occurs in the Northern Cape. Due to the long geological time interval between the deposition of the oldest rocks of the Griqualand West

Supergroup, the Campbellrand Dolomite, and the youngest rocks in the area, the Kalahari Group sand, a number of uplift and erosion cycles and deformational events are recorded in the rock record.

In the vicinity of Sishen Mine, the iron ore deposits are located on the western flank of the Maremane Anticline, which strikes north-south and dips shallowly (~11°) to the west. Local structures in the mine area are, however, very complicated and the interplay between the various tectonic events and resulting geological structures were

critical to ore formation and preservation. In general, the high-grade laminated and massive ore is preserved in synclinal and pseudo-graben structures, which are the result of multiple deformation events. Medium- and lower-grade iron ore zones, comprising conglomeratic and brecciated ore, are preserved within deep palaeosinkhole structures on the southern portions of the deposit, where these structures are the result of karstification of the underlying dolomites during periods of uplift and erosion.

All mining at Sishen Mine is done by open cast methods. The current mining process entails topsoil removal and stockpiling, followed by drilling and then blasting of waste lithologies and ore. Overburden is backfilled in the pit or hauled to waste rock dumps on the edges of the pit. The iron ore is loaded according to blending (grade) requirements and transported to the beneficiation plants, where it is crushed, screened into size fractions and beneficiated. Each size fraction is beneficiated using a dense medium or jigging process before stockpiling on the various product beds. Plant slimes are pumped to evaporation dams and the plant discard material is stacked on a dedicated waste dump. Seven iron ore products (conforming to different chemical and physical specifications) are produced from Sishen ore. The ores are reclaimed from the product beds and loaded into trains for transport to local steel mills and Saldanha Bay for export to international markets.

Sishen Mine currently produces 28.4 million tonnes (Mt) of high-grade (>65% Fe) product per annum from the dense medium separation (DMS) plant and is ramping up to the full production of approximately 13Mt per annum at the end of 2009 from the eight modular jig plant (SEP Plant). The jig plant employs beneficiation technology (jigging) capable of beneficiating medium- and lower-grade material to produce a 64% Fe saleable product known as SEP ore.

Thabazimbi Mine

The remaining iron ore production comes from Thabazimbi Mine, which is located in the Limpopo Province close to the town of Thabazimbi (*Figure 1*).

The operation extracts iron ore mainly occurring as basal units within the Penge Formation, a banded iron formation of the

Transvaal Supergroup. It locally features as a series of east-west striking, south-dipping (45°) hills, which are the remnants of the ore-bearing strata that have been triplicated by thrust faulting believed to be the result of the intrusion of the Bushveld Igneous Complex.

The mine beneficiates run-of-mine material in a DMS plant typically located close to the mining areas. Where active mining pits are far from the plant, ore is trucked to crushers located close to the active pits. The crushed material is then transported via conveyor belt to a stockpile that feeds the plant. Fine ore from the Kwaggashoek East pit, one of the current three active pits at Thabazimbi Mine, is screened and does not require further beneficiation before stockpiling on the fine product stockpiles.

Thabazimbi Mine's product is sold exclusively to ArcelorMittal South Africa (AMSA). The mine is a captive business that operates on a cost plus 3% management fee basis. The product is transported mostly by rail to AMSA's steel works at Vanderbijlpark and Newcastle, although limited amounts of lumpy ore were transported by road to Vanderbijlpark during 2008 due to Transnet related logistical constraints.

Sishen South Project

The mining right area is located in the Northern Cape Province near Postmasburg (*Figure 1*) and is situated on the southern tip of the narrow north-south trending belt of iron-bearing lithologies of the Griqualand West Supergroup that host the Sishen Mine deposit towards the north.

Similarly to Sishen Mine, iron ore at Sishen South is preserved in the chemical and clastic sediments of the Proterozoic Transvaal Supergroup, which define the western margin of the Kaapvaal Craton in the Northern Cape Province. The stratigraphy has been deformed by thrusting from the west and has undergone extensive karstification. The thrusting has produced a series of open, north-south plunging anticlines, synclines and grabens. Karstification was responsible for the development of deep sinkholes and the iron ore at Sishen South has been preserved from erosion within these geological structures.

The Sishen South has been designed as a direct shipping ore operation, where conventional open pit drilling and blasting, shovel loading and truck hauling will be used to mine the ore from three different pits.

A combination of run-of-mine buffer- and product- stockpiles will be used for blending to ensure that the product complies with the required specifications. Product size will be controlled via a crushing and screening plant for all buffer stockpile and run-of-mine material.

Pre-stripping at Sishen South is due to commence in July 2009, with the hot-commissioning for the crushing and screening facility scheduled for February 2011 and first production in 2012. Annual production of 9Mt of 64% Fe iron ore product is planned and this will be transported on a dedicated rail link to join the existing Saldanha export system down to the port of Saldanha Bay. The product will be blended with the Sishen SEP ore at Saldanha Bay and marketed to several of Kumba's international clients.

Zandriverspoort Project

The Zandriverspoort prospecting right is located approximately 25km northeast of Polokwane in the Limpopo Province of the Republic of South Africa (*Figure 1*).

Zandriverspoort is a low-grade magnetite deposit in the Palaeoproterozoic Rhenosterkoppies Greenstone Belt, or Rhenosterkoppies Fragment, which occurs northwest of the main, northeast-trending Pietersburg Greenstone Belt. The lower-grade (~35% Fe) ore comprises Archaean-aged metamorphosed banded iron formation that has been exposed to at least three deformational events, which resulted in recumbent isoclinal folding. These deformational events controlled the ore formation at Zandriverspoort as they deformed the total ore zone into a thick (>100m) sequence of magnetite-quartzite that can be separated into several practicably mineable horizons of ~10m.

The project is currently in the prefeasibility study phase and several options in terms of the product specification, product types and annual product volumes are being investigated. It is assumed that a Zandriverspoort product could support AMSA's domestic demand for raw material input to their steel works. Investigations have shown that Zandriverspoort magnetite concentrate could comprise up to 5% of a sinter mix, which yields improved production rates in the iron ore sintering process. However, this product would only support a limited market and alternatives of green micro-pellets or baked mini-pellets, both as a sinter ore replacement, or conventional pellets (as a blast furnace feed) are being investigated to increase the market size for Zandriverspoort.