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WHAT IS FIRST QUANTUM DOING IN BOTSWANA?

*The news earlier this year that copper miner First Quantum Minerals (FQM) – which operates Africa's biggest copper mine at Kansanshi in Zambia – had entered into a strategic partnership with Botswana-focused exploration company, Tsodilo Resources Limited (Tsodilo), was intriguing, given that Botswana has never really been a major copper producer, notwithstanding the recent opening by Discovery Metals of the Boseto copper mine to the south of Maun. To learn more about the motivation for the deal **Modern Mining's** Arthur Tassell recently spoke to James M Bruchs, Chairman and CEO of Tsodilo, and his colleague Dr Mike de Wit, who is President and COO.*

As Bruchs makes clear, FQM's interest in both Botswana and Tsodilo is based on Tsodilo's discovery of what it believes is the south-westerly extension of the Central African Copperbelt of Zambia and the DRC on its tenements in north-west Botswana. "It has become increasingly apparent to us over the past several years that the area hosts a sequence of rocks that is identical in age and composition to those on the Copperbelt," says Bruchs. "First Quantum has seen the potential of the area and hence the partnership agreement. We're delighted to be partnering with them as we have only very limited copper expertise in house whereas they have a proven record in terms of exploration for copper and subsequent mine development. First Quantum now has a team on the ground in Botswana which is busy

launching what will be a very aggressive exploration programme."

Mike de Wit, a well-known figure in African geological circles (earlier in his career he headed De Beers' exploration programme in Africa), notes that there is a particular correlation between the Botswana rocks and those found in the area of the Sentinel-Lumwana-Kansanshi deposits of north-west Zambia, with the same hydrothermal alteration of sedimentary rocks seen in this area having been intersected in several holes drilled by Tsodilo. FQM is developing a new copper mine at Sentinel, where it has defined a resource of 1 027 Mt at 0,51 % copper, and also a new nickel mine at nearby Enterprise, where the resource amounts to just over 40 Mt at 1,07 % Ni.

"The recognition that Katangan rocks, identical to



A CT14 core rig working at one of Tsodilo's sites in north-western Botswana.

those hosting the world-class deposits of the Central African Copperbelt, occur throughout the Tsodilo licence blocks makes this area incredibly attractive as a major new copper play,” he says. “The demonstrated presence of syn-sedimentary faulting and large-scale hydrothermal alteration from our regional drilling indicates that the right features are present for major base metal deposits.”

An interesting point is whether the wider geological world agrees with Tsodilo that its Botswana properties host an extension of the Copperbelt. “One of our board members is Dr Murray Hitzman, a world authority on Iron Oxide Copper-Gold (IOCG) deposits and an expert on the Copperbelt, and he’s utterly convinced,” responds de Wit. “In fact, he was instrumental in putting us in touch with First Quantum. In addition, the geologists from the University of the Witwatersrand in Johannesburg have been driving a large industry-sponsored research project to understand the geology of the region and they have come to the same conclusion.”

The person, incidentally, who first – in 2007 – alerted Tsodilo to the copper potential in its licence areas was University of Cape Town professor, Maarten de Wit (who is Mike de Wit’s brother). He was studying core from one of Tsodilo’s kimberlite targets and immediately noticed the resemblance to the rocks of the Copperbelt.

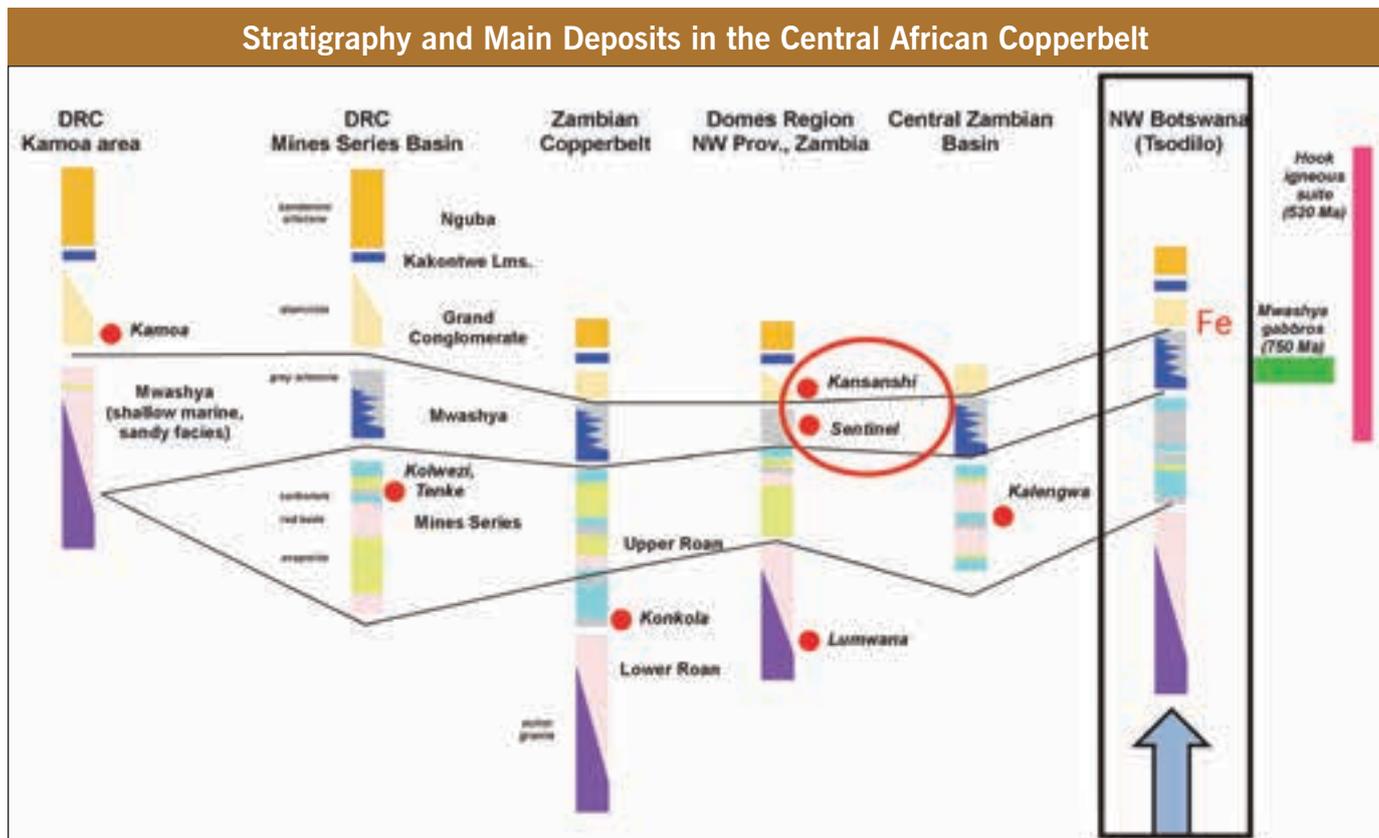
Under the terms of the agreement between Tsodilo and FQM, the latter will – in addition to making an initial strategic equity investment in Tsodilo of C\$2.5 million – also acquire the right to earn up to a 70 % interest in metals prospecting licences in Botswana granted to Tsodilo’s subsidiary, Gcwihaba Resources (Pty) Ltd, by funding exploration expenditure over



Core from the Xaudum project showing the BIF magnetite (with a Cu seam cutting through it).

the next several years. The exact amount to be committed by FQM will depend on various requirements stipulated in the agreement being met but the minimum amount will be US\$6 million over the next two years. The interests to be earned by FQM specifically exclude any rights to iron ore.

One point that needs to be emphasised is that the copper mineralisation seen in the rocks in Tsodilo’s licence area – which covers around 11 000 km² in the far north-west of Botswana (Ngamiland) on both sides of the Okavango River – is not related to that encountered further south in the Ghanzi belt between Maun and Ghanzi. This corridor already has one operating mine – Boseto – and has been dubbed the ‘Kalahari



This graphic illustrates the correspondence between the rocks of the Copperbelt and those in Tsodilo’s licence areas.

Copperbelt' by companies such as Australia's Discovery Metals (which owns Boseto) and US-based Cupric Canyon Capital (which has an advanced project in the area).

Comments de Wit: "Our rocks are much younger than those further south – 730 million years as opposed to 1,1 billion – and the style of mineralisation is quite different. The so-called Kalahari Copperbelt bears no real resemblance – geologically speaking – to the true Copperbelt. Our properties, by contrast, host an actual extension of the Copperbelt – the stratigraphy and structure are so similar that we're talking about one and the same system."

The reason that iron ore has been excluded from the First Quantum agreement is that iron ore has been discovered on Tsodilo's tenements in the Shakawe area. "The investment by FQM will allow us to now accelerate our exploration on what we call the Xaudum BIF magnetite project," says Bruchs. "This deposit – which is similar to the Rapitan iron-formation of Canada – is the first significant iron ore find in Botswana. The project is at a very early stage and we're a long way from having even an inferred resource but we believe Xaudum could shape up into something really big – perhaps at least a billion tonnes of iron ore given that the magnetic anomaly we're targeting is about 50 km in length.

"We have drilled over 20 holes into the deposit and the results look good, with maximum values for iron of up to 57 %. Moreover, Davis Tube Recovery results indicate a recovery of between 71 % and 79 % by magnetic separation with most of the iron reporting in the magnetic fraction."

Proving up a decent-sized deposit at Xaudum looks eminently 'do-able' but the problem then, of course, will be logistics. Botswana's current rail system is inadequate to handle bulk commodities such as coal and iron ore, with the problem being com-



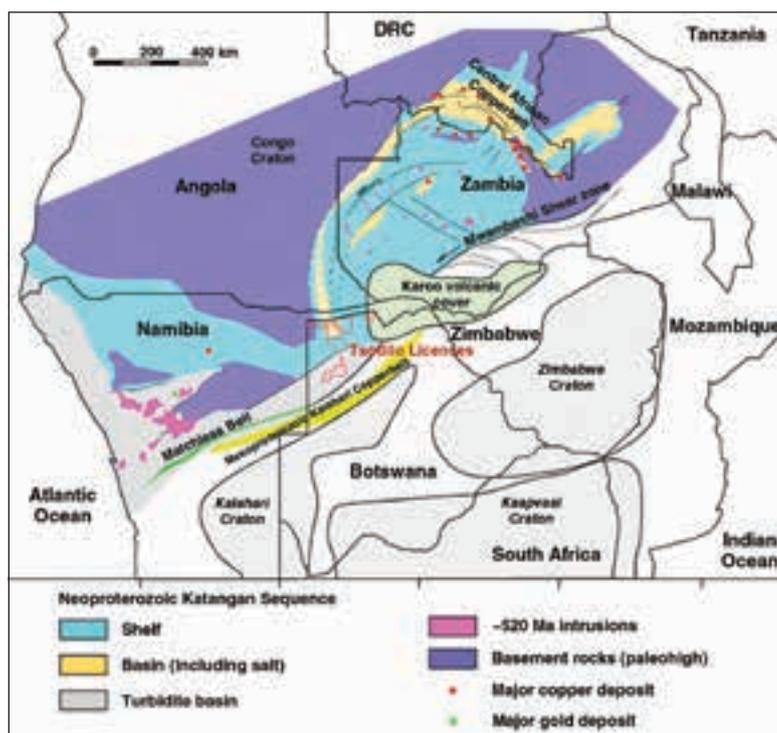
Tsodilo's core shed – where 36,7 km of core is stored – is located in a leased hangar at Maun's airport.

pounded in the case of Xaudum by the fact that it is several hundred kilometres from the nearest Botswanan rail line. The railhead at Tsumeb in neighbouring Namibia could conceivably be used, although this would require the construction of a 400 km rail spur to Xaudum.

Bruchs points out that a mine at Xaudum – assuming a viable resource is defined – is, at the very least, several years away and that by that time progress may well have been made in upgrading Botswana's rail links to South Africa and Mozambique. He also notes that there is a strong possibility of an entirely new rail route through to Walvis Bay or Luderitz (or both) in Namibia – the much-discussed Trans-Kalahari railway – being constructed. While current thinking is that this would run through to Namibia from Gaborone, there is no inherent reason why it could not incorporate links to the Okavango Delta area.

There is also, of course, the option of utilising the iron ore on site and Tsodilo is already tentatively looking at the feasibility of producing briquetted metallic iron ore using Finesmelt technology, an approach which would ease – though not eliminate – the logistics issues.

Whatever the obstacles to developing the Xaudum deposit, Tsodilo is confident that they can be overcome and it has signalled its serious intentions by appointing Dr Alistair Jeffcoate as Project Manager/Chief Geologist to lead its metals exploration and resource development programmes. Previously (for his entire career, in fact) with Rio Tinto, his most recent position was as Senior Geologist on the Simandou iron ore project in Guinea, West Africa. His duties included planning, co-ordinating and implementing the drilling activities on site for a fleet of up to 11 RC and diamond drilling rigs. Between assignments at Simandou



Tsodilo believes that its licence areas in Botswana are located within the south-western extension of the Central African Copperbelt of Zambia and the DRC.

he also worked in Australia's famed Pilbara iron ore region, at the Greater Paraburdoo mines and later on the Koodaideri evaluation project.

While Tsodilo's future seems to be intimately bound up with metals, it is by no means neglecting its diamond exploration, which originally constituted the entire thrust of its efforts in Botswana. The company started life in the mid-90s as Trans Hex International, a subsidiary of diamond miner Trans Hex Group, and was renamed Tsodilo Resources in 2002, after minorities bought out Trans Hex's interest.

Bruchs has headed the TSX-V listed company since 2002. A US citizen with his home in Washington, DC, he is a lawyer by profession but his passion is diamond exploration and he spends a good portion of each year in Botswana. He finds the country a perfect destination in every way, having previously worked in much more 'demanding' areas of the continent, including Chad, the Central African Republic, Rwanda, the DRC and Congo Brazzaville. He leads a Tsodilo team now numbering nearly 40 people, mostly citizens of Botswana, and stresses that the company's resources are all directed into exploration. "I'm the only executive to live outside Africa and Maun in Botswana is our operational base, although we do maintain a very small office in Canada," he says.

The company's core shed – where 36,7 km of core is stored – is located in a leased hangar at Maun's airport. Unusually for an explorer, Tsodilo also has its own drill fleet consisting of two diamond rigs as well

as support trucks – all 6 x 6 to cope with the difficult conditions in the Botswanan bush.

Tsodilo's diamond licences cover 3 255 km² and are held by its subsidiaries, Newdico and Gcwihaba Resources. Apart from a recently acquired new diamond permit south-west of Jwaneng, the licences are all in the north-west of Botswana and take in the Nxau Nxau kimberlite field just east of the Namibia-Botswana border and close to two major unexplained surface concentrations of both diamonds and G10 garnets – the Tsumkwe and Omatako targets – in Namibia. Looking ahead, Tsodilo is planning to complete its first stage assessment of two of the Nxau Nxau kimberlites (K10 and K11) and also has five further targets which are drill ready.

Summing up, Bruchs says that Tsodilo now has a busy time ahead of it with copper, iron ore, uranium and diamonds all in the company's portfolio. "Obviously, there is an enormous amount of work to be done and we are still at the early exploration stage in respect of the metals," he says. "But if these targets do shape up the way we hope they will, the consequences could be very far reaching. Certainly the potential is there to transform Botswana's mining sector, which is over-dependent on diamonds and desperately needs further diversification. We're very excited by developments and hope we will be able to release further good news to the market over the next year or two."

Photos courtesy of Tsodilo Resources

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