

# Uranium in Tanzania – The Next Big Thing?

The curious paradox of the moment is how one can meet so many people who are ultimately bullish on uranium while the price of the mineral remains at decade lows and stubbornly refuses to get off it's behind. While capitulation was passed for many metals in the last few years, in uranium there is always a hard core of very logical people who sustain that its day in the sun is inevitable. We are amongst this group. It is very much a mindset of "buying straw hats in winter".

The last go around the hot spots were Namibia, the Athabasca (a perennial), Australia's Northern Territory and the US Sun Belt. Next time around we should see Tanzania figure prominently as the "Next Namibia". This is not to say that Tanzania didn't capture some of the heat last time around. Back then it was particularly in favour with Australian explorers and Russian strategic buyers. The transaction with Mantra Resources set the bar high, but it's now been years since the area received the focus it deserved so we thought it time to revisit.

## **Secrets is the Sandstones**

Uranium mineralization in Tanzania was first discovered in follow-up exploration to country-wide airborne radiometric surveys completed in the late 1970's in which several anomalies were identified.

Uranium deposits in Tanzania are sandstone-hosted with the most significant deposits of this type contained within permeable sandstones. Mineralization occurs when oxidising fluids transport the uranium into sandstone, where it is deposited under reducing conditions. There are four main types of sandstone deposits, rollfront, tabular, basal channel and

tectonic/lithologic. The host sandstones can be of differing ages with grades typically in the 400-4,000 ppm U.



Most of the active projects for potential uranium extraction are taking place in the Karoo structure, which is the violet coloured portion of the above map. A large part of the southern Tanzania geology comprises Karoo rocks, a 6,000 metre thick succession of terrigenous sediments that accumulated in NNE-NE striking intracratonic basins during the Late Paleozoic-Early Mesozoic. The Karoo structure stretches through Malawi (the location of Paladin Energy's Kayelakera Mine – 46mn lbs grading 802 ppm U<sub>3</sub>O<sub>8</sub>) and then into Zambia (where GoviEx is just acquiring Denison's Mutunga project.

Most of the focus has been on the Ruhuhu Basin and Selous Basin. The Ruhuhu Basin is a typical east-African Karoo depositional sequence. The basal series comprises glacial deposits (hard to imagine, I concede, in sub-tropical Africa), which in turn are overlain by fluvial-deltaic coal-bearing sediments succeeded by arkoses and continental red beds. Transitional carbonaceous shales with coals gradually develop into thick lacustrine series which are topped by Late Permian bone-bearing beds. The depositional evolution of the Ruhuhu Basin was controlled by both tectonic and climatic factors. During the basin's evolution, important energy resources were deposited such as considerable resources of coal and source rocks of moderate potential for hydrocarbon generation. Uranium enrichment is observed in the Triassic arenaceous series with alteration and subsequent cementation.

The mainly sandstone-hosted Uranium deposits of Tanzania are of a type suitable for In-situ leaching ore extraction. About a quarter of the world's identified uranium resources are of the sandstone type, currently contributing to a major share of the world production of uranium. Some of these sandstone deposits are mined thru in situ leaching, which currently

accounts for over 40% of annual world uranium production, which is low cost and can be brought into production faster than other deposit types.

### **The Legislative Environment**

In 2010, the Tanzanian government passed the Mining Act of 2010, which increased royalties on gold and base metals to 4% from 3%; and rough diamond and colored gemstones, to 6% from 5%. Royalties on uranium were set at 5% and other minerals, at 3%. The new legislation also required companies to list domestically, allowed the Government to take a share in future mining projects, and restricted foreign participation in small-scale mining.

In early 2014, Reuters reported that Tanzania was “holding talks” with foreign companies planning uranium and nickel production in the country to ensure the government receives stakes under a 2010 law requiring it to take shares in strategic mines. The President claimed that local business leaders, politicians and activists were pressing the government to ensure Tanzanians benefit more from natural resources. He did not say what level of shareholding the government was looking to take in mines.

While this development was theoretically not news to miners, they do tend to ignore the issue until it rears its ugly head. There has been a change of government since that time but local ownership on the South African model is always a potential threat in the continent.

### **Mantra Resources/Uranium One**

The story of the Mjuku River project is one of consolidation for enormous prices. ARMZ Uranium Holdings Company (an entity of Russia’s state-owned RosAtom) acquired the ASX-listed Mantra Resources in late 2010 for US\$1.15bn. ARMZ initially purchased a 17% stake in Uranium One in 2009 but then moved to 100% control of Uranium One in January 2013.

Mkuju River (confusingly also known as Nyota) is a uranium development project located in southern Tanzania, about 470 km southwest of Dar es Salaam. The Mkuju River project was originally owned by Mantra Resources, in which Uranium One had a minority interest. Uranium One also owned part of the Tanzanian project company directly.

In 2010, Mantra Resources completed a prefeasibility study at the Mkuju River project. The study estimated that the Nyota property could support a new uranium mine with average production of nearly 1,700 tpa of  $U_3O_8$ . Mantra estimated the resources at Nyota as 108.9mn tonnes at a grade of 0.04%  $U_3O_8$ . The latest stated resource we could find was a Measured and Indicated resource of 101.4mn lb  $U_3O_8$  grading 404 ppm  $U_3O_8$ .

### **Uranex (formerly ASX:UNX)**

This company has been morphing into and out of and then back into Tanzanian uranium in recent years. Several years back it announced a maiden Measured & Indicated resource of 6.1mn lb of  $U_3O_8$  grading 237 ppm and a 15mn-25mn lb (at 200-400 ppm  $U_3O_8$ ) exploration target range for its Likuju North Prospect.

Uranex were busy beavers in their heyday. They undertook a prefeasibility study on the Manyoni project with a projected seven-year life and a capacity of between 350 and 400 tpa of  $U_3O_8$ . It also considered extending the study to consider heap leaching that could increase production and mine life. It had announced a revised resource estimate of 92mn tonnes at a grade of 0.014%  $U_3O_8$ .

Uranex also explored at the Mkuju project in southwestern Tanzania in 2010. The 5000 km<sup>2</sup> Mkuju Uranium Project adjoins the aforementioned Mkuju River of Uranium one (ex-Mantra).

We guess it's not surprising but with Uranium looking so grim, Uranex tossed its efforts in the yellow mineral and shifted to

graphite in 2014, changing its name to Magnis Resources. This move worked out for it (one of the few).



And now... Surprise... it is demerging its uranium assets into a new vehicle via a pro rata distribution of shares in Uranium Africa Limited (ASX:UAL). This happened in recent days, which may indeed represent the first swallow of a nuclear summer (to mix a metaphor).

### **Karoo Exploration (TSX:KE.H)**

Karoo has gone into that dark place on the TSX-V where they append a H to your ticker and the executives just hope the monitor doesn't start to flatline. Such is the state of things that holding territory in the promising Mkuju east project area, with its covering of Karoo sediments, is not enough to keep the grim reaper from the door.

Karoo owns a 100% interest in five uranium licences, encompassing 953 km<sup>2</sup> in the Selous Basin of southern Tanzania. A total of 27 anomalies were identified using airborne radiometric data to refine ground targets. At last report, the company had made applications for an additional 2,137 km<sup>2</sup> in the Karoo Basin.

### **Uranium Resources PLC (URA.L)**

The company's main target is the 1,200 km<sup>2</sup> Mtonya project located approximately 60 km south of Uranium One's Mkuju River Project and 100 km east of the district capital of Songea. Its geology consists of Usagaran orogenic basement rocks in the west and sediments of the Luwegu Sub-basin of the Selous Basin in the east. Roll-front style uraniumiferous mineralisation hosted by the Karoo sandstone units is thought by the company to be analogous to that of Mantra's Nyota deposit, which contains an inferred resource of 55.8 mn lbs of U<sub>3</sub>O<sub>8</sub>.

The completion of the 26,485m resource-definition drilling programme in 2012 resulted in the announcement in 2013 of a maiden CIM-compliant Inferred Resource of 2.014mn lb U<sub>3</sub>O<sub>8</sub> grading at 255 ppm. Pretty small stuff though in our estimation.

The problem we have with this company is that during the long drought in investor interest it took a dripfeed of funds from a Russian source (Estes Limited – not a household name, though one of its directors is named Medvedev) and in the process has ended up majority controlled by them without the “benefit” for shareholders of a takeover. Estes now owns 417mn out of the 746mn shares on issue.



Uranium Resources said it is expecting the Mtonya licence to be extended but conceded that it cannot be guaranteed, with the delay in approval being exacerbated by the change in government in Tanzania following the general election.

## **Conclusion**

Our exposure to Tanzania in recent times has been limited to Peak Resources with their REE project in the Southwest of the country. The number of uranium projects, even at the metal's recent highs (admittedly a few years ago now) were never many but the whopping price paid for Mantra put Tanzania on the uranium map, alas just before the massive dieback of uranium explorers.

One thing of note is the on-going intense Russian interest in Tanzania that somewhat mirrors the Chinese interest in Namibia.

With Tanzania regarded as one of the better jurisdictions in Africa these days, we would expect it will be a first port of call when the uranium liftoff takes place and we find the spin-off from Magnis of a new vehicle as a promising sign that

reactivation is not necessarily going to await the spot price stirring from its slumbers.