

The outlook on potential uranium ISL Mining at Nyota Deposit (Tanzania)

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The Nyota Deposit, located in the Karoo sedimentary basin in South Western Tanzania, is currently the subject of a detailed feasibility study by the Uranium One subsidiary, Mantra Tanzania.

The Nyota deposit has JORC compliant resources of 152 Mlb's of U₃O₈ (at a 100ppm cut-off), at an average grade of 286 ppm. The original mining and extraction philosophy was based around an open cast mining operation, and a conventional IX, resin in pulp processing plant, producing up to 7 Mlb of U₃O₈ per year over life of mine of 11 years.

With their extensive ISL experience worldwide, Uranium One recognised that an opportunity might exist to convert a larger portion of the resource to reserves by extending the extraction options to include ISL. Preliminary work done in 2012 on the water table and mineral resource revealed that approximately one third of the resource (up to 50Mlb's U₃O₈) both within and outside the current pit designs, are situated in permeable sediments below the groundwater level and potentially amenable to ISL.

Due to the undulating topography, densely forested area and large proportion of shallow resource above the groundwater table, ISL as an extraction philosophy has not been considered seriously in the past. Furthermore there is no history of successful ISL mining within the regional Karoo basin.

A systematic, toll gated ISL testing program was initiated in 2012 at one of the areas where mineralisation occurs below the water table. The first step was a preliminary hydrological study, conducted in 2012. The results demonstrated that major geological, hydrological and technical parameters are favorable for ISL mining. However, comparing to known roll front type sandstone type uranium deposits for ISL mining, the ore hosting aquifer horizon is unconfined and free flow.

This was followed up with a very successful Push Pull test, conducted in 2013, which revealed the suitability of the mineralisation to leaching with acidic solutions. Uranium leaching with sulphuric acid concentrations of 5, 10 and 20 g/l, with exposure times ranging from 1 to 3 days, demonstrated positive leaching dynamics. Commercial grade uranium content was obtained in the solutions which ranged from 30 to 124 mg/l U.

These R&D successes have led to an increase in confidence that ISL could work, and the planned follow-up work for 2014 consists of an ISL specific resource estimate, a more advanced hydrological study and a 5 spot ISL field leaching trial.

The concept of ISL at Nyota is not without its technical environmental and approvals challenges. Uranium mining is a fairly new concept for Tanzania. It will remain important to work closely with the Tanzanian regulators during the testing. Should ISL prove to be viable, it holds the potential to unlock the region as an ISL production centre.

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