



MANDELA MINING PRECINCT
MINDS FOR MINES

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Mandela Mining Precinct

A programme of the Department of Science and Innovation and Minerals Council South Africa, hosted and managed by the CSIR and the Minerals Council.

CALL FOR INTEREST FROM UNIVERSITIES TO ESTABLISH A SAMERDI RESEARCH CENTRE

INTRODUCTION AND BACKGROUND

Mining Research, Development and Innovation (RD&I) landscape in South Africa has been on a downward decline for many years. The National Development Plan (Vision for 2030) identifies **education, training and innovation** as being at the centre of South Africa's long-term development, and specifically states that *"inadequate capacity will constrain knowledge production and innovation unless effectively addressed"*. This is precisely the situation in the South African mining R&D space.

The **Mandela Mining Precinct (MMP)** was established to **facilitate research, development and implementation (RD&I) in the mining industry** in South Africa. The RD&I work must **focus primarily on the underground gold and platinum sectors** and would focus on **"quick wins"** as well as developing a longer-term strategy. The RD&I must be aligned to industry needs and deliver implementable solutions, focussing more on the higher technology readiness level (TRL) of research.

The MMP is responsible for facilitating the implementation of the South African Mining Extraction Research, Development & Innovation (SAMERDI) strategy, which aims to: *"To maximise the returns of South Africa's mineral wealth through collaborative, sustainable Research, Development, Innovation and Implementation of mining technologies in a socially, environmentally and financially responsible manner that is rooted in the wellbeing of local communities and the national economy."*

The SAMERDI Strategy is achieved via the following research focus areas:

- **Longevity of Current Mines (LoCM)** – Designed to increase the efficiency of ore reserve extraction, improvement in Occupational Health and Safety, the reduction in costs of current conventional mining operations and explore opportunities turning liabilities into assets for future sustainable mining.
- **Mechanised Mining Systems (MMS)** – Aimed at providing sustainable mechanised drill, blast and mechanical rock breaking solutions in advancement to facilitate achieving zero harm, whilst maintaining and defending desired production rates at minimised costs, within the Au, and PGM mining industries.
- **Advanced Orebody Knowledge (AOK)** – Aims to create the ultimate 'Glass Rock' environment which includes improving geological confidence ahead of the face, reduction or identification of risks associated with geology and to have timeous information.
- **Real Time Information Management Systems (RTIMS)** - Aims to develop and implement smart connected systems for mining from sensor to dashboard and facilitate the achievement of 4IR Technology Readiness for Mining.
- **Successful Application of Technologies Centred Around People (SATCAP)** - The aim of the SATCAP Programme is to understand the challenges, effects and impacts of mining modernisation on people in the minerals sector.

To assist with the process of developing and enhancing Mining research capacity, the Mining Precinct plans to **establish a SAMERDI Research Centre (SRC)** at different participating universities. They plan at this stage to have one SRC for each of the programmes that form part of the SAMERDI Strategy.

At this stage, the Mining Precinct has already established four such centres based on an earlier **Expression of Interest (EOI)** run previously, and now plans to establish one for the Advanced Orebody Knowledge Programme (AOK). It is critical that the Universities interested in hosting such a research centre have a **strong faculty of geosciences** which is a core focus for the AOK programme work.

After receiving EOIs from interested universities, those that potentially qualify for being considered as an SRC, will be invited to submit a formal proposal for an AOK SRC, using a standard template provided by the Precinct at that point in time. This will be provided in the form of a set of **Terms of Reference** for such an SRC.

ADVANCED OREBODY KNOWLEDGE PROGRAMME

The main focus of the AOK programme is to create the ultimate 'Glass Rock' environment which includes improving geological confidence ahead of the face, reduction or identification of risk associated with geology and to have timeous information. This will contribute to the optimal extraction and "zero harm" objectives. The key AOK questions which are currently being addressed are:

- Where is the orebody?
- The mineral content of the orebody (what is the grade and what other minerals)?
- What structures are present that are preventing or impeding extraction?

Through an enhanced knowledge of the geometry of the orebody and its associated characteristics as well as the surrounding geology ahead, above and below the mining horizon, it can be possible to optimize extraction.

There is need to access and process low-grade mineral deposits that lie at greater depths, under more complex geotechnical constraints. If alternative technologies are not identified to access and process these orebodies it may potentially become sterilized and un-minable in future.

With current operating mines the AOK programme remains focussed on hazard/risk identification, improvement of confidence with regard to mining blocks ahead of the face and timeously information which will assist with improved planning, reduction of cost and improved safety. This could potentially extend our current operations life of mine.

Whilst this programme focusses on geophysical and geological techniques, there is a need to intergrade these technologies for optimised outcomes. At the same time the programme needs to extend its scope along the mine value chain, which may include mine design and scheduling, and aspects of Mineral Asset Management.

BENEFITS TO A UNIVERSITY FOR HAVING A SAMERDI RESEARCH CENTRES

- Funding for a three-year programme that will allow for capacity and capability building.
- Funding can be supplemented by NRF funding allowing for more students
- MQA post graduate bursary programme being mooted.
- Additional funding for academic supervisor to be involved in applied research programme.
- These students could be eligible to be absorbed into the applied research space or by academia or even the mining industry.

OPERATIONAL GOVERNANCE OF EACH SRC

The research work of the SRC must be aligned to the specific SAMERDI programme, even though at a more fundamental level, as per the Frascati model/definition. To ensure that there is full alignment to the SAMERDI programme, it is necessary to have a **Research Advisory Committee** that will have full oversight of the technical and governance issues of the SRC. This oversight committee will incorporate the appropriate oversight structures of the respective university and representation from the Precinct Executive.

CONDITIONS FOR THE ESTABLISHMENT OF AN SRC

Each SRC will appoint a **Research Competence Leader**, who will be a suitable qualified individual who has sufficient gravitas in both the academic environment as well as within the mining industry to offer mentorship and guidance to post-graduates. The Research Competence Leader will be responsible for the supervision and development of postgraduate students in the area identified. Each SRC must support at least **four masters or doctoral degree** students of which at least one must be from a historically disadvantaged university. The proposal must state clearly the steps planned to identify and recruit the student (s) from historically disadvantaged university and how this student will be supported and supervised. The SRC may support the employment (partial or fully funded) of one administrative post to assist the Research Competence Leader.

FUNDING

The total funding available for an SRC will be **R 3.3 million** per annum (**VAT inclusive**) for a three-year period, on condition that the funding is approved for each year. The funding is to be applied as follows:

- **R 1.2 million** will be for the remuneration of the **Research Competence Leader**
- A maximum value of **R500 000** may be used for administration /operating costs.
- Each Student will be supported to a maximum of **R 200 000** per annum (guided by NRF student Rates) for a period of three years or until the completion of the degree (whichever comes first). An upfront payment (in full) will be made for year one based on the signing of the contract with the university by the CSIR/Mandela Mining Precinct. Should the university/centre not deliver in year one, as per contract agreement, the funding for the following year (and each subsequent year) will be re-negotiated between the parties.

WHAT IS REQUIRED FOR THIS EOI?

Each university interested in submitting an EOI should provide a short succinct document providing the MMP with sufficient information on their geosciences y Faculty to indicate suitability to be considered for the submission of a proposal to establish an SRC. The minimum information required can be found in Annexure A of this document.

DEADLINE FOR SUBMISSION

The due date for submission of the EOI is **8 April 2022** to the following email address: tmataboge@csir.co.za for attention: Tshepiso Mataboge

The Mandela Mining Precinct is looking forward to receiving your submissions

Yours sincerely



Johan le Roux
Director: Mandela Mining Precinct



Dick Kruger
Strategic Advisor: MMP

ANNEXURE A: FORMAT OF EOI

Information required	Response from University
Name of University	
Contact information of relevant parties to be invited to submit a proposal	Name: Telephone: Email address:
Indication of why they are interested in establishing an SRC	
Brief description of why they believe they have the appropriate faculty/expertise to be considered as an AOK SRC and alignment with the AOK programme	
Proposed Research Competence Leader	
Any other pertinent information deemed relevant for decision making	