MANDELA MINING PRECINCT
MINDS FOR MINES

ADVANCED OREBODY KNOWLEDGE



The Advanced Orebody Knowledge (AOK) programme is a forward-thinking initiative designed to significantly enhance the safety, efficiency, and overall effectiveness of mining operations. Its primary goal is to establish a "glass rock" environment. At its core, the AOK programme aims to improve geological confidence by providing a more accurate and reliable understanding of geological conditions ahead of the mining face. This enhanced geological insight is crucial for better planning and decision-making, minimizing uncertainties and risks associated with mining operations. This will contribute to the optimal extraction and "zero harm" objectives.

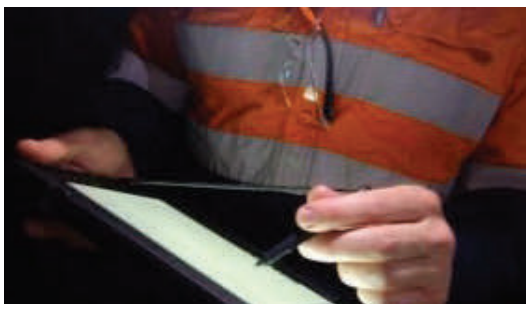
KEY MINING CHALLENGES ADDRESSED BY THE PROGRAMME

- Difficulty in accurately understanding the underground orebody before and during extraction.
- Hazards due to inadequate information about geological conditions.
- Ineffective resource management and planning, leading to wasted resources.
- High operational costs due to these uncertainties and inefficiencies.
- Limited operational life due to sub-optimal extraction methods.
- Negative effects on the environment and local communities from mining activities

MMP/SAMERDI SOLUTION

Empowering mining professionals with advanced tools to visualise and interpret geological conditions and ore distribution in real time during the extraction phase. This innovative approach transforms operational decision-making and significantly enhances both safety and efficiency on-site.





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Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

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ADVANCED KNOWLEDGE INDUSTRY

KEY BENEFITS:

- **Improved Safety** - The real-time 3D modelling provides a clear view of underground conditions, enabling better anticipation and management of potential hazards. This proactive approach helps to minimise risks and create safer working environments for miners.
- **Increased Productivity** - Detailed knowledge of the orebody allows for more strategic planning of extraction methods. By understanding the ore's distribution and surrounding rock characteristics, mining operations can be more precisely planned to maximise resource recovery and minimize waste. Accurate orebody models allow for optimised planning and extraction processes, leading to more efficient resource utilisation and increased overall productivity.
- **Cost Efficiency** - By reducing uncertainty and improving operational planning, the AOK programme helps lower operational costs. Efficient resource management and reduced downtime contribute to significant cost savings.
- **Extended Mine Life** - Improved planning and management strategies supported by the AOK technology can extend the operational lifespan of mines, ensuring more prolonged resource extraction and operational sustainability.
- **Community Benefits** - Extended mine life and enhanced safety contribute to the economic stability of local communities by providing sustained employment opportunities and supporting local businesses.

Overall, the AOK programme is committed to advancing technological solutions that not only improve mining operations but also deliver positive outcomes for both the industry and the communities it serves.

STATISTICS:

Visited and conducted trials at over
30
operations

Published over
30
conference and scientific papers

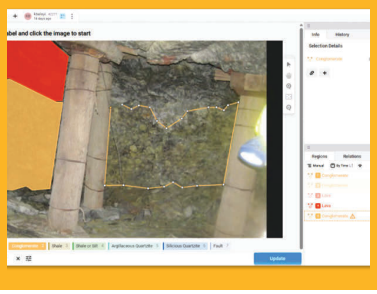
Collaborations with over
40
institutions

Exposed over
20
students, interns and junior researchers within the field of Geosciences through the AOK Programme.

HIGHLIGHTS

- **Tunnel Seismic Tomography (TRL 9)**
  Advanced geological prediction into great depths using tunnel and underground seismics.
- **Stratafy Seeker (TRL7)**
  A multi-camera that can create 3D models from photogrammetry, currently in development.
- **ITAD (TRL 6)**
  A device that can identify loose rocks during barring practices, currently in development.
- **Au and PGM Resource Atlas**
  Available from Council for Geoscience Interactive Web Map
- **Guidelines and Training materials:**
  Application of GPR in South African Mining/Application of ERT in South African Mining/In-Mine geophysics in Research and Development.





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