



MANDELA MINING PRECINCT
MINDS FOR MINES

STUDY: EPIROC Drilling Monitoring

About the Mandela Mining Precinct



The Mandela Mining Precinct is a Public-Private Partnership between the Department of Science and Innovation and the Minerals Council South Africa. The Precinct is jointly hosted by the Council for Scientific and Industrial Research and the Minerals Council. The Mandela Mining Precinct is an initiative aimed at revitalising mining research, development and Innovation in South Africa to ensure the sustainability of the industry. This is achieved through the South African Mining Extraction, Research, Development and Innovation (SAMERDI) strategy.

The strategy comprises six research programmes:

1. Longevity of Current Mining;
2. Mechanised Mining Systems;
3. Advanced Orebody Knowledge;
4. Real-Time Information Management Systems;
5. Successful Application of Technologies Centred Around People; and
6. Test Mine.

This summary was developed under the **Longevity of Current Mines (LoCM)** research programme. The programme is aimed 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.

LONGEVITY OF CURRENT MINES PROGRAMME: 2018/2019
LoCM18WP1

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Introduction

This is a development-based project that aims to provide an independent performance review of latest (2018) drilling technologies. The review would involve monitoring of the machine performance in selected underground trial sites. However, there were challenges encountered with obtaining trial sites to conduct independent monitoring of the machine performance. The three drilling technologies that were identified are the VIBES Telescopic (GST) drilling machine, the CMTI MT 3500 Multi-drilling machine and the EPIROC HRD 100 drill machine.

In October 2018, a visit was conducted at Anglo American Platinum's Amandebult where the HRD100 was being utilized at the modern stope, a modern working area which is not equipped with compressed air. Communication regarding the trial data and successes were then commenced with Anglo American.

The trials for the Epiroc HRD100 machine were conducted, and various modifications were done on the machine to improve its performance during the trials. From the trial results, the hand-held drill machine has the potential to improve efficiency and reduce safety risks that are associated with the drilling activity.

Methodology

- To engage with the manufacturer to organise underground trials to monitor drill performance
- To obtain the drill machine specifications and do comparisons against the underground performances. This includes the full accessories and system parts to investigate the full drill system.

Research Findings

The machine was tested at Siphumelele, Twickenham, and Amandebult mines. The performance of the EPIROC HRD 100 machine varies between the three sites tested, which vary from 0.78 to 1.09 metre/minute, which compared to the pneumatic drills at 0.43 metre/ minute, it is faster by a factor between 2 and 3 times. Higher penetration rates were due to the modifications that were made to the machine at Siphumelele mine and Twickenham mine.

Conclusions

The production trials on EPIROC HRD 100 hand-held drill machine were conducted at Siphumelele, Amandebult, and Twickenham mines to determine its potential of improving drilling efficiencies and safety. The modifications that were made to the technology throughout the production trial process resulted in improved, efficient technology.

Way Forward

It is recommended that further trial results are obtained from other mining companies in order to complete the TARA Database update, the Best Practice document and Blueprint, as the EPIROC HRD 100 drill machine are to be compared against the late Isidingo Challenge drill machine once being tested underground.