

# PASSIVE SEISMIC IMAGING AND MONITORING

## MINEX CRC PROGRAM 2

### Data from Drilling

#### PHD PROJECT

Curtin University

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#### RESEARCH PROJECT

Seismic surface and borehole methods are widely used for geophysical subsurface imaging and monitoring. In many cases, active seismic acquisition for such purposes could be limited or constrained by the cost of the surveys. Utilising passive and ambient energy allows us to obtain information about the subsurface more efficiently, providing insights for exploring and discovering resources. Monitoring of microseismic events, caused by various phenomena like fault reactivations, mining production activities, natural seismicity, etc., is essential for safe operations. Constant developments in seismic sensors and the current availability of nodal systems and distributed fibre optic arrays provide capabilities to design adaptable and on-demand receiver arrays to acquire passive seismic data. The main goal of the research project is to develop an efficient and adaptable methodology for passive seismic imaging and monitoring that will become a standard part of the exploration workflow and mine operations.

The activities will include:

- Legacy data analysis (both fibre optic and conventional geophones)
- Development of algorithms for the detection of microseismic events and subsurface characterisation using a combination of passive seismic data recorded by fibre optic sensors and geophones
- Algorithms validation using data acquired at the Curtin Research Well Facility and other sites across Australia.