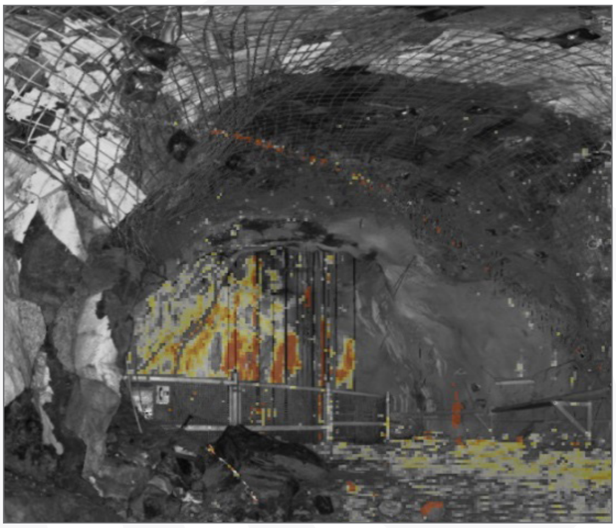
GroundProbe®

CASE STUDY:

Targeted Ground Support

MAKING MINING SAFER



GML-UNDERGROUND MONITORS REAR WALL OF SHAFT TO DETERMINE OPTIMAL TARGETED GROUND SUPPORT

Underground environments are very dynamic by nature, with the effectiveness of ground support always changing. Through monitoring, areas of high risk can be identified and rehabilitated in a targeted way. At a large, well-known, hard rock mine in Queensland, Australia, visual inspections on the rear wall of this shaft showed cracking in the shotcrete.

On-site geotechnical engineers were uncertain if the entire shaft was moving, if the pillars were moving, or indeed if the entire drive was on the move.

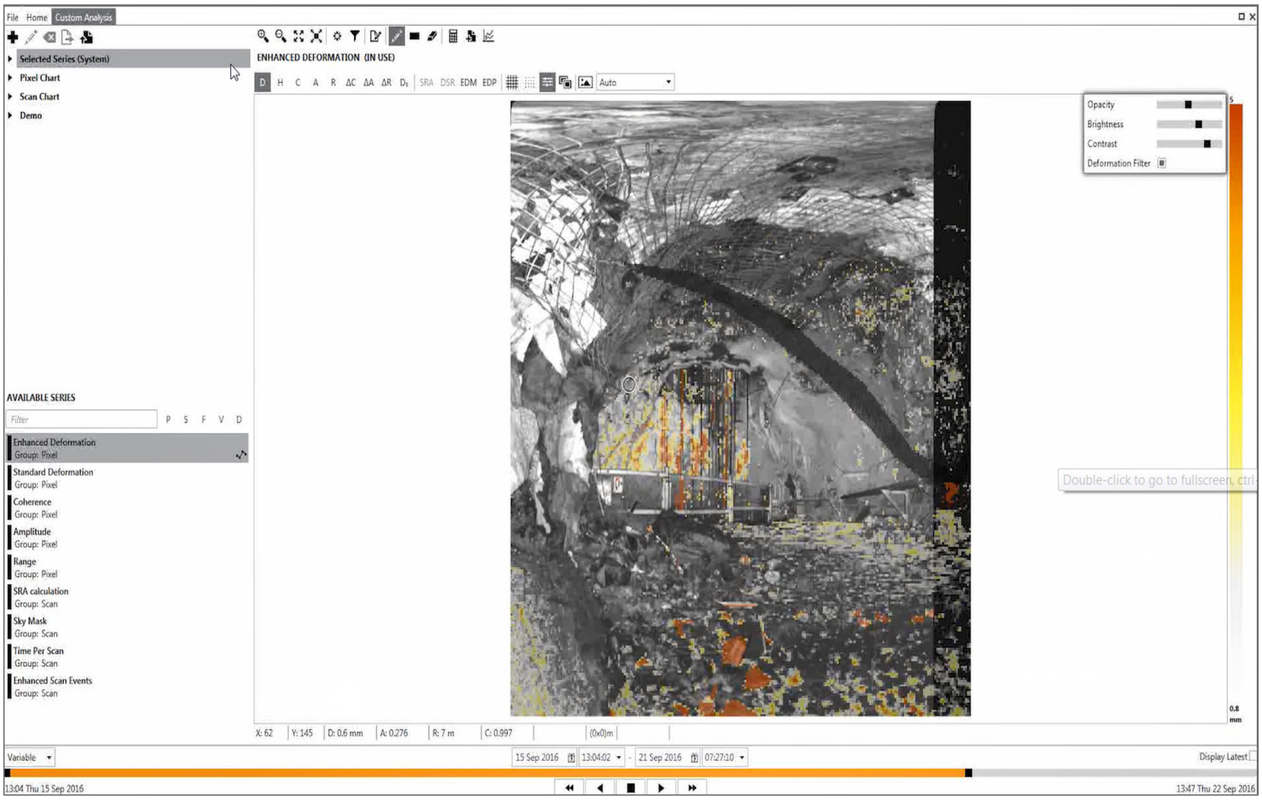
The potential for rock falls in this shaft was a safety concern; however shutting down the shaft for rehabilitation would involve shutting down the entire mine which would detrimentally affect production levels.

To help manage the risk, GroundProbe's GML-Underground was deployed and began monitoring to determine where movement was occurring within this area of concern.

"Through the data gathered by the GML's scans, which were then analysed in SSR-Viewer, it was determined that convergence was indeed occurring in this particular area, predominately around the cracked areas. The data showed that there was linear to regressive movement occurring in the area, but it was certainly on the move in those structurally controlled areas."

Peter Saunders, Principal Geotechnical Engineer, GroundProbe.

The data also proved that other sections of the wall, which were thought to be moving, remained stable.



With this information, the mine site was able to implement targeted ground support in the area, only needing to concentrate their efforts to the areas they knew were moving. As a result, they only needed to close the shaft for the shortest amount of time possible.

Following the installation of the targeted ground support the Geotechnical Engineers began to monitor the area again using the GML.

"The results of the targeted ground support could be seen immediately," said Mr Saunders.

"Identifying the mechanisms that drive convergence and the regions showing maximum displacement allows for targeted, efficient ground support installation.

"We can also use GML to monitor the effectiveness of that support post-installation."

Mr Saunders elaborated to further explain the benefits of the GML-Underground's accuracy and precision in contrast to conventional measurement tools.

"We should not assume that convergence is uniform. We know that rock generally isn't homogenous or isotropic," said Mr Saunders.

"Using a point or line measurement tool, like convergence tape or prisms, as opposed to the full spatial resolution achieved with GML, may provide misleading information.

"This information can potentially be used to make high value decisions that can have a direct impact on costs and profit… so we need the decision confidence that GML provides."

Mr Saunders concluded by discussing the practical applications of the GML-Underground, to maximise safety and productivity, with regard to mine planning.

"We can now monitor the ground effectively with GML, to better understand the regional impact of mining induced stress," said Mr Saunders.

"This includes direct measurement of the impact and effectiveness of backfilling which is really a world first I think.

"We can then use this information to optimise short and long term mine planning strategy, maximising asset value and minimising costs."

Operationally insignificant but nonetheless interesting, while the GML was monitoring the area, a small rock fall was detected in the drive near the shaft. The GML detected the movement 45 minutes before it fell.

This shows the highly accurate and precise nature of the GML as a real-time, underground monitoring solution for convergence.

decision confidence™