

# PT Freeport Grasberg Mine uses 4 Slope Stability Radar Systems



## SSR Making mining safer™

PT Freeport's Grasberg Mine has been using GroundProbe's Slope Stability Radar (SSR) system since November 2003.

Common to open pits with slope heights and scale of mining comparable to Grasberg, there are geotechnical challenges that need to be managed.

The Grasberg mineralization is bounded by a heavy sulphide zone that is shaped like a funnel around the intrusion.

Radial concentric structures that pose potential wedge and plane shear failure modes are present in all wall orientations within the intrusive rock types.

Grasberg's monitoring strategy is currently made up of multiple monitoring technologies. The mine uses approximately 140 prisms, 14 extensometers, 12 GPS systems and 4 of GroundProbe's SSR-X (eXtended)\* systems. Using these technologies, multiple layers of monitoring enhances the management of slope stability risks.

In particular, the SSR-X systems provide monitoring of critical areas where the potential for multiple bench instability exists, and where the occurrence of a failure would be considered a high cost to the mine.

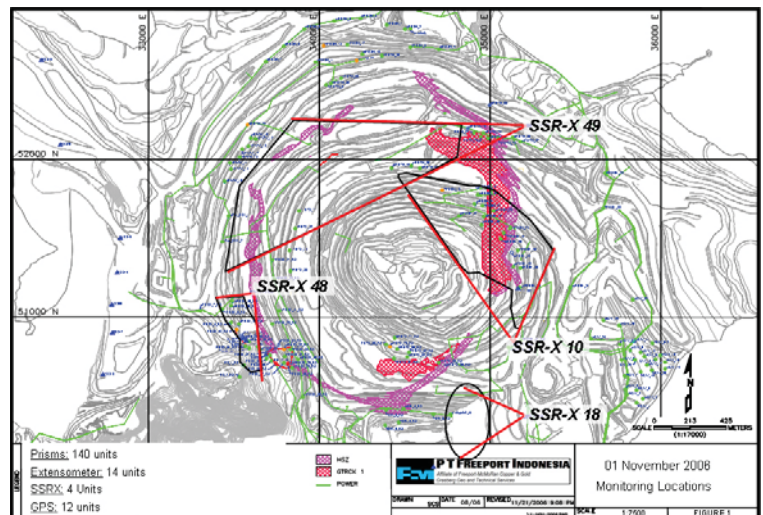
In addition, the SSR-X systems are also used to monitor post-failure areas where the stability of adjacent areas need to be assessed prior to re-initializing activities.

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The mine has experienced several failures in which the SSR-Xs have provided the geotechnical team with the data needed to manage risks. Today, these systems provide coverage of critical areas where instability has occurred and where a potential for instability exists.

The image below shows how the systems have been integrated into the mine. SSR-X 10 recently recorded a double bench wedge failure. SSR-X 18 is scanning an overburden stacker foundation to determine settlement, SSR-X 48 is critically monitoring a wall after recent instability was detected, and SSR-X 49 is monitoring a wall at long range.

Steve Schmelter  
Grasberg Geotechnical Superintendent



\* SSR-X has 4 times the spatial resolution of the smaller dish SSR system, which allows the tracking of movements and failures of 1/8 the size than previously achievable.