



RISK REDUCTION

RISK REDUCTION STRATEGY INCORPORATES TAILINGS DAM MONITORING AT SAMARCO MINES. *UPDATE.*

OVERVIEW

The collapse of the Fundão tailings dam in Mariana, Brazil in November 2015 resulted in the catastrophic loss of life and caused severe environmental, social and economic impacts.

Taking immediate action to ensure ongoing safety, stability and ultimately avoid the possibility of a future failure, mine owners Samarco Mineração S.A. commissioned an extensive monitoring and rehabilitation risk reduction strategy to be implemented for all six of their tailings dams, including Fundão, Germano, Sela, Tulipa, Selinha and Santarem.

CHALLENGE

Samarco's initial challenge to GroundProbe was to provide an immediate slope stability monitoring solution to detect any movement or instability at their Santarem and Germano tailing dams. This was quickly followed by an ongoing, targeted risk-reduction strategy to

predict and mitigate potential future failures by effectively monitoring their three remaining tailings dams: Sela, Tulipa and Selinha.

SOLUTION

GroundProbe's key solution included the supply of two targeted, safety-critical mobile radars (**SSR-XT**) and three long-range, high-resolution fixed-deployment radars (**SSR-SARx**).

Complimenting their advanced hardware technology, GroundProbe provided Samarco with their intuitive visualisation software, SSR-Viewer. SSR-Viewer enabled the geotechnical team to pinpoint movement hotspots by visually representing the data through a colour gradient heatmap draped over a photographic representation of the area, allowing for easier reading and reporting of the complex data.

UNEXPECTED ISSUES

Understanding that no two mines are the same, GroundProbe had several logistical issues to overcome, including lack of adequate infrastructure (power supply, road and transportation), the distance between Belo Horizonte and Samarco, local regulations, communication with local authorities, as well as a skilled labour shortage.

RESOLUTION

GroundProbe resolved the many obstacles quickly and systematically, including installing solar power while also re-locating the local GroundProbe office to Ouro Preto. Experts flew from Australia to oversee the project and offer technical support and guidance while the Samarco team received specialist geotechnical training.

GroundProbe provided a complete tailor-made monitoring solution, including Real Aperture Radar (RAR) and Synthetic Aperture Radar (SAR) technological and real-time monitoring software.

Groundprobe's Business Manager for Brazil, Peru and Colombia, Antonio Rocha, stated: *"When monitoring tailings dams, the SSR-XT systems are typically placed close to the dam wall to monitor the stability of targeted, safety-critical locations, such as tailing facilities or areas where known hazards have been identified. In addition, the SSR-SARx systems are used to detect any gradual deformation of the dams over extended periods."*

Lachlan Campbell, VP of Marketing and Technology, GroundProbe, added: *"Since the release of the SSR-SARx system in 2015, GroundProbe is the only company in the world that offers all slope stability radar technologies, making us truly radar technology agnostic."*



Image 1. GroundProbe's SSR-XT

Linked by our standard software solution, SSR-Viewer, our complete suite of radar technologies, allows us to generate tailored monitoring solutions that meet any customer's or site-specific application's needs."

RESULTS

Considered a success, Samarco's risk reduction strategy, supported by GroundProbe, now reflects their commitment to ongoing dam stability and safety practices.

"We have invested heavily in the continued monitoring of the project, employing a wide range of monitoring solutions to ensure the stability of the dams."

Our radar operators unanimously agree... that GroundProbe's high-quality software solution, SSR-Viewer, [is]... unparalleled in terms of analysis and interpretation of slope monitoring data."

*GroundProbe is not just a provider,
but a partner."*

– Samuel Ricardo Carvalho Carneiro,
Geologist, Samarco Mineração

Having established the world's first
Geotechnical Monitoring Center, Samarco
is now considered a positive geotechnical
monitoring reference point.



Image 1. Germano Tailings Dam 2017

GroundProbe is the most trusted
brand for real-time geohazard
monitoring.

With a track record that speaks
for itself, our fleet of cutting-edge
technologies deliver the most
precise and valuable data.



Image 2. Samarco Monitoring Centre



Image 3. Santarem Tailings Dam 017

GroundProbe is proud to have understood
Samarco's unique needs, and as a long-term
partner, is committed to providing them with
the best possible ongoing customer support
in the future.

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