

Geobotica NanoRadar

The Geobotica NanoRadar is a compact smart radar device for monitoring deformation in rock or soil surfaces.

Originally designed to detect and warn of rock movements in underground mines, the NanoRadar has proved useful for monitoring rates of deformation in tailings embankments.

Real-Time Monitoring

The NanoRadar can scan every two minutes and provide local alarms based on preset thresholds. Its built-in communications module transmits data to local networks and can be relayed to the internet.

RockD Filtering

The Rock Detector Algorithm (RockD) removes pixels that represent humans and machinery and retains only the pixels that represent rock or other solid objects. This minimizes false triggering of alarms.

Easy Analysis

GeoPoint software can display heatmaps that highlight movements. Warmer colors signify larger displacements and green colors signify stability. Trend plots of displacement vs time are created by clicking points on the map.

Flexible Deployment

The NanoRadar operates autonomously and is self-powered and weatherproof. It can be relocated easily and automatically starts monitoring when it is stable. For long term deployment and frequent reporting, it can be powered by solar-charged external batteries.

Specifications

Radar Range: 262 feet.

Scan Width: 420 foot strike length.

Scan Height: 40°

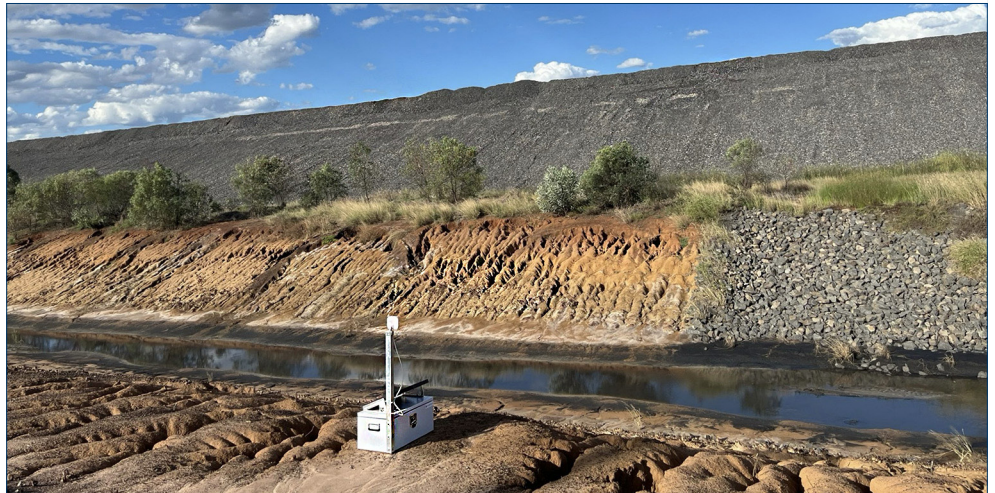
Scan Spheres: 2.5° wide by 1.3 ft deep.

Selectable Scan Duration: 30 sec to 1 hr.

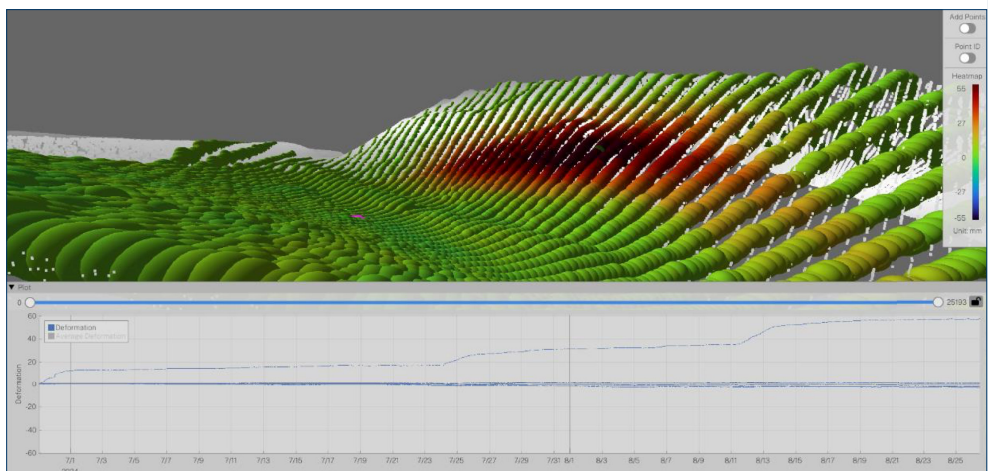
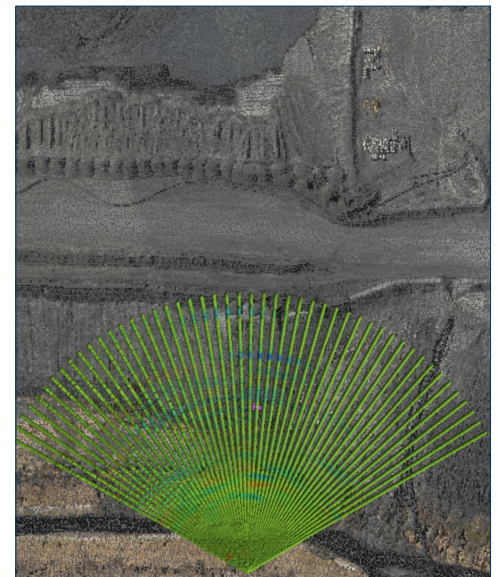
Communications: Low Power WiFi.

Software: Geobotica GeoPoint.

Images courtesy Queensland Tailings Group. NanoRadar is a product of Geobotica, a long-term partner of GEO-Instruments.



Thirteen NanoRadar units, spaced approximately 400 feet apart, were deployed to monitor this tailings embankment. Measurements were transmitted to a Starlink WiFi network and relayed to a project website.



Middle: NanoRadar and scanned area. Bottom: Heatmapped images can be zoomed, panned, and rotated to inspect areas of concern. Trend plots of displacement vs time are created by clicking points on the map. Flat trends indicate stability. Steeper trends indicate acceleration of displacements.