

AUTOMATED DATA COLLECTION

Remote, Automated Tailings Dam Monitoring

A CUSTOMER SUCCESS STORY



Node (data logger with sensor) in a protective enclosure, with Yagi antenna.

BACKGROUND

A tailings dam at an Australian mine had vibrating wire piezometers which were measuring the pore water pressure of the dam. Readings from the piezometers were taken manually; the regularity of the readings was interrupted by harsh weather, site hazards, staffing and related factors.

OBJECTIVE

The customer wanted to eliminate the interruptions of the readings and achieve continuous real-time data that was reliable and accurate.

CHALLENGES

The monitoring area for the tailings dam was expansive with on-site civil construction being performed. Exposure to corrosive elements and extreme weather also had to be considered. The solution addressed all these issues and ultimately worked harmoniously with the customer's existing SCADA & instrumentation, while providing automated realtime site monitoring capabilities from a remote location.

SOLUTION

RST and its Australian partner, HMA Geotechnical, provided RST's 'RSTAR' Radio Array System as a 'turn-key' data collection solution. It addressed all the site's challenges and met the user's requirements, enabling them to improve their decisionmaking and increase productivity without sacrificing safety.

KEY FACTS

- **LOCATION**

Queensland, Australia

- **PROJECT PARTNERS**

RST Instruments

- **PROJECT DETAILS**

The data collection from the vibrating wire piezometers installed on a tailings dam at the mine was being collected manually. The collection schedule eventually became sporadic due to on-site factors such as environmental difficulties and staffing.

- **SCOPE/OBJECTIVE**

The mine managers needed to eliminate the roadblocks inherent with taking manual readings and achieve more continuous data that was reliable and accurate.

• CHALLENGES

The proposed solution needed to work harmoniously with the customer's existing SCADA & instrumentation - while providing automated real-time site monitoring capabilities from a remote location.

The monitoring area for the tailings dam was wide and expansive.

On-site civil construction was being continuously performed.

• SOLUTION

HMA utilised RST's 'RSTAR' Radio Array System as the back bone for an automated data collection system.

Coupled with RST's 'DT Series' Data Loggers deployed at the node level (vibrating wire piezometer with data logger), the RSTAR System was configured to seamlessly work with the existing SCADA and sensors.

The RSTAR System sported a custom-designed base station (RSTAR 'hub'), with an omnidirectional antenna, a 120Ahr Battery, and a 100W Solar Panel. This resulted in self-reliant power with no downtime.

• BENEFITS

The nodes' data loggers were powered by a single lithium 'D' cell which provides years of power.

Automated, reliable and accurate sensor data was sent in real-time to the user's desktop PC - allowing for quick decision-making and data analysis from a remote site. Direct support/service was provided by HMA, in addition to RST's technical expertise and support/service.

• RESULTS

Successful implementation of the RSTAR System; it performs readings as scheduled without interruption.

The logistics and costs associated with performing manual readings at the tailings dam have been decreased through automation.

Coverage over the expansive monitoring area was addressed by the use of Yagi antennas installed at node level. Signals are transmitted to the Hub, which is nearly 2km away from the farthest node.

Potential disruptions to the mining operations are now minimised.

• INSTRUMENTATION

'RSTAR' Radio Array System (with Hub)

'DT Series' Data Loggers (for sensors)

flexDAQ Data Logger (inside the Hub)

• COMPLETION DATE

2018



On-site photo of base station (RSTAR 'Hub'), housed in a protective enclosure and shown with the installed omni antenna and solar panel.

HMA Geotechnical installed the RSTAR System and provided additional support services to the customer.

RSTAR - A QUICK OVERVIEW

An RSTAR System consists of nodes (sensors with 'DT Series' Data Loggers) that wirelessly transmit data to an RSTAR 'Hub' (central base station). The Hub sends the received data to the user(s) for analysis on their desktop PC in real-time.

RSTAR 'NODES & HUBS'

Nodes are deployed in a star topology from the Hub. Their respective DT Series Data Loggers have an antenna and are powered by a single lithium 'D' cell, which provides years of power. Most major sensor types can be accommodated.

The Hub has its own data logger (RST's 'flexDAQ' System) and is housed in a protective enclosure. It uses an antenna and is typically powered by a solar panel or AC power.

