

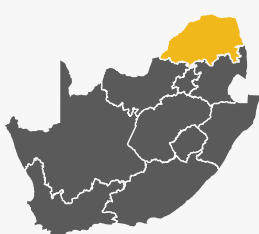


“Realising that connectivity is key to unlocking value for the team at Dwarsrivier we were eager to find a partner to charter the course and offer an agnostic backbone for a range of suppliers to join us on our digitalisation journey. A key focus of ours is centred on our ability to elevate our Overall Equipment Effectiveness (OEE). To achieve this, we will require real-time data from machines for proactive decision-making during shifts and to aggregate this for insight and analysis on a regular basis post-shift. An established backbone that can handle blast concussion, the harsh underground environment and be adopted by our workforce is key to this strategy.”

-Quote from Client

ASSORE DWARSRIVIER CHROME MINE

Underground connectivity is key to visibility of mission critical fixed and mobile assets. Dwyka Mining Services is a pan-African mining technology platform that assists underground mining clients to adopt and adapt to evolving technologies with a focus on supporting efforts to improve safety, health and environmental conditions in the collaborative pursuit of the digital mine of the future.



MINE/PROJECT LOCATION:

South Deep Gold Mine, Westonaria, Gauteng

CLIENT:

Dwarsrivier Chrome Mine

PROJECT FOCUS:

Accurate blasthole surveying using a lightweight drillhole survey tool.

COMMODITY:

Chrome



PROBLEM:

A key lever for digitalization in underground mining is securing mine-wide, robust and resilient broadband wireless connectivity. The nature of underground mining is that digital infrastructure must operate and be maintained in a harsh, often unforgiving environments.

Whilst legacy fibre installations are established and commonplace these are generally terminated with a network switch at level access or waiting places with limited connectivity up to the working face, known as the “last-mile”. Reliance on well-designed wireless infrastructure with high up time availability are critical to connecting workers and assets on mine site.

Dwarsrivier North Shaft is in a remote area where established connectivity on surface can be a challenge. To deliver on digitalisation objectives and encouraging technology experimentation by the executive team an end-to-end connectivity solution was required to connect their trackless mobile machinery (TMM) equipment.

Operating a mixed fleet of underground TMM equipment and in a pursuit to aggregate equipment data and insights, connectivity was required right up to the blast face. This includes collecting vehicle telemetry data whilst in the panel which can trigger certain alarms with preset thresholds for short interval control.

SOLUTION:

The primary goal was to establish an easy to advance and maintain ruggedized backbone to extend connectivity from level ramp access into the “last-mile”. Embarking on a new underground wireless architecture, our client adopted the use of Ekahau Site Survey suite of heat maps to visually identify the current state of connectivity for users to define and optimise the design to extend the WiFi and distributed power with Plexus PowerNet to where they needed connectivity.

With this visualisation all guesswork to deliver coverage underground at two separate strikes from their decline was eliminated. This ensured adequate coverage, data rate and range, to allow for their TMM equipment and connected tablets and devices to offload data onto the network.

The secondary goal with the established backbone in place, was to deliver real-time data for improved ventilation. This involved the installation of our Vigilante and Zephyr Air Quality Stations at both intake and return on level to understand blast clearance in sections as well as valuable intake volumes for equipment utilisation and DPM mitigation strategies. The ability to power over Ethernet (PoE) meant additional cameras were installed at the tips empowering the team to monitor and manage these locations from the safety of their offices on surface.

RESULT:

Maestro Digital Mine’s Plexus PowerNet was successful in providing a high broadband connectivity and stable, low voltage distributed power backbone over a single coaxial cable. This was demonstrated through the visualisation achieved by monitoring video footage from tips and belts on Strike 4 and Strike 6 in real-time.

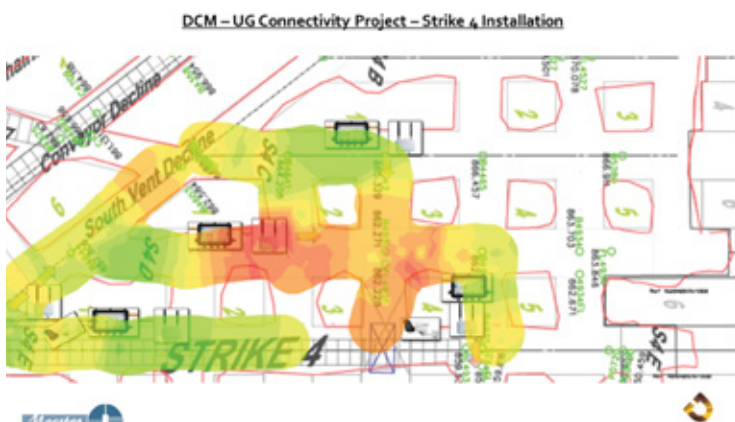
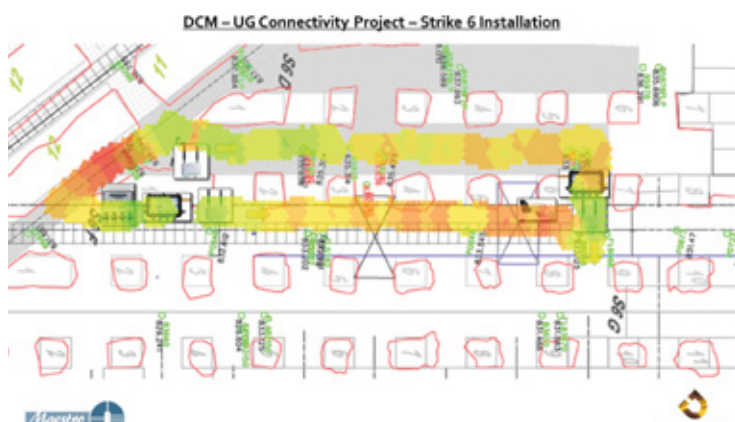
Ekahau Site Survey proved that a robust and resilient broadband wireless connectivity and communication network was available. Safety improvements with real-time ventilation data and increased transparency of mission critical processes through live video feeds further enhances the teams ability to shorten decision making capability for a range of optimisation opportunities.

Matiki Setagane: “By being able to access real-time ventilation data, the team will now start to experiment with very accurate airflow dynamics and balance this against vehicle usage, to optimise production and safety applications in our underground workings.”

This installation met the requirements in time and within budget allowing it to form part of an internal toolkit, so other operations could replicate and leverage connectivity for a host of other connected solutions. “Dwyka’s team proved to our management team that robust underground connectivity is achievable. This now serves as a solution within our own toolkit and strategy for underground communications and connectivity as we tackle digitalisation within the group”. Quote: Rian Burger GM

KEY TAKEAWAYS:

- ✓ Installation met the requirements in time and within budget
- ✓ Maestro Digital Mine’s Plexus PowerNet was successful in providing a high broadband connectivity and stable, low voltage distributed power backbone over a single coaxial cable
- ✓ Ekahau Site Survey proved that a robust and resilient broadband wireless connectivity and communication network was available.



For more information on this case study and/or general info on Dwyka Mining Services, send us an email, or visit our website.

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