About Baringa

At Baringa, we are as excited about the Metals and Mining industry as you are

Baringa Partners is an award-winning independent consultancy practice established in the UK in 2000. We have grown through a dedicated focus on delivering exceptional work in specific sectors including Energy & Resources, Telecoms and Media, Financial Services and Retail. While our global footprint continues to grow, our focus on delivering deep industry expertise remains critical to the way we work with our clients.

What sets us apart from other consulting firms is the way we work with our clients. We are passionate about the sector, we put collaboration at the heart of everything we do, and we share and develop our thinking with you at every step of the journey with you.

Baringa was founded in 2000 and now has:

- **650** Employees
- **65** Partners
- **7** Offices Worldwide

What makes working with Baringa different?

- **Deep industry experience** and subject matter expertise
- **Small teams** of hands-on senior experts who deliver tangible results
- **Close client collaboration** to embed lasting change
- **Iterative** hypothesis-driven approach to problem solving
- **Agile teams** with a flexible, client-centric working style
Our clients

Our clients are global operators and niche players, headquartered in London, Australia, across Europe and Africa. What they have in common is their need for support from people who understand their industry and will mobilise to where they are needed most.

Baringa’s very special culture

In Baringa, we have worked tirelessly to create a very unique culture within our firm. It is one that is focused on collaboration, inclusiveness, diversity and excellence. It’s why we continue to be recognised as an Employer of Choice year after year.

Our Energy & Resources practice

Our Energy & Resources practice is a team of mining and metals, and oil and gas specialists who work with our clients in solving complex challenges across front-line operations and back-office supporting functions. As fast adopters of digital technology ourselves, we are also leading the way with our customers in using new technology and data to improve the way we do business.
What’s happening in the world of Asset Management

Like much of the Metals & Mining industry, advancements in digital technologies have created real opportunities for the care and maintenance of heavy assets. Businesses are now expecting greater steps to be made towards operational excellence in asset management given the increase in accessibility of new tools and approaches.

Digital Trends in Asset Management and the good news for Metals & Mining

1. Data, and more data. Internet of Things (IoT), cheaper storage options, and greater surface and sub-surface connectivity means we have more data about the performance of equipment than ever before.

2. Predictive analytics and visualisation. The industry is developing capability in using this data to analyse patterns, identify value drivers, and predict failure to greater degrees of certainty than before. This can lead to decreased maintenance costs; reduced business-halting failures in critical equipment; and greater asset lifespan.

The advancement of visualisation platforms such as Tableau and PowerBI means this information can be presented in a more visually captivating, and more intuitive way.

3. Right information, right time, right place. Mobile technology and devices mean we can now access information outside the Control Room. Handheld devices, mobile cameras and visual aide tools, can take asset information to where operators need it most.

There’s more to Asset Management Excellence than sensors and shiny new reports

Digital technologies will never replace the need to improve Asset Management processes, data integrity, corrective action discipline, and company-wide capability. Rather we see data driven Asset Management as building on these capabilities, leveraging data and analytics to improve equipment performance and health, and eventually business productivity.

For this reason, when taking on a move upwards on the maturity curve, Metals & Mining organisations still need to consider some of the fundamental challenges that must be addressed first:

▲ **Data is not information**: While the proliferation of data continues, there is both art and science required to turn this into ‘information’ that supports solutioning, decision making, and corrective action.

▲ **Talent**: Accessing digital and analytics talent will be a challenge for the coming years, as many organisations now recognise the need for maths and data analytical talent.

▲ **Master Data quality**: This is essential for any AM advancement. We find many organisations have not undertaken an asset audit for many years, and without true custodianship, existing data varies in degree of quality. Companies can start small by focusing on data quality of business-critical assets first.

▲ **Objective data analysis**: To achieve true predictive analytics, we must objectively understand the actual lead indicators of failure. This often requires a ‘step-back’ to understand equipment and processes, rather than relying on experience and gut-feel.
The Asset Management Landscape at Baringa

In Metals & Mining we rely heavily on the reliability and availability of assets to achieve plan. For this reason, Baringa have mapped the Asset Management landscape and the opportunities available to businesses to navigate their journey towards operational excellence.

One of the newest, and possibly most challenging areas of opportunity sits with data-driven asset management. That is, harnessing your world of data, transforming it into information, presenting it in ways that is intuitive and directly aligned to business decision making, and leveraging the power of predictive analytics.

This is where Baringa can help.
Step One: Where are you now?

Firstly, understanding where the business is in relation to Asset Management excellence, and/or data-driven maintenance analytics, and secondly where it aspires to be, are the initial steps in any improvement journey.

What we often find is that while elements of 'Excellence' are in place (for example, consolidated operations and maintenance planning, or pattern analysis for maintenance planning), threshold capabilities such as Master Data and value-driven KPIs are not.
How Baringa can support you in bridging the data-driven Asset Management gap

Once we understand where you want to take your maturity in data-driven Asset Management, there are a number of ways Baringa can support you in your journey of bridging the gap between now and the future:

**Data Analytics Strategy**
Working with you to build your internal capability and embed processes needed to support data-driven decision making as a core part of how organisations do business.

**Data Management and Automation**
Delivering on a data analytics strategy requires delivery of end-to-end data management and automation platforms.

**Advanced Analytics**
We employ cutting edge techniques in predictive analytics, prescriptive analytics and artificial intelligence to deliver value to our clients businesses.

**Data Visualization and Custom Applications**
Visualising key data messages in an appealing way requires domain expertise, knowledge of best practice and a keen eye for design.

Our unique partnership with 4CDA

Baringa are proud to work with 4CDA, a boutique data analytics firm who specialise in end-to-end data management and analytics solutions.

4CDA are data analytics experts with deep Metals & Mining industry experience. The team has delivered data analytics solutions for some of the world’s leading mining organisations assisting them to drive evolution into sophisticated companies, as well as driving significant value.

4CDA’s team also service cross-industry clients, including private equity and asset intensive industries with a strong focus on driving value and multiples of return on investment.

Technically they thrive on excellence, delivering expertise in big data, data analytics, data modelling, predictive modelling capability, robotic process automation and custom application development.

They provide leading-practice data visualization solutions using Tableau, PowerBI, Spotfire, R, Python and D3.
Case in Point

Digital and Data-Driven Asset Management

Predictive Constraint Analysis

The client runs an integrated copper project (mine to smelter), which was constrained by the haul fleet. Using predictive statistics, it was determined that HME traffic delays across a key intersection were associated with poor cycle times across the whole system.

Key Outcomes

▲ Using the model, the size of the potential uplift was estimated and used to develop a business model for remediation
▲ Currently the client is trialling changes to the traffic flow and control at the intersection

Real time equipment health monitoring

Equipment failures on rotating equipment for a global oil and gas company were causing significant production downtime. Analysis revealed that in many cases, early warning indicators of failure were available from existing data, but not available to the ops and maintenance teams.

Our team member led the project to rapidly develop a first release of a real-time equipment health monitoring application, leveraging the existing OSI PI infrastructure and augmenting with visualization and statistical modelling capability.

Key Outcomes

▲ Significant reduction in rotating equipment failures leading to improvement in overall reliability / availability

Inventory Stock Outs

Inventory stock outs affect planned maintenance and increase risks. This project analysed historical data, purchasing lead times and supplier data to dynamically generate purchase orders for “just in time” inventory for each site and supplier.

Key Outcomes

▲ Stock out rates reduced to 2% across all sites
▲ Inventory value reduced
▲ Planned maintenance materials made available more consistently
▲ Automated purchase order generation saved purchasing team time and increased accuracy of orders
Real-time IoT Dashboards

Developed world-first real-time IoT dashboards to visualise daily performance against plan for a Bauxite mine including the overall mine value chain, fixed plant and mobile fleet dashboards.

Key Outcomes
- Developed world-first IoT dashboards using custom web technologies on the GE Predix IoT platform
- Led development and agile project delivery role of a mixed onshore and offshore based team
- Automated data collection of existing site-based planning spreadsheets into cloud-based database
- Pulled data from various site-based systems including the historian, various planning spreadsheets and the fleet management system into a centralised cloud-hosted data repository

Maintenance Excellence

Underground Mine & Mill Maintenance Transformation

This 60 year old mine was operating with past-life assets, and the large number of production stops were due to a continued conflict between operations and maintenance due to a lack of integrated planning. Starting with a clean sheet of paper, we redesigned the maintenance and integrated planning process from the ground up, breaking down decade-long silos.

Key Outcomes
- Established the first integrated operation plan that combined production and maintenance
- Reduced shut-down costs by 50%
- Reduced Maintenance Function headcount by 33%
- Re-baselined inventory stock

Maintenance process and performance improvement

This global oil and gas client lacked a consistent way of running maintenance across their global operated asset base. Our team member led a process to develop a new standard process and maturity model and perform maturity assessments. This was a rapid, collaborative exercise building on our team’s previous experience and assets.

Key Outcomes
- Global alignment on a single framework and approach for maintenance across a diverse asset base
- Maturity assessment and roadmaps for key assets to improve reliability
Our team

Johan Nell
Partner, Resources
London

- Asset management and operations efficiency improvement
- Maintenance, operations and capital project management
- Expert systems architecture and implementation

Silas O’Dea
Partner, Resources
London

- Digital and technology enabled operational improvement
- Maintenance and Reliability management in asset intensive industries
- Data and analytics
- Risk Management

Amanda Gower
Director, Resources
London

- Digital front line transformation and automation
- Operational excellence
- Management Operating Systems (MOS)
- Extensive experience in Australia, Southern and Eastern Africa, the UK and Middle East.

Hugh Greene
Director, Resources
London

- Commercial excellence
- Supply chain analysis and logistics management
- Due diligence and feasibility assessment
- Extensive mine-site and downstream experience in Asia, Africa, North America and Europe

Tim Perkins
Managing Director
BSC(UWA), PHD(CANTAB.)

- 15+ years experience
- Data visualization (Tableau, Spotfire, R, PowerBI, etc.)
- Database development and complex data structuring (T-SQL, PG-SQL)
- Common developer tools (R, bash, Python)
- Experienced with of a variety of statistical and simulation techniques
- Project management and de-risking

Matthew Ambrose
Analytics Lead
BSC(UWA), PHD(UWA)

- 7+ years experience
- Database development and complex data structuring (T-SQL, PL-SQL, HIVE, SparkSQL)
- Big Data Platforms (Cloudera, MapR, Oracle BDA)
- Common developer tools (R, Python / Pandas)
- Experienced with a variety of statistical, machine learning and simulation techniques

Uros Urosevic
Lead Developer
BSC(ECU), MSC(UWA)

- 7+ years experience
- Database Development
- Automation
- Cloud Administration
- Web Development
- UX Design
- SharePoint and Office365 DevOps
- Internet of Things
- Professional Scrum Master I.

Data Analytics in Asset Management for the Mining industry