

# Capability Statement

February 2024



# The orelogy difference

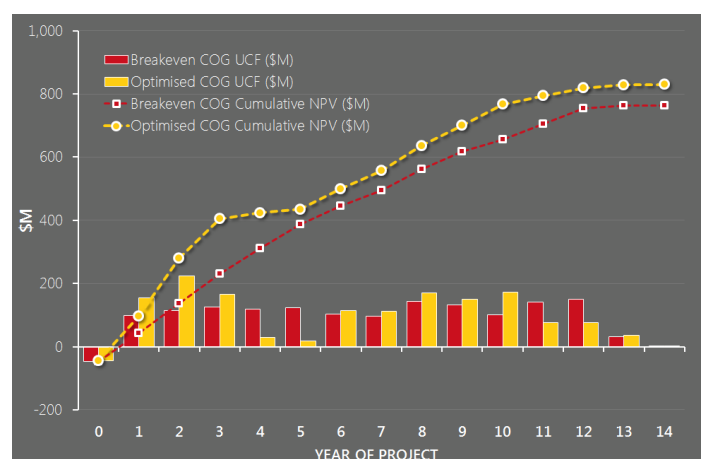
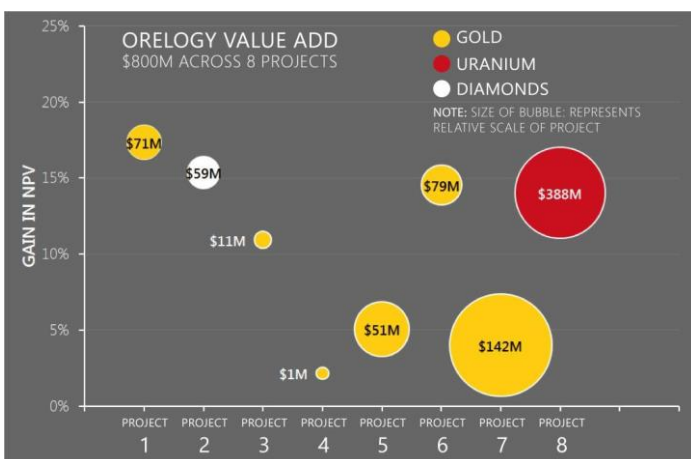
## Our number one goal is to unlock the true value of your project.

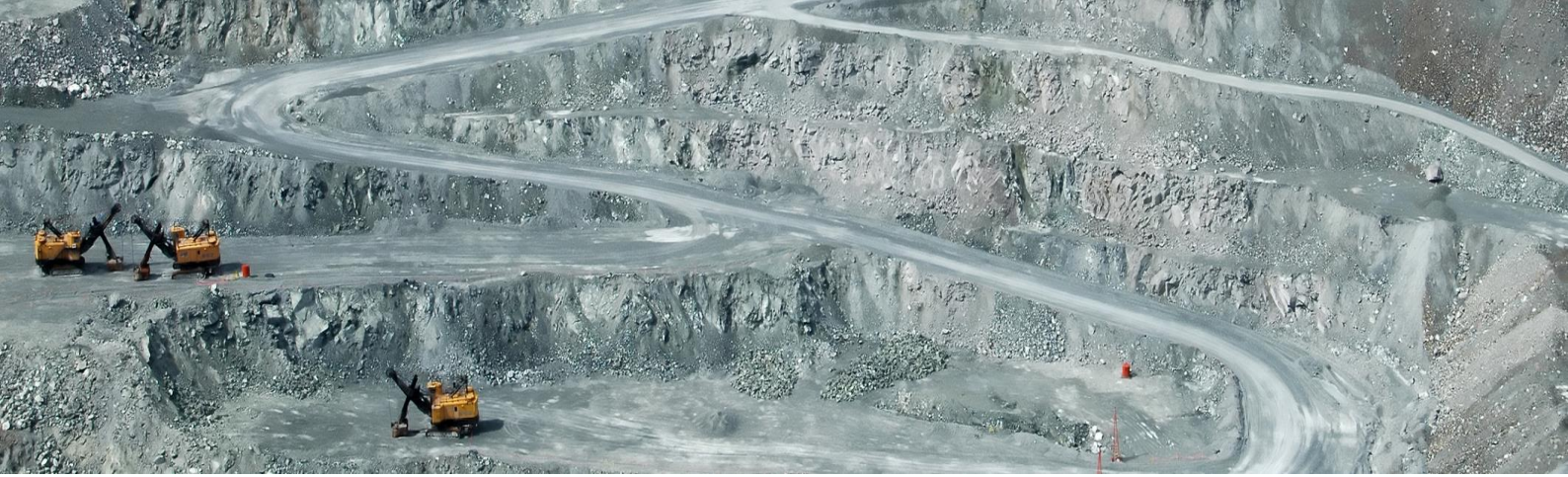
Cut-off Grade optimisation is the single biggest value adding task that can be applied to a mining operation. orelogy, utilising Maptek's cutting edge and innovative Evolution™ solution, have generated significant added value to client projects in just a few months.

Whether your project is precious metal, base metal or energy commodity based, you will be guaranteed to add value and improve the early cash flow of your operation. orelogy ensure that the value is gained within a practical and achievable framework.

**Talk to orelogy today to unleash YOUR projects full potential by optimising your life-of-mine cut-off grade strategy.**

## orelogy consulting added \$800M NPV across 8 projects.





# About orelogy

We are a rare combination of both operational experts and technologists that have demonstrably improved the profitability of mining projects for the past 20 years.

## Who we are

Established in March 2005, orelogy has organically grown to become a close-knit team of highly experienced professionals and specialist associates.

orelogy has a diverse range of clients from junior explorers, mid-tier developers to some of the world's largest miners in Australia, Africa, Canada and Asia; many being longstanding clients. orelogy's personnel have operational and consulting experience in a range of different commodities throughout the world. As a result, we bring a global understanding of the mining industry to develop practical solutions within a strategic framework.

orelogy offers a range of professional services that include Study & Project Management, Mineral Resource Estimation and Reporting, Open Pit & Underground Mine Design, Scheduling, Technical Reporting, Ore Reserve Estimates, Due Diligence, Cost Modelling, Equipment Assessment and ongoing site support to mining operations.

The continued success of the company can be directly attributed to the professionalism, diligence and innovation of our team of orelogists.

In February 2022 orelogy was acquired by idoba, part of the Perenti Group. idoba is a new digital transformation service business, bringing together multiple technology and service offerings including management consulting, industrial mathematics, data science, artificial intelligence and product development.

## Experience and expertise

orelogy has a track record consulting in a large range of differing commodities, locations and mining methodologies. As a company and individually we have particular experience and knowledge in the following:

### Commodities

Gold	Lithium	Lateritic Ni/Co/Sc
Nickel	Graphite	Zinc & other base metals
Copper	Uranium	Mineral Sands

### Mine planning specialists including:

- Exploration data analysis
- Geological modelling and resource estimation
- Strategic mine optioneering
- Cut-off grade optimisation
- Open pit haulage minimisation and waste landform optimisation
- Alternative materials handling such trolley-assist IPPC/railveyor assessment and implementation
- Blend Vectored Modelling and Scheduling
- Underground mining method selection and access optimisation



## Company ethos

Since 2005 orelogy's primary focus has been on providing our clients with value. orelogy achieve this by not only utilising smarter technical approaches, but also providing cost effective outcomes in a timely fashion. We call our approach to consulting "AGILE THINKING".

We "think" for our client, utilising our experience, leading-edge technology and common sense to solve problems. Our objective is to always deliver practical, high value outcomes, not just apply cookie-cutter solutions. orelogy have a proven track record in applying world class technical solutions to mining projects at both the feasibility and operational phase. Our team of dedicated of mine strategists are fully invested in the projects we undertake and seek to consistently provide the highest value deliverable.

And we are "agile". As a small group we can react quickly and efficiently to our clients' needs and the markets unpredictability, changing approach and deliverables when the goal posts change.

## Client services

orelogy's key to successful delivery is that we "think" for our clients, utilising our experience, leading-edge technology and common sense to solve problems and deliver practical, high value outcomes, not just apply cookie-cutter solutions. orelogy have a proven track record in applying world class technical solutions to mining projects at both the feasibility and operational phase. Our team of dedicated of mine strategists are fully invested in the projects we undertake and seek to consistently provide the highest value deliverable.

And we are quick on our feet. As a small group we can react quickly and efficiently to our clients' needs and the markets unpredictability, changing approach and deliverables when the goal posts change.

orelogy are constantly evaluating the opportunities and risks associated with your project. Our goal is to meet your key outcomes with the greatest likelihood of success and lowest risk.

**orelogy provides an extensive range of services to assist clients with the planning and management of their project, and the journey from resource to reserve to operation. These include:**

1. Project management
2. Exploration data analysis and Mineral Resource Estimation (MRE).
3. Independent valuations, due diligence studies and independent review
4. Pre-feasibility & feasibility studies
5. Scoping studies
6. NI43-101 & JORC 2012 technical reporting
7. Site specific mine planning solutions
8. Equipment assessment, selection and costing
9. Operational implementation & benchmarking
10. Mine operations production, planning & support
11. Underground Mining Ventilation
12. Training
13. Scheduling



## 1. Project management

orelogy undertake management of studies on behalf of clients, ensuring all relevant elements are incorporated, assessed to an acceptable level and completed in a timely fashion.

The management of study programs, particularly feasibility type studies, requires a fundamental understanding of all facets of the proposed mine development.

The development of a project's mine plan must effectively encapsulate all relevant aspects of an entire project, including not just mining but also mineral resource estimation, geotechnical, hydrological, processing, environmental, marketing, tenure, closure, safety and more. This plan will determine the eventual economic viability and overall scale of the project. The requirement for mine planning to interface with all parties to determine project value gives orelogy an inherently comprehensive appreciation of all the key parameters of a project and their interaction with each other.

orelogy have a core group of highly experienced Principal Consultants and Project Managers who can bring a wealth of experience to any project, across a huge range of locations and commodities.



## 2. Mineral Resource evaluation studies

orelogy has recently expanded its inhouse capabilities from consulting services specialising in mine planning to include the following comprehensive mineral resource evaluation services :

- Advising on the appropriateness of the methods and procedures used to collect exploration data that informs geological modelling and mineral resource estimation.
- Statistical analysis of client and laboratory QAQC data to assess the precision and accuracy of the assay data that informs resource estimation.

- Exploratory data analysis to determine the statistical characteristics of the analytical attributes (e.g. grades and in-situ density) and their corresponding relationships with the project geology and mineralisation.
- 3-D modelling of geological surfaces and solids reflecting changes in lithology, weathering, host rock alteration and mineralisation styles with different physical, geophysical and geochemical characteristics.
- Geostatistical analysis (e.g. variography and kriging neighbourhood analysis) to guide the determination of appropriate sample search parameters for input to resource grade estimation and the definition of resource classification criteria.
- Analysis and advice on drill spacing requirements aligned with appropriate JORC resource classification criteria.
- 3-D grid modelling of narrow vein deposits or block modelling of broader mineralisation styles.
- Estimation of global insitu mineral resources using traditional linear estimation techniques (e.g. ordinary kriging) or estimation of recoverable resources using non-linear estimation techniques such as local uniform conditioning (LUC) or multiple indicator kriging (MIK).
- JORC 2012 CP signoff and reporting of gold-silver, nickel-cobalt, iron ore, lead-zinc, copper, lithium and graphite Mineral Resources for a wide variety of geological settings, deposit types and mineralisation styles.
- Technical report preparation at an appropriate level aligned with the study objectives whether a stand-alone resource estimation study or as part of a broader project due diligence assessment, scoping study, prefeasibility study or feasibility study.

The new resource geology arm of orelogy has a broad range of previous resource modelling experience on gold-silver, nickel-cobalt, iron ore, lead-zinc, copper, lithium and graphite projects in Australia, Africa, North America, South America, Europe and Indonesia.





### 3. Independent reviews and due diligence appraisals

orelogy is able to provide demonstrably independent analysis and assessments for mining companies, banks and lenders, investors, insurance companies and the like. This form of study includes:

- Due diligence type assessments of both current operations and planned projects for the purposes of investment, acquisition and divestment.
- Independent technical audits public reporting
- Technical reviews for internal company evaluation.
- Fatal flaw reviews of completed studies.

These appraisals cover a range of issues to varying levels of detail, dependent on time frame, budget and client requirements. They can include:

- Examination of exploration data quality, appropriateness of geological modelling constraints and resource estimation technique(s) used by our clients or their consultants, and whether an estimate is likely to reflect the ore tonnages and grades that will be recovered upon mining.
- Detailed assessment of the validity and robustness of the parameters used to develop a project (e.g. mining models, optimisation parameters, design parameters, optimise costs). This is particularly important in the case of verifying reported ore reserves conform to the required reporting codes.
- Examination of planning systems and assumptions to ensure they are practical while at the same time meeting corporate requirements and expectations.
- Rigorous review of proposed or actual operating systems and management strategies to determine their suitability, effectiveness and whether short or long-term targets are achievable.
- Assessment of the interface between mining and all other aspects of the project (e.g. geology, processing, environmental) to determine if any of the interacting systems or assumptions adopted are suitable or could be improved.
- Review the basis for operating and economic projections to determine whether they can be considered valid and realistic.

orelogy can produce reports complying with all relevant disclosure requirements and reporting codes and brings a wealth of practical experience, both within Australia and internationally, to the formation of these reports.



### 4. Pre-feasibility, feasibility & implementation studies

orelogy undertake all mineral resource evaluation and mining engineering related aspects of pre-feasibility and feasibility assessments. Such studies are usually defined as providing engineering and cost estimates to an accuracy of  $\pm 25-30\%$  and  $\pm 10-15\%$  respectively and are always based on Mineral Resources classified as either Measured or Indicated. Implementation studies are generally undertaken to budget level accuracy. The projects can be comprised of proposed “green-field” projects, expansions to existing operations, resumption of abandoned developments or combinations of all three. Components covered can include, but not limited to:

- All aspects of exploration data analysis and resource estimation previously detailed in Section 2.
- Mining Method determination and production rate assessments.
- Optimisation of excavation geometry, be it open pit bench height or underground stope / panel, in conjunction with appropriate modifying factors (ore loss, dilution, equipment selection, productivity estimation etc.)
- Open pit optimisation and / or underground layout optimisation and assessment of any interaction / trade-off between the two.
- Strategic project development assessment including cut-off grade and / or blending strategies.
- Detailed, practical open pit and / or underground designs.
- Calculation of mineable Ore Reserves in compliance with the appropriate reporting standard (JORC, NI-43101, AIM, SAMREC).
- Life of Mine (LoM) mine scheduling including cut-off grade, stockpiling and blending strategies.
- Design of mine layouts including mine infrastructure, road networks, surface water management etc.
- Mine closure and rehabilitation plans.
- Generation of LoM cash-flows and analysis of key project parameters.
- Risk and opportunity assessment.



orelogy can also cater for the geotechnical appraisal and infrastructure requirements of these studies by utilising our network of recognised and trusted service providers.

orelogy have the background and expertise to take mining operations from study level through implementation and execution, with a history of involvement in projects from feasibility through execution to on-going support. We can provide the next level of practical detail to ensure feasibility studies translate into a viable and sustainable operation with the greatest likelihood of success.



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## 5. Scoping studies

orelogy can undertake all aspects of scoping studies or provide specific resource modelling and/or mining engineering contributions as part of a larger team.

This style of study involves an early evaluation of the project mineral resources and practical assessment and economic viability of a project, with a view to confirming whether further, more detailed assessment is warranted.

The resource modelling component aims to understand the nature, spatial coverage and quality of the early exploration data and identify any shortcomings to be considered in future exploration programmes. It also aims to broadly assess and characterise the styles of potential economic mineralisation present and provide a 'global' estimate of the insitu Mineral Resources available for input to the mining evaluation component of the study.

The mining study component involves high-level first pass evaluation using generic or historical parameters to determine potential scale, extent and whether there is a potential break point for applying an underground mining approach. orelogy then builds on this by quickly conducting high level strategic scheduling while concurrently assessing the benefits of a cut-off grade and / or blending strategy to fully understand and realise the projects true value.

The toolset orelogy uses also allows rapid assessment of different project development options, or "optioneering", which provides our clients with an improved forward view of what their project may realistically look like. In this way, an early indication of the scale of operations and the most appropriate development path can be determined, unlocking the project's true value while also identifying possible risks and opportunities.

The advantage orelogy has is our combination of experience and innovative toolsets enables us to turn around these initial assessments in a short time-frame. This agility saves our clients both time and money and allows rapid decision-making on a sound technical basis.



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## 6. NI43-101 & JORC 2012 technical reporting

Over almost 20 years of feasibility level study work and associated Ore/Mineral Reserve reporting, the orelogy Principal Consultants have amassed Competent Person / Qualified Person status over a range of commodities, styles of mineralisation, mining methods and locations. orelogy Principals are all Members or Fellows of the AusIMM and are therefore qualified to act as CP for Mineral Resource and Ore Reserve reporting under the Australian JORC Code and Qualified Persons for Mineral Reserve reporting under the Canadian National Instrument 43-101. We have developed multiple feasibility level reports for the mining components supporting Ore Reserves and Technical Reports supporting Mineral Reserves.

orelogy currently have QPs/CPs covering:

- Precious metals
- Lead/Zinc
- Lithium
- Iron
- Nickel
- Graphite
- Vanadium
- Mineral Sands
- Rare Earths
- Copper
- Uranium



## 7. Site specific mine planning solutions

The orelogy team has a vast amount of collective experience in developing robust and transparent solutions to challenging mine planning problems. This is a result of our orelogists utilising the mine planning software packages currently available not only in operations, but in constantly developing outcomes for complex mining projects as part of ongoing study work. As such we are uniquely placed to tailor a mine planning solution to your project.

Some examples are:

1. Developing a systematic methodology to complex pit or stope optimisation scenarios.
2. Modelling of complex dilution approaches and then automating via scripting.
3. Application of complicated geotechnical criteria to optimisation or design process.
4. Developing robust and achievable mining schedules while catering for multifaceted geometallurgical considerations.

orelogy also have considerable experience in assessing and modelling many of the alternative mine production technologies such as autonomous haulage, trolley-assist haulage, In-Pit Crushing Conveying (IPCC) etc.

We can include the site specific aspects of these approaches to the mine planning solution we develop.



## 8. Equipment assessment, selection & cost modelling

orelogy has undertaken many studies involving both optimisation of mining methods and assessment of mining equipment selection options.

This includes assessment of:

- Continuous Surface Miners
- In-Pit Crushing and Conveying (IPCC)
- Railveyor Material Handling
- Trolley-Assist Truck Haulage

It has the knowledge and experience to provide detailed cost estimation and provide recommendations for mining applications and purchases of associated capital items.



## 9. Operational implementation & benchmarking

orelogy are able to provide support and guidance to our clients not only through the study phases of a project, but right through implementation and execution. orelogy's Principal and Senior Consultants have managed mining projects, some of them as greenfields start-ups, some as brownfield re-starts, or existing operations. It is important to appreciate that the environment around which a feasibility study is developed can quickly change on the journey to execution. We are therefore well placed to provide the project execution support while also having the mine planning background to amend mine plans to fit with changing goal posts. Our orelogy team bring a wealth of experience across commodities and locations which can be tapped into to add value at any stage of the execution process.

orelogy can also review and comment on mining related production targets or cost estimates, either via comparison to historical data available on the orelogy's internal database, or by building comparable first – principal estimates.





## 10. Tailored mine planning support and mentoring

orelogy personnel collectively have considerable mine planning experience and high-level competency in most recognised mine planning packages, including MineSight, Vulcan, Whittle 4X, Surpac, Deswik and Datamine. They are regarded as the pre-eminent experts in Maptek Evolution globally.

orelogy also has expert scripting and programming skills to help projects where a customised solution is necessary. As a result, orelogy can develop comprehensive mine planning systems and procedures tailor-made to the specific requirements of our client. This can vary from strategic life-of-mine planning for multiple working areas to short term planning for individual open pits.

orelogy can provide a bespoke planning support service to operations at either the implementation, pre-production or production phases of operation. This includes every level from Life of Mine (LoM) schedules, annual budgets to monthly production schedules, including development plans and blast layouts.

orelogy personnel have considerable practical site experience, and this background can be of considerable benefit to clients. orelogy personnel have often been embedded with our client's team to offer on-going mine planning expertise, training and mentoring to site based personnel. Their role can include review and optimisation of all aspects of site mining operations, from the mine face right through the mine operations and planning chain to the end customer.

orelogy are also agile enough to quickly react to a client's requirements and provide support as and when needed.



## 11. Underground Mine Ventilation

Introducing a new capability to our services, orelogy offers expertise in the field of underground mine ventilation. This addition strengthens our expertise and dedication to excellence. We are devoted to providing outstanding value and enhanced safety to our clients with this new offering.

Ventilation capabilities include:

- Life of mine ventilation planning.
- Ventilation system and network analysis, design, and optimisation.
- Detailed cost-estimation and scheduling.
- Concept designs and trade-off studies.
- Heat Load analysis and thermodynamic network modelling.
- Ventilation equipment sizing and selection.
- Rock thermal properties and geothermal studies.
- Project support, site support, document reviews and ventilation audits.

Trusted by a growing list of mining operators, we collaborate with clients who prioritise safety and seek innovative ventilation solutions.



## 12. Training

The orelogy team has a vast amount of collective experience in the effective use of many of the mine planning software packages currently available. This includes, but is not limited to products from:

- Maptek
- Deswick
- Hexagon
- Geovia (Whittle™ and Surpac)

We can develop and present training courses tailored to your specific company, project or operation. However more importantly, we do not just teach the “how”, we also teach the “why”. In other words, our training is not just an exercise in showing which buttons to push. It will also cover the concepts and “tips and tricks” associated with all aspects of the mine planning process, be it pit or stope optimisation, open pit or underground design, and short/medium/long term scheduling or any other area of mine planning.

orelogy personnel have often been “embedded” with clients to offer ongoing mine planning expertise, training and mentoring to site based personnel. Their role can include review and optimisation of all aspects of site mining operations, from the mine face right through the mine operations and planning chain to the “end client”.

orelogy pride ourselves on our ability to quickly respond to a client’s requirements and provide support as and when required.



## 13. Scheduling experts

As mine planning engineers, our primary goal is to improve the value of a mining project. This goal is best served through development of robust and practical high value mine plans using smart scheduling techniques.

orelogy has always sought ways to deliver improved solutions to our clients, and as part of that process orelogy developed EVOLUTION, a best-of-breed open-pit mine scheduling solution that harnesses a variety of optimisation techniques.

In October 2014 Maptek™, providers of the Vulcan general mining software, acquired the EVOLUTION suite of products from orelogy . Its acquisition by Maptek is a validation of the unique and proven product orelogy developed.

orelogy remain the pre-eminent power users of the EVOLUTION product globally and bring an unrivalled capability in the application of this product to provide real world mining solutions.



# Projects by location & commodity



## All Projects

- Base metals
- Battery
- Energy
- Industrial
- Poly-Metallic
- Precious Metals
- Steel making



# The orelogists



Ross Cheyne

## Chief Executive Officer

*BEng (Mining- Hons), FAusIMM*

Ross has been employed professionally since 1990. And has extensive operational and planning experience. This includes working in Australia, Ghana, Malaysia, Myanmar and Ireland. He began his consulting career in 2001 with CSA in Dublin, then with Snowden Consultants in Perth before co-founding orelogy with Steve Craig in 2005.

As a Principal Consultant, Ross has managed work on numerous projects in a range of commodities, scales and locations across the globe. He has undertaken all aspects of the mine planning cycle with an emphasis on costing and financial modelling.

When Steve Craig was seconded to Maptek as part of the Evolution software acquisition, Ross took the reins as MD of orelogy from 2014 to 2017, successfully navigating a challenging period in the mining industry. In 2017 Steve completed his tenure with Maptek and resumed his role as MD, with Ross supporting him as Technical Director.

In February 2022 orelogy was acquired by idoba, part of the Perenti Group. orelogy now provide idoba with crucial mining domain knowledge as part of their vision to co-create a better and more sustainable future, in mining and beyond.

With Steve taking a step back from the business in November 2023, Ross made the natural transition to CEO of orelogy.

Ross's role will be to guide orelogy through the next phase of the company's journey, integrating orelogy into the idoba ecosystem while continuing to drive and develop orelogy's core consulting business.



Steve Craig

## Executive Consultant

*BEng (Mining- Hons), FAusIMM*

Steve has been professionally employed in the mining industry since 1988 in a variety of operational, management and mine planning roles.

From January 1995, he worked as an independent consultant specialising in mine planning, software implementation and training. This has afforded Steve an extensive range of experience in both mining locations across multiple continents and multiple commodities.

In 2005, Steve co-founded orelogy with Ross Cheyne. The key objective was to provide specialised mine planning services to the mining industry worldwide. As Managing Director of orelogy, Steve has been pivotal in both growing orelogy's consulting business and the in-house development of the EVOLUTION mine scheduling solution. When the software and IP was acquired by Maptek in 2014, Steve was seconded to Maptek to provide continued development of Evolution under the Maptek banner; returning to orelogy in November 2017 to resume the position of MD. His role then changed to CEO as part of the idoba acquisition in 2022.

In November 2023 Steve took a step back from the day-to-day management of the business to focus on both maintaining orelogy's strong customer connections while also establishing new clients and relationships across the industry. Steve will also continue to provide high-level corporate advisory services, utilising his world class experience and knowledge to provide critical value-add to our clients.





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Ryan Locke

**Principal Mining Consultant**

*DipEng, MAusIMM*

Ryan has worked in the mining industry since 1999, predominantly in nickel & gold operations, in both OC & UG.

Since commencing with orelogy in 2009, Ryan has undertaken the lead technical role for numerous commodities both inside and outside Australia, including cost estimates, mine design, mining schedules, project evaluations, dilution & recovery analysis from scoping studies through to BFS.

Ryan is considered one of the pre-eminent users of Maptek's Evolution software worldwide.



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Jake Fitzsimons

**Principal Mining Consultant**

*BEng (Geological Eng), FAusIMM*

Jake commenced work in the mining industry in 1986 and has a depth of experience in site-based operations. His experience included 10 years at Cawse Nickel Laterite Operations rising to the level of Mining Manager.

Jake moved to a technical role in 2008 and joined a mid-tier company as Study Manager working on a large world class magnetite project before joining orelogy in 2012.

As a Principal Consultant Jake works on a wide range of projects and commodities around the globe managing our consultants and engaging with clients.



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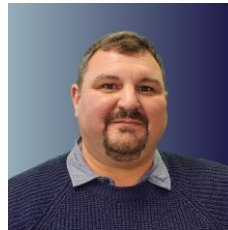
Andrew Hollis

**Principal Mining Consultant  
Open Pit Team Leader**

*BEng (Mining), MAusIMM*

Andrew commenced work in the mining industry in 1986 and has a broad range of experience in surface site-based operations and management, both within Australia and Africa. Andrew's experience includes management of mine operations, mining contracting and consulting across a broad range of commodities including gold, copper, nickel and coal.

Joining orelogy in August 2023, Andrew has substantial experience in cost modelling, equipment performance assessment, operational performance analysis, trolley assist & IPCC operations and all aspects of the mining contract process.



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Julian Broomfield

**Principal Mining Consultant  
UG Team Leader**

*BEng (Mining), MAusIMM*

Julian joined orelogy beginning of February 2023 with over 25 years of experience in mine planning, operations, project management, consultancy and contracting, Julian has worked with a variety of mining methods and operations, both within Australia and internationally. Experienced in mine design and scheduling, project management, technical studies (PEA/Scoping through to Feasibility), strategic/life of mine planning, as well as Reserve/43-101 statements generation and sign off. In addition to a Mining Engineering degree, he has a First Class Mine managers ticket, a Diploma of Business - Front Line Management (FLM) and working towards his AusIMM CP status.



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Laurynne Joyce

**Principal Mining Consultant**

*BAppSc. (Applied Geology), GDip. (Mining), MAusIMM*

Laurynne is a mining professional with 20+ years of experience working in many roles across geology, mine engineering, and learning design.

Laurynnes experience includes advanced technical knowledge in open pit resource and sequencing strategy, resource planning, life of mine planning, project evaluation, project optimisation and reserve reporting. Laurynne believes in leading teams to identify problems and build robust, sustainable, and safe solutions from the back of the envelope to market.

Laurynne enjoys supporting projects to reach their full potential through thoughtful research and application of suitable technology to optimally extract resource value. Some of Laurynnes favourite technologies include ore sorting, just-in-time mineralisation definition, and reaching for the ultimate goal of a peopleless pit.

Laurynne joined the oreology team in January 2024.



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Carel Moormann

**Principal Mining Consultant**

*MSc (Mining), FAusIMM*

Carel has been employed as a professional mining engineer since 1982 in variety of underground and open pit mines, with extensive experience in operational, management & planning roles. In 2005, Carel started work in the mine planning environment with BHP Billiton.

Carel joined oreology in October 2007 and has worked as project manager on numerous projects.



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James Ridley

**Principal Resource Consultant**

*BSc (Geology), MAusIMM*

James is a geologist with over 35 years' experience specialising in mineral resource evaluations, mining geology and near mine exploration across a wide variety of geological settings, deposit types and mineralisation styles for commodities including gold-silver, nickel-cobalt, iron ore, lead-zinc, copper, scandium, lithium and graphite. James has a strong background working collaboratively within small and large exploration, mining and consulting businesses and has a successful track record scoping and delivering resource evaluation studies and mine geology outputs meeting business specific needs.

James, our first Resource Consultant, joined oreology in October 2023.



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Aleks Mihailovic

**Senior Mining Consultant**

*BSc (Mining-Hons), MAusIMM*

Aleks started in the mining industry in 1994 and has experience working worldwide, including 8 years in technical and managerial roles in large open pit mining operations in Africa. He has significant exposure to coal, copper, gold, bauxite, mineral sands, rare earths.

His experience includes open pit mine planning and production management systems, feasibility studies, open pit cost evaluations, project expansion studies, project optimisation studies, equipment selection and Mine-to-Mill Optimisation. His specialist expertise includes mine planning with continuous mining systems. Aleks joined orelogy in 2013.



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Buffy Davies

**Senior Mining Consultant - UG**

*BEng (Mining), MAusIMM*

Buffy joined orelogy in September 2019 as an experienced underground planning engineer. Over her 20 year career, Buffy has a diverse background gained from working with Macmahon, Goldfields, Golden Grove and Kimberly Nickel Mines and others in a variety of roles from Management through to technical including Alternate Mining Manager, planning engineer and underground tendering.



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Hossein Parhoon

**Senior Mining Consultant**

*MEng (Mining) MAusIMM*

Hossein has worked in the mining industry since 2008. Whilst working for consulting companies in Iran he gained valuable site and head office experience in various aspects of the mining industry. Since coming to Australia, he has continued professional growth by working on a variety of different projects.

Hossein joined orelogy in 2011, and since this time has broadened his knowledge and experience with project work completed including pit optimisation, pit design and LOM scheduling.



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Jun Liang

**Senior Mining Consultant - UG**

*BEng (Mining), MAusIMM*

Jun joined orelogy in Dec 2018 and brings her knowledge of Underground and Open Pit Mining gained from working in operations such as Nifty and Homestead/Bullant Underground mine and Enterprise open pit.

Jun has considerable underground planning experience delivering life of mine planning, feasibility studies, and detailed mine design across a range of mining methods. More recently Jun was promoted to Senior Mining Consultant.



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David Eaton

**Senior Mining Consultant**

*MMinEng, MAusIMM*

David's site experience includes 5 years at Tropicana Gold Mine as a mine planning engineer, drill and blast engineer, and registered alternate quarry manager. Prior to this, David has worked in an engineering consultancy with experience in major underground infrastructure projects and mine site services.

David commenced work at orelogy in 2018 as a mining consultant focusing on mine planning and design



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Lawrence Vincent

**Senior Mining Consultant**

*BEng (Hons)/BCom, Dip. Mod. Lang. (French), MAusIMM*

Lawrence has worked in both OP & UG hard rock mining operations in Western Australia. Graduating in 2011, he gained experience in Drill & Blast and Geomechanical Engineering.

Lawrence joined orelogy in 2015 and has been developing his understanding and skills at the more strategic horizon of mine planning. He has worked on pit optimisation, pit design, life-of-mine strategic and detailed scheduling, cost modelling, and geotechnical studies across commodities such as gold, nickel, copper, iron ore, uranium, graphite, and lithium.



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Sarah Collings

**Senior Mining Consultant**

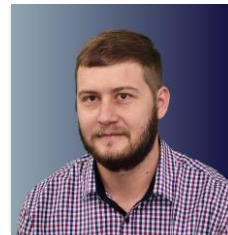
*B.Sc Mining Engineering, MAusIMM*

Sarah's mining career has included both site based and consulting work. Her site work includes roles at both underground and open pit operations. During her time on underground mine sites, she has been exposed to a variety of mining methods such as longhole open stoping, alimak raise mining, narrow vein mining and unconventional remnant mining methods.

Sarah also has open pit experience with one of Australia's largest iron ore producers.

Since entering the world of consulting, Sarah has been involved in scoping and feasibility studies, ore reserve verification and optimisation.

Sarah joined the orelogy team in April 2022



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Ruan Roos

**Senior Mining Consultant - UG**

*B.Sc Honours (Physiology) AusIMM, MVSSA, MAIOH*

Ruan is a mining professional with 8 years of dedicated experience in the mining sector in both Australia and South Africa.

Ruan has a specialised focus on strategic ventilation planning, ventilation modelling and project management. His experience spans across a range of mining methods and operations, encompassing diamond, copper, and gold.

Ruan joined orelogy as a Senior Mining Consultant beginning of August 2023.





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Brendan Hart

**Mining Consultant**

*BEng (Mining) MAusIMM*

Brendan completed his undergraduate study at the Western Australian School of Mines. During this time Brendan worked in several vacation placements including Maggie Hays Nickel Mine, Frog’s Leg Gold Mine and Phosphate Hill Mine.

After graduating with honours, Brendan completed a Graduate Program with Gold Fields at Agnew Gold Mine.

Prior to joining orelogy, Brendan has held consulting positions with Rock Team, Mining Plus, and Mine Geotech. Brendan commenced work at orelogy in 2019 as a mining consultant focusing on mine planning and design.



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Damien Steinbacher

**Mining Consultant**

*Grad Dip. Mining , BSc (Mine & Engineering Surveying)*

Damien is a professional mining consultant with over 13 years’ experience in the mining industry across a variety of technical disciplines, including geology, surveying and engineering. Prior to joining orelogy, Damien worked as a contractor and consultant for 10 years, gaining practical knowledge of mining operations and systems at dozens of mine sites across Australia.

Damien commenced work at orelogy in September 2020 and has been consulting as a mining engineer and planner, focusing on short- to medium-term mine planning and design.



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Aline Costa

**Mining Consultant - UG**

*BEng (Mining), AAusIMM*

Aline commenced her career in Brazil after completing her mining engineering degree in 2017. After spending some time with Samarco Mineração, Aline commenced working with Datamine in Johannesburg during 2017 with a focus on underground mining applications and supporting clients across a range of commodities and mining methods.

Aline commenced work at orelogy in March 2021.



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Amir Khaki

**Mining Consultant**

*MEng (Mining) BE(Mining) PRE IEAUST , MAusIMM*

Amir has gained diverse experience in consulting and operations since graduating in 2011.

He specialises in pit optimisation, mine design, planning, and LOM scheduling and provided services to the mining sector across base materials, gold and iron ore commodities.

Amir joined orelogy in April 2022 as a Mining consultant focusing on mine planning and design.



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Hamid Mergani

**Mining Consultant**

*MEng (Mining), BE(Mining) PRE IEAUST, MAusIMM*

Hamid has three years of operational experience working in an open-pit mine involved in various responsibilities including planning, production and D&B.

He has practical knowledge in open-pit production cycle by using industry-accepted software packages to ensure safe production and make operations more efficient.

Hamid has joined orelogy in August 2022 as a Mining Consultant focusing on mine planning and design.



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Jafar Khademi

**Mining Consultant**

*PhD, MEng (Mining), MAusIMM*

Jafar recently joined orelogy at the end of 2022 as a Mining Consultant, and has over 8 years of combined research, operation, consulting and teaching experience in the field of mining engineering covering all technical matters of operation & production for surface and underground mines, mine strategic planning and design, optimisation techniques and mining method selection, mechanisation and automation, energy consumption and responsible mining.

Jafar brings his knowledge and experience in developing standard operating procedures, codes of practice and regulations, and ISO standards for safe, responsible and sustainable mining.



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Bora Turan

**Mining Consultant**

*MSc. Mining Engineering, MAusIMM*

Bora joined the orelogy team in July 2023 as a Mining Consultant and has over 13 years of operation and consulting experience in the field of mining engineering and mine geotechnics covering all technical matters of operation & production for surface and underground mines, mine strategic planning and design, optimisation techniques, mining method selection, slope stability analysis and slope monitoring systems and underground support system design. Bora brings his demonstrated history of working in the mining & metals industry provide practical solutions to mining operations.



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Farnoush Eftekhari

**Mining Consultant**

*MEng (Mining), MAusIMM*

As a mining engineer, Farnoush has worked in both academia and mine sites, gaining valuable experience in different aspects of mining. Farnoush is familiar with life-of-mine scheduling, mine production, mine rehabilitation, and has experience in pit design and developing extraction plans for both ore and waste.

Farnoush joined orelogy in October 2023 as a Mining Consultant.



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**Julia Batkhuyag**

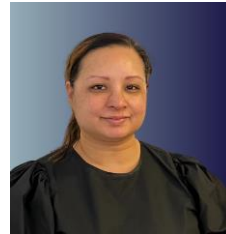
**Mining Consultant - UG**

*BSc. Honours (Industrial Economics & Mining Engineering), MSc. Mining Engineering, MAusIMM*

Julia is a professional with 15 years experience in the mining industry across a variety of technical disciplines. Prior to joining orelogy, she worked as production and planning engineering, gaining practical knowledge of both OP and UG hard rock mining operations such as longhole open stoping, narrow vein mining, unconventional remnant mining and sub level caving and systems at mine sites across a broad range of commodities including gold, copper, zinc, lead, silver, lime and coal in Australia and Mongolia.

Julia has substantial experience in underground drill and blast cost analysis, fragmentation analysis, stope optimisation, and mine design & optimisation.

Julia joined orelogy in October 2023 as a Mining Consultant.



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**Natasha Mascurine**

**Office Manager**

*BBus (Marketing & Tourism)*

Natasha has over 20 years of experience in the Mining and Oil & Gas Industry. Natasha joined orelogy in January 2017 and brings a range of skills from running the day to day office along with extensive knowledge of document control and management, tender coordination and compilation whilst providing consistency and delivery of high quality submissions. Natasha has a strong background in Business Improvement and continually applies this to her role here at orelogy.

# Snapshot of Relevant Projects

COMPANY	PROJECT	COUNTRY	COMMODITY – WORK
Polyus Gold International	Sukhoi Log	Russia	Au – Owners Engineer
Eurochem	Kovdorsky Gok	Russia	Mine Planning Study
Zincor	Shaimerden	Kazakhstan	Mine planning and FS Studies
JSC Varvarinaskoye	Varvarinaskoye	Kazakhstan	Mine planning and FS Studies
Barrick Gold	Hemlo	Canada	Au – PFS & NI43-101
AIC Mines	Jericho	Australia	CU – UG PFS & Reserves
Sarama Resources	Sanutura	Africa	Au - PEA
Whitehaven Coal	Winchester South	Australia	C - PFS
ANAX	Multiple	Australia	Cu, Zn – UG & OP PFS, FS & Reserves
Goldfields	Gruyere Expansion	Australia	Au -Study Management & support
Centamin	Doropo	Côte d’Ivoire	Au - PFS
Superior Gold	Plutonic	Australia	Au – Planning Transformation Project Support & Project Management
Consolidated Copper Corp	Tschudi	Namibia	Cu – PFS
Red 5	King of the Hill	Australia	Au - Implementation Plan
Matador Mining	Cape Ray Gold	Canada	Au – Scoping Study
Liontown Resources	Kathleen Valley	Australia	Li – PFS open pit and underground mining study
Dacian Gold	Mt Morgans	Australia	Au – LOMP Update & Ore Reserves
Primary Gold	Rustlers Roost	Australia	Au – PFS Update
Superior Lake Resources	Superior Lake	Canada	Zn – DFS
Hanking Australia	Toms Gully	Australia	Au – UG PFS
Superior Gold	Plutonic	Australia	Au – NI-43 101 underground development; Mine Planning support
Allied Gold	Various	North Africa	Au – Strategic Planning/DFS/PFS/Implementation Studies including mine re-start
Ibaera Capital	Gold	Ghana	Au – Wa Gold DFS, Tender package and implementation studies
Cheetah Resources	Rare Earths	Canada	REE - Nechalacho PFS
Kamoto Copper Co	Katanga	DRC	Cu/Co - LOM Planning Review
Alita/AMAL/Tawana	Bald Hill	Australia	Li – UG Mining Contract Tender & PFS
Sandfire Resources	T3/A4	Africa	Cu – DFS/LOMP
Nzuri Copper	Kalongwe	DRC	Cu – PFS / DFS
St George Mining Limited	Project Destiny	Australia	Ni – Mining Study/LOM Strategic Plan
RTG Mining	Mabilo	Philippines	Cu/Au/Fe – Scoping / PFS
Atalaya Mining	Rio Tinto Copper Mine	Spain	Cu – Mine planning Review
Barrick	Lumwana Copper	Zambia	Cu - SS/PFS/FS continued mine planning support from inception to 2019
RMG	Tuina Copper Project	Chile	Cu – Mine planning study
Mod Resources	Mahumo Cu project	Botswana	Cu – Mine planning study
Swakop Uranium	Husab Project	Namibia	U – SS/PFS/DFS operational planning (involved over the past 14 years)



# Projects by Method & Commodity

		Primary Commodity																										
		Coal	Bauxite	Iron Ore	Manganese	Garnet	Mineral Sands	Limestone	Kaolin	Poly Metallic	Copper	Zinc	Lead	Tin	Nickel Laterite	Sulphide Nickel	Graphite	Vanadium	Molybdenum	Niobium	Lithium	Tungsten	Uranium	REE	Gold	PGE	Diamond	Other
Surface Mining	Strip Mining	•					•																•					•
	Quarrying		•			•	•	•	•																			
	Open Pit (Large/Bulk)			•	•				•	•	•				•	•	•	•		•	•		•	•	•		•	
	Open Pit (Selective)			•	•		•		•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Mineral Sands					•	•																					
	IPCC			•																								
	Surface Miners		•	•																			•					
Underground Mining	Block Caving									•															•			
	Sub-level Caving														•													
	Stoping with fill									•	•	•			•										•			
	Open Stoping								•						•					•								
	Cut and Fill Stoping									•	•				•										•			
	Room & Pillar									•	•	•								•					•	•		
	Narrow Vein Stoping									•	•														•		•	
	Airleg Stoping													•		•									•		•	
	Civil Tunnelling																										•	





Contact orelogy,  
an idoba company  
for more information.

+61 (0) 9318 5333

[info@orelogy.com](mailto:info@orelogy.com)

[www.orelogy.com](http://www.orelogy.com)

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