

STARK ADVISORY

CAPABILITIES



75 6 regions employees with over 150 speaking projects 15 languages worldwide 50+ technical services: + mining offices + engineering in 5 countries + geology advisory

Who We Are and What Problems We Solve

STARK Advisory provides global engineering and mining advisory solutions from a network of offices in Asia-Pacific, Europe and Africa.

As part of the STARK Resources Group, we specialise in providing comprehensive solutions for the mining and mineral processing industries.

With over 20 years of experience, we offer expertise in various commodities, including precious metals, base metals, and industrial and rare earth minerals. Our global presence allows us to navigate diverse regulatory and operational environments.

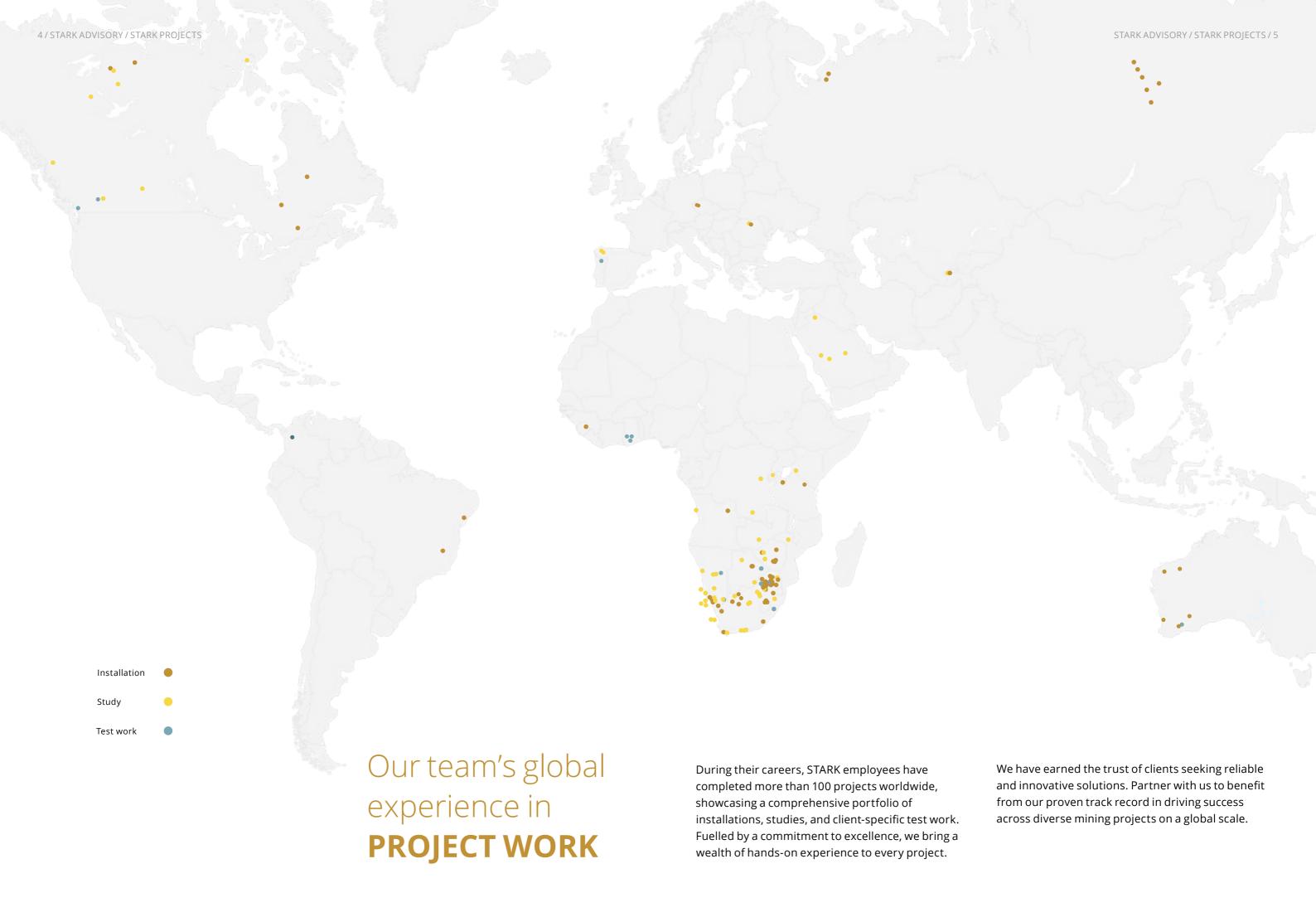
Our team addresses a wide range of challenges, from improving ore recovery rates to advancing sustainability practices in mining. We cover the entire mining lifecycle, from concept and scoping to feasibility, detailed engineering, and beyond, ensuring projects are both feasible and optimised for efficiency and environmental responsibility. By tackling issues such as inadequate ore body characterisation and slow technology adoption, we aim to mitigate risks and unlock untapped value throughout mining development.

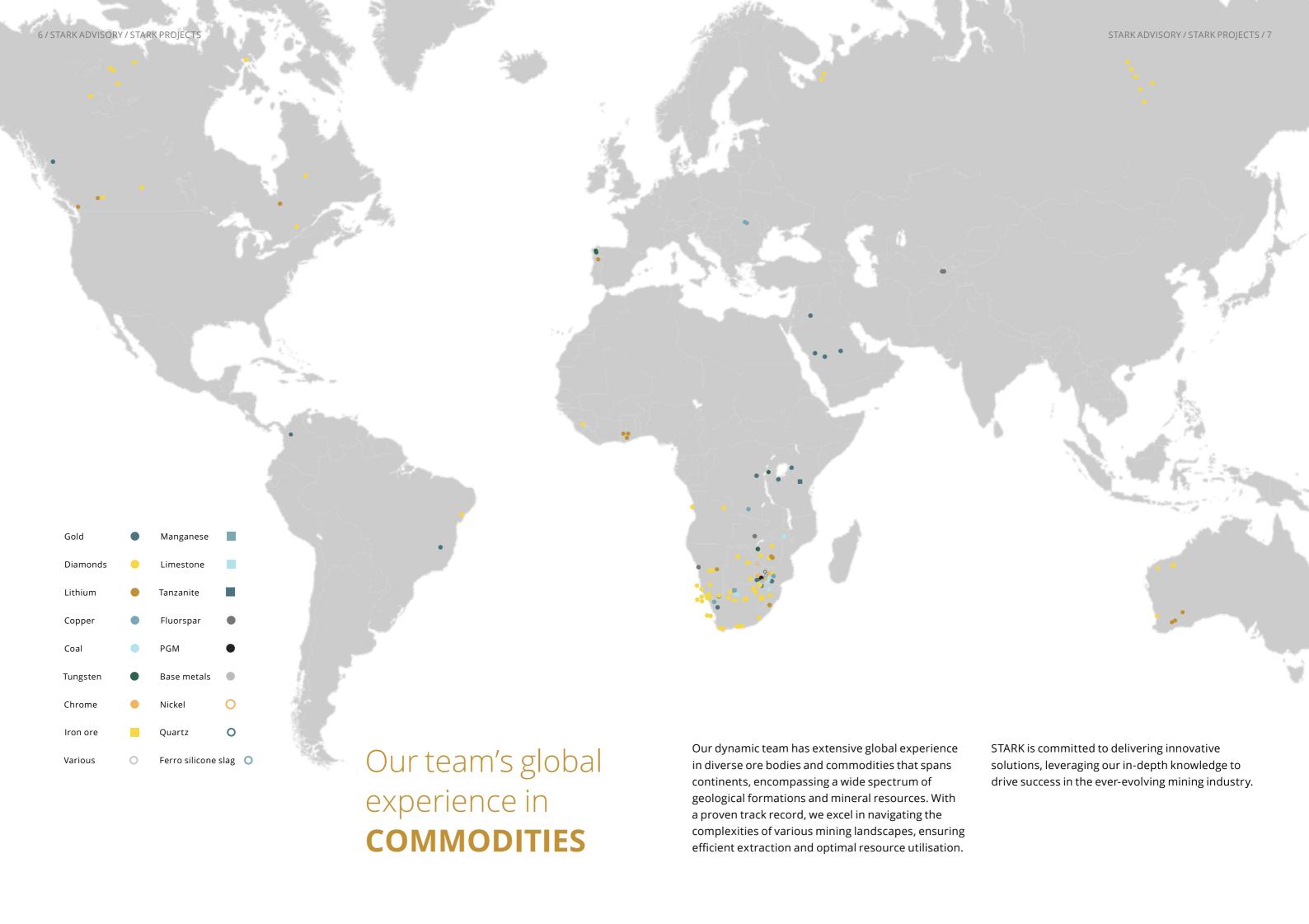
STARK's multidisciplinary team combines expertise in geology, mining, metallurgical and process engineering, as well as mechanical, electrical, and civil engineering.

This comprehensive approach allows us to offer tailored solutions for each project, incorporating cutting-edge technology to ensure our clients' long-term success.

Our commitment to solving industry challenges is evident in our diverse service portfolio, which includes advanced ore body evaluation, riskadjusted financial modelling, and the integration of sustainable mining technologies. Through strategic insight and technical expertise, STARK Advisory not only addresses immediate operational issues but also lays the foundation for future innovation and profitability in the mining sector.

STARK Advisory embraces a holistic approach to mining consultancy and project management, offering effective and transformative solutions. Our goal is to redefine leadership in the mining industry by solving today's complex problems and paving the way for a sustainable, efficient, and profitable future.





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Details of select STARK Projects



North America, Canada

We conducted a comprehensive study for the integration of an XRT ore sorting plant into an underground gold mine in Canada. This study involved the full design of the plant, including detailed estimates of both CAPEX and OPEX. Techno-economic evaluations was performed to assess the viability of the project.

Capabilities

- + Test work
- → Sorter integration
- → Flowsheet simulation
- Test work design

Project Owner

Dian Heinrich Page **Group Head of Advisory** Pr.Sci.Nat / M.Eng Geo Tech





A comprehensive due diligence and gap analysis for the restart of a tin/tungsten plant and underground mining operations in Western Spain, including CAPEX and OPEX requirements for refurbishment and the integration of ore sorting for enhanced processing efficiency. On another project we conducted an economic assessment of a 10 tph modular spirals gravity plant, analysing the

feasibility and financial implications of the project.

South America, Colombia

Capabilities

- → Metallurgical audits
- + Underground setups

Project Owner

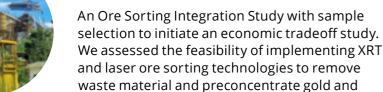
Eugene Collins Mineral Recovery Analyst Pr. Eng. / B. Eng. (Chem.)

Capabilities

- Feasibility study
- + Test work execution
- + Preliminary plant design

Project Owner

Rynard Brits Mineral Resource Manager Pr.Sci.Nat / MSc Engineering Management



Gold

Africa, Botswana Diamond

copper-bearing ore.



After nearly six years of effective XRT sorting operations at a diamond mine in Botswana, the XRT Sorters were on the brink of failure due to severe corrosion. In response, five XRT Sorters were replaced with new stainless steel XRT Sorters, along with ancillary upgrades. These replacement and upgrade efforts were carried out during three consecutive shutdowns and were accomplished promptly and within the allocated budget.

Capabilities

- + Retrofit sorters into existing operation
- Expediting commissioning

Project Owner

Willem Viljoen **Project Manager** B.Tech Mech Eng



Europe, Romania Polymetallic

A transformative project in Romania focused on the execution of a Ground Control Management Plan (GCMP) and the implementation of mechanised drilling rigs. Our team spearheaded the implementation of ground control monitoring strategies as well as the deployment of state-ofthe-art mechanised drilling rigs.

Capabilities

- → Implementation of geotechnical knowledge
- Transitioning to modern mining techniques

Project Owner

Rynard Brits Mineral Resource Manager Pr.Sci.Nat / MSc Engineering Management



Central Asia, Tajikistan Fluorspar

The design and execution of a Fluorspar flotation plant capable of processing 7,000 tonnes per month. Our team spearheaded the construction and execution phases, leveraging cutting-edge technologies such as 3D scanning to optimise brownfields and enhance plant design.

Capabilities

→ Recommissioning abandoned projects

Project Owner

Eleanore Forner Principal – Lithium Pr. Eng. / B. Eng. Hons (Chem.)



Africa, Tanzania Waste rejection - Gold

We spearheaded the design and execution of an XRT plant in Tanzania. After assessing the feasibility, we integrated an XRT sorter into a comprehensive pilot plant solution, allowing for remote operation in challenging environments.

Capabilities

- Expedited pilot plant deployment
- Rapid commissioning in remote locations

Project Owner

Fabian Riedel **Chief Technical Officer** Dipl.-Ing. Mining Engineering



Kalgoorlie, Western Australia Lithium

Implementation of ore sorting technology, conducting a high-level design for an 8 XRT sorter plant aimed at waste removal. The project involved detailed planning and design to enhance the efficiency of waste removal, optimising resource utilisation and operational performance at the mine.

Capabilities

+ Full-scale plant operation integration

Project Owner

Ryan Szabo **Project Manager** B. Tech Mech Engineering

Africa, South Africa Lithium



A scoping study for a lithium mine with a primary focus on ore sorting operations. We conducted XRT and UV testing to assess the feasibility of integrating sorting technology and rapidly deployed an XRT integrated plant in 6 weeks to remove waste material, surpassing nameplate capacity expectations.

Capabilities

- + Economic trade-off studies
- → Expedited XRT plant deployment

Project Owner

Rynard Brits Mineral Resource Manager Pr.Sci.Nat / MSc Engineering Management

Environment, Social and Governance

At STARK, we are committed to Environmental, Social, and Governance (ESG) principles in all aspects of our operations. Specialising in expedited mineral processing solutions, we recognise the importance of sustainable practices in the mining industry. Our approach to consultancy and project management is rooted in a holistic perspective that considers not only the economic aspects but also the environmental and social impacts of our activities.

Environmental Responsibility:

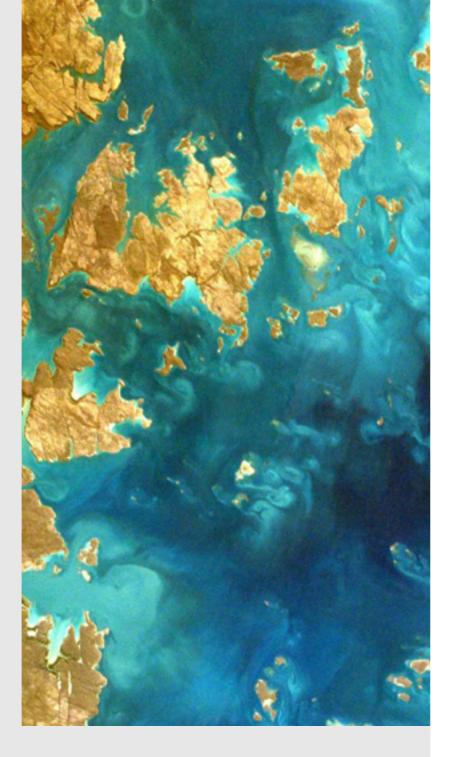
We strive to minimise our ecological footprint by implementing innovative and efficient mineral processing techniques that reduce energy consumption, water usage, and waste generation.

Social Accountability:

We are committed to fostering positive relationships with local communities by considering the well-being of communities and transferring knowledge before completing a project.

Governance:

We uphold the highest standards of corporate governance, transparency, and ethical behaviour in all our activities. Our management practices prioritise integrity, accountability, and compliance with relevant regulations and industry standards. We promote a culture of fairness, diversity, and inclusion within our organisation and encourage responsible decision-making at all levels.



Sustainability

STARK prioritises sustainability through innovative mineral processing solutions, reducing environmental impact. Embracing a holistic approach, we engage with local communities, promoting social well-being and fostering positive relationships. Our stringent governance ensures ethical conduct, transparency, and adherence to regulations, driving long-term value while safeguarding the planet for future generations.

Our Global Mining and Minerals Services

Our approach to global mining and mineral processing begins with a thorough understanding of the ore body and geological context. We go beyond traditional methods by integrating engineering, innovative processing techniques, and a dedication to advancing metallurgical practices. This comprehensive strategy ensures the success of our projects, with each aspect playing a crucial role.

Central to our methodology is customisation and precision. We tailor our solutions to fit the unique characteristics of each site, starting from the initial scoping and design phase. This meticulous attention to detail lays a strong foundation for project success, ensuring alignment with specific deposit requirements.

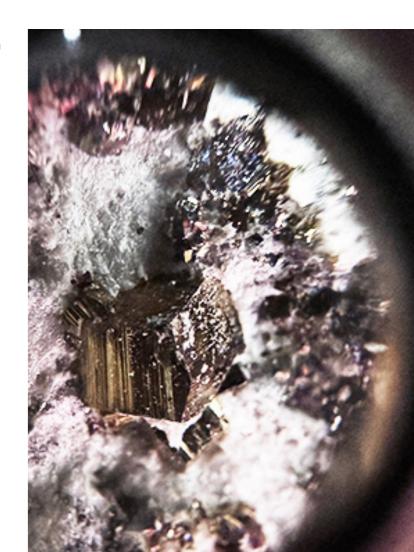
We believe in the power of collaboration, integrating independent advisors, partner companies, and specialised consultants into our projects. Drawing on a diverse network of professionals ensures that our solutions benefit from comprehensive knowledge and varied perspectives. This collaborative spirit is key to delivering integrated and impactful solutions across the mining spectrum.

Our commitment to innovation is evident in our tailored metallurgical testing and proprietary technologies. By refining processing strategies and developing innovative, proprietary technologies like a modular DMS, diamond cleaning detachment plants, in-house conveyors and RFID tracer technology, we strive for efficiency and accuracy in mining operations.

Our multidisciplinary team of experts, including geologists, engineers, and process specialists, ensures an integrated approach to every project. This synergy across disciplines is essential for crafting effective, sustainable, and economically viable solutions.

Our track record of success across different geological settings demonstrates our capacity for innovation, efficiency, and sustainability. We approach each project with a lifecycle perspective, ensuring economic success, environmental responsibility, and social accountability from exploration through to post-mining rehabilitation.

At our core, we are dedicated to sustainability and innovation, striving to minimise environmental impact and maximise operational efficiency in every project. As a leader in integrated mining solutions, STARK Advisory stands out for our holistic approach, innovation, and collaboration, ensuring unparalleled success, sustainability, and profitability for our clients.



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Our Services



Concept **Development** and Scoping

+ Geological and mineral exploration advice and mapping services

- Gap analysis and scoping studies
- Preliminary Economic Assessment (PEA)
- + Technology and innovation consulting
- + Geotechnical and sampling assessment for early-stage projects
- Preliminary resource estimation and modelling
- Strategic project evaluation and selection
- Preliminary metallurgical test work

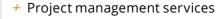


Feasibility Study and Basic **Engineering** + Comprehensive mine design and engineering

- + Metallurgical test work
- + Financial modelling and project economics
- + Feasibility study management and reporting
- + Process engineering and process flow diawgram (PFD) development
- + Hybrid PFD designs
- FEED study
- + Specialist ore sorting, DMS and flotation recovery circuit design
- + Comminution circuit design and trade-off studies



Plant Process Optimisation, **Technology** and **Operations** Consulting



- + Construction management and quality assurance
- + Operational readiness and commissioning support
- + Cost control and budget management
- + Equipment training and workforce development
- + Construction phase risk management
- Commissioning and start-up planning
- + Plant performance testing and validation

Process plant optimisation and studies

+ Manufacturing, legacy and reverse engineering support



Plant

and

Integration,

Construction

Operations

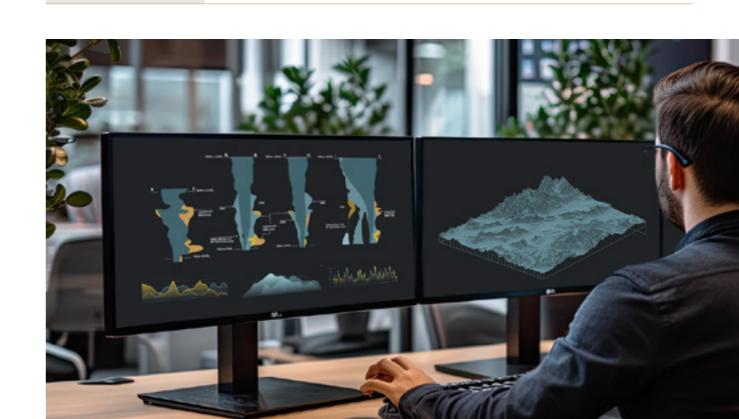
Management

- + Mine to mill optimisation studies
 - + Economic evaluation and asset management assessment
 - + Brownfields process plan site visit and audits
 - Operational troubleshooting and problem solving
 - + Technology integration and automation optimisation
 - Maintenance and reliability engineering
 - Production planning and scheduling optimisation
 - + Technology assessment and implementation
 - + Productivity analysis and benchmarking
 - → New product development



Detailed Engineering

- Detailed engineering mine design and engineering
- + Advanced simulation and modelling for PFD
- + Construction planning and project scheduling
- + Laboratory and pilot plant testing services
- Detailed plan layout and design
- Specialised process control and instrumentation design
- Piping and Instrumentation Diagrams (P&ID)
- Detailed electrical design
- + Civil and structural engineering and analysis
- + Dry and wet tailings management solutions



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Concept Development and Scoping

In the early phases of mining projects, concept development and scoping play a pivotal role in laying the groundwork for success. STARK Advisory specialises in providing a comprehensive suite of services that encompass these crucial stages, setting the trajectory for the entire project lifecycle. These service offerings form the foundation of our expertise in guiding mining projects from inception to fruition.

STARK Advisory undertakes rigorous geological desktop studies, site visits, surveys, and mapping exercises to meticulously identify geological features and potential mineral resource deposits. Leveraging advanced geospatial, geophysical, and hyperspectral imaging technologies, we offer comprehensive mineral exploration advisory and management services. Our approach includes developing and executing exploration programs that utilise field sampling, testing techniques, and core inspection to characterise resources effectively.

Recognising the importance of environmental stewardship, STARK Advisory conducts initial assessments to identify potential environmental impacts of mining operations. We guide early planning efforts to mitigate negative effects on ecosystems and communities, ensuring responsible and sustainable mining practices.

STARK Advisory performs gap analysis and high-level scoping studies to assess technical and economic viability. This includes evaluating initial project design, providing cost estimates (CAPEX & OPEX), and conducting potential return on investment analyses. Our expertise lies in developing economic models that evaluate financial performance under various scenarios, incorporating risk assessments to identify and mitigate potential project challenges.

Our consultancy offers preliminary designs of mine layouts, including pit configurations, underground access points, and waste management strategies. We focus on maximising resource extraction efficiency while ensuring environmentally responsible waste management practices.

STARK Advisory provides advisory services on structuring project financing, identifying potential investors, and developing investment strategies to secure funding. Additionally, we offer guidance on navigating complex regulatory environments, ensuring compliance with local and international reporting codes such as JORC, NI43-101, and SAMREC.

We identify and evaluate emerging technologies and innovations that can improve mineral recovery, operational efficiency, and safety measures. STARK Advisory conducts in-depth analysis of global market trends, demand forecasts, and commodity pricing to inform strategic planning and market positioning.

In summary, STARK Advisory concept development and scoping services encompass a holistic approach to mining consultancy. From geological studies and environmental impact assessments to economic evaluations and technological innovations, we provide comprehensive support to guide mining projects towards successful outcomes. Our commitment to excellence, sustainability, and responsible resource management underscores every aspect of our consultancy services.

Feasibility Study and Basic Engineering

At STARK Advisory, one of our areas of expertise includes conducting comprehensive feasibility studies and basic engineering assessments, laying the groundwork for successful mining projects.

We develop detailed mine plans, including pit and underground designs, to optimise extraction methods, enhance safety, and minimise environmental impact, ensuring efficient and sustainable resource extraction.

Our extensive metallurgical test work determines optimal processing routes, equipment selection, and plant design for efficient recovery and product quality, ensuring effective resource utilisation.

We perform comprehensive financial analysis, including cash flow projections, sensitivity analysis, and return on investment calculations, providing stakeholders with a clear understanding of economic feasibility.

STARK Advisory coordinates and compiles feasibility studies, ensuring a comprehensive assessment of technical, economic, and environmental aspects of the project, facilitating informed decision-making processes.

Our in-depth metallurgical testing refines processing methods, develops comprehensive flow sheets, and optimises metal recovery rates, ensuring efficient mineral processing operations.

Utilising a range of recovery techniques and technology selection, we enhance recovery rates and product quality, ensuring sustainable project outcomes.

We provide detailed cost estimation for capital expenditures and operating costs, offering a solid foundation for budgeting and financial planning, ensuring long-term project viability.

At STARK Advisory, our commitment to excellence in feasibility study and basic engineering ensures meticulously planned and strategically executed mining projects, paving the way for sustainable growth and success. Trust us to deliver tailored solutions to meet your unique needs and objectives.



Detailed Engineering

Within our consultancy services, we provide comprehensive support encompassing detailed engineering, with a focus on creating intricate plans for the construction and layout of mining and processing plants. This service seamlessly integrates into our portfolio, ensuring operational efficiency and safety across all aspects of your project.

We leverage state-of-the-art simulation tools to model mining and processing operations, aiming to identify bottlenecks and opportunities for process improvements. This strategic approach helps optimise plant performance and maximise productivity.

Our team excels at developing detailed construction schedules, identifying critical paths, and efficiently allocating resources to meet project timelines. By meticulously planning each phase, we ensure smooth execution while prioritising quality and safety.

To uphold reliability and efficiency, we conduct comprehensive laboratory and pilot plant tests to validate process design and engineering assumptions. This meticulous approach assures the integrity of your final plant design and operational processes.

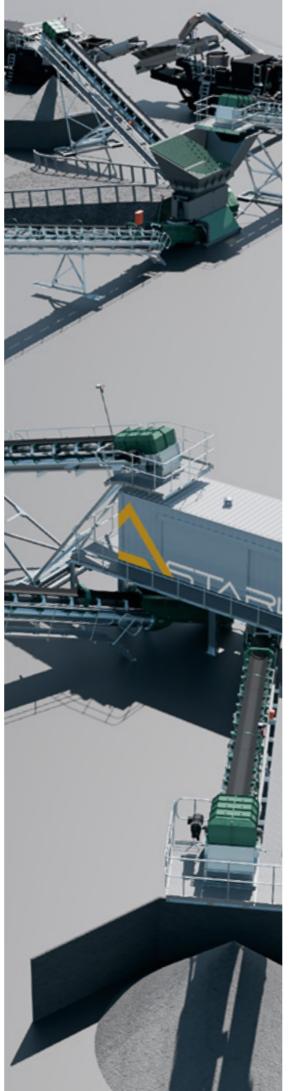
STARK Advisory emphasises optimising plant layout and design for efficient workflow, minimal environmental impact, and ease of maintenance and operation. Our designs are crafted to enhance productivity while aligning with sustainable practices.

We specialise in developing advanced process control systems and instrumentation to optimise production, enhance safety, and ensure product quality. By implementing cutting-edge technologies, we empower your operations for peak performance.

Our expertise extends to creating detailed P&ID drawings that outline process flow and instrumentation details accurately. These drawings serve as crucial blueprints for construction and operations, ensuring seamless execution and compliance.

STARK Advisory offers reliable electrical systems, control panels, and instrumentation designed for mining and processing facilities. Our solutions prioritise safety and reliability, ensuring smooth and secure operations throughout your project lifecycle.

Detailed engineering is seamlessly integrated into our holistic consultancy approach. By combining advanced technology with industry expertise, we deliver tailored solutions that drive operational excellence and success for our clients.



Plant Integration, Construction and Operations Management

Comprehensive services in plant integration, construction, and operations management are available, ensuring the seamless transition from design to full-scale production within mining and processing facilities.

Our approach begins with conducting thorough structural engineering assessments and analyses to guarantee the integrity and durability of all structures within mining and processing facilities. Safety and longevity are paramount considerations in our assessments.

We specialise in designing efficient material handling and storage systems aimed at minimising losses, reducing contamination, and ensuring smooth operations. By optimising workflow and enhancing operational efficiency, we streamline processes for maximum productivity.

STARK Advisory provides end-to-end project management services, encompassing planning, execution, and monitoring of mining construction projects. Our goal is to ensure projects are completed on time, within budget, and to the desired quality standards, prioritising safety and compliance with regulations throughout the process.

During the construction phase, we implement rigorous construction management practices to oversee the process, ensuring quality assurance and adherence to specifications and regulations. Our focus on safety and project requirements is unwavering.

As projects near the start-up phase, we meticulously prepare operations by conducting comprehensive testing of systems and processes, providing personnel training, and establishing operational plans. Our aim is to facilitate a smooth transition to full-scale production without disruptions.

STARK Advisory employs strategic cost management practices, including budgeting, forecasting, and expense monitoring, to keep projects within financial constraints while delivering high-quality outcomes. We prioritise efficient resource allocation to support project objectives.

In addition to our construction services, we offer technical training and development programs to build a skilled workforce capable of operating new technologies and processes efficiently and safely. Our programs enhance workforce capabilities and drive operational excellence.

Throughout the construction phase, STARK Advisory identifies, assesses, and mitigates risks to ensure project safety, meet timelines, and control costs. Proactive risk management minimises disruptions and ensures project success.

Plant Process Optimisation, Technology and Operations Consulting

This service leverages cutting-edge solutions to enhance productivity, reduce costs, and improve product quality within mining and processing facilities.

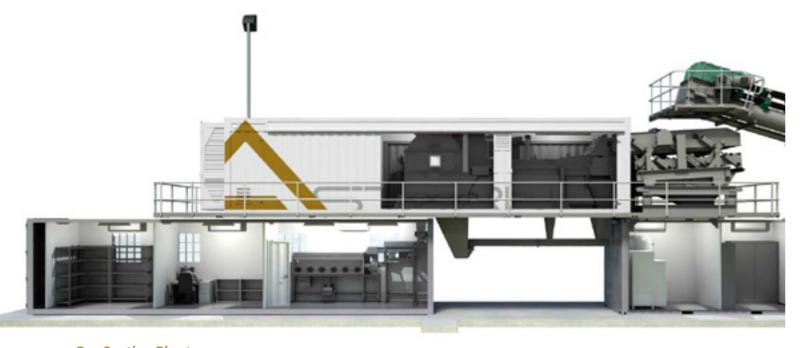
We utilise STARK Technology's in-house developed RFID tracer technology to simulate ore tracking and identify bottlenecks in existing processes. By analysing inefficiencies and opportunities for improvement, we implement tailored solutions to drive productivity enhancements, cost reductions, and quality improvements.

Our expertise extends to the integration and optimisation of mining and milling operations, enhancing overall efficiency and production outcomes. Initiatives such as the integration of ore sorting, including pebble sorting, into SAG / AG mill circuits to improve grades downstream, reduce energy consumption, maintain recoveries, and unlock additional revenue streams.

STARK Advisory conducts studies to identify opportunities for increasing production throughput and improving recovery rates, leveraging the latest technologies and methodologies to drive operational excellence.

We provide expert troubleshooting services to resolve operational issues swiftly and efficiently, minimising downtime and productivity losses. Our focus is on enhancing process efficiency, safety, and reducing operational costs through the integration and optimisation of automation technologies.

Applying maintenance and reliability engineering principles, STARK Advisory improves equipment uptime, reliability, and lifespan, reducing maintenance costs and preventing unplanned downtime.



Ore Sorting Plant



We optimise production planning and scheduling processes to improve order fulfilment, reduce lead times, and balance production capacity with demand, ensuring operational efficiency and customer satisfaction.

STARK Advisory evaluates new technologies for potential adoption in operations, managing the implementation process to ensure successful integration and realisation of benefits.

We conduct productivity analyses and benchmarking against industry standards or competitors to identify performance gaps and areas for improvement, driving continuous improvement initiatives.

STARK Advisory also provides advice on various sensors to assist in exploration, mining, and process plant operations, enhancing data collection and decision-making processes.

We facilitate innovation management processes to encourage the development of new products and services, driving growth and maintaining competitive advantage for our clients.

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Stark Advisory at a Glance

STARK Advisory is dedicated to addressing a range of critical issues that plague the mining and mineral processing sector, hindering efficiency, sustainability and profitability.

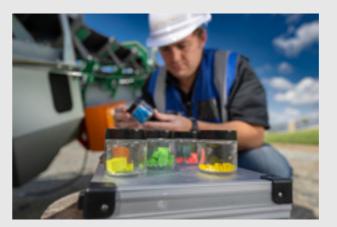
Key problems in the industry that we solve:

- Ineffective processing strategies often lead to suboptimal ore recovery rates. This means that companies are unable to maximise their potential profits from the resources they extract.
- There is a lack of comprehensive solutions that take into account the entire production chain. Many existing approaches fail to consider the interconnectedness of different stages and processes, which can result in inefficiencies and missed opportunities for improvement.
- + Standardised assessments frequently fall short in capturing the full range of project risks and opportunities. This can lead to flawed decisionmaking and hinder the overall success of mining and mineral processing operations.
- Insufficient characterisation of ore bodies poses a significant challenge. Without a thorough understanding of the unique characteristics of each ore body, it becomes difficult to develop tailored and customised recovery solutions that optimise mineral recovery.

- The industry is often slow to adopt the latest technologies, such as sensor-based sorting, and hybrid recovery techniques in one flow sheet, such as ore sorting, DMS and flotation. This reluctance to embrace innovation can hinder operational efficiency and limit the potential for improvement and optimisation.
- + Legacy practices in the mining and mineral processing sector can be environmentally taxing. There is a pressing need to shift towards more sustainable and eco-friendly practices to mitigate the industry's impact on the environment.
- There are significant value-generation opportunities that are often overlooked and missed across mining and processing operations. By making the most of these untapped opportunities, companies can unlock additional value and boost their overall profitability.

STARK Advisory forms part of the STARK Resources Group of companies, a privately held engineering group with a global mining footprint.

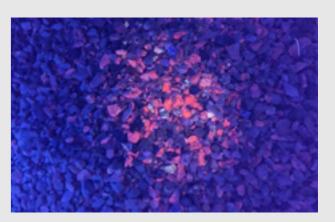
STARK focuses on fast-tracked design, fabrication and construction of minerals processing plants on a fixed price basis (EPC/LSTK). It specialises in delivering projects in developing countries and Tier-1 jurisdictions.



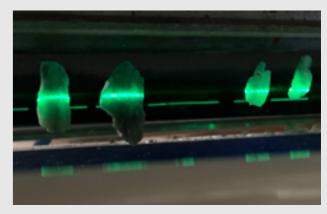












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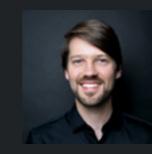
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How far along is your asset in the life cycle of a mineral recovery? **Call STARK** to speak to one of our advisors.

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