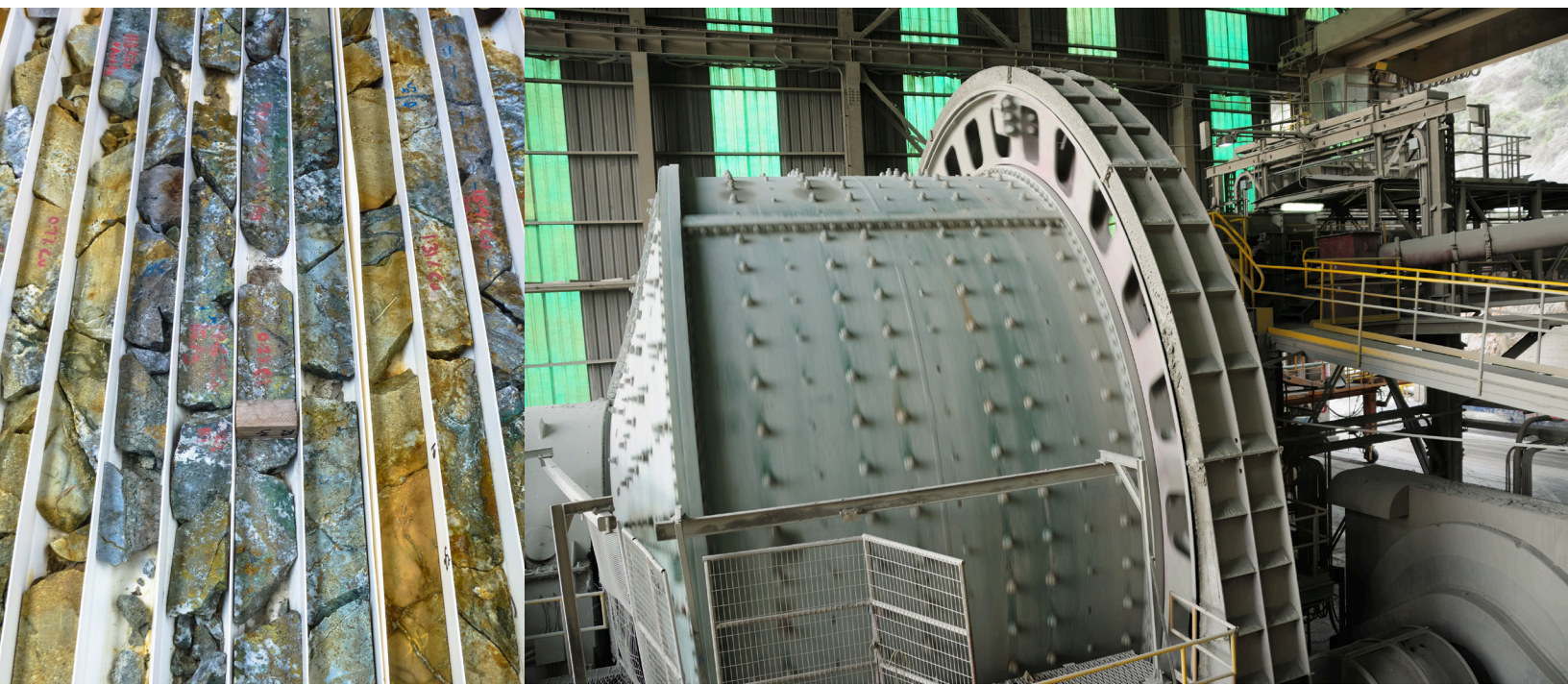


Technology in Mineral Processing



Smarter solutions for today's challenges

Are you managing a concentrator or process operation?
Developing the strategy for a new project? Today's operations are more remote, more complex, and more challenged by lower grades than ever before. This, coupled with the cyclical nature of commodity prices, adds even more pressure for operators to embrace all avenues for optimization.

The industry has recognized the importance of zero harm to people and the environment. It's good business and a prerequisite for maintaining the social license to operate. But cost pressures still exist.

Future success stories will not simply be incremental improvements based on cost cutting and continuous improvement techniques.

We at Hatch believe a step change is possible. That's why we have developed our technology roadmap to show the way to significantly increase productivity and bottom-line shareholder value.

With today's best practices as a baseline, we'll work with you to take it to the next level. We'll help boost your capacity.

Our professionals come from many different disciplines, with a world of experience serving the mining industry. You'll get targeted,

innovative solutions that can enhance your operation and save you money. Together, we'll prove technologies for your specific applications, derisking expenditures and gaining execution credibility.

Whether it's finding new technologies and tools or adapting and modernizing old ones, it's about credibility to achieve smarter solutions. We can help.

If you are considering any of the following, we can support you:

- Process intensification
- Mine-to-mill optimization
- Bulk ore sorting and preconcentration
- Heap leach monitoring
- In-situ leaching
- Process measurement and control

In-situ leaching has the potential to create an entirely new deep mine of the future





Early waste rejection significantly
reduces operating costs

Services

Process intensification

The key to enhancing value is to do more with less, in terms of both capital and operating costs. Our focus is on processing as early as possible in the value chain and pushing the boundaries on cost, energy, water, and labor efficiencies by employing innovative processing techniques. The plant of the future will be smaller and more agile, with seamless integration between the mine and the mill.

Mine-to-mill optimization

You need total value-chain optimization with integrated services in modeling and simulation for geometallurgy, drill-and-blast, comminution, and downstream concentration processes. We have them. You'll see process efficiency, cost savings, and improvements in energy and water efficiency. We'll help you develop site-specific operating strategies, incorporating them into operating practices and implementing technology transfers.

Bulk ore sorting and preconcentration

Reducing the amount of an ore that needs to be milled by the application of ore sorting or preconcentration can significantly increase value by cutting processing costs and enabling mine cut-off grades to be lowered. We can help determine whether or not the profitability of your project or mine can benefit from these techniques and engineer the solutions, whether it's a smaller plant or increased production.

Heap leaching monitoring

When you partner with us, you get a multidisciplinary team using a comprehensive mine-to-heap-leach model that evaluates all the variables to find the best solutions. Hydrodynamic, reaction kinetics, and economic analysis combine to maximize realized values. The ultimate goal is to be able to monitor the performance of the heap in real time and enable intelligent control. Our specialists are developing measurement techniques for monitoring the leach reaction within the heap.

In-situ leaching

In-situ leaching (ISL) is receiving renewed attention as mining operations face increasing pressure around decreasing ore grades, higher costs, tailings disposal, water quality, and a range of environmental issues. We provide a comprehensive service supporting the development, design, and execution of ISL operations and are an industry leader at the cutting edge of in-situ leaching technologies and their implementation.

Process measurement and control

Many of today's process measurement and control schemes are limited by the inability to measure directly what needs to be controlled. Our process engineering, control, and instrumentation specialists are working together to find direct measurement techniques for such parameters as gas holdup and bias rate, amongst others, to enable better control of flotation columns.



About Hatch

Whatever our clients envision, our engineers can design and build. With over six decades of business and technical experience in the mining, energy, and infrastructure sectors, we know your business and understand that your challenges are changing rapidly.

We respond quickly with solutions that are smarter, more efficient, and innovative. We draw upon our 9,000 staff with experience in over 150 countries to challenge the status quo and create positive change for our clients, our employees, and the communities we serve.

hatch.com