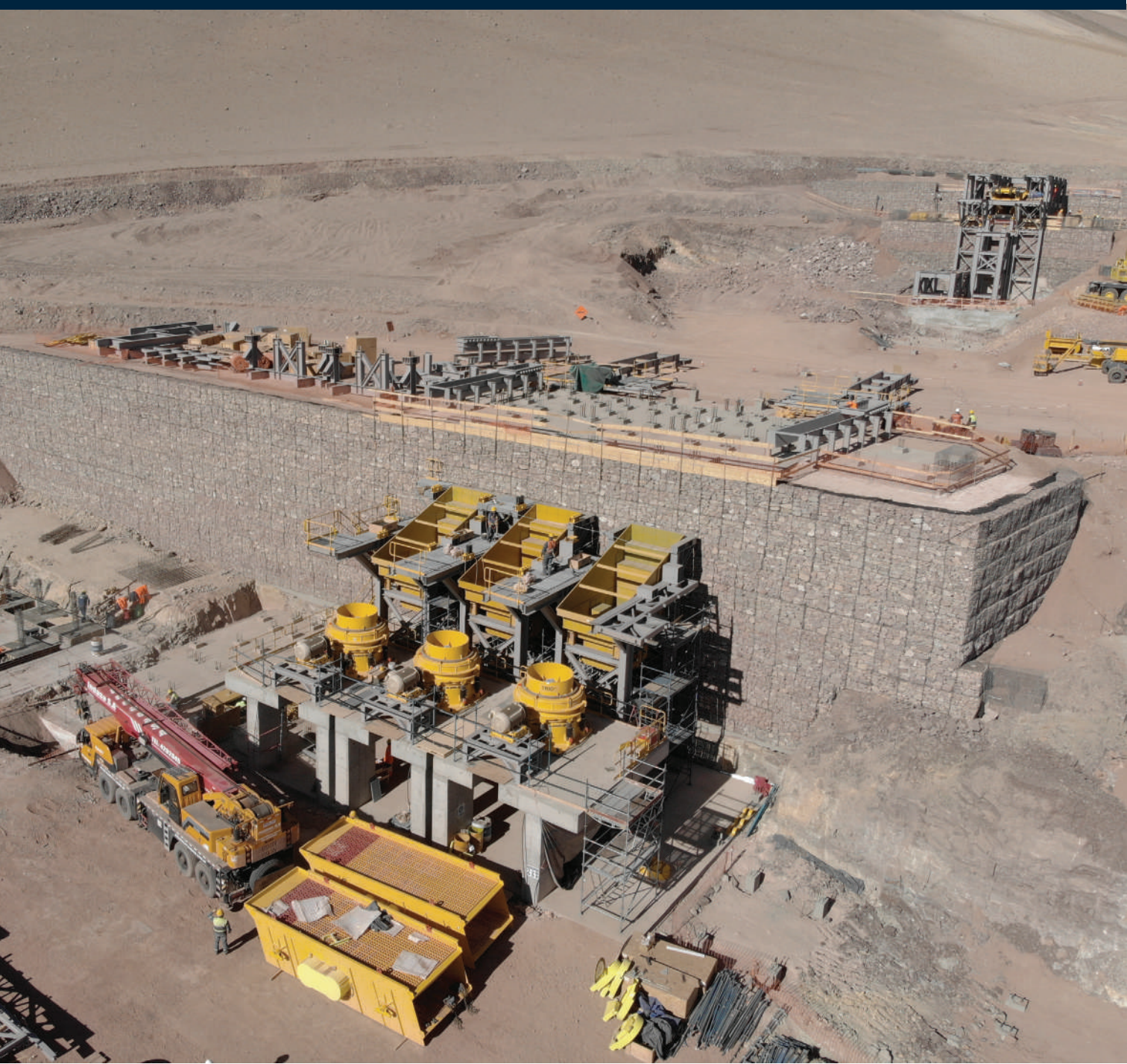


WWW.SAXUM.US



**MINING QUALIFICATIONS**

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*PROJECTS & EXPERIENCE*



## MISSION & VISION

**SAXUM** is a multi-disciplinary engineering and project management services enterprise specializing in the mineral processing, oil and gas, and infrastructure industries. It includes 4 (four) companies in the USA, Brazil, Australia and Argentina, and 6 (six) offices, in Tucuman and Buenos Aires, Argentina; Irving, TX, USA; Belo Horizonte, MG, Brazil; and Perth, WA, Australia.

### MISSION

To provide high-quality engineering and project/construction management services to the industry. We timely meet the demanding technical needs of our customers with accuracy, quality and cost effective solutions during all stages of their projects, from Pre-Feasibility to construction/erection. We promote training and continuous improvement of our professionals to achieve excellence in engineering and procedures.

### VISION

To enhance our clients' bottom-line results through efficient engineered solutions and management, and accurate cost estimates and planning for their industrial projects, everytime, everywhere.

*Providing multidisciplinary technical assistance with excellence since 1996*



## ABOUT US

### IN ENGINEERING, WE OFFER KEY DISCIPLINES FOR PLANT DESIGN

PROCESS ENGINEERING FOR THE MINERAL PROCESSING INDUSTRIES

MECHANICAL ENGINEERING (PLANT DESIGN, PIPING, PROCESS GAS HANDLING, ENVIRONMENTAL CONTROLS, NUISANCE DUST COLLECTION AND MATERIALS HANDLING, CRUSHING AND GRINDING SYSTEMS)

CIVIL AND STRUCTURAL ENGINEERING (EARTH WORKS AND SLOPES, PONDS, TAILING DAM STABILITY, DRAINAGE, ROADS, FOUNDATIONS, STRUCTURES, CONNECTIONS DETAILING, SEISMIC ANALYSIS, ETC.)

ELECTRICAL, INSTRUMENTATION AND CONTROL ENGINEERING



## OFFICES

# ENGINEERING AND EPCM CAPABILITIES ALL AROUND THE WORLD



**ARGENTINA**  
TUCUMAN  
BUENOS AIRES

**BRAZIL**  
BELO HORIZONTE

**UNITED STATES**  
DALLAS, TX

**AUSTRALIA**  
PERTH



*SAXUM in its continuous improvement process has adapted all the procedures to the highest international requirements with the ISO 9001:2015 quality certification.*



## SERVICES

We differentiate ourselves from other engineering companies by offering strong expertise and knowledge in Engineering, Procurement, and Construction Management (EPCM) services for mineral processing industries (cement, lime, mining), as well as the Oil & Gas and infrastructure industries.

Our services are characterized by high level project management and engineering teams which allow our clients to rely on our way to execute their projects with a focus on delivering either refurbished or new facilities within realistic schedules and budgets as well as optimal technical solutions.

AUDITING

CONSULTING SERVICES

FEASIBILITY STUDIES

EPCM SERVICES

PLANNING AND PROJECT CONTROL

PROCUREMENT

LOGISTIC & EXPEDITING

COMMISSIONING

SITE SUPERVISION

MULTIDISCIPLINARY ENGINEERING

CAPEX/OPEX EVALUATIONS

CONCEPTUAL, BASIC & DETAILED DESIGNS

TRADE OFF STUDIES



# CLIENTS

## NORTH AMERICA

VCNA Charlevoix	Martin Marietta
St Marys Cement Inc	FLSmidth
Cementos Fortaleza.	BUZZI UNICEM
CEMEX	GCC
Drake Cement	Votorantim Metals NA Inc.
Nelson Brothers	TKS Group
LAFARGE - HOLCIM	HEIDELBERG CEMENT
Lattimore Materials Corp.	GIANT CEMENT
Panamerican Silver	RECON
Fortuna Silver Mines Ltd.	Intrepid Mines Ltd.
Lattimore Materials	Elementia S.A.B. de C.V.
Barrick Gold Corp	Titan Cement
FMC Corp	Orvana Minerals Corp.

## EUROPE

LAFARGE - HOLCIM	CEMEX
Italcementi	Thyssenkrupp AG
CIMPOR	FL Smidth
Cementos Molins	Bilfinger
Fives FCB	Cementos Portland
Hochtief AG	Valderribas
Siemens AG	Calucem

## ASIA

LAFARGE-HOLCIM
Inter cement
SINOMA
Taiwan HS Rail Corp.
Bilfinger

## MIDDLE EAST & AFRICA

Bilfinger & Berger
QN Cement Company
Inter cement
VOTORANTIM
Sotacib, Grupo Molins
Kuwait Cement Co.

## DOMINICAN REPUBLIC

Grupo Estrella

## SOUTH AMERICA

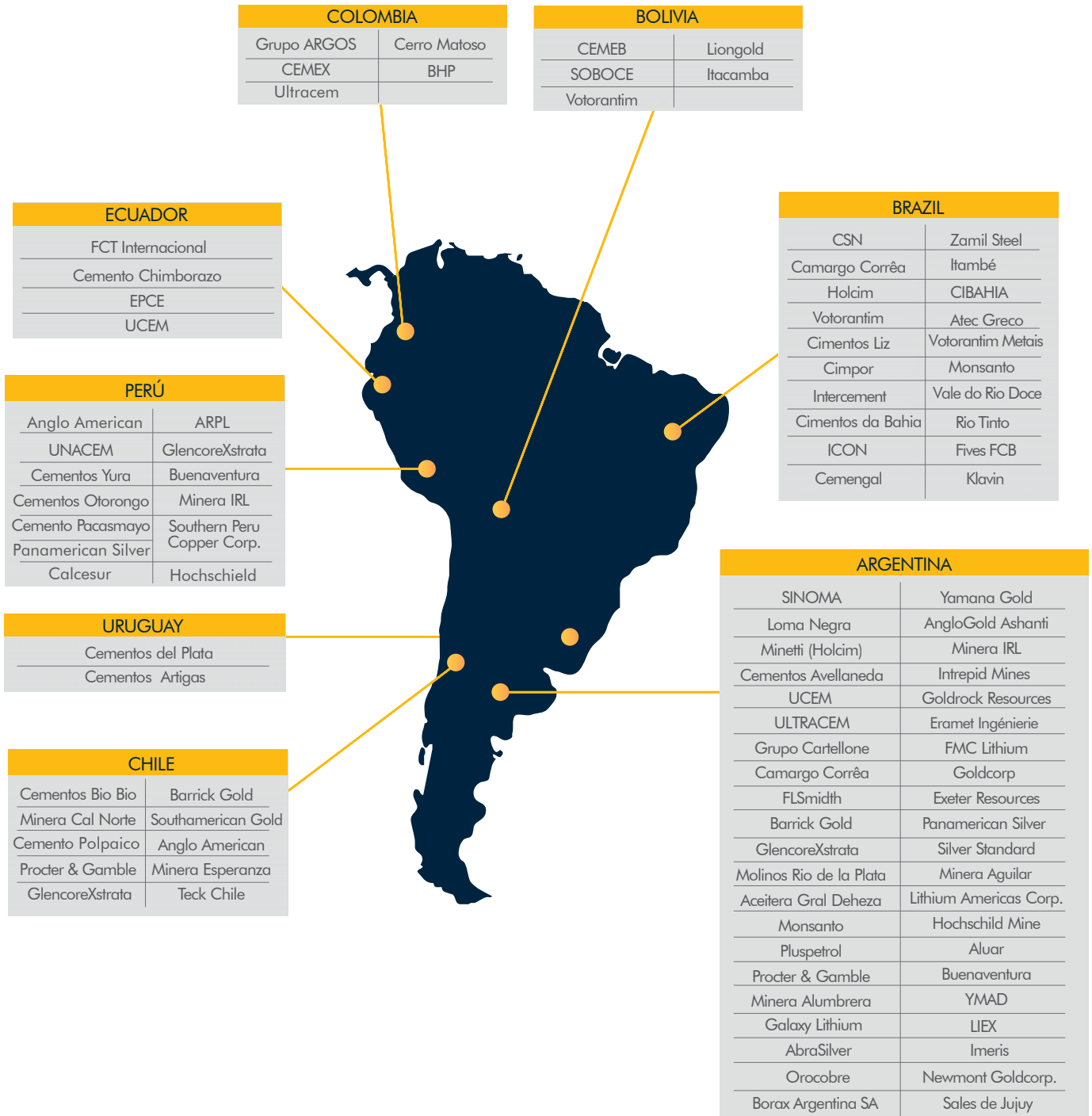
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## AUSTRALIA

Ernest Henry Mining (GlencoreXstrata)
Adbri Cement
Cockburn Cement Ltd



# CLIENTS



## EPCM SERVICES

### PROJECT MANAGEMENT

SAXUM provides Professional Project Management services to our clients, based on PMI best practices and clear procedures, highly experienced personnel, and clear understanding of our clients needs and expectations. Our Project Managers act as the primary contact, as well as the overall responsible for coordination of all project activities, both in office and in the field.



#### SAXUM SUCCEFULL PROJECT MANAGEMENT IN BASED ON

- PRECISE PROJECT UNDERSTANDING AND SCOPE INFORMATION
- TRACKING PERFORMANCE AND TAKING NECESSARY ACTIONS
- COMPLETE, TIMELY AND ACCURATE INFORMATION
- CLEAR AND OPEN COMMUNICATION
- TEAM COMMITTED TO THE PROJECT AND CLIENT OBJECTIVES

SAXUM's Project Management processes have been designed and improved through the years, and based on lessons learned on previous projects to ensure succesfull implementation and execution of the contracted scope of work.

SAXUM manages projects focused on meeting the client's goals for Cost, Schedule, Quality and Safety. Conscious of risks and showing the ability to respond to client needs with efficient solutions.

Client's needs set the Vision that will be the basis for SAXUM's Project Managers to coordinate and lead all parties involved in the projects, to follow the Project Execution Plan through Project Initiation, Planning, Execution, Monitoring and Closure.



## EPCM SERVICES

### CONSTRUCTION MANAGEMENT

SAXUM's Construction Management is the core of the company's services. It involves the direction, regulation and supervision of a project from early development to its completion and is responsible for planning work schedules, coordinating the most efficient method and construction strategies and budgeting. The team is composed of multidisciplinary professionals that allow us to administer the different disciplines, such as: Civil/Structural, Mechanical, Electrical and Instrumentation, Safety, Contracts, Administration, Commissioning, etc.



### PROJECT SUCCESS

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SAXUM's Construction Management team knows that Project Success is all about organization, planning and follow-up work to achieve the results that comply with client requirements and design criterias. These are all challenging tasks, particularly in the mining industry at high altitudes, where we find sensitive environments that include special local communities and cultures, harsh weather, and strong technical and logistics difficulties.

### RESOURCES

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To achieve a successful project under these tough conditions, SAXUM has all the necessary resources to be strongly focused in safety and environmental control, strong planning in advance (FEL – PDRI), excellent Project Control, field supervision and administration management. The key word for SAXUM, as EPCM and project integrator, is Team Work, that include all project's stakeholders: client, EPCM, contractors, consultants, vendors, local authorities and communities, unions, etc.

## EPCM SERVICES

### PROJECT CONTROL

SAXUM manages all aspects of the construction process, from the initial design phase to the end. Throughout, we maintain constant communication between all parties, while satisfying the interests and needs of the owner. SAXUM's Project Control Teams offer their clients a wide range of project management services. The services are adapted to each project to meet the needs and wishes of the owner. The following list represents a general description of our project management services:



#### PROGRAMMING

Project Control has extensive experience in selecting and directing programming consultants. This experience in working with programmers will insure that the owner's facility needs are clearly determined and defined.

#### REPORTING

Project Control prepares written monthly status reports for distribution to the appropriate parties. The reports address the current status of each individual project. Project Control will attend meetings, then report to the owner and answer questions.

#### SCHEDULING

Our experience in managing the entire process, not just any segment, allows us to prepare reliable project schedules for both the design and construction phases early in the project development stage. These schedules are monitored and updated periodically.

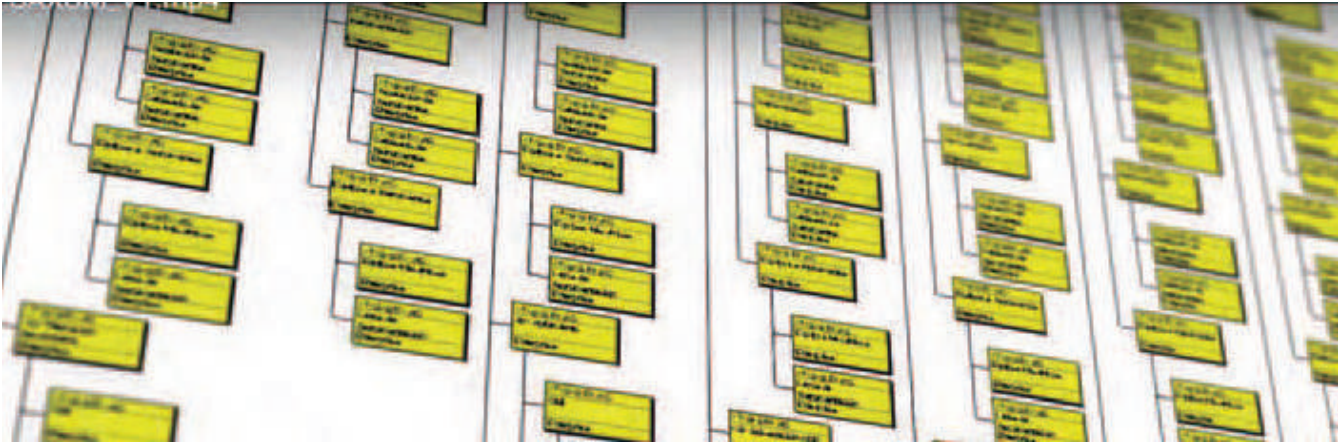
#### MONITORING

To finish a project on time, within budget and with the desired quality, professional monitoring on a daily basis is necessary. Project Control continuously oversees all aspects of a project, anticipates problem areas and assists in resolving problems and conflicts that may arise.



## EPCM SERVICES

### PROJECT CONTROL



#### EARNED VALUE

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Project Control has saved owners millions of dollars in construction costs. We work constantly with the owner and design team during the completion of documents to review savings opportunities while the project design is being developed. With the agreement of the owner, these opportunities are available to be implemented prior to bidding. By working with the contractor, additional cost savings options can be developed during construction. SAXUM uses the Earned Value Management System Technique.

#### CONTRACTING

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Project Control has prepared and negotiated hundreds of contracts for owners on over 100 projects with an aggregate value of over millions dollars. Our contracts have been developed from the owner's perspective for the benefit of the project.

#### CONSULTANT SELECTION

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Project Control assists the owner in selecting the most qualified consultants for various projects by preparing requests for proposals, evaluating the proposals and making recommendations to the owner. Following this process, Project Control conducts interviews with the firms. With Project Control's proven and thorough techniques for consultant selection, the owner is able to make the most appropriate consultant selection for the project.

#### CLOSE OUT

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During final stages of project completion, Project Control closely monitors the activities of the contractor to make certain that punch list items are promptly completed. During the warranty period, Project Control continues to serve as the owner's advocate to make certain that any warranty work is expeditiously completed.

## EPCM SERVICES

### PROCUREMENT

SAXUM's team of multidisciplinary professionals has extensive experience in procurement services supported by our first class engineering team which covers all technical disciplines. Our procurement services are based on proven procedures and cover a wide range of activities, from the preparation of bidder lists and contractual terms, to expediting, logistics and QA/QC.



### SUPPLY CHAIN ACTIVITIES

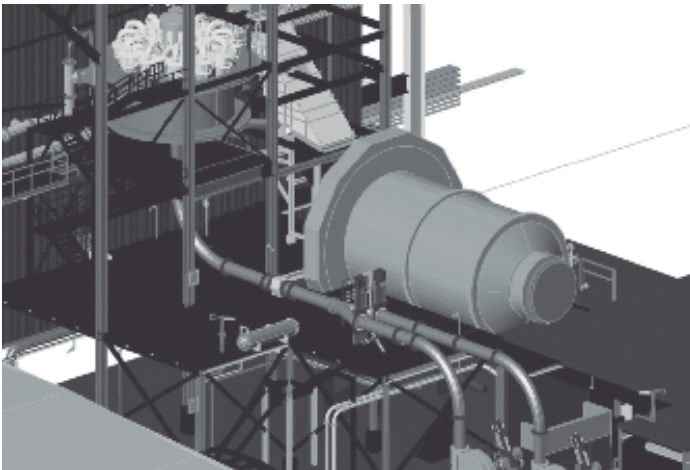
- HIGHLY EXPERIENCED PROFESSIONALS
- PURCHASING & ACQUISITIONS
- VENDOR DEVELOPMENT & AUDITS
- CONSULTING SERVICES
- PROCESSES AND PROCEDURES
- INTERNATIONAL IMPORTS & EXPORTS
- CUSTOMS CLEARANCE CONSULTING SERVICES
- LOGISTICS - DOMESTIC & INTERNATIONAL
- CONTRACTING & OUTSOURCING
- CONTRACT MANAGEMENT & ADMINISTRATION
- COSTS AND BUDGETING PROJECTS
- MATERIALS MANAGEMENT
- KPI'S

SAXUM's procurement team provides our client an integral and detailed service to assure the fulfilment of projects objectives regarding quality, cost and schedule. Our team has proven ability to complete the acquisition of all items and close all contracts of highly complex industrial projects within short time-frames, and in the framework of project budget and quality.



## ENGINEERING

WE PROVIDE ENGINEERING SERVICES FROM CONCEPT TO REALITY



SCOPING STUDIES AND TRADE OFF ANALYSIS

CAPEX AND OPEX STUDIES

PREFEASIBILITY AND FEASIBILITY STUDIES BASED ON NI43-101 STANDARDS

COMPLETE ENGINEERING: CONCEPTUAL, BASIC AND DETAILED

PROCESS, MECHANICAL/PIPING/DUCT, CIVIL/STRUCTURAL, ELECTRICAL,  
I&C ENGINEERING

SCHEDULE DEVELOPMENT

MAIN PROCESS EQUIPMENT BID DOCUMENT PREPARATION

AUXILIARY EQUIPMENT SELECTION ASSISTANCE

CONSTRUCTION BID DOCUMENT PREPARATION

PROCUREMENT

CONSTRUCTION MANAGEMENT

SITE SUPERVISION

## ENGINEERING

### PROCESS ENGINEERING & PLANT OPTIMIZATION



PROCESS AUDITING, CAPACITY UPGRADES

TROUBLESHOOTING

OPERATIONS ANALYSIS

MASS AND ENERGY BALANCES

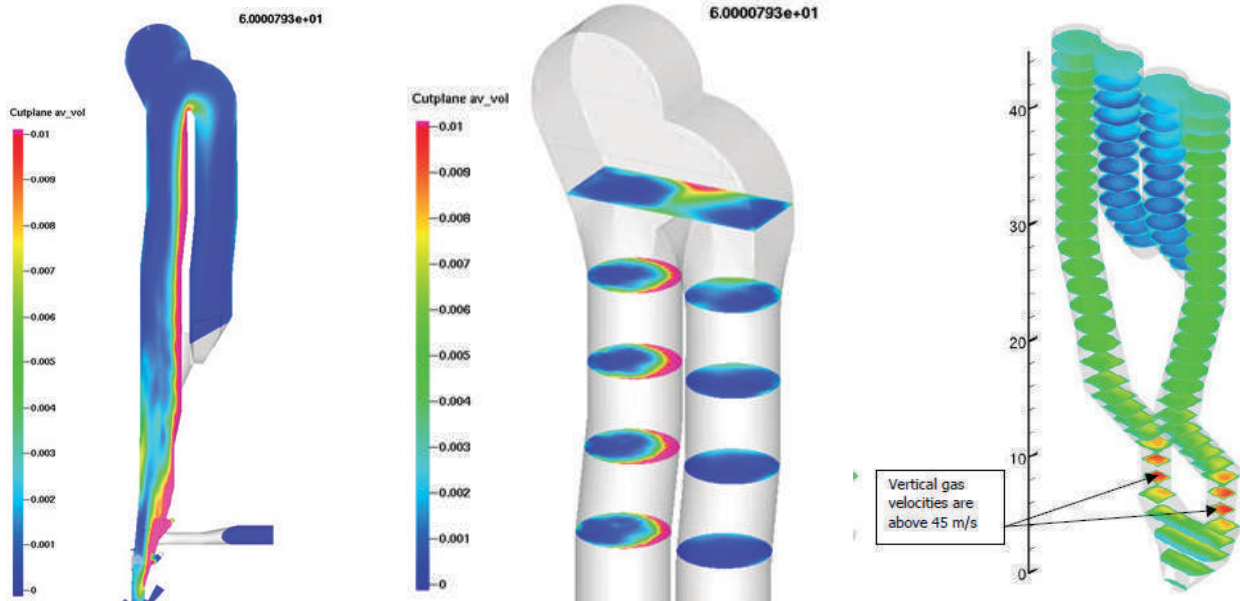
PROCESS CALCULATIONS AND FLOW DIAGRAMS

ANALYSIS OF OPTIMUM MATERIAL STORAGE REQUIREMENTS

DEVELOPMENT OF COST-EFFECTIVE ENGINEERING SOLUTIONS

COMMISSIONING

## CFD FOR ALTERNATIVE FUELS ASSESSMENT



Computational Fluid Dynamics Analysis (CFD) are performed at SAXUM at the highest level of quality, in the following industrial problems:

### SOILS SLOPE STABILITY ANALYSIS FOR THE MINING INDUSTRY

CFD analysis with fluid-solid interaction is considered for the evaluation of infiltration lines in porous media like soils in the slopes of tailing dams and their consequences in the overall slope stability.

### STRESS ANALYSIS IN PIPING SYSTEMS

CFD analysis with fluid-solid interaction is also used by SAXUM to evaluate resulting stress distributions in piping systems under consideration of the real hydraulic properties of the fluid, its pressure, and the temperature conditions. These analyses give rise to the selection of the optimal designs of piping systems in industrial applications.



## ENGINEERING

### MECHANICAL ENGINEERING & PLANT DESIGN



SYSTEMS INTEGRATION WITH MULTIPLE VENDORS

PLANT LAYOUTS

GENERAL ARRANGEMENTS

FULL 3D MODELLING

EQUIPMENT TECHNICAL EVALUATIONS

EQUIPMENT SIZING AND CAPACITY DETERMINATION

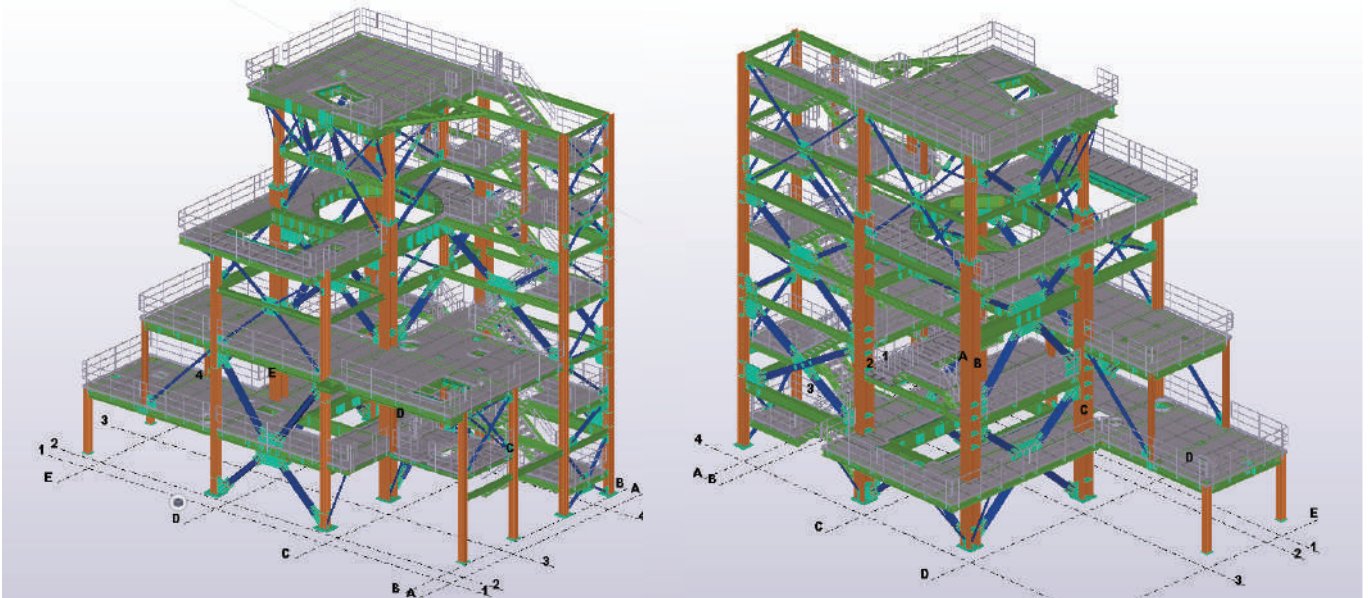
EQUIPMENT AND INSTALLATION SPECIFICATIONS

DUCTWORKS

ENGINEERING DESIGN: PIPING SYSTEMS - MATERIAL HANDLING SYSTEMS  
PROCESS EQUIPMENT LAYOUTS

# ENGINEERING

## CIVIL & STRUCTURAL ENGINEERING



STRUCTURAL ANALYSIS & DESIGNS (INCLUDING HIGH SEISMIC & HURRICANE ZONES) FOR INDUSTRIAL PLANTS

EVALUATION AND IMPLEMENTATION OF GEOTECHNICAL REPORTS

STRUCTURAL DESIGN BASED ON VIBRATION MITIGATION

DYNAMIC FOUNDATION ANALYSIS

DESIGN OF REINFORCED CONCRETE AND STEEL STRUCTURES

CONCRETE SILOS AND BUNKERS

STEEL BINS AND HOPPERS

TUNNELS AND UNDERGROUND STRUCTURES

DESIGN OF ROADS, EARTHWORKS, AND SLOPES.

DESIGN OF PONDS AND TAILING DAMS.

STABILITY ASSESSMENT OF SOIL/ROCK SLOPES.

## ENGINEERING

### ELECTRICAL ENGINEERING



POWER DISTRIBUTION SYSTEMS

INSTRUMENTATION AND CONTROLS

HMI INTERFACE COORDINATION

PLC PROGRAMMING

MOTORS (MEDIUM VOLTAGE AND LOW VOLTAGE)

MEDIUM VOLTAGE STARTERS AND BREAKERS

TRANSFORMERS

MOTOR CONTROL CENTERS

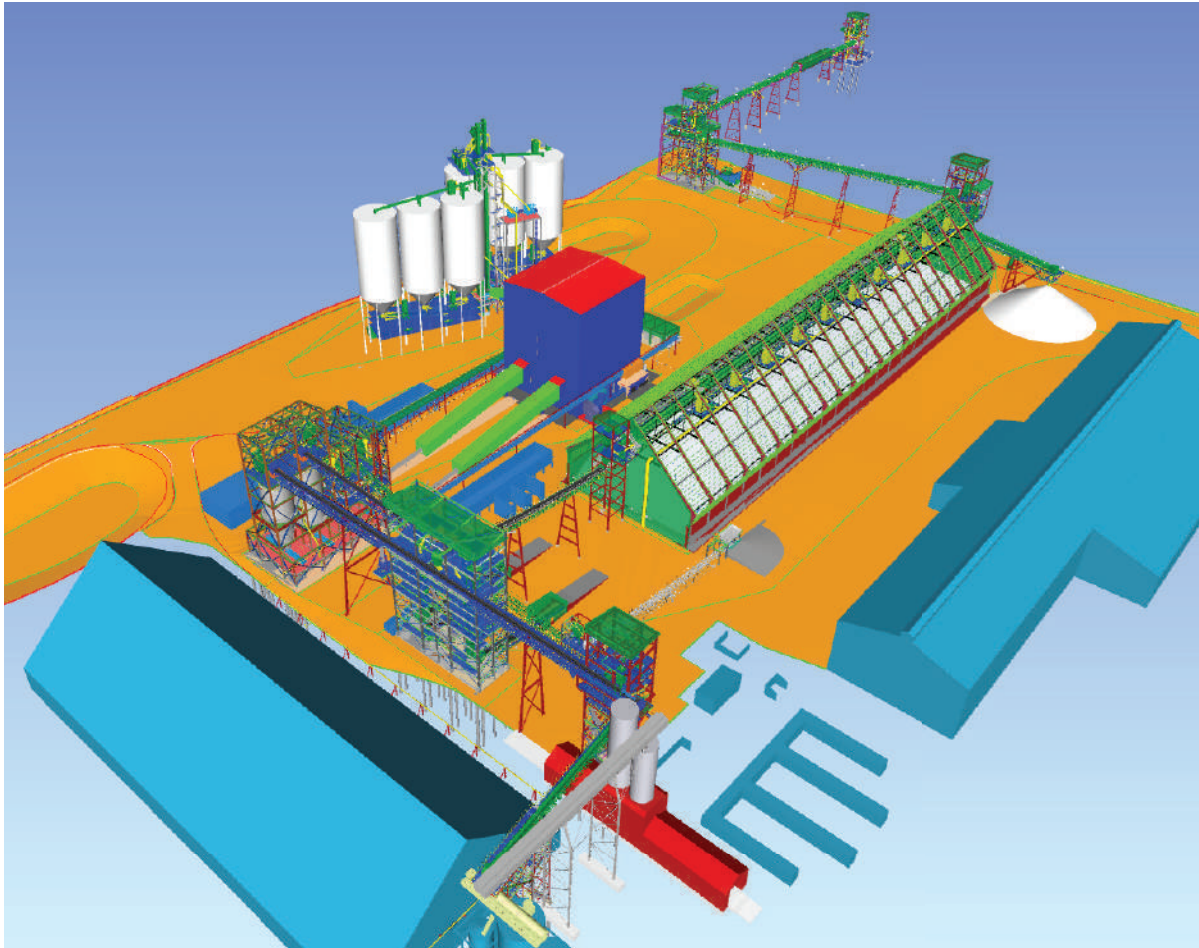
SHORT CIRCUIT ANALYSIS

POWER STUDIES



## ENGINEERING

### 3D MODELLING FOR FULL PROJECT INTEGRATION



INTEGRATION OF EQUIPMENT ENGINEERING WITH THE CIVIL, MECHANICAL FABRICATION AND ELECTRICAL ENGINEERING

SHOP DRAWING REVIEWS

FABRICATION SHOP INSPECTIONS

COORDINATION OF MATERIALS FABRICATION FOR CONSTRUCTION AND DELIVERIES TO THE JOB SITES

## ADVANTAGES OF WORKING WITH US

TOTAL RESOURCES IN HOUSE

KNOW-HOW AND EXPERIENCE IN MINING SOLUTIONS

LEADERSHIP IN DETAILED ENGINEERING SOLUTIONS

DEEP KNOWLEDGE OF STANDARDS AND CONSTRUCTIVE PROCEDURES

ENGINEERING MANAGEMENT ORIENTED TO SATISFY CLIENT TECHNICAL NEEDS

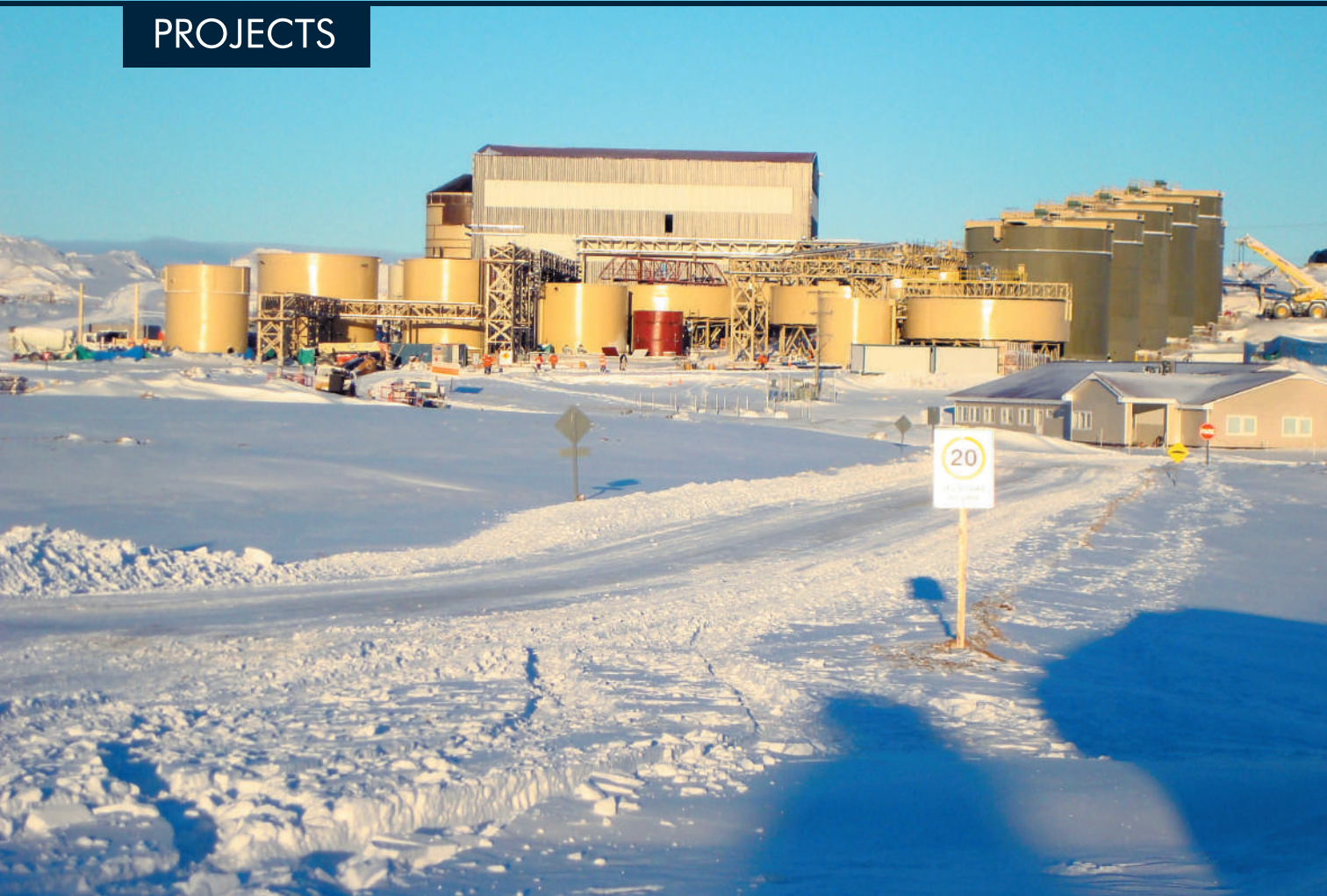
EXTENSIVE EXPERIENCE IN VALUE ENGINEERING FOR INDUSTRIAL PROJECTS

ACCURATE BUDGETS, SCHEDULES AND COST CONTROL

PROVEN PROCEDURES FOR PROCUREMENT, CONSTRUCTION  
MANAGEMENT & PROJECT CONTROL.



## PROJECTS



## Pan American Silver – Argentina – Manantial Espejo

**Project Budget:** USD 350 M

**SAXUM scope of work:** Detailed mechanical, electrical and civil/structural engineering, as well as construction management assistance for Gold and silver extraction project. 2000 tpd processing plant comprising primary crushing, grinding, gravity concentration and leaching, CCD and Merrill Crowe.



## PROJECTS



### Intrepid Mines Ltd. – Argentina – Casposo Project

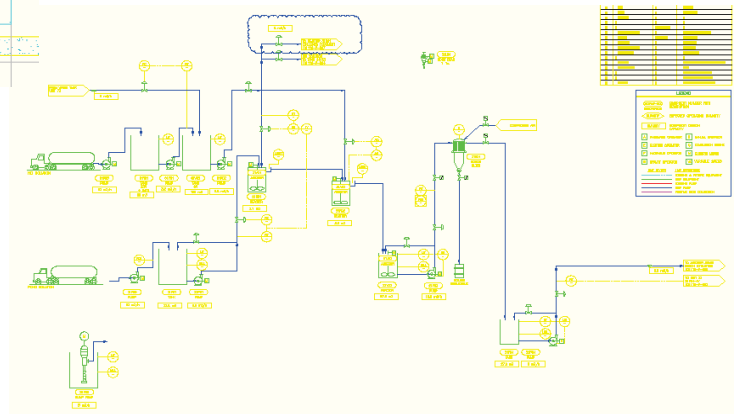
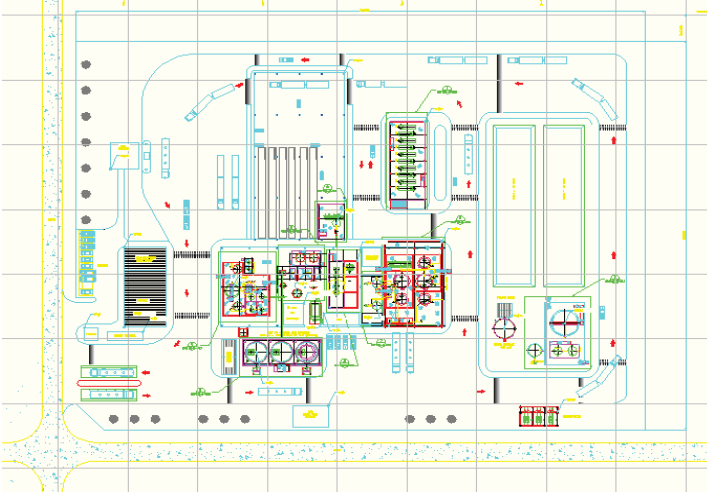
**Project Budget:** USD 90 M

**SAXUM scope of work:** EP & CM services, starting from basic engineering. Our services include metallurgical process, mechanical, civil/structural, electrical, instrumentation and control engineering, as well as procurement and construction management. Gold mine project in the province of San Juan, Argentina.



Project related to the extension of the salts and lithium production in the FMC plant in Salar del Hombre Muerto, Salta province, Argentina.

## PROJECTS



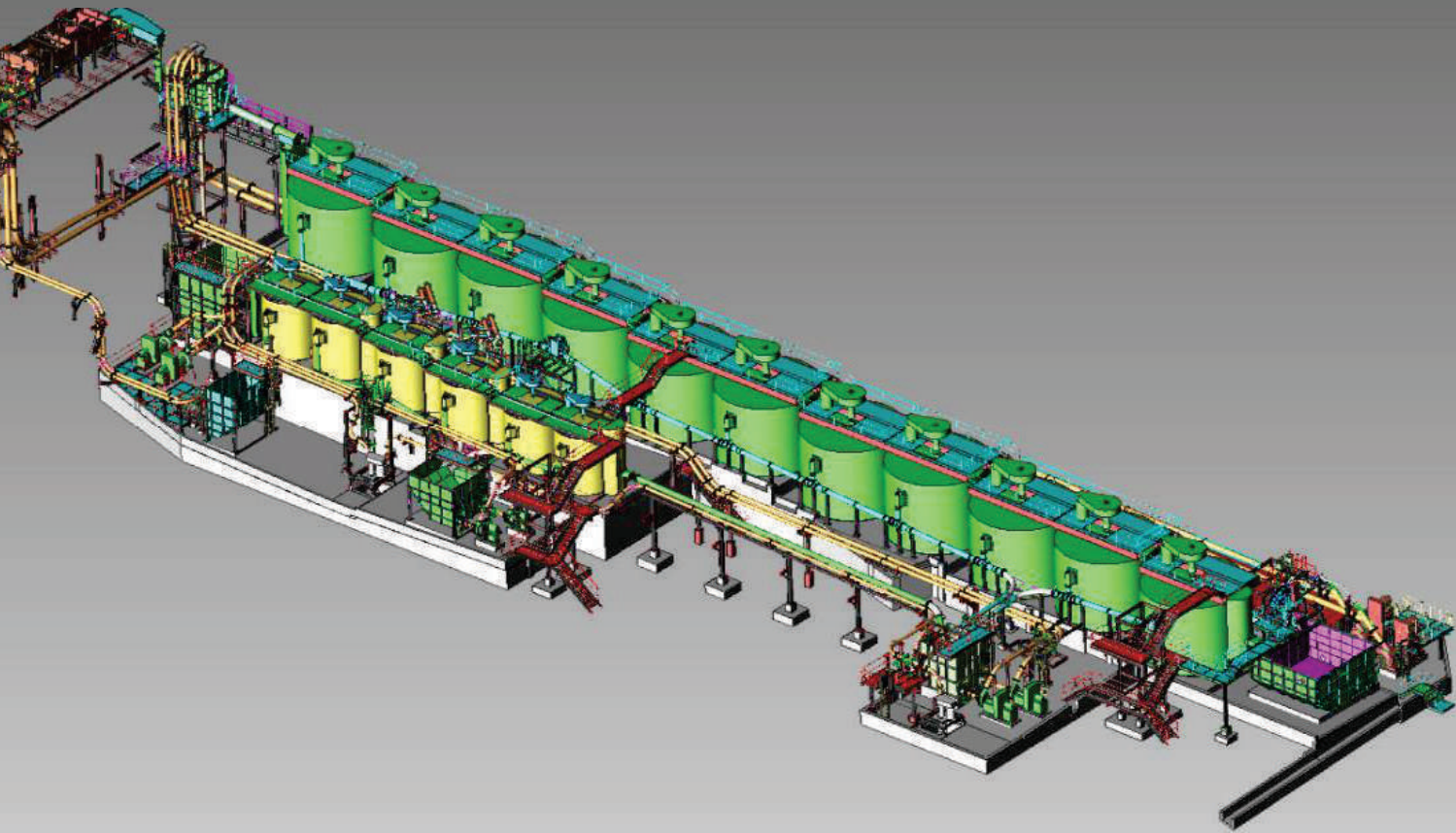
## Eramet Ingenierie – Argentina – Salinas Grandes

**Project Budget:** USD 160M

**SAXUM scope of work:** Full conceptual and basic engineering (including process, civil/structural, mechanical/piping, and electrical, I/C) for CapEx and OpEx evaluation. Lithium carbonate and potassium chloride production plant in the province of Salta, Argentina.



## PROJECTS



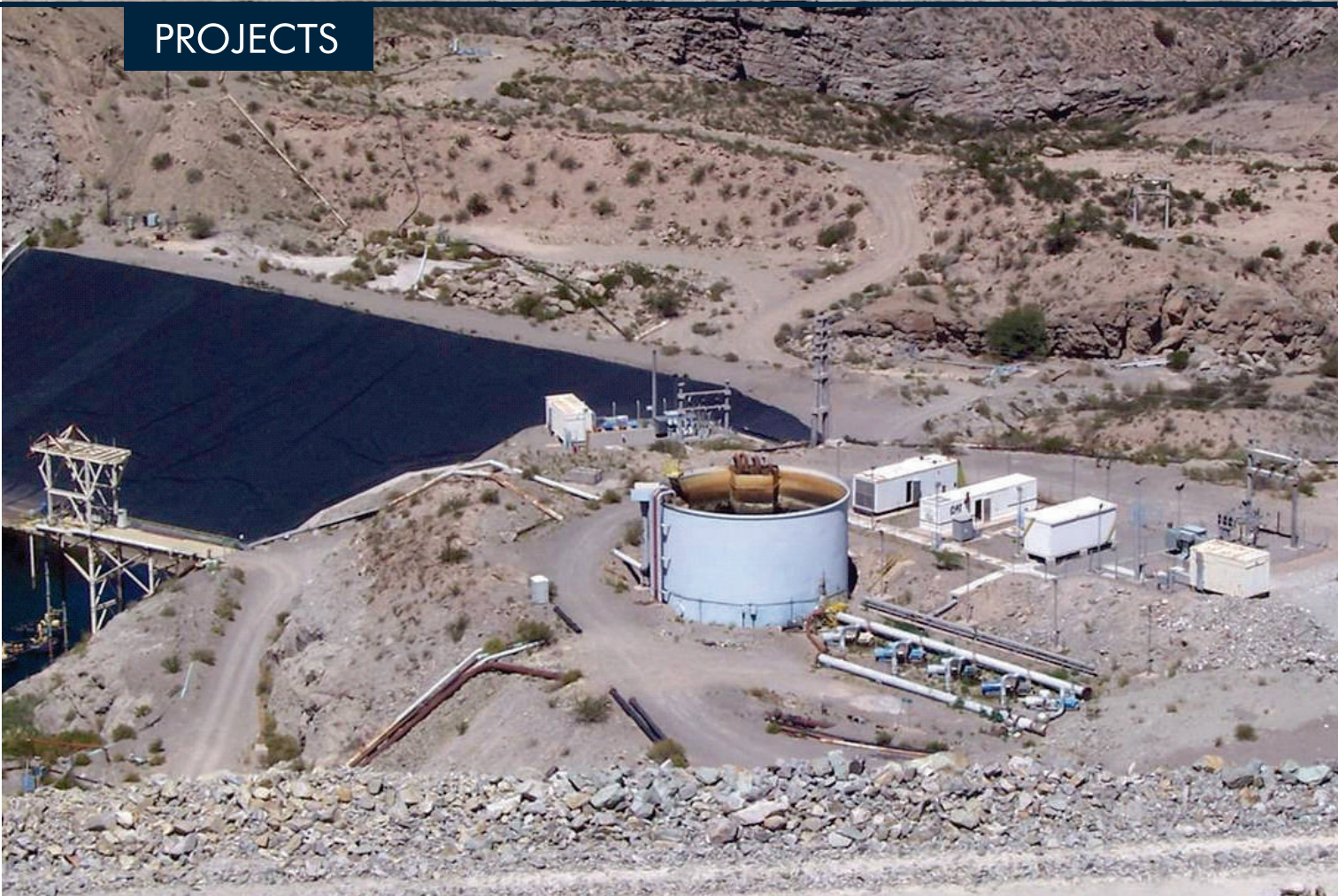
### Minera Alumbrera Ltd - Copper and Gold Mine - Glencore Argentina

**Project Budget:** USD 48 M - **New Cleaning Cells Project**

**SAXUM scope of work:** Complete conceptual, basic and detailed engineering as well as CapEx analysis.

Project related to the new cleaning cells in Minera Alumbrera Ltd.  
Catamarca Province, Argentina.

## PROJECTS



## Minera Alumbrera Ltd - Copper and Gold Mine - Glencore Argentina

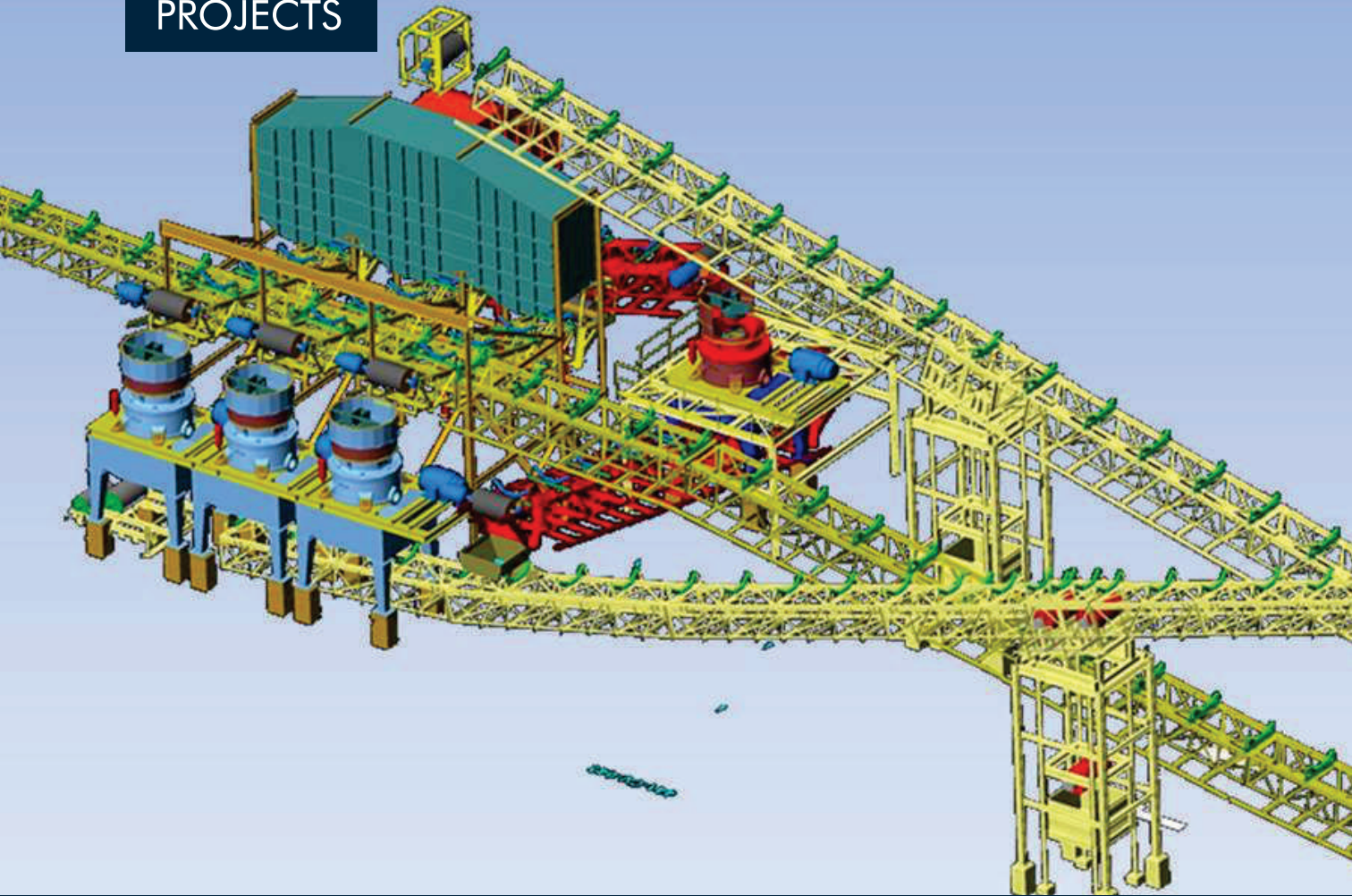
**Project Budget:** USD 8 M - **TAILING DAM WATER RECOVERY PROJECT**

**SAXUM scope of work:** Technical/economic analysis for different layout and equipment arrangement alternatives, Conceptual and detailed engineering.

Tailing dam water recovery system at Minera Alumbrera Ltd.  
Province of Catamarca, Argentina.



## PROJECTS



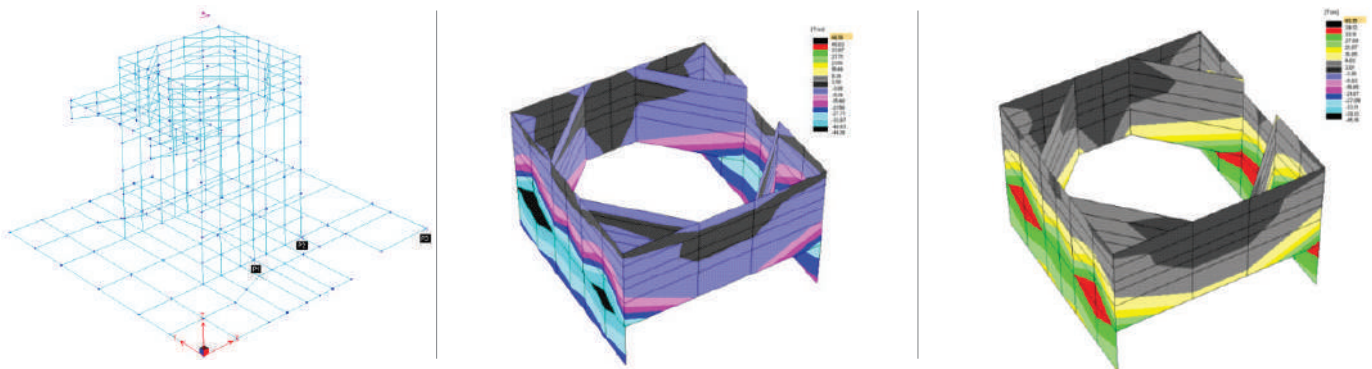
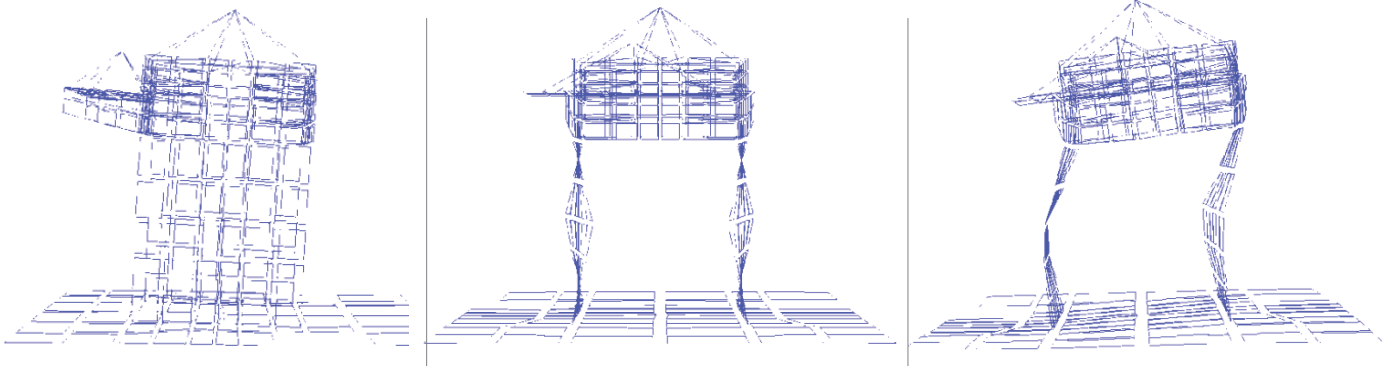
### Minera Alumbrera Ltd - Copper and Gold Mine - Glencore Argentina

**Project Budget:** USD 28 M - **PEBBLES PROJECT**

**SAXUM scope of work:** Conceptual and detailed mechanical and structural engineering. Site supervision and RFI services during construction phase. Pebbles crushing plant expansion at Minera Alumbrera Ltd. Province of Catamarca, Argentina.



## PROJECTS



## VELADERO - GOLD MINE - BARRICK GOLD ARGENTINA

**Project Budget: US\$ 1.8 B - PRIMARY AND SECONDARY CRUSHING SYSTEM PROJECT**

**SAXUM scope of work:** Detailed mechanical and structural engineering for primary and secondary crushing systems.

Veladero green field project of Barrick in the province of San Juan, Argentina.

## PROJECTS



### **CODELCO – Chile – Chuquicamata**

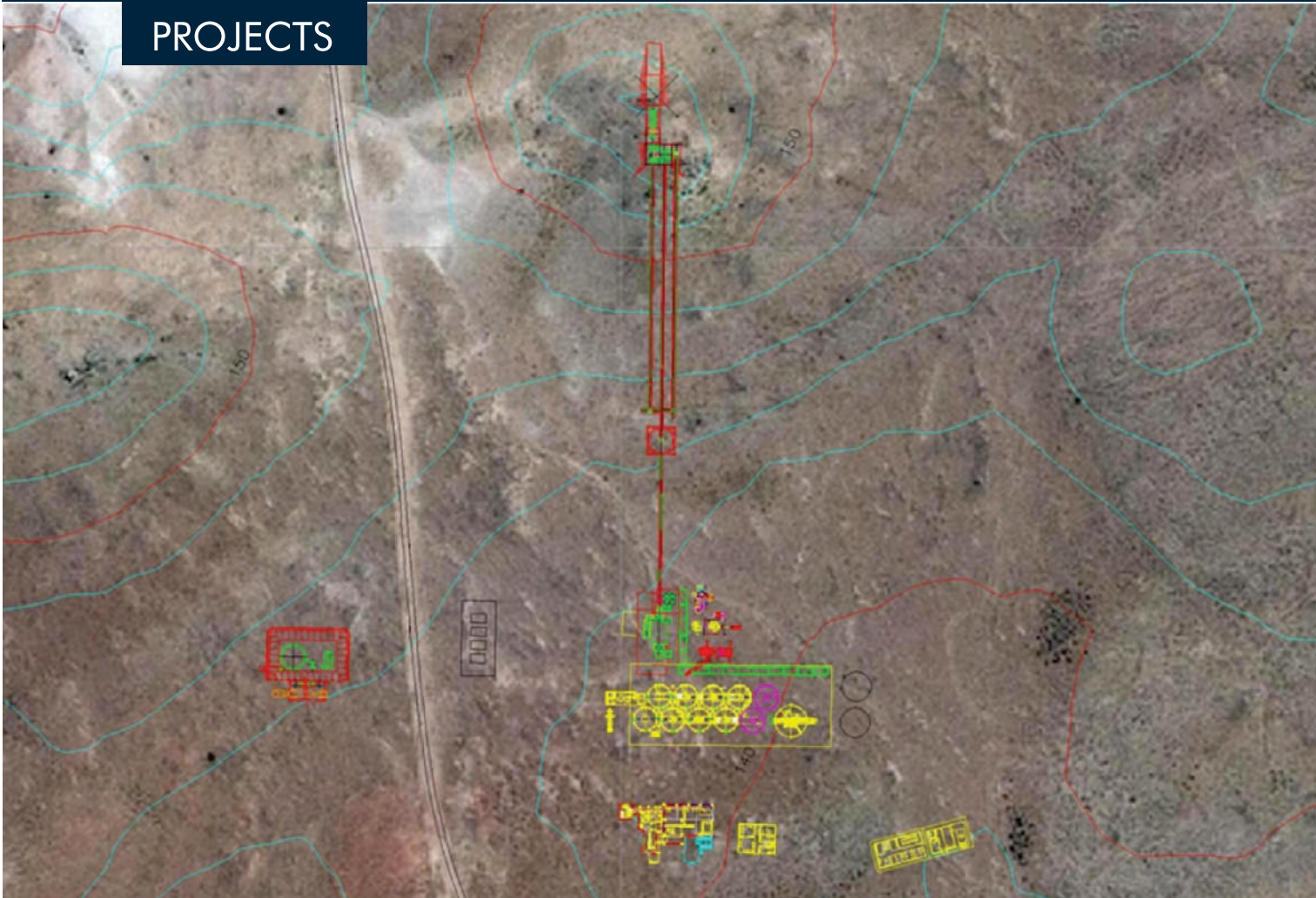
**Project Budget:** US \$24 M.

**SAXUM scope of work:** Detailed engineering and construction assistance.

Value recovery from fresh tails generated in the Chuquicamata Concentrate Plant, Chile.



## PROJECTS



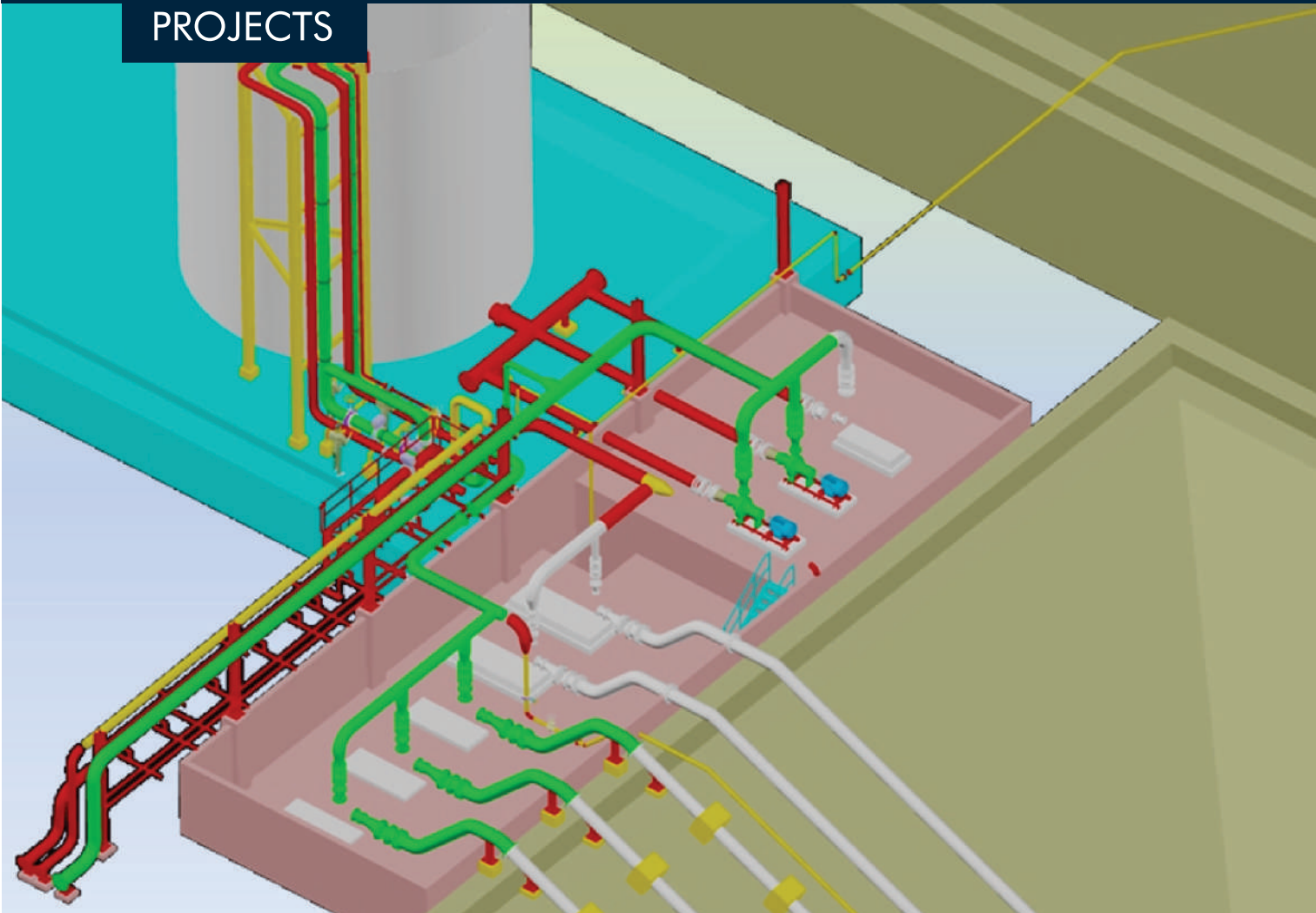
## Minera IRL – Argentina – Don Nicolás project

**Project Budget: US\$ 87 M**

**SAXUM scope of work:** Pre-Feasibility and Feasibility studies. Preliminary process design criteria, plot plan and facilities layout. Tailings management design, Hydrological campaign/Water development campaign. Green field project related to a Gold Mine. Santa Cruz province, Argentina.



## PROJECTS



## AngloGold Ashanti – Argentina – Cerro Vanguardia

**Project Budget:** US\$ 8 M.

**SAXUM scope of work:** Basic and detailed engineering as well as construction assistance services.

Crushing/agglomerating plant and heap leach pumping station.  
Cerro Vanguardia plant of AngloGold Ashanti. Santa Cruz province, Argentina.

## PROJECTS



### ANTAPACCAY PROJECT - COPPER AND GOLD MINE - GLENCORE PERU

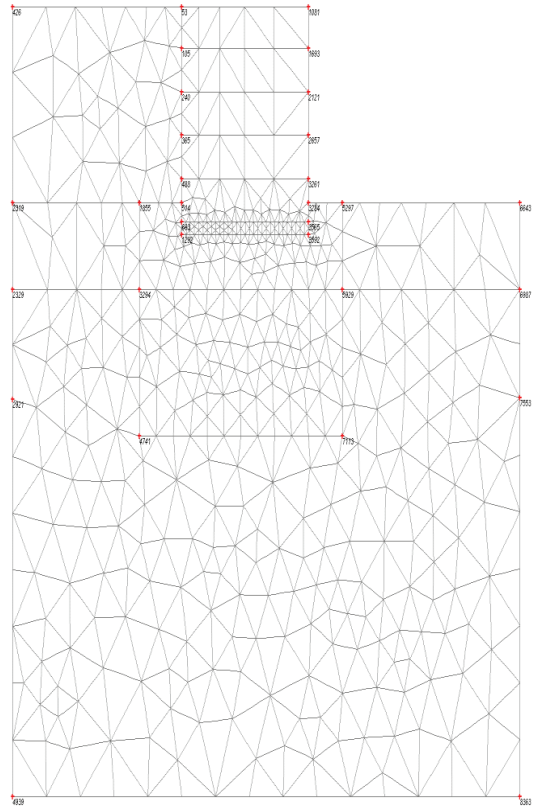
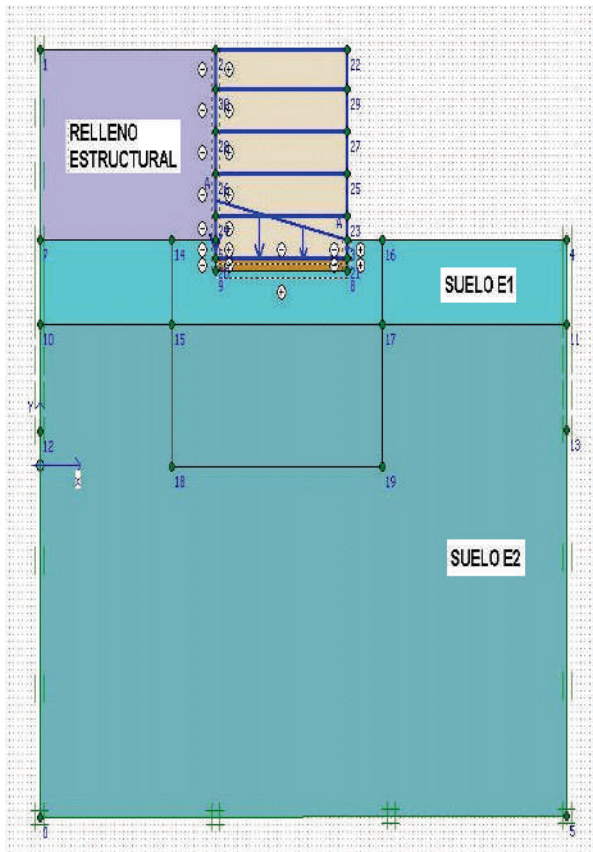
**Project Budget: US\$ 124 B - BROWNFIELD PROJECT RELATED TO THE TINTAYA PLANT EXPANSION**

**SAXUM scope of work:** Review and verification analysis of the Stacker design made by Thyssen-Krupp and design of its foundation system.

Tintaya Copper Mine, Expansion Antapaccay, Glencore (ex Xstrata Copper), Peru.



## PROJECTS



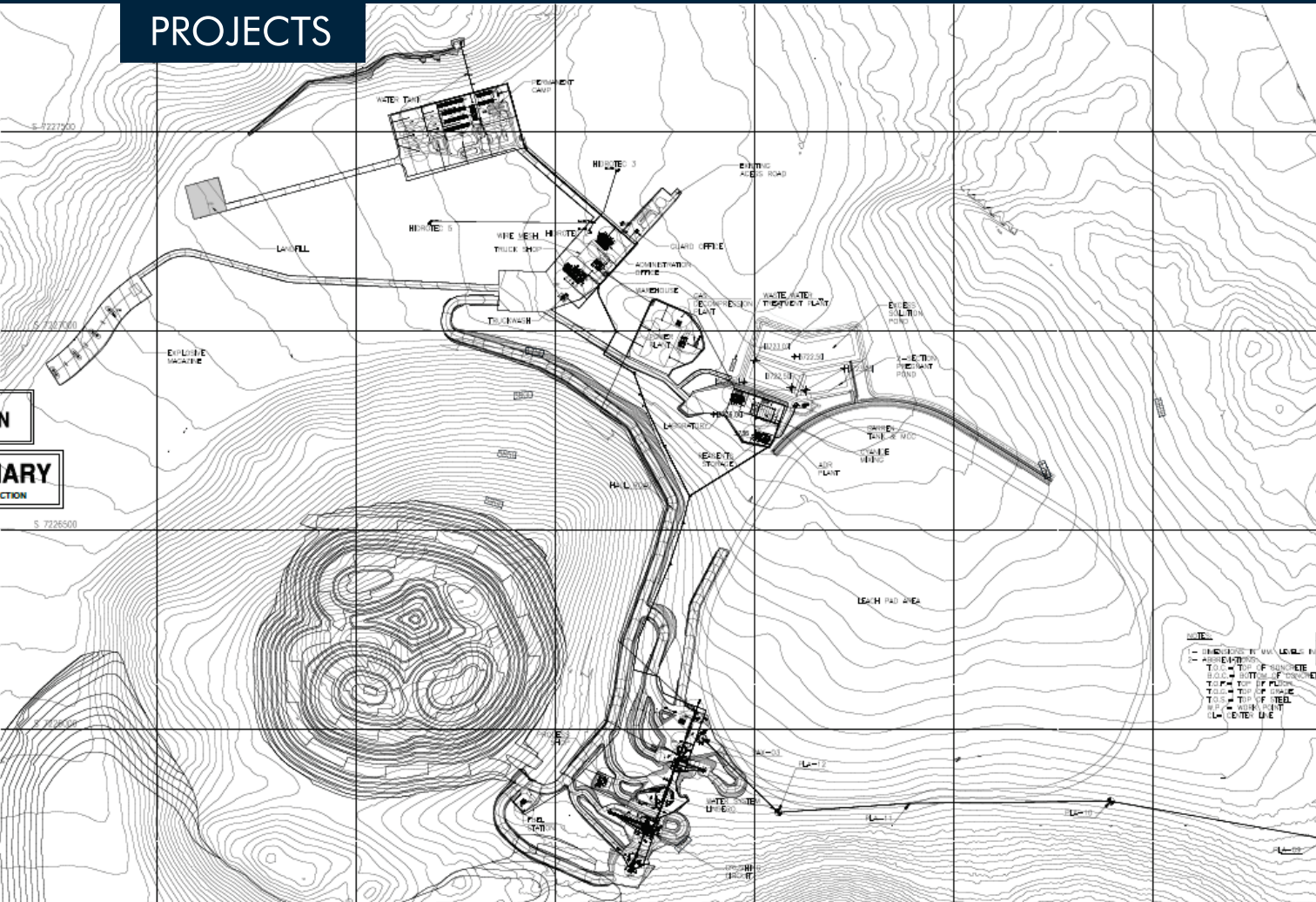
## ANTAPACCAY PROJECT - COPPER AND GOLD MINE - GLENCORE PERU

**Project Budget: US\$ 2.2 B - BROWNFIELD PROJECT RELATED TO THE TINTAYA PLANT EXPANSION**

**SAXUM scope of work:** Value added engineering services for the CapEx optimization related to the SAG and Ball Mill foundations, and to the structures and foundations of the secondary crushing system.



## PROJECTS



## Goldrock Mines Corp. - Argentina - Lindero Project

**Project Budget: US\$ 360M**

**SAXUM scope of work:** Prefeasibility and Feasibility studies, then Basic Engineering of the Lindero gold mine project including all engineering disciplines. CapEx and OpEx estimates. Trade off studies for energy supply.

## PROJECTS



### Sales de Jujuy S.A. - Argentina - Olaroz Project

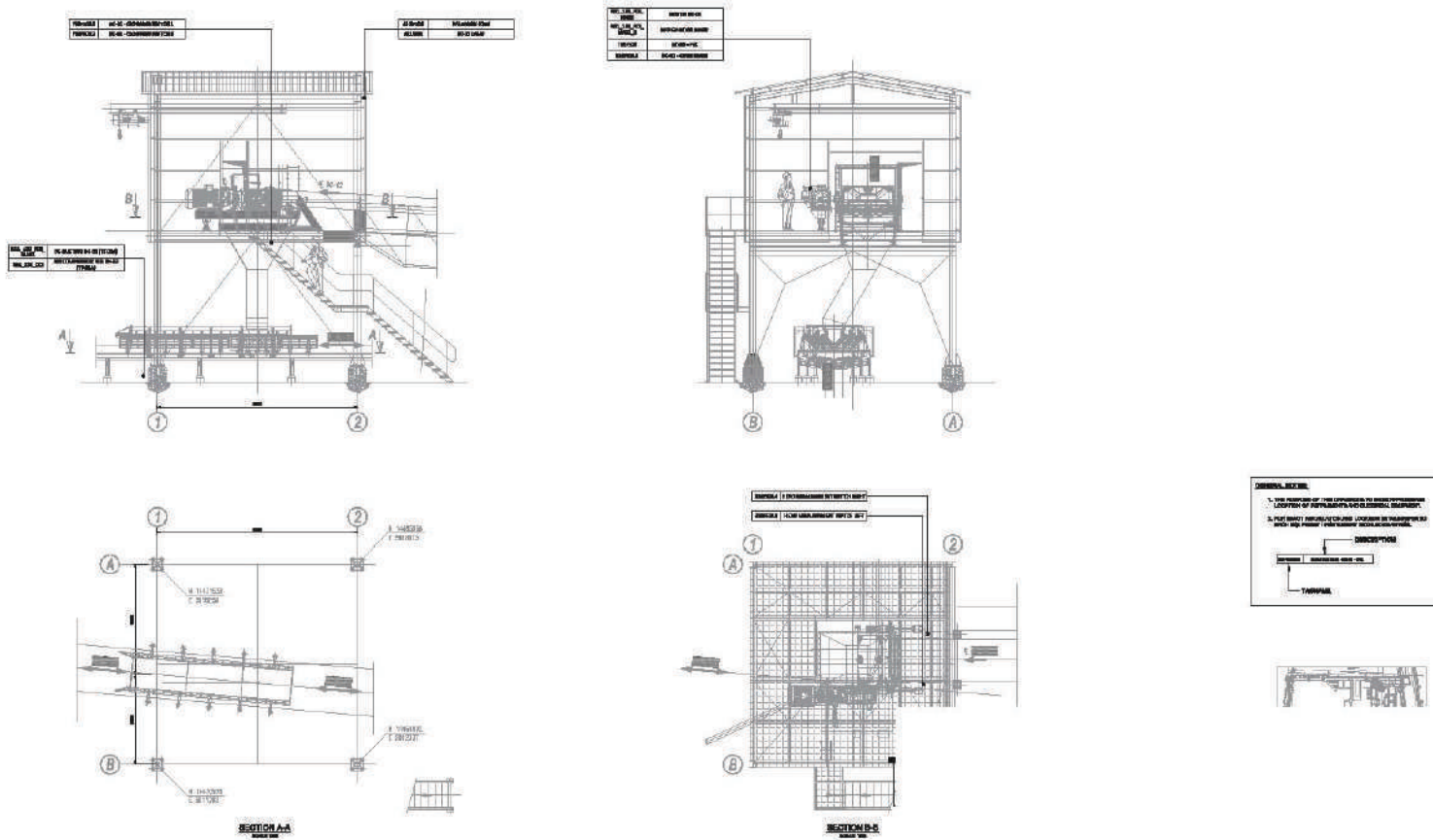
**Project Budget: US\$ 240 M**

**SAXUM scope of work:**

**DEVELOPMENT OF CONCEPTUAL AND DETAILED ENGINEERING FOR CO2 RECOVERY:** Complete engineering for gas recovery and re-injection. Dimensioning of all involved equipment. Evaluation of gas consumption.

**STEAM SYSTEM OPTIMIZATION:** Definition of the thermal energy balance. Evaluation of the most appropriate procedure for incorporating the new steam generator to the system.

## PROJECTS



## PHB Wesserhütte US - USA - Gowest Voestalpine Project

**SAXUM scope of work:** PE STAMP ELECTRICAL DRAWINGS.

Internal checking, US codes verification and sign and seal of all electrical engineering documents by a Texas Registered Professional Engineer.

Electrical engineering for medium and small voltage installations at basic and detailed levels.



## PROJECTS



### LINDERO PROJECT FOR GOLD & COPPER MINE - FORTUNA SILVER MINES INC.

**Project Budget: US\$ 340 MM - FULL EPCM SERVICES FOR THE GREENFIELD PROJECT - FROM PRECONSTRUCTION WORKS TO START UP**

**SAXUM scope of work:** Complete EPCM services of the Lindero gold mine Project:

- Detailed Engineering for the construction of the entire project (Civil, Structural, Mechanical, Piping, Electrical and Instrumentation and Architectural).
- Procurement services to develop the specifications, bidding process and the purchase of all equipment and services necessary.
- Construction Management services at different stages with the objective of ensuring the coordination and correct execution plan in accordance with the Master Schedule, CAPEX and updates.
- Pre-Commissioning and Commissioning services for project main areas and equipment

## PROJECTS



# Goldcorp Inc. - Argentina - Cerro Negro Project

**Project Budget: US\$ 1.05 M**

**SAXUM scope of work:** developement of the engineering designs and the project control during the construction phase of these projects. Perform the designs (from conceptual to detailed solutions) in all different disciplines, including Mechanical, Civil, Structural, Electrical and Instrumentation engineering. In parallel, SAXUM is developing/defining all needed data sheets and specifications for purchasing the required equipment and construction/erection works.



## PROJECTS



## NEWMONT GOLDCORP ARGENTINA - CERRO NEGRO GOLD MINE

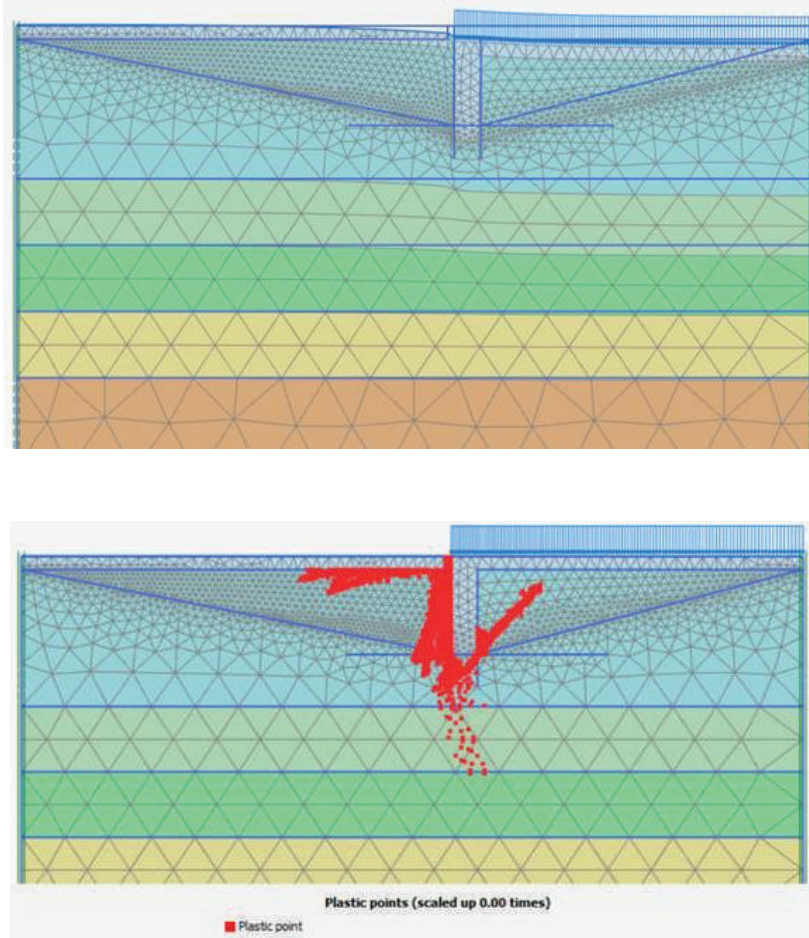
### ENGINEERING SERVICES FOR EXPANSION PROJECTS IN THE MINE

**SAXUM Scope of Work:** Engineering support for the development of Mining Projects in several plant locations, including the designs of tunnel portals/doors, general facility installation, mining auxiliary services and infrastructure site works. SAXUM's services include CapEx Estimate.

SAXUM onsite Project Control Services and Field Support for Cerro Negro, working together with Cerro Negro's staff aiming the planning and monitoring of the construction execution through a work schedule.



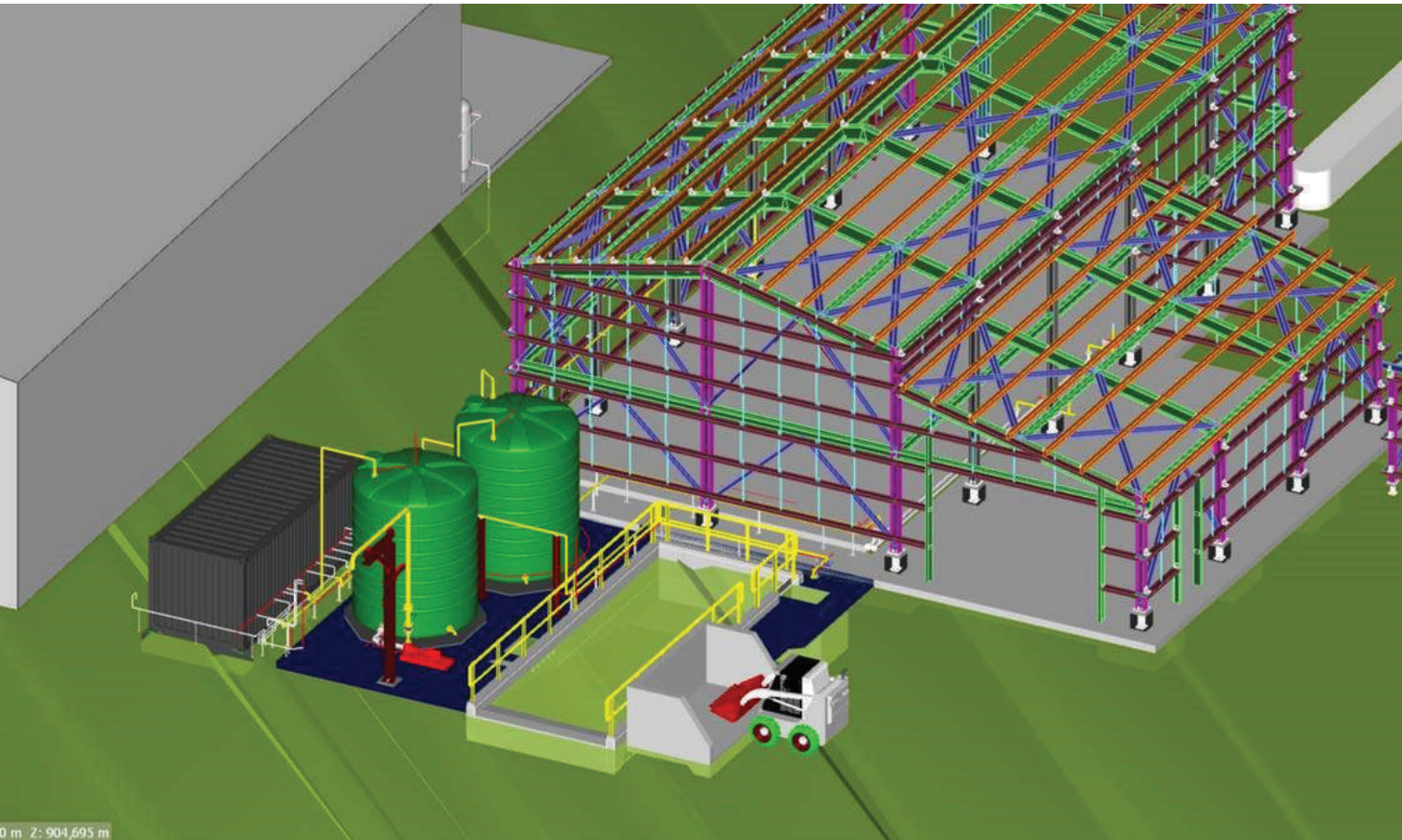
## PROJECTS



### YAMANA - Cerro Moro - Argentina

**SAXUM Scope of Work:** SAXUM performed soils investigations to determine the static and dynamic features of the subsoils in the sector where the lixiviation tanks are localized. The purpose of this investigations was the assessment of the eventual need of soils injection procedures to improve soils mechanical conditions and avoid further tank foundations' settlements.

## PROJECTS



### NEWMONT Goldcorp - East District Project

**SAXUM Scope of Work:** SAXUM performed the engineering of the Mechanical, Civil/Structural and Electrical and Instrumentation & Control disciplines, with the target of an early stage Capital Estimate. Also the development of several plans, drawings and specs for the San Marcos Portal as well as basic and detail engineering for the Bajo Negro and Silica Cap locations.

## PROJECTS



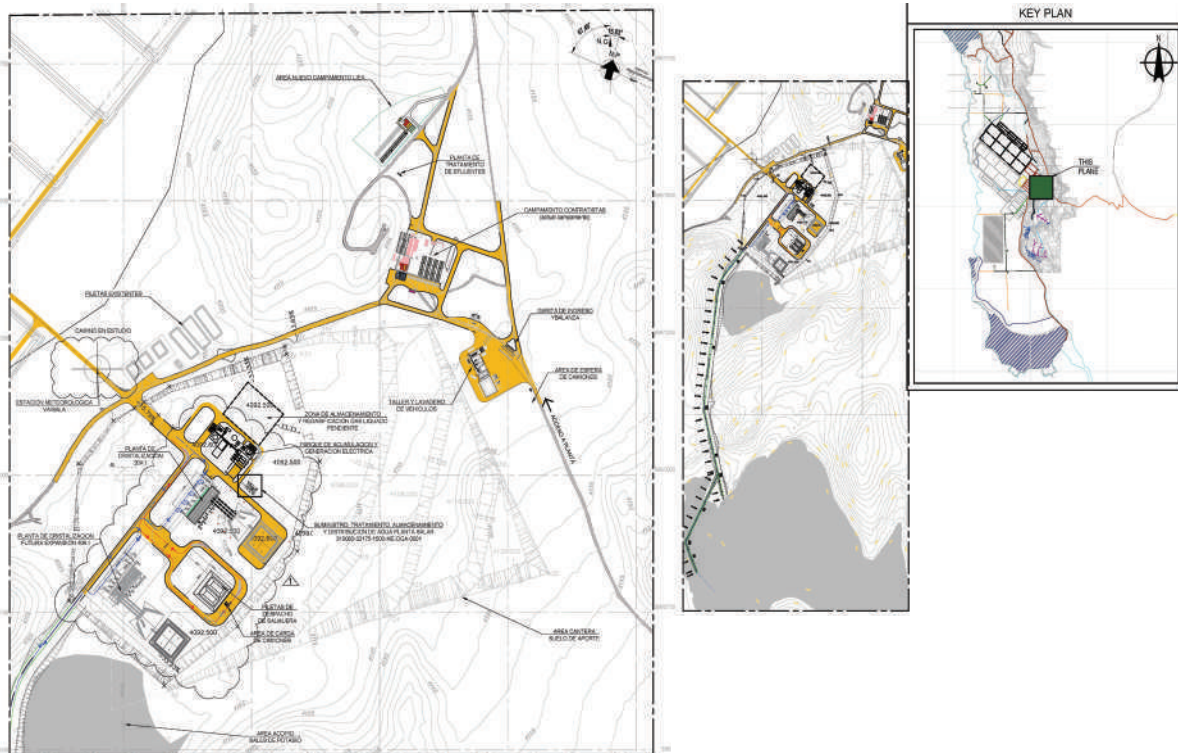
## Abrasilver Resources - Diablillos Gold Mine Project - Argentina

### UPDATE OF PROJECT ECONOMICAL ASSESSMENT & TRADE OFF STUDY FOR ENERGY SUPPLY.

**SAXUM Scope of Work:** Five different options were considered. The Trade-off report by SAXUM included a comparative analysis of the CapEx and OpEx of the different energy alternatives and the recommendation on the optimal one for the Diablillos project.



## PROJECTS

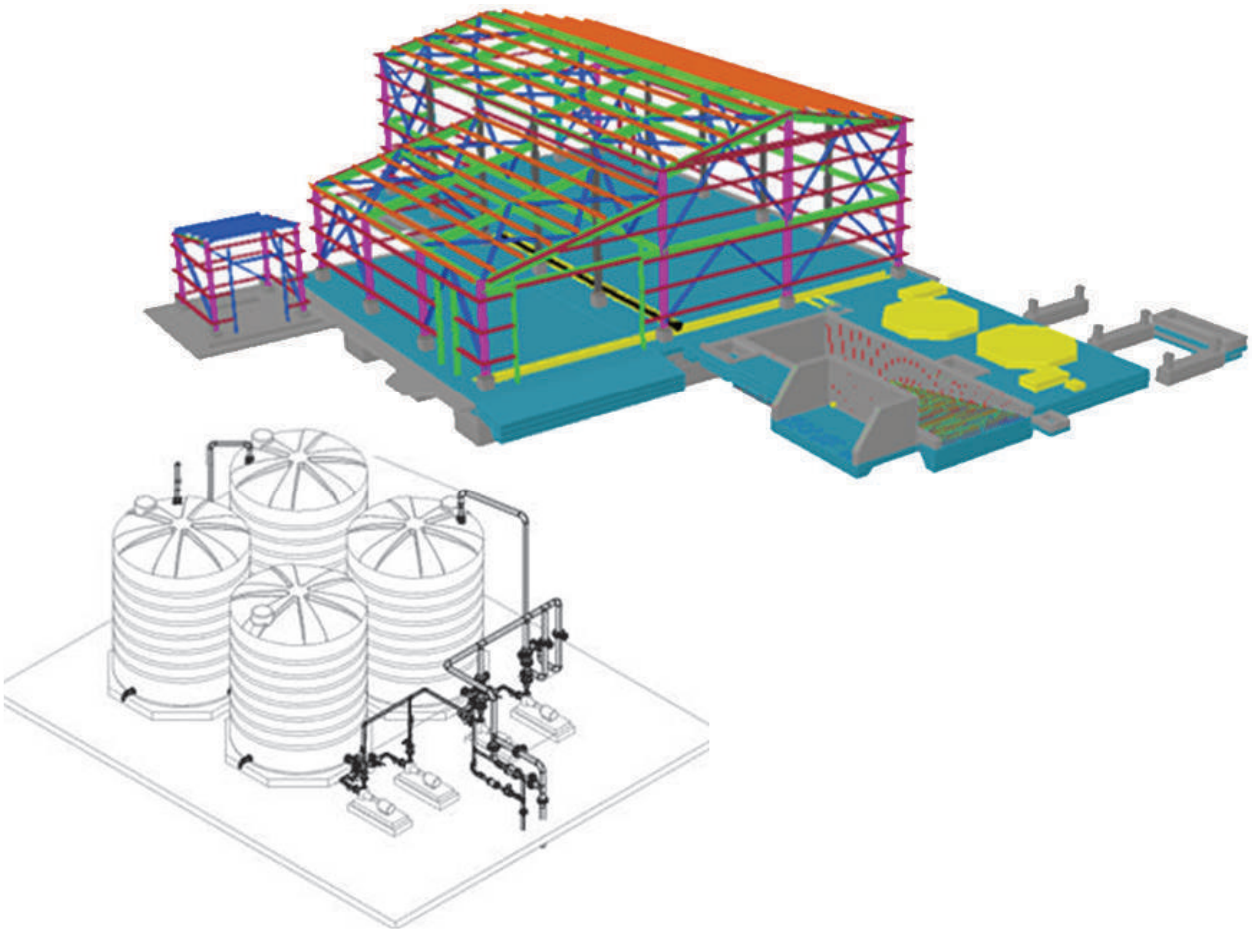


## Liex - 3 Quebradas Lithium Carbonate Project - Argentina

**OWNER'S ENGINEERS FOR THE REVIEW OF FEASIBILITY STUDY FOR THE GREENFIELD PROJECT.**

**SAXUM Scope of Work:** Review of the feasibility study and engineering designs developed by third parties for the greenfield lithium plant carbonate in Catamarca, Argentina. SAXUM's review included all engineering disciplines and the CapEx estimate.

## PROJECTS



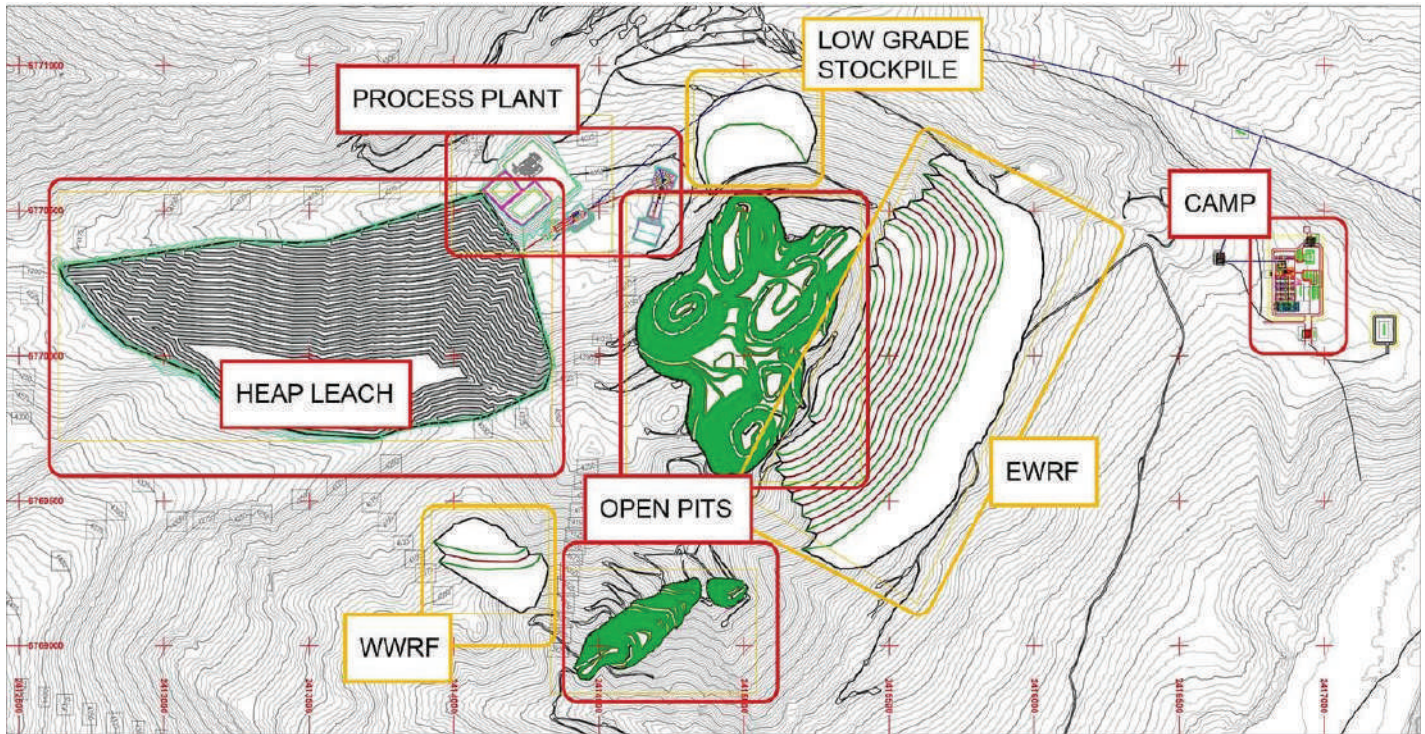
## NEWMONT GOLDCORP ARGENTINA - CERRO NEGRO GOLD MINE

### NEW TRUCKSHOP PROJECT.

**SAXUM Scope of Work:** Engineering for the update of the Trackshop and Truck Wash Bay of Cerro Negro gold mine. FEL II & FEL III (Conceptual & Basic Engineering and CAPEX) and detailed mechanical and piping engineering for New Truck Ship and Truck Wash



## PROJECTS



## Orvana Minerals - Taguas project - Argentina

**SAXUM Scope of Work:** SAXUM performed the Project Economical Assessment (PEA) of the Taguas gold mine project of ORVANA in the province of San Juan, Argentina. SAXUM was the main responsible of this PEA report which was issued according to the NI43-101 standards.



## Most Relevant Projects

COMPANY	OBJECTIVES	LOCATION	PERIOD	BUDGET
<b>CSN - Compania Siderurgica Nacional Brasil</b>	Basic and detailed engineering for New Line production in Arcos Plant. M/H Saxum = 66,700hr	Arcos, MG Brasil	2013/2015	560 MM USD
<b>FMC - Minera del Altiplano- Argentina.</b>	Production Expansion Project Plant Sales in Salar del Hombre Muerto. M/H Saxum = 14,300 hr	Salar del Hombre Muerto. SaltaArgentina	2004/2005	25 MM USD
<b>YMAD - Yacimientos Minerales Aguas de dionsio</b>	Pre-Feasibility Study for Upgrade of Farallon Negro plant.CapEx and OpEx Studies.Trade off studies for alternative production . Design of the new refinery . M/H Saxum = 15,000 hr	Catamarca Argentina	2012/2014	75 MM USD
<b>CSN - Compania Siderurgica Nacional Brasil</b>	Basic and detailed engineering and construction supervision. New Grinding System ( Mills # 2 and # 3). Arcos plant . M / H Saxum = 43,500 hr	Arcos MG Brasil	2011/2014	73 MM USD
<b>Minera IRL Patagonia S. A. Gold-Silver Mining Plant</b>	Don Nicolas Gold-Silver Project. Pre -Feasibility Phase: Process Engineering, Mechanical, Civil and Electrical CapEx and OpEx Studies.Feasibility phase: Design of Infrastructure. M/H Saxum = 21,000 hr	Santa Cruz Argentina	2010/2013	75 MM USD
<b>Minera EXAR S. A.</b>	Lithium Project Salar de Cauchari.Engineering Services and Procurement . Feasibility phase : Revision of Basic Engineering . M / H Saxum = 3,500 hr	Jujuy Argentina	2011/2012	250 MM USD
<b>Votorantim Brasil</b>	Detailed engineering and integration for new production line .Plant Salto de Pirapora .San Pablo .Brasil . M/ H Saxum = 16,600 hr	Sao Pablo Brasil	2010/2011	340 MM USD

## Most Relevant Projects

COMPANY	OBJECTIVES	LOCATION	PERIOD	BUDGET
<b>Intrepid Mines Ltd.</b>	Casposo Gold -Silver Project. EPC M contract .Basic Engineering ; CapEx / OpEx Studies; Environmental impact ; Procurement (1st phase); Field supervision (1st phase). M/ H Saxum = 35,000 hr	San Juan Argentina	2008/2010	83 MM USD
<b>Panamerican Silver Corporation</b>	Manantial Espejo project . Basic and detailed Engineering in all specialties. M/ H Saxum = 83,000 hr	Santa Cruz Argentina	2005/2007	250 MM USD
<b>Southern Peru Copper</b>	Gas Management Project and Environment in Ilo plant , Southern Peru Copper , Moquegua , Peru. M/ H Saxum = 8,600 hr	Ilo, Moquegua Peru	2009/2010	67 MM USD
<b>Xstrata Copper Chile</b>	Detailed engineering Moliendas Elementary and Secondary Truck Shop. Plant Tintaya Antapaccay expansion , Peru. M/H Saxum = 8,900 hr	Tintaya Peru	2009/2010	950 MM USD
<b>Minera Alumbreira Ltd</b>	Engineering for New Provision of Water Pipes DCP recovery . M/H Saxum = 5,200 hr	Catamarca Argentina	2010/2010	9,5 MM USD
<b>Eramet Ingenierie</b>	Basic Engineering for Evaluation CapEx and OpEx of new lithium carbonate plant - Salinas Grandes . M/H Saxum = 9,400 hr	Salta Argentina	2012/2012	160 MM USD
<b>Oroplata S.A.</b>	Engineering for wastewater treatment plant underground mine Eureka. M/H Saxum = 9,400 hr	Santa Cruz Argentina	2010/2010	7 MM USD

## Most Relevant Projects

COMPANY	OBJECTIVES	LOCATION	PERIOD	BUDGET
<b>Cerro Vanguardia Ltd</b>	Engineering and project supervision for Heap Leach and grinding for 285 tph . M/H Saxum = 17,600 hr	Santa Cruz Argentina	2011/2012	26 MM USD
<b>Eramet Ingenierie</b>	Feasibility study for a Lithium Carbonate and a Potassium Chloride Plant. M/ H Saxum = 35,000 hr	Salta Argentina	2011/2011	165 MM USD
<b>Minera Alumbrera Ltd.</b>	Rougher feeding cells . M/ H Saxum = 7,300 hr	Catamarca Argentina	2010/2011	4,2 MM USD
<b>Itacamba Cemento S.A., Bolivia</b>	New clinker and cement lime. Santa Cruz de la Sierra , Bolivia . M/ H Saxum = 24,300 hr	Santa Cruz Bolivia	2014/2015	160 MM USD
<b>Bolera Minera SRL</b>	Feasibility studies and detailed engineering for a lithium evaporation pilot plant. M/ H Saxum = 4,600 hr	Salta Argentina	2011/2012	2,3 MM USD
<b>Xstrata Copper Peru</b>	Feasibility studies and engineering for building roofs mill and flotation area . M/ H Saxum = 4,600 hr	Tintaya Peru	2012/2012	28 MM USD



# CLIENTS

MINERA TRITON S.A. Argentina (Pan American Silver).

MINERA AGUILAR S.A. Argentina.

BARRICK-GOLD Argentina.

BARRICK GOLD Chile.

CERRO VANGUARDIA SA. Argentina (Anglo Gold Ashanti).

SOUTHERN PERU COPPER CORP. Peru.

MINAS BUENAVENTURA. Peru.

MINERA ALUMBRERA LTD. Argentina (Glencore, ex Xstrata Copper)

MINA PIRQUITAS. Argentina (Silver Standard)

MINERA IRL. Don Nicolas, Argentina.

GLENCORE Chile (ex Xstrata Copper).

MINA DISPUTADA DE LOS CONDE. Chile (Anglo American)

ANGLO AMERICAN Perú (Quellaveco Project)

MINA SIERRAS BAYAS Chile (Glencore, ex Xstrata Copper)

MINA CERRO MATOSO Colombia (BHP Billiton)

CSN – Companhia Siderurgica Nacional – Brazil

INTREPID MINES LTD. Canada

FMC Argentina

MINERA EXAR LITHIUM AMERICAS S.A. Argentina

ERAMET Ingenierie, Francia

BOLERA MINERA S.R.L. Argentina

GALAXY RESOURCES Ltd.

YAMANA GOLD Argentina

EXTORRE Gold Mine Ltd



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