

Marcelo Jo López

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Professional and Personal Profile

Thirty-six years of professional experience in copper mining. Competent person in extractive metallurgy. For seven years I have been working from my own process consulting company, with a team of ten full-time professionals, oriented to process engineering, with intensive use of mathematical simulations of metallurgical processes using METSIM software.

In addition, I advise the postgraduate school of mineral processing of the University of Antofagasta, interacting with the teams of researchers led by PhD Maria Elisa Taboada.

I have worked in seven mining companies. My professional career has five consecutive stages: thirteen years in research and development of metallurgical processes; six years in operations as metallurgist senior, development and quality control; seven years in management positions: operations manager, general manager and technology development manager; three years in the direction of two joint ventures (Collahuasi and Antamina) participating in several management and technical committees; and six years managing and developing my own process engineering company.

I have passion and dedication for my work, I am oriented to the value generation. As strengths I could work in multidisciplinary teams. For decision making I have a global vision of the business and a good balance between the technical and strategic aspects.

Competent person in extractive metallurgy Registration No 360 Chile.

Professional Experience

July 2013 **Jo & Loyola Process Consultants SpA**

At present Partner and director of the process analysis-oriented consulting company.

We have developed more than twenty-five thousand-man hours of process engineering to different mining companies: Collahuasi, Spence, Cerro Colorado, Escondida, Tesoro, Alxar, Lomas Bayas, Antucoya, Zaldívar, Mitsubishi, Radomiro Tomic, Ministro Hales, AMSA, Wheatherly, Continental Gold, Marimaca Copper Corp., Mineros SA.

July 2013 **Biohydro.cl**

Dec. 2013 Technical Manager and Partner at Biohydro.cl

Biohydro.cl is an expert engineering company in copper ore bioleaching that provides and manufactures its own materials, designs and solutions to its customers' requirements.

June 2010 **Xstrata Copper División Joint Ventures**

to May 2013 *General Manager Technical Support.*

Leads the technical area of Xstrata Copper's Joint Ventures Division South America including the JVs: Collahuasi, Alumbrera and Antamina.

The scopes of the realized work were planning, improvement of the operative performance, review of: expansion projects, projects of sustenance, operational strategies and decision-making support. participated in several

working committees, administration of large projects, and as a director member. Leads operational standardization and operational review processes.

October 2007 **Xstrata Copper Northern Chile Division**

to June 2010 *Technological Development General Manager.*

Leads the technology platform to support the operations and growth of projects in Chile's Northern Division, which includes the Altonorte Foundry and Lomas Bayas Mining Company. Acts as a member of the Executive and Technical Committee of Compañía Minera Doña Inés de Collahuasi. In addition, he participated in the management committees of Xstrata Lomas Bayas and the Altonorte Foundry with positive results in several improvement actions and projects. The alternatives of application of new technologies for the recovery of new metals and application of new processes, are milestones of this stage.

As part of the integration actions with the community, he acts as a member of the Honorable Board of Principals of the University of Antofagasta, Principal of the Graduate School of Mining Business of the Universidad Católica del Norte, Member of the Innovation Sub-Committee of the Regional Development Agency of the Second Region, Professor of the Graduate School of Mineral Processing of the Universidad de Antofagasta.

February 2006 **Lomas Bayas Mining Company CMXLB.**

October 2007 **Xstrata Copper División Norte de Chile**

General Manager.

Leads CMXLB's management of: Mine, Processes, Maintenance, Projects, Administration, Human Resources, Safety, Health and Environment, 650 direct employees and 570 contractors. In 2007, feasibility studies were completed, and capital authorization was obtained for the expansion of the Lomas Bayas plant to 75ktpy and environmental approval for the Fortuna de Cobre project. In October 2006 Lomas Bayas received the annual José Tomás Urmeneta award from the Chilean Institute of Mining Engineers as the best mining company in the country for its management of low-grade resources. In August 2006 Xstrata Plc takes control of Falconbridge, leading the integration process. A new production record of 64,247 tons of cathodes was reached in 2006. Participates in technical committees with the regional government of Antofagasta and in initiatives of technological development of CORFO for the II region.

March 2005 **Compañía Minera Falconbridge Lomas Bayas CMFLB**

Jan 2006 *Assistant general manager.*

Leads the Mine, Process and Maintenance management, responsible for the operational and continuous improvement areas (Six Sigma). In 2005, a new production record of 63,146 tons of copper was reached.

August 2002 **Falconbridge Lomas Bayas Mining Company. Noranda.**

March 2005 *Process Manager.*

Leads CMFLB process management, 115 people, responsible from ore crushing to cathode production. Annual production of 60,000 tons of copper

from the leaching of low-grade oxide ores. In this period the annual production and quality records of cathodes have been improved in consecutive years. He also leads technical integration projects between Lomas Bayas and the Altonorte Foundry. He also collaborates as an advisor for Compañía Minera Doña Inés de Collahuasi's marginal resource leaching projects and its oxide plant expansion projects. Participates in the processes of analysis of purchase and sale of mining properties.

August 1997 **Cerro Colorado Mining Company. BHP Billiton.**

July 2002 *Senior Metallurgist.*

Responsible for performance and improvements in production processes. Cerro Colorado Mining Company is recognized as a world leader in the development and bacterial leaching of copper ore, with annual production of 120,000 tons per year.

Leads and develops the process team for the Spence deposit, operation projected for a capacity of 200,000 tons Cu per year and an investment of 800 million dollars, feasibility study.

Head of the BHP-Billiton Management Committee of the bacterial leaching research project on chalcopyrite minerals.

Nov. 1996 **Cerro Colorado Mining Company. Rio Algom.**

August 1997 *Developer Metallurgist.*

Establishes key factors for the improvement of the production processes and establishes new Mine-Process criteria for short- and long-term copper production planning. It performed the metallurgical characterizations of the Spence project. He also worked as Head of the Quality Control Department of the CMCC until May 1998. Participates in the purchase and sale analysis process of mining properties at the corporate level.

June 1996 **Michilla Mining S.A. Antofagasta Minerals.**

Nov. 1996 *Senior Metallurgist.*

Development of internal research projects, advice to the operations area and general management.

May 1986 **Pudahuel Mining Society Ltda. SMP. Management of Research and Development.**

May 1996 *Research Engineer.*

Pudahuel Mining Society SMP was directly responsible for the growth of the hydrometallurgical copper projects at the national level, passing the country from an annual production of approximately 50,000 tons per year to 1.5 million per year at present, through the leaching of oxidized and sulfide copper ores.

He is the head of the Cerro Colorado project, from the laboratory stages to industrial scale, including the start-up and subsequent optimization and industrial operation. Participated in several development and application projects with minerals from the country's main deposits. At the same time, he works as an assistant professor at the University of Santiago de Chile, in the

Departments of Chemical Engineering and Engineering in Metallurgy, where he teaches Hydrometallurgy and Electrochemistry.

January 1984 **Mining and Metallurgical Research Center (CIMM).**

March 1986 *Research Engineer. Extractive Metallurgy Division.*

As a research assistant, he collaborates in the execution of more than ten applied research projects in the extractive metallurgy division.

August 1981 **University of Santiago de Chile USACH.**

August 1985 *Laboratory Assistant Chair of Inorganic Chemistry.*

He worked for 10 semesters as a laboratory assistant in inorganic chemistry for students in the civil engineering and execution careers in chemistry, biochemistry and chemistry degree.

Education He studies his secondary education at the Liceo de Hombres N°7, Santiago.

University of Santiago de Chile 1979-1985 Civil Chemical Engineer.

Attends seminars and advanced courses in: finance, management skills at Rottman Toronto Business School, Pontificia Universidad Católica de Chile and Universidad Adolfo Ibáñez. He has training in leadership, communications, safety, process analysis and simulation, biochemistry, computing and Six Sigma.

Other In 2008, he joined the University of Antofagasta as a professor of the Mineral Processing Engineering Postgraduate Program. Co-author of eight Invention Patents, related to new processes and mining equipment. Author of eight technical articles and presentations in the copper hydrometallurgy field. He has directed from the industry four degree works for civil and execution engineers in chemistry and metallurgy. Invited as professor, speaker, moderator and member of technical committees in congresses and advanced courses of the IIMCH. President of the Hydrocopper 2010 congress. Expert in hydrometallurgical process simulation. Technical English proficiency. Member of the Institute of the Chilean Mining Engineers.

References Devesh Baijnath Head of Project BHP

Roberto Darouiche Glencore

Fernando Porcile. Independent Consultant.

Randolph Scheffel. International Metallurgical Consultant.

María Elisa Taboada. Postgraduate Principal, University of Antofagasta.

September 2020