

**JULIO BRUNA NOVILLO**  
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## **EDUCATION**

- 2014 - 2018                      **PhD in Geology.** National University of Catamarca (Argentina).  
Title: "Geology and Genesis of the Porphyry of Au-Cu of the Bajo El Durazno, Province of Catamarca, Argentine Republic".  
Directors: Florencia Marquez Zavalia and Christoph A. Heinrich.
- 2006 – 2009                      **Magíster** (Master in Business Administration College of Economy and Business Administration (ESEADE), Argentina. Accreditation by CONEAU, Resolution N° 522/04. Argentina.
- 1986 – 1993                      **Geologist.** National University of Córdoba (Argentina).

## **PROFESSIONAL**

- Canadian Institute of Mining, Metallurgy and Petroleum. MEMBER CIM # 152176.
- Australasian Institute of Mining and Metallurgy. MAusIMM # 992246 CP (Geo) (Member Chartered Professional Geology).
- College of Geologists of the Province of Córdoba. Professional Registry: M.P. N° A-759.

## **LANGUAGES**

Native language: Spanish.

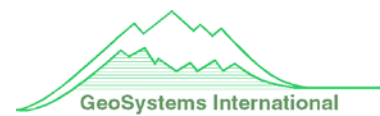
Other languages: Level Intermediate in English (translation, speaking and writing).

## **SUMMARY OF PROFESSIONAL ACTIVITIES**

I have worked as a geologist in the minerals industry for over 23 years. My work experience includes 9 years as an exploration geologist for gold and base metal deposits, 10 years as a mine geologist in open pit mining and more than 4 years as a consulting geologist working in base metals and precious metals.

Mineral Resources Geologist with solid geological experience and extensive knowledge in:

- Strong commitment demonstrated in environment, communities and safety of the daily work with contractors.
- Integration of the mining process at different stages: from greenfield-brownfield exploration, pre-feasibility and feasibility studies, to mine production.
- Leadership and management of geological studies in phases of pre-feasibility and feasibility according to international standards (JORC, NI 43-101), including geotechnical studies, metallurgical and hydrogeological for the development of the project (Projects: Bajo de La Alumbrera, Bajo El Durazno and Agua Rica).
- Technical review and audit the basics of recoverable resources model: sampling (database, QA/QC) and geological model (Projects: Cobre Panamá, Zafranal, Antamina, Spence and Las Bambas).
- Geological Modeling of deposits epithermal and porphyry Cu-Au-Mo, using field observations and drill cores (La Cabeza, Bajo de La Alumbrera, Bajo El Durazno, Bajo San Lucas, Bajo Las Pampitas and Zafranal).
- Design, management, and execution of drilling programs. Training, leadership, management and supervision of work teams.
- Preparation and cost analysis, planning and implementation of budgets and estimated.



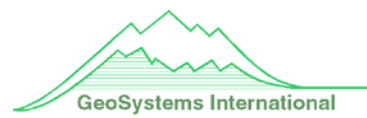
## TEACHING EXPERIENCE

- 2015 to date      **National University of Córdoba. F.C.E.F. y N. Geology – Department of Applied Geology.**  
Geology and Mining Operations (240 h). Associate Professor by public contest.
- 2012 to 2013      **National University of Buenos Aires.**  
F.C.E.F. and N. Post-graduate of specialization in Mining Geology. Module 2: Prospecting and Exploration (40 h).
- 2009                **National University of San Luis. F.C.E. and N.**  
Geology and geotechnical applied to open pit mine. Department of mining (20 h)
- 2004 to 2013      **Minera Alumbrera Ltd. – Xstrata Copper. Leadership Development Program.**  
Senior Facilitator. 2006 -2013  
Facilitator. 2004 - 2006
- 2002 to date      **National University of Córdoba. F.C.E.F. y N. Geology – Department of Applied Geology.**  
Subject: Well Drilling and Sludge Injection (160 h) Assistant Professor for public contest.  
Drilling Manual for Geologists and Engineers: Autor: Chapter 5: Drilling Muds and Chapter 13: Drilling Mining. Ed. Eduvin, 2015.



## WORK EXPERIENCE

- Nov. 2013 to date      **PRINCIPAL GEOLOGIST CONSULTANT**
- 02-11/2017 to date      **Geological Technical Support and Training. Servicio Geológico Minero Argentino (SEGEMAR).**  
Argentina.
- 10/2016                **“Antamina Mine”. Compañía Minera Antamina S.A. Perú.** Audit Geological Model of Antamina. Final report.
- 05/2016                **“Zafranal Project”. Compañía Minera Zafranal SAC, Perú.** (AQM Copper). Conduct and responsibility as QP in the points 10, 11 and 12 of the Technical Report NI 43-101. Firm consents to NI-43101 for AQM Copper (Zafranal Project, Peru Technical Report on the Pre-Feasibility Study).
- 10/2015                **“Las Bambas Project”. Compañía Minera Las Bambas, Perú. (MMG).** Ferrobamba, Chalcobamba and Sulfobamba deposits. Technical Review of QA/QC and Geological Model. Final reports.
- 08/2014 to 05/2015      **Zafranal Compania Minera SAC (AQM - Teck Resources). Peru.**  
Geological support for the re-logging program and "infill" drilling. Geological model. Final Report.
- 09/2014                **Compania Minera Antamina SA Peru.**  
Geological Model Audit Antamina. Final Report.
- 08/2014                **Meridian Mining Company LTD (Yamana Gold). Chile.**

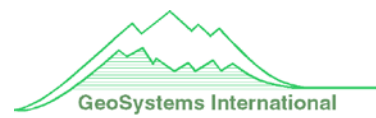


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Technical visit to the plant of the El Peñón mine. Final report on sampling processing plant.

- 02/2014 a 03/2014 **Compañía Minera Alumbreira Ltd. (Glencore. Argentina).**  
Updated and calculation of reserves for BLA, 2014. Firm consents to NI-43101 for Yamana Gold.
- 11/2013 a 12/2013 **Zafranal Compania Minera SAC (AQM - Teck Resources). Peru**  
Report: "QA/QC data analysis, proposed infill DDH program and criteria and procedures used to interpret and obtain the solids models for the updated mineralization zones model.
- April 2013 to Oct. 2013 **MINERA PANAMA S.A. – FIRST QUANTUM MINERALS LTD.**  
Proyecto "Cobre Panamá" (Panamá). SUPERINTENDENT GENERAL OF GEOLOGY.  
Report: Analysis and recommendations in the geological models".  
Report: "Interpret, define and build geological wireframe models. Realization of the exploratory data analysis (EDA). Interpretation and definition the Geological Units".  
Work with the FQM Mineral Resource group in Perth (West Australia) to review and re-build the entire Cobre Panamá resource.
- Nov. 1998 to March 2013 **MINERA ALUMBRERA LTD. – XSTRATA COPPER.**  
"Bajo de La Alumbreira" Mine and "Agua Rica" Project. Province of Catamarca (Argentina).  
Bajo de la Alumbreira Mine, Copper-Gold-Molybdenum Porphyry system: Annual statement of reserves and resources, by code JORC (CP) and NI 43-101 (QP).  
MEMBER AUSIMM # 992246 (Chartered Professional Geology).  
SUPERINTENDENT OF GEOLOGY & EXPLORATION (Greenfield – Brownfield areas).  
Disseminated areas, vetiform system and Agua Rica Project (Feasibility Study). November 2008 to date  
SUPERINTENDENT OF GEOLOGY (Department of Geology, Geotechnics & Dewatering). Nov. 2007 / Nov. 2008.  
SUPERINTENDENT OF GEOLOGY (Department of Geology & Geotechnics). June 2005 – Nov. 2007.  
SENIOR GEOLOGIST (Department of Geology). February 2004 - June 2005  
ORE CONTROL GEOLOGIST. March 2003 – January 2004  
EXPLORATION GEOLOGIST. November 1998 – October 1999; April 2000 – February 2003
- Nov. 1999 to March 2000 **IAMGOLD ARGENTINA S.A.**  
Project: "Mesa". Province of Santa Cruz (Argentina).  
EXPLORATION GEOLOGIST. (PROJECT CHIEF).
- August to October 1998 **ARGENTINA MINERAL DEVELOPMENT s.a.**  
Project: "La Cabeza". Province of Mendoza (Argentina).  
EXPLORATION GEOLOGIST.
- January to June 1998 **WESTERN MINING CORPORATION**  
Project: "Río Frío", "Regalito", "Guanaco Zonzo" and "Fabiana". Valle del Cura. Province of San Juan (Argentina).  
EXPLORATION GEOLOGIST.
- August 1996 to Sept. 1997 **MINERA ELDORADO S.A.**  
Project: "Peña Negra" and "Laguna Verde". Province of La Rioja and Catamarca (Argentina).  
EXPLORATION GEOLOGIST.
- February 1995 – July 1996 **HIGH AMERICAN GOLD S.A.**  
PROSPECTING AND EXPLORATION GEOLOGIST.

## TECHNICAL TRAINING



"The application of robust governance processes to provide assurance on the generation and reporting of Exploration Results, Mineral Resources and Ore Reserves". AusIMM Webinar by Mark Noppe FAusIMM (CP), Corporate Consultant and Chair, SRK Consulting (Australasia). 1 h. 12/2017.

"Professional Development and Recognition for Community Relations Specialists webinar". AusIMM Webinar by Pam Bourke Consulting. 2 h. 09/2017

"Fundamentals of Professional Ethics: Elements and Examples". AusIMM Webinar by David Abbott Jr. FAusIMM (CP) Geo. 2 h. 06/2017

"Course Director of Thesis". (National Technological University. Regional Faculty of Buenos Aires). 20 h. 11-12/2015

"Community Relations Management and Conflict Environmental Social in the Mining Sector". (Intercade. Consultancy & Training). 200 h. April 2012 to April 2013.

"International Regulations for the certification of resources and mineral reserves". UNSL. By M. Rossi. 24 h. April 2011.

"Balanced Score Card Applied to the Mining Industry". (Intercade. Consultancy & Training). 40 h. February 2011.

"Management of Mining Projects". (Intercade. Consultancy & Training). 40 h. September 2010.

"Public report and Code JORC". Workshop Xstrata Copper (AUSIMM – A. Clark). 16 h. Junio 2010.

"Geostatistics Applied to Resources and Reserves Calculation". Nivel I y II. UNSL. By M. Rossi. 60 h. March – Nov. 2008.

"Basic Statistics course and Sampling for Deposit Evaluation". Mine Engineering. University of Chile. 30 h. December 2006.

"Geotechnics Applied to Open Pit Mine". (E-Mining Technology. Chile). 30 h. October 2006.

"Advanced Course on Acquire". (Metech Chile). 40 h. March 2005.

"Geostatistic and Modelling of Minesight". (Mintec Chile). 40 h. March 2004.

"Basic Minesight". (Mintec Chile). 40 h. May 2003.

"Basic Autocad 2000". (Center Kandinsky). Córdoba. Argentina. 40 h. November 2002.

Workshop Field of 10 days of duration. Directed by E. Llambías. "Massif North Patagonic and "El Deseado". (Argentina). December 1999.

Handling and interpretation of sampling data (macroscopic and drilling), with PIMA II (Portable Infrared Spectrometer). By Spectral International, Inc. 30 h. December 1997.

"Introduction to linear Geostatistics Applied to Evaluation of Mineral Resources". Superior Professional Council of Geology. Bs. As. Argentina. 30 h. September 1995.

## **MANAGEMENT TRAINING**

LEADERSHIP DEVELOPMENT PROGRAM (LDP). Facilitator and trainer of facilitators from other divisions. December 2004 -2103. Minera Alumbrera Ltd. – Xstrata Copper.

Participation in the design and realization of STRATEGIC PDL WORKSHOP OF MINERA ALUMBRERA LTD. June 2009

Course: "TRAINING THE TRAINER". Level I y II (IGH Group, Tucumán. Argentina). 60 h. August 2008

Course: "PROFESSIONAL SUPERVISOR". University of Queens, Canadá. (Tucumán, Argentina). 30 h. August 2003.

## **CONFERENCES AND PUBLICATIONS**

### **XIX ARGENTINO GEOLOGICAL CONGRESS (CORDOBA, ARGENTINA)**

"The Risks in the Fundamentals of the Recoverable Resources Model".

Authors: Bruna Novillo J., Bassan J., Rossi. June 2014.

### **XIX ARGENTINO GEOLOGICAL CONGRESS (CORDOBA, ARGENTINA)**

"The genetic model of mineralization Agua Tapada, Farallon Negro Volcanic Complex, Catamarca, Argentina".

Authors: Carrazana A. and Bruna Novillo J. June 2014.

### **X CONGRESS ON ECONOMIC GEOLOGY (SAN JUAN, ARGENTINA)**

"Episodes of the mineralization of Mo in Bajo de la Alumbrera mine, Catamarca, Argentina".

Authors: D. Mutti, M. Marzano, A. Carrazana y J. Bruna Novillo. September 2013.

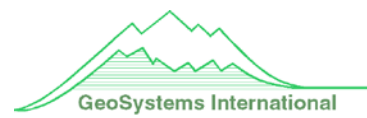
### **SPANISH SOCIETY MAGAZINE MINERALOGÍA. MACLA N° 15 (BARCELONA, ESPAÑA)**

"Mineralogy of Bajo Agua Tapada Project, Catamarca, Argentina".

Authors: D.G. Torrente, A. Carrazana, J. Bruna Novillo and J.L. Fernández Turiel. September 2011.

### **REGIONAL CONFERENCE MINESIGHT (SANTIAGO, CHILE)**

"Using the Minesight Software 3D, in the Fundaments of the Model of Recoverable Resource".



Authors: J. Bassan and J. Bruna Novillo. November 2010.  
 CONFERENCE MINING 2010 (SAN JUAN, ARGENTINA)  
 “The Board of Control like Management Tool in the Model of Recoverable Resources”.  
 Authors: J. Bruna Novillo, J. Bassan and M. Rossi. Speaker: J. Bruna Novillo. August 2010.  
 CONFERENCE MINING 2010 (SAN JUAN, ARGENTINA)  
 “The System of Veins Intermediate-sulfidation, in Bajo de La Alumbrera Mine, Catamarca, Argentina”.  
 Authors: N. Montenegro, A. Carrazana and J. Bruna Novillo. August 2010.  
 XVI MINE ENGINEERING SIMPOSIUM. SIMIN 2009 (SANTIAGO, CHILE)  
 “Fundamentals of the Recoverable Resources Model”.  
 Authors: J. Bruna Novillo, J. Bassan and M. Rossi. August 2009.  
 CONFERENCE MINING DAY 2009 (CATAMARCA, ARGENTINA)  
 “Process and Stages of an Exploration Program for Copper Porphyry Deposits”.  
 Authors: J. Bruna Novillo. Speaker: J. Bruna Novillo. May 2009.  
 INTERNATIONAL CONFERENCE ON MINING INNOVATION - MININ 2008 (SANTIAGO, CHILE)  
 “Ore Control System in Bajo de La Alumbrera, Catamarca, Argentina”.  
 Authors: I. Zapata, J. A. Bassan and J. Bruna. Speaker: J. Bruna Novillo. August 2008.  
 INTERNATIONAL CONFERENCE ON MINING INNOVATION – MININ 2006 (SANTIAGO, CHILE)  
 “Geotechnical Characterization and Modeling of its Variables in Bajo de La Alumbrera Mine, Catamarca, Argentina”.  
 Authors: C. Giraud, J. A. Bassan and J. Bruna. May 2006  
 ACQUIRE REGIONAL CONFERENCE (SANTIAGO, CHILE)  
 “Use to Acquire in the Processes of Minera Alumbrera”.  
 Authors: J. A. Bassan and J. Bruna Novillo. March 2005.  
 38° BRASILIAN CONGRESS OF GEOLOGY (CAMBORIU, BRASIL)  
 “Methodological extensions of the Matheron corrector in the petro-structural analysis of para-granite massif, Copina area  
 (“Sierras Chica” and “Grande” in Cordoba) – Argentina.”  
 Authors: Bruna Novillo J. and Lucero Michaut H. October 1994.

