



John T. Boyd Company

Mining and Geological Consultants

MESSAGE FROM THE MANAGING DIRECTOR

South America's geological and mining potential represents a great opportunity for the economical growth for the region. BOYD has been offering specialized consultancy services in South America for over 40 years starting from the coal sector then venturing to metals, precious stones and industrial minerals. However, given the relative recent involvement in mining from many of the countries, mining policy has become a key service offered by BOYD in the region. Our strong relationships with government, mineral producers and investors are based on respect, trust and collaboration. BOYD has south American technical, economical and policy making capabilities that combined with the international consulting strengths of our foreign offices create a unique talent and experience base.

SOUTH AMERICA EXPERIENCE

BOYD has visited and prepared multiple technical reports that include: geotechnical, geological, mine planning, expert witness, valuations, and production cost improvements. We have also completed multiple financial due diligence studies for various international mining companies interested in investing in the region.

The following is a representative list of recent Colombian and other South American projects completed by BOYD:

- ❑ The Servicio Geológico Colombiano (SGC) contracted BOYD via a Consortium with a local engineering firm to act as the auditor to ensure the technical, legal, and contractual quality and standards were achieved for the Airborne geophysics of 87,490 km² to increase geological knowledge for an entity linked to the Ministry of Mines and Energy.
- ❑ The Servicio Geológico Colombiano (SGC) contracted BOYD via a Consortium with a local engineering firm to act as the auditor to ensure the technical, legal, and contractual quality and standards were achieved for the geochemical sampling program in Colombia.
- ❑ The Servicio Geológico Colombiano (SGC) contracted BOYD via a consortium to act as the auditor to ensure the technical, legal, and contractual quality and standards were achieved for the geological mapping program of four geological blocks in Colombia.
- ❑ The Agencia Nacional de Minería (ANM) contracted BOYD via a Consortium to complete a technical assistance program to identify key technical, corporate, and environmental weaknesses of mid-size coal and industrial mineral projects in Colombia, and then prepare improvement plans for each of the 40 mines visited and also provide generalized recommendations for the mining sector.

- ❑ Retained by government of Colombia to act as their consultant relative to the Project entitled "Strategy to Strengthen the Attractiveness of Colombia as a Mining Investment". As part of this effort, the following initiatives were undertaken:
 - Government Take - BOYD researched and summarized the mining tax regime and legal framework for Brazil, Chile, Mexico, and Peru; the results of which were utilize to benchmark the effective of the Colombian mining tax regime.
 - Resource endowment and mining potential – BOYD collected information regarding the coal and copper industries of Russia, Indonesia, and South Africa as a means to compare/ assess the attractiveness/ commercial opportunities within Colombia's mining industry. Findings were prepared for review by the government.
 - Investor Mapping – Prepared a preliminary list of major mining companies/ investment groups that have undertaken global mining projects and which could be interested in investing in and/or expanding their presence in Colombia. Results were presented to the Government.
 - Analysis of Mining Rents - Reviewed the World Bank definition of Mineral Rent and researched issues surrounding the impact of mineral rent on Latin American countries. Researched historic values of mining rent as a percentage of country GDP. Available information regarding Mineral Rent for Colombia, Peru, and Brazil was collected, summarized and presented to the Government.
 - Industry Promotion - Prepared a document that identified and recommended ways for UPME to lead and coordinate the process of promoting investment in the Colombian mining sector. The suggested measures for promoting and marketing the investment opportunities were to consider potential investors with and without a presence in Colombia. Results were presented to the Government.
 - Reporting of Exploration Results, Mineral Resources and Mineral Reserves – BOYD recommended that The Government of Colombia initiate development of a CRIRSCO- based Code for the reporting of Exploration Results, Mineral Resources and Ore Reserves be developed. Recommended/ identified steps and measures to UPME that are needed to implement this approach. Findings were reported to Government representatives.

SOUTH AMERICA EXPERIENCE (Continued)

The following is a representative list of recent Colombian and other South American projects completed by BOYD:

- ❑ The Government of Colombia through its Agencia Nacional de Minería (ANM) contracted BOYD via a Consortium to develop national guidelines for mine rescue operations and to train local mine rescue personnel in the new policies and procedures. Tasks included:
 - Review existing mine safety practices and procedures, and visit mine rescue stations to understand the national mine rescue system.
 - Develop new guidelines in accordance with international standards and recognized mine safety and rescue practices.
 - After approval and adoption of the guidelines by the National Mining Agency, conducted multiple training sessions with local mine rescue personnel throughout the country.
 - ANM officially adopted our guidelines and published them as the new standard for all mine rescue operations.
- ❑ The Agencia Nacional de Infraestructura (ANI) contracted BOYD via a local consultant to support the preparation of a case study to determine the viability of completing a mining corridor (rail) in Colombia. The tasks included coking coal price forecasting, production cost estimations for Colombian mines, investment requirements and possible coal productions for two department of Colombia (Boyacá and Cundinamarca), and a study of the validity of recommending processing coke versus coal.
- ❑ Provide technical and professional support to complete the validation of the process related to the control of the mineral production control in Colombia hoping to increase royalty collection. Tasks included:
 - Provide key recommendations that include insight to the appropriateness of the measures taken by the Colombian government for the mineral production control.
 - Support our partner in the validation of the process implemented by the Colombian government at the key mineral operations.
 - Support our partner in the preparation and review of the forms and documents that will take place during the duration of the field visits to the mine operations.
 - Take part in the site visits and provide technical support to our partner in the collection of the key data to ensure the adequate validation process of the production control of minerals.
- ❑ The Ministry of Mines and Energy of Colombia contracted BOYD via a consortium to provide advice and technical assistance for the reduction and eliminations of mercury use in legal gold processing units, gold panners, and hard rock gold miners and to monitor the technical conditions of gold processing plants around Colombia.
 - Provide training, technical support, and implementation of alternative (non mercury use) clean production techniques and efficient gold recovery to 25,000 Gold Panners in Colombia.
 - Provide training on environmental and health problems as a result of mercury use and presenting clean production techniques for gold recovery to 600 hard rock gold miners in Colombia.
 - Conduct site visits and prepare detailed reports on 51 gold processing plants to monitor their incorporation of mercury substitutions programs and policy. The reports included air, water, metallurgical, and other laboratory sampling per processing plant. Additionally, BOYD completed an assessment on air quality (using a Lumex) of the population as multiple gold processing plants and amalgamation sites are located within urban regions.
 - Intervention of 20 new gold processing plants to conduct site visits and prepare detailed reports to assess the implementation of the mercury substitution programs and policy. The reports included air, water, metallurgical, and other laboratory sampling per processing plant. Additionally, BOYD completed an assessment on air quality (using a Lumex) of the population as multiple gold processing plants and amalgamation sites are located within urban regions.
- ❑ Prepare the Colombian models of supply and demand and mineral balance using scenarios and establishing forecasts of supply and demand for 18 minerals to 2035 (scenarios include short-, medium-, and long-term). Minerals include gold, platinum, copper, phosphate, magnesium, thermal coal, coking coal, iron ore, coltan, bauxite, chromium, manganese, silver, nickel, and emeralds, among others.
- ❑ Completed an update of independent expert estimates of the coal resources and reserves for mining concessions in the Ubaté area, Cundinamarca Department, Colombia.
- ❑ Retained to provide summary findings, conclusions, and recommendations regarding our geotechnical evaluation of planned expansion projects in Boyaca Department, Colombia.
- ❑ Completed a Phase I assessment of the mine modeling and mineral valuation capabilities of the Colombian government agency responsible for the planning and management of the country's energy and mining sectors (UPME).
- ❑ Retained to prepare a mine planning and technical evaluation of a potential coal mining facility in Cordoba Department, Republic of Colombia.
- ❑ Presented a preliminary "fatal flaw" analysis of a surface coal mining project located in Santander Department, Republic of Colombia.

SOUTH AMERICA EXPERIENCE (Continued)

The following is a representative list of recent Colombian and other South American projects completed by BOYD:

- ❑ Overview of the Colombian coking coal industry for a large industrial firm.
- ❑ Review of proposed high volatile, PCI project for a joint venture including port and review facilities.
- ❑ Initial review of large undeveloped coal concessions including an assessment of exploration target tonnage and design of an initial exploration program.
- ❑ Operational overview and near-term planning assessment of an operating underground mine including a review of expansion plans.
- ❑ Geotechnical assessment of an active mine to determine if the existing design is reasonable.
- ❑ Evaluated the overall project viability achieved by consolidating multiple mining concessions located in the Caparrapí region of Cundinamarca.
- ❑ Preliminary Due Diligence of an operational underground mining project located in Boyacá.
- ❑ Retained to support the overall assessment and property evaluation in Colombia of the mining potential of open-pit and underground operations in Boyacá, Cundinamarca, and Guajira for a multinational mining company.
- ❑ Evaluated the mining potential, mechanization, and increased production of an underground mine located in the Cerro Tasaiero region of Norte de Santander.
- ❑ Provided an independent estimate of alluvial gold resources located on a property in Colombia's Córdoba Department.
- ❑ Provided a preliminary valuation of a coking coal project located in the Norte de Santander Department, Colombia.
- ❑ Preliminary valuation of an existing underground metallurgical coal mining operation located in Norte de Santander, Colombia, for an international company evaluating the purchase of the operation.
- ❑ Provided a geotechnical study of an underground iron ore mine located in Paz del Rio, Boyacá in Colombia.
- ❑ Completed a series of studies involving estimates of coal resources and underground mining plans regarding Colombian coal holdings.
- ❑ Provided a preliminary geotechnical assessment for the development of an underground mine located in Cundinamarca Department, Colombia, to recover iron ore resources located adjacent to an existing open pit operation.
- ❑ Completed an independent review and resulting confirmation of coal reserve statements prepared by our client for a surface mine located in Cesar Department, Colombia.
- ❑ Provided a preliminary review of underground mining plans, mine services, and related infrastructure for a gold mine located in Antioquia Department, Colombia.
- ❑ Assessed the potential to improve the operational and financial performance of an underground iron ore mine located in Boyacá, Republic of Colombia.

JOINT VENTURES PROJECTS

BOYD has engaged in numerous South America Joint-Venture Projects

- Mercury Elimination Project
- Mine Rescue Standards
- Training for Mine Rescue
- Royalty Control
- Coal and Industrial Minerals Mining Improvement Plans
- Mining Attractiveness Regional Study
- Forecast of Mineral Production for 18 Minerals
- Royalty Calculation Models
- Geological Mapping
- Geochemical Mapping
- Geophysics Mapping