
El Alineamiento de Estándares en Brasil

Alignment of Standards in Brazil

Santiago, 14 de Octubre



El Alineamiento de Estándares en Brasil

Authors and Collaborators

Economic Outlook of Brazilian Mining

Brazilian Institutions

Brazilian Mineral Legislation

Current Situation

Vale

Votorantin

AngloGold Ashanti

Samarco

Yamana Gold Inc

Final Considerations



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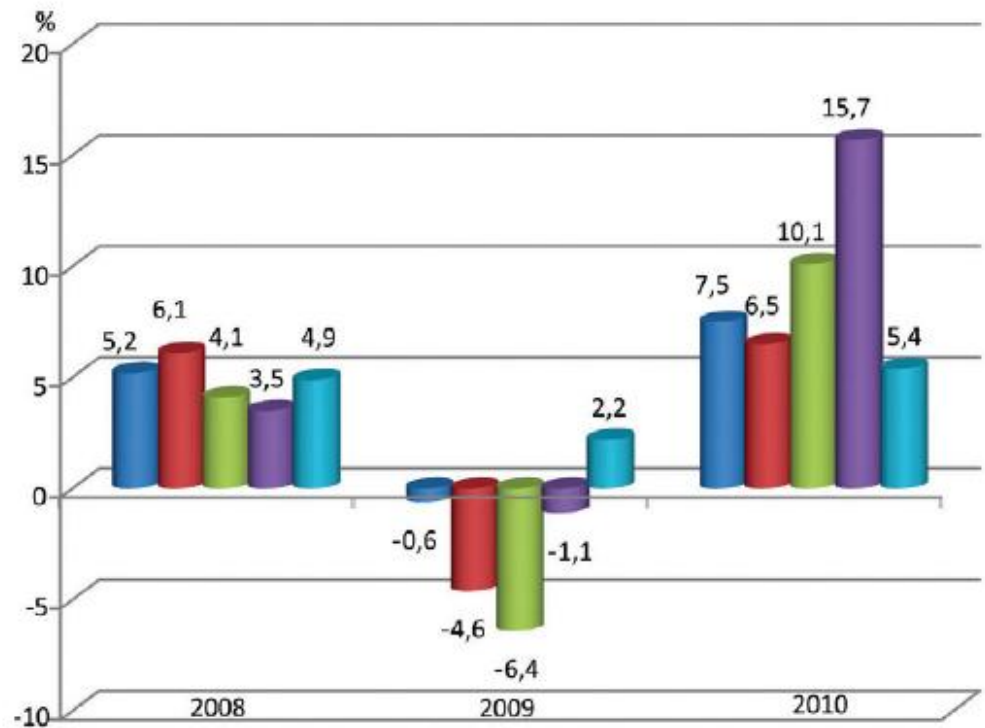


Economic Outlook of Brazilian Mining

DNPM – 14 Brazilian Mining Congress

- ▶ The production of goods and services (GDP) increased 7.5%, registering a total of R\$3.7 trillion (USD2.1 trillion).
- ▶ From the perspective of the supplier, the industry had the best performance among the sectors of the economy, reaching (10,1%), especially the extractive mining industry (15.7%).
- ▶ The extractive activity contributes with US\$43.9 billion to the national economy .

PICTURE 1 – Actual Rates of GDP Variation – 2008 to 2010



Source: IBGE

■ GDP ■ Agricultural Sector ■ Industrial Sector ■ Extractive Mining ■ Services Sector

Economic Outlook of Brazilian Mining

DNPM – 14 Brazilian Mining Congress

- ▶ the product of the Brazilian Mining resumed its growth in 2010, after a decline in the previous year.
- ▶ the world economic recovery, particularly the emerging economies, and the increased prices of mineral commodities caused by the mismatch between supply and demand, have led the mining industry to record a growth of 15.7%, contributing US\$43.9 billion to the national economy .
- ▶ despite the significant growth in late 2010, the activity will grow at a slower rate in 2011.



Economic Outlook of Brazilian Mining

DNPM – 14 Brazilian Mining Congress

The main mineral resources in Brazil are represented by approximately 27 minerals

Substance	1,000 * t	% World
Iron	20.359.000	11.3
Nickel	7.532.310	10.0
Aluminum	2.600.000	9.5
Coal	2.482.000	0.3
Magnesite	298,626	11.5
Phosphate	273,000	0.4
Talc	227,000	40.8
Cobalt	89,000	1.2
Manganese	60,000	10.3
Potash	17,684	0.2
Copper	9,800	1.6
Niobium	4,097	98.4
Zirconium	4,053	7.1
Titanium	3,050	0.5
Zinc	2,600	1.0
Barite	2,488	2.2
Vermiculite	2,200	5.3
Chromium	2,170	1.0
Tin	712	14.4
Vanadium	175	1.3
Tantalum	88	67.0
Lead	86	0.1
Rare earths	40	<0.1
Platinum	14	<0.1
Gold	2	4.7
Silver	2	0.4
Substance	1,000 * ct	% World
Diamond	9,500	1.6

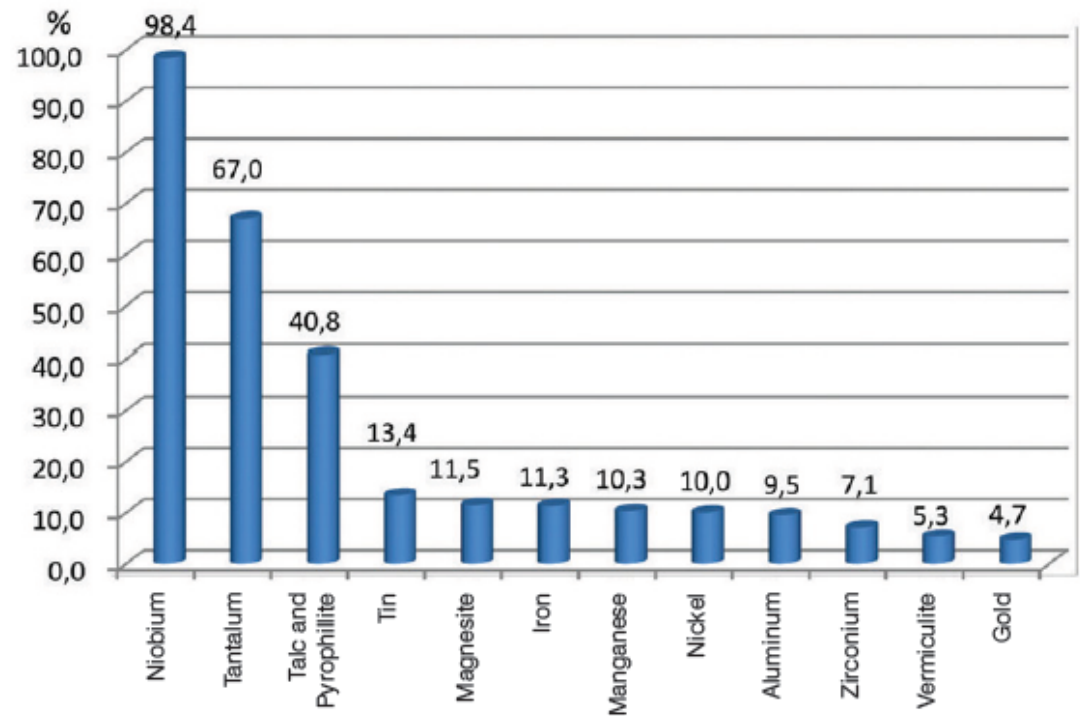
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DNPM – 14 Brazilian Mining Congress

Compared to the world's reserves, the highlights are 12 substances.

The other mineral commodities have reserves of less than 4% of the global reserves.

PICTURE 3 – World Share of Main Mineral Reserves in Brazil – 2010



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Brazilian Institutions

DNPM – Departamento Nacional de Produção Mineral



Departamento Nacional de Produção Mineral

General director: Sérgio Augusto Dâmaso

- ▶ created by decree of 03/08/1934, DNPM is linked to the Ministry of Mines and Energy, but as a self-governing body (autharchy);
 - to foster the planning and promotion of exploration and mining of mineral resources
 - to supervise geological and mineral exploration...to ensure, control and monitor the exercise of mining activities throughout the national territory, in accordance with the Mining Code.
 - to grant mineral rights and to coordinate, systematize and integrate geological data
 - to formulate and propose guidelines for mineral policy;
 - to establish and run data banks to assist the work on mineral policy required for governmental planning;



Brazilian Institutions

CONFEA - Conselho Federal de Engenharia, Arquitetura e Agronomia



- ▶ the Federal Council of Engineering, Architecture and Agronomy – CONFEA – was created by decree in 1933
 - ▶ in its current conception, CONFEA regulates and supervises the professional practice of working in the areas it represents, including geologists and mine engineers
 - ▶ the Federal Council is the highest level to which a professional can turn in relation to the regulation of professional practice.
 - ▶ linked to CONFEA, we have the regional councils (CREA). They are federal agencies that regulates and supervises the exercise of professional engineering, including geologists and mine engineers, in each state of Brazil.
-



Brazilian Institutions

IBRAM – Instituto Brasileiro de Mineração



IBRAM

President: Paulo Camillo Vargas Penna

- ▶ IBRAM - Brazilian Mining Institute is the national representative of companies and institutions working in the mining industry and was created in 1977.
- ▶ it is a private, nonprofit organization, which aims to gather, represent, promote and make known the Brazilian mining industry, contributing to its national and international competitiveness.
- ▶ the exchange of ideas and knowledge, as well as discussion of mineral sector barriers and its issues of interest, are very encouraged by IBRAM.
- ▶ events, sponsored by IBRAM, like EXPOSIBRAM, attracts a wide audience. Such events include courses, exhibitions, seminars, workshops, conferences nationwide and internationally.



Brazilian Institutions

ADIMB – Agência de Desenvolvimento Tecnológico da Indústria Mineral Brasileira



President: Jones Belther - Votorantim

- ▶ created in 1996, the Agency of Technologic Development for the Brazilian Mining Industry is a non-profit institution.
 - ▶ created by suggestion of the National Department of Mineral Production - DNPM and Ministry of Mines and Energy, ADIMB has today 60 associated companies.
 - ▶ ADIMB aims to promote technical and scientific development and training of human resources for the mining industry in Brazil, through cooperative action between government, businesses and research institutions.
 - ▶ the agency promotes the SIMEXMIN – The Brazilian Symposium on Mineral Exploration
-



Brazilian Institutions

SBG – Sociedade Brasileira de Geologia



President: Herbet Conceição

- ▶ the Brazilian Geological Society is a technical-scientific society created in 1945.
- ▶ SBG promotes the progress of Geosciences in Brazil, bringing together multiple geoscientists, disseminating technical and scientific information and actively participating in major decisions involving national education and research in the field of Geosciences.
- ▶ biannually the institution promotes the Geological Brazilian Congress



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Brazilian Mineral Legislation

DNPM – Departamento Nacional de Produção Mineral

- ▶ The Brazilian Mining Code (Decreto N° 62.934/68 - *Regulamento do Código de Mineração*) dates back to 1968, and since then, despite of few amendments, hasn't change significantly.
- ▶ The main issue is the definition: the term “Reserves” is applied to mineral resource as defined by current international codes and it is classified as Measured, Indicated and Inferred:
 - ▶ Measured *Reserves* include the part of the deposit that is well defined by geological researches and in which the differences to the “real” quantities are less than 20% (!?).
 - ▶ Indicated *Reserves* permits extrapolation from the data in a “reasonable distance”. It includes the Indicated and part of Inferred JORC Resources,
 - ▶ Inferred *Reserves* can be estimated “with a few or none explorations works”.



Brazilian Mineral Legislation

DNPM – Departamento Nacional de Produção Mineral

- ▶ another significant issue is that there is no sound economic concept in DNPM's reserve definitions.
- ▶ to be granted with the mining licenses, after a successful geological research, the applicant should present a report named Plano de Aproveitamento Econômico – PAE (Economic Feasibility Plan) to the DNPM.
- ▶ Aware about these conflicts, DNPM created two working groups (2002 and 2010) to propose revision of the Brazilian Mining Code towards international standards.



Brazilian Mineral Legislation - Update

DNPM – Departamento Nacional de Produção Mineral

- ▶ The first attempt was in 2002 which has begun as an adequacy to the JORC, without any change (only Mineral Reserves instead of Ore Reserves) and has culminated introducing new concepts for the Reserve and Resource definitions that were closer but not equal to the JORC.



Brazilian Mineral Legislation - Update

DNPM – Departamento Nacional de Produção Mineral

- ▶ The second trial was in 2010, when a new working group produced a document entitled “Comentários e Sugestões sobre a Proposta para Atualização dos Conceitos de Recursos e Reservas Minerais no Brasil” (Comments and Suggestions on the Proposal for Upgrade of the Concepts of Resources and Ore Reserves in Brazil”
- ▶ This group suggested the adoption of CRIRSCO as standard, and more specifically the CRIRSCO Template as a reference for the standardization of concepts and reporting for submission to the DNPM.
- ▶ This recommendation would meet the initiative of the International Accounting Standards Board (IASB), which is responsible for International Financial Reporting Standards intended to be adopted in Brazil.



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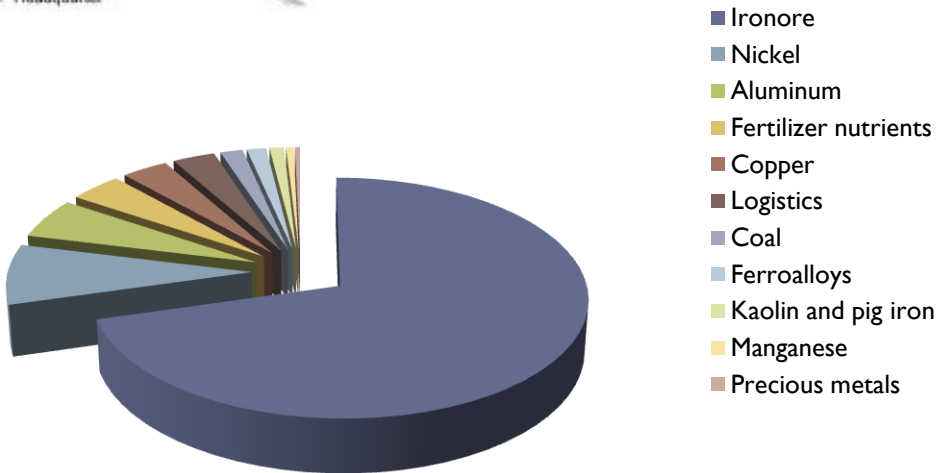
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PRODUCTION 2010

Iron ore	308 Mt
Pellets	49 Mt
Manganese	1.8 Mt
Ferroalloys	0.5 Mt
Coal	3 Mt
Nickel	179 Kt
Copper	207 Kt
Bauxite	33 Mt
Phosphates	5 Mt
Potash	662 Kt



Operating revenues 2010 US\$46,481 millions

Key Topics	Company's practice
Public Reporting	New York and Hong Kong Stock Exchanges
Listed at Stock Exchanges	BOVESPA, NYSE, HKSEEx, LATIBEX / Madri, Euronext / Paris
Code(s) adopted	Mandatorily SEC and Internal MRMR Global Guide (<i>which is based mainly on SEC, JORC, NI43101 and Samrec</i>)
Reporting of Exploration Results	It's not allowed under SEC's rules
Reporting of Mineral Resources	It's not allowed under SEC's rules
Reporting of Ore Reserves	Yes, at a Feasibility Study level
Competent/Qualified Person Requirement	Yes, usually assigned one for each Business Area (i.e. Iron Ore, Coal, Base Metals...)
Professional association compulsory	Not officially, but strongly recommended (<i>mainly CIM, AUSIMM and SAMREC</i>)
Chain of Custody is transparent and official	Under development: aiming to improve traceability, the assignment of "responsible person" for internal reports is increasing.
Internal auditing/review process implemented	Not totally, but well consolidated in some Business Areas.
Use of external auditing as routine	Yes, as specified by the Internal MRMR Global Guide
Resource/Reserve classification method standardized	Not across all commodities but there is a process of minimize discrepancies, respecting its specificities.
"Reasonable perspectives for economic extraction" is a judgment from Competent/Qualified Person	In some Business Units it is demonstrated by a cash flow, but in another it's due to the QP to define it.
Inferred Resources Allowed for Economic Studies	Can be admitted only for internal studies



Votorantim Metais is a subsidiary of Votorantim a brazilian multinational Group

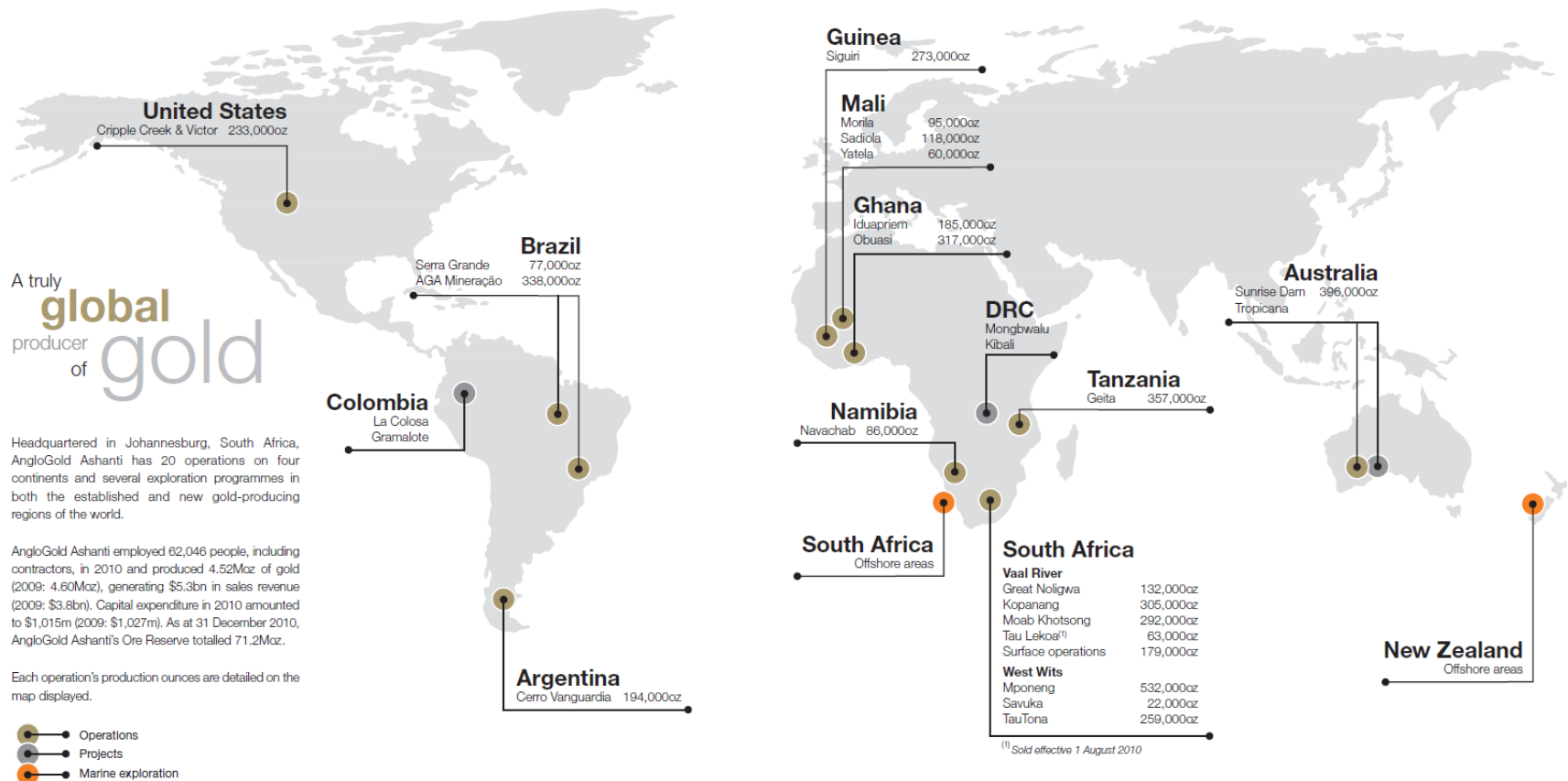


US\$ 60MM (2010)

Key Topics	Company's practice
Public Reporting	No
Listed at Stock Exchanges	No
Code(s) adopted	JORC
Reporting of Exploration Results	JORC – internal reports only
Reporting of Mineral Resources	JORC – for FEL stage projects and current operations
Reporting of Ore Reserves	JORC – for FEL stage projects and current operation
Competent/Qualified Person Requirement	Yes, competent team for base metals, Ni, bauxite
Professional association compulsory	AUSIMM association for competent team
Chain of Custody is transparent and official	Under development for advanced projects
Internal auditing/review process implemented	Yes, for advanced projects
Use of external auditing as routine	Yes, for advanced projects
Resource/Reserve classification method standardized	Yes, for all business units, but with variable criteria according to deposit type
"Reasonable perspectives for economic extraction" is a judgment from Competent/Qualified Person	Yes, but with economic support following corporate premises
Inferred Resources Allowed for Economic Studies	Can be admitted only for internal studies



- In Brazil: Anglogold Ashanti CDS Mineração
- Operations:
 - Cuiabá , Lamego and Córrego do Sítio I & II Mines
 - Mineração Serra Grande
- Total Production 4.52Moz in 2010
- Americas Production in 2010: 0.89Moz
- Main Projects/ Expansions: Tropicana (Australia); Kibali and Mongbwalu (Congo); La Colosa and Gramalote (Colombia); Marine Exploration (South Africa and New Zealand)



Anglo Gold Ashanti



Key Topics	Company's practice
Public Reporting	JSE in South Africa, as well as the stock exchanges in London, New York, Ghana, Australia, Paris and Brussels. It is also submitted the United States Securities and Exchange Commission (SEC) on a Form 6-K. Ashanti prepares an annual report on Form 20-F.
Listed at Stock Exchanges	LSE, NYSE, Ghana, JSE
Code(s) adopted	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves and South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code) 2007 edition
Reporting of Exploration Results	JORC Code 2004 & SAMREC Code 2007
Reporting of Mineral Resources	JORC Code 2004 & SAMREC Code 2007
Reporting of Ore Reserves	JORC Code 2004 & SAMREC Code 2007
Competent/Qualified Person Requirement	Relevant Experience on the mineralization and substance, certified by a Recognized Overseas Professional Organization (Membership of AusIMM, SAIMM, SME, CIM)
Professional association compulsory	Yes (<i>AusIMM, SAIMM, SME, CIM</i>)
Chain of Custody is transparent and official	Yes, accountable professionals at the operational, regional and corporate levels with sign off established
Internal auditing/review process implemented	Yes, internal and external
Use of external auditing as routine	Yes, over periods of 3 years all the resources and reserves are externally audited
Resource/Reserve classification method standardized	Yes, preferentially the resources are classified by quantitative analysis (15% rule)
"Reasonable perspectives for economic extraction" is a judgment from Competent/Qualified Person	Yes, all the resources must be supported by a conceptual, pre-feasibility or feasibility demonstrating the economic extraction perspective
Inferred Resources Allowed for Economic Studies	Yes, for internal perspectives and support exploration investments

Name

- Samarco Mineração S.A

Operation

- Mine – Beneficiation – Pipeline – Pelletizing - Port

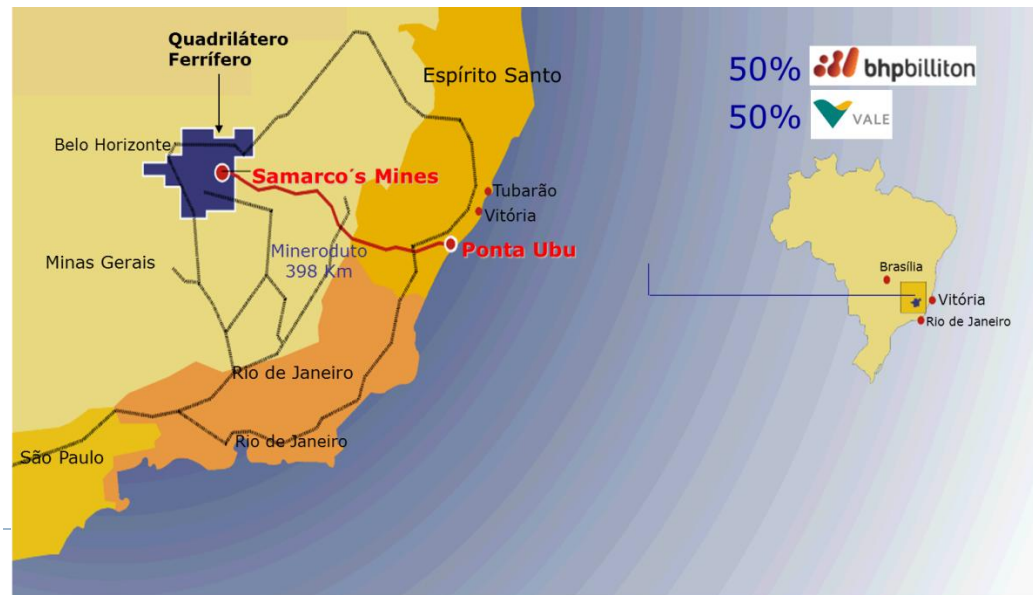
Production

- 41.1 M NMT (ROM) – 23.2 M DMT (Concentrate) - 21.5 M DMT (Pellet)

Projects

- P4P project - New concentrate Plant start up at 2014

Location



Key Topics	Company's practice
Public Reporting	No, just internal reports
Listed at Stock Exchanges	No
Code(s) adopted	SEC, JORC
Reporting of Exploration Results	No
Reporting of Mineral Resources	Internal Report
Reporting of Ore Reserves	Internal Report
Competent/Qualified Person Requirement	Yes, usually assigned two C.P for Resources and two C.P for Reserve
Professional association compulsory	AUSIMM
Chain of Custody is transparent and official	Procedure to transfer the resource block model to the mine plan team and a financial protocol (ore price and cost) as guideline to optimize the pit
Internal auditing/review process implemented	Every two year by MPOR team (BHP Billiton)
Use of external auditing as routine	Yes, independent consulting companies audit the routine, last time was at 2010
Resource/Reserve classification method standardized	Resource classes depend on sample distribution around the blocks and its average distance (100m for measured, 200m for indicated and 300m for inferred) To the reserve the measured block is consider proved and the indicated block is consider probable
"Reasonable perspectives for economic extraction" is a judgment from Competent/Qualified Person	There is a judgment considering process technological capacity. Two cut off are apply at the resource, L.O.I and size (compactness) parameters.
Inferred Resources Allowed for Economic Studies	No, all the inferred resource inside the pit is consider as waste



Key Topics	Company's practice
Public Reporting	Toronto, New York and London Stock Exchanges
Listed at Stock Exchanges	TSX: YRI / NYSE: AUJ / LAU: YAU
Code(s) adopted	NI43101
Reporting of Exploration Results	Under NI43101
Reporting of Mineral Resources	Under NI43101
Reporting of Ore Reserves	Under NI43101
Competent/Qualified Person Requirement	Yes, usually assigned two QPs for each Project/Mine sites (Resources and Reserves QPs)
Professional association compulsory	AusIMM, PGeo, APGO, Comisión Minera (Chile)
Chain of Custody is transparent and official	Yes, traceability from exploration to Laboratory
Internal auditing/review process implemented	Yes, it is an annual routine.
Use of external auditing as routine	Yes, it is a routine to support material changes in resources and/or reserves
Resource/Reserve classification method standardized	<ul style="list-style-type: none"> - Yes. following the international best practice for classification MRMR. - Under development, for coming years: <ul style="list-style-type: none"> • Conditional simulation to support the geological limits and resource classification • Ore reserves risk and mining planning optimization using stochastic models
"Reasonable perspectives for economic extraction" is a judgment from Competent/Qualified Person	The projects are submitted to economic analysis to support QP judgment.
Inferred Resources Allowed for Economic Studies	Only for internal studies applying historical conversion rates. Not for public disclosure.



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Final Considerations

- ▶ The first (2002) and second (2010) attempts were particularly positive as it raised the subject to be discussed between the governmental institutions (DNPM) and the society through its working groups.
- ▶ The Brazilian Mining Code needs an approval from the majority of the Brazilian congressmen to be changed. To overcome this the legal matters, both working groups presented proposals that intended to be a “*where you read understand*” type of document.
- ▶ Nevertheless, none of documents produced by these working groups, in practice, achieved any improvement to the BMC.
- ▶ This situation implies in a very complex situation: the mining companies are required to comply with its legal obligations by the DNPM under its definitions and reporting format. They are also committed to different international codes with proper definitions and reporting format.
- ▶ It is a common sense among representatives from Brazilian mining companies that we should work towards the standardization according to international codes such as CRISRSCO.

