



Ouro-Bahia Project

Location

The area is placed about 3 hours away from Feira de Santana, in the state of Bahia, where the products can be sent either to ports in the Brazilian northeast or industries in the southeast region.

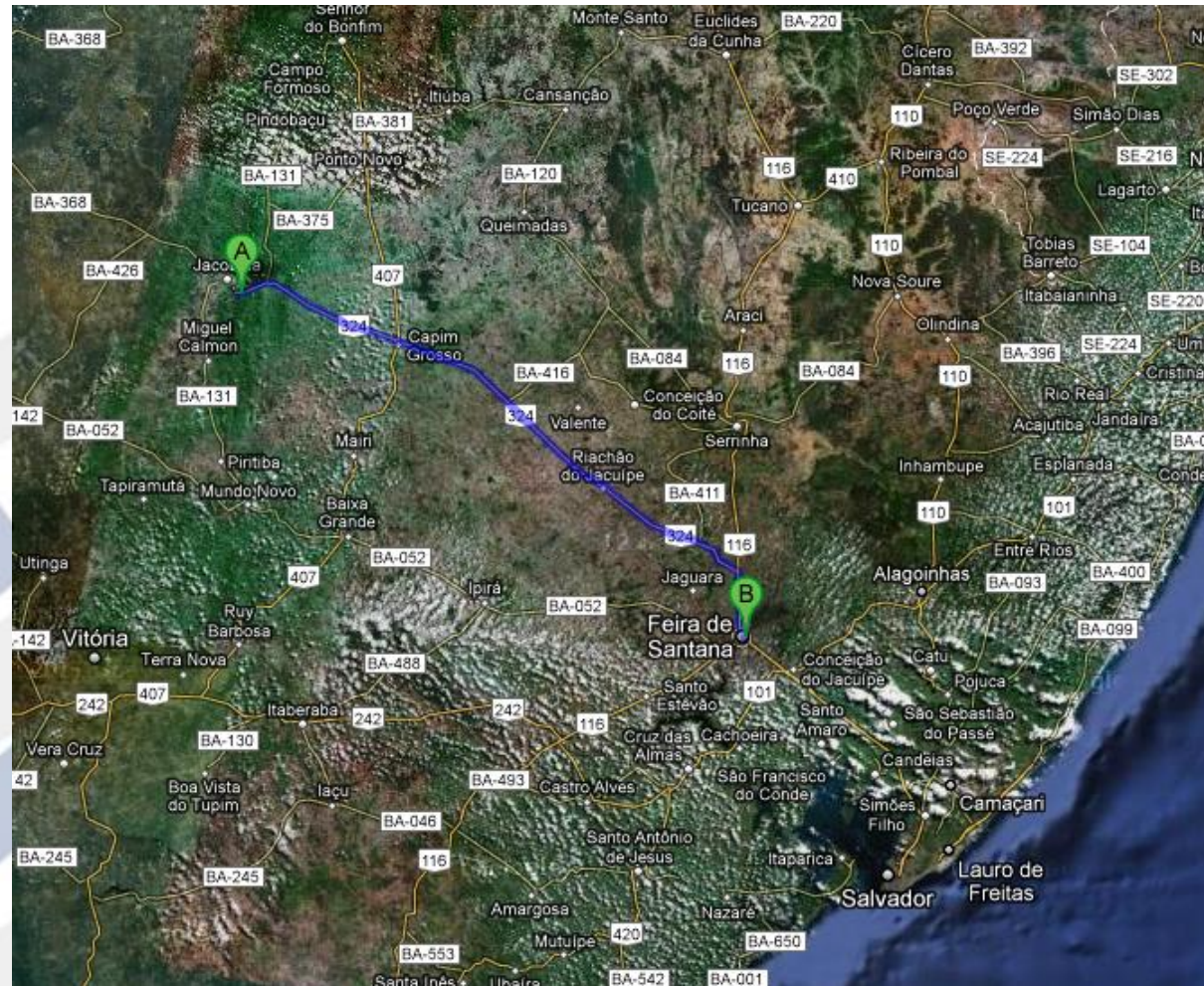
The access is made by the BR-324 and BR-116 roads.

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Location



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Regional Geology

The geology and topography of the Jacabina Mountain Range lead to infer it was originated from a major flaw in the N-S direction. Being the southern part of it is structurally simple, composed of four blocks failed in two orthogonal directions, with the tectonic fractures filled by basic intrusive rocks like basalt. There are still iron rocks, hematitic phyllites, without, however, similarities between them, and itabirites from the Super Group Minas.

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Regional Geology

The mountain range formation took place in Lower Precambrian, with its metasediments, from the Jacobina group, consisting of quartzites, phyllites and siltstones, with intercalations of ferruginous quartzites or even itabirites and conglomerates. To explain the geological structure, it is suggested that the sediments were deposited in the graben type tectonic basin and along the crest of the large anticline, formed through efforts that have been submitted the basement and the Pre-Minas group.

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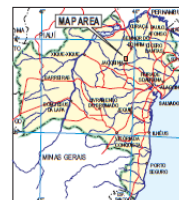
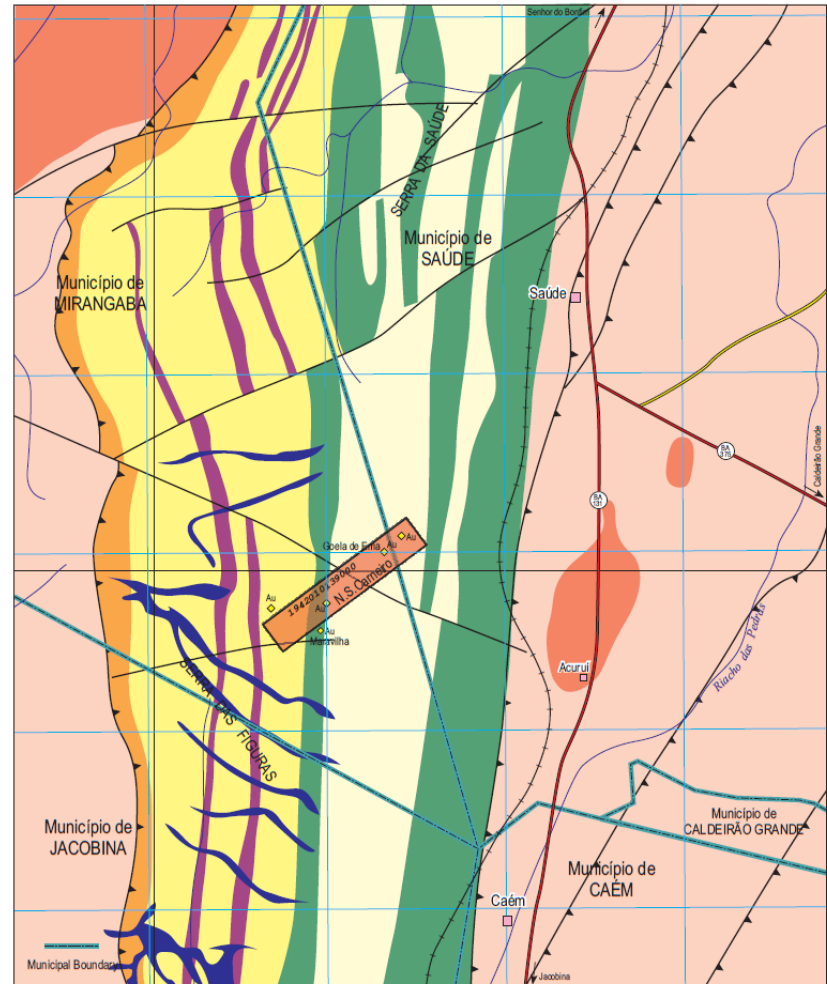
Regional Geology

The metasediments forming the “Serra da Jacobina” (Jacobina Mountain Range) were divided in four formations, named, from the basin to the top, of Bananeira Formation, Serra do Córrego Formation, Rio do Ouro Formation and Cruz das Almas Formation. Ultrabasic rocks metamorphosed in sills are observed in most of the area. Dykes and lenses of amphibole occur within the metasediments and granitic gneiss basement.

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- Paleoproterozoic Intrusive Rocks
- Mafic Dikes
 - Granitoids
 - Ultramafic Dikes & Sills
- Jacobina Group
- Serra da Paciência Formation
 - Rio do Ouro Formation
 - Serra do Corégo Formation
- Archean
- Mundo Novo Greenstone Belt
 - Basement

♦ Au Occurrences

GEOLOGY

SCALE 1:100 000

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Local Geology

Metasedimentary rocks of the Rio do Ouro Formation, consisting of quartzites and metasilicates, occur oriented in N-S direction and strongly inclined to E. From west to east, the sequence begins with fine quartzites in white to pale green, with large amounts of sericite. The fucsite occurs frequently and is responsible for the greenish color of the rock. Pipple marks are common. These rocks form the “Serra da Maravilha”, site of intense mining activity in the 1940’s.

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Local Geology

There are 4 quartz veins, that were object of intense mining activity and are named, from the foothills to the top of the wall: Trecho dos Antigos, Grana Velha, Frincha Nova e Frincha do Céu. The quartz is milky to dark gray and often has iron oxide. The quartz is within the mylonitic range and has a thickness that locally affects more than 3 m. the mylonite, in greenish color, often shows itself changed and is well exposed in certain places.

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Local Geology

The association of quartz and mylonite have similar appearance, both in Frincha Nova and Frincha do Céu. In the last site, the mylonite has iron oxide changed, showing intense red color. In some places, however, the quartz is in direct contact with the quartzite, showing low similarity to the mineralized bodies of Maravilha.

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Local Geology

Below the metasilite occurs white to light gray quartzite, sometimes showing greenish color, and fine to coarse texture. It is the predominant lithologic type in the subarea of Goela da Ema, displaying gentle dips near the shaft, reflecting, possibly, the folding hinge zone. This package of rocks exhibits variation in its composition. At the top, fine ferruginous quartzite can be found, containing sericite in good levels. Interspersed in the main rock occurs levels of white, fine, micaceous and green quartzite.

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Local Geology

In the shaft of Goela da Ema, there are the most typical occurrences of vein quartz, with good exposures, due to the research work. The sulfides (pyrite and chalcopyrite) can be found in abundance in both quartz and mylonite as in the host quartzite. Free gold occurs often, filling fractures in the quartz vein. Although free gold isn't seen in quartz, results of chemical analysis of borehole samples and channel galleries ones revealed the presence of the metal also in this type of lithology. The most representative occurrences, in terms of gold mineralization in quartz veins, are located at the bottom of the shaft of Goela da Ema. It is a body of lenticular shape with a maximum of 3,2 m of width to 23 m length.

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Local Geology

The mylonite occurs in a range of up to 5 m of thickness and appears intensely folded, indicating proximity to the fault plan. It was found a quartz vein, with maximum thickness of 1,2 m and free gold in quantity. The shape of this body indicates a second boudin parallel to the one found in the shaft, what lead to expectations of increasing the reserves in the sub-area of Goela da Ema.

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Local Geology

The quartzite, the lithologic type most common in Goela da Ema, predominantly sericitic, varying the percentage of sericite up to 20% of the rock, usually quartz grains show tendency to rounding and fracturing; the contact between grains, in most cases, is geared and welded, but the smaller the recrystallization is, sericite flakes still occur between them; tourmaline, zircon and opaques minerals are accessories. There is no regularity in the mineralogical composition of the quartzite as the percentage accessory minerals vary in distance of centimeters. The tourmaline is presented in short prisms, idiomorphic and associated to the sericitic levels.

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Infrastructure and Access

The access to Goela da Ema is done by a road that starts on BA-138. This road went through deforestation and improvements along the entire stretch, about 6 km. At the end, it was coated with stones and mortar, in order to allow vehicle access to the operation yard of Goela da Ema. In addition, it was implemented a floating bridge in Rio das Pedras (15 m span) and two bridges (2 m span each), over minor streams.

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Infrastructure and Access

In the sub-area of Goela da Ema, can be already found the following installations:

- 3 storehouses in brickwork, 68 m³ each;
- Compressor house, with an area of 20 m²;
- 2 bathrooms, near the central warehouse;
- 2 storehouses for dynamite and accessories, with double brick walls and 13 m³;
- House of the winch;
- Office with 84 m²;
- Powerhouse, with 7,5 m²;
- Cement tank to store the water infiltrated from the north wall of the shaft, with capacity of 10 m³;
- 4 m³ supply tank, to store water to be used in the work sites;
- Covered area intended for the repair of vehicles and equipment;
- 28 m wall, to protect the shaft against possible nearby bearing;
- 1800 m of wire fence enclosing the work area of Goela da Ema.

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Infrastructure and Access

It was built a dam at the Goela da Ema Creek, representing a volume of 22 m³, allowing accumulation of water to provide the needs of work fronts, offices and camps. The area of the dam was sealed with cement. a pipe of 3" transfers the water from the dam to the 4 m³ tank and, from this reservoir, it goes through a ¾" pipe that spreads it over all plants of Goela da Ema.

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Infrastructure and Access

For the pilot processing plant, the water is obtained from the dam built in Goela da Ema Creek, next to the processing building and a storage capacity of 40 m³; and a 10HP pump, near Rio das Pedras, that was implemented to increase the safety margin.

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Infrastructure and Access

The following equipments are already installed in the area:

- 3 electro pumps of 7,5 hp, to drain water from the shaft;
- A clutched electro winch;
- Compressed air system;
- 2 trolleys for transportation of the material removed from the galleries.

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Works of Economic Evaluation

MARAVILHA

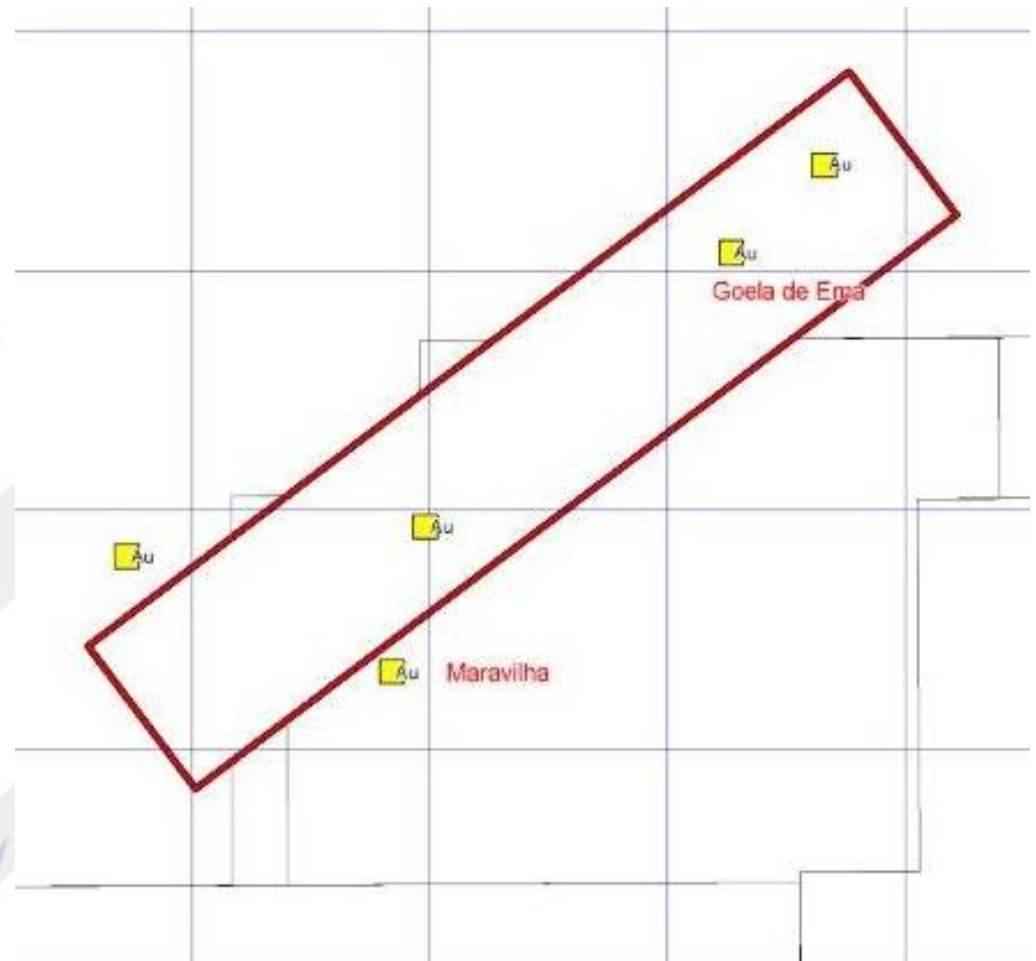
The samples were collected due to the detailed mapping, in Gruna Velha and Frincha Nova, in many lithologic types, such as the quartz vein, quartzites, mylonites and rejected gravel from old excavations. There was no systematic collection, opting for performing them in places that seemed more conducive to gold mineralization. It was collected 69 samples, 39 of rejected gravel and 30 of quartz veins or their contact with mylonite and quartzite.

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Works of Economic Evaluation



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Works of Economic Evaluation

MARAVILHA

It was collected 5 surface samples, in Gruna Velha, obtained from a perpendicular channel to the mineralized body.

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Works of Economic Evaluation

MARAVILHA

A total of 74 samples was collected for measurement of gold. The sampling consisted of collecting fragments of approximately 300 g, which were sent to GEOQUÍMICA – Serviços Geológicos e Analíticos Ltda., to perform the analysis, through the atomic absorption method.

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Works of Economic Evaluation

GOELA DA EMA

Five trenches were excavated in the sub-area of Goela da Ema, in order to verify the continuation of the mineralized body to the south of the shaft. They account for 96,5 m length in total, with an average width of 2 m and maximum depth of 4 m.

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Works of Economic Evaluation

GOELA DA EMA

The sampling revealed quartz veins of centimeter thickness and mylonitic ranges, containing pyrite and chalcopyrite in large quantities; despite the occurrence of sulfide suggests, in principle, a promising potential for gold mineralization the results of chemical analysis did not confirm this possibility.

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Works of Economic Evaluation

GOELA DA EMA

Surface samples were collected randomly, during the mapping, in quartzite, mylonite and vein quartz. In the north of the shaft, it was made channel sampling in a quartz vein outcropping, elsewhere the sampling was conducted in mining holes. In total, it was done chemical analysis in 89 surface samples.

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Works of Economic Evaluation

GOELA DA EMA

In experimental mining, in auriferous quart vein, 30 tons of ore produced 283,2 g of gold, corresponding to approximately 9,44 g/t.

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Contents and Reserve

MARAVILHA

Due to the randomly sampling, it wasn't possible to obtain an average representative grade for the ore in the Maravilha area. However, it is possible to infer the auriferous quartz reserve is close to 80.000 tons.

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Contents and Reserve

GOELA DA EMA

Measured Reserve is equal to 3.646 tons, with an average percentage 9,15 ppm.

Indicated Reserve equal to 8.513 tons and it has an average ore percentage of 7,50 to 9,51 ppm.

Inferred Reserve there are two hypothesis, with one or two mineable bodies. Mining only one body, it is gotten 34.052 tons; mining both bodies, 51.145 tons.

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