



# CONE

MINE EXPLORATION

## Ouro Verde

Gold Mine  
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## SUMMARY

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## 1. Introduction

This document is a summary of the data obtained in the mining activities of *Ouro Verde*, a gold mine located in the southwest (SW) portion of *Pará*, a state located in the north region of Brazil.

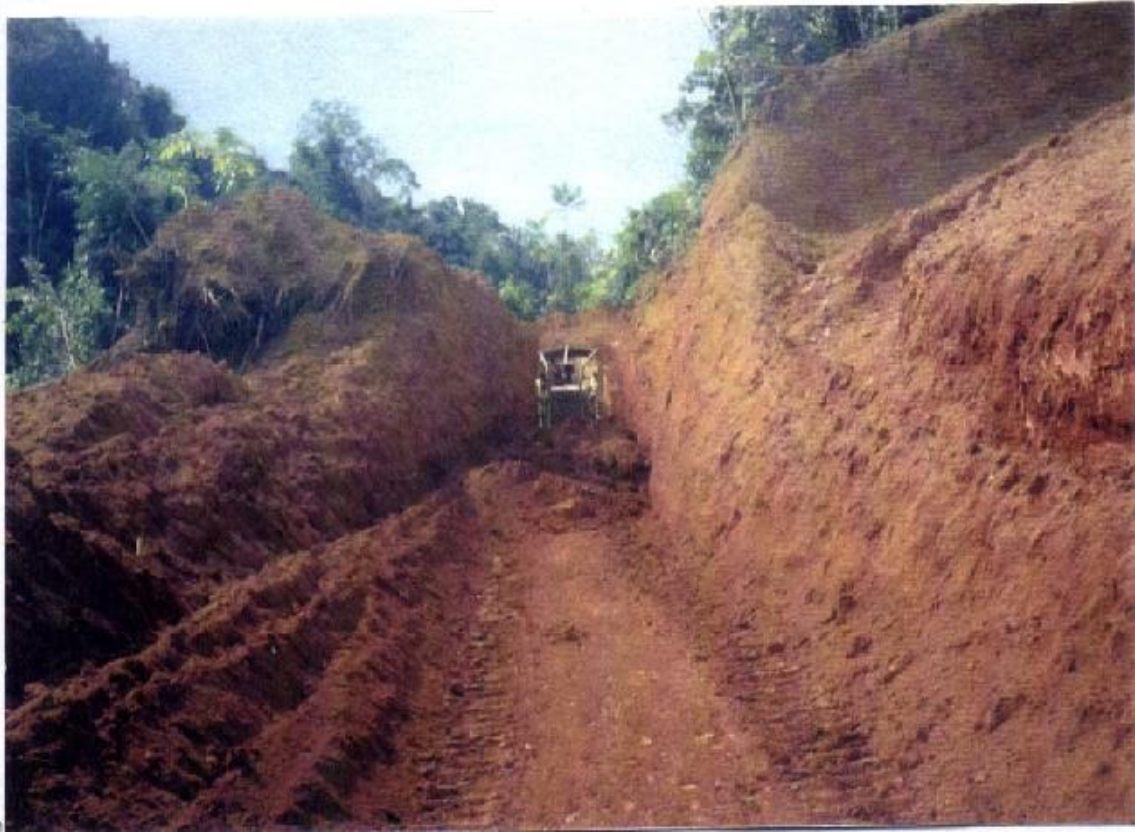
The knowledge of the occurrence of various tabular bodies (veins) consisting of mineralized quartz, sulfides and gold, stretching for several hundred feet encased in basic rocks of the region, led the company to request the area with the National Department of Mineral Production of Brazil (*DNPM*) and call it *Ouro Verde*, that means green gold in Portuguese.

The evaluation of the deposit presented here, was based upon a study of the veins in surface and subsurface. In a first step, the gold mineralization was evaluated through studies of the former mining works, which used wooden pits (shafts) on the veins of quartz and open pit works.

The second phase of the research involved a more thorough investigation of the area. The fieldwork identified a high occurrence of quartz veins and eight of them were targeted for more detailed studies. Looking to measure them both in surface and subsurface, were made lines of research, geological mapping, trenches, galleries and pits (*Figures 1 and 2*), all supported by a topographic survey.

During the work, some targets were selected to collect samples. These samples were sent for chemical analysis, aiming to obtain the grade table.

The local geology is described by mineralized quartz veins that are embedded in basic rocks of the Proterozoic age, classified as microgabbros and diorites. These rocks normally have gray to black color, fine particle size and a massif aspect.



*Figure 1: trench opened to study the behavior of the mineralized vein*



*Figure 2: the beginning of a shaft*

## 2. Location and Access

The municipality of *Itaituba* is located in the southwest portion of *Pará*, known as "Physiographic Zone of the *Tapajós* River". It is limited to the north with the municipality of *Aveiro*, to the south with the municipalities of *Novo Progresso* and *Jacareacanga*, to the east with the municipalities of *Altamira*, *Ruopólis* and *Trairão*, and on the west with the state of *Amazonas*. Its higher elevation reaches 490 m, while the lowest is near 21 m. The city of *Itaituba* is situated on the right bank of the *Tapajós* River, far from *Belém* about 890 km in a straight line.

The area of interest and object of this study is a gold mine called *Ouro Verde* that is located less than 300 km from *Itaituba*. Access to the area can be performed using the river, air or a mixed route.

The river access starts in the city of *Itaituba*, navigate through *Tapajós* River about 200 km until arriving at a small harbor. Using aluminum boats with 40HP outboard this route is done in 6 hours. Using ferries that make the transport of goods, this same course lasts for 36 hours. From this port, navigate near 30 Km through a small affluent to the confluence with another affluent. From there, navigate approximately 15 km to the center of the area where is developed the mining activities of *Ouro Verde*. Because of their size, these two affluent receive exclusive aluminum boats with 40HP outboard, and are spend approximately 2 hours through them (*Figure 3*).

The second way to enter the area is using a mixed route. This route starts in the city of *Itaituba*, followed by a 200 km car drive along the highway BR-230 (*Transamazônica*) on the left bank of the *Tapajós* River (about 10 hours ride). The journey continuous with aluminum boats with 40HP outboard for approximately 50 km to the interior area, spending up to do so, additional 2 hours and 30 minutes. Given the current trafficability condition of BR-230, is high recommended for this type of access, the use of pick-ups with four-wheel drive and only during the dry season (summer).

Air access is performed from *Itaituba* to the airstrip of the mine. It can be done by single-engine and twin-engine planes, lasting approximately 1 hour flight. The airstrip has 1000 meters long by 20 meters wide.

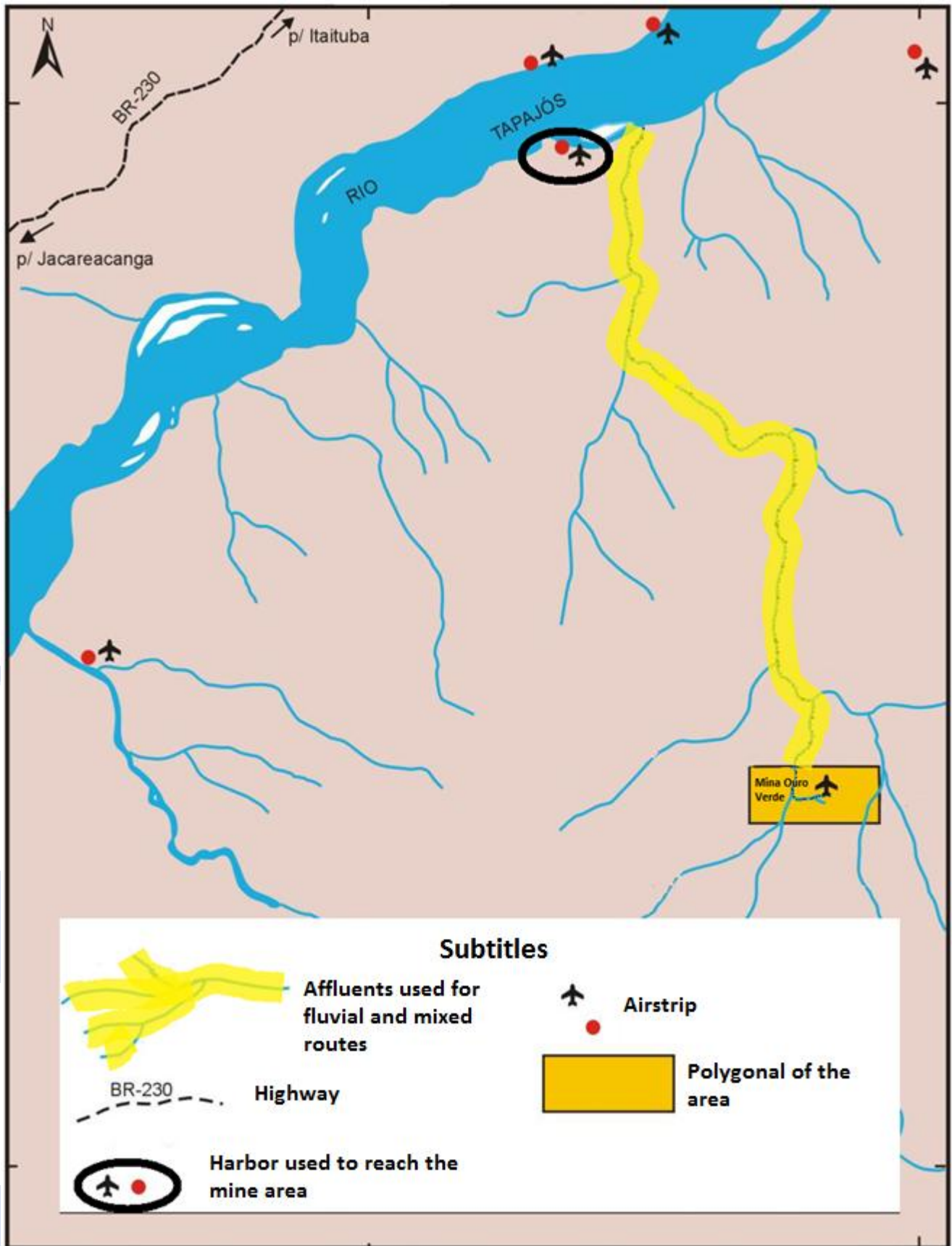


Figure 3: Map showing the tributary rivers used to access the area

## 3. Local Geology

The geology of the area is described by quartz veins with sulfide associated with gold. These veins are embedded in basic rocks of Proterozoic age designated Gabbro Ingarana (PERSON et al, 1977).

These rocks have gray to black color, have fine grains size, massif aspect and are mineralogically composed of pyroxene and hornblende, biotite, phlogopite, plagioclase, K-feldspar and quartz. As accessories are featured pyrite, chalcopyrite, pyrrhotite, specularite, titanite, iron oxide. These characters indicate a classification ranging from microgabbro to diorite and occur in approximately 80% of the required area (north, south and southwest), where can be found a weathered mantle varying from 10 m to 16 m.

Rocks belonging to the *Suíte Maloquinha* were mapped using photo interpretation and occur in the northwest and southeast portions of the area required. These rocks are granitoids that resulted from an intense plutonic-volcanism that acted in the region during the Middle Proterozoic.

Covering these rocks, there are some alluviums located along watercourses, with intercalations and interdigitations of unconsolidated sandy and clayey sediments, which usually in the area, covers a gravel, that normally have mineralized gold. In the river inside the area, this profile has an average thickness of 4 meters, being 2.5 m of sterile capping and 1.5 m gravel. The gold content / m<sup>3</sup> diluted for the profile is of the order of 0.7 g.

The structural features, where can be found the systems of main and secondary veins, indicate the presence of ductile and brittle-ductile shear bands, marked by centimetric mylonitic zones, with general guidance NE and NW. The secondary bands are oblique and convergent to the primary system. Opened sigmoidal arrangements characterize the transcurrent regime installed.

The primary gold mineralization that occurs inside the area is closely related to large tectonic lineaments with development of sinistral transcurrent faults and shear zones that have led to the rise of the gold and sulfide solutions. The mineralized veins are mainly oriented N45°E with variations up to N90° and secondarily to NW, and they seem to be the system of extensional fractures. The shafts have thicknesses ranging from 0.15 m to 1.06 m, with dips typically ranging from 50° to 78°. The mineral paragenesis usually found is: gold, quartz, sulfide (pyrite and chalcopyrite), specularite and iron oxide.

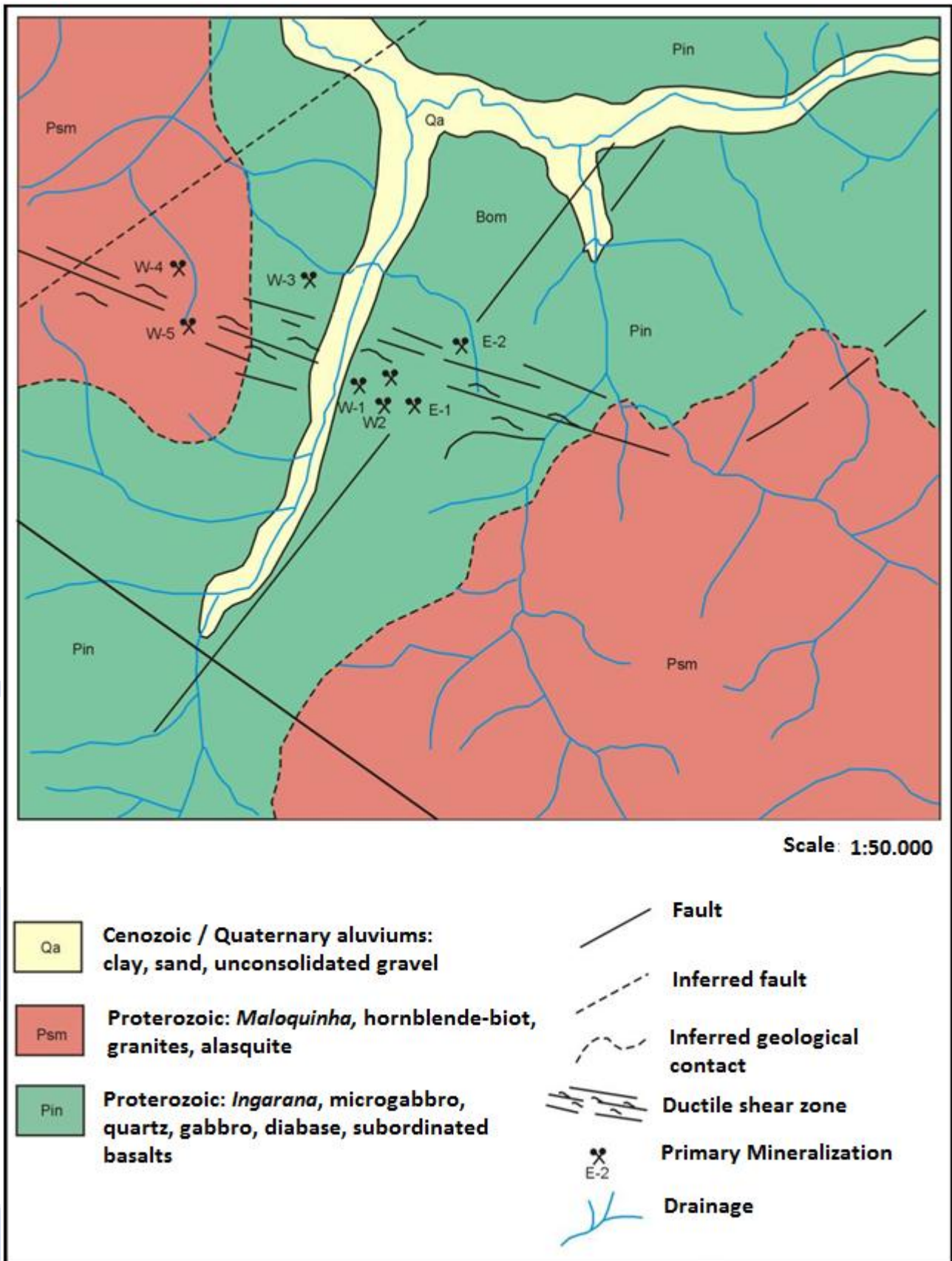


Figure 4: regional geological map



## 4. Ore Bodies

In the area, we have proven the existence of eight mineralized veins with gold associated with sulfides. They were named as: Main Body, Body E-1, Body E-2, Body W-1, Body W-2, Body W-3, Body W-4 and Body W-5.

In four of these veins were performed mining work (Main Body, the Body E-1, Body E-2 and Body W-1). In other known bodies, the level of work done has been limited to sampling of veins and superficial studies.



*Figure 5: Body E-1 during exploitation work*



*Figure 6: Body W-1, extensional veins oblique to the Main Body*



*Figure 7: Body E-2, tabular body outcropping with 0.50 m thick, consisting of mineralized quartz vein with gold associated with sulfide*

## Main Body

The Main Body is a tabular body with some almond shape intervals due to efforts of tension. It consists of a quartz vein with general direction of E-W varying from N 250° to N 275° and dips ranging from 48 ° to 80 ° SE, varying sometimes to SE and sometimes to SW lying embedded in Proterozoic and intrusive gabbroic rocks.

This shaft is already mapped along its "trend" for a distance of 900m with the opening of eight Shafts located all over the body and a proven depth of 50 m.

The shaft is mainly composed by quartz, whitish to light gray color, have micro fractures and sulfide (pyrite and chalcopyrite). Pyrite generally generates irregular form masses or small massive shafts to 4 cm thick. The gold occurs like small millimetric fillets filling the micro fractures, forming irregular masses included in the massif quartz, as occurs in the internal structure of the crystals of sulfides.

Average grades for this body were obtained by calculating the weight of gold recovered in several samples from the hammer mill attached with amalgamated copper plates and they have values near 134.23 g / t for lode and 36.05 g / t diluted to the volume of the gallery. A sampling carried out only in the vein, treated in a ball mill and opened to 160 "mesh" indicated a grade of 200 g / t, whereas analysis by atomic absorption indicated for Lode 161.71 ppm.

## Body E-1

The Body E-1 is also a tabular body with almond shape intervals, constituted of a quartz vein in the general direction N80 ° and dip varying from 50 ° to 65 ° SE.

This vein was mapped for a distance of 160m between the "shafts" n°1 and n°3 where it was mined. In the "shaft" n° 2 was opened a gallery just 14m east of this body and was observed an average width of 0.30 m, and rocks embedded in Proterozoic age gabbroic rocks.

The shaft is whitish to light gray, micro fractured, have sulfide (pyrite and chalcopyrite), specularite, iron oxide, manganese and molibdenite. It wasn't observed visible gold, believing the same to be present in the internal structure of sulfides.

The average grades of gold obtained for this body was calculated from rocks processed in a hammer mill and recovered with copper plate and they are 72.17 g / t for lode and 18.04 g / t diluted to the volume of the gallery, considering a section of 1.2 m wide, 2m high and 2m.

## Body E-2

It is also a tabular body consists of a quartz vein with general direction of N45° and dip ranging from 52° to 72° SE that is embedded in gabbroic and dioritic intrusive rocks from Proterozoic age.

Only one "shaft" was opened on the body with a depth of 27m where a gallery was built on the lode. On surface were opened two trenches, one in NE direction and another in SW, blocking this vein by a distance of 306m.

The quartz vein is milky, have an average width of 0.30 m, a micro fractured paragenesis given by sulfides (pyrite and chalcopyrite), specularite, molibdenite, iron oxide and gold. The sulfides present in isolated crystals forming irregular masses or small massif veins up to 0.10 m wide. Sulfides when altered, give an aspect of cavernous structure "boxwork" to the vein, with the presence of oxides and hydroxides of iron and manganese.

Average grades obtained for this body were 136.28 g / t for lode and 34.07 g / t diluted to the volume of the gallery, considering a section of 1.2 m wide, 2m high and 2m long. Analyses conducted by "Fire Assay" / Atomic Absorption indicated 148 ppm gold.

## **Body W-1**

Located and defined by surface stripping of the saprolite during mining work in the open pit, the Body W-1 discovered south of the Main Body to which converges, represents a system of three extensional quartz veins which join each other before converge towards the vein of the Main Body forming an angle of 20°. Locally have azimuthal directions N80°, N95° and N100° with vertical to subvertical dips to SE and SW.

The body is tabular, composed by milky quartz veins, hyaline, sulfited and gold mineralization. the average thickness of each vein is 0.10 m with the exception of places where they become almond shaped, and its extent is known of 50m. In subsurface, it is already known to occur up to 25m (gallery of level 25, built from the No. 2 shaft, which is now disabled).

An average grade obtained for the lode is 134.8 g / t and this value was obtained from the processing of the samples in 1.92 t H-2 mills, recovering 259 grams of gold, and the thinnest grain size observed was approximately 40 "mesh."

## **Body W-2**

It is located 380m south of the Main Body. Currently is being built on this body a "shaft" for research and extraction which is 15.5 m deep.

Discovered from artisanal mining, this body has a width of approximately 0.30 m, the azimuthal direction of N 70 ° and a 45 ° SE dip.

There is no data in this body depth. Ancient manual extraction works (open pit) on this vein gave some fragments of rocks that were processed in a hammer mill H-2, indicating grades exceeding 140 g / t. In this work was considered a grade of 40 g / t diluted to the section of a gallery built on the lode.

## Body W-3

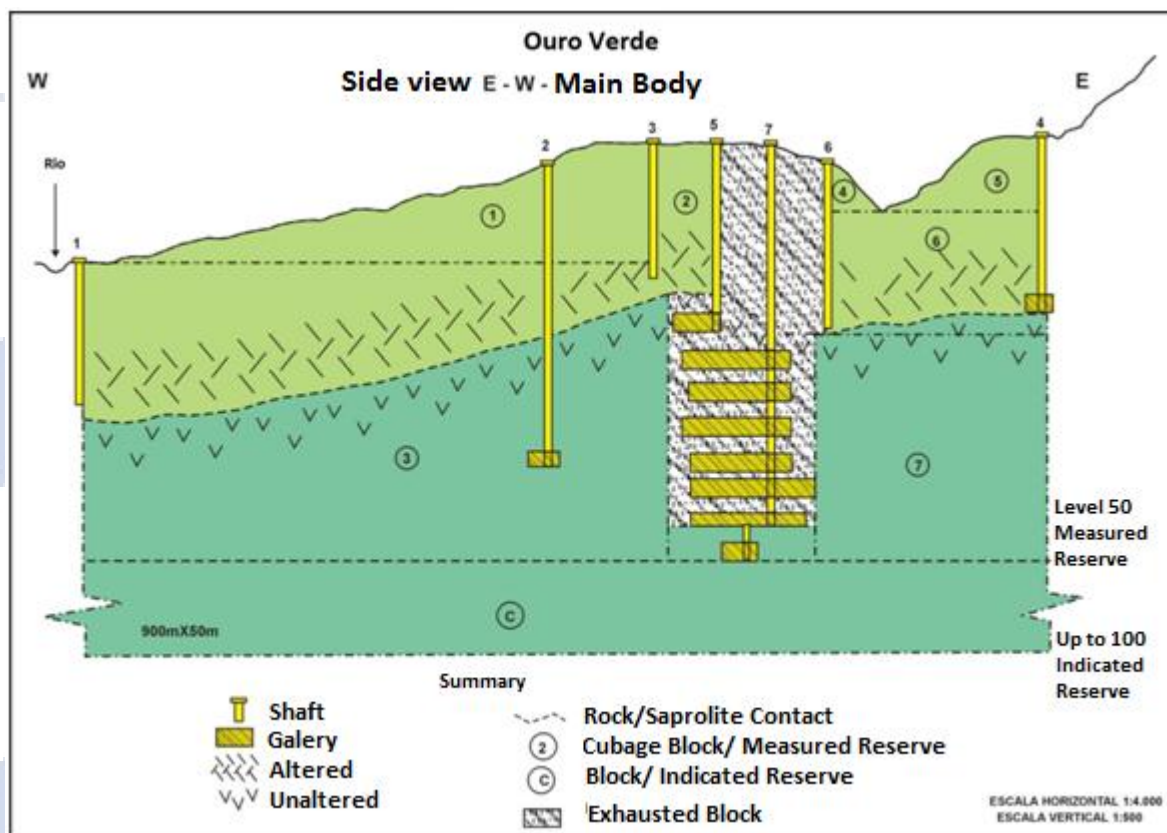
It was discovered from artisanal mining and is located 400m to NW from the Main Body. None underground mining work was performed in this body, and it has an overall direction 58°N, sub vertical dip and a width of 0.33 m. Values of grades obtained for this body were taken from the processing of lode fragments on mills H-2, indicating 20.0 g / t dilute to volume of the gallery.

## Body W-4

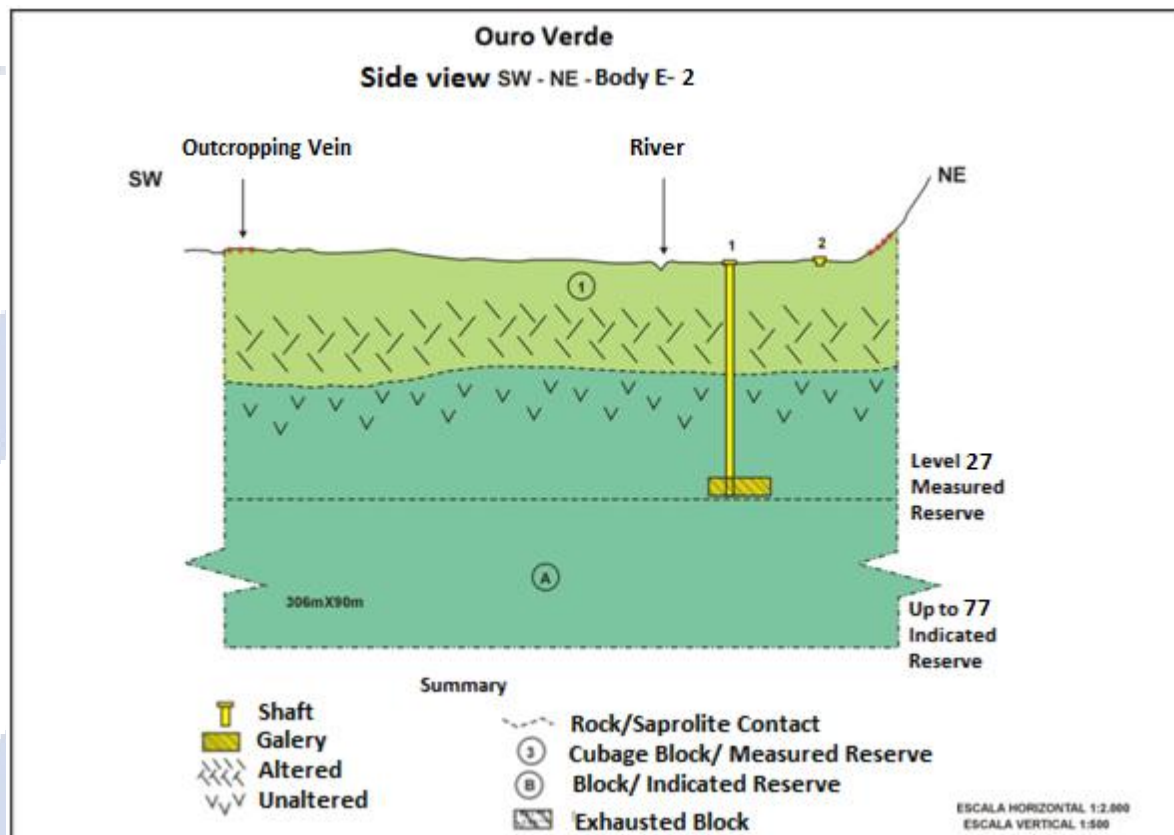
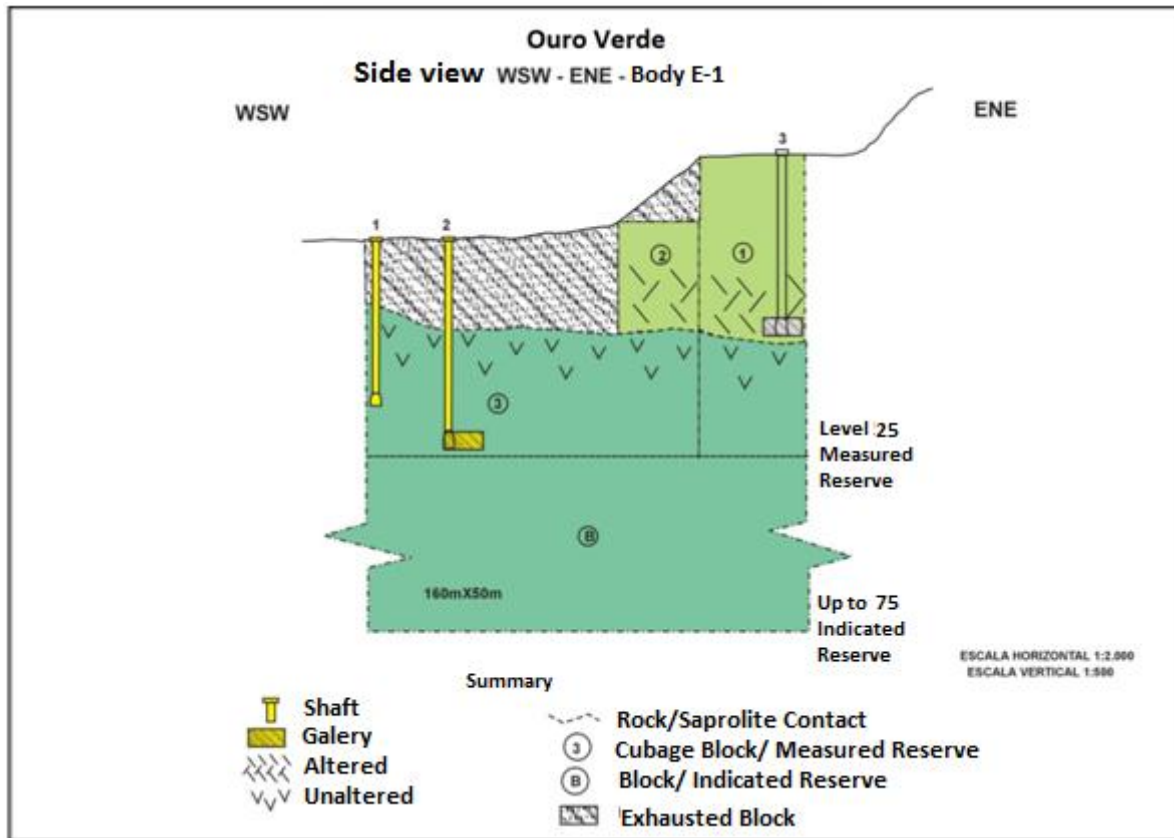
It is a tabular body with direction N 325 °, vertical dip and width of 0.40 m. This body is located 1,400m to NW from Body W-3. Samples made with quartz vein material treated in mills H-2, with recovery of gold on copper plates indicate levels of 20.0 g / t diluted to volume in a gallery.

## Body W-5

It is a tabular body with direction N 112°, vertical dip and width of 0.30 m. It was also discovered from artisanal mining in the alluvium river. It is located 500m to SW from Body W-4. Locally outcrops for approximately 100m. Samples obtained from the vein and processed with hammer mill H-2, indicated a grade of 20.0 g / t diluted to volume into a gallery.



Figures 8: side view of the Main Body



Figures 9 and 10: side view of Body E-1 and Body E-2

## 5. Studies of the Reserve

### Partial Reserve of the Main Bodies

The volume of work performed allows us to say that the gold deposits of the area of *Ouro Verde* consist a poly metallic mineralization where the primary paragenesis is: gold, silver, and molybdenum sulfides, mainly pyrite and chalcopyrite occurring yet oxides and hydroxides of iron and manganese in the form of films percolating fractures and micro fractures came as both the host rock.

The most significant mineralization whose grades range from 72.17g / t to 161.71 g / t, is contained in the quartz vein with tabular format, almond shaped in some places, whereas the host rock near the vein (0.30 m) in each side, has a mineralization with grades about 9.6 g/ t gold.

To calculate the volume was considered: The body width is the same of the gallery (1.2 m), the length of the body is only known on surface (trenches) or subsurface (delimited by wells), and height were determined by the lowest level of the gallery existing on the vein.

Certain values of grades used in the calculations were obtained from analyzes "Fire Assay" / absorption, but most of them were obtained from processing of samples in hammer mills and recovering them with amalgamated copper plates.

The value of the specific weight of the material for both the shaft and the host rock used to calculate reservation was 2.6 (specific weight of quartz).

As boundaries for the assessment of reserves in each vein, we used the following parameters.

For Measured Reserve: the block was bounded by the ground surface and the elevation of the last gallery built in depth and buoyed by side by "shafts" (pit) opened on lode. In bodies with ancient mining works, the larger block was internally divided into smaller blocks to exclude areas already mined. To calculate the measured reserve, we considered only the values of the Main Body, Body E-1, Body E-2 and Body W-1. Bodies values of Body W-2, Body W-3, Body W-4 and Body W-5, entered as indicated reserve. These data can be displayed in Tables 1, 2, 3 and 4.

**Table 1**  
**Main Body - Measured Reserve**

Blocks	Volume (m³)	Specific Gravity	Weight of the Ore (t)	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
1	3888	2,6	10.108,8	36,05	0,364	11717,8
2	1320	2,6	3432,0	36,05	0,123	3978,3
3	23.016	2,6	59841,6	36,05	2,157	69.366,2
4	960	2,6	2496,0	36,05	0,089	2893,3
5	4320	2,6	11232,0	36,05	0,404	13.019,7
6	3360	2,6	8736,0	36,05	0,314	10.126,5
7	6864	2,6	17846,4	36,05	0,643	20.686,9
<b>TOTAL</b>	<b>43.738</b>		<b>113.692,8</b>		<b>4,094</b>	<b>131.788,7</b>

**Table 2**  
**Body E-2 - Measured Reserve**

Blocks	Volume (m³)	Specific Gravity	Weight of the Ore (t)	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
1	9914,4	2,6	25.777,4	34,07	0,878	28.239,1
<b>TOTAL</b>	<b>9914,4</b>		<b>25.777,4</b>		<b>0,878</b>	<b>28.239,1</b>

**Table 3**  
**Body E-1 - Measured Reserve**

Blocks	Volume (m³)	Specific Gravity	Weight of the Ore (t)	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
1	2100,0	2,6	5460,0	18,04	0,098	3.151,1
2	1344,0	2,6	3494,4	18,04	0,063	2.025,7
3	2160,0	2,6	5616,0	18,04	0,101	3.247,5
<b>TOTAL</b>	<b>5604,0</b>		<b>14.570,4</b>		<b>0,262</b>	<b>8.424,3</b>

**Table 4**  
**Body W-1 - Measured Reserve**

Blocks	Volume (m <sup>3</sup> )	Specific Gravity	Weight of the Ore (t)	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
1	1.500	2,6	3.900	20,75	0,080	2.602,0
<b>TOTAL</b>	<b>1.500</b>		<b>3.900</b>	<b>20,75</b>	<b>0,080</b>	<b>2.602,0</b>

For Indicated Reserve: The block was bounded by the dimension of the last gallery in depth and 50m below this gallery and buoyed on the sides by the extensions of the "shafts" in the subsurface.

In the case of the bodies W-2, W-3, W-4 and W-5, which there is not any processed any mining work, they were all considered part of the indicated reserve, calculating the volume of each body from inscription on them in a regular geometric figure with only 100m long, 50m depth (elevation level 50) and taking as average width for a gallery, the value of 1.2 m. The average grade except for the body W-2, which is 40 g / t was 20.00 g / t (W-3, W-4 and W-5), value obtained from samples processed in hammer mill with gold recovery in amalgamated copper plates. For these bodies studies were made in a superficial form aiming to discover the occurrence of bodies, veins/enclosing relationship, direction of the "trend" and positioning and lateral extent. The results are summarized in Table 5.

**Table 5**  
**Indicated Reserve - W-2 W-3 W-4 W-5**

Body Name	Volume (m <sup>3</sup> )	Specific Gravity	Weight of the Ore (t)	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
<b>Main</b>	54.000	2,6	140.400	36,05	5,061	162.746,6
<b>E-1</b>	9.600	2,6	24.960	18,04	0,450	14.478,4
<b>E-2</b>	18.360	2,6	47.736	34,07	1,626	52.294,7
<b>W-1</b>	3.000	2,6	7.800	20,75	0,161	5.204,1
<b>W-2</b>	6.000	2,6	15.600	40,00	0,624	24.064,3
<b>W-3</b>	18.000	2,6	46.800	20,00	0,936	30.096,4
<b>W-4</b>	6.000	2,6	15.600	20,00	0,312	10.032,1
<b>W-5</b>	6.000	2,6	15.600	20,00	0,312	10.032,1
<b>TOTAL</b>	<b>120.960</b>		<b>314.496</b>		<b>9,482</b>	<b>308.948,7</b>



Thus, with the current level of knowledge of these bodies in both surface and subsurface, the gold reserve for the studied area is 14.796 tons.

- Measured Reserve = 5.314 tons of gold
- Indicated Reserve = 9.482 tons of gold

Knowing that the gold of the region near *Ouro Verde* is ionically associated with other metallic minerals such as silver (20%), palladium, platinum and copper (considered impurities and representing 30% of total weight), its raw weight decreases by 30%, which leads to new values of reserves, calculated as follows:

- Measured Reserve x 70% (30% less impurities) = gold mil (thin)
- Indicated Reserve x 70% (30% less impurities) = gold mil (thin)

So, the Measured Reserve is:  $5,314 \times 70\% = 3.719$  t of gold mil (thin) and the Indicated Reserve will be:  $9,482 \times 70\% = 6.637$  t of gold mil (thin)

Being the total reserve of raw primary gold the sum of the two reserves (Measured + Indicated), thus we have:  $3.719 + 6.637 = 10.356$  t of gold mil, corresponding to 333,003.2 Oz refined.

## Reserve Contained in Tailings

With the development of mining activities at the mine since 1997, have been produced until today, 13,637.3 t of tailings from the ore treatment and 5,875.9 t of tailings from the dismantling of the host rocks of the veins. About this material which is now silted riverbed, was made a grid square to help collect samples and determine their volume.

Analyzes made by "Fire Assay" of these materials indicated the content of the order of:

- For the coarse tailings, particle size which varies from 30 to 45 mesh, the three analyzes obtained values of 44 g / t, 44.4 g / t and 22.8 g / t each.
- For the fine tailings upstream, having particle sizes ranging from 45 to 60 mesh, three analyzes were also performed where the grade values obtained are 28 g / t, 28.5g / t and 17.5g / t.
- For the fine tailings downstream, having particle sizes ranging from 45 to 60 mesh, only one analysis was performed and found a grade of 12.2 g / t.

- For the tailing called "Casqueiro" (host rock of the vein), was also carried out an analysis and the result was 9.6 g / t.

The tailings are stored in open air and considering the average values of the grades, there is a reserve of 0.327 t of gold. Considering the minimum values of the grades still have a reserve of 0.267 t of gold.



*Figure 11: stock of tailings coming from the ore treatment process, consisting primary mineralized material*

For immediate treatment of this material is being mounted beside the piles of tailings, a plant that combines gravimetric and chemical process involving: jaw crusher, industrial mills, ourocone, conveyor belt, ball mills, table concentrators, amalgamators, complete laboratory for analysis, containers to deposit materials, containers for tailings and pachucas.

**Table 6**  
**Gold Reserve in the Tailing – Medium Values of Grade**

Material	Weight	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
Coarse Tailing (Piles)	1.629,8	37,1	0,060	1.944,23
Fine Tailing (Upstream)	5.203,5	24,7	0,128	4.132,68
Fine Tailing (Downstream)	6.804,0	12,2	0,083	2.669,09
Casqueiro (Host Rock)	5.875,9	9,6	0,056	1.813,78
<b>TOTAL</b>	<b>19.513,2</b>		<b>0,327</b>	<b>10.559,78</b>

**Table 7**  
**Gold Reserve in the Tailing – Minimum Values of Grade**

Material	Weight	Grade Au (g/t)	Contained Gold (t)	Contained Gold (Oz)
Coarse Tailing (Piles)	1.629,8	22,8	0,037	1.194,83
Fine Tailing (Upstream)	5.203,5	17,5	0,091	2.928,01
Fine Tailing (Downstream)	6.804,0	12,2	0,083	2.669,09
Casqueiro (Host Rock)	5.875,9	9,6	0,056	1.813,78
<b>TOTAL</b>	<b>19.513,2</b>		<b>0,267</b>	<b>8.605,71</b>

## Alluvial Reserve

Until now, the obtained data do not allow us to make an accurate evaluation of the potential of secondary mineralization. That's because there is a lack of a drilling program over the 9200 meters of drainage, obtained from conventional aerial photographs (OBRA-257 / PROSPEC) with scale 1:73.000. The alluvium "Flats" range from 40m to 200m wide with a depth of 4m, which lead to values near of 3,000,000 m<sup>3</sup> of silt.

Some grades along the drainages were obtained from artisanal mining. These values are near 0.7 g of gold / m<sup>3</sup>, representing minimum values for the region. Samples of the same sites yielded variations from 0.7 to 1.87 g of gold / m<sup>3</sup>.

Thus, we can assume a reserve with potential for 2 t gold in alluvial area.



*Figure 12: Level of characteristic gravel with 1.5 m thick, capped by layers of sand and clay. The diluted gold content of the silt is 0.7 g / m<sup>3</sup>*

## Total Reserve

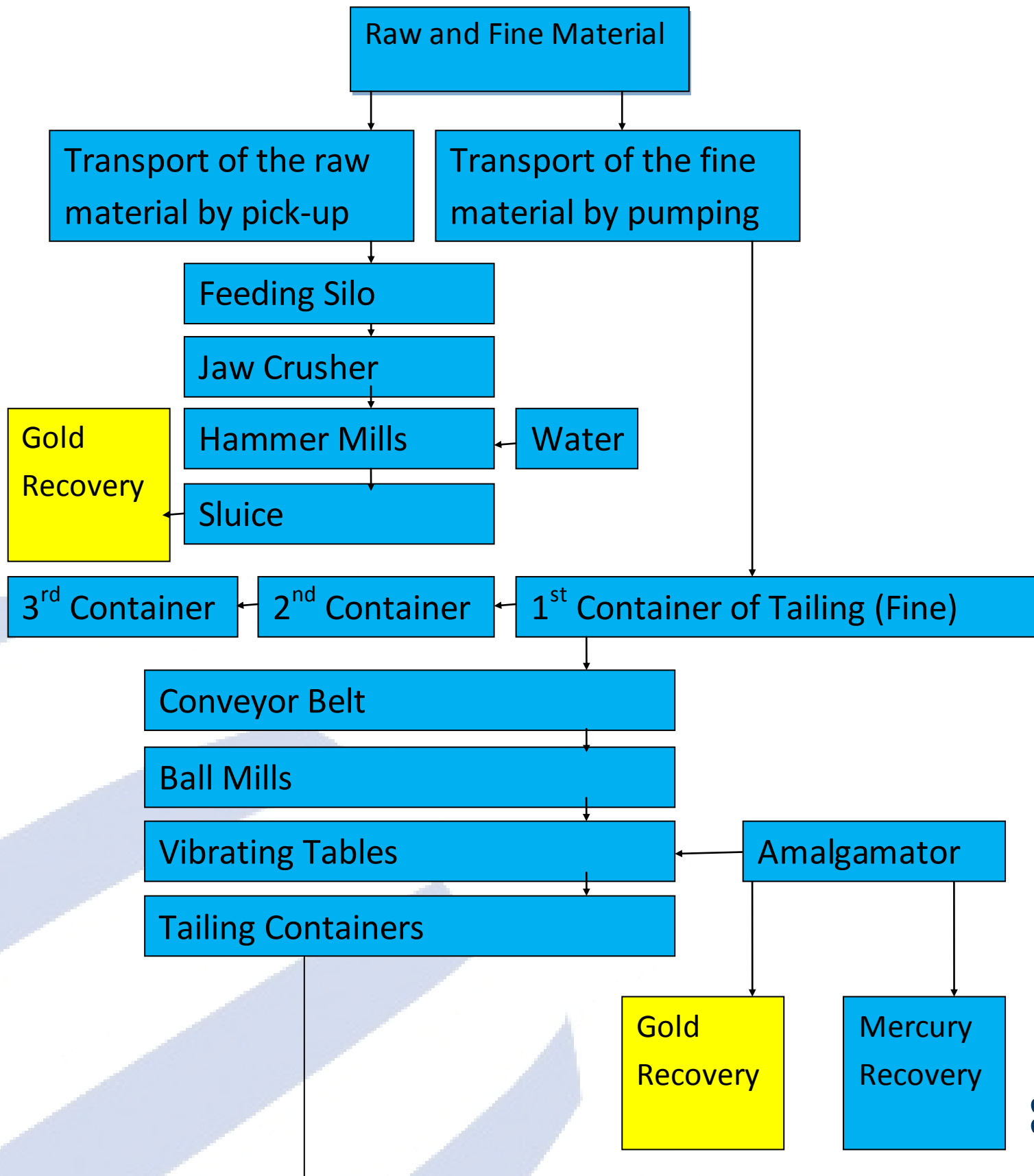
Processing the values found for the gold reserves in primary and secondary deposits, as well as piles of tailings, we can say that with the current level of knowledge of the mineralized bodies in the area, this presents a partial reserve of raw gold of around 15.063 tons. These data can be viewed at Table 8.

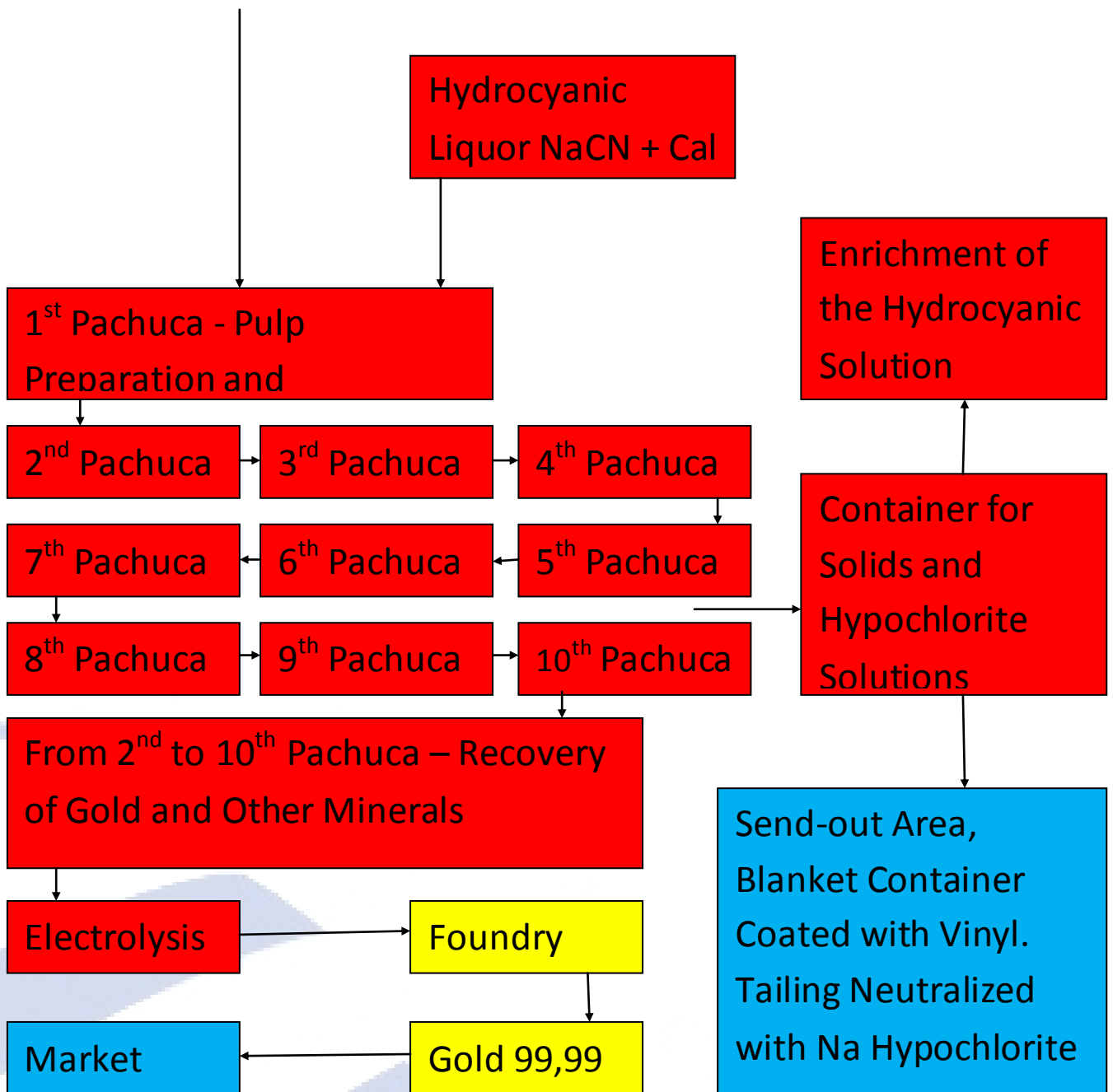
**Table - 8**  
**Total Reserve – Ouro Verde**

Type of Material		Volume (m <sup>3</sup> )	Weight (t)	Average Grade (Weighted)	Contained Gold (t)
Primary	R. Measured		157.940,6	33,6	5,314
	R. Indicated		314.496,0	30,1	9,482
Tailing			19.513,2	13,6	0,267
Alluvial		2.880.000		*	*
<b>TOTAL</b>		<b>2.880.000</b>	<b>491.949,8</b>		<b>15,063</b>

\* Not sufficient data to measure

## 6. Ore Treatment







*Figure 13: industrial mill placed in series with "Sluice" and Ourocone*



*Figure 14: pool of solids settling*





*Figure 15: Front view of the industrial mill powered by Perkins*



*Figure 16: ball mill powered by 40 hp electric motor*



*Figure 17: front view of the ball mill and vibrating table*



*Figure 18: overview of the vibrating table concentrator*



Figure 19: ourocone placed in series with industrial mill



Figure 20: power generation units, motors 6c MWM coupled to generators 100 and 60 Kwa



*Figure 21: diesel oil container - 10,000l with electric pump*

## 7. Perspectives

Keeping the expectations to produce around 1123.2 t / month of raw gold (24m<sup>3</sup> / day) and considering the total weight of mineable ore near 472,436.2t (calculating for the eight bodies currently known), the deposit will have a useful life of 35.0 years.

If the company develops the work with its own resources it is planned a beneficiation of 1,500 t / month of tailings with average weighted grade of 13.6 g / t and the development of two fronts of galleries in a pit with a monthly production of 1,123,2t of mineralized material with an average weighted grade of 33.6 g / t. The processing of this material can produce 58.1 kg / month of gold and considering a price of \$ 21.00 / g, the total income would be R \$ 1,220,100.00.

If the Company receives help from external resources of around R \$ 5,000,000.00, there is a foreseen beneficiation of 2,400 t / month of tailings with average weighted grade of 13.6 g / t, and the development of twelve galleries on three fronts pits with a monthly production of 6739.2 tons of primary mineralized material at an average weighted grade of 33.6 g / t. The beneficiation of this material can produce 259.07 kg / month of gold that considering a price of \$ 21.00 / g would provide an income of R \$ 5,440,470.00.

Therefore, considering the second hypothesis, the company can increase its production capacity with the purchase of some equipment such as: three screw compressors brand SCHULZ mod. SRP 2075-E, each unit having capacity of 340 cfm effective flow with a pressure of 116 lb. / Inch, 450 Kwa Generator Sets, mechanical shovel, dump buckets, outboard motors, power transmission lines, winches, analytical scales, drills and various inputs.

It is not yet provided by the company to develop an alluvium mining.

## 8. Infrastructure and Equipments

Currently the mine has the support of a whole camp made with hardwood containing canteen with deposit for supplies and parts, coupled with housing, suite and bathroom, dining room for 30 people, community and individual accommodation for employees, workshop, fuel station with two containers with a capacity of 5,000 l each, electric pump supply, generator with power distribution for 24 hours and an artesian well. The camp is located on the right bank of the *Tapajós River*, less than 50 km from the mine.

There are 10,000 meters of compacted earth road linking the camp to all mining activity and ports.

There is a landing runway in the mine area with 1000m long by 20m wide which allows the landing and takeoff of single-engines and twin-engines aircraft.

As infrastructure to support the mining operations and processing, the company built two bunkers in Masonry, being one to deposit explosives (dynamite - 25t) and the other to deposit accessories.



Figure 22: camp to support the mining operations and processing



Figure 23: airstrip within the mine area with 1000 m X 20 m

The following equipments are part of the company's patrimony:

- 1 Skyline Plane
- 2 Aluminum Boats with Capacity of 2,000 kg Each.
- 1 Jaw Crusher Furlan
- 2 Electronic Scales for 3 kg (Gold)
- 2 Stands for Conveyor Belt
- 1 Concrete Mixer
- 30 Iron Bars with 1.80m
- 5 Expansion Drills of 3.5 "
- 4 Polypropylene Vacuum Pumps
- 2 Grease Pumps of 10kg

- 1 Vacuum Pump Fabbe
- 1 Electric Pump for Refueling.
- 3 Water Pumps Famac 4cv
- 2 Water Pumps Kollbach
- 1 Water Pump Merck
- 2 Compressor Wayne 5 heads
- 2 Concentrators Maknelson
- 2 Compressors Wayne 10 heads
- 2 Electronic Hydrometers
- 4 Spirals double AKW
- 3 Furnaces for Melting
- 4 Winches for Shafts
- 1 Generator Group of 100 Kwa with a Turbocharged Engine MWM 6c
- 2 Generator Groups of 60 Kwa with an engine MWM 6c
- 3 Generator Groups of 30 Kwa with an engine MWM 3c
- Complete laboratory Instruments Set
- Full Set of Tools (light and heavy)
- 2 Sander Bosch
- 2 Outboard Engine Johnson 40hp
- 3 Hammers HR-656
- 3 Hammers HR-658 with Column
- 1 Hammer BBC-17 with Column
- 1 Hammer Stoper - 464
- 400 Meters of Steel Cable
- 4 Hammer Mills H-2 1



- 1 Continuous 4X4 Ball Mill
- 1 Closed Ball Mill
- 1 Ball Mill Denver 2X2
- 2 Hammer Mills Furlan
- 2 Hammer Mills Universal II
- 1 Roll Mill Furlan
- 1 English Vibratory Table
- 2 Vibratory Table Mineralmaq
- 4 Engines Yanmar-18
- 2 Motors Agrale M-93
- 2 Motors Agrale M-790
- 3 Engine MWM 3c.
- 2 Welding Machines
- 1 Machine to Vulcanize Chambers.
- 4 Electric Motors of 30 hp
- 8 Electric Motors 15 hp
- 6 Electric Motors of 7.5 hp
- 2 Electric Motors 10cv Weg
- 1 Electric Motor 12.5 hp Weg
- 1 Chain saw Husquarna
- 4 Chain saw stil
- 1 Ourocone Fabrimaq M20
- 2 Vibrating Screen Furlan 2 Decks
- 8 Pachuca with a Volume of 8,000 l.
- 1 Pick-up for cargo

# Ouro Verde

- 1 Mercury Precipitator with shower
- 1 vibratory sieving Produtest
- 1 Vibrating Sieve Maviuhde mod. 950
- 1 Bunker for Explosives
- 1 Bunker for Chemicals
- 4 Transceivers Radios Yaesu / Cobra
- 1 Tractor D-6D.
- 80 Plastic Barrels of 50lt
- 1 Tank Vacuum
- 2 Containers for fuel 5.000lt
- 1 Bench Lathe
- 1 Transformer 75 Kwa

## 9. Conclusion

Considering that the calculation already done for the reserve (primary material) is 14,796 t gold, and this was determined within only 30% of the total required area, is reasonable to expect that with the continuing of the technical research which now takes place in the rest of the required area, this value can be drastically increased.

Of the total of 15.063 t gold which represents the sum of reserve for primary material (14.796 t) and the reserve contained in tailings (0.267 t), is reasonable to expected that the steps that are scheduled for beneficiation of the ore, which involve together gravimetric and chemical processes, has a recovery of about 13.556 t corresponding to 95% of the total amount.

All grades determined for the tailing were obtained in laboratory by "Fire Assay". Taking apart some primary bodies, the other calculated grades were obtained from samples processed in a hammer mill and recovered with amalgamated copper plates.

The lower level which borders the base of the package considered as indicated reserve was only 50 meters below the level of the last gallery of mining. It was done because there is no borehole made in the area. Structural parameters visible in pictures taken by radars and satellites delineate the continuity of these structures for more than 25 km and entail that its continuation at depth extends for hundreds of meters.

The geophysical map made during the CPRM projects in the region of *Tapajós* covers the area of *Ouro Verde* correlates the appearance of large lineaments with movements that cut deeply into the crust.