MICON INTERNATIONAL LIMITED | mineral industry consultants

# CERRADO GOLD INC.

# A MINERAL RESOURCE ESTIMATE FOR THE SERRA ALTA DEPOSIT AT THE MONTE DO CARMO PROJECT, TOCANTINS STATE, BRAZIL

**Report Date: April 3, 2019**
**Report Effective Date: December 5, 2018**
**Mineral Resource Effective Date: December 5, 2018**



Source: Cerrado, 2018

**Report By**

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# 1.0 SUMMARY

Micon International Limited (Micon) was retained by Cerrado Gold Inc. (Cerrado) to visit (Feb. 26 to March 2, 2018 and again Sept. 4 to 8, 2018) the Monte do Carmo gold project in Tocantins State, Brazil and to comment on the prospectivity of the project. After the site visit, Cerrado decided to commission a National Instrument 43-101 (NI 43-101) Technical Report describing the history and work completed to date and recommending an exploration program and budget to support the listing of Cerrado on a Canadian stock exchange, as well as a financing. Later, in cooperation with Cerrado technical staff, Micon estimated an initial mineral resource compliant with National Instrument 43-101 (NI 43-101) for the project. This amended report discloses that mineral resource.

Micon does not have, nor has it previously had, any material interest in Cerrado or related entities or interests. The relationship with Cerrado is solely a professional association between client and independent consultant. This report was prepared in return for fees based upon agreed commercial rates and the payment of these fees was in no way contingent on the results of the report.

This report includes technical information which requires subsequent calculations or estimates to derive sub-totals, totals and weighted averages. Such calculations or estimations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the Qualified Person (QP) does not consider them to be material.

This report is intended to be used by Cerrado, subject to the terms and conditions of its agreement with Micon. That agreement permits Cerrado to file this report as a National Instrument 43-101 Technical Report with the Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities laws and for the reliance on the report by the TSX or TSXV, any other use of this report, by any third party, is at that party's sole risk.

The conclusions and recommendations in this report reflect the author's best judgment in light of the information available at the time of writing. The author and Micon reserve the right, but will not be obliged, to revise this report and conclusions if additional information becomes known to them subsequent to the date of this report. Use of this report acknowledges acceptance of the foregoing conditions.



## 1.1 THE PROPERTY

The Monte do Carmo Gold Project is located in the State of Tocantins, Brazil, immediately east of the town of Monte do Carmo. The Serra Alta Deposit, the main focus of exploration at the project, is located at 10° 45' 4" south latitude and 48° 4' 20." west longitude. Monte do Carmo (7,700 inhabitants) is located 39 km east of the city of Porto Nacional (55,000 inhabitants). Porto Nacional is 50 km (60 km by road) south of the state capital of Palmas (250,000 inhabitants) and 760 km north of Brasilia, the federal capital. (Figure 1.1)

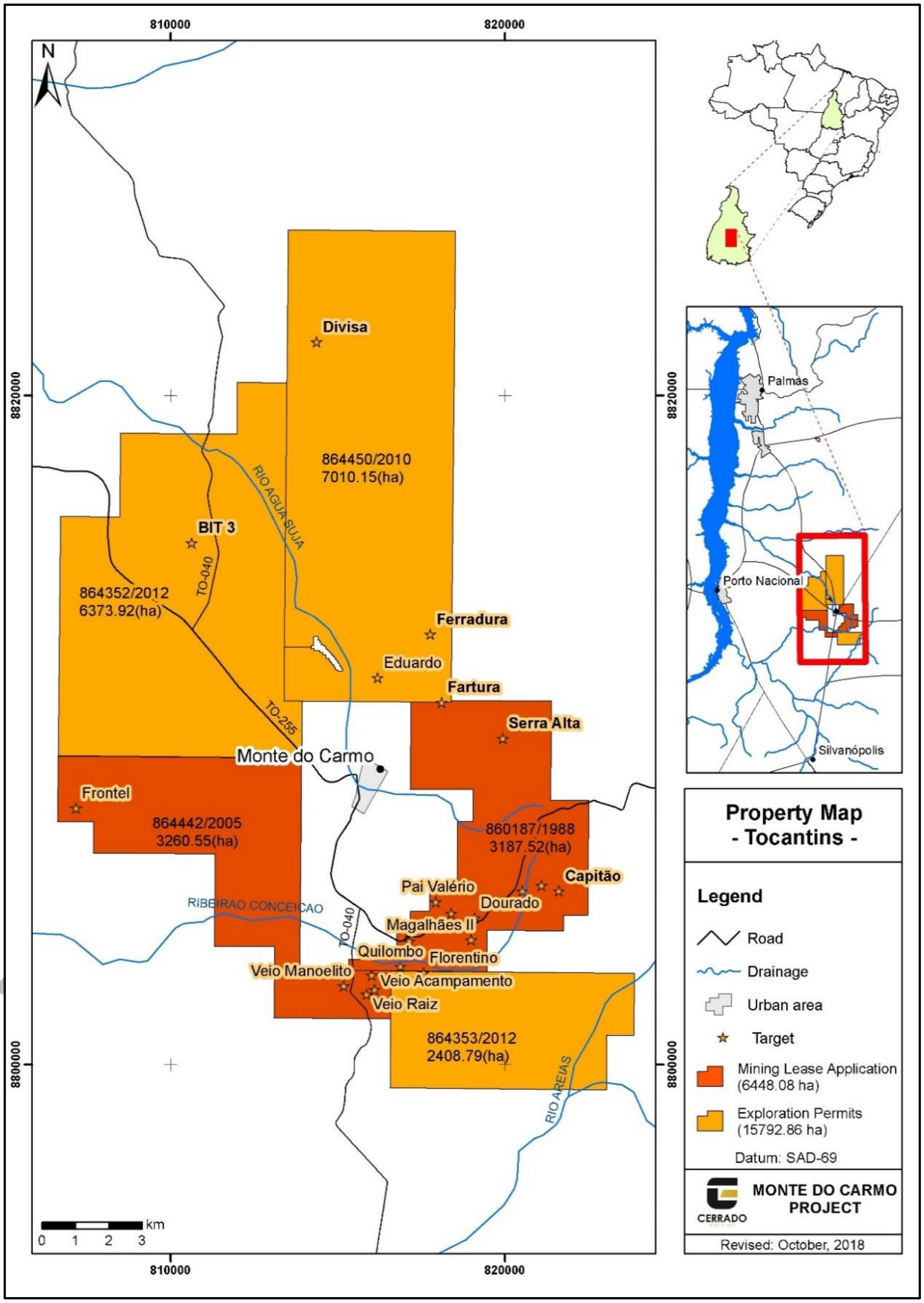
**Figure 1.1**
**Project Location Map**


Source: MSM, 2018.

The Monte do Carmo project consists of five concessions, as shown on Figure 1.2. The principal mineralized targets at the project are also shown on that figure. The concessions are currently held by Monte Sinai Mineração Ltda. (MSM) but are subject to an agreement with Cerrado, discussed in Section 4.3 below.

Cerrado's agreement with MSM also includes an exploration concession in Minas Gerais state, Brazil called the Morro Vermelho project. This report concerns the Monte do Carmo project. Morro Vermelho is not part of the Monte do Carmo "mineral project", as that phrase is defined in NI 43-101, and will not be discussed in this report.

**Figure 1.2**
**Concessions and Principal Exploration Targets**




Source: Cerrado 2019.

## 1.2 GEOLOGY

The regional geology of the Monte do Carmo area is characterized by a volcano-sedimentary sequence of Upper Proterozoic age, intruded by a large granite body of Lower Proterozoic age. The gold mineralization at Serra Alta is associated with a granite cupola. It is interpreted to fit into the Intrusion Related Gold System style of mineralization, very similar to the Fort Knox Deposit, Alaska, USA.

Serra Alta gold mineralization is associated with hydrothermally altered and sheared granitic rocks with quartz vein and veinlet swarms, moderately rich in sulphides (pyrite, galena, sphalerite and chalcopyrite). Other gold mineralization in the region is often hosted in single large quartz veins within fractures (the Giant Quartz Veins target).

The mineralized granite is overlain by a quartzite (yellow unit in Figure 1.3) which caps the cupola. A much younger sequence of flat lying red bed sediments (light brown unit in Figure 1.3) overlies the quartzite. The quartzite and red beds form cuestas (mesa-like features) several hundred metres high and will likely limit any push back of a pit wall to the east.

The Giant Quartz Veins are located about 5 km to the south of Serra Alta in the same granite body. Twenty-four of these veins have been mapped. Their width varies from just under a metre to several metres.

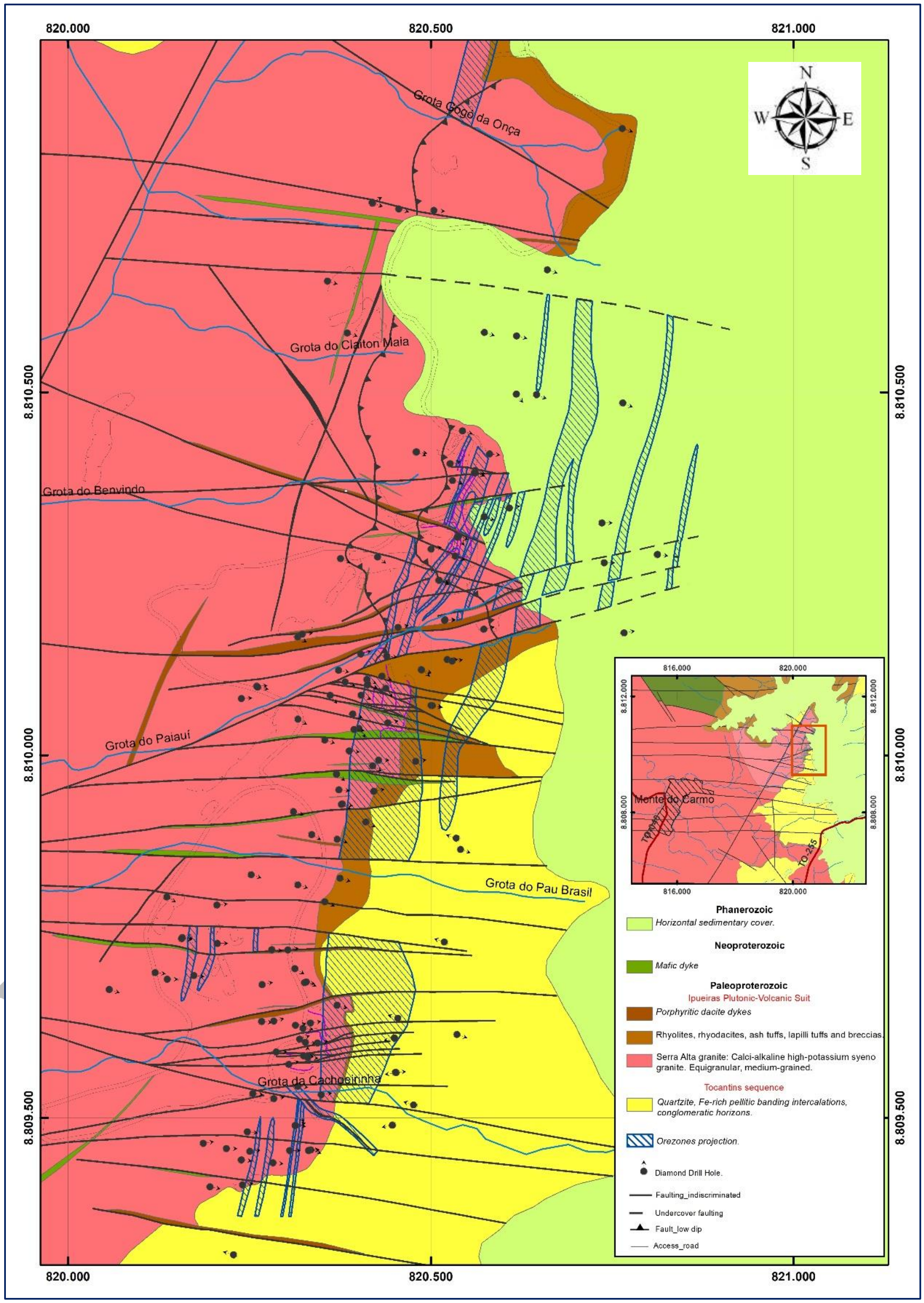
## 1.3 EXPLORATION HISTORY

It is understood that gold was originally discovered in the Monte do Carmo area during the 17th century. At this time early explorers and developers known as bandeirantes were opening up the interior regions of Brazil, often using river access on major waterways such as the Tocantins River. They used slave labour to recover gold, mostly from alluvial sediments and weathered saprolitic rocks. Bandeirante workings are found at Serra Alta.

During the 1980s the area experienced an influx of artisanal gold miners (garimpeiros) motivated by the recent rise in gold prices. MSM staff report that over 2,000 garimpeiros were working around Monte do Carmo at the time. Serra Alta was a major focus of garimpeiro activity. These informal miners were ultimately compensated and moved off of the concessions. No garimpeiro activity was occurring on the Serra Alta concession at the time of Micon's site visits. Modest scale artisanal mining was still active on some of the "Giant Quartz Veins" and was viewed by the QP during the site visit.

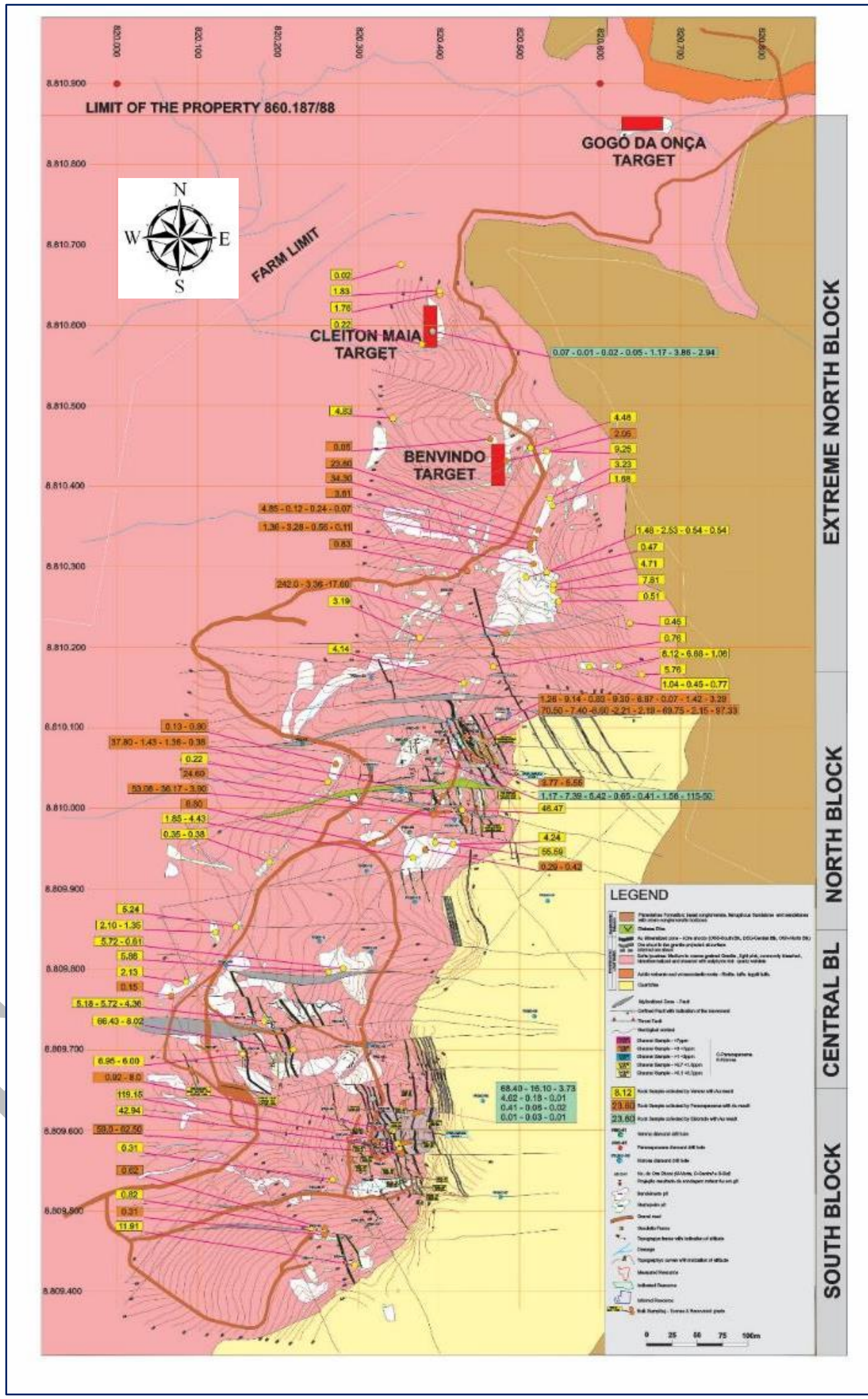
No reliable records exist for the total gold production by the bandeirantes and garimpeiros, however, the local historical workings (pits and tunnels) at Serra Alta are extensive. The white patches on Figure 1.4 show the location of mapped bandeirante and garimpeiro workings at Serra Alta.

**Figure 1.3**
**Serra Alta Geological Map**




Source: Cerrado, 2019. Scale on map grid.

**Figure 1.4**
**Serra Alta Geological Map Showing Garimpos in White**




Source: MSM, 2012. Scale on map grid.

### 1.3.1 Modern Exploration

Modern exploration in the area commenced in 1985 with work by Verena Mineração Ltda. (VML) and related companies. VML was incorporated in 1986 by the current directors of MSM to explore for gold in Tocantins State, particularly in the region of Porto Nacional and Monte do Carmo.

Investments in mineral exploration in the area, by entities other than Cerrado, are reported to have amounted to US$4.7 million from 1985 through 1995, and over US$20.0 million from 1996 to date. Most of the investment was applied in the Monte do Carmo Project area with many known occurrences of gold.

Modern exploration work targeted many regional targets but concentrated on the Giant Quartz Veins, and, in particular, on the Serra Alta Deposit.

The total number of holes drilled and assayed, at and around the Monte do Carmo project, as of the data-freeze date of this report (November 21, 2018) are set out in Table 1.1

Drilling, and exposures from mining, at the Serra Alta Deposit have demonstrated a wide, hydrothermally altered and gold-mineralized series of zones about 300 m wide with approximately 1,500 m of strike length, as demonstrated by the bandeirante and garimpeiro workings shown as white patches in Figure 1.4. The zone series is a corridor which contains individual veined, mineralized shoots generally striking N10° E and dipping 60° W. The structures are like ladder veins in the individual mineralized zones.

At the time of the QP's site visit, MSM and Cerrado geologists were discussing the possible interpretation of three distinct sub-corridors or trends of mineralization within this wider corridor. There are exposed bedrock sources of veining on the eastern side up against the cuesta wall. Extensions of the sheared granite cupola mineralization on the eastern side, under the quartzites, have been confirmed by drilling.

## 1.4 HISTORICAL RESOURCE ESTIMATES

There are no known mineral resource estimates for the Monte do Carmo project which have been prepared prior to the acquisition of the project by the current concession holder, MSM. An in-house estimate of resources has been prepared by a consultant to MSM (Geoprocess, 2011). This estimate is not considered to be NI 43-101 compliant and has not been reviewed by the QP. As the project concessions are still owned by MSM, it is not disclosed here.

**Table 1.1**
**Monte do Carmo Project, Historical Drilling Summary**

| Targets | Cerrado | | Verena | | Paranapanema | | Kinross | | Rio Tinto | | Total Metres | Total Holes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metres | No. Of Holes | Metres | No. Of Holes | Metres | No. Of Holes | Metres | No. Of Holes | Metres | No. Of Holes | | |
| Serra Alta | 13,467.54 | 88 | 449.90 | 5 | 2,713.57 | 31 | 3,083.30 | 17 | 0.00 | 0 | 19,714.31 | 141 |
| Giant Qtz Veins | 0.00 | 0.00 | 0.00 | 0 | 1,061.05 | 17 | 436.90 | 4 | 3,876.30 | 53 | 5,374.25 | 74 |
| Capitão | 0.00 | 0.00 | 0.00 | 0 | 0.00 | 0 | 1,085.95 | 9 | 0.00 | 0 | 1,085.95 | 9 |
| Bit-3 | 493.66 | 4 | 1,924.00 | 14 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 2,417.66 | 18 |
| Ferradura | 1,286.65 | 8 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 1286.65 | 8 |
| Eduardo | 286.64 | 4 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 286.64 | 4 |
| | | | | | | | | | | | | |
| **Total** | **15,534.49** | **104** | **2,373.90** | **19** | **3,774.62** | **48** | **4,606.15** | **30** | **3,876.30** | **53** | **30,165.46** | **254** |

## 1.5 PRODUCTION HISTORY

From 2012 to August, 2017, MSM, in partnership with the Paranaense Group from Parana State, invested approximately US$4.5 million in infrastructure and a bulk sampling gravity plant at Serra Alta which processed about 60,000 tons of ore and is reported to have produced 2,923 oz of gold. The QP has not verified any of the production claims made by MSM.

## 1.6 INTERPRETATION AND CONCLUSIONS

### 1.6.1 Giant Quartz Veins - General

One of the veins visited by the QP (Feb. 26 to March 2, 2018), the Verena vein, was being actively mined by at least three groups of garimpeiros at the time of the QP's visit. They were using small crushers and grinding machines, to recover the gold. The other veins visited were not being actively mined but had been within the last decade or so.

Total mineralized widths were generally 1 to 4 m at the workings visited, although locally they could be somewhat higher. Distances between the veins were typically at least 300 to 400 m and occasionally in excess of 1 km.

At Verena and Magalhaes 1, two of the three large quartz veins visited by the QP, the grade of the veins is believed to be low, estimated at about 2 g/t Au by MSM staff. However, the sheared wall rock on either side is of much better grade and the garimpeiros preferentially process only that material. MSM personnel estimate that the grade of the wall rock must be at least 7 to 8 g/t Au for the garimpeiros to operate successfully.

Grades of the quartz veins are reported to be too low for the garimpeiros to process. Total grade over the full mineralized width (vein plus sheared wall rock) is partially a function of the vein width, which is effectively internal dilution. The wider the quartz vein, the lower the overall grade.

Total tonnage potential at each vein is likely to be relatively low and the distance between veins will make it difficult to fully share infrastructure should mining commence. Small-scale open pits may be possible with ore trucked to a central location. Mercury contamination from previous garimpeiro operations may also be an issue.

Given the above, the QP concurs with Cerrado's decision to concentrate exploration effort on the Serra Alta Deposit where the potential for size is considered to be much greater. However, limited further exploration at the Giant Quartz Veins is considered to be justified.

### 1.6.2 Serra Alta Observations

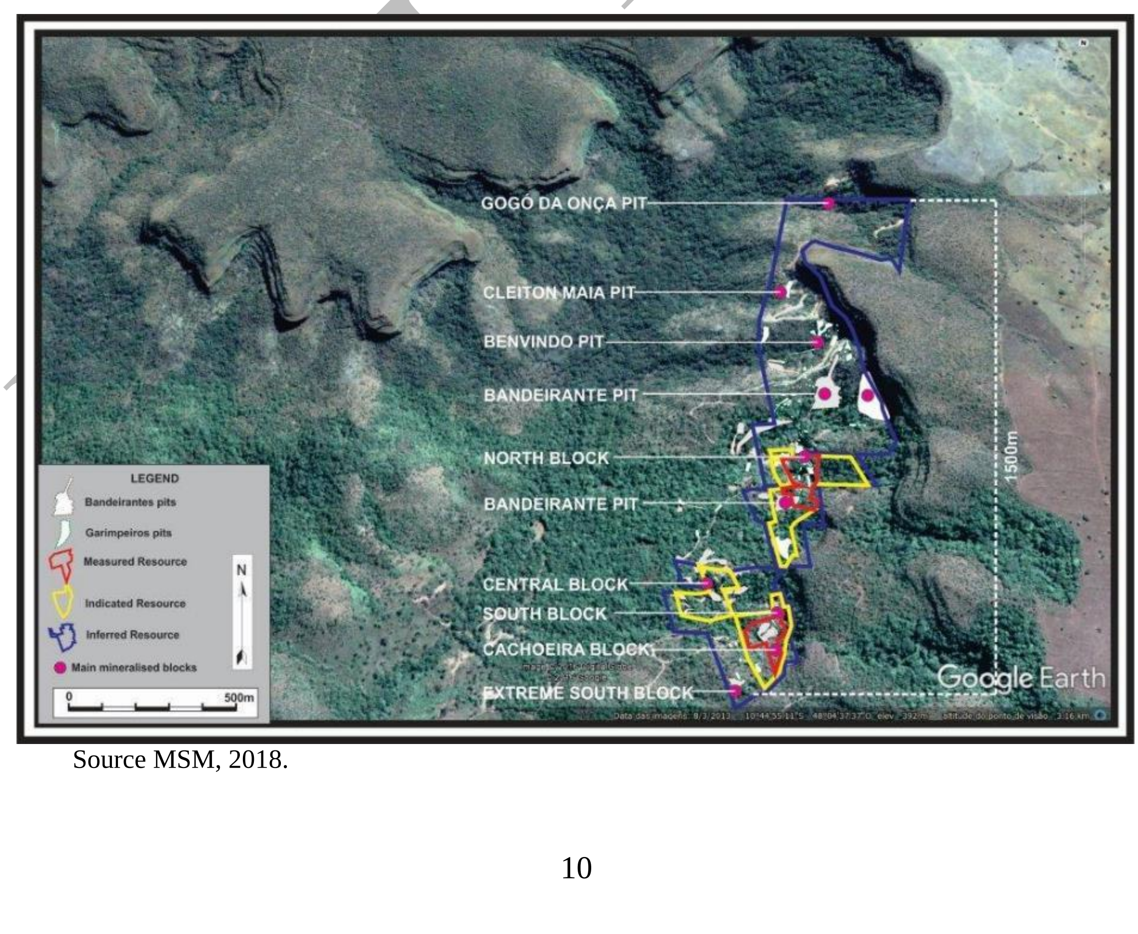
Traversing the Serra Alta portion of the property to visit mineralized exposures, the QP was struck by the extensive development of historical mine workings (bandeirante workings), more recent garimpos and the bulk sample small open pits completed by MSM. The historical workings are reported to date back over 200 years. The garimpeiros were reportedly bought out a number of years ago and have moved on. No activity is occurring on the Serra Alta portion of the property, other than that conducted by Cerrado and/or MSM.

The white patches in the pink granite of Figure 1.4 are the mapped positions of the bandeirante pits and garimpos. Except for the Gogó da Onça pit in the far north, the mapped garimpos stop at the Cleiton Maia pit (Figures 1.4 and 1.5). During the site visit, it was clear that they extended beyond this, close to the north property limit. They appear over a width of at least 200 m, and possibly 300 m, and a strike length of at least 1,500 m. Within this corridor, MSM and Cerrado geologists have interpreted three distinct sub-corridors or trends of mineralization. It is possible that the far western trend is composed largely of colluvium shed from the slope and has no immediate bedrock source. However, there are large exposed bedrock sources of veined and altered granite on the eastern side.

Clearly a large amount of mining work, over a wide area, mostly by hand, has been completed at this location over a long period of time. Intuitively, this leads to the conclusion that the recovered gold was sufficient to justify the significant effort and expense for that much activity. It is the QP’s opinion that this justifies the expense of an exploration program to more fully test the true grade, depth and width of the mineralization.

The true width of the sub-corridors does not seem to be currently well defined. Figure 1.5 shows the locations of the principal pits and zones at Serra Alta.

**Figure 1.5**
**Satellite Photo of Serra Alta Showing Principal Pits and Zones**




Source MSM, 2018.

## 1.7 CONCLUSIONS

Serra Alta is an interesting gold exploration project with a long history of artisanal mine workings and exposures over significant widths and strike length. The deposit is open along strike in both directions and down dip. The possibility exists that more mineralization will be found under the quartzite and red bed sediments to the immediate east of the known mineralization. However, grades there will likely need to justify underground mining for much of the mineralization, due to the significant amount of waste stripping of the overlying sediments which would be required for an open pit mine.

It is the QP's opinion that further exploration is justified.

The Giant Quartz Veins to the south are rather small tonnage targets and are unlikely to support a mining and milling operation on their own. However, should a mill be built at Serra Alta, they may contribute some mill feed.

The exploration work carried out at Serra Alta is generally being done to accepted industry standards. A few minor recommendations have been made.

### 1.7.1 Current Mineral Resource Estimate

The drilling completed to date, or relogged, resampled and validated, by Cerrado is sufficient to interpret mineralized shells (see Section 14) and to estimate an inferred mineral resource for the Serra Alta Deposit.

The mineral resource statement for the Serra Alta Deposit is summarized in Table 1.2.

**Table 1.2**
**Statement of Inferred Mineral Resources for Serra Alta**
**(Effective Date December 5, 2018)**

| Mining Method / Cut-Off | Domain | Tonnes (kt) | Grade (Au g/t) | Metal Content (Au oz, '000) |
|---|---|---|---|---|
| Open Pit @ 0.49 g/t Au Cut-off | N1 | 2,865 | 1.43 | 132 |
| | N2 | 7,594 | 1.72 | 420 |
| | S1 | 2,602 | 2.43 | 203 |
| | S2 | 172 | 1.22 | 7 |
| | **Subtotal** | **13,234** | **1.79** | **762** |
| Underground @ 1.5 g/t Au Cut-off | All | 405 | 3.92 | 51 |
| **Pit and Underground** | **Total** | **13,639** | **1.85** | **813** |

Mineral resources which are not mineral reserves do not have demonstrated economic viability. At the present time, Micon does not believe that the Serra Alta mineral resource estimate is materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

Micon considers that the resource estimate for the Serra Alta Deposit to have been reasonably prepared and to conform to the current 2014, CIM standards and definitions for estimating mineral resources.

## 1.8 RECOMMENDATIONS

### 1.8.1 Micon Recommendations

In addition to continued exploration at Serra Alta, the QP makes the following recommendations:

- Map the location of the last of the garimpo/bandeirante pits at the north end of the trend and update the map shown in Figure 7.4. This is a useful figure to demonstrate the scale of the mineralized body at Serra Alta.

- Eventually Cerrado should consider switching to electronic core logging, directly to tablets or laptop computers, rather than to paper. There is the potential for error in the required follow up transcription of logs.

- Put multiple columns in the database for first assay and reassays, along with a final "accepted assay" column to be used for resource estimation. Maintain a log book of all requested reassays and the reasons for them. This will create an audit trail for any eventual resource review prior to financing mine construction.

- The current blank material being used in the Quality Assurance/Quality Control program is reported to be a dirty limestone from a nearby quarry. This should be switched to a quartz, or unmineralized granite, blank which will react to the assay flux in a manner more similar to the local granite mineralization. It will also clean the sample preparation equipment more effectively, thereby identifying gold carry over between samples.

- The data package for the Canadian Resource Laboratory (CRL) standards came with two sets of round robin assays, one with AAS finish and one with gravimetric finish. They each had a slightly different standard deviation (SD) which is used to establish the failure lines on the control charts. CRL should be contacted to find out which accepted value and SD to use with screen metallics assays, AAS or gravimetric.

- Contact SGS and find out what their sample batch size is and how many positions in it are available to the client. Then submit Cerrado samples in batches to be analyzed together, thereby controlling the location of the QA/QC samples and ensuring that Cerrado samples are not mixed in a batch with another company's.

- Eventually, should Serra Alta become an advanced project, consideration should be given to making matrix-matched CRMs (analytical standards) from local mineralization.

### 1.8.2 Serra Alta Proposed Exploration Program

Cerrado has initiated an exploration program designed to confirm and expand the gold mineralization at Serra Alta and to follow up other favourable targets from earlier programs. This report proposes to continue that work. This program includes definition drilling and expansion of the areas north, south and along strike of what is referred to as the North Block and South Block, and the areas between the blocks.

Also included is the follow up of favourable targets of earlier exploration programs with channel sampling, detailed geological mapping, and sampling of the extensive garimpeiro workings. Part of this program focuses on investigating the area between the North Block and the area immediately north, for a strike length of 1,500 m.

The area between the North and South Blocks is a focus of the drill program in order to explore for additional mineralization along strike, both north and south from the known areas at Serra Alta, as well as those areas in between. The ultimate goal is to produce a database suitable for additional mineral resource estimates. A program comprised of 31,000 m of drilling has been proposed.

A total budget of $6,687,102.78 is proposed by Cerrado for the recommended 2019 exploration program, as set out in Table 1.3 below. It is anticipated that this work will be completed over the next year. An additional $2,724,543.62 is budgeted for debt repayment conditions outlined in Section 4.3.

### 1.8.3 Exploration Budget

The proposed exploration program budget for Serra Alta is summarized in Table 1.3 below.

**Table 1.3**
**Proposed 2018 Serra Alta Exploration Budget**

| Monte Do Carmo Project - Exploration | 2019 Total (US$) |
|---|---:|
| Serra Alta | 3,020,511.11 |
| Capitão/Magalhaes + Drilling at Other Quartz Veins | 1,417,655.56 |
| Other Quartz Veins (Field work only) | 6,875.00 |
| Fartura (Field work only) | 10,972.22 |
| Operation Expenses | 1,477,422.22 |
| G&A Expenses | 753,666.67 |
| | |
| **Total** | **6,687,102.78** |

The QP has reviewed the proposed exploration program and finds it to be reasonable and justified. Should it fit with Cerrado's strategic goals, it is the QP's recommendation that the company conduct the proposed exploration program.

The data used in the preparation of this report are current as of November 21, 2018.

# 2.0 INTRODUCTION

Micon International Limited (Micon) was retained Cerrado Gold Inc. (Cerrado) to visit the Monte do Carmo gold project in Tocantins State, Brazil and to comment on the prospectivity of the project. After the site visit, Cerrado decided to commission a National Instrument 43-101 (NI 43-101) Technical Report describing the history and work completed to date and recommending an exploration program and budget to support the listing of Cerrado on a Canadian stock exchange, and a financing. Later, in cooperation with Cerrado technical staff, Micon estimated an initial mineral resource compliant with National Instrument 43-101 (NI 43-101) for the project. This report discloses that mineral resource.

The concessions at the project are currently held by Monte Sinai Mineração Ltda. (MSM) but are subject to a binding letter of intent for Cerrado to acquire them. The application to transfer mineral rights was filed with Brazil's National Mining Agency (ANM).

This report has been prepared using data and reports provided by MSM and Cerrado's exploration staff in Brazil. These reports and data sources are summarized in Section 20 of this report.

The main focus of Cerrado's exploration efforts at Monte do Carmo is the Serra Alta Gold Deposit and this report will concentrate on that.

B. Terrence Hennessey, P.Geo., of Micon, travelled to Brazil and visited the Monte do Carmo project and MSM's offices in Tocantins State during the period February 26 to March 2, 2018, to review the exploration activities, geology and mineralization. The visit was made in the company of Mr. R. A. Campbell and Mr. Kurt Menchen. This was the QP's first visit to the site. A second visit to the project was made from September 4 to 8, 2018 to review drilling, trenching and channel sampling progress.

Mr. Hennessey is a Professional Geoscientist registered in Ontario. He has over 35 years of experience in mineral exploration, mine operations, resource estimation and consulting. Mr. Hennessey is a Vice President of Micon and the author of this report. The author is a Qualified Person and independent of Cerrado as defined by NI 43-101.

All currency amounts in this report are stated in US or Canadian dollars (US$, CDN$), as specified, with commodity prices generally in US dollars (US$). Quantities are generally stated in SI units, the Canadian and international practice, including metric tons (tonnes, t), kilograms (kg) or grams (g) for weight, kilometres (km) or metres (m) for distance, hectares (ha) for area, litres (L) for volume and grams per tonne for gold (g/t Au) and silver (g/t Ag) grades. Historical production information may be presented using the Imperial system of measurement. Base metal grades are usually expressed in weight percent (%). Geochemical results or precious metal grades may be expressed in parts per million (ppm) or parts per billion (ppb). (1 ppm = 1 g/t). Elevations are given in metres above sea level (masl). Precious metal quantities may also be reported in troy ounces (ounces, oz), a common practice in the mining industry.

Micon is pleased to acknowledge the helpful cooperation of Cerrado's management and field staff, all of whom made any and all data requested available and responded openly and helpfully to all questions, queries and requests for material.

The QP has reviewed and analyzed data provided by Cerrado, its consultants and previous operators of the property, and has drawn his own conclusions therefrom, augmented by his direct field examination. Micon has not carried out any independent exploration work, drilled any holes or carried out any sampling and assaying on the property.

While exercising all reasonable diligence in checking, confirming, and testing it, the QP has relied upon Cerrado and MSM's presentation of the project data from previous operators and from Cerrado and MSM's mining and exploration experience at the Monte do Carmo project in formulating his opinion.

The descriptions of geology, mineralization and exploration are taken from reports prepared by various companies or their contracted consultants. The conclusions of this report rely on data available in published and unpublished reports, information supplied by the various companies which have conducted exploration on the property, and information supplied by Cerrado and MSM. The information provided to Cerrado was supplied by reputable companies and the QP has no reason to doubt its validity.

The figures and tables for this report were largely reproduced, or derived, from reports written for Cerrado. Where the figures and tables are derived from sources other than Micon, the source is acknowledged below the figure or table.

**Table 2.1**
**List of Abbreviations**

| Name | Abbreviation |
|---|---|
| Atomic Absorption Spectroscopy | AA, AAS |
| ALS Global Laboratories | ALS |
| Canadian Dollar | CAD |
| Canadian Institute of Mining, Metallurgy and Petroleum | CIM |
| Canadian National Instrument 43-101 | NI 43-101 |
| Canadian Securities Administrators | CSA |
| Centimetre(s) | cm |
| Certified Reference Materials (Analytical Standards) | CRM (Standards) |
| Copper | Cu |
| Degree(s), Degrees Celsius | °, °C |
| Digital elevation model | DEM |
| Digital Terrain Model | DTM |
| Gold | Au |
| Grams per metric tonne | g/t |
| Hectare(s) | ha |
| Hour | h |
| Inductively Coupled Plasma - Emission Spectrometry | ICP-ES |
| Iron | Fe |

| | |
|---|---|
| Kilogram(s) | kg |
| Kilometre(s) | km |
| Lead | Pb |
| Litre(s) | L |
| Metre(s) | m |
| Micon International Limited | Micon |
| Million (e.g. million tonnes, million ounces, million years) | M (Mt, Moz, Ma) |
| Milligram(s) | mg |
| Millimetre(s) | mm |
| National Instrument 43-101 | NI 43-101 |
| Not available/applicable | n.a. |
| Parts per billion, part per million | ppb, ppm |
| Percent(age) | % |
| Qualified Person (as defined in NI 43-101) | QP |
| Quality Assurance/Quality Control | QA/QC |
| SGS Brazil Ltd. (SGS do Brasil Ltda.) | SGS |
| Silver | Ag |
| Specific gravity | SG |
| Square kilometre(s) | $km^2$ |
| System for Electronic Document Analysis and Retrieval | SEDAR |
| Thorium | Th |
| Three-dimensional | 3D |
| Tonne (metric)/tonnes per day, tonnes per hour | t, t/d, t/h |
| Tonnes per cubic metre | $t/m^3$ |
| United States Dollar(s) | USD |
| US Securities and Exchange Commission | SEC |
| Universal Transverse Mercator | UTM |
| Uranium | U |
| Year | y |
| Zinc | Zn |

## 3.0 RELIANCE ON OTHER EXPERTS

The various agreements under which Cerrado and/or MSM hold title to the mineral lands for this project have not been thoroughly investigated or confirmed by the QP and the QP offers no opinion as to the description of, or validity, of the mineral title claimed. The description of the property has been presented here for general information purposes only, as required by NI 43-101.

Micon is not qualified to provide professional opinion on issues related to mining and exploration title and land tenure, royalties, permitting and legal and environmental matters. The author has accordingly relied upon the representations of the issuer, Cerrado Gold Inc., as well as Monte Sinai Mineração Ltda., for Section 4 of this report and has not verified the information presented in that section.

The QP has also relied on information regarding royalties provided by Cerrado.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

## 4.1 LOCATION

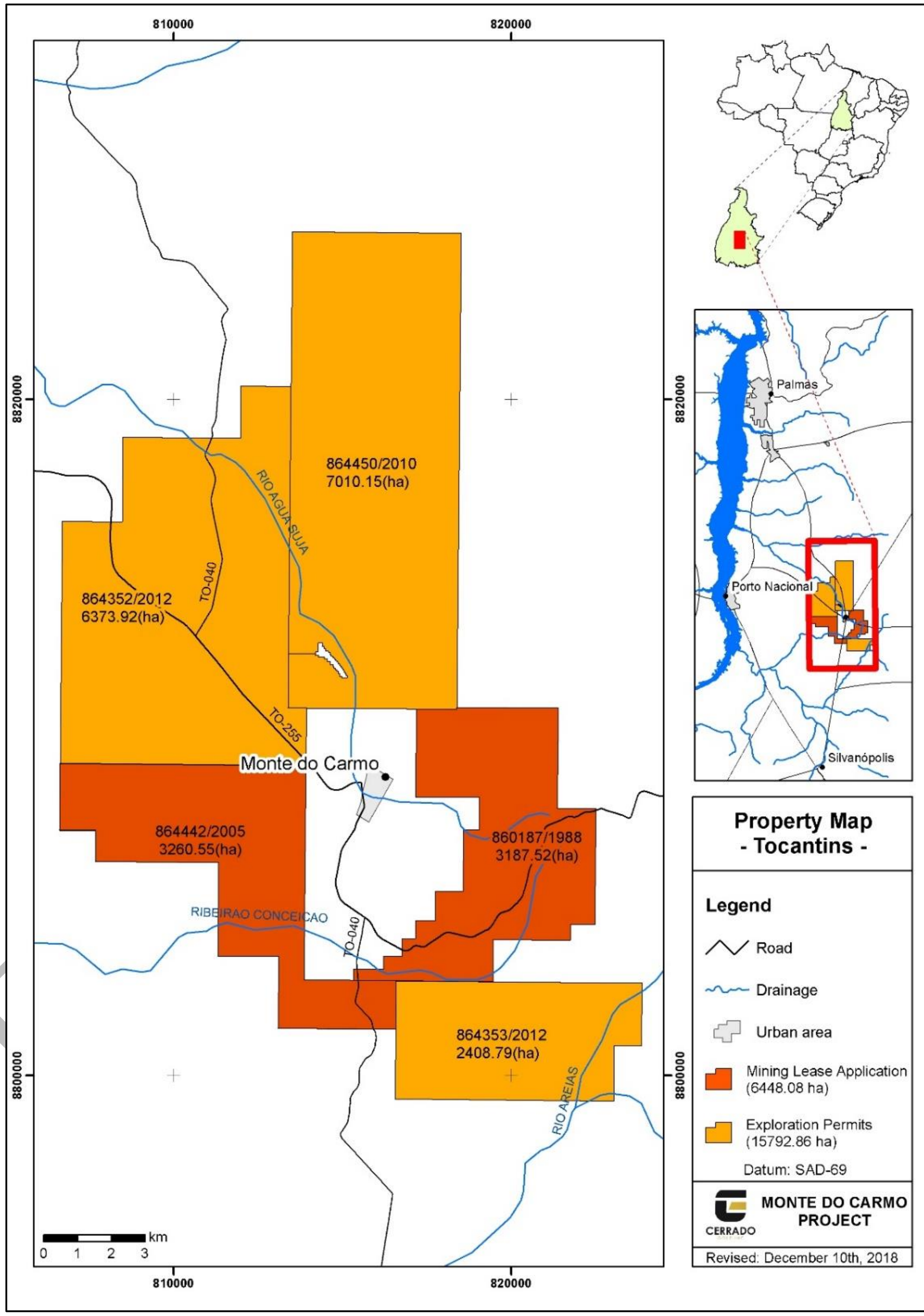
The Monte do Carmo Gold Project is located in the State of Tocantins, Brazil, immediately east of the town of Monte do Carmo. The Serra Alta Deposit, the main focus of exploration at the project is located at 10° 45' 4" south latitude and 48° 4' 20." west longitude. Monte do Carmo (7,700 inhabitants) is located 39 km east of the city of Porto Nacional (55,000 inhabitants). Porto Nacional is 50 km (60 km by road) south of the state capital of Palmas (250,000 inhabitants) and 760 km north of Brasilia, the federal capital (Figure 4.1).

**Figure 4.1**
**Tocantins State Location Map**


Source: MSM 2018

Figure 4.2 shows the local details of the Monte do Carmo project location.

**Figure 4.2**
**Monte do Carmo Project Location Map**




Source: Cerrado 2019.

Elevation in the vicinity of the town of Monte do Carmo varies between approximately 300 and 600 m above sea level.

## 4.2 CONCESSIONS

The Monte do Carmo project consists of five concessions as shown in Table 4.1 and on Figure 4.3. The principal mineralized targets at the project are also shown on Figure 4.3. The concessions are currently held by MSM. The Monte de Carmo project is owned by a Brazilian entity called Serra Alta Mineração Ltda. (SAML).

Upon execution of the agreement described in Section 4.3 below, MSM and SAML have formally requested to the ANM that the titles to the concessions be transferred to SAML.

Cerrado's agreement with MSM also includes a concession in Minas Gerais state, Brazil, the Morro Vermelho project, as shown in Table 4.2. This report concerns the Monte do Carmo project. Morro Vermelho is not part of the Monte do Carmo "mineral project", as that phrase is defined in NI 43-101, and will not be discussed further in this report.

Registration of mining and exploration concessions is controlled by National Department of Mineral Production (DNPM), now known as the National Mining Agency (ANM).

Brazil has a straight forward and transparent system for issuing exploration permits. It can be accessed on line at: http://www.anm.gov.br/assuntos/ao-minerador/cadastro-mineiro.

A company can apply for any property on line but the priority of application is only guaranteed when its physical filing occurs, and a protocol number is issued.

When a property application is made, the ANM records a number for the application (e.g. 864.442/2005), which will then await approval (usually about 3 months). If the application is all in order, it will be approved and published in the Federal Official Gazette (DOU), which has a unique sequential number (Alvará, e.g. 9,239). Once published in the DOU, the application becomes a permit, and its first 3-year period begins to run. For the next 3 years, annual fees will be charged, and exploration is permitted. Sixty days before the third-year expiry date, a request for extension can be made, which must be supported by a technical report.

The extension may be granted in approximately one to two years, usually for an additional 3-year period, although sometimes less. For this reason, good communications with ANM is paramount.

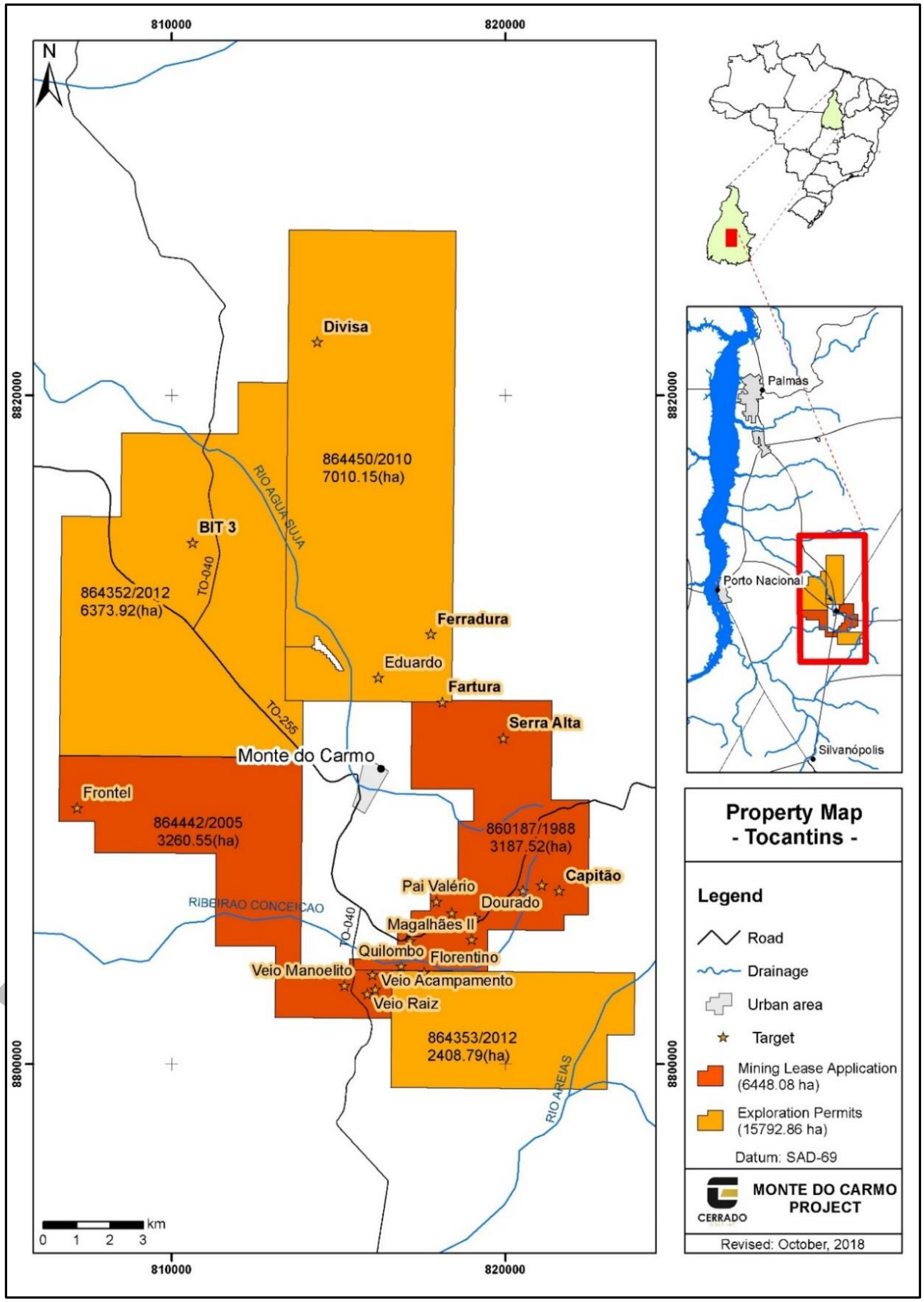
**Table 4.1**
**Monte do Carmo Project Concessions**

| ANM N° | Claim Date | Area (Ha) | Alvará N° | Alvará Date D.O.U. | End Date Of The Alvará | Owner | Annual Tax Due Date | Targets | Observations |
|---|---|---|---|---|---|---|---|---|---|
| 860.187/88 | 01/03/1988 | 3,187.52 | 11,124 | 07/07/2009 | | MSM | | Serra Alta, Conceição Giant Qtz Veins, Fartura | Final report approved March, 2017 |
| 864.442/05 | 07/11/2005 | 3,620.55 | 9,239 | 08/09/2009 | | MSM | | Giant Qtz Veins | Final Report approved March, 2018 |
| 864.353/12 | 12/09/2012 | 2,408.79 | 1,691 | 24/02/2016 | 24/02/2019 | MSM | 31-Jul | Giant Qtz Veins | Concession |
| 864.352/12 | 12/09/2012 | 6,373.92 | 1,690 | 24/02/2016 | 24/02/2019 | MSM | 31-Jul | Bit-03 | Concession |
| 864.450/10 | 03/08/2010 | 7,010.15 | 16,921 | 13/01/2015 | 13/01/2018 | MSM | 31-Jul | Ferradura | Concession Renewed |
| **Total** | | **22,240.93** | | | | | | | |

**Table 4.2**
**Morro Vermelho Project Concessions**

| ANM N° | Claim Date | Area (Ha) | Alvará N° | Alvará Date D.O.U. | End Date Of The Alvará | Owner | Annual Tax Due Date | Observations |
|---|---|---|---|---|---|---|---|---|
| 832.626/13 | 29/08/2013 | 1,999.46 | 14,260 | 13/11/2015 | 13/11/2018 | MSM | 31-Jan | Concession |
| **Total** | | **1,999.46** | | | | | | |

**Figure 4.3**
**Concessions and Exploration Target Locations**




Source: Cerrado 2019.

At the end on the sixth year of valid title, and before the final day, a company must submit a Final Exploration Report. Once the Final Report has been approved by the ANM (which is also published in the DOU) the ANM has accepted that a potentially viable deposit has been discovered on that property. The company then has a term of one year within which to submit an Economic Assessment of the Project (PAE, which is similar to a Preliminary Economic Assessment under NI 43-101). In the case of concessions 860.187/88 and 864.442/05 from Table 4.1, the PAE was submitted in March, 2018. In the PAE, an extension to both concessions was requested and approved in October, 2018. Once the PAE has been approved by the ANM, a company may then request the Final Mining Lease, which is also issued by ANM.

After the mining lease is granted, a company has to submit a simplified production report every year, or it may ask for an extension to the mining lease, providing a reason for not being in production. Mining leases have no time limit.

Production taxes are payable on mining leases. The gold tax is now 1% of net revenue. An additional royalty equivalent to 50% of gold tax (in this case 0.5%) is paid to the land owner. In the case of Serra Alta, the land owner is MSM.

## 4.3 AGREEMENTS

Pursuant to an Acquisition Agreement with MSM, the Monte de Carmo project is owned by a Brazilian entity called SAML, which in turn is a wholly owned subsidiary of Cerrado Gold Inc. (formerly Templewood Capital Inc.), a privately held Canadian corporation.

In accordance to the terms of the Acquisition Agreement, Cerrado Gold Inc. is required to raise US$5,000,000 within twelve months of the execution of the Acquisition Agreement to continue the exploration activities.

Additionally, the terms of the Acquisition Agreement provide for a 2% net smelter return royalty granted to the former owners of the project, with a right of repurchase of 1% by Cancap Investment Ltd. in exchange for US$3,000,000.

Further, the former owners of the project, as per the terms of the Acquisition Agreement, have the right to be paid US$500,000 if 1,000,000 oz of gold in an NI 43-101-compliant mineral resource estimate results from exploration activities in connection with the exploration titles/mining rights of the Acquisition Agreement. An additional US$1,500,000.00 shall be paid if an aggregate of 2,500,000 oz of gold are identified in a mineral resource estimate compliant with NI 43-101.

## 4.4 PERMITS

There is a License of Operation (LO, a permit issued by the state environmental agency) in place at Serra Alta which is valid until July 13, 2020. This allows for the small-scale mining operation of MSM, which is currently suspended. It includes permission for drill and blast operations, processing of ore and leaching of concentrates with the use of cyanide.

All of the required permits for exploration, including drilling, are in place. They are currently in the process of being reviewed in light of the change of land ownership

## 4.5 Environment and Liabilities

The principal known environmental liabilities are related to the historic gold panning activities of the bandeirantes in the 1600s and 1700s and the more recent garimpeiro/artisanal mining activities of the late 1900s. The principal issues are related to the use of mercury by the garimpeiros and their related small-scale construction, as well as the piles of rocky rubble left by the Portuguese explorers.

Currently the liabilities connected to garimpeiro activity and the historic use of mercury accrue to MSM. When the concession titles get transferred to Cerrado, the company has to formally communicate the nature of the illegal mining activities to the ANM. Cerrado will not be prosecuted for the illegal activity but may be held responsible to clean it up, or arrange some compensatory measures in the future.

A small pond with approximately 800 $m^3$ of liquor coming from a previously operated electrowinning plant was left to natural evaporation. Assays of 3 samples taken from the pond showed no presence of poisonous cyanide, only the presence of harmless cyanate. The pond and concrete flooring were demolished and subsequently buried at the same site.

# 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

## 5.1 ACCESSIBILITY

The Monte do Carmo project is located in the central region of Brazil, in the State of Tocantins, 62 km southeast of the state capital Palmas. Palmas has an international airport with several daily flights to Brasilia, Goiânia and São Paulo with onward connections to most places in the world.

Monte do Carmo is accessed via a paved road (highway TO-255) east from Porto Nacional, where a field office is established at the project site (see Figure 4.2).

## 5.2 LOCAL INFRASTRUCTURE AND RESOURCES

The principal industry in this part of Tocantins state is agriculture. Large fields of soybeans and corn lie to the west of the town of Monte do Carmo. Cattle are also raised. Monte do Carmo itself is surrounded on 2 sides by cuestas (mesa-like features) on which there is little agriculture.

The city of Porto Nacional's principal purpose is the support of the agricultural industry. All of the basic project needs can be sourced there. Permits for the project, such as those from the ANM, environmental agencies and others, can be applied for directly in Palmas.

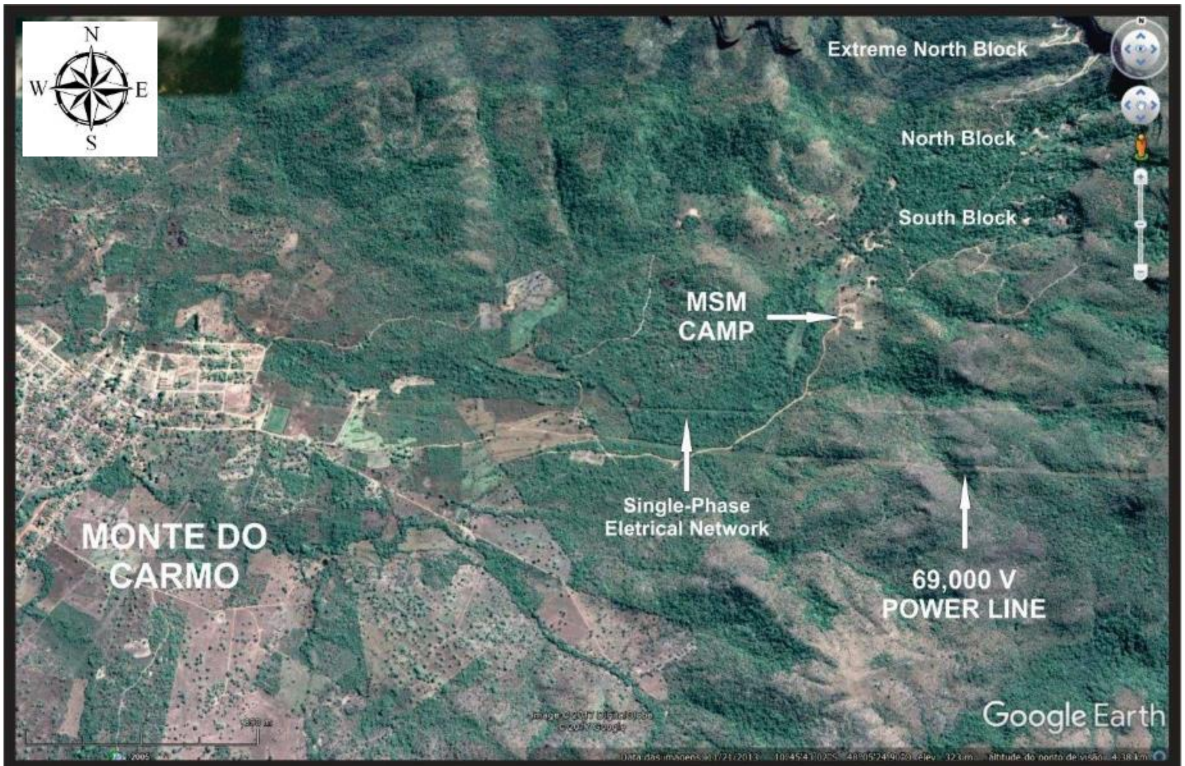
Porto Nacional has much of the basic necessary infrastructure, including a paved landing strip with capacity for landing large planes, but no refueling capacity.

The Tocantins River is dammed down-stream (north) of Palmas to feed the Lajeado Hydroelectric Power Plant. The river is flooded and quite wide from there to the south of Porto Nacional.

To the east of Monte do Carmo, near the municipality of Ponte Alta, high voltage power is available from the Izamu Ikeda power plant (30 MVA) located on the Balsas River, a tributary of the Tocantins River. A high-tension power line (69 kV) from this plant crosses the concession containing Serra Alta (860.187/88), approximately 500 m south of the main Serra Alta project facilities (see Figure 5.1).

From 2012 to 2017, MSM operated a small mill with gravity recovery and reported a processed tonnage of 60,361 t at a recovered grade of 1.508 g/t Au. The material milled was sourced from the Serra Alta Deposit. The mill has been dismantled but the foundations and tailings are still present.

**Figure 5.1**
**Satellite View of Monte do Carmo and Serra Alta Area**




Source: Cerrado, 2018. Note: Scale is in lower left corner of figure.

Cerrado has a field office at the site of the former mining operation at Serra Alta. This consists of a laboratory building, office building, cafeteria, work shop, fuel station and change house/bathroom (Figure 5.2). The tailings from the milling operation are visible in the lower left corner of the figure. Cerrado has since completed an open air, covered core logging facility with attached offices and core sawing room (Figure 5.3, also visible in Figure 5.2).

Ample labour is available in the nearby towns and cities. Some of the field labourers have been preferentially hired in the local communities, in accordance with the company's policies of providing local benefits.

While the local industry is dominated by agriculture, Brazil is a country with an extensive mining industry. Experienced mining professionals, skilled trades and labourers are available from nearby states.

**Figure 5.2**
**Aerial View of Serra Alta Field Office Facilities (From Drone)**

Source: Cerrado, 2018

**Figure 5.3**
**Cerrado Core Logging Area and Office**

Source: Cerrado, 2018

## 5.3 CLIMATE

A rainy tropical climate prevails in the Monte do Carmo area, equivalent to type Aw in the classification of Köppen - wet summer and dry winter (Radambrasil, 1981). Two distinct seasons are noted: rainy from September or October to April and dry from May to August. Annual rainfall varies from 1,600 to 2,100 mm. Relative humidity exceeds 80% in the rainy season, but falls to less than 30% in the dry season. Average annual temperatures range from 24 ° to 28 ° C.

## 5.4 WATER RESOURCES

The local drainage network reflects the lithological constitution and structure of the underlying rock units. The sedimentary rocks of the Parnaíba Basin represent an important porous aquifer, whereas in the impermeable crystalline basement rocks, small aquifers prevail, restricted to the fractured portions of the substrate (Radambrasil, 1981).

The Monte do Carmo area is drained by the headwaters of small tributaries on the east bank of the Tocantins River. Locally the streams (Sucuri, a tributary of the Água Suja, and Conceição) are tributaries of the Areias River which drains to the Tocantins.

The sandy aquifer provides strong flows of good quality, clear water. The predominant water courses are controlled by the local rock units and structure. In the Serra do Carmo (the cuestas near the town), they often occupy rugged stream beds, with small waterfalls (Figure 5.4).

**Figure 5.4**
**Overlying Sedimentary Rock Cuesta and Water Falls.**

Source: Micon, 2018

Rudimentary extraction of gold, begun in the 18th century, had severe impacts on the local waters, seen in the local stream Água Suja. Currently, in the nearby areas, there are impacts from large scale mechanized agriculture, with consumption for irrigation and contamination of surface and groundwater by soluble fertilizers and pesticides.

## 5.5 GEOMORPHOLOGY

The Monte do Carmo region encompasses the western border of the Parnaíba Sedimentary Basin, deposited on the crystalline basement which hosts the local gold mineralization. Two geomorphological domains, characterized by Radambrasil (1981), are identified:

- On the crystalline basement rocks, the Tocantins Depression was developed. The depression is composed of flat to gently undulating land, with elevations of approximately 200 to 300 m. There are isolated remnants of the overlying sediments with flattened tops and elevations of about 500 m or greater (e.g. Lajeado hill, east of Porto Nacional). Pediplanar surfaces occur at the western end of the domain. The drainage valleys have different orders of magnitude, usually with limited depth and flat bottom.

- Where the sedimentary rocks have not largely eroded away, lies the Residual Plateau of Tocantins. These are extensive plateaus bordered by escarpments (see Figure 5.4), with elevations between 350 and 600 m, on the tops (cuestas) of the sediments.

The boundary between the two domains is marked by a front of cuestas (an asymmetric hill with gentle slopes on one side and a steep slope on the other, looking like a mesa from the steep side). These are notable in the landscape east of Monte do Carmo. In this context lies the hydrothermally altered granite of the Serra Alta Deposit, once mined by the Portuguese bandeirantes and more recent garimpeiros. Locally, at the base of the cliffs located at the edge of the sediments (which extend eastward) is relatively rugged terrain. The elevations of on the exposed mineralized granite varies between 350 and 470 m.

## 5.6 SOIL

The local soils are derived from the weathering of the underlying rocks. In tropical climates, they tend to be acidic with poor fertility due to nutrient leaching. Sandstones and quartzites result in sandy soils, while granitoid rocks produce more clay-rich soils. In turn, basic volcanic rocks tend to result in more fertile soils.

In general, they are chemically poor soils with physical characteristics that are restrictive to conventional agricultural use. However, when corrected for their chemical limitations, they allow for mechanized agriculture and the production of soybeans and corn.

## 5.7 VEGETATION

The local vegetation cover is typical of savannas (Radambrasil, 1981). There is a great diversity of species, characteristic of the Cerrado biome. In the crystalline basement terrains, there is a predominance of grassy Cerrado (open tree savanna), with forests along the valleys and on the slopes of the Carmo mountain range (the cuestas). On the flat lying sediments to the east, only thin cover is found, without forests.

In recent decades, large areas of vegetative cover were removed for the establishment of pastures and mechanized farms. Initially these housed a rich and varied fauna: jaguars, anteaters, wolves, deer, alligators, diversified snakes, macaws, hawks, etc. Pressed by this agricultural occupation, the fauna seek shelter, although precarious, in the intact portions of savanna east of Monte do Carmo.

The original vegetation cover was characterized by Radambrasil (1981):

- Open Tree Savanna without gallery forest: Covers the Tocantins Residual Plateau. It includes low grasses and small tortuous trees with thick bark, bright coriaceous leaves or protected with hairs, suitable for vegetation adapted to low nutrient conditions (especially phosphate and nitrogen).

- Open Tree savanna with gallery forest: The dominant physiography in the crystalline terrains of the Tocantins Depression. The forests denote permanent humidity and greater accumulation of nutrients, favoured along the water courses and on the cliffs of the Carmo mountain range. The monotonous landscape of the Cerrado fields is interrupted by sinuous forest strings or by the presence of rainforest.

These forests are composed of arboreal elements with habits different from the surrounding species. They represent real forest refuges. They have variable dimensions and composition, but the vegetation is always high and dense.

# 6.0 HISTORY

## 6.1 INTRODUCTION

It is understood that gold was originally discovered in the Monte do Carmo area during the 18th century. At that time, early explorers and developers known as bandeirantes were opening up the interior regions of Brazil, often using river access on major waterways such as the Tocantins River. They used slave labour to recover gold, mostly from alluvial and weathered saprolitic rocks. Bandeirante workings are found at Serra Alta.

During the 1980s, the area experienced an influx of artisanal gold miners (garimpeiros) motivated by the recent rise in gold prices. MSM staff report that over 2,000 garimpeiros were working around Monte do Carmo at the time. Serra Alta was a major focus of garimpeiro activity. These informal miners were ultimately compensated and moved off the concessions. No garimpeiro activity was occurring on the Serra Alta concession at the time of the QP's visit. Modest scale artisanal mining was still active on some of the "Giant Quartz Veins" (the tightly clustered group of targets in concession 860187/1988 in the southern portion of Figure 4.3) and was viewed by the QP during the site visit.

No reliable records exist for the total gold production by the bandeirantes and garimpeiros, however, the local historical workings (pits and tunnels) at Serra Alta are extensive. The white patches on Figure 6.1 show the location of mapped bandeirante and garimpeiro workings at Serra Alta.

## 6.2 PRIOR EXPLORATION HISTORY

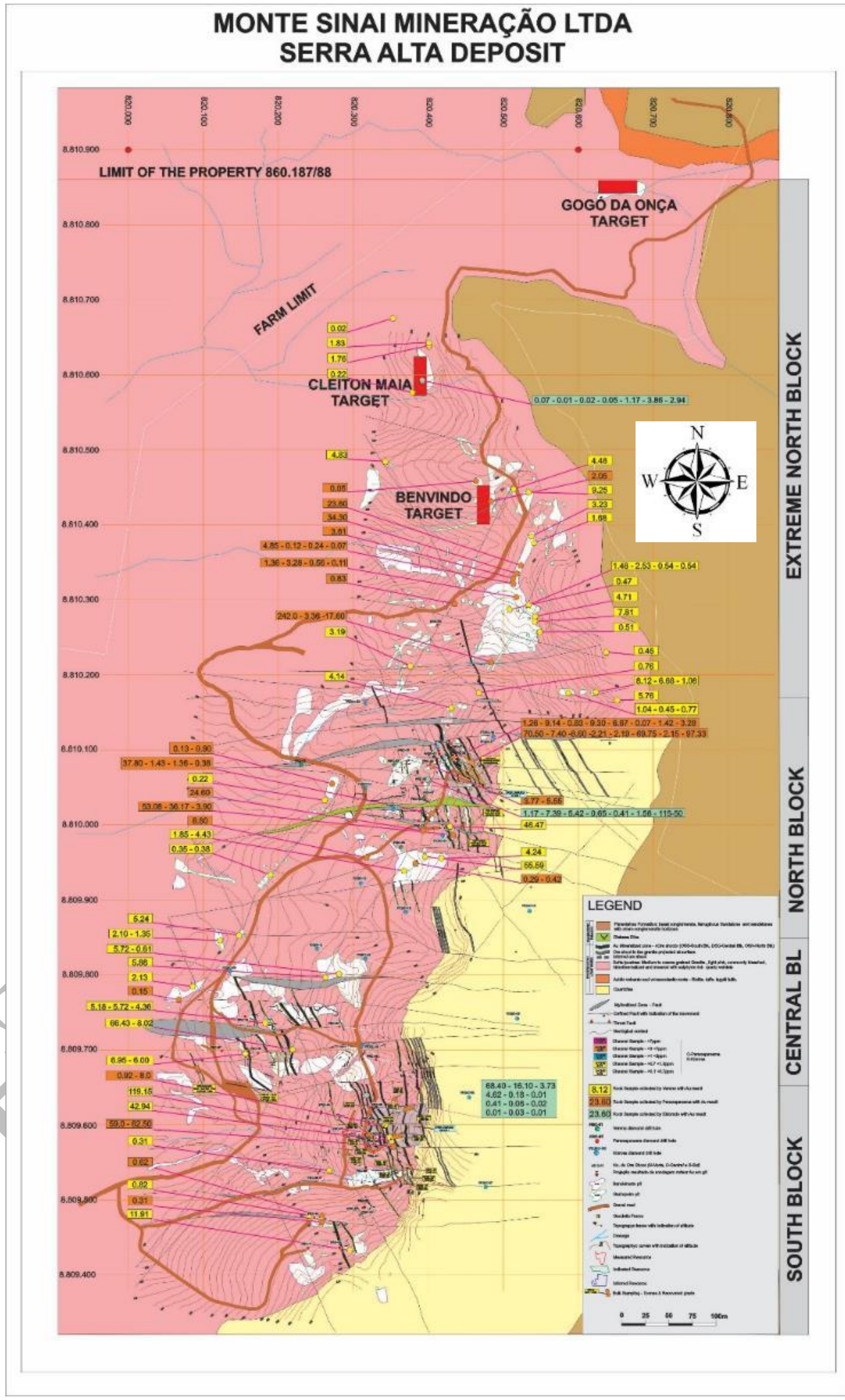
Modern exploration commenced in 1985 with work by Verena Mineração Ltda. (VML) and related companies. VML was incorporated in 1986 by the current directors of MSM to explore for gold in Tocantins State, particularly in the region of Porto Nacional and Monte do Carmo.

Investments in mineral exploration, by entities other than Cerrado, amounted to US$4.7 million from 1985 through 1995, and over US$20.0 million from 1996 to date. Most of the investment was applied in the Monte do Carmo project area with many known occurrences of gold.

In the modern exploration history of the Monte do Carmo project, the following events took place:

- 1985 to 1988 - Commencement of exploration in the Monte do Carmo area. Large volume sampling (900 t) of large quartz veins in the southern concessions, called Giant Quartz Veins.

**Figure 6.1**
**Serra Alta Geological Map Showing Artisanal Workings in White**




Source: MSM 2012. Scale in metres on map grid.

- 1989 - Joint venture (JV) with Rio Tinto. Investment of US$1.0 million. Work concentrated on the Giant Quartz Veins. A total of 26 veins were mapped and sampled. Four were drilled (53 diamond drill holes, totaling 3.876.30 m). Their size was considered insufficient for Rio Tinto, which, at the time, was looking for deposits with 3 million ounces or more of contained gold.

- 1989 to 1990 - Partnership with Musa Engenharia Ltda. Construction of the Torre Mine, a heap leach mining operation near Porto Nacional. The operation was abruptly interrupted by the advent of the Collor Plan (a government inflation stabilization plan, 03/15/1990), which drastically reduced the price of gold and effectively confiscated the company's working capital, making its continued operation unfeasible. About 5,000 tonnes of ore were processed.

- 1991 to 1992 - Partnership with the Paranapanema Group (PNP). Efforts focused on the Monte do Carmo region, with greater attention paid to the hydrothermally altered granite zone (Serra Alta). Investments made were equivalent to US$1.6 million, including 3,718.79 m of diamond drilling. The grades encountered were considered insufficient for continuity of the project, mainly due to the price of gold at the time.

- 1994 - Partnership with Companhia Nacional de Mineração (CNM, of the EBX Group). Invested US$1.1 million, focusing on shear zones in metavolcanic rocks, near the municipalities of Porto Nacional and Natividade.

- 1996 - Formation of Verena Minerals Corporation (VMC), aimed at attracting risk capital on a Canadian stock exchange. Investments were prioritized in the State of Tocantins, once again with emphasis on Porto Nacional and Monte do Carmo. The company remained listed on TSX-V until 2010.

- 1996 - VMC undertook an extensive and detailed 200 x 200 m magnetometer and Gama-Spectrometry Airborne Geophysics Survey covering an area of about 170 x 50 km. The data highlighted tectonic structures and mafic-ultramafic layered intrusions within the volcano-sedimentary sequence, one being the BIT-03 Target. This was partially explored by VMC. The last significant exploration work was carried out for gold in a shear zone crossing the intrusion on the property. Selected targets for gold were then mapped and soil geochemistry, terrestrial geophysics, trenching and exploratory diamond drilling were conducted (total drilled: 7,416.95 m).

- 1998 - VMC conducted a similar airborne geophysical survey in the area of the Conceição do Tocantins target.

- 2004 - Exploration work on the Serra Alta target recommenced with detailed mapping, sampling and diamond drilling (total drilled: 2,224 m).

- 2005 to 2008 - JV with Kinross at the Serra Alta target. Exploration work was conducted in the hydrothermally altered granite and quartz veins, with a further 5,043.05 m of diamond drilling. Investments made were the equivalent of US$3.5 million. However, the minimum target of 2 million ounces of contained gold was not defined and, given the uncertainties generated by the US financial crisis in 2008, the JV was undone. The properties were returned along with delivery of the technical data obtained.

- 2009 - VMC suspended investments in the Monte do Carmo region and redirected its efforts to the Volta Grande Gold Project in Para State.

- 2010 - The Forbes & Manhattan Group took over VMC, changing its name to Belo Sun Mining Corp.

- 2010 - The mineral rights to the concessions in the Monte do Carmo area were transferred to MSM, the current holder (pending formal assignment to SAML, see Section 4.2 above for clarification). MSM was engaged in the discovery and evaluation of the feasibility of operation of small to medium sized gold deposits.

- 2012 to August, 2017 - Partnership with the Paranaense Group from Parana State. Investment of approximately US$4.5 million in infrastructure and a bulk sampling gravity plant at Serra Alta which processed about 60,000 tons of ore and produced 2,923 oz of gold. The QP has not verified any of the production claims made by MSM.

The drilling at Serra Alta, outlined above, is described in more detail in Section 10 of this report.

The end of the garimpeiro mining on the granite at Serra Alta provided full access to places of interest and the observation of relevant geological features previously inaccessible. This, combined with the exposures created by the mining activities of 2012 to 2017, made it possible to better understand the geometry of, and controls on, the mineralized zone.

Cerrado became involved in the project in September, 2017.

### 6.3 HISTORIC DRILLING

From 1989, up to Cerrado's involvement in the project in 2017, a total of 150 drill holes, totaling 14,630.97 m, were completed on the Giant Quartz Veins, Serra Alta, Capitão and Bit-3 targets (Table 6.1). The collar information for the holes drilled at Serra Alta is presented in Table 6.2.

**Table 6.1**
**Monte do Carmo Project, Historical Drilling Summary**

| Targets | Verena | | Paranapanema | | Kinross | | Rio Tinto | | Total Metres | Total Holes | ANM Concession |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metres | No. Of Holes | Metres | No. Of Holes | Metres | No. Of Holes | Metres | No. Of Holes | | | |
| Serra Alta | 449.90 | 5 | 2,713.57 | 31 | 3,083.30 | 17 | 0.00 | 0 | 6,246.77 | 53 | 860.187/88 |
| Giant Qtz Veins | 0.00 | 0 | 1,061.05 | 17 | 436.90 | 4 | 3,876.30 | 53 | 5,374.25 | 74 | 864.442/05 |
| Capitão | 0.00 | 0 | 0.00 | 0 | 1,086.30 | 8 | 0.00 | 0 | 1,086.30 | 8 | 860.187/88 |
| Bit-3 | 1,924.00 | 14 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 1,924.00 | 14 | 864.352/12 |
| Ferradura | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 864.450/10 |
| Eduardo | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 864.450/10 |
| | | | | | | | | | | | |
| **Total** | **2,373.90** | **19** | **3,774.62** | **48** | **4,606.15** | **30** | **3,876.30** | **53** | **14,630.97** | **150** | |

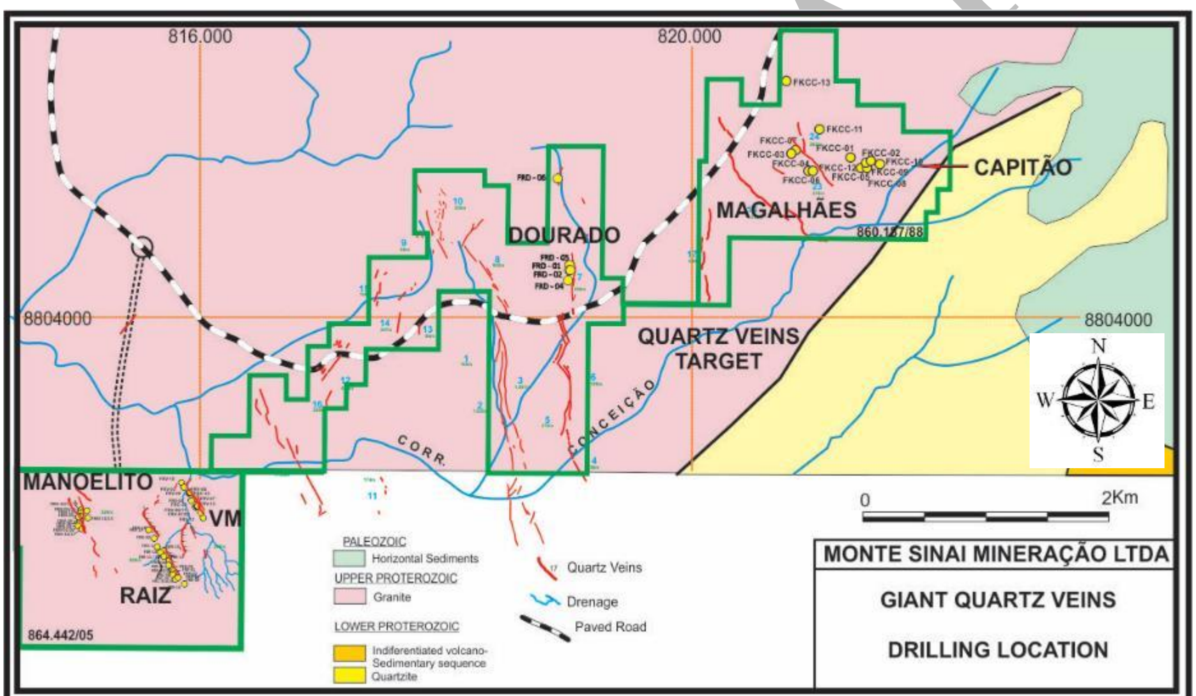
**Table 6.2**
**Historical Drill Hole Collar Information at Serra Alta**

| Drill Hole | X Coordinate | Y Coordinate | Elevation | Drill Hole | Company | Period | Dip | Az. |
|---|---|---|---|---|---|---|---|---|
| FKMC-01 | 820411.33 | 8810104.66 | 199.30 | 454.57 | Kinross | 2006/2007 | -45.00 | 199.30 |
| FKMC-02 | 820316.20 | 8810162.92 | 310.20 | 449.19 | Kinross | 2006/2007 | -50.00 | 310.20 |
| FKMC-03 | 820419.31 | 8809985.31 | 163.30 | 458.52 | Kinross | 2006/2007 | -50.00 | 163.30 |
| FKMC-04 | 820316.37 | 8810049.58 | 201.90 | 435.17 | Kinross | 2006/2007 | -50.00 | 201.90 |
| FKMC-05 | 820135.80 | 8809804.50 | 164.35 | 415.60 | Kinross | 2006/2007 | -50.00 | 164.35 |
| FKMC-06 | 820312.27 | 8809705.91 | 220.10 | 478.49 | Kinross | 2006/2007 | -40.00 | 220.10 |
| FKMC-07 | 820476.43 | 8809517.50 | 148.10 | 541.51 | Kinross | 2006/2007 | -50.00 | 148.10 |
| FKMC-08 | 820454.60 | 8809636.86 | 145.10 | 563.38 | Kinross | 2006/2007 | -50.00 | 145.10 |
| FKMC-09 | 820518.62 | 8809742.03 | 220.10 | 564.49 | Kinross | 2006/2007 | -50.00 | 220.10 |
| FKMC-10 | 820535.03 | 8809885.39 | 220.10 | 561.66 | Kinross | 2006/2007 | -50.00 | 220.10 |
| FKMC-11 | 820252.02 | 8809835.35 | 92.70 | 445.45 | Kinross | 2006/2007 | -45.00 | 92.70 |
| FKMC-12 | 820370.53 | 8809884.19 | 163.10 | 469.88 | Kinross | 2006/2007 | -45.00 | 163.10 |
| FKMC-13 | 820310.36 | 8809922.33 | 157.10 | 452.46 | Kinross | 2006/2007 | -45.00 | 157.10 |
| FKMC-14 | 820353.64 | 8810020.89 | 142.10 | 445.64 | Kinross | 2006/2007 | -45.00 | 142.10 |
| FKMC-15 | 820316.33 | 8809821.40 | 77.75 | 464.53 | Kinross | 2006/2007 | -45.00 | 77.75 |
| FKMC-16 | 820486.61 | 8810117.80 | 231.80 | 489.72 | Kinross | 2006/2007 | -40.00 | 231.80 |
| FKMC-17 | 820486.88 | 8810117.52 | 226.20 | 489.69 | Kinross | 2006/2007 | -50.00 | 226.20 |
| FRC-01 | 820286.80 | 8809590.60 | 84.19 | 459.06 | PNP | 1991/1992 | -60.00 | 84.19 |
| FRC-02 | 820323.98 | 8809585.53 | 89.99 | 478.91 | PNP | 1991/1992 | -60.00 | 89.99 |
| FRC-03 | 820266.26 | 8809632.88 | 101.75 | 441.87 | PNP | 1991/1992 | -60.00 | 101.75 |
| FRC-04 | 820280.51 | 8809731.66 | 70.00 | 468.69 | PNP | 1991/1992 | -60.00 | 70.00 |
| FRC-05 | 820316.03 | 8809543.52 | 102.90 | 467.53 | PNP | 1991/1992 | -60.00 | 102.90 |
| FRC-06 | 820325.58 | 8809686.42 | 117.85 | 484.20 | PNP | 1991/1992 | -60.00 | 117.85 |
| FRC-07 | 820119.62 | 8809699.97 | 83.63 | 412.81 | PNP | 1991/1992 | -60.00 | 83.63 |
| FRC-08 | 820254.13 | 8809533.37 | 87.65 | 447.55 | PNP | 1991/1992 | -60.00 | 87.65 |
| FRC-09 | 820323.47 | 8809623.39 | 98.20 | 473.15 | PNP | 1991/1992 | -60.00 | 98.20 |
| FRC-10 | 820172.87 | 8809696.03 | 86.55 | 436.84 | PNP | 1991/1992 | -60.00 | 86.55 |
| FRC-11 | 820238.25 | 8809442.11 | 119.57 | 498.20 | PNP | 1991/1992 | -50.00 | 119.57 |
| FRC-12 | 820412.20 | 8810096.84 | 102.53 | 455.00 | PNP | 1991/1992 | -50.00 | 102.53 |
| FRC-13 | 820156.92 | 8809748.46 | 91.08 | 425.71 | PNP | 1991/1992 | -50.00 | 91.08 |
| FRC-14 | 820281.81 | 8809438.06 | 100.52 | 507.35 | PNP | 1991/1992 | -50.00 | 100.52 |
| FRC-15 | 820381.56 | 8810100.71 | 125.43 | 449.54 | PNP | 1991/1992 | -50.00 | 125.43 |
| FRC-16 | 820313.03 | 8809489.61 | 121.65 | 487.69 | PNP | 1991/1992 | -50.00 | 121.65 |
| FRC-17 | 820386.97 | 8810005.65 | 120.75 | 452.25 | PNP | 1991/1992 | -50.00 | 120.75 |
| FRC-18 | 820246.64 | 8809480.67 | 105.90 | 482.69 | PNP | 1991/1992 | -50.00 | 105.90 |
| FRC-19 | 820426.49 | 8810273.22 | 137.30 | 531.95 | PNP | 1991/1992 | -60.00 | 137.30 |
| FRC-20 | 820438.83 | 8810136.47 | 36.15 | 462.81 | PNP | 1991/1992 | -50.00 | 36.15 |
| FRC-21 | 820432.19 | 8810108.54 | 100.70 | 455.00 | PNP | 1991/1992 | -50.00 | 100.70 |
| FRC-22 | 820313.03 | 8809489.61 | 67.11 | 487.69 | PNP | 1991/1992 | -50.00 | 67.11 |
| FRC-23 | 820313.03 | 8809489.61 | 73.84 | 487.69 | PNP | 1991/1992 | -60.00 | 73.84 |
| FRC-24 | 820403.42 | 8810082.35 | 104.35 | 455.86 | PNP | 1991/1992 | -50.00 | 104.35 |
| FRC-25 | 820391.96 | 8810056.55 | 82.86 | 451.63 | PNP | 1991/1992 | -50.00 | 82.86 |
| FRC-26 | 820437.91 | 8810092.37 | 79.75 | 454.72 | PNP | 1991/1992 | -50.00 | 79.75 |
| FRC-27 | 820393.80 | 8810035.18 | 74.87 | 451.68 | PNP | 1991/1992 | -50.00 | 74.87 |
| FRC-28 | 820330.17 | 8809583.30 | 70.24 | 480.13 | PNP | 1991/1992 | -45.00 | 70.24 |
| FRC-29 | 820330.17 | 8809583.30 | 65.21 | 480.13 | PNP | 1991/1992 | -90.00 | 65.21 |

| Drill Hole | X Coordinate | Y Coordinate | Elevation | Drill Hole | Company | Period | Dip | Az. |
|---|---|---|---|---|---|---|---|---|
| FRC-30B | 820326.58 | 8809603.99 | 11.05 | 479.55 | PNP | 1991/1992 | -70.00 | 11.05 |
| FMC-01 | 820372.56 | 8810116.76 | 85.90 | 445.00 | Verena | 1997 | -45.00 | 85.90 |
| FMC-02 | 820400.76 | 8810036.86 | 86.25 | 456.77 | Verena | 1997 | -45.00 | 86.25 |
| FMC-03 | 820361.06 | 8810082.56 | 85.45 | 447.73 | Verena | 1997 | -45.00 | 85.45 |
| FMC-04 | 820370.06 | 8809974.06 | 103.30 | 458.42 | Verena | 1997 | -45.00 | 103.30 |
| FMC-05 | 820234.16 | 8810081.36 | 89.00 | 429.20 | Verena | 1997 | -45.00 | 89.00 |

The first drilling was carried out by Rio Tinto in a JV with VML in 1989. Rio Tinto completed 53 RC drill holes totaling 3,876.30 m at three of the Giant Quartz Veins, Raiz (20 holes), VM (16 holes) and Manoelito (17 holes) (Figure 6.1 and 6.2).

**Figure 6.2**
**Giant Quartz Veins Map Showing the Location of the Rio Tinto and PNP Drill Hole Locations**




Source: MSM, 2018

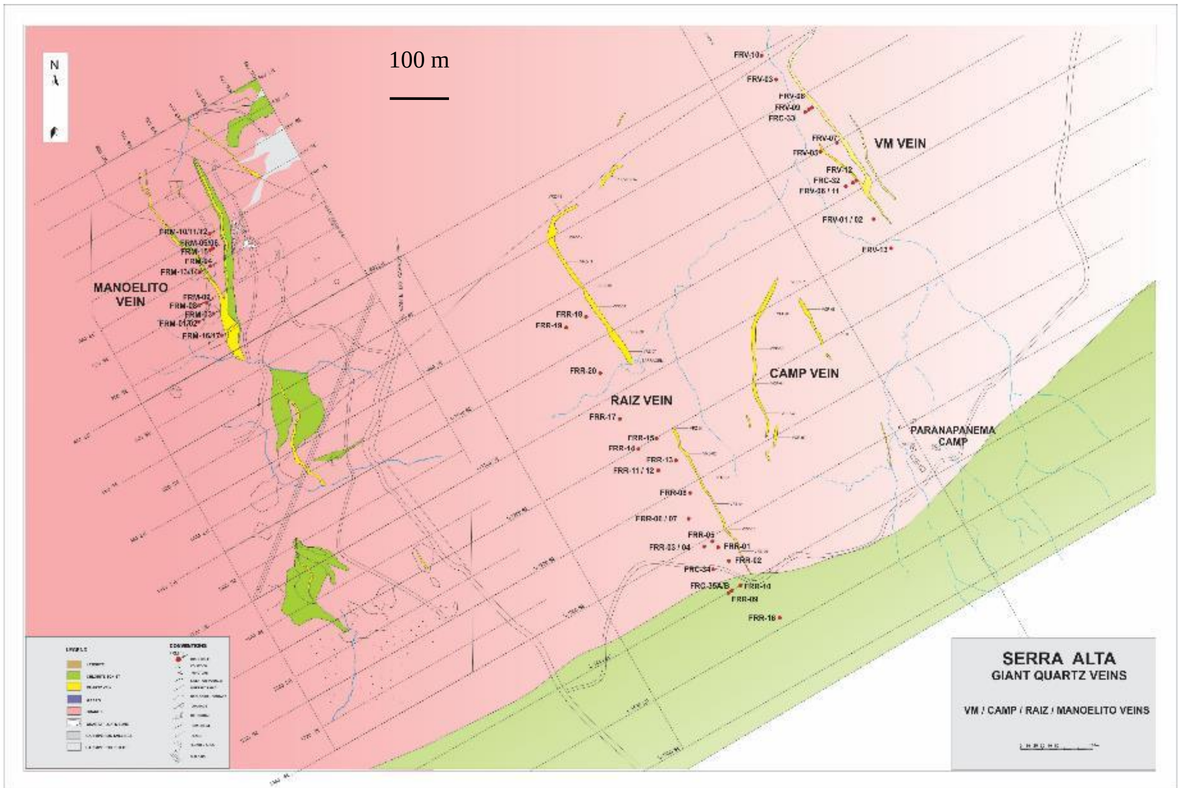
At the Capitão target, the surface auriferous potential was first confirmed through channel sampling. The objective of the work was to test the potential in the gold bearing granite zones and in the Magalhães giant quartz veins system. Table 6.3 presents the better drill hole intercepts from drilling at Capitão (Kinross 2007).

**Table 6.3**
**Capitão Drilling Summary**

| Hole Number | From (m) | To (m) | Width (m) | Au (g/t) | Peak Value (Au g/t) |
|---|---|---|---|---|---|
| FKCC-01 | 20.70 | 24.52 | 3.82 | 0.30 | 21.45 |
| | 52.20 | 73.90 | 21.70 | 1.76 | |
| | 60.40 | 68.74 | 8.34 | 3.73 | |
| | 64.50 | 68.74 | 4.24 | 6.13 | |
| | 75.70 | 76.60 | 0.90 | 0.97 | |
| | 94.60 | 96.80 | 2.20 | 1.12 | |
| | 110.44 | 111.34 | 0.90 | 7.91 | |
| FKCC-02 | 33.55 | 45.50 | 11.95 | 0.36 | 1.29 |
| | 80.51 | 81.24 | 0.73 | 0.73 | |
| FKCC-03 | Nothing Over 0.5 g/t | | | | |
| FKCC-04 | 54.51 | 55.27 | 0.76 | 2.86 | |
| FKCC-05 | 44.29 | 44.79 | 0.50 | 2.86 | |
| FKCC-06 | Nothing Over 0.5 g/t | | | | |
| FKCC-07 | 19.63 | 20.25 | 0.62 | 5.96 | |
| FKCC-08 | 2.90 | 5.30 | 2.40 | 1.77 | 4.67 |
| FKCC-09 | 18.50 | 31.45 | 12.95 | 0.84 | 3.23 |
| | 51.09 | 61.45 | 10.36 | 0.51 | |
| | 51.09 | 54.20 | 3.11 | 1.13 | |
| | 59.93 | 60.70 | 0.77 | 0.70 | |
| FKCC-10 | Nothing Over 0.5 g/t | | | | |
| FKCC-11 | Nothing Over 0.5 g/t | | | | |
| FKCC-12 | 33.10 | 34.10 | 1.00 | 4.07 | 4.07 |
| | 43.10 | 44.10 | 1.00 | 0.77 | |
| | 86.10 | 93.10 | 7.00 | 0.24 | |
| FKCC-13 | Nothing Over 0.5 g/t | | | | |

Figure 6.3 presents a geological map of the Raiz, VM and Manoelito veins.

**Figure 6.3**
**Geology and Drill Hole Locations, Raiz, VM and Manoelito Veins**



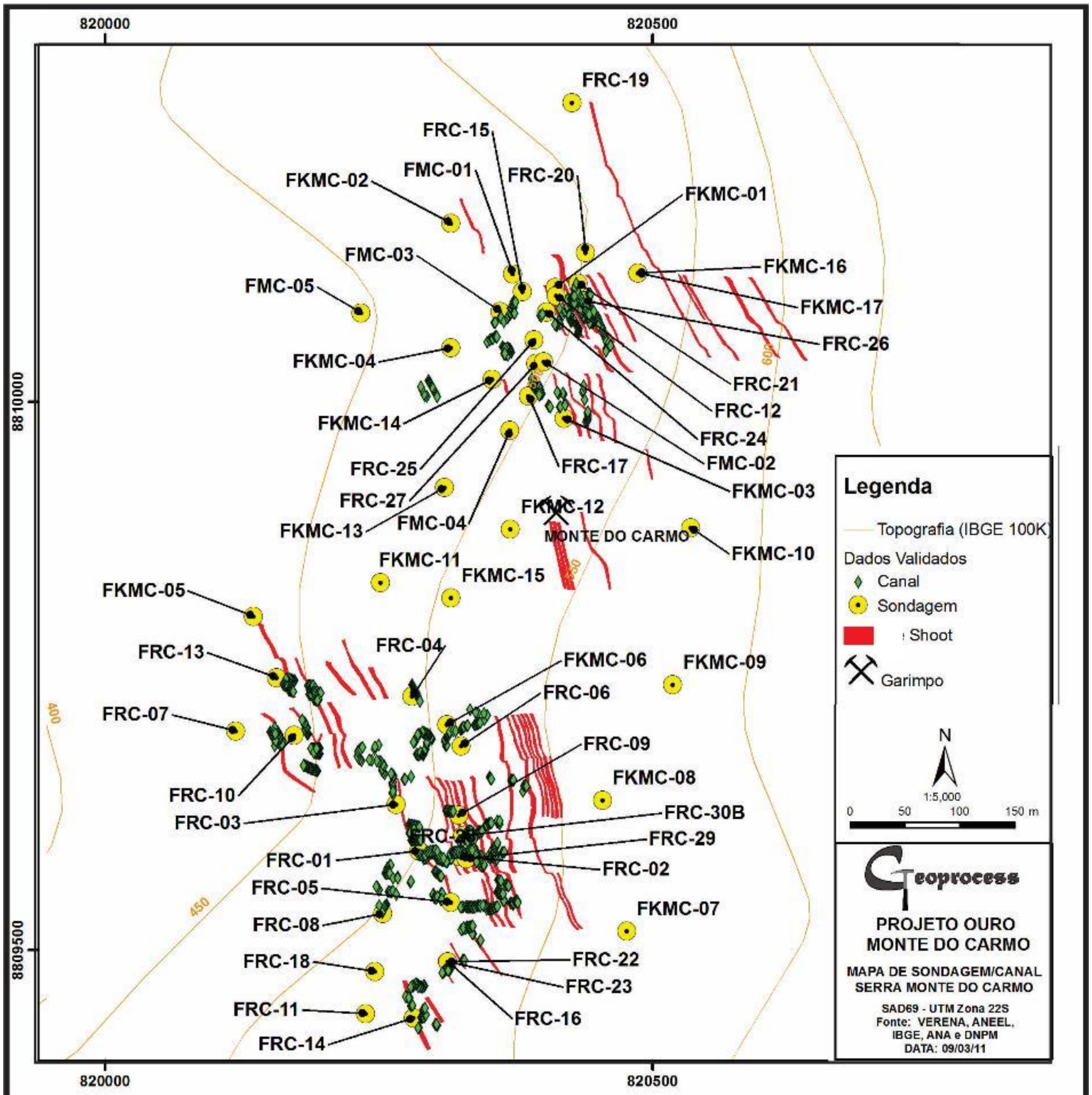

Source MSM, 2018

In 1991 and 1992, the PNP Group, through its subsidiary Mineração Taboca, in a JV with VML, completed 47 diamond drill holes. 31 holes were drilled at the Serra Alta target (2,713.57 m, Figure 6.4) and 17 at the Giant Quartz Veins (Figure 6.1), of which two drill holes targeted the VM Vein (96.53 m), four targeted the Raiz Vein (247.79 m), six targeted the Dourado Vein (378.19 m, Figure 6.5) and five targeted the Frontel Vein (338.54 m, Figure 6.6).

In 1997/98, VMC drilled 20 holes, totaling 2,373.90 m, 14 at the Bit-3 target (1,924.0 m, Figure 6.7) and 5 holes at the Serra Alta target (449.90 m, Figure 6.4).

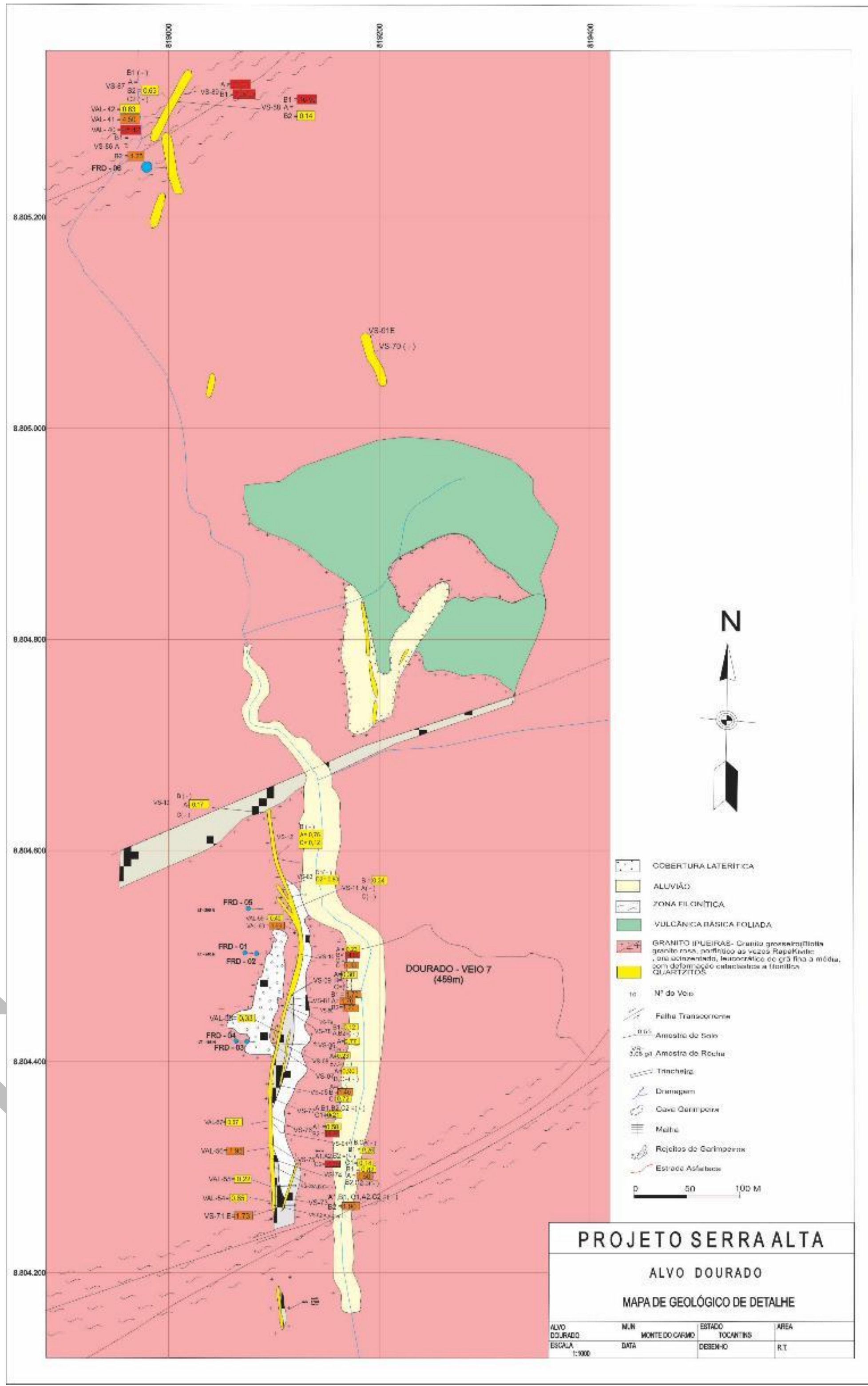
In 2006 and 2007, Kinross, in a JV with VMC, completed 30 drill holes totaling 4,606.15 m, 17 of which were at the Serra Alta target (3,083.30 m Figure 6.3), 9 holes were at the Capitão target (1,085.95 m - Figure 6.1) and four holes were on the Giant Quartz Veins target (436.90 m, Figure 6.8).

**Figure 6.4**
**Serra Alta Drill Hole Locations**



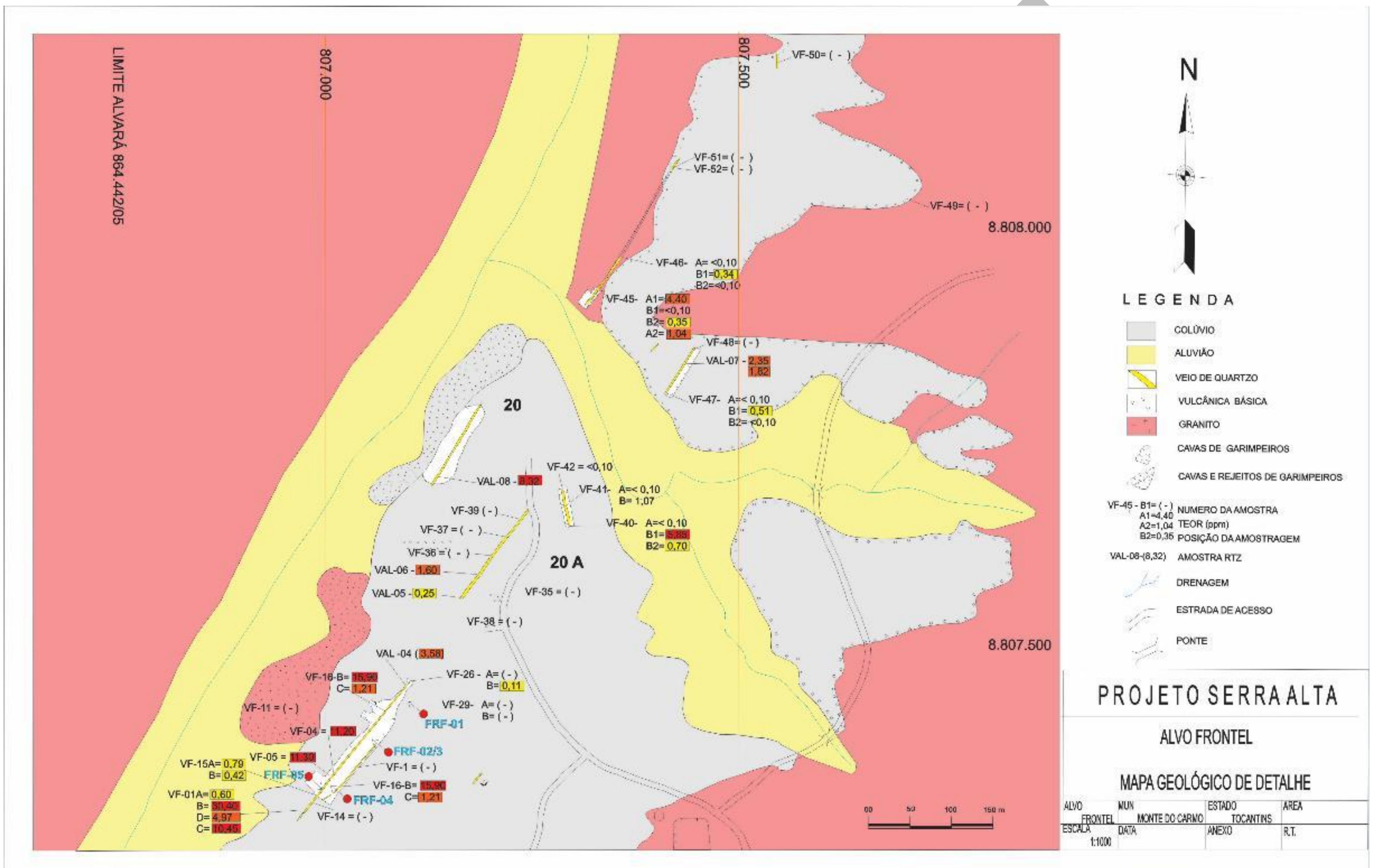

Source: MSM. Paranapanema holes (FRC), Kinross holes (FKMC) and Verena holes (FMC)

**Figure 6.5**
**Dourado Vein Details, Geology and Paranapanema Hole Locations**



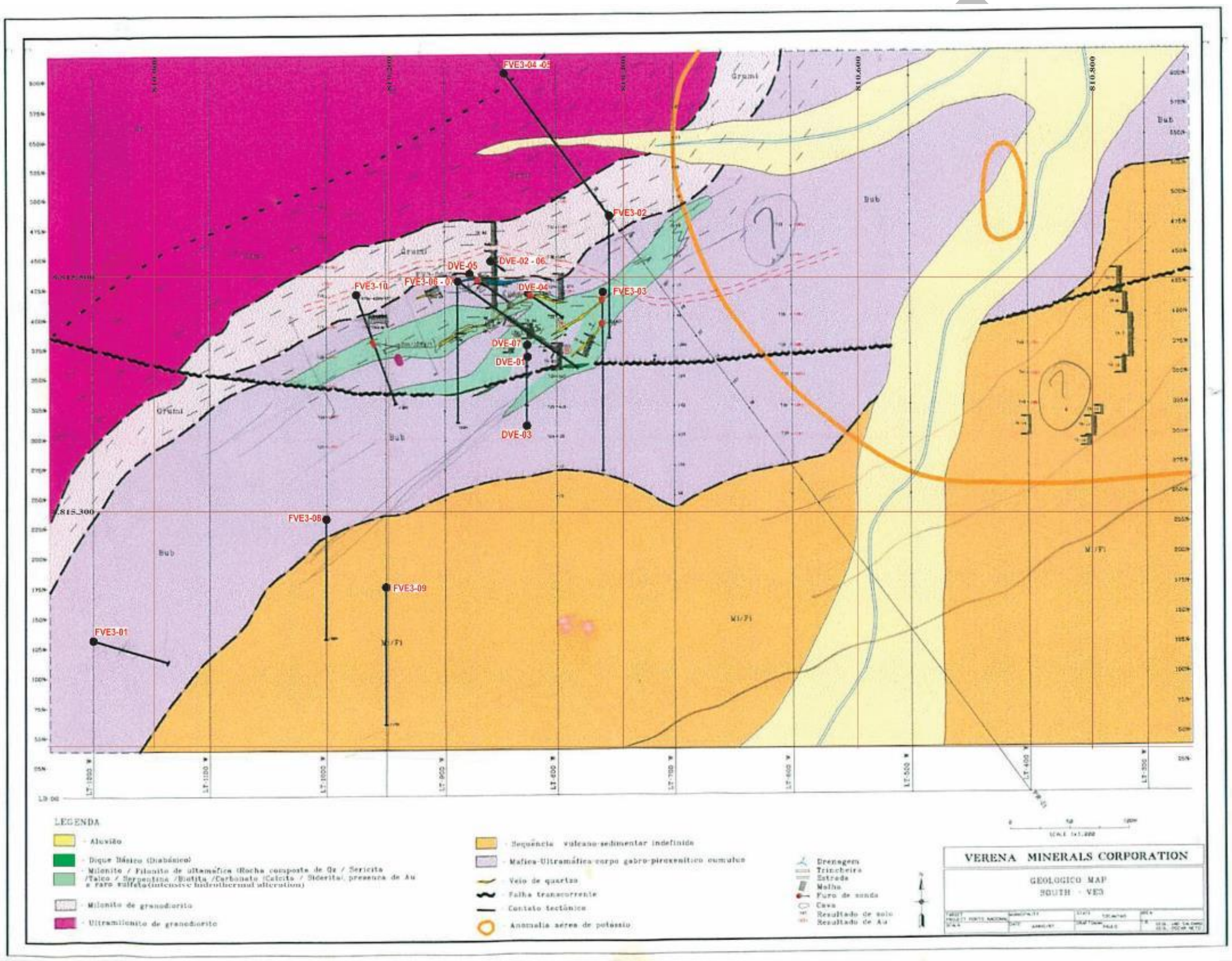

Source: MSM 2018.

**Figure 6.6**
**Frontel Vein - Geology and Drill Hole Locations**




Source: MSM 2018

**Figure 6.7**
**Bit-3 Geology and Verena DDH location**




Source: MSM 2018



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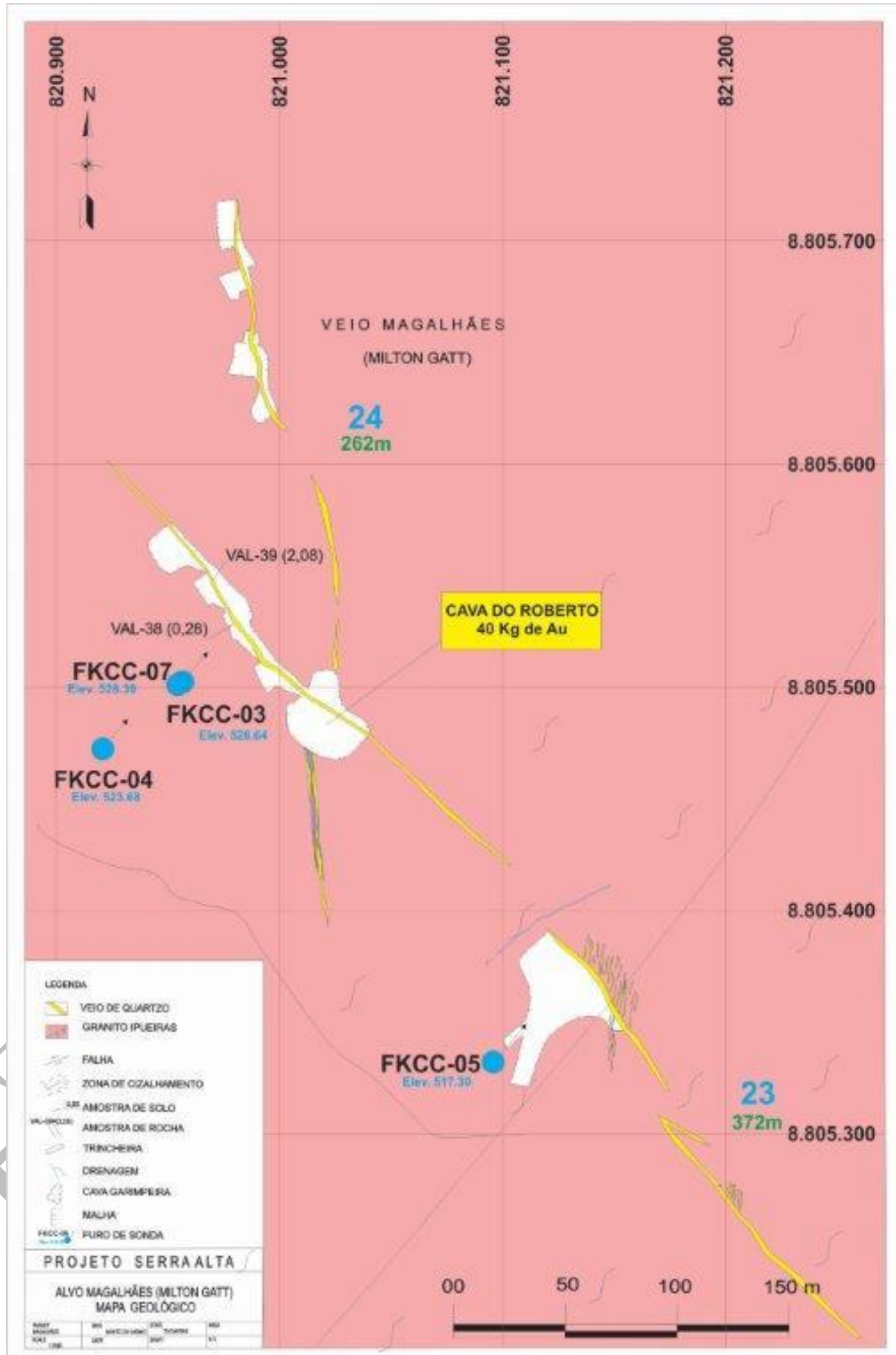
**Figure 6.8**
**Magalhães Vein Showing Kinross Drill Hole Locations**




Source: MSM 2018

Table 6.4 shows a summary of the drill methods and core sizes used by the various companies at the Monte do Carmo project.

**Table 6.4**
**Drilling Type Summary**

| Company | Drill Contractor | Drilling Method | Core Size | | Analytical Method |
|---|---|---|---|---|---|
| | | | Weathered Rock | Fresh Rock | |
| Rio Tinto | Geosol | RC | HX | NX | Fire Assay/AAS |
| PNP | Geosol | Diamond | NX | BX | AAS/MIBK collector |
| Verena | Isoagua | Diamond | NX | BX | Fire Assay/AAS |

AAS = atomic absorption spectroscopy (AAS)

Table 6.5 presents a list of significant intersections from the historical drilling at the Serra Alta Deposit. As Serra Alta is the focus of Cerrado's exploration activity going forward, results from drilling at the other targets will not be discussed further.

**Table 6.5**
**Significant Historical Drill Intersections from Serra Alta**

| Hole Number | From | To | Length | Au (g/t) |
|---|---|---|---|---|
| FKMC-01 | 0.85 | 4.00 | 3.15 | 1.62 |
| FKMC-01 | 9.88 | 32.00 | 22.12 | 3.62 |
| FKMC-01 | 34.00 | 35.00 | 1.00 | 1.12 |
| FKMC-01 | 55.00 | 63.50 | 8.50 | 0.19 |
| FKMC-01 | 64.50 | 71.38 | 6.88 | 0.63 |
| FKMC-01 | 85.90 | 87.40 | 1.50 | 0.39 |
| FKMC-01 | 110.55 | 113.05 | 2.50 | 1.13 |
| FKMC-01 | 171.15 | 173.15 | 2.00 | 0.38 |
| FKMC-02 | 1.80 | 5.20 | 3.40 | 0.64 |
| FKMC-02 | 31.28 | 34.50 | 3.22 | 1.54 |
| FKMC-02 | 53.70 | 61.50 | 7.80 | 0.49 |
| FKMC-02 | 77.70 | 83.50 | 5.80 | 0.47 |
| FKMC-02 | 97.60 | 99.20 | 1.60 | 0.23 |
| FKMC-03 | 3.10 | 4.10 | 1.00 | 0.84 |
| FKMC-03 | 10.45 | 23.45 | 13.00 | 1.08 |
| FKMC-03 | 38.21 | 39.30 | 1.09 | 4.21 |
| FKMC-03 | 61.15 | 62.68 | 1.53 | 0.48 |
| FKMC-03 | 73.82 | 76.82 | 3.00 | 0.51 |
| FKMC-03 | 89.30 | 91.38 | 2.08 | 2.66 |
| FKMC-03 | 135.30 | 136.80 | 1.50 | 1.23 |
| FKMC-04 | 0.00 | 7.57 | 7.57 | 0.90 |
| FKMC-04 | 48.40 | 49.14 | 0.74 | 0.49 |
| FKMC-06 | 23.49 | 24.75 | 1.26 | 1.61 |
| FKMC-06 | 40.25 | 54.50 | 14.25 | 0.60 |
| FKMC-06 | 57.60 | 75.57 | 17.97 | 0.49 |
| FKMC-06 | 77.55 | 89.93 | 12.38 | 0.02 |
| FKMC-06 | 108.60 | 109.60 | 1.00 | 0.88 |
| FKMC-07 | 83.71 | 95.40 | 11.69 | 1.22 |
| FKMC-07 | 106.81 | 109.81 | 3.00 | 0.50 |
| FKMC-07 | 143.00 | 144.10 | 1.10 | 0.60 |
| FKMC-08 | 74.23 | 84.01 | 9.78 | 2.00 |
| FKMC-08 | 94.60 | 107.02 | 12.42 | 5.37 |

| Hole Number | From | To | Length | Au (g/t) |
|---|---|---|---|---|
| FKMC-08 | 116.92 | 124.36 | 7.44 | 0.56 |
| FKMC-10 | 151.84 | 152.80 | 0.96 | 0.90 |
| FKMC-10 | 193.10 | 196.90 | 3.80 | 0.74 |
| FKMC-12 | 31.10 | 37.97 | 6.87 | 1.29 |
| FKMC-12 | 42.00 | 57.80 | 15.80 | 1.82 |
| FKMC-12 | 57.80 | 65.40 | 7.60 | 0.13 |
| FKMC-12 | 65.40 | 70.77 | 5.37 | 0.61 |
| FKMC-12 | 70.77 | 72.00 | 1.23 | 0.08 |
| FKMC-12 | 80.15 | 82.10 | 1.95 | 0.12 |
| FKMC-12 | 82.10 | 86.10 | 4.00 | 0.95 |
| FKMC-12 | 149.66 | 150.47 | 0.81 | 2.10 |
| FKMC-13 | 46.70 | 47.70 | 1.00 | 2.79 |
| FKMC-13 | 57.74 | 59.74 | 2.00 | 1.33 |
| FKMC-13 | 76.27 | 80.20 | 3.93 | 0.82 |
| FKMC-13 | 96.10 | 98.10 | 2.00 | 0.54 |
| FKMC-13 | 121.10 | 122.15 | 1.05 | 6.92 |
| FKMC-13 | 140.10 | 141.10 | 1.00 | 0.39 |
| FKMC-14 | 11.60 | 13.39 | 1.79 | 3.35 |
| FKMC-14 | 90.53 | 94.49 | 3.96 | 0.31 |
| FKMC-16 | 44.40 | 50.40 | 6.00 | 1.64 |
| FKMC-16 | 63.00 | 64.00 | 1.00 | 1.29 |
| FKMC-16 | 96.00 | 102.00 | 6.00 | 2.16 |
| FKMC-16 | 121.60 | 135.80 | 14.20 | 2.76 |
| FKMC-17 | 41.73 | 47.40 | 5.67 | 3.10 |
| FKMC-17 | 78.35 | 79.52 | 1.17 | 0.69 |
| FKMC-17 | 110.90 | 120.00 | 9.10 | 0.68 |
| FMC-01 | 17.00 | 19.00 | 2.00 | 0.52 |
| FMC-01 | 42.00 | 51.00 | 9.00 | 1.18 |
| FMC-01 | 54.00 | 56.00 | 2.00 | 3.16 |
| FMC-01 | 63.00 | 73.00 | 10.00 | 0.33 |
| FMC-02 | 1.00 | 3.00 | 2.00 | 2.51 |
| FMC-02 | 34.00 | 39.00 | 5.00 | 1.73 |
| FMC-02 | 41.00 | 59.00 | 18.00 | 0.96 |
| FMC-02 | 78.00 | 81.00 | 3.00 | 1.48 |
| FMC-03 | 0.00 | 1.00 | 1.00 | 0.09 |
| FMC-03 | 12.00 | 13.00 | 1.00 | 0.44 |
| FMC-03 | 46.00 | 51.00 | 5.00 | 1.26 |
| FMC-03 | 68.00 | 69.00 | 1.00 | 0.66 |
| FMC-04 | 30.00 | 36.00 | 6.00 | 0.62 |
| FMC-04 | 42.00 | 47.00 | 5.00 | 0.53 |
| FMC-04 | 56.00 | 60.00 | 4.00 | 0.52 |
| FRC-02 * | 23.00 | 26.00 | 3.00 | 0.52 |
| FRC-02 * | 28.00 | 31.50 | 3.50 | 2.29 |
| FRC-02 * | 48.00 | 49.00 | 1.00 | 0.41 |
| FRC-02 * | 66.00 | 72.00 | 6.00 | 5.05 |
| FRC-04 * | 12.00 | 14.00 | 2.00 | 0.74 |
| FRC-05 * | 0.00 | 0.80 | 0.80 | 2.84 |
| FRC-05 * | 80.00 | 81.00 | 1.00 | 0.54 |
| FRC-06 * | 21.00 | 22.00 | 1.00 | 0.72 |
| FRC-06 * | 33.00 | 46.00 | 13.00 | 0.99 |
| FRC-06 * | 49.00 | 65.00 | 16.00 | 1.34 |

| Hole Number | From | To | Length | Au (g/t) |
|---|---|---|---|---|
| FRC-06 * | 68.00 | 78.55 | 10.55 | 0.47 |
| FRC-09 * | 0.00 | 0.80 | 0.80 | 4.09 |
| FRC-09 * | 5.00 | 8.00 | 3.00 | 0.59 |
| FRC-09 * | 23.00 | 28.00 | 5.00 | 0.62 |
| FRC-09 * | 51.00 | 53.00 | 2.00 | 0.97 |
| FRC-09 * | 67.00 | 68.00 | 1.00 | 0.76 |
| FRC-09 * | 77.00 | 80.00 | 3.00 | 0.92 |
| FRC-10 * | 14.00 | 15.00 | 1.00 | 1.17 |
| FRC-11 * | 16.00 | 18.00 | 2.00 | 1.09 |
| FRC-11 * | 32.00 | 33.00 | 1.00 | 2.48 |
| FRC-12 * | 0.00 | 5.00 | 5.00 | 2.36 |
| FRC-12 * | 7.60 | 32.00 | 24.40 | 1.39 |
| FRC-12 * | 49.00 | 50.00 | 1.00 | 5.13 |
| FRC-12 * | 61.00 | 72.00 | 11.00 | 0.93 |
| FRC-13 * | 9.00 | 13.00 | 4.00 | 0.68 |
| FRC-13 * | 18.00 | 20.00 | 2.00 | 0.97 |
| FRC-13 * | 22.00 | 24.00 | 2.00 | 4.15 |
| FRC-13 * | 34.00 | 35.00 | 1.00 | 1.62 |
| FRC-14 * | 3.00 | 4.00 | 1.00 | 0.32 |
| FRC-14 * | 8.00 | 9.00 | 1.00 | 0.65 |
| FRC-15 * | 12.00 | 33.00 | 21.00 | 1.35 |
| FRC-15 * | 49.00 | 54.00 | 5.00 | 2.88 |
| FRC-15 * | 68.00 | 69.00 | 1.00 | 0.40 |
| FRC-17 * | 7.00 | 14.00 | 7.00 | 1.42 |
| FRC-17 * | 27.00 | 28.00 | 1.00 | 2.53 |
| FRC-17 * | 33.00 | 35.00 | 2.00 | 1.64 |
| FRC-17 * | 39.00 | 40.00 | 1.00 | 5.58 |
| FRC-17 * | 48.00 | 49.00 | 1.00 | 1.35 |
| FRC-17 * | 67.00 | 68.00 | 1.00 | 0.88 |
| FRC-17 * | 85.00 | 86.00 | 1.00 | 0.56 |
| FRC-18 * | 3.00 | 4.35 | 1.35 | 0.45 |
| FRC-18 * | 16.00 | 17.00 | 1.00 | 0.81 |
| FRC-21 * | 22.00 | 26.00 | 4.00 | 2.60 |
| FRC-21 * | 29.00 | 31.00 | 2.00 | 1.21 |
| FRC-21 * | 52.00 | 53.00 | 1.00 | 1.50 |
| FRC-24 * | 9.00 | 29.00 | 20.00 | 0.92 |
| FRC-24 * | 37.00 | 40.00 | 3.00 | 0.77 |
| FRC-24 * | 50.00 | 51.00 | 1.00 | 0.61 |
| FRC-25 * | 0.00 | 1.00 | 1.00 | 0.75 |
| FRC-26 * | 0.00 | 5.00 | 5.00 | 0.70 |
| FRC-26 * | 11.00 | 15.00 | 4.00 | 1.23 |
| FRC-27 * | 0.00 | 1.70 | 1.70 | 0.47 |
| FRC-27 * | 7.50 | 9.00 | 1.50 | 1.55 |
| FRC-27 * | 17.00 | 18.00 | 1.00 | 1.71 |
| FRC-27 * | 62.00 | 63.00 | 1.00 | 1.04 |
| FRC-28 * | 4.00 | 7.00 | 3.00 | 1.64 |
| FRC-28 * | 9.00 | 13.00 | 4.00 | 2.14 |
| FRC-28 * | 15.00 | 19.00 | 4.00 | 1.05 |
| FRC-28 * | 20.00 | 27.00 | 7.00 | 0.93 |
| FRC-28 * | 35.00 | 38.00 | 3.00 | 1.12 |
| FRC-28 * | 55.00 | 58.00 | 3.00 | 0.91 |

| Hole Number | From | To | Length | Au (g/t) |
|---|---|---|---|---|
| FRC-29 * | 7.50 | 14.00 | 6.50 | 3.54 |
| FRC-29 * | 17.00 | 22.00 | 5.00 | 1.23 |
| FRC-29 * | 29.00 | 32.00 | 3.00 | 0.92 |
| FRC-29 * | 45.00 | 46.00 | 1.00 | 0.24 |
| FRC-29 * | 53.40 | 62.00 | 8.60 | 6.57 |
| FRC-30B * | 4.00 | 11.05 | 7.05 | 0.45 |

* - PNP assays performed by AAS analysis at their own laboratory. See cautionary language in Section 11.1.
FRC holes - PNP, FKMC holes - Kinross, FMC holes - Verena, FSA holes - Cerrado Gold

Cerrado has access to the assay certificates for the Kinross drilling. No PNP certificates are available. However, there is a PNP assay report with no sample numbers provided.

## 6.4 HISTORICAL RESOURCE ESTIMATES

There are no known mineral resource estimates for the Monte do Carmo project which have been prepared prior to the acquisition of the project by the current concession holder, MSM. An in-house estimate of resources has been prepared by a consultant to MSM (Geoprocess, 2011). This estimate is not considered to be NI 43-101 compliant and has not been reviewed by the QP. It is not disclosed here.

# 7.0 GEOLOGICAL SETTING AND MINERALIZATION

This chapter describes the regional and local geological setting and is taken from a summary provided by MSM. The main lithostratigraphic units and structures, metamorphism, hydrothermal alteration and weathering are discussed.

## 7.1 REGIONAL GEOLOGY

### 7.1.1 Main Litho-Stratigraphic Units

The regional scale geological map, edited by IBGE (2007), provides the best reference for description of the regional geology, as shown in Figure 7.1 below. It is a re-evaluation of information collected by Radambrasil, updated based on data obtained from third parties (CPRM, 2004, among others).

The synthesis incorporates information collected by MSM and related companies during the course of exploration in the region. As discussed below, the detailing of some targets added important data for understanding the geological context and the controls on the mineralization. There are also geochronological data derived by several researchers.

The regional geological framework is marked by a complex polyphase evolution. The region is the basement of the Araguaia Belt, which represents a Neoproterozoic orogenic belt, developed on the eastern edge of the Amazon Craton, in the zone of interaction with the São Francisco Craton. It is composed of metamorphic pelitic and psammitic sediments, felsic alkaline plutons, mafic-ultramafic bodies and granitic rocks (Schobbenhaus et al., 1984; Bizzi et al., 2003).

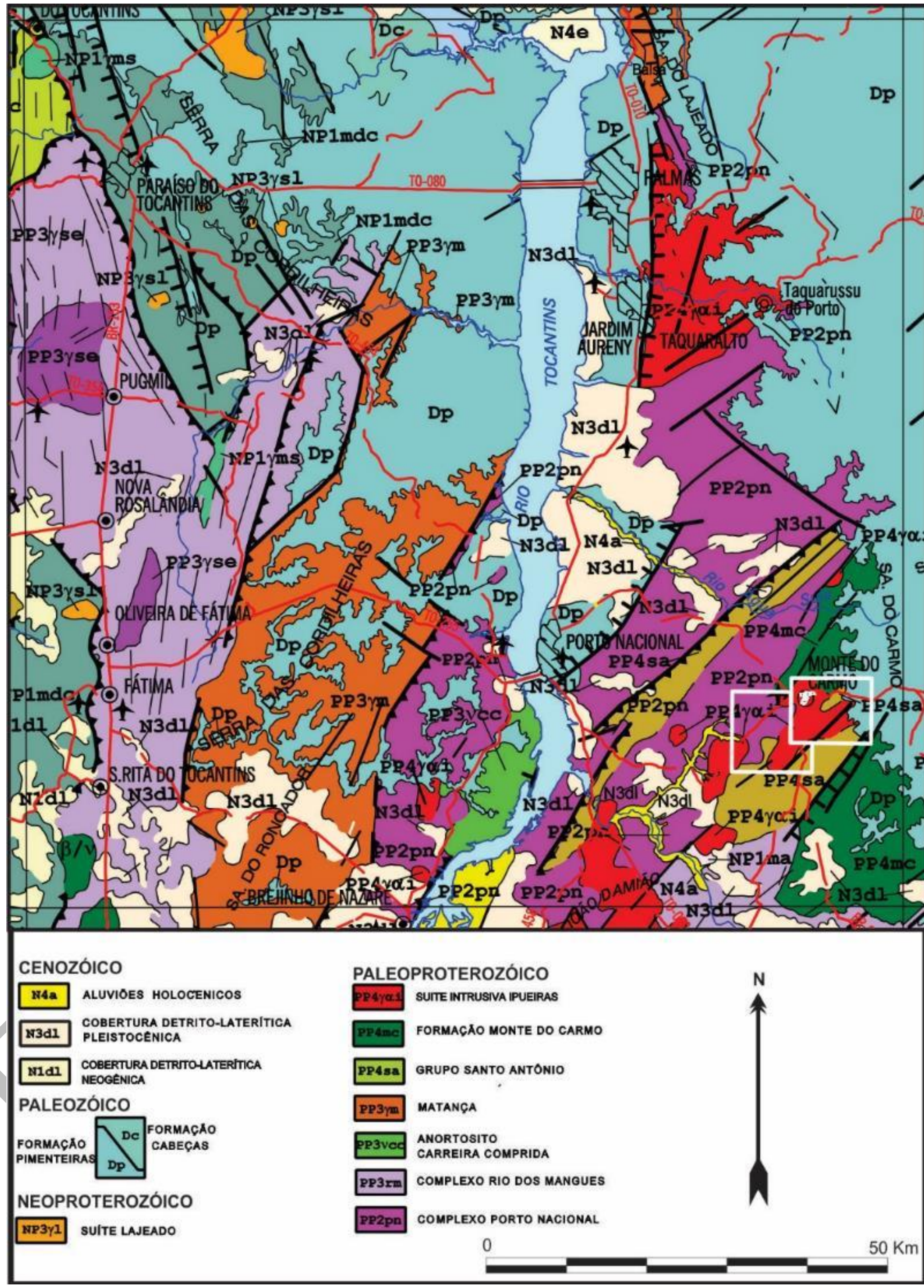
In the area of interest, the following units, from the base to the top, stand out:

a) Porto Nacional Granulite Complex: These are high grade metamorphic rocks: orthogranulites and supracrustal rocks. The orthogranulites cover enderbite, meta-hornblende gabbro-norite, charno-enderbite and charnockite. The supracrustal set is formed from aluminous gneiss, sillimanite-kyanite gneiss, garnet gneiss, kinzigite and gondite (CPRM, 2004). It is Paleoproterozoic in age, estimated between 2,300 and 2,050 MY (IBGE, 2007).

b) Rio dos Mangues Complex: Composed of orthogneiss, tonalitic to partially migmatized granodiorite, amphibolite and granitoids. Paleoproterozoic age, lead-lead dating: 2,127 to 2,050 MY (CPRM, 2004).

c) Carreira Comprida Gabbro (Anorthosite): Mafic-ultramafic layered complex composed of meta-norite, meta-diorite, meta-anorthosite, meta-quartz-diorite, meta-tonalite, meta-gabbro, meta-gabbro-norite and pyroxenite. Paleoproterozoic in age, uranium-lead dating: 2072 MY (CPRM, 2004).

**Figure 7.1**
**Regional Geology (IBGE, 2007)**




d) Monte do Carmo Formation: Volcano-sedimentary sequence formed by metamorphosed rhyolite, rhyodacite, dacite, tuffs, basic volcanic rocks, quartzites, pelites and conglomerate. Paleoproterozoic age, lead-lead dating: 2,130 to 2,020 MY (CPRM, 2004).

e) Grupo Santo Antonio: Volcano-sedimentary sequence separated by IBGE (2007), but ignored in CPRM (2004). In the course of the work reported by MSM, it was informally called the Porto Nacional Sequence (or Tocantins Sequence) and compared to the Natividade Group, which occurs to the south. It is composed of metapelites, meta-psammites, gondites, banded iron formation, carbonaceous schists and meta-basites (an obsolete group name for all basic igneous rocks) (Veiga and Latorraca, 1997; MSML, 2011a). Paleoproterozoic age, estimated between 1,800 and 1,600 MY.

f) Ipueiras Intrusive Suite: Large granitic intrusion in the Monte do Carmo area. It was described by IBGE (2007) as Paleoproterozoic, but attributed by CPRM (2004) to the end of the Neo-Proterozoic, under the name Suíte Lajeado (see item g). During MSM exploration, this granite was also called Lajeado, but referred to the Paleoproterozoic.

   This 1,000 Ma discrepancy is perhaps a sign of confusion in the names of granites. However, the existing granite in the Monte do Carmo area seems to be older than the Brazilian bodies known in the region, since it is affected by shearing and hydrothermal events associated with auriferous mineralization (MSML, 2011a).

   More recently however, in a master's thesis specifically on the Serra Alta Deposit area and sponsored by the University of Brasilia with the support of MSM, the following observation stands out:

   > "The Serra Alta gold Deposit is Intrusion Related type associated to the Carmo Granite, which is the more evolved and fractioned phase of a type I sienogranitic (sic) magmatism. It is present alkaline-calcium to high potassium calci-alkaline (sic) and peraluminous geochemical characteristics, as well as moderate fractionation between ETRL and ETRH. It presents yet cordillera type geotectonic environment geochemical signature most likely to oceanic-continental plate collision. The crystallization age uranium-lead is 2083 ± 21 Ma, with TDM values between 2.05-2.15 MY and εNd (2.083) positive, belonging to the Intrusive Suite Ipueiras, within the context of the Araguaia Belt, Tocantins Province." (Gomes, Jessica - 2016)."

g) Lajeado Suite: Granite intrusions syn to late Trans-Brazilian orogeny, comprising granite, alkali-granite, porphyritic granite and granitoids. Neoproterozoic in age, lead-lead dating cited by CPRM (2004): Matança Granite - 564 to 552 MY; Lajeado Granite - 546 MY; Palmas Granite - 548 MY.

h) Pimenteiras Formation: Argillites and siltstones with intercalations of ferruginous sandstone and basal conglomerate lenses. Part of the Parnaíba Sedimentary Basin. Devonian in age, between 400 and 380 MY, approximately (CPRM, 2004; IBGE, 2007).

i) Detritus-Lateritic Cover: Detritus-laterite cover developed on flat terrain, comprising sandstones and conglomerates. Age attributed to the end of the Neogene and early Pleistocene, estimated around 1.75 MY (CPRM, 2004).

j) Alluvial deposits: Unconsolidated sediments deposited along river valleys, comprising sands, clays and gravel lenses. Pleistocene to Holocene in age (IBGE, 2007).

## 7.2 REGIONAL LITHOLOGICAL AND STRUCTURAL MAPPING

Regional geological mapping, carried out by VML and MSM at a 1:100,000 scale covers most of the municipalities of Porto Nacional, Monte do Carmo, Ipueiras and Brejinho do Nazaré. In the northern portion of the block, mapping was conducted at 1: 25,000 scale. Sites of interest were described by VML, its JV partner companies, and more recently by MSM (2011a). The geological context has been characterized by different professionals throughout the work carried out, with different purposes and degrees of detail. Figure 7.2 illustrates the main features of the areas under consideration.

Airborne geophysical surveys and interpretation of aerial photographic images were integrated with the field acquired data. In general, the geological exposure is impaired by the deep weathering and the destruction of some characteristics occurring in the garimpeiro-mined areas (garimpos). However, the garimpos and other old workings facilitate the location of mineral occurrences.

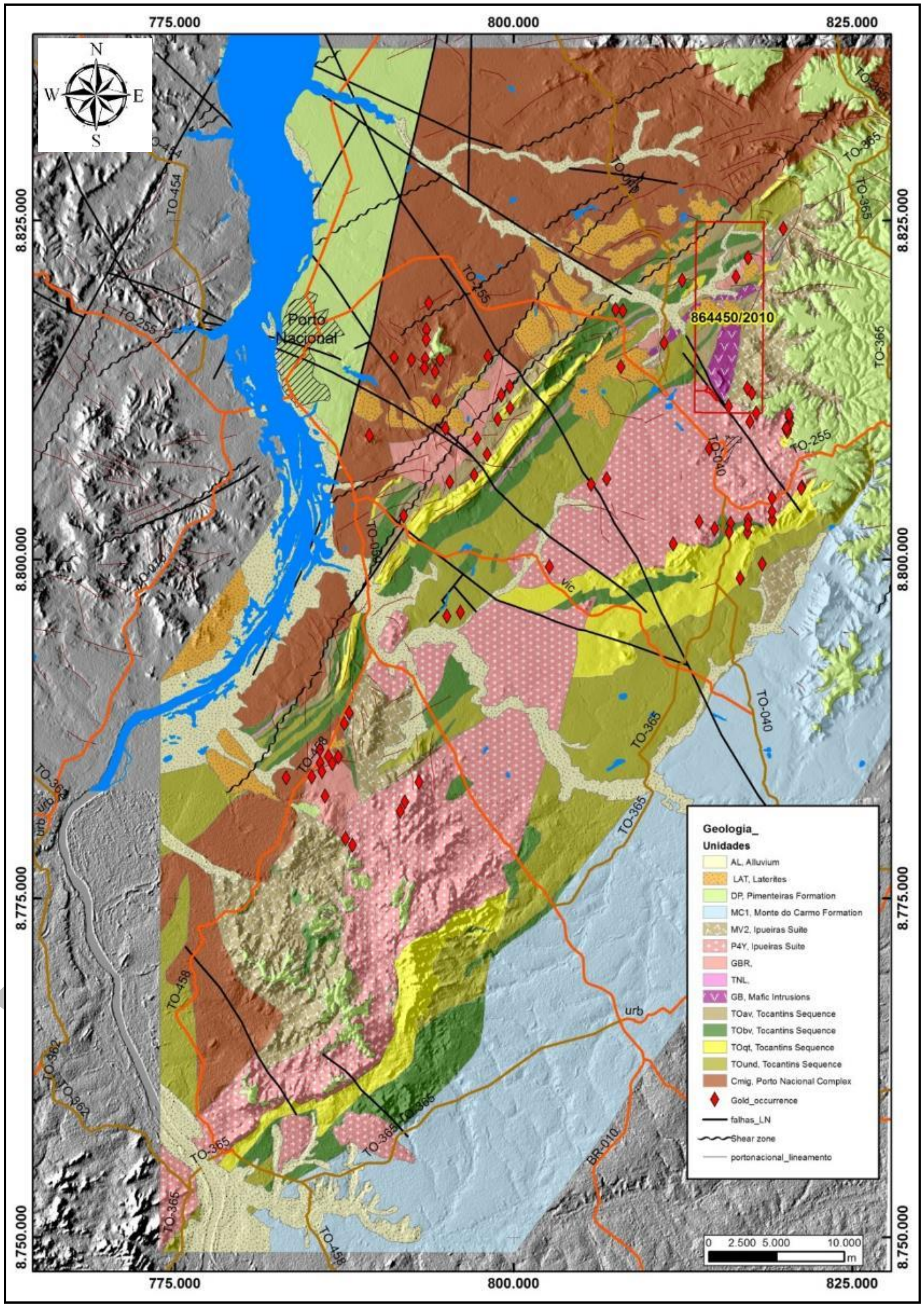
The depiction of the lithological and structural diversity is understood to be superior to the regional syntheses available from sources such as the IBGE (2007) map (Figure 7.1). Suggestions of the economic potential of the areas is evidenced by the numerous occurrences of gold catalogued in the surveys (MSM, 2011a).

At the same time as the mapping and compilation, other scientific studies, supported by several universities, resulted in masters and doctoral theses focusing on the petrologic and metallogenic evolution of the area.

Mapping was assisted by three masters' theses and one doctoral thesis, which incorporated VMC's accumulated knowledge of the region. MSM believes that this aided in the generation of new geological concepts to guide regional exploration work. A final geological map, at 1:100,000 scale, of the most important portion of the belt is shown in Figure 7.2. This map covers most of the principal target areas, the concessions, the principal lithostratigraphic units and the geotectonic features of the region.

The Porto Nacional region, which covers an entire gold province, is geotectonically packed onto a transcontinental shear belt known as the Trans-Brazilian Lineament. In this area, the shear/lineament as a whole has an elliptical shape and is over 170 km long and up to 40 km wide.

**Figure 7.2**
**Regional Geologic Map of Porto Nacional**




Source: VMC, 2010

As shown in Figure 7.2, from west to east, the geological packages can be defined as follows: the Porto Nacional Complex, the Archean Porto Nacional Volcano-Sedimentary Sequence intruded by the Lower Proterozoic Ipueiras Granite and other acidic and mafic-ultramafic layered intrusions, and the continental volcano-sedimentary sequence of the Monte do Carmo Formation of Upper Proterozoic age. All of these units, formations and intrusions have been subject to the Trans-Brazilian deformation. Due to the large central granite intrusion, the structure is characterized as a great anticlinorium.

Structural control is well defined and regionally expressed by the disposition of the above-mentioned units, which are elongated subparallel to each other in a north-northeast-south-southwest direction. Each unit is frequently limited, and internally affected, by a brittle-ductile shear model, associated with predominantly transcurrent movement.

The interpretation above identifies a system of shear zones that defines the Porto Nacional Belt. Although the shear zones exhibit a somewhat anastomosing nature, they may be grouped into four main belts, named from east to west: the Matança, Cachimbo, Mutum and Conceição Shear Zones.

## 7.3 PROPERTY GEOLOGY

Based on the work completed and results obtained, MSM reduced the exploration area for gold to 5 concessions on a cupola over, and related targets derived from, the Ipueiras Granite, using the Reduced Intrusion-Related Gold Systems model. Figure 7.3 shows the Monte do Carmo regional geological context and the MSM properties, as well as the main targets.

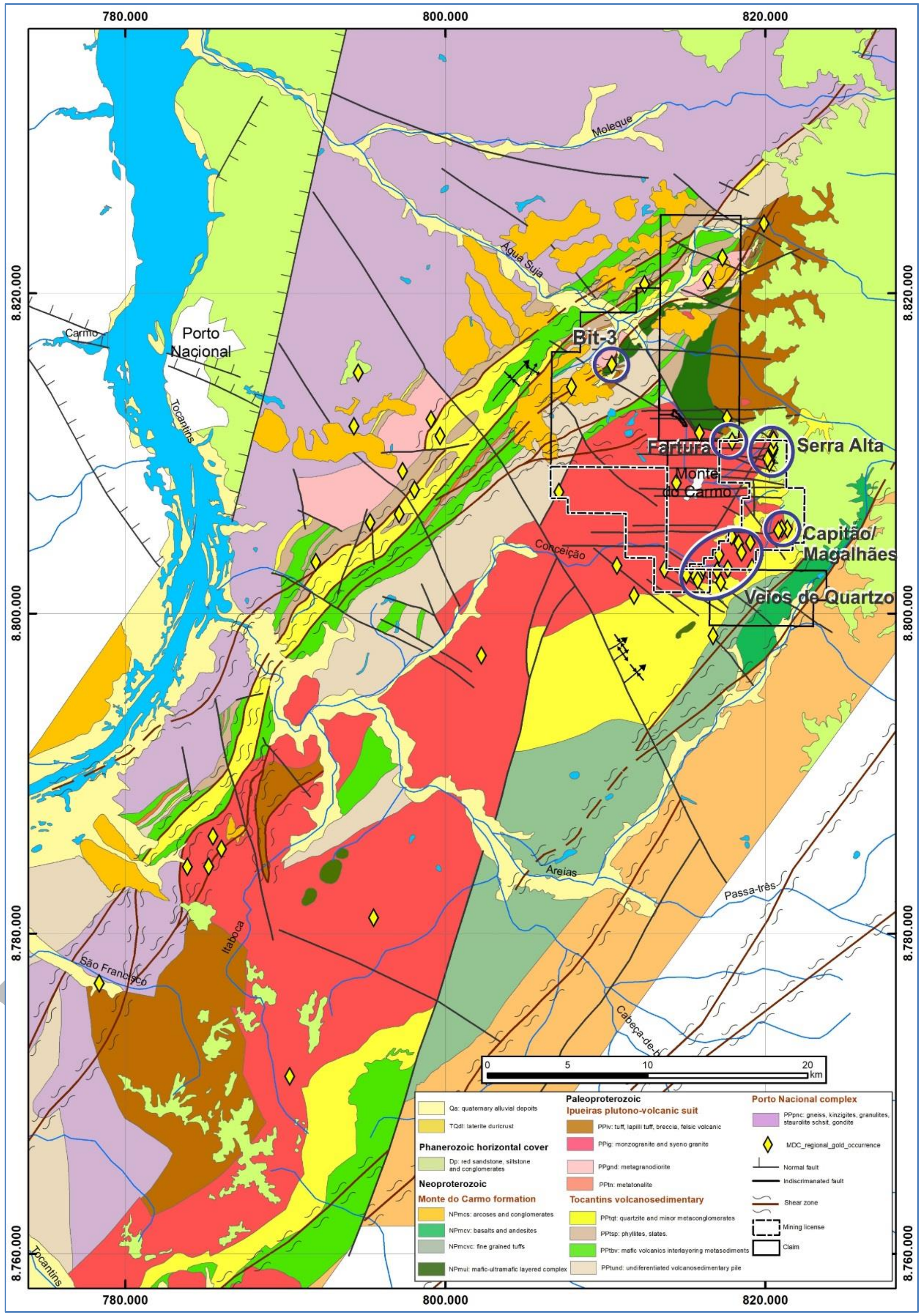
Cerrado's principal target of interest is the Serra Alta Deposit which appears to have the best potential for the development of significant tonnage.

The remainder of this report will concentrate largely on observations about, and opinion on, the Serra Alta area, with only brief descriptions of the other targets.

### 7.3.1 Serra Alta Geology

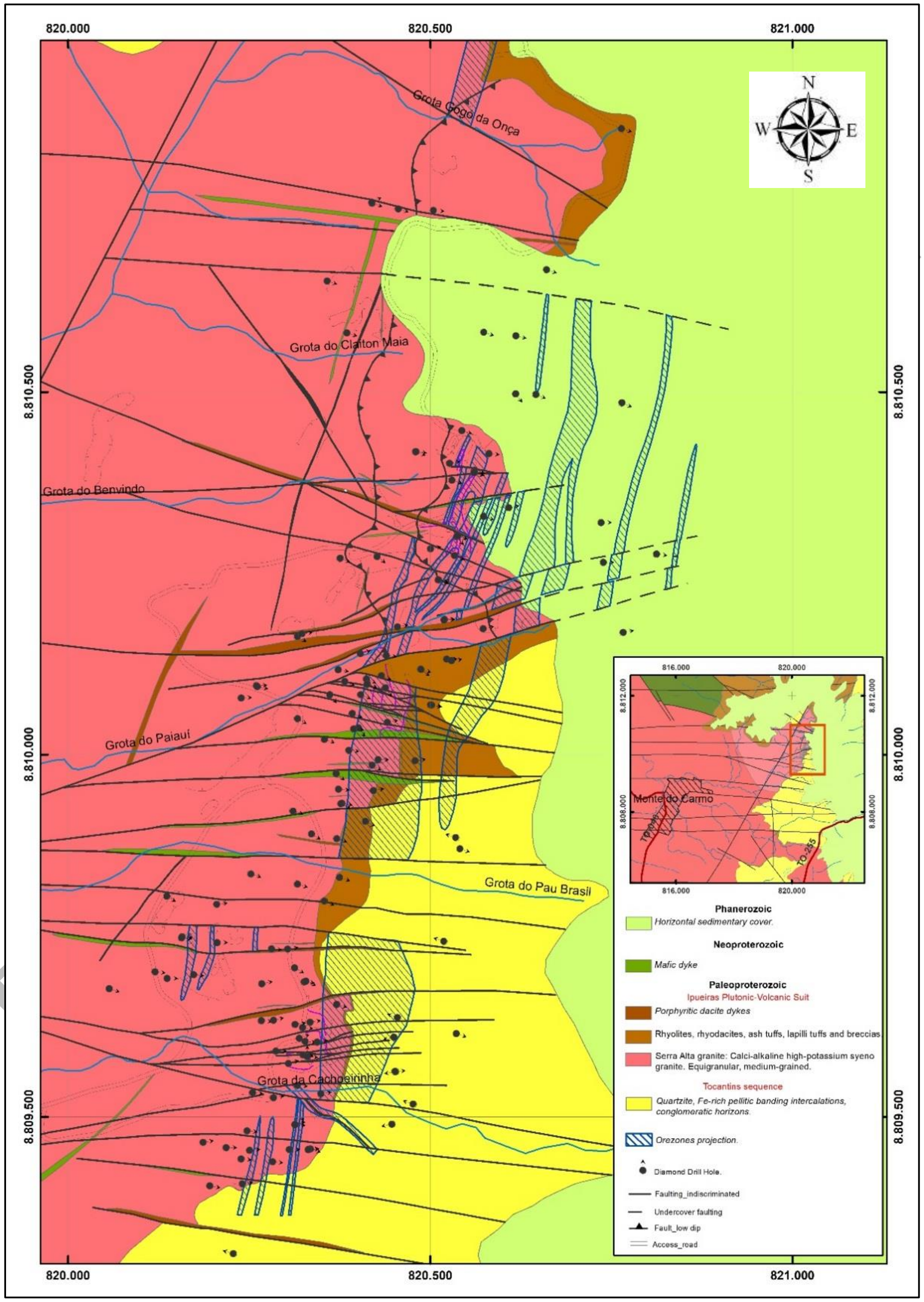
Figure 7.4 shows the geology of the Serra Alta target.

**Figure 7.3**
**Monte do Carmo Region Geologic Map Showing Property Boundaries and Important Targets**




Source Cerrado, 2019.

**Figure 7.4**
**Serra Alta Geology**

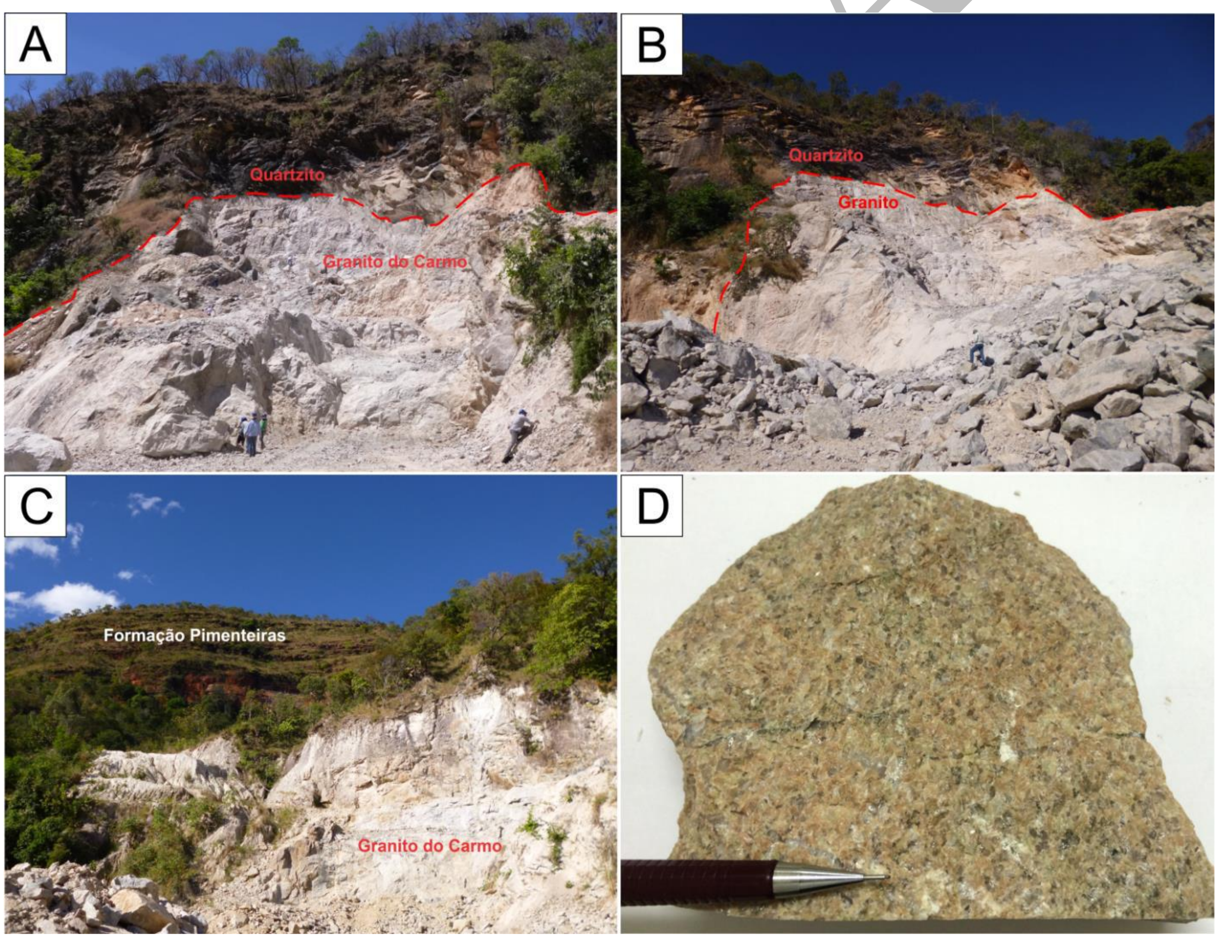



Source: Cerrado 2019. Scale in metres on map grid.

The geology of the Serra Alta target area is relatively monotonous, composed largely of a potassic granite (pink unit in Figure 7.4) of the Ipueiras Suite of upper Proterozoic age. The granite is partially covered by a remnant of quartzite (yellow unit in Figure 7.4) of the lower Proterozoic volcano-sedimentary sequence which, in turn, is covered by the Paleozoic horizontal sediments (light brown).

The granite is a large intrusive body aligned in a northeast-southwest direction and intruded into rocks of the Monte do Carmo Volcano Sedimentary sequence. This sequence is locally represented only by a discontinuous remnant of quartzite. To the east and north, there is more continuous cover of the Paleozoic Parnaíba Basin, represented by the Pimenteiras Formation of Meso-Neo Devonian age (Figure 7.5 A to C). The altered granite disappears under these overlying rocks.

**Figure 7.5**
**Serra Alta Granite Exposures**




Source: MSM 2018. Figure 7.5 - A) and B) Photographs of the South Block mining front (Serra Alta Project small scale mining) where it is possible to observe the contact between the dome of the local granite and the older quartzite; C) Photograph of the North Block mining front showing the Pimenteiras Formation covering the granite; D) Representative sample of the Monte do Carmo area granite in more preserved condition, where macroscopically the phaneritic texture of the rock can be observed.

In the Serra Alta region, the granite, in its less altered form, shows a homogeneous colour from light green to slightly pink, exhibiting inequigranular, isotropic and medium to coarse grain size (Figure 7.5 D).

The granite is composed of potassic feldspar (40 to 60%), quartz (20 to 40%) and plagioclase (albite, An 6 to 12, 10 to 20%). Rare crystals of zircon and a few of white mica are included in some quartz crystals (<1%). Secondary or replacement minerals occur such as muscovite, chlorite and carbonate. The estimated modal proportion of the essential mineralogy allowed for the classification, using a QAP diagram (Streckeisen, 1976), as syenogranitic composition (Maia, Jessica, 2016).

The granite has abundant zones richer in gold, which have been mapped as mineralized shoots, mostly oriented N10-15E and dipping 60° to 80° to the northwest (Figure 7.6 A and B).

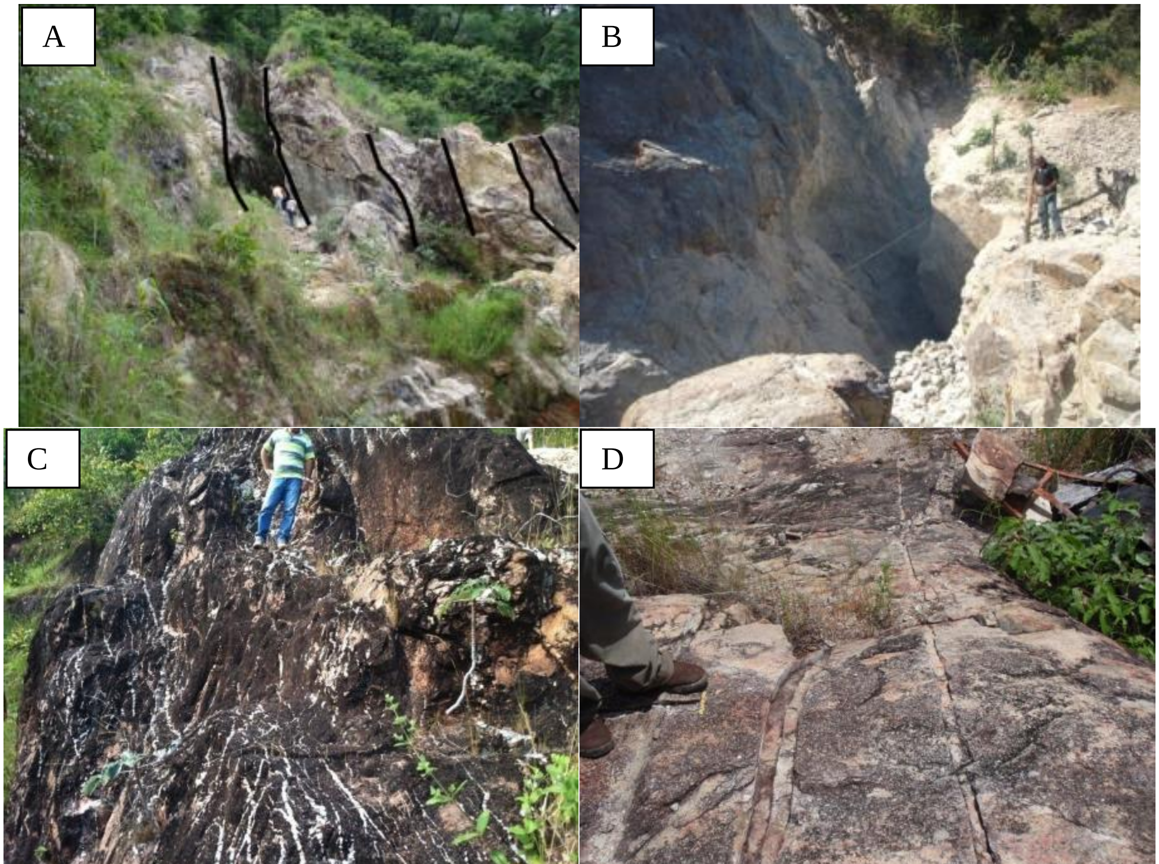
They vary in thickness from 0.5 m up to 67 m. The presence of more prominent gold grades, quartz veinlets and sulphides are the main difference between the normal granite and the mineralized shoots (Figure 7.7 A). The shoots were defined from the interpretation of drilling results, projected to surface based on the mapping of the outcropping mineralization and the mining pits of the garimpeiros, as well as the results of channel samples in hard rock. These samples were collected with a diamond saw, by both Paranapanema and Kinross, and analyzed every metre. Cerrado is continuing with the process of channel sampling of exposures and trenches.

Within the immediate area the main fault systems are oriented N30E and east-west. These faults can affect the mineralized shoots with small displacements (Figure 7.7 B) or slightly larger ones seen in vein offsets in Figure 7.4. Locally, they may promote development of a barren zone, but only a few of these are thick, up to a maximum of 15 m. The granite has been sheared along an azimuth of N10 - 15E where important quartz stringers were developed.

The lode gold vein system is set within fracture systems running N10E, representing sub vertical vein systems dipping steeply to the northwest. Dikes of younger diabase are present, cutting the granite within the fault zones.

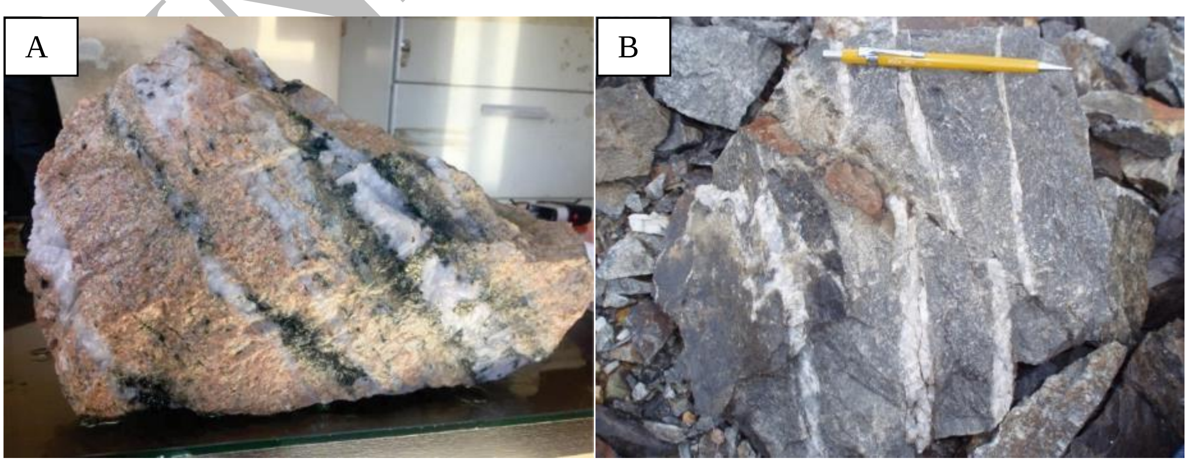
Covering the southern portion of the east edge of the granite, Proterozoic quartzites dipping 30°SE are in contact with a "cooked" intrusive contact. The northern portion of the deposit is covered directly by the Devonian sediments. A number of shoots are believed to extend, and be trapped, under the quartzites. These may represent possible underground mining targets should their grade justify it. Mining them by open pit would involve a higher stripping ratio.

**Figure 7.6**
**Serra Alta Mineralized Exposures**




Source MSM 2018. Figure 7.6 A and B - Garimpeiro pits and typical mineralized shoots; C - Veining system within the mineralized shoot; D - Chanel sample location collected with a diamond saw (on the left by PNP, on the right by Kinross)

**Figure 7.7**
**Mineralized Serra Alta Boulders**




Source MSM 2018. Figure 7.7 A - Hand sample representing large scale steeply dipping mineralized shoots within the granite; B - Example of and east-west fault offsetting veins.

The lode gold hydrothermal mineralization is characterized by the presence of epidote, chlorite, tourmaline, galena, sphalerite, arsenopyrite, pyrite and chalcopyrite. The sulphide content in the mineralized zones is typically around 0.5 to 1.0% by volume. The presence of galena is generally an indicator of higher grade gold.

### 7.3.2 Serra Alta Mineralization

The Serra Alta Deposit is a wide mineralized zone about 300 m wide with approximately 1,500 m of exposed strike length, as demonstrated by the bandeirante and garimpeiro working shown as white patches in Figure 7.4. The zone is a corridor which contains veined, mineralized shoots generally striking N10°, dipping 60° to 80° W.

At the time of the QP's site visit, MSM and Cerrado geologists were discussing the possible interpretation of three distinct sub-corridors or trends of mineralization within this wider corridor. It is possible that the far western trend is composed largely of colluvium shed from the slope and the artisanal workings there may have no immediate bedrock source. There are exposed bedrock sources of veining on the eastern side up against the cuesta wall. Extensions of the sheared granite cupola mineralization on the eastern side, under the quartzites, have been confirmed by drilling.

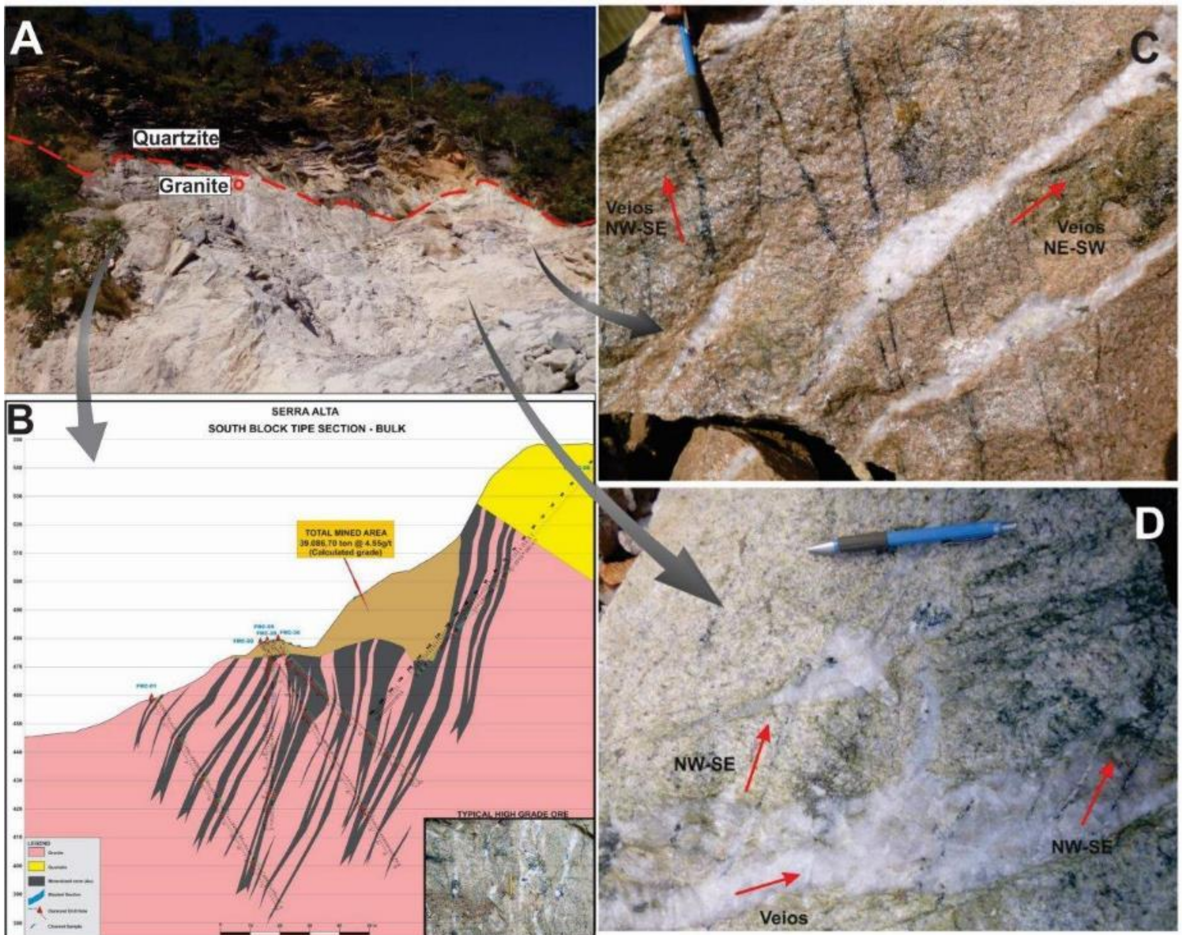
The field information obtained in the Serra Alta Deposit small pits mined by MSM caused it to classify the gold mineralization hosted in the cupola portion of the granite under the Reduced Intrusion Model. The mineralization occurs within a system of veins and veinlets commonly associated with zones of hydrothermal alteration. This system of veins and veinlets is characterized by quartz associated with gold and sulphides (pyrite, arsenopyrite galena, sphalerite and chalcopyrite), whereas the hydrothermal alteration is characterized by phyllic and propylitic alteration zones, as well as sulphidation and silicification.

The granite hosts a system of intersecting northeast-southwest- and northwest-southeast-trending veinlets, which occur in most areas of the deposit. (Figure 7.8).

The northeast-southwest-oriented vein system is millimetre- to centimetre-scale, but tends to be thicker and truncates the veins and veinlets of the older system (Figure 7.8C). These veins are predominantly composed of milky quartz crystals, moderately fractured and medium to coarse grained. However, they exhibit borders and internal zones of expansion, often filled by sulphide minerals and gold, as well as rare aggregates of white mica + chlorite + carbonate. In this system, free gold can also occur, filling cracks in the quartz veins.

Occasionally a re-opening and filling phase of the northwest-southeast system is identified, passing through the northeast-southwest milky quartz vein system (Figure 7.8D). This represents the last stage of dilation recorded in the granite dome. It is filled with aggregates of chlorite + white mica + carbonate ± pyrite as veinlets.

**Figure 7.8**
**Serra Alta Vein Orientations**




Source: MSM 2018. Figure 7.8 - A) Photograph of the cupola portion, where the granite is in contact with the quartzite, observed at the South Block; B) Type Section of the mineralized zone showing the mineralized shoots within the granite, covered by the quartzite; C) Photograph showing the relation of northwest-southeast veinlets being cut by northeast-southwest ones; D) Photograph of the northwest-southeast veins being truncated by northeast-southwest veins, as well as the re-opening and filling of veinlets of the northwest-southeast system on northeast-southwest veins.



The presence of different phases of dilation is interpreted to be indicative of successive episodes of reopening and filling of cracks, which are independent, but can occur almost simultaneously or separated by short intervals of time. This characteristic refutes the model of effective and prolonged convective circulation of hydrothermal fluids, favouring the combination of successive fracture events in the cupola, the product of increased pressure of confined hydrothermal fluids (Jensen & Bateman, 1981; Guha et al., 1983; Foxford et al., 2000).

The hydrothermal system is likely due to the exsolution of aqueous solutions from the granitic magma.

#### 7.3.2.1 Hydrothermal Alteration

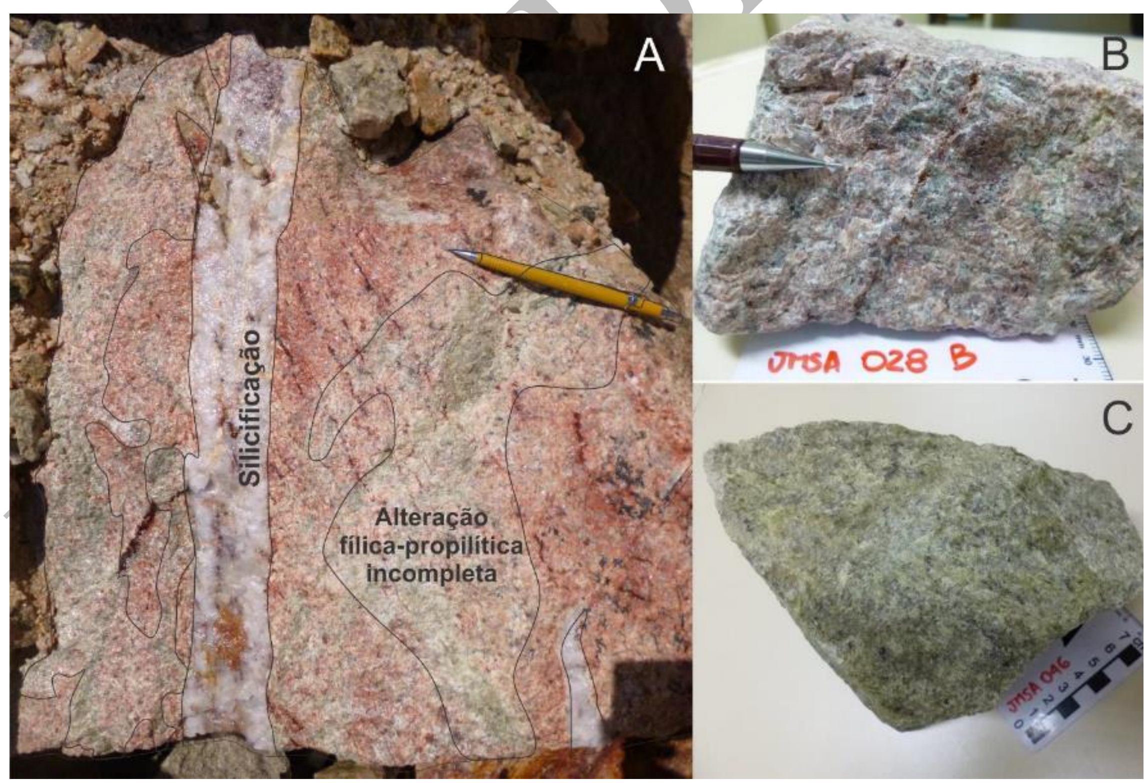
Three types of hydrothermal alteration, propylitic alteration, sulphidization and silicification, occur at Serra Alta. However, these hydrothermal zones usually appear overlapping each other, making it difficult to determine a better temporal analysis of the events.

The occurrence of hydrothermal minerals is marked by two distinct patterns. The first pattern is related to the formation of neo-minerals as a substitution of primary minerals, mainly feldspars. The second pattern is characterized by the presence of these hydrothermal minerals filling veins and veinlets generated during the fracturing phase.

Propylitic alteration is apparently the first phase of alteration that occurred, with the pervasive substitution of primary minerals of the granite by hydrothermal minerals (Figure 7.9). The feldspars were replaced by aggregates of muscovite + chlorite + carbonate ± albite ± Ti minerals (ilmenite, rutile and titanite). This hydrothermal mineral paragenesis forms the propylitic style of alteration. This hydrothermal mineral association also occurs filling millimetre to centimetre scale veinlets, corresponding to the first fracturing event in the granite cupola.



**Figure 7.9**
**Examples of Alteration Styles**




Source: MSM 2018. Figure 7.9 - A) Sample from the South Block mining front where propylitic alteration is observed acting pervasively on the granite; B) and C) Samples where it is possible to macroscopically observe the essential mineralogy that composes the propylitic alteration. Muscovite and chlorite are more prominent in the green areas.

Hydrothermal white mica occurs in two distinct forms: 1) aggregates of lamellar microcrystals, the most common form, and 2) disseminated euhedral crystals. Microlamellar aggregates of muscovite are observed both in the alteration of primary minerals and in the filling of cavities (mainly veins and veinlets), whereas euhedral crystals essentially occur filling cavities.

Chlorite occurs in a very similar pattern to the hydrothermal white mica 1) as aggregates of microlamellae that replace primary minerals and fill veins, veinlets and cavities and 2) rarely as euhedral crystals, with sizes ranging from 0.1 to 0.3 mm, as well developed, generally radially-shaped lamellae.

Carbonate occurs as an alteration product of the primary albite, as well as in alteration masses and infilling veins, veinlets and cavities. It normally occurs in subhedral to euhedral forms. The carbonate crystal grain size varies from very fine to up to 0.5 mm. Analysis indicates that the carbonates are mainly calcite and dolomite, with subordinate siderite.

Titanium minerals occurs occasionally, typically ilmenite ($FeTiO_2$), rutile ($TiO_2$) and titanite ($CaTiOSiO_4$).

Sulphidation is marked by the presence of pyrite, galena, sphalerite and chalcopyrite ± covellite ± quartz, usually filling veins and veinlets. In this alteration phase gold can occur associated with and/or included in the pyrite.

Sphalerite occurs as nodules or irregular masses on which the other sulphide minerals develop. Inclusions of chalcopyrite are commonly observed. This marked presence of chalcopyrite in sphalerite is usually attributed to exsolution (Barton & Bethke, 1987), however, this may be the result of the substitution of iron in the sphalerite by chalcopyrite crystal aggregates and sphalerite with low iron content, at moderate temperatures, ranging from 200 to 400°C.

Chalcopyrite occurs mainly in association with sphalerite, as inclusions and exsolutions. It also occurs intermixed with, and next to, pyrite-galena-sphalerite aggregates, forming irregular masses. Occasionally, chalcopyrite is replaced by covellite along fractures.

Galena occurs distributed in a widespread manner. It may also occur as inclusions in pyrite, sphalerite and gold. Galena crystals may have subhedral shapes, but they often occur as irregular masses.

Pyrite is present in the deposit in three phases, usually with coarse grain sizes between 70 μm to greater than 3 cm. The most significant occurrence is as aggregates of euhedral to subhedral cubic crystals filling veinlets and fissures. Pyrite may contain gold, galena and chalcopyrite inclusions. Pyrite also occurs filling zones of dilation within and/or at the edges of quartz veins, usually along with gold, galena, sphalerite and chalcopyrite. Another less common occurrence is as euhedral pyrite disseminated in the rock, usually near quartz-sulphide veins.

Gold (or electrum) may occur associated with and/or included in pyrite and, rarely, sphalerite crystals. It also may be associated with silicification and sericitization-propylitization processes. Electron microprobe analyses indicated compositions of gold and silver ranging from 67 to 72% and 27 to 32%, respectively with associated content of cadmium, molybdenum and iron ± copper, sulphur selenium cobalt and nickel totalling 0.1 to 1.2%

Silicification appears to have been one of the last phases of the alteration and is characterized by the formation of veins and veinlets from millimetre to centimetre thickness, and metre to decimetre length. They are formed essentially of euhedral to subhedral milky quartz crystals ranging from 0.1 to 2.0 mm in size. They are without sign of recrystallization. The silicification may be accompanied by sulphides (pyrite - galena - sphalerite - chalcopyrite) and may have phengite ± carbonate ± chlorite formation at the edges of the veins. It occurs in more intensively in highly fractured areas.

Native gold in this phase usually occurs as isolated disseminations of free form grains with irregular shapes. Electron microprobe analyses indicate homogeneous compositions and higher concentrations of gold compared to grains associated with sulphide paragenesis (Au = 88% and Ag = 11%), in addition to trace amounts of copper and molybdenum ± cobalt, selenium, iron and cadmium totalling 1%.

#### 7.3.2.2 Chronology of the Hydrothermal Events

A fluid inclusion study led to a proposed chronological sequence for the hydrothermal events identified in the area of the Serra Alta Deposit.

The first stage of alteration is marked by the generation of fluids released during the final phase of magmatic crystallization, which are responsible for the alteration of the primary minerals, leading to phyllic, and to incomplete propylitic alteration. Titanium, probably released from silicate minerals under oxidizing conditions, would be present, allowing the crystallization of ilmenite, rutile and titanite, as well as some sulphides, mainly pyrite (Lobato, 1993).

Subsequently, with the lowering of temperature and increase of pressure, ruptures occurred at the cupola interface, generating cracks in a northwest-southeast direction that were filled by fluids from the phyllic to propylitic phases, characterizing the second stage of alteration (the infilling phase).

With the continuous circulation of fluids at this interface zone, the fluids are progressively fed with cyclic sulphur and metal (copper, zinc, gold, lead and iron) inputs. In this phase, the interaction between distinct fluids of magmatic and meteoric derivation increases, favouring the lowering of temperature and changing the pH, Eh, $FO_2$ and S conditions, making for a hydrothermal environment with more reducing characteristics. In this phase, subsequent tension events occur that promote the re-opening of the northwest-southeast cracks, as well as the opening of new cracks. This, in turn, leads to new filling phases, forming veins, some formed essentially of sulphides. They may also contain minerals from the phyllic to propylitic alteration, especially on the edges of these veins.

The later phases are marked by the action of silica-rich fluids under conditions of lower temperature (Jensen & Bateman, 1981). These fluids were then channeled into northeast-southwest oriented fracture systems, forming quartz veins that may still contain some of the constituents of the previous phases (sulphide minerals and phyllic to propylitic alteration minerals at the edges).

The final phase is marked by reactivation of the northwest-southeast system forming veinlets superimposed on the northeast-southwest veins.

The circulation of hydrothermal fluids of magmatic derivation, interacting with meteoric fluids, has been intense and constant for a period of some time. This process favoured the overlapping of these hydrothermal alteration styles.

### 7.3.3 Other Zones

Figure 7.3 shows the location of several other targets on the concessions, including the Bit-3, Divisa, Eduardo, Ferradura, Fartura, Capitão, Conceição and Giant Quartz Veins.

During the site visit, the QP went to the southern edge of the Monte do Carmo granite intrusion and visited the Giant Quartz Veins and Conceição targets. At Giant Quartz Veins only, the Verena vein was seen as it was actively being mined by garimpeiros.

The Verena vein is a single quartz vein, of substantial width, in the granite. Total mineralized widths were generally 1 to 4 m at the workings visited, although locally they could be somewhat higher. MSM reports that the veins reach a maximum width of 16.9 m. Distances between the veins at Giant Quartz Veins are typically at least 300 to 400 m and occasionally in excess of 1 km.

The veins themselves were somewhat poorly mineralized but the sheared wall rock is reported to contain a substantial amount of gold. Therefore, total grade over the full mineralized width (vein plus sheared wall rock) is partially a function of the vein width, which is effectively internal dilution. The wider the quartz vein, the lower the overall grade.

Total tonnage potential at each vein is likely to be relatively low and the distance between veins will make it difficult to fully share infrastructure should mining commence. Small-scale open pits may be possible with ore trucked to a central location. Mercury contamination from previous garimpiero operations may also be an issue.

For these reasons, and the potential for much higher tonnages, Cerrado has chosen to concentrate its exploration efforts on Serra Alta.

# 8.0 DEPOSIT TYPES

Within the properties at the Monte do Carmo Project, MSM has recognized three types of gold deposits, using the 10 class system promoted by the website www.911Metallurgist.com (https://www.911metallurgist.com/blog/classification-of-gold-deposits-auriferous):

1. Class 1 - Auriferous Coarse Grained Granitic Deposits.
2. Class 5 - Auriferous Veins, Lodes, sheeted zones in faults and fractures.
3. Class 6 - Gold veins, lodes in silicified zones associated with basic to ultrabasic intrusives and complex volcano-sedimentary environments.

Class 1 - These deposits are representative of those classified as the intrusion-related cupola mineralization model, the Serra Alta target being the most important one. The Capitão and Fartura targets are similar. As mentioned below, these targets have similarities with Fort Knox and Dublin Gulch.

Class 1 targets are typically open pit deposits but, because all of the local targets are partially covered by quartzites and/or flat-lying younger Devonian sediments with steep slopes and mesa-like tops, it is possible that parts of any deposit outlined will have to be mined by underground methods, should the grades allow.

Class 5 deposits are often associated with the same Serra Alta granitic environment. The Giant Quartz Vein targets can be classified as Class 5, since they represent sheeted veins penetrating into faults and fractures of the final phase of the granite intrusion. The Eduardo, Divisa and Frontel targets fit this type.

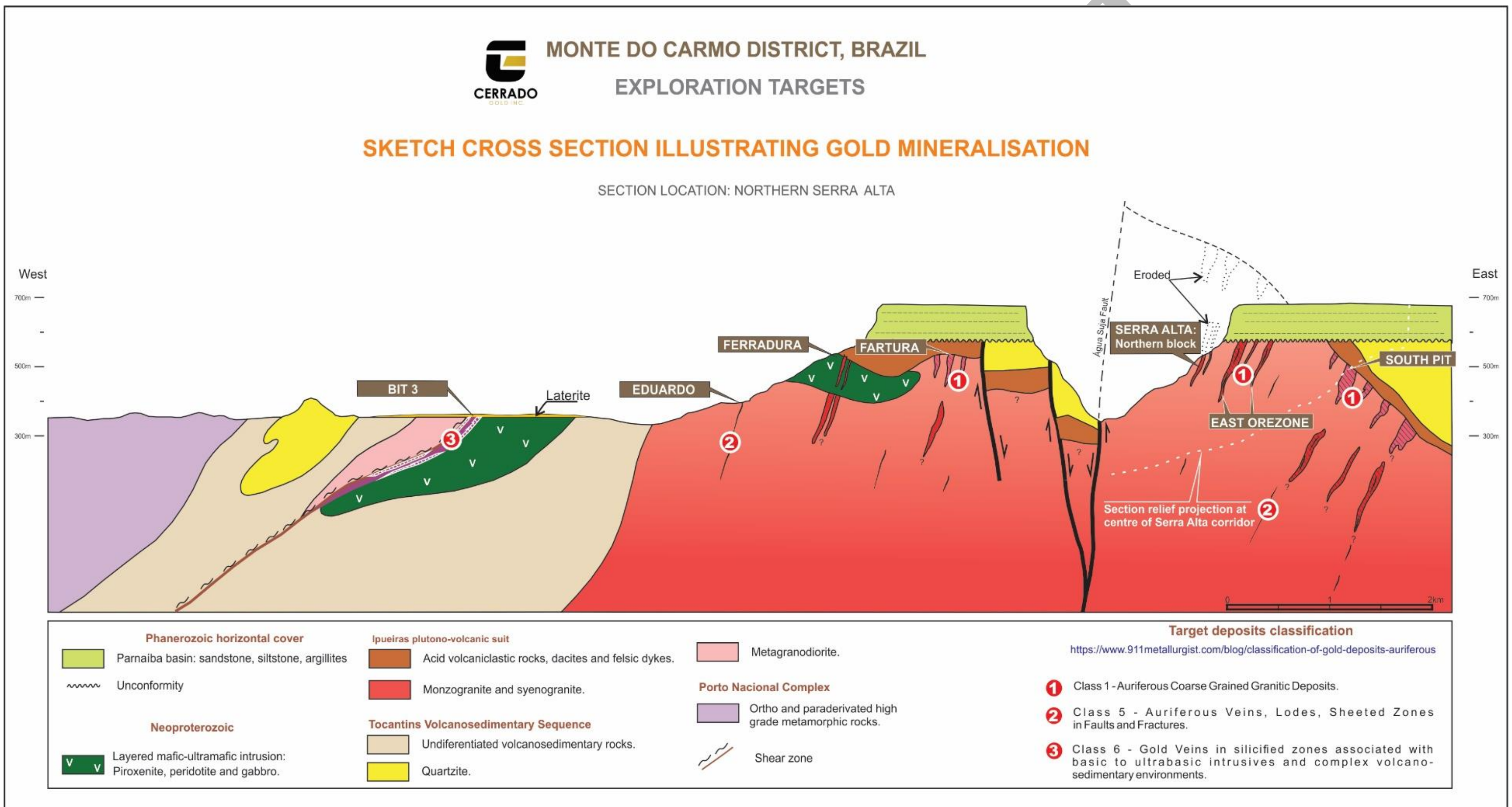
Class 6 - The Bit-3 target is associated with mafic-ultramafic layered intrusions. Ferradura is associated with mafic volcanic/volcanoclastic rocks in a very complex environment where quartz vein-hosted lode gold occurs and, therefore, can also be considered as a Class 6 type.

The major mineralization types are shown schematically in Figure 8.1.

## 8.1 SERRA ALTA

The intrusive at Serra Alta is a syenogranite, composed predominantly of orthoclase, quartz and albite, with a peraluminous character. It has a moderate alkali content with high potassium, indicating a subalkaline composition. Despite the fact that it possesses certain affinities with A-type granites, the samples of the granite studied also have characteristics of highly fractionated I-type granites, whose petrographic and geochemical characteristics may be confused with the former. The hypothesis is that such similarities are derived from multi-stage actions involving reworked protoliths submitted to extensive fractionation.

**Figure 8.1**
**Geological Section Showing Major Mineralization Types**




Source: Cerrado, 2019.

Formed in a volcanic arc to post-collisional environment, the Serra Alta granite has geochemical and petrographic similarities with granites observed in the Western Cordillera of the Andes. These granites are also distributed in the second phase of volcanic arc to post collisional environments, proposed by Pearce et al. (1984). They are comprised of intruded bodies in active continental margins, due to the subduction of oceanic crust under continental crust.

Geochronological data (uranium-lead and samarium-neodymium) define an age of 2,083 ± 21 Ma (MSWD = 3.3) for the crystallization of the Serra Alta granite. The calculated crystallization age can be related to late phases of the great tectono-magmatic event which occurred on the South American craton in the Transamazonic Cycle (2,100 - 1,800 Ma).

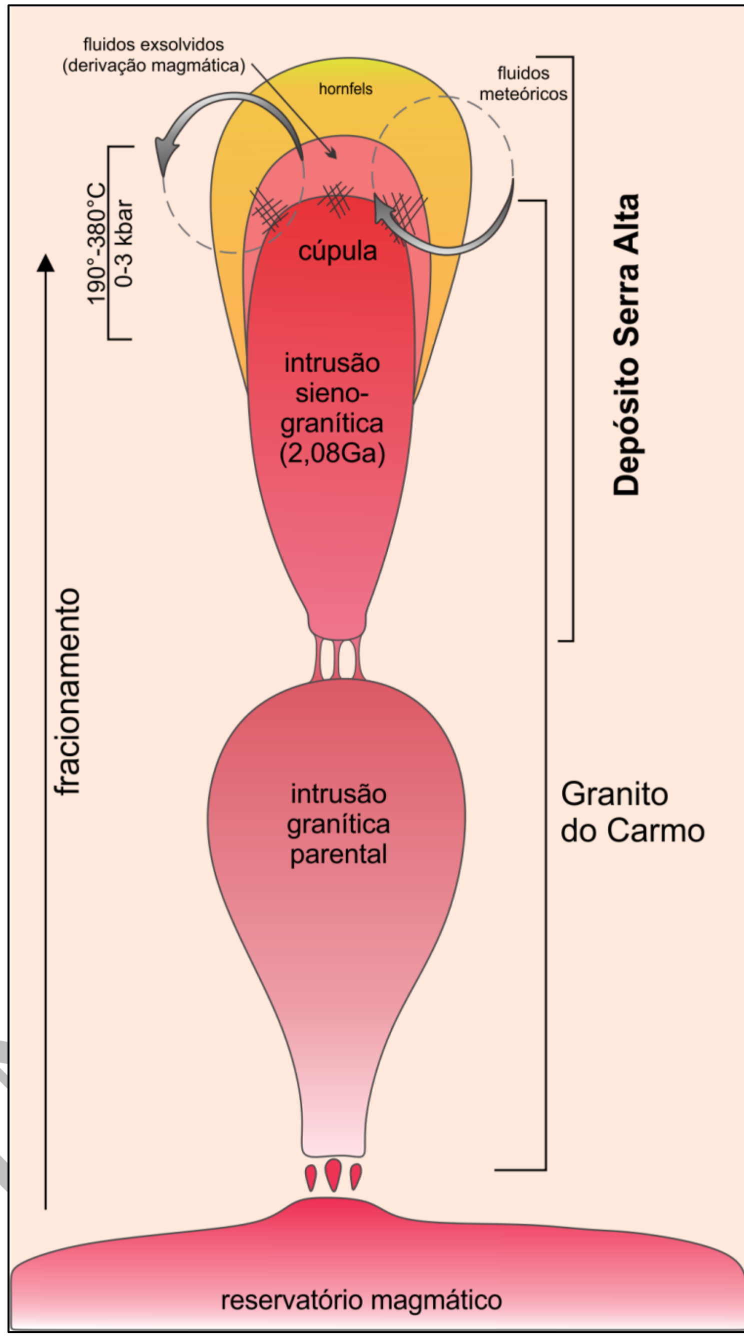
Fluid inclusion studies indicate the action of heterogeneous fluids during the formation of the northeast-southwest mineralized veins. This hydrothermal process is late to post magmatic, involving fluid systems of different compositions with a wide variety of salinity and density, which indicates the interaction of magmatic fluids with meteoric fluids. The conditions of entrapment of these fluids occurred at a temperature between 194° and 382° C and a pressure between 0.02 and 3 Kbar, indicating an epi- to mesozonal environment for the formation of the deposit.

MSM proposes that the Serra Alta granite formed during the Paleoproterozoic and was generated under epi- to mesozonal conditions, from the extensive fractionation of a parental I-type magma.

This process of magmatic evolution involved the exsolution of fluids rich in volatiles, which were hypersaline and contributed metals (gold + iron + lead + zinc + copper) to the granite cupola. The hydraulic pressure resulting from the actions of these confined fluids allowed for the cracking of the cupola, and consequently, the formation of fractures and cavities. These fluids maintained their gold content as ionic complexes, probably as AuS- or AuHS-2 species (Seward, 1984). The interaction with the meteoric solutions of low salinity favoured the lowering of temperature and changes in the composition of the fluid, which led to the precipitation of its metallic contents in the open spaces, as the gold-sulphide mineralization of the Serra Alta Deposit.

Figure 8.2 is a schematic representation of the hypothetical model of formation of the Serra Alta Deposit.

**Figure 8.2**
**Schematic Drawing Representing the Hypothetical Model of Formation of the Serra Alta Deposit.**




(Adapted from Hart, 2007)

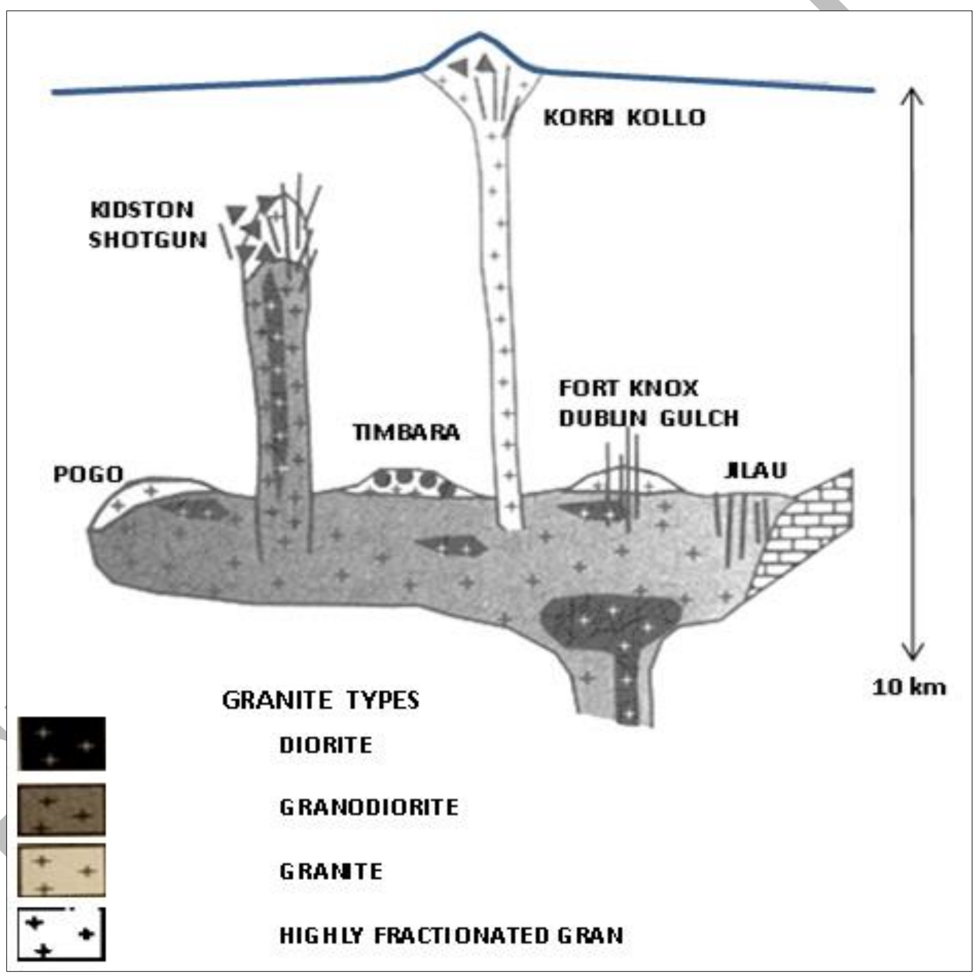


MSM believes that the best model fit is the Fort Knox intrusion-related deposit in Alaska (Figure 8.3 and Figure 8.4). Table 8.1 shows a selection of granite-related gold deposits. All are younger in age than Serra Alta. Fort Knox and Dublin Gulch are believed to be the most closely related to Serra Alta.

**Table 8.1**
**Selected Granite - Related Gold Deposits**

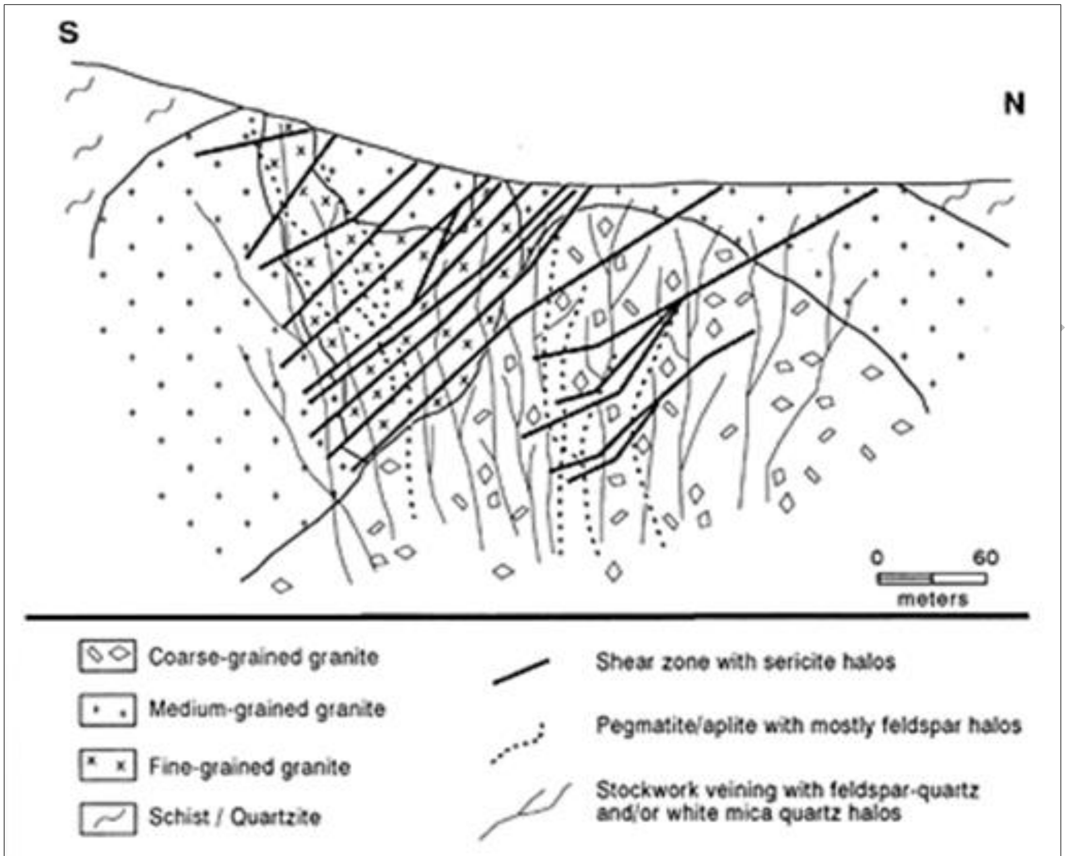
| Deposits | Age | Region |
|---|---|---|
| Fort Knox | Cretaceous | Alaska |
| Pogo | Cretaceous | Alaska |
| Dublin Gulch | Cretaceous | Alaska |
| Kidston | Palaeozoic | Australia |
| Jilau | Palaeozoic | Tajikistan |
| Serra Alta | Proterozoic | Brazil |

**Figure 8.3**
**Schematic Models of Granite Related Gold Deposits**




Source MSM, 2017

**Figure 8.4**
**Cross Section of the Fort Knox Granite-Hosted Gold Deposit**




Source: Bakke (1991).

# 9.0 EXPLORATION

Exploration work at the Monte do Carmo project and other targets in the region has been ongoing since 1985, conducted by MSM, its predecessors and associated companies, as described in Section 6 of this report. This chapter concentrates on work at the Serra Alta Deposit, the planned focus of Cerrado's exploration activity.

## 9.1 EXPLORATORY APPROACH ADOPTED FOR THE PROJECT

The exploration work targeted hydrothermal concentrations of gold, located within a granite dome, as well as nearby large quartz veins and shear zone-hosted gold. There are no known significant alluvial deposits in the region.

The project area is marked by deep weathering, in a tropical regime. Locally thick soils may reduce geological exposures and weathering of the exposed rock favours the remobilization of gold in saprolite, laterite and soils (Veiga, 1990).

The region is marked by extensive artisanal mining dating back to the 17$^{th}$ century when bandeirantes first explored and developed Brazil's interior. Later in the 20$^{th}$ century, with the increasing price of gold, artisanal miners returned to the sites mined by the bandeirantes. Once the garimpeiros had been compensated and moved out, it was possible to inspect the mined sites and commence modern exploration.

The exploration activities carried out on the Monte do Carmo area properties by MSM, associated companies and JV partners can be summarized as follows:

- 1985 - Beginning of exploration work, on the VM Vein and other Giant Quartz Vein targets (MSML, 2011a). At that time, Marex was searching for gold in the region. The data obtained by Marex were subsequently incorporated into the company files.

- 1989 - JV with Rio Tinto - investigation of 26 Giant Quartz Veins: detailed mapping; opening of large trenches; chip sampling; gold analyses by fire assay; processing of excavated material in small gravity plant (crusher, hammer mill, sluice box); exploratory drilling by reverse circulation (RC) drilling.

- 1991 - Partnership with the PNP Group. Exploration work focused on the Serra Alta granite and four of the Giant Quartz Veins (Raiz, VM, Dourado and Frontel), comprising: detailed mapping; sampling of hard rock (channel and chips); diamond drilling and assaying by atomic absorption (with MIBK analyses).

- 1994 - JV with the EBX Group. Work restricted to other targets in the area. In the Monte do Carmo area, informal mining continued to be common.

- 1996 to 1998 - Creation of VMC and fund raising in Canada. Regional exploration scope, comprising pioneering airborne geophysical surveys (magnetometer, radiometrics); geological mapping; geochemical stream sediment sampling (fine fraction and pan concentrates). At the Serra Alta target, detailed mapping was carried out; soil sampling on a regular grid; terrestrial geophysics (magnetometer and induced polarization (IP) dipole-dipole).

- 2004 - Focus of exploration work returned to the Serra Alta target: diamond drilling (5 new holes and re-drill of 3 holes by PNP). Gold analyzed by 30 g fire assay. The Giant Quartz Veins were not explored at this time.

- 2005 to 2008: JV with Kinross. Kinross took over the project's technical data. The previous work in the area was systematically verified and, to a large extent, replicated, with the confirmation of results: stream sediment and soil sampling, trench sampling (hard rock, channel and chips), diamond drilling, gold analysis by fire assay. Adoption of accurate record keeping and technical controls, to what Kinross considered to be NI 43-101 compliant (Kinross, 2008).

- 2009 - Exploration effort concentrated on the Serra Alta target, with land acquisition and cessation of informal mining. Full access to the target made it possible to review geological modelling more carefully and, for the first time, the internal evaluation of the mineral resources (Geoprocess, 2011).

- 2012 to August, 2017 - Partnership with a group from Parana State. Construction of infrastructure and a bulk sampling gravity plant at Serra Alta. Processing of about 60,250 tons of ore and production of 2,923 oz of gold.

## 9.2 METHODOLOGY ADOPTED

The exploration work completed covered the entire concession area and other permits in the region. This included:

- environmental inspection and data integration.
- interpretation of aerial photographs and satellite images.
- airborne geophysical surveys.
- regional geological mapping.
- alluvial geochemical prospecting (stream sediment fine fraction and pan concentrates).

The known promising areas and newly revealed targets were systematically investigated to verify their gold mineralization potential. The work completed covered:

- detailed geological mapping.
- soil geochemistry.
- terrestrial geophysics (magnetometer and induced polarization).
- opening of pits and trenches.
- sampling of excavations and mining faces in the garimpos.

- various exploratory drilling programs - motorized auger, RC and diamond drilling.

The internal mineral resource evaluation was carried out, based on the following:

- RC and diamond drilling data.
- statistical and geostatistical analysis of the results.
- three-dimensional modeling of mineralized bodies.
- estimation of the content of the block model.

MSM reports that the planning and control of the exploration work followed guidelines to minimize local impacts, ensure the recovery of affected sites and protect the health and safety of workers, in accordance with Brazilian law.

An environmental inspection was carried out on the exploration properties and surrounding areas, with preliminary evaluation of the state of the vegetation cover, soil and water. The observations made covered the sites occupied by garimpeiros, pastures, houses and roads. At the same time, collection of socioeconomic data was initiated at the properties and in the region. In 2007, the environmental consulting company Brant Meio Ambiente Ltda. was contracted to perform a preliminary environmental assessment in the area of ANM concession 860.187/1988 (Kinross, 2008).

Detailed topographic surveys of the areas were completed with the establishment of 7 auxiliary landmarks in the Monte do Carmo Project area (4 at Serra Alta and 3 at Capitão). A more recent topographic survey completed with modern drone-type equipment was also conducted by MSM.

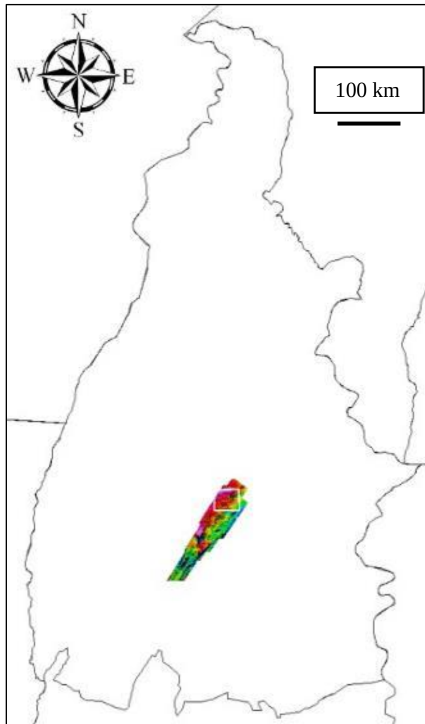
## 9.3 AIRBORNE GEOPHYSICAL SURVEY

Airborne geophysical surveying was conducted in the area of interest around Porto Nacional and Monte do Carmo, in order to discriminate the lithologies, structures and potentially auriferous hydrothermal zones.

The survey was performed with a magnetometer and gamma-spectrometer (MAG-GAMA) in an area covering approximately 4,500 km² (Figures 9.1 and 9.2). The service was contracted by VML with Geomag SA. Prospecções Geofísicas, in 1996 (MSML, 2011a).

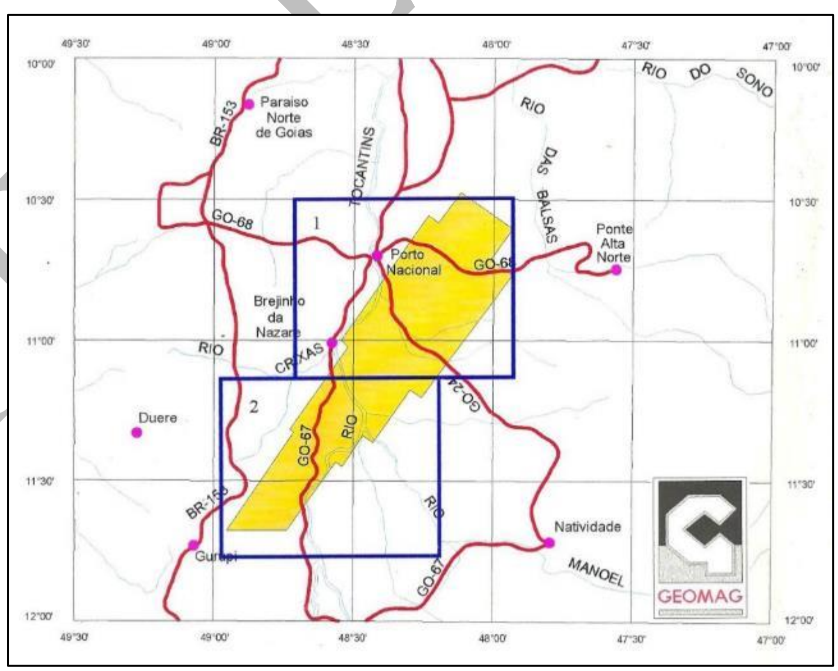
The survey recorded total field magnetics and discriminating radiometrics with a line spacing of 220 m and a ground clearance of 100 m, for a total of 21,520 line-km.

**Figure 9.1**
**Airborne Geophysical Survey Area within Tocantins State**




Source: MSM 2018

**Figure 9.2**
**Airborne Geophysical Survey Limits - Geomag, 1996**




Source: MSM 2018. North at top of grid. Scale on grid labels.

The final products of the survey were presented on maps at 1: 100,000 scale:

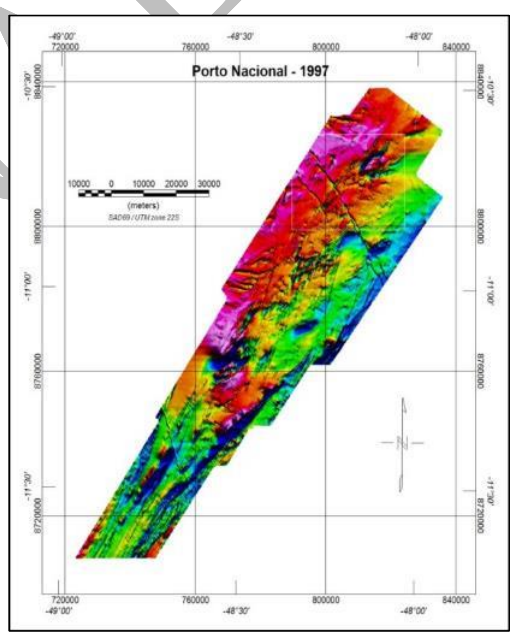
- Outline of the total magnetic field (corrected for IGRF variation).
- Pseudo-illumination of the total magnetic field.
- Total count radiometric contour map.
- Potassium radiometric contour map.
- Uranium radiometric contour map.
- Thorium radiometric contour map.
- Ternary distribution of the radiometric channels of thorium, uranium and lanthanum.
- Elevation of the terrain

The surveys confirmed the main geological features of the area surveyed. The northeast-southwest regional structuring is clear (Figures 9.3 to 9.8). Known gold occurrences coincide with lineaments marked by high magnetic responses.

Interpretation performed by RTDM (Rio Tinto) (1997) highlighted 68 anomalous prospective targets. Those considered to be the most important ones were systematically investigated in the course of exploration work. Many of them have confirmed occurrences of gold.

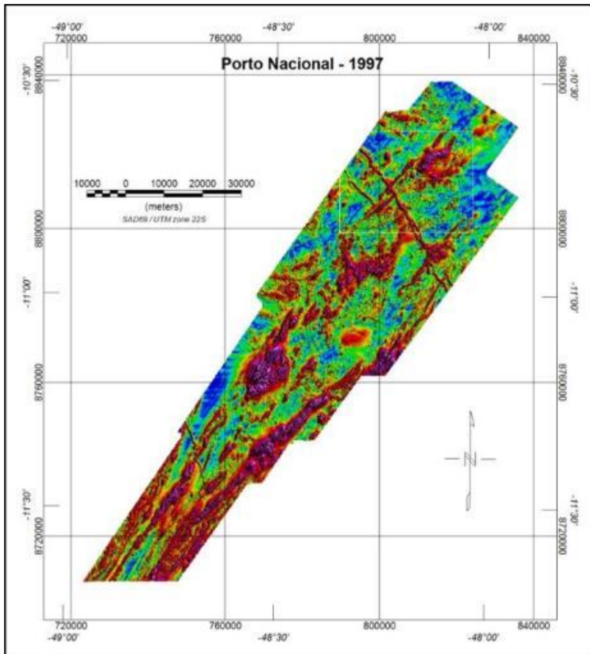
In 1999, the results of the regional work were reprocessed by De Beers, in order to detect potential diamond-hosting bodies (kimberlites and lamproites). Sixty-six anomalies were detected, of which 19 were followed up in detail, but without confirmation of the desired host lithologies (MSML, 2011a).

**Figure 9.3**
**Total Magnetic Field - Geomag, 1996**



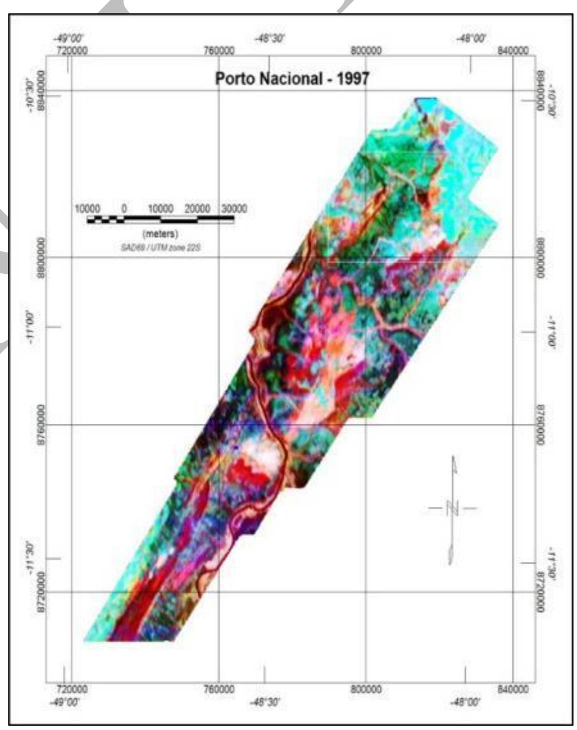

Source MSM, 2018

**Figure 9.4**
**Amplitude of the Analytical Signal**



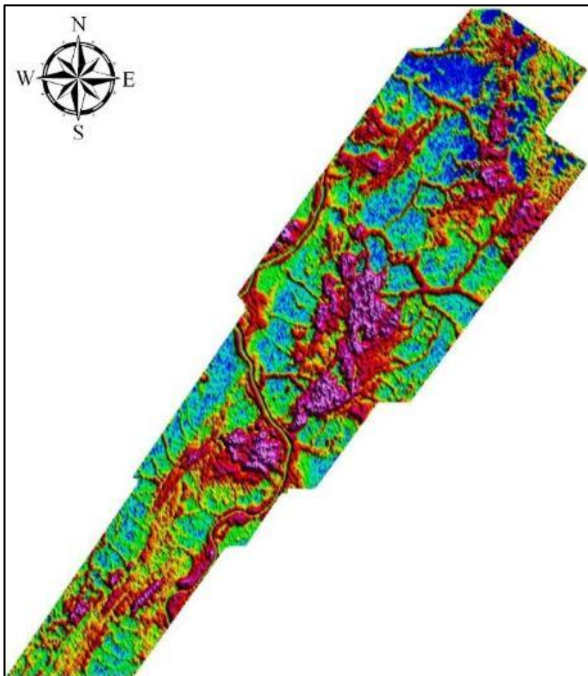

Source MSM, 2018

**Figure 9.5**
**Gamma Spectrometry Ternary Plot**



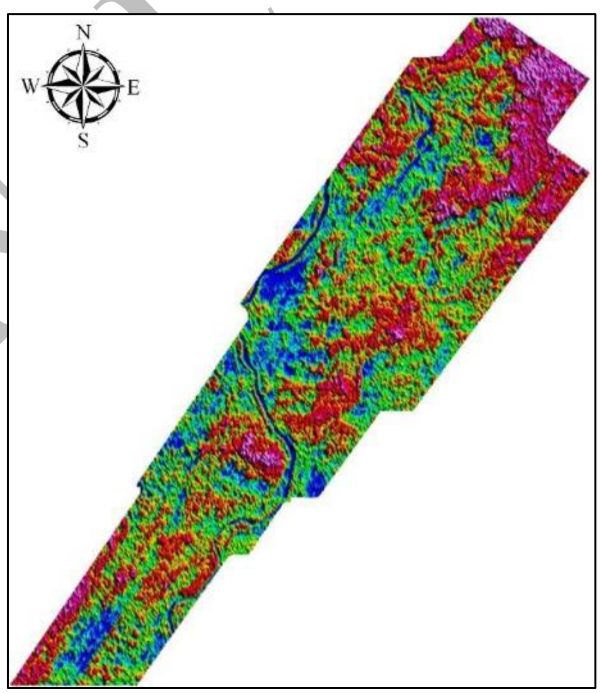

Source MSM, 2018

**Figure 9.6**
**Potassium Count**



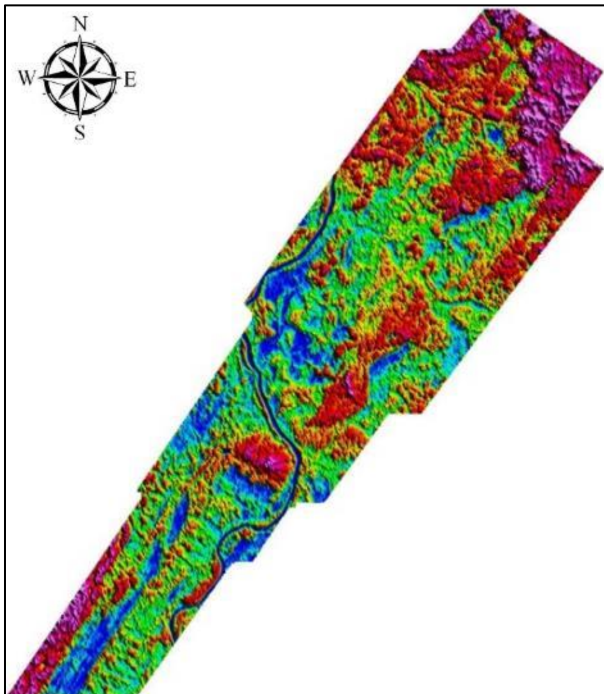

Source MSM, 2018. Scale of survey block on Figure 9.4.

**Figure 9.7**
**Uranium Count**




Source MSM, 2018. Scale of survey block on Figure 9.4.

**Figure 9.8**
**Thorium Count**




Source MSM, 2018. Scale of survey block on Figure 9.4.

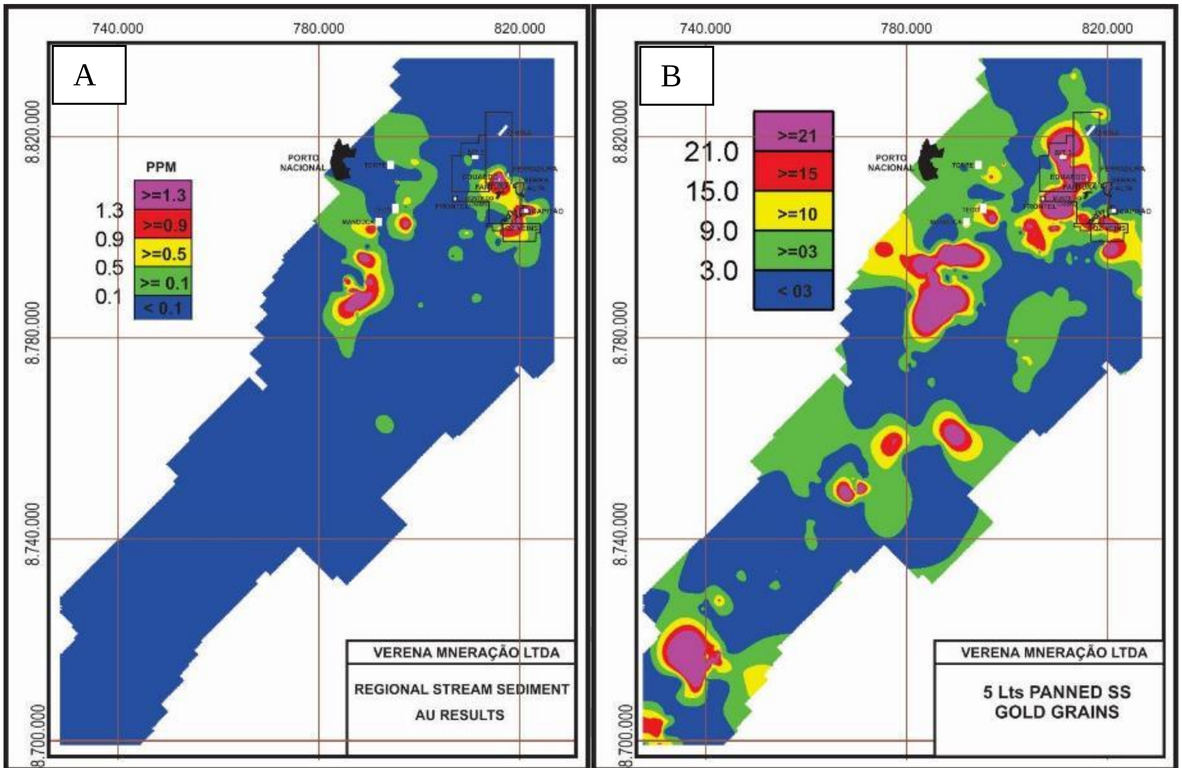
## 9.4 STREAM SEDIMENT SURVEY

Regional and detailed stream sediment surveys were carried out in 1996 by VMC, after the airborne geophysical survey. The regional work covered an area of about 1 million hectares and the results, particularly those for gold, were used to define the areas with the most potential.

A total of 369 5-litre samples were collected regionally. Two litres were split off and analyzed for gold by 30 g fire assay (Figure 9.9 A), as well as for copper, lead, zinc and arsenic (Figure 9.10 C, D, E and F). The remaining material from each sample point was panned and the number of gold "colours" were counted (Figure 9.9 B).

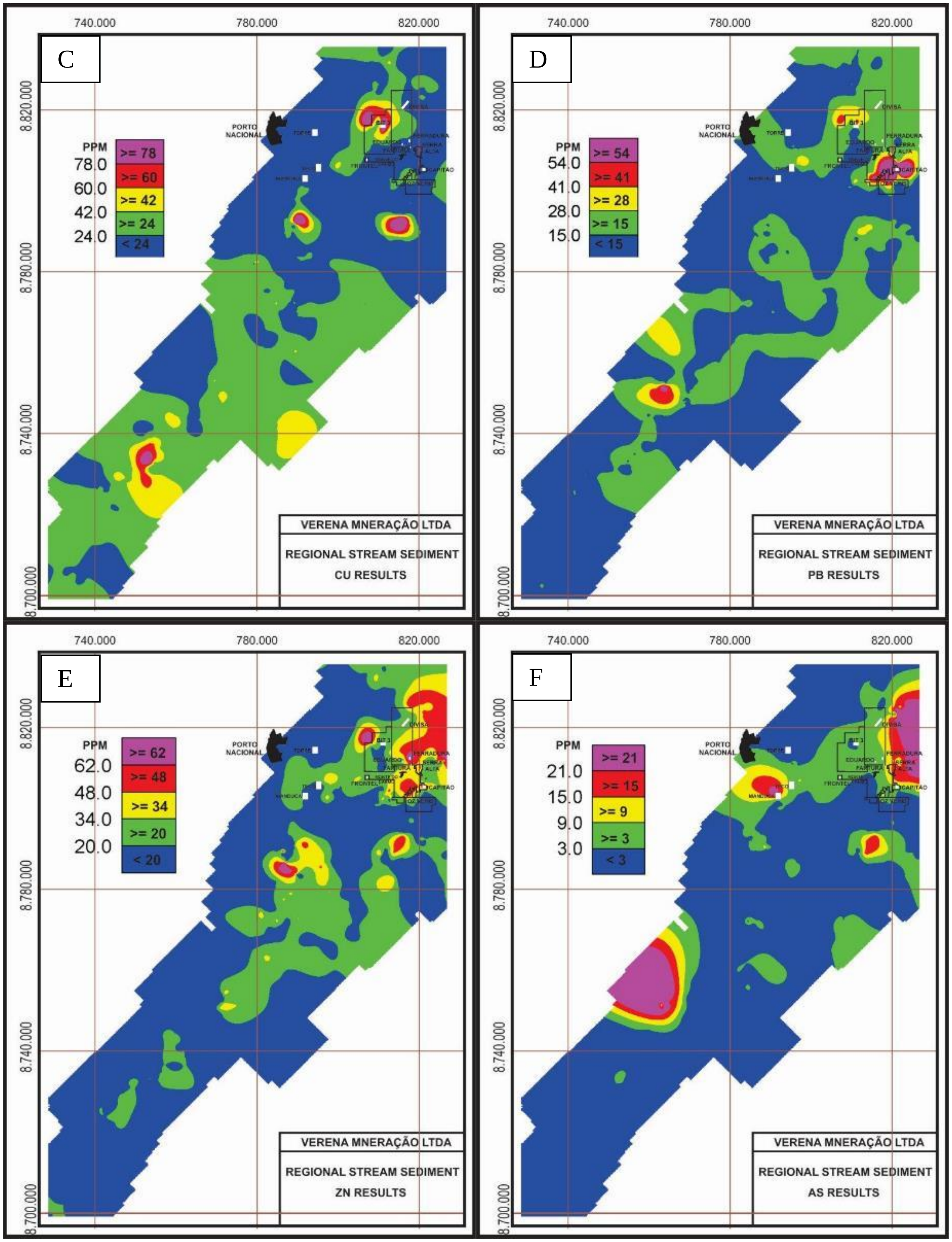
For each element, the results were interpreted after statistical studies.

**Figure 9.9**
**(A)-Stream Sediment Au Results, (B) Au Colour Count**




Source: MSM 2018. North at top of figure. Scale in metres on map grid.

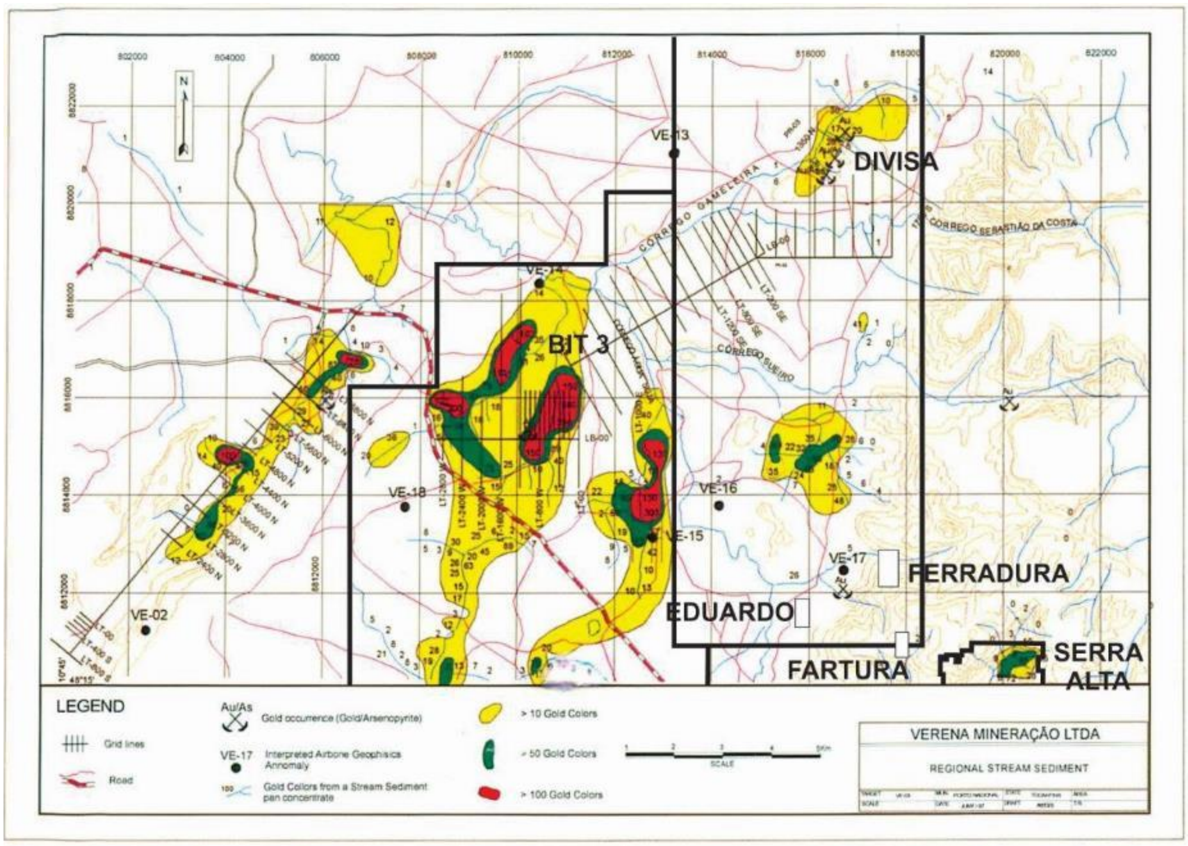
**Figure 9.10**
**Regional Stream Sediment Interpretation Cu, Pb, Zn and As**




Source MSM, 2018. North at top of figure. Scale in metres on map grid.

The most important drainages were sampled in detail, but only for gold colours (Figure 9.11). The Bit-3 target stood out as the most anomalous by the stream sediment survey.

**Figure 9.11**
**Detailed Stream Sediment Survey Showing Bit-3 as the Most Anomalous Target**




Source MSM, 2018

## 9.5 TOPOGRAPHIC SURVEYS

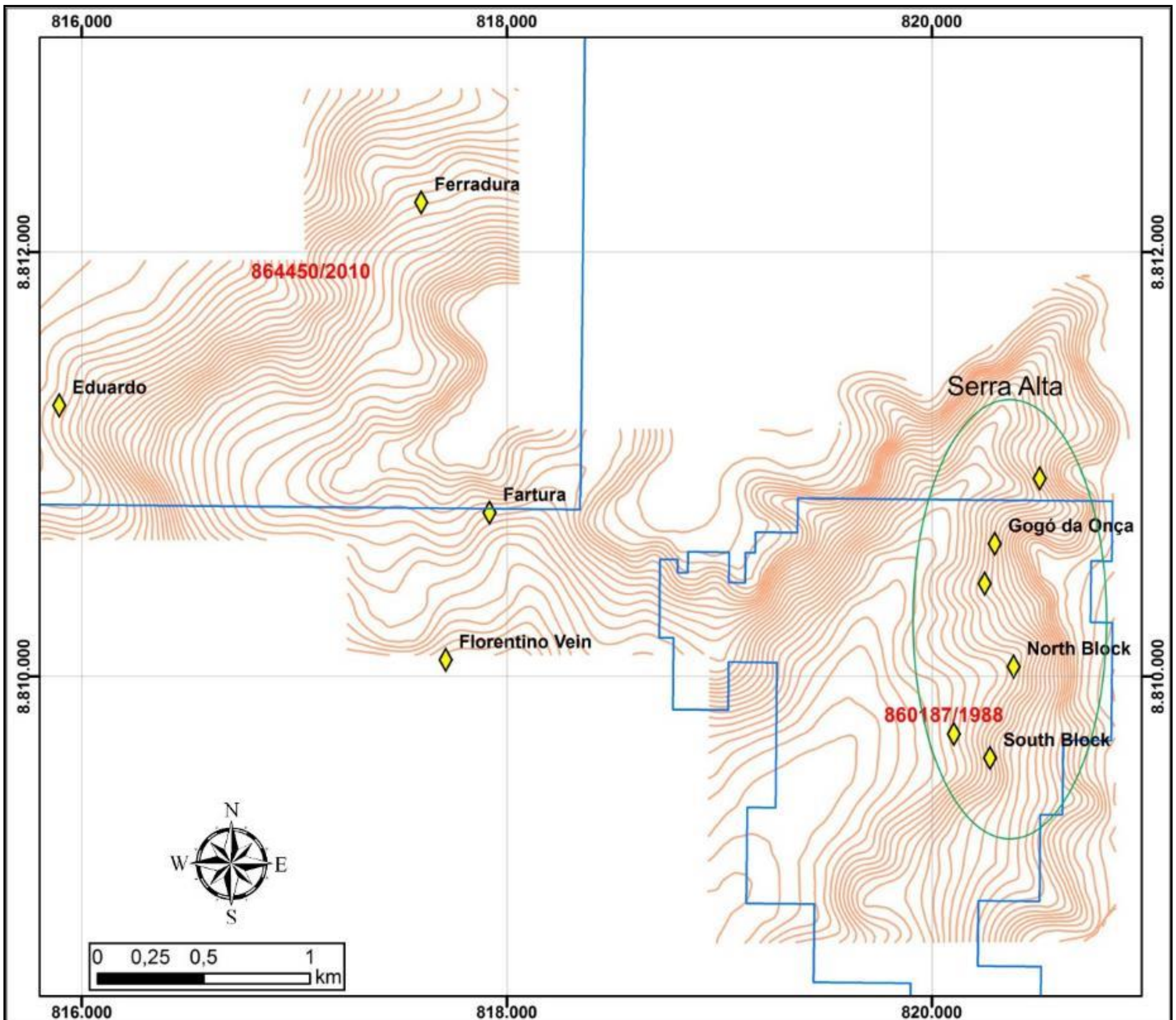
Several terrestrial topographic surveys were completed at the Serra Alta target and one at Ferradura.

The first topographic survey in the Serra Alta area was carried out by PNP in 1991, only partially covering the target area with contour lines every 5 m. This survey also plotted the location of many of the artisanal pits.

Later, in 2013, a detailed topographic survey was carried out on the South Block, North Block and the camp area at Serra Alta, this time with contour lines every 1 m.

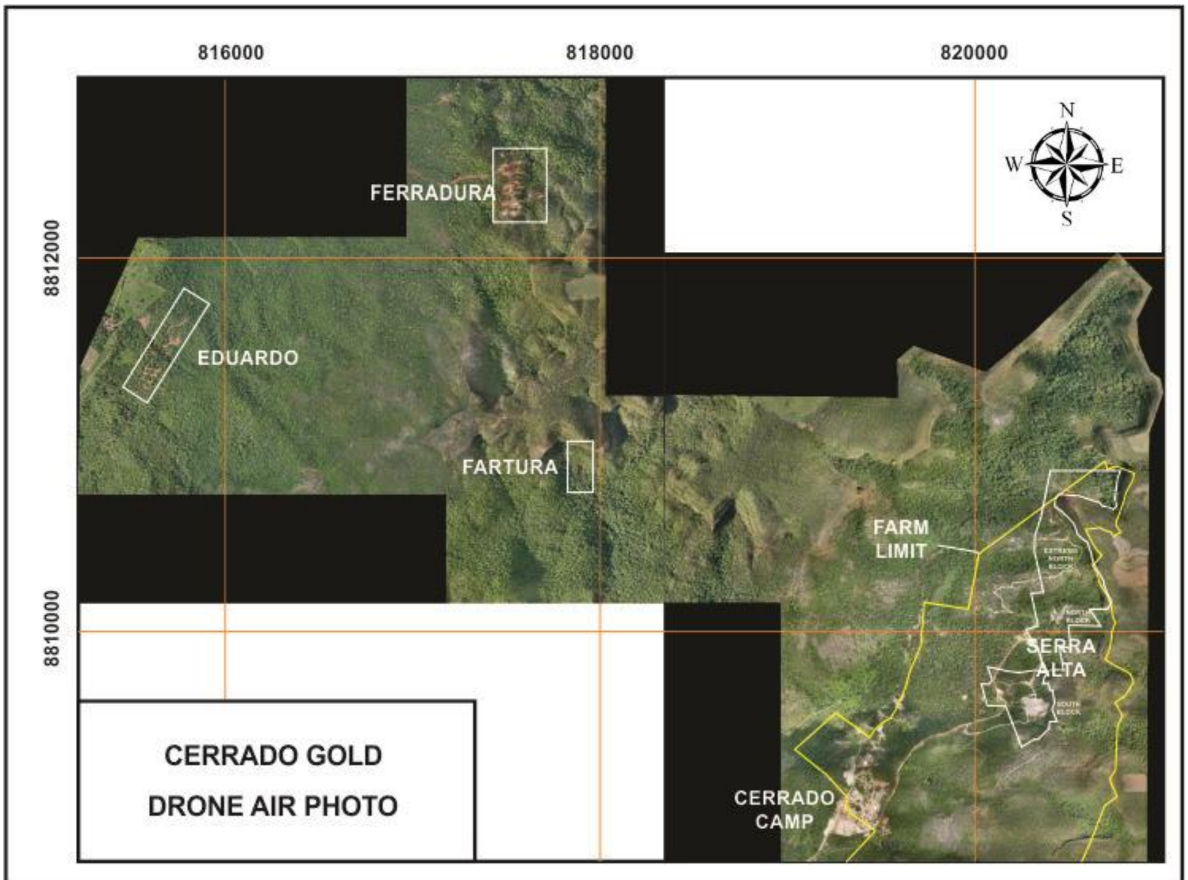
In January, 2018, the services of Drone Records were contracted to carry out topographic surveys of the Serra Alta, Fartura, Ferradura and Eduardo targets, followed by a second survey over the Capitão and Giant Quartz Veins targets using a Lidar-equipped drone. This most recent survey captured the recent small-scale open pit mining completed by MSM. The drone also captured aerial photography (Figure 9.12 and 9.13).

**Figure 9.12**
**2018 Drone Topography of Serra Alta and Ferradura**




Source MSM, 2018

**Figure 9.13**
**Drone Air Photo of Serra Alta and Ferradura**




Source MSM, 2018. Scale in metres on photo grid.



## 9.6 Chip Channel and Grab Sampling

Channel sampling was first carried out by the PNP Group in 1991. A total of 1,146 approximately one metre samples were collected. In 2006, Kinross, under a JV with VMC, collected a total of 1,345 channel samples, but only 596 were collected within the Cerrado properties. In December, 2017, MSM collected 121 channel samples in hard rock limited to the Serra Alta south pit. Lara Resources also collected some grab and chip samples on the occasion of a due diligence visit.

Most of the channel samples in fresh rock were collected using an electric saw with a diamond disk blade, powered by a portable generator (Figure 9.14).

**Figure 9.14**
**PNP Channel Samples Collected in Hard Rock Using Electric Saw with Diamond Blade**

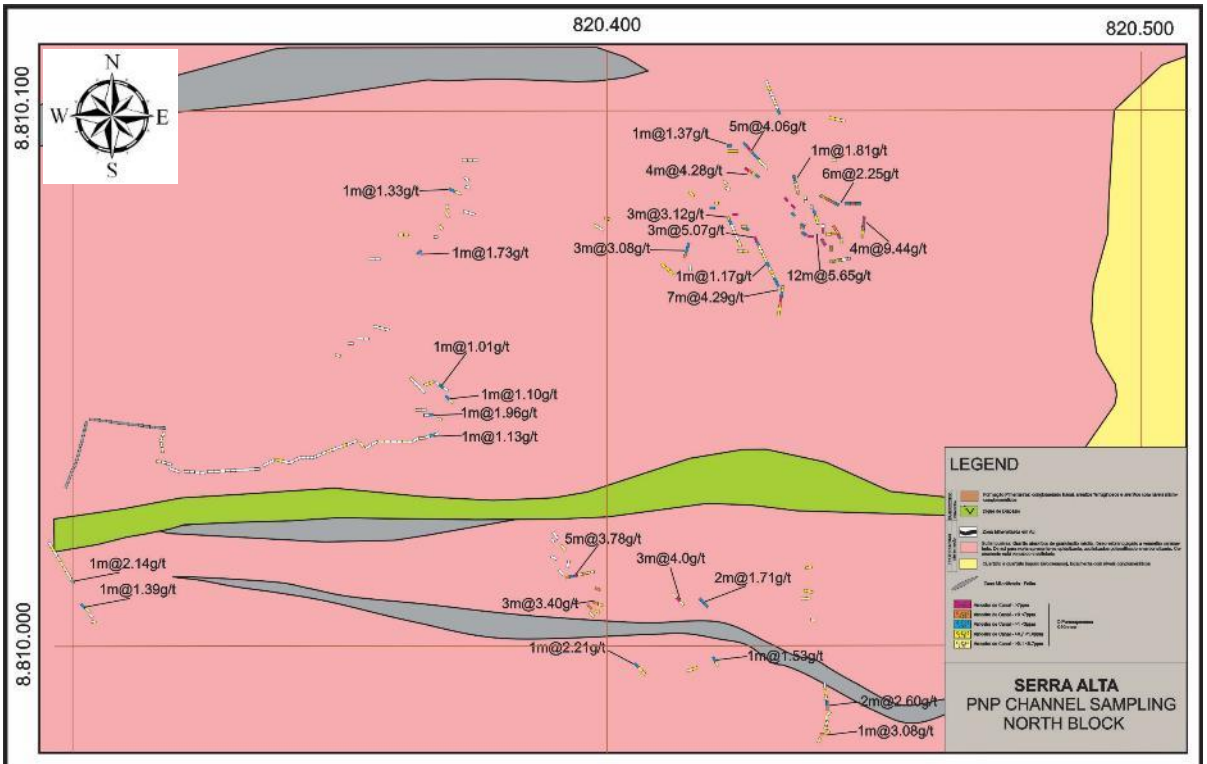
Source MSM, 2018

The PNP channel sampling was limited to the Serra Alta target, North, Central and South Blocks. Sampling at the Extreme North Block was only done by chip and grab samples, discussed below.

The 1,146 PNP channel samples were analyzed only for gold, by atomic absorption (MIBK finish). It is not known what the size of the sample aliquot was.

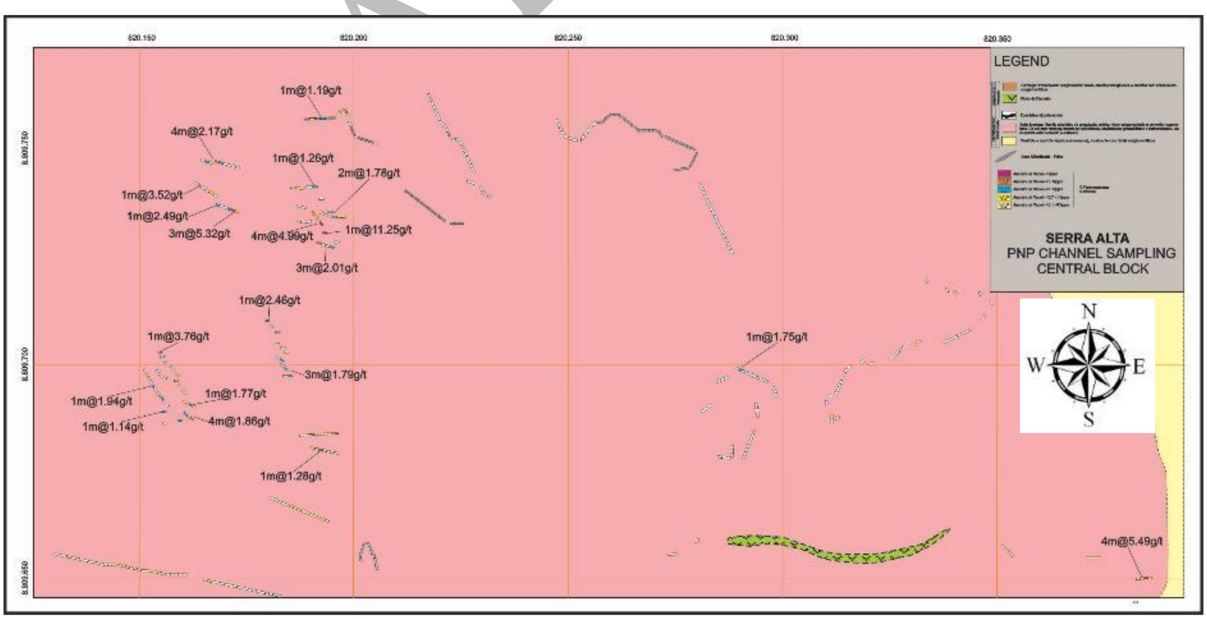
Figure 9.15 to Figure 9.17 show the samples locations and results above 1.0 g/t Au for the North, Central and South Block channel samples respectively. Figure 9.18 shows an example of a PNP channel in hard rock, sized 4 cm by 3 cm.

**Figure 9.15**
**PNP North Block Channel Sample Locations Showing Important Au Results**



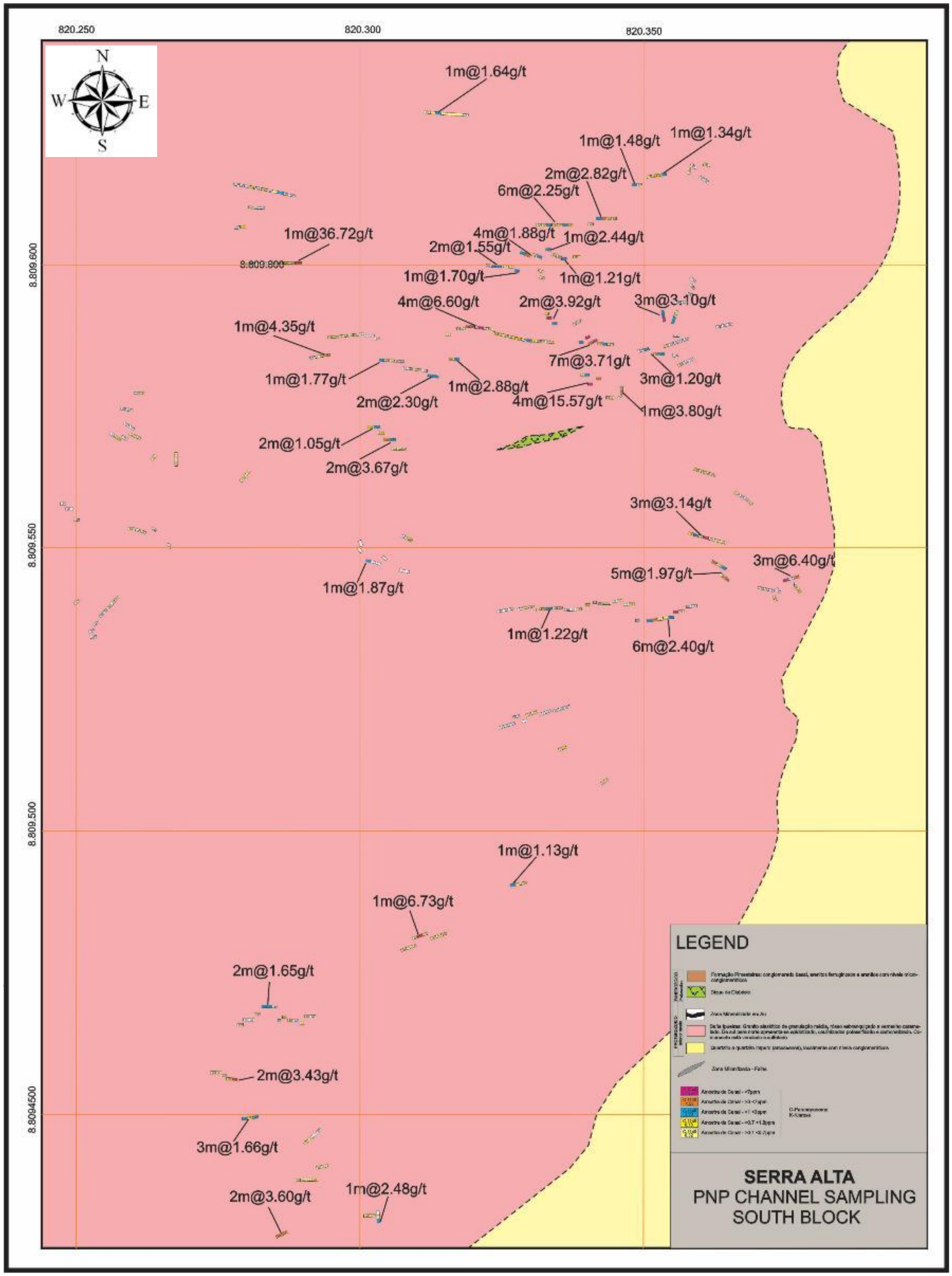

Source: MSM 2018. Scale in metres on grid lines.

**Figure 9.16**
**PNP Central Block Channel Sample Locations Showing Important Au Results**




Source: MSM 2018. Scale in metres on grid lines.

**Figure 9.17**
**PNP South Block Channel Sample Locations Showing Important Au Results (>1g/t)**




Source: MSM 2018. Scale in metres on grid lines.

**Figure 9.18**
**PNP Channel Sampling in Hard Rock**


Source: MSM 2018.

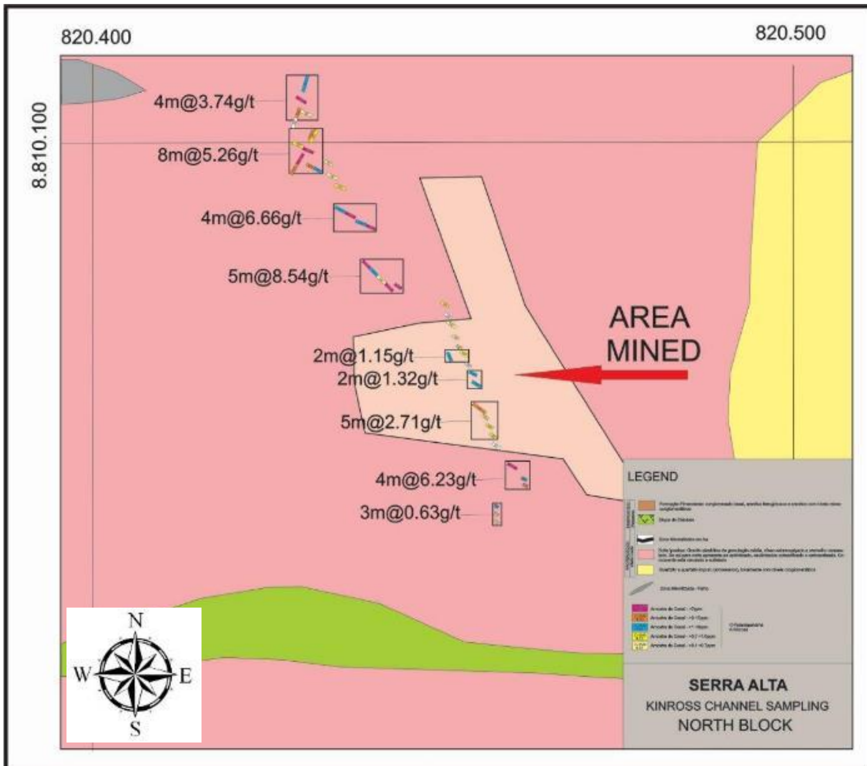
In 2006, Kinross collected a total of 618 channel samples of which 110 were collected at Serra Alta, 45 in the North Block and 65 in South Block. Additionally, 293 samples were collected at the Capitão target and 215 at the Giant Quartz Veins.

The cut channels were 5 cm in width and 4 cm in depth, with lengths between 1 and 2 m, selected in an attempt to honour lithological changes. All were assayed for gold by fire assay and by a multi-element determination.

The channels collected at Serra Alta and Capitão were located with a total station survey instrument. At other targets the samples were located by GPS.

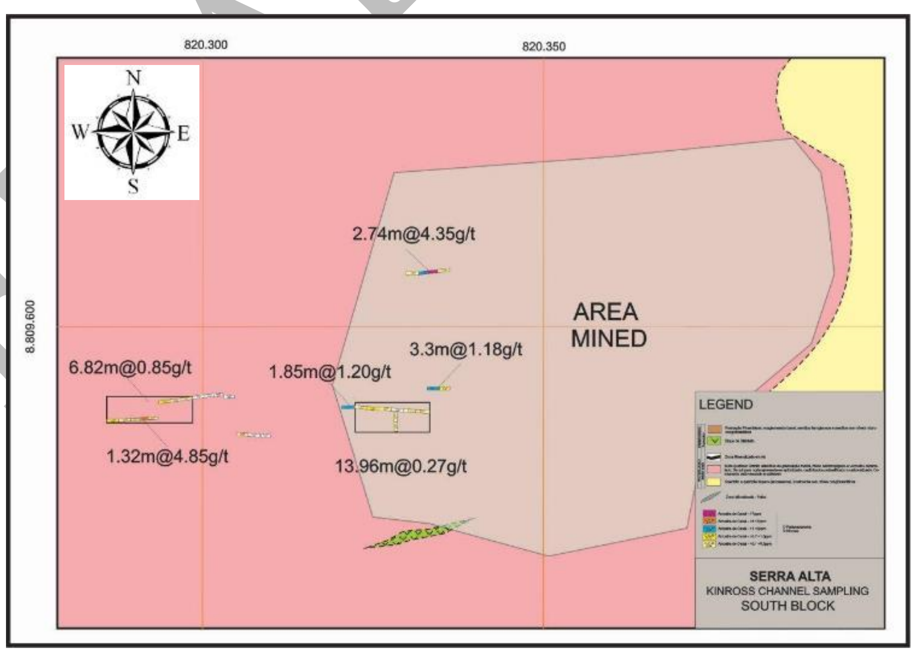
Figure 9.19 and Figure 9.20 show the best results from the channel samples at the North and South Blocks respectively. Sampling results from the Capitão and Giant Quartz Veins targets are not shown.

**Figure 9.19**
**Kinross Channel Sample Locations and Best Results at Serra Alta North Block**




Source: MSM 2018. Scale in metres on grid lines

**Figure 9.20**
**Kinross Channel Sample Location and Best Results at Serra Alta South Block**




Source: MSM 2018. Scale in metres on grid lines

In December, 2017, MSM washed much of the floor of the South pit, and cut four parallel channels, 10 m apart and collected 121 samples from them. The channels were laid out on an azimuth of N75E, perpendicular to veining. The channels cut were 9.0 cm wide by 2.5 cm deep, with samples taken every metre. (Figure 9.21 A and D). Half of the sample was sent to the laboratory and the right half was stored in core boxes (Figure 9.21 B and C).

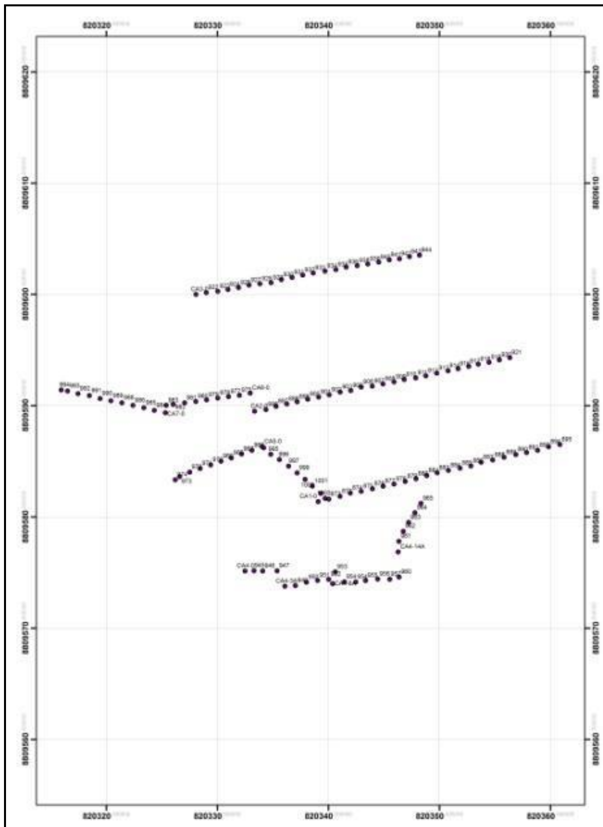
**Figure 9.21**
**MSM Channel Sampling**


Source: MSM 2018. (A and B) Channel samples being collected and stored in core box; (C) 1-m samples stored in plastic bags; (D) 1 m channel after sampling.

The samples were analyzed by SGS using the screen metallics method. The channel locations are shown in Figure 9.22. The individual results of the four channels are shown in Figure 9.23 with a simple arithmetic mean for the intervals.

Channel sampling at Serra Alta was ongoing by Cerrado at the time of the QP's visits.

**Figure 9.22**
**MSM Channel Locations**



Source MSM 2018. North at top of figure. Scale in metres on map grid.

**Figure 9.23**
**Individual Results of the South Pit Channels 1, 2, 3 and 4**

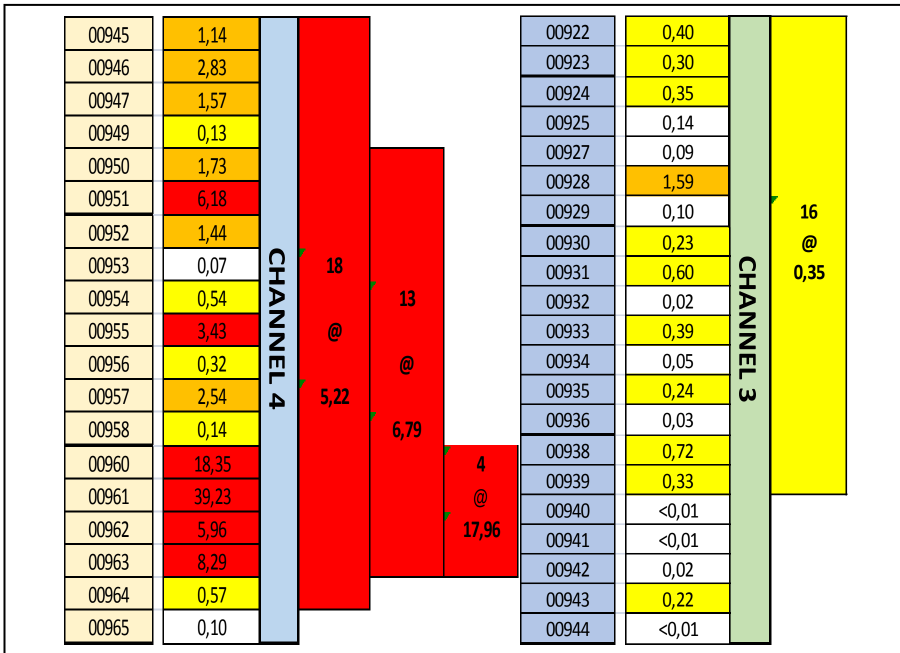
CHANNEL 1 (20 @ 1,71; 15 @ 1,85; 12 @ 2,00)

| Sample n° | Au (ppm) |
|---|---|
| 00872 | 4,68 |
| 00873 | 1,70 |
| 00874 | 0,47 |
| 00875 | 1,51 |
| 00876 | 7,99 |
| 00877 | 0,88 |
| 00878 | 0,88 |
| 00879 | 0,06 |
| 00880 | 0,13 |
| 00881 | 2,41 |
| 00883 | 0,13 |
| 00884 | 3,14 |
| 00885 | 1,53 |
| 00886 | 1,15 |
| 00887 | 1,12 |
| 00888 | 0,30 |
| 00889 | 0,22 |
| 00890 | 0,49 |
| 00891 | 1,05 |
| 00892 | 4,31 |
| 00894 | 0,02 |
| 00895 | <0,01 |

CHANNEL 2 (24 @ 1,17; 15 @ 1,02; 12 @ 1,17)

| Sample n° | Au (ppm) |
|---|---|
| 00896 | 0,23 |
| 00897 | 5,17 |
| 00898 | 0,10 |
| 00899 | 0,20 |
| 00900 | 2,36 |
| 00901 | 0,09 |
| 00902 | 0,27 |
| 00903 | 0,47 |
| 00905 | 0,03 |
| 00906 | 0,92 |
| 00907 | 0,18 |
| 00908 | 2,90 |
| 00909 | 1,40 |
| 00910 | 0,25 |
| 00911 | 0,74 |
| 00912 | 0,23 |
| 00913 | 0,07 |
| 00914 | 0,06 |
| 00916 | 0,07 |
| 00917 | 0,61 |
| 00918 | 1,42 |
| 00919 | 0,03 |
| 00920 | 0,07 |
| 00921 | 10,24 |

**Figure 9.23 (cont'd.)**



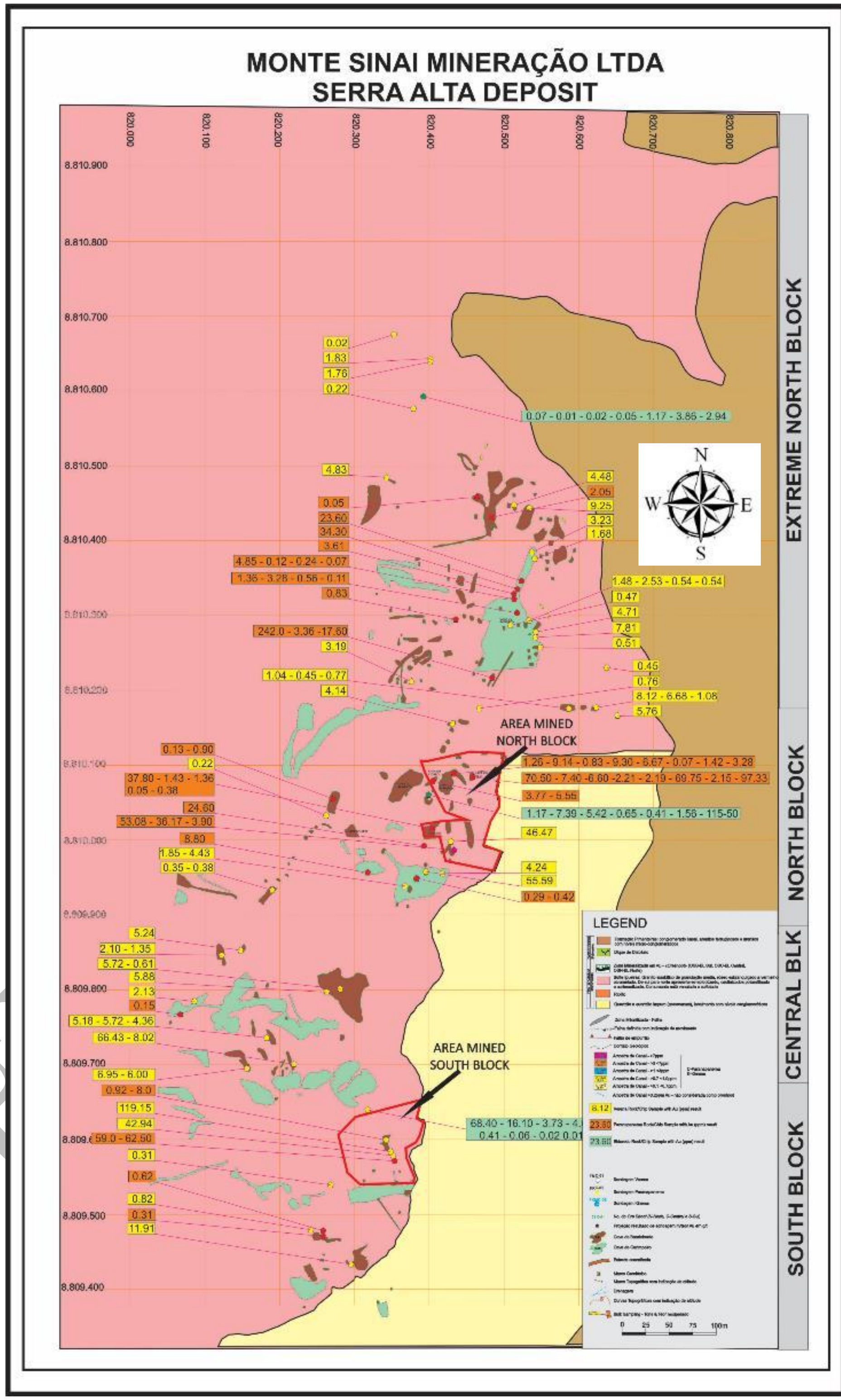

Source MSM, 2018

A total of 127 grab and chip samples were collected within the Serra Alta Deposit by PNP, Verena/MSM and Eldorado (the latter during due diligence), distributed as shown in Table 6. The results are shown on Figure 9.24. The figure also highlights the garimpeiro and bandeirante pit locations.

**Table 9.1**
**Grab/Chip Samples Collected at Serra Alta**

| Location | No. of Samples | | | Total |
|---|---|---|---|---|
| | PNP | VML | Eldorado | |
| South Block | 5 | 5 | 12 | 22 |
| Central Block | 1 | 14 | 0 | 15 |
| North Block | 32 | 8 | 0 | 40 |
| Extreme North Block | 17 | 28 | 7 | 52 |
| **Total** | **55** | **55** | **19** | **129** |

**Figure 9.24**
**Serra Alta Grab/Chip Sample Locations and Results**




Source: MSM 2018. North at top of figure. Scale in metres on map grid. Source MSM, 2018. Samples collected by PNP (orange) VML (yellow) and Eldorado (green).

## 9.7 EXPLORATION COMPLETED IN LATE 2018

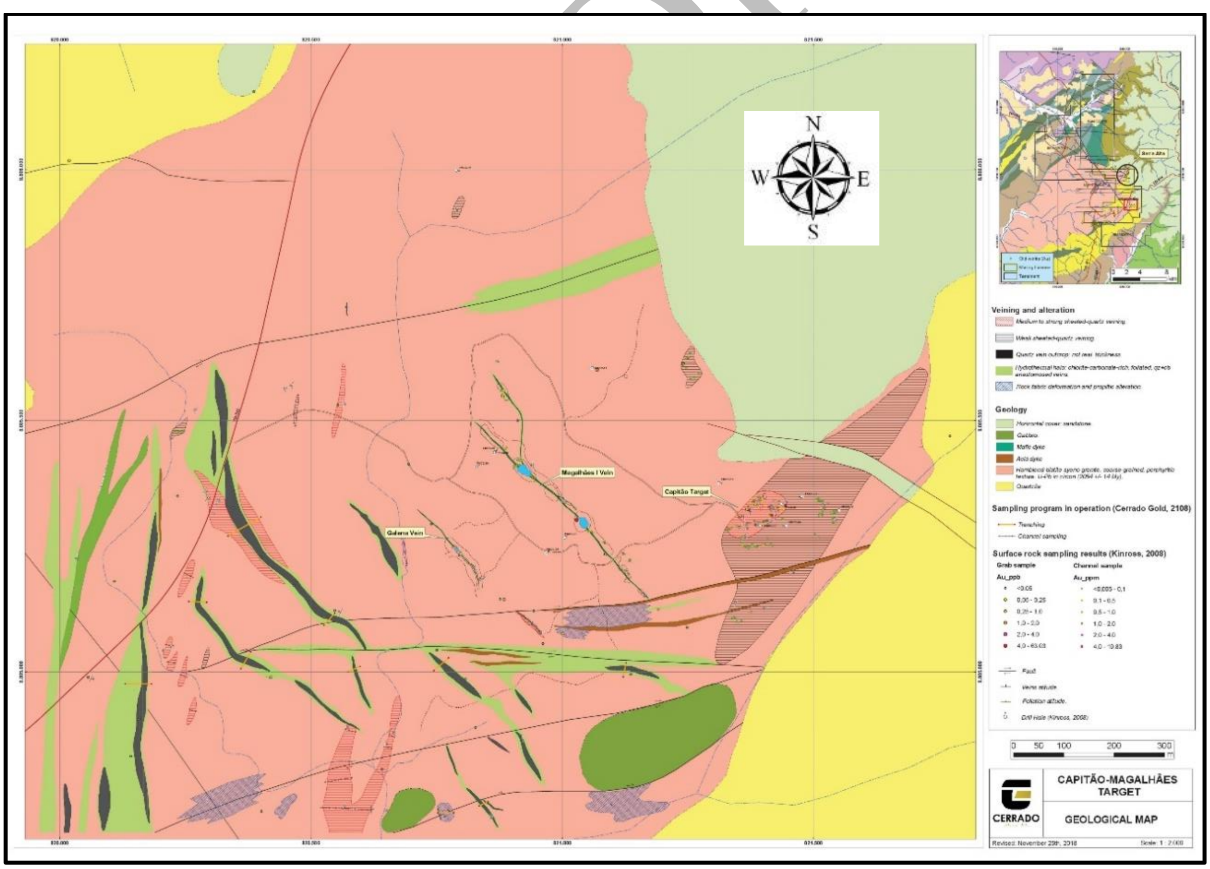
Monte do Carmo exploration activities in 2018 were focused on Serra Alta. However, several gold occurrences up to about 15 km to the south, west and north had been identified, mapped, sampled and in some cases drilled in the past by other parties. In 2018, Cerrado completed additional exploration on these targets.

### 9.7.1 Capitão Target

This target occurs in a shear zone parallel to the Serra Alta Deposit, within the same permit, and located about 5 km to the south. As at Serra Alta, Capitão and Magalhães mineralization is associated with the same granite intrusion which is covered by quartzite and Devonian flat-lying sediments. It has the same mineralogical paragenesis and tectonics. These targets have 13 drill holes completed by Kinross in 2007. It was superficially mined by garimpeiros in the past. The mineralized zone has a width of about 70 m and strike of about 300 m, where 7 mineralized shoots were mined by garimpeiros. See Figure 9.25.



**Figure 9.25**
**Capitão/Magalhaes Geological Map**




Source: Cerrado, 2019

At Capitão/Magalhães a sampling program was conducted by Cerrado totaling 22 trenches. The assay results are pending. The work was completed to re-evaluate this area and to update a proposed drilling program. The geological map of this area includes the Capitão target, Magalhaes Vein, Galena Vein and another 11 unnamed veins located at the north portion of Giant Quartz Vein Area.

At these targets, 22 trenches were reopened, and work focused on improving the collection of structural details with emphasis on the vein's shape. Some of the Giant Veins were sampled and mapped, with apparent thickness up to 4 m. The samples have few sulphides, mostly box work textures from oxidized pyrite. The veins are classified as shear veins and a quartz veinlet system is observed in the hanging wall and footwall.

### 9.7.2 Fartura Target

This target is located about 3 km west of the Serra Alta Deposit, associated with the same granite intrusion. It is also similar to the Capitão Target. It was superficially mined by the Bandeirantes (17th century Portuguese explorers) and garimpeiros (1980s and 1990s). It has the same features (geological, mineralization and gold grades) as the Serra Alta Deposit.

Rock chip sample assay results from 9 samples returned encouraging grades, confirming the presence of gold mineralization at the Fartura silicification zones. The best grades are 2.18, 1.99, 1.03 0.33 and 0.20 g/t Au, as shown on Figure 9.26. Most of them are from old artisanal pits except one which came from a newly discovered and unmined zone about 200 m east of the Fartura main pit, which returned 0.33 g/t Au. A geological map of the Fartura target is presented in Figure 9.27. Figure 9.28 is a photograph of the trench in the unmined zone 200 m east of the Fartura main pit.

**Figure 9.26**
**Fartura Target Chip Samples Anomalies**

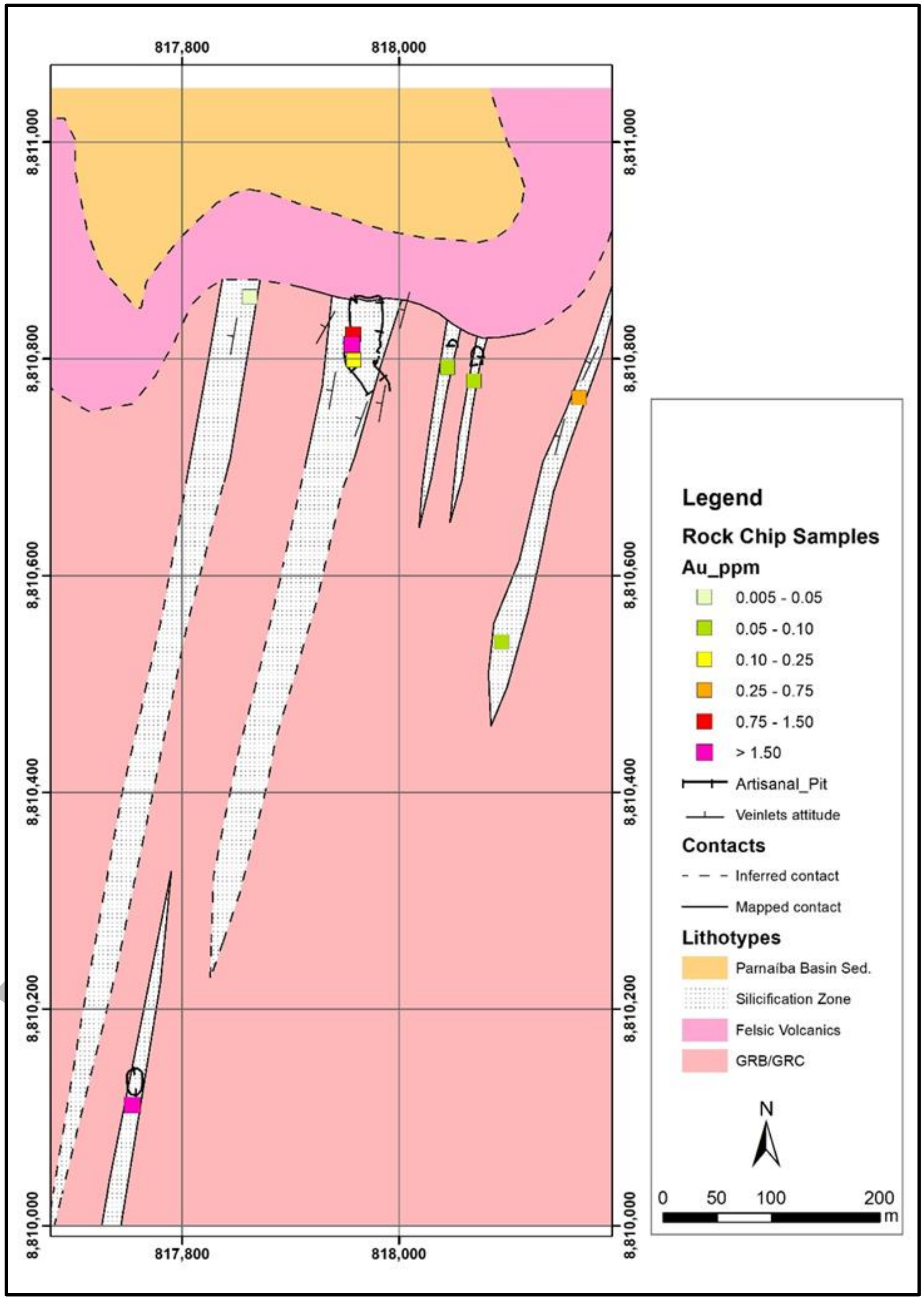
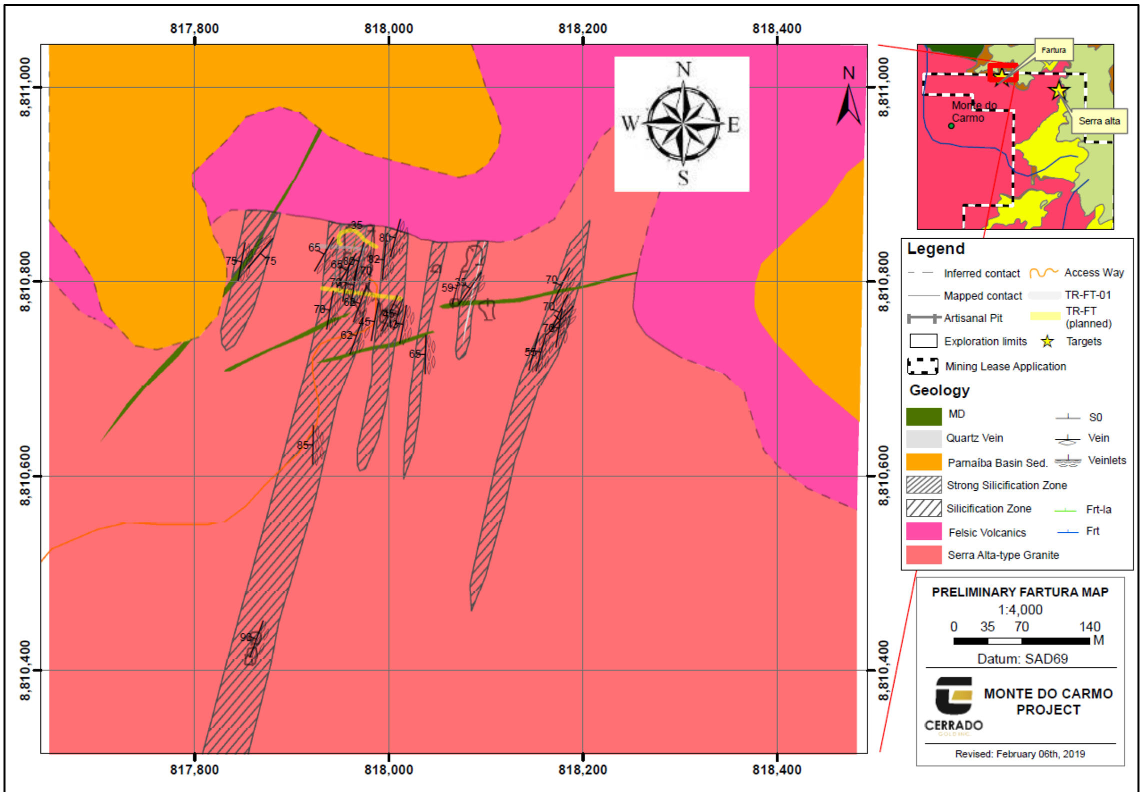


**Figure 9.27**
**Fartura Target Detailed Geological Map**

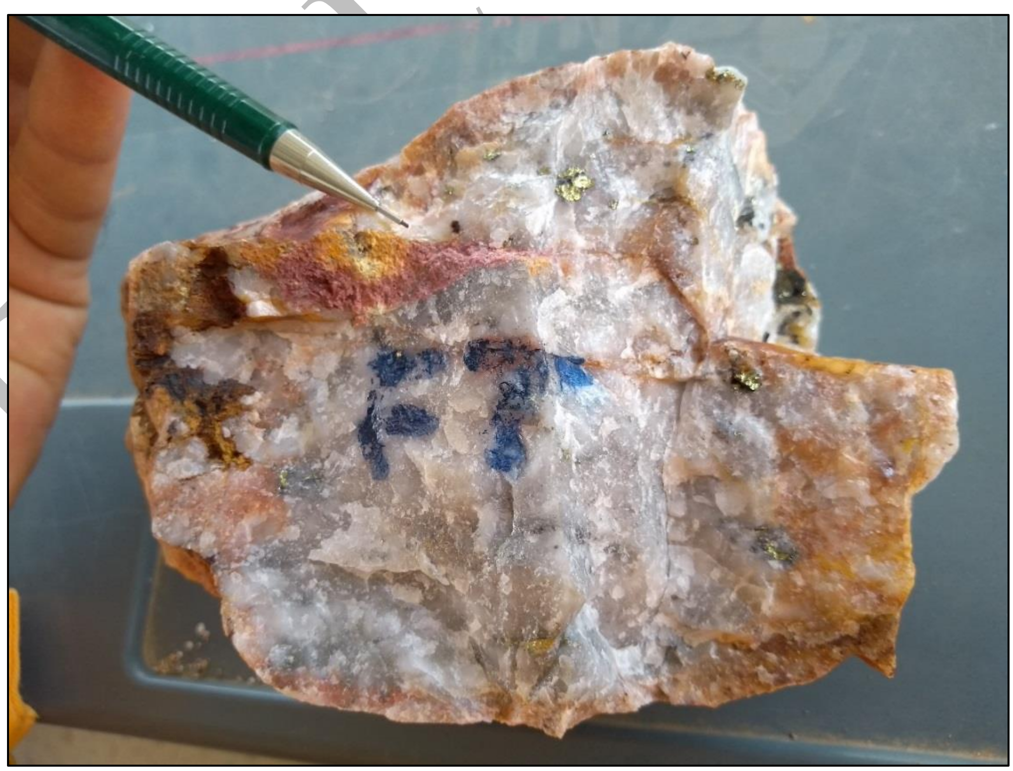



Five trenches were opened and sampled, and it was possible to map strong hydrothermal alteration (Figure 9.28). Figure 9.29 shows a close-up view of a mineralized vein.

Further work is needed to follow up the Fartura silicification zones (veins and veinlets).

**Figure 9.28**
**Swarms of Quartz Veins in Wall of Trench**

**Figure 9.29**
**Closeup View of Partially Weathered Pyrite-Chalcopyrite-Bearing Quartz Vein at Fartura**

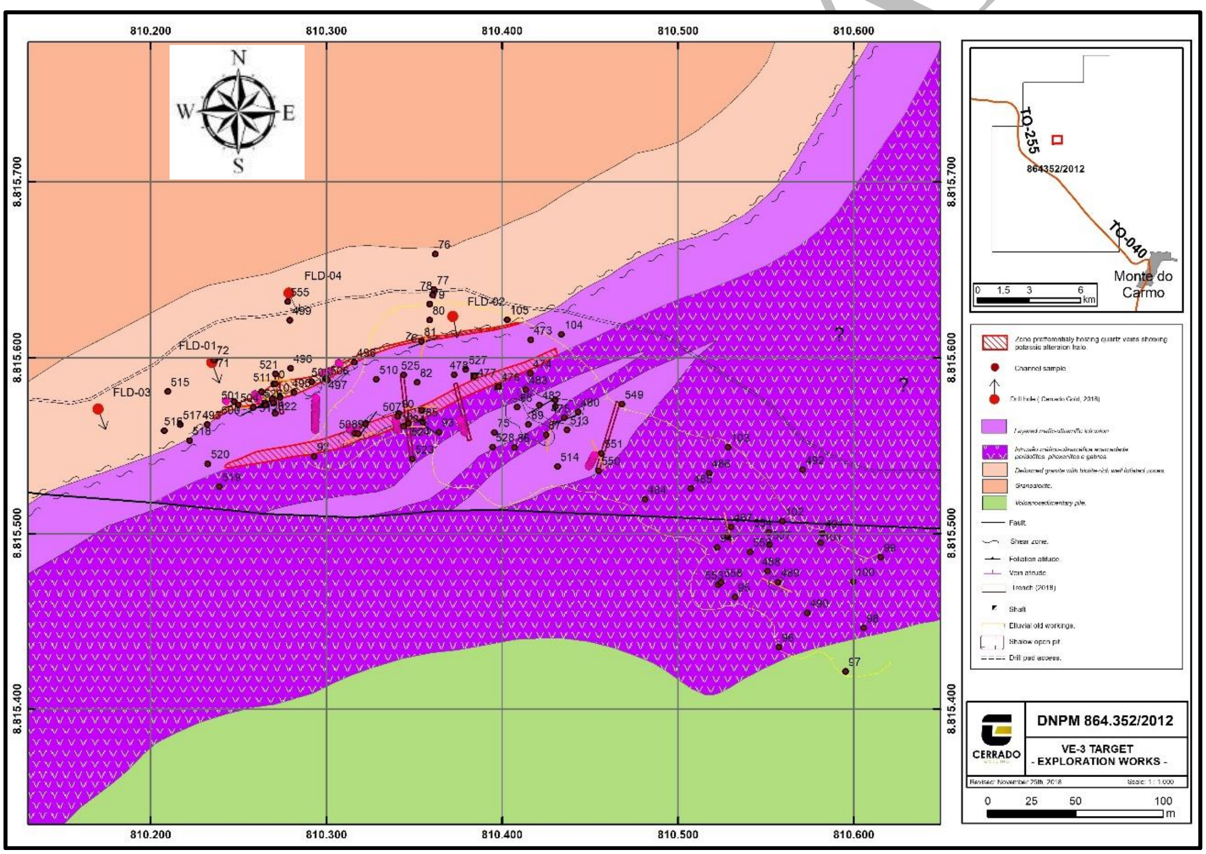


### 9.7.3 Bit-3 Target

The Bit-3 target was developed by Verena in the 1980s following up on an airborne geophysical anomaly that indicated a large mafic/ultramafic unit. Initial drilling by Verena led to some positive results but due no QA/QC was conducted with the sampling. Cerrado is only using those results for general guidance. In 2018, five trenches and 4 drill holes were completed and positive assays were produced.

Also in 2018, the geological map of this target was revised, and detail improved, as shown in Figure 9.30. The results indicate that the main mineralized structure is continuous to the northeast and southwest and should be explored.

**Figure 9.30**
**Bit-3 Geological Map**




In 2018, Bit-3 was drilled and interesting gold grades from a biotite-quartz altered zone were returned from drill holes FLD-01 and FLD-04 (see Table 9.2). Drill holes FLD-02 and FLD-03 fail to extend the main mineralized intersection to north and south, respectively. The geological model of the mineralized zone indicates potential to down dip extension. Also, four trenches totaling proximately 100 m were excavated and sampled indicating interesting gold anomalies.

**Table 9.2**
**Bit-3 2018 Drill Hole Results**

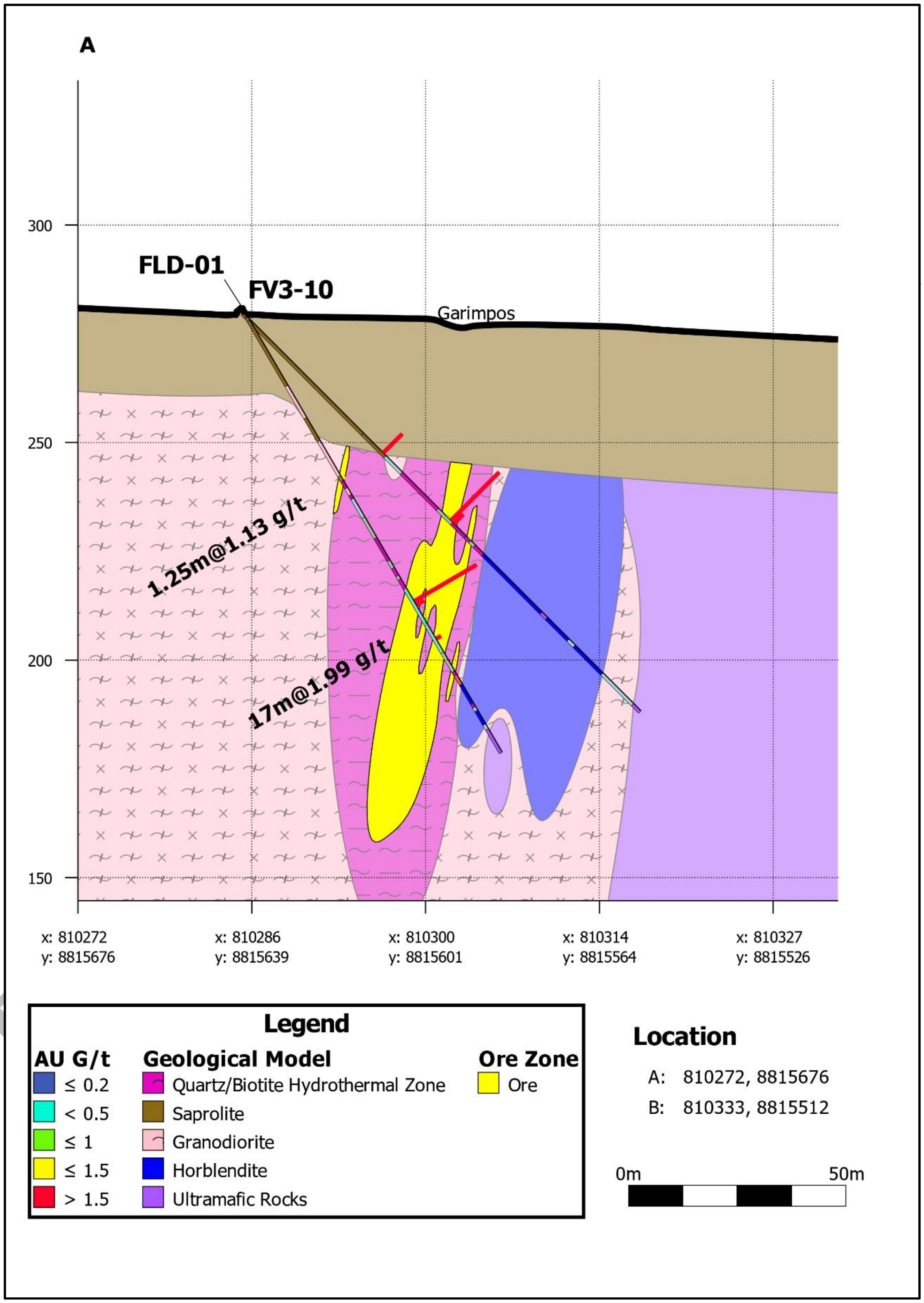
| DDH | From (m) | To (m) | Length (m) | Au (ppm) | True Width (m) |
|---|---|---|---|---|---|
| FLD-01 | 42.50 | 43.75 | 1.25 | 1.13 | 0.88 |
| FLD-01 | 72.50 | 89.50 | 17.00 | 1.99 | 12.00 |
| FLD-02 | No significant values | | | | |
| FLD-03 | No significant values | | | | |
| FLD-04 | 76.00 | 78.00 | 2.00 | 1.07 | 1.41 |
| FLD-04 | 94.40 | 97.50 | 3.10 | 1.25 | 2.19 |
| FLD-04 | 110.77 | 114.2 | 3.43 | 1.31 | 2.42 |

FLD-01: This hole was planned to extend mineralization from historical drill hole FV3-10 down dip. FLD-01 successfully intercepted 17 mineralized metres. The down-dip extension of this new drill hole is interpreted to have good exploration potential.

FLD-04: This hole was planned to intercept the down dip extension of garimpos mapped at surface. The results indicated weak mineralization. The lithologies encountered are the same as observed in FLD-01, indicating a northward continuity of the mineralized zone.

Figure 9.31 shows a geological section through drill hole FLD-01.

**Figure 9.31**
**FLD-01 Geological Section**




Source: Cerrado, 2019

# 10.0 DRILLING

Drilling at the Monte do Carmo project took place in six different stages. The first four stages were completed by earlier operators in 1989 to 2008 and are discussed in Section 6. The remaining two programs were conducted by Cerrado:

- 2017 - Diamond drilling by Cerrado at the Ferradura and Eduardo Targets;
- 2018 - Ongoing diamond drilling by Cerrado at Serra Alta since January, 2018.

## 10.1 CURRENT DRILLING

### 10.1.1 2017 Other Targets

Late in 2017 Cerrado drilled 12 holes, 8 at Ferradura for 1,286.65 m and 4 at Eduardo for 286.64 m (Table 10.1).

**Table 10.1**
**2017 Cerrado Drilling, Other Targets**

| Targets | Total Metres | Total Holes | ANM Concession |
|---|---|---|---|
| Ferradura | 1,286.65 | 8 | 864.450/10 |
| Eduardo | 286.64 | 4 | 864.450/10 |
| | | | |
| **Total** | **1,573.29** | **12** | |

The collar information for the holes drilled at Ferradura and Eduardo is shown in Table 10.2.

**Table 10.2**
**Ferradura and Eduardo Hole Collar Data**

| Drill Hole | X Coordinate | Y Coordinate | Elevation | Depth | Target | Az. | Dip |
|---|---|---|---|---|---|---|---|
| FED_01 | 815780.343 | 8811366.993 | N.D | N.D | Eduardo | 115 | -60.31 |
| FED_02 | 815805.023 | 8811285.224 | N.D | N.D | Eduardo | 290 | -50.08 |
| FED_03 | 815900.193 | 8811439.195 | N.D | N.D | Eduardo | 290 | -49.09 |
| FED_04 | 815965.012 | 8811625.527 | N.D | N.D | Eduardo | 270 | -61.16 |
| FFE_01 | 817538.33 | 8812271.2 | 453.94 | 161.04 | Ferradura | 90 | -50.36 |
| FFE_02 | 817564.52 | 8812325.31 | 445.75 | 160.93 | Ferradura | 90 | -48.8 |
| FFE_03 | 817570.45 | 8812217.38 | 469.39 | 133.93 | Ferradura | 90 | -49.54 |
| FFE_04 | 817574.56 | 8812173.43 | 476.62 | 151.96 | Ferradura | 90 | -50.56 |
| FFE_05 | 817596.32 | 8812123.27 | 485.77 | 160.68 | Ferradura | 90 | -48.69 |
| FFE_06 | 817599.56 | 8812074.93 | 495.17 | 154.58 | Ferradura | 90 | -50.09 |
| FFE_07 | 817726.81 | 8812171.13 | 473.65 | 152.07 | Ferradura | 270 | -49.02 |
| FFE_08 | 817666.81 | 8812135.8 | 475.49 | 212.46 | Ferradura | 90 | -70.27 |

No significant intercepts were encountered at Eduardo. The significant intercepts from Ferradura are shown in Table 10.3.

**Table 10.3**
**Significant Cerrado Drill Intersections from Ferradura**

| Hole | From | To | Length | Au (g/t) | Composite |
|---|---|---|---|---|---|
| FFE_01 | 57.00 | 67.00 | 10.00 | 0.51 | 10 m @ 0.51 g/t Au - from 57 m |
| FFE_01 | 67.00 | 69.15 | 2.15 | 5.35 | 2.15 m @ 5.35 g/t Au - from 67 m |
| FFE_01 | 78.00 | 85.00 | 7.00 | 0.92 | 7 m @ 0.92 g/t Au - from 78 m |
| FFE_03 | 92.50 | 94.50 | 2.00 | 0.67 | 2 m @ 0.67 g/t Au - from 92.5 m |
| FFE_03 | 98.50 | 103.50 | 5.00 | 1.57 | 5 m @ 1.57 g/t Au - from 98.5 m |
| FFE_04 | 87.50 | 89.00 | 1.50 | 0.77 | 1.5 m @ 0.77 g/t Au - from 87.5 m |
| FFE_05 | 28.00 | 29.00 | 1.00 | 1.60 | 1 m @ 1.6 g/t Au - from 28 m |
| FFE_05 | 81.00 | 82.23 | 1.23 | 0.72 | 1.23 m @ 0.72 g/t Au - from 81 m |
| FFE_05 | 111.00 | 112.00 | 1.00 | 5.95 | 1 m @ 5.95 g/t Au - from 111 m |
| FFE_05 | 126.00 | 127.00 | 1.00 | 3.33 | 1 m @ 3.33 g/t Au - from 126 m |
| FFE_05 | 134.50 | 144.00 | 9.50 | 1.67 | 9.5 m @ 1.67 g/t Au - from 134.5 m |
| FFE_06 | 72.00 | 73.00 | 1.00 | 4.02 | 1 m @ 4.02 g/t Au - from 72 m |
| FFE_06 | 100.00 | 101.00 | 1.00 | 1.17 | 1 m @ 1.17 g/t Au - from 100 m |
| FFE_07 | 134.56 | 135.21 | 0.65 | 1.94 | 0.65 m @ 1.94 g/t Au - from 134.6 m |
| FFE_07 | 146.65 | 147.62 | 0.97 | 1.00 | 0.97 m @ 1 g/t Au - from 146.7 m |
| FFE_08 | 95.26 | 97.40 | 2.14 | 5.10 | 2.14 m @ 5.1 g/t Au - from 95.3 m |
| FFE_08 | 193.18 | 194.00 | 0.82 | 1.54 | 0.82 m @ 1.54 g/t Au - from 193.2 m |

For the time being exploration work at Eduardo and Ferradura has ceased.

### 10.1.2 2018 Serra Alta Drilling

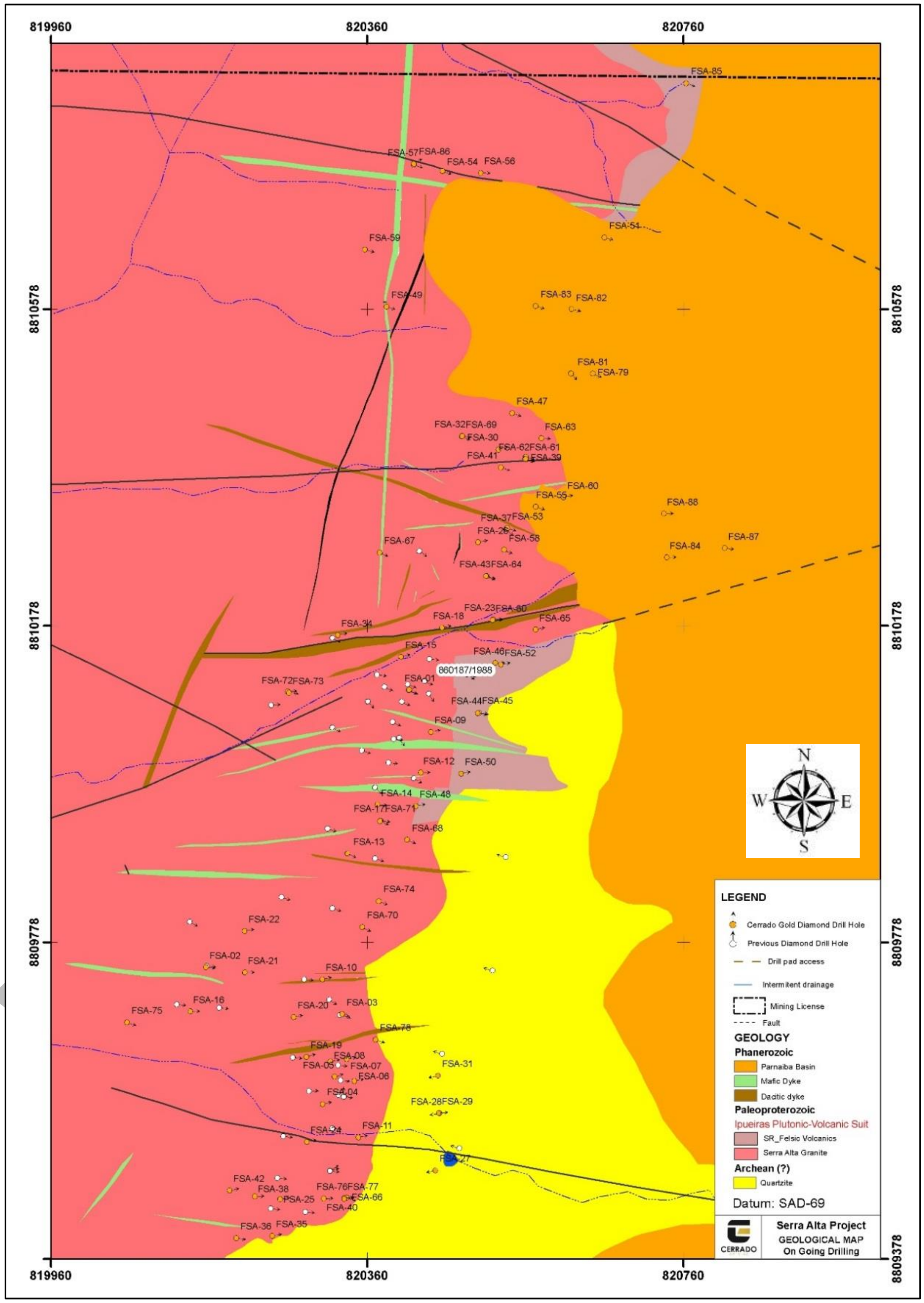
In January, 2018 Cerrado commenced drilling at the Serra Alta Deposit. The company planed a program of about 10,000 m of diamond drilling in 2018. As of the data-freeze date for this report (November 21, 2018) Cerrado had completed 88 drill holes and received assays for, 87 diamond drill holes (up to hole FSA-87) totalling 13,178.93 m (Table 10.4).

**Table 10.4**
**2018 Serra Alta Drilling Summary**

| Targets | Total Metres | Total Holes | ANM Concession |
|---|---|---|---|
| Serra Alta | 13,467.54 | 88 | 860.187/88 |
| | | | |
| **Total** | **13,467.54** | **88** | |

The drill hole collar locations are shown on Figure 10.1. The collar information for the holes drilled by Cerrado at Serra Alta is shown in Table 10.5.

**Figure 10.1**
**Serra Alta Drill Hole Locations**




Source: Cerrado, 2019, Scale in metres on grid lines.

**Table 10.5**
**Cerrado Drill Hole Collar Information at Serra Alta as of Data Freeze Date**

| Drill Hole | X Coordinate | Y Coordinate | Elevation | Depth | Date Finished | Az. | Dip |
|---|---|---|---|---|---|---|---|
| FSA-01 | 820412.72 | 8810097.4 | 454.26 | 104.31 | 15/01/2018 | 112 | -50.07 |
| FSA-02 | 820156.15 | 8809746.9 | 425.79 | 92.07 | 18/01/2018 | 97 | -50 |
| FSA-03 | 820327.95 | 8809687.4 | 482.23 | 118.05 | 24/01/2018 | 112 | -61.07 |
| FSA-04 | 820304.01 | 8809574 | 469.93 | 93.08 | 29/01/2018 | 75 | -50.91 |
| FSA-05 | 820318.91 | 8809608.2 | 466 | 94.96 | 01/02/2018 | 70 | -54.62 |
| FSA-06 | 820343.81 | 8809603.2 | 467.66 | 115.69 | 05/02/2018 | 80 | -45.87 |
| FSA-07 | 820334.02 | 8809630.6 | 472.12 | 85.99 | 06/02/2018 | 80 | -50.31 |
| FSA-08 | 820313.47 | 8809627.7 | 469.92 | 103.87 | 09/02/2018 | 80 | -51.96 |
| FSA-09 | 820440.76 | 8810044.3 | 467.78 | 123.35 | 15/02/2018 | 80 | -50.9 |
| FSA-10 | 820303.1 | 8809731.6 | 479.36 | 78.5 | 17/02/2018 | 80 | -45 |
| FSA-11 | 820348.98 | 8809531.7 | 471.09 | 160.75 | 27/02/2018 | 80 | -44.66 |
| FSA-12 | 820427.94 | 8809993 | 459.34 | 127.73 | 21/02/2018 | 90 | -46.09 |
| FSA-13 | 820335.59 | 8809890.4 | 462.79 | 122.54 | 24/02/2018 | 120 | -65.12 |
| FSA-14 | 820373.35 | 8809952.3 | 455.83 | 70.12 | 27/02/2018 | 95 | -50.6 |
| FSA-15 | 820403.18 | 8810139.3 | 445.99 | 103.97 | 01/03/2018 | 75 | -50 |
| FSA-16 | 820136.53 | 8809691.1 | 413.93 | 94.83 | 06/03/2018 | 90 | -53.79 |
| FSA-17 | 820377.54 | 8809932.5 | 460.11 | 109.93 | 05/03/2018 | 100 | -49.96 |
| FSA-18 | 820454.58 | 8810176.1 | 459.99 | 100.91 | 07/03/2018 | 80 | -44.63 |
| FSA-19 | 820283.2 | 8809633.3 | 452.02 | 31.62 | 07/03/2018 | 73.54 | -43.63 |
| FSA-20 | 820266.93 | 8809683.7 | 447.84 | 115.74 | 10/03/2018 | 78.7 | -43.52 |
| FSA-21 | 820205.43 | 8809740.7 | 442.29 | 100.57 | 10/03/2018 | 90.73 | -44.62 |
| FSA-22 | 820205.22 | 8809792.9 | 438.03 | 124.79 | 13/03/2018 | 80.95 | -46.1 |
| FSA-23 | 820519.3 | 8810186.8 | 478.42 | 234.96 | 16/03/2018 | 90.73 | -44.42 |
| FSA-24 | 820283.59 | 8809526.4 | 456.08 | 97.74 | 15/03/2018 | 80 | -44.73 |
| FSA-25 | 820250.11 | 8809454 | 499.01 | 97.28 | 17/03/2018 | 85 | -46.51 |
| FSA-26 | 820500.36 | 8810283.9 | 522.24 | 97.96 | 23/03/2018 | 80.36 | -45.3 |
| FSA-27 | 820446.8 | 8809490.2 | 541.34 | 151.22 | 20/03/2018 | 257.64 | -55.03 |
| FSA-28 | 820451.8 | 8809562.2 | 546.92 | 146 | 23/03/2018 | 260.46 | -54.17 |
| FSA-29 | 820450.68 | 8809562.7 | 546.99 | 121.85 | 26/03/2018 | 86.1 | -79.83 |
| FSA-30 | 820526.46 | 8810401.4 | 542.96 | 123.49 | 27/03/2018 | 77.44 | -45.55 |
| FSA-31 | 820449.77 | 8809609.9 | 558.85 | 122.22 | 28/03/2018 | 255.41 | -54.9 |
| FSA-32 | 820479.52 | 8810418 | 537.56 | 130.69 | 29/03/2018 | 112.2 | -49.73 |
| FSA-33 | 820227.72 | 8809311.3 | 537 | 175.77 | 03/04/2018 | 285.96 | -45.46 |
| FSA-34 | 820322.75 | 8810166.5 | 452.96 | 145.23 | 05/04/2018 | 79.78 | -50.88 |
| FSA-35 | 820240.05 | 8809407.5 | 508.74 | 109.21 | 05/04/2018 | 81.03 | -49.47 |
| FSA-36 | 820195.04 | 8809404.8 | 498.32 | 62.39 | 06/04/2018 | 99.46 | -44.48 |
| FSA-37 | 820536.48 | 8810300.7 | 539.73 | 94.95 | 06/04/2018 | 139.61 | -81.05 |
| FSA-38 | 820218 | 8809457.6 | 488.37 | 77.46 | 10/04/2018 | 89.1 | -44.29 |
| FSA-39 | 820560.88 | 8810392.1 | 548.78 | 68.32 | 10/04/2018 | 109.09 | -60 |
| FSA-40 | 820305.07 | 8809454.7 | 504.06 | 91.84 | 12/04/2018 | 88.79 | -45.2 |
| FSA-41 | 820529.73 | 8810378.6 | 541.66 | 58.05 | 12/04/2018 | 110 | -60 |
| FSA-42 | 820186.2 | 8809465 | 474.48 | 71.49 | 16/04/2018 | 80 | -45 |
| FSA-43 | 820511.22 | 8810240.9 | 506.65 | 160.02 | 19/04/2018 | 111.78 | -43.97 |
| FSA-44 | 820501.5 | 8810068.3 | 504.1 | 34.81 | 16/04/2018 | 100 | -45 |
| FSA-45 | 820500.43 | 8810068.5 | 504.17 | 106.56 | 18/04/2018 | 101.59 | -70.64 |
| FSA-46 | 820522.24 | 8810131.8 | 490.46 | 57.48 | 20/04/2018 | 90.67 | -45.06 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FSA-47 | 820543.51 | 8810446.8 | 554.22 | 105.16 | 23/04/2018 | 108.19 | -49.53 |
| FSA-48 | 820421.61 | 8809950.3 | 473.57 | 109.76 | 24/04/2018 | 80.24 | -44.6 |
| FSA-49 | 820384.72 | 8810581.6 | 527.62 | 73.72 | 25/04/2018 | 109.16 | -44.93 |
| FSA-50 | 820479.1 | 8809991.3 | 476.12 | 100.89 | 26/04/2018 | 79.66 | -44.95 |
| FSA-51 | 820660.33 | 8810668.9 | 558.73 | 195.34 | 07/05/2018 | 109.03 | -45.05 |
| FSA-52 | 820529.22 | 8810129.3 | 490.84 | 85.27 | 02/05/2018 | 79.6 | -70.12 |
| FSA-53 | 820537.58 | 8810301.7 | 539.98 | 226.62 | 14/05/2018 | 108.74 | -46.4 |
| FSA-54 | 820455.39 | 8810752.9 | 565.05 | 121.79 | 15/05/2018 | 108.42 | -43.53 |
| FSA-55 | 820573.6 | 8810328.5 | 570.13 | 263.07 | 25/05/2018 | 107.51 | -44.9 |
| FSA-56 | 820503.99 | 8810750.6 | 551.36 | 153.66 | 23/05/2018 | 92.5 | -46.97 |
| FSA-57 | 820419.47 | 8810760.8 | 554.69 | 150.22 | 04/06/2018 | 109.71 | -48.42 |
| FSA-58 | 820533.06 | 8810274.3 | 523.48 | 263.33 | 07/06/2018 | 111.97 | -70.84 |
| FSA-59 | 820357.3 | 8810653.5 | 523.11 | 164.03 | 13/06/2018 | 106.94 | -46 |
| FSA-60 | 820608.4 | 8810340.6 | 581.34 | 250.42 | 20/06/2018 | 79.92 | -45.55 |
| FSA-61 | 820559.76 | 8810389.3 | 548.62 | 31.19 | 15/06/2018 | 107.93 | -45.87 |
| FSA-62 | 820560.7 | 8810389.1 | 548.78 | 169.54 | 23/06/2018 | 107.49 | -44.25 |
| FSA-63 | 820580.44 | 8810415.3 | 554.13 | 232.65 | 02/07/2018 | 96.13 | -61.44 |
| FSA-64 | 820510.74 | 8810241.1 | 507.97 | 210.83 | 05/07/2018 | 106.43 | -64.53 |
| FSA-65 | 820572.74 | 8810173.5 | 506.74 | 55.61 | 09/07/2018 | 78.79 | -47.02 |
| FSA-66 | 820334.43 | 8809456 | 514.63 | 251.13 | 21/07/2018 | 110.82 | -64.57 |
| FSA-67 | 820375.32 | 8810270.9 | 520.6 | 367.73 | 26/07/2018 | 112.18 | -55.79 |
| FSA-68 | 820410.33 | 8809907.6 | 485.06 | 193.37 | 27/07/2018 | 113.26 | -54.8 |
| FSA-69 | 820480.28 | 8810418 | 537.56 | 284.63 | 14/08/2018 | 97.77 | -44.68 |
| FSA-70 | 820353.5 | 8809797.5 | 482.09 | 243.73 | 04/08/2018 | 112.71 | -50.27 |
| FSA-71 | 820376.29 | 8809932.1 | 459.68 | 283.85 | 11/08/2018 | 115.94 | -57.78 |
| FSA-72 | 820259.75 | 8810095.2 | 430.33 | 38.45 | 07/08/2018 | 87.92 | -46.24 |
| FSA-73 | 820261.24 | 8810093.9 | 430.55 | 190.5 | 11/08/2018 | 100.91 | -45.19 |
| FSA-74 | 820374.96 | 8809830.6 | 467.63 | 319.82 | 24/08/2018 | 110.39 | -43.71 |
| FSA-75 | 820056.37 | 8809677 | 394.01 | 169.78 | 20/08/2018 | 108.13 | -46.28 |
| FSA-76 | 820331.48 | 8809455 | 513.69 | 25.45 | 22/08/2018 | 85.91 | -45 |
| FSA-77 | 820331.32 | 8809454.8 | 513.73 | 228.7 | 29/08/2018 | 85.42 | -49.68 |
| FSA-78 | 820370.67 | 8809655.4 | 493.92 | 258.74 | 01/09/2018 | 107.5 | -46.15 |
| FSA-79 | 820645.54 | 8810496.9 | 667 | 274.75 | 12/09/2018 | 111.42 | -65.14 |
| FSA-80 | 820518.77 | 8810185.7 | 478.48 | 203.49 | 11/09/2018 | 91.36 | -79.93 |
| FSA-81 | 820618.05 | 8810497.5 | 667.89 | 315.19 | 24/09/2018 | 141.1 | -49.95 |
| FSA-82 | 820618.45 | 8810578 | 661.18 | 268.63 | 21/09/2018 | 104.65 | -49.69 |
| FSA-83 | 820573.57 | 8810582.4 | 663.28 | 253.77 | 28/09/2018 | 109.12 | -54.91 |
| FSA-84 | 820739.14 | 8810265 | 682.46 | 273.69 | 03/10/2018 | 90 | -90 |
| FSA-85 | 820763.84 | 8810863.7 | 541.9 | 96.7 | 02/10/2018 | 110.04 | -45.75 |
| FSA-86 | 820418.95 | 8810762.2 | 554.65 | 330.86 | 12/10/2018 | 63.95 | -49.33 |
| FSA-87 | 820812.47 | 8810276.5 | 678.99 | 432.49 | 18/10/2018 | 97.73 | -85.79 |
| FSA-88 | 820735.66 | 8810320.2 | 678.18 | 288.61 | 30/10/2018 | 90.6 | -86.15 |

Since January, 2018 the drilling has been carried out by Servitec Foraco Serviços de Sondagem using two modern, diesel-hydraulic CS-14 drill rigs.

Holes are started with HQ-size rods and down-sized to NQ when in fresh rock.

All drill hole collars are surveyed by a technician specialized in the use of total station survey instruments. Surveys are completed using the SAD 69 datum with collection of coordinates in UTM format. Some spot checking of old drill holes has been performed with no significant errors found.

Drill hole deviation is monitored with a Devi Flex non-magnetic electronic multishot tool from Devico, which can survey inside the drill rods. The Devi Flex tool consists of two independent measuring systems. Three accelerometers and four strain gauges are used to calculate inclination and change in azimuth. All of the surveys were performed with 2 runs (in and out of the hole) with deviations systematically measured every 3 m. To date the approximate average deviation is reported to be 1.04° per 100 m.

When a drill hole is completed the collar is marked by a 1.5-m long plastic pipe placed in the hole and set in a concrete monument (Figure 10.2). The monument is marked with a metal tag containing basic information about the hole.

**Figure 10.2**
**Drill Hole Collar Monument**


Source: Cerrado 2019

The significant intersections received as of the data-freeze date (November 21, 2018), from the Cerrado drilling at Serra Alta, are set out in Table 10.6.

**Table 10.6**
**Significant Cerrado Drill Intersections from Serra Alta**

| DDH | | From (m) | To (m) | Length (m) | Au (ppm) |
|---|---|---|---|---|---|
| FSA-01 | | 8.00 | 31.50 | 23.50 | 3.07 |
| | Includes | 11.90 | 23.00 | 11.10 | 9.57 |
| | Includes | 29.00 | 30.50 | 1.50 | 3.66 |
| FSA-02 | | 11.50 | 36.00 | 24.50 | 0.45 |
| | Includes | 16.50 | 28.00 | 11.50 | 0.81 |
| FSA-03 | | 15.02 | 76.00 | 60.98 | 0.74 |
| | Includes | 65.00 | 74.00 | 9.00 | 2.90 |
| FSA-04 | | 8.00 | 48.50 | 40.50 | 0.93 |
| | Includes | 39.00 | 48.50 | 9.50 | 1.89 |
| | and | 75.00 | 84.00 | 9.00 | 1.25 |
| FSA-05 | | 0.00 | 31.00 | 31.00 | 0.65 |
| | Includes | 18.50 | 30.25 | 11.75 | 1.10 |
| FSA-06 | | 41.00 | 76.00 | 35.00 | 0.50 |
| FSA-07 | | 15.00 | 52.00 | 37.00 | 0.42 |
| | Includes | 44.00 | 52.00 | 8.00 | 1.27 |
| FSA-08 | | 0.00 | 82.00 | 82.00 | 1.31 |
| | Includes | 0.00 | 28.90 | 28.90 | 3.03 |
| | Includes | 67.85 | 71.00 | 3.15 | 2.27 |
| FSA-09 | | 0.00 | 23.00 | 23.00 | 0.37 |
| FSA-11 | | 7.00 | 48.36 | 41.36 | 1.43 |
| | Includes | 36.00 | 48.36 | 12.36 | 3.11 |
| | Includes | 44.00 | 48.36 | 4.36 | 7.45 |
| FSA-12 | | 8.80 | 81.00 | 72.20 | 0.99 |
| | Includes | 53.75 | 66.00 | 12.25 | 3.94 |
| | Includes | 53.75 | 60.00 | 6.25 | 6.56 |
| FSA-15 | | 38.00 | 51.77 | 13.77 | 0.41 |
| FSA-17 | | 19.19 | 35.84 | 16.65 | 0.51 |
| FSA-18 | | 4.21 | 23.00 | 18.79 | 0.50 |
| FSA-23 | | 21.25 | 89.00 | 67.75 | 1.85 |
| | Includes | 34.00 | 71.50 | 37.50 | 3.11 |
| | Includes | 47.00 | 71.50 | 24.50 | 4.38 |
| | Includes | 57.00 | 71.50 | 14.50 | 6.45 |
| | Includes | 58.00 | 63.00 | 5.00 | 14.95 |
| FSA-26 | | 27.00 | 30.50 | 3.50 | 2.11 |
| | and | 55.40 | 60.00 | 4.60 | 1.14 |
| FSA-27 | | 117.50 | 122.82 | 5.32 | 0.99 |
| FSA-28 | | 71.00 | 73.50 | 2.50 | 4.22 |
| | and | 82.00 | 91.50 | 9.50 | 1.51 |
| | and | 106.00 | 123.50 | 17.50 | 0.38 |
| FSA-30 | and | 60.85 | 69.28 | 8.43 | 0.84 |
| | Includes | 64.50 | 66.03 | 1.53 | 3.88 |
| | and | 100.75 | 111.00 | 10.25 | 0.51 |
| FSA-31 | | 73.00 | 73.80 | 0.80 | 6.75 |
| | and | 81.21 | 89.00 | 7.79 | 1.99 |
| | Includes | 81.21 | 83.12 | 1.91 | 3.75 |
| | and | 102.50 | 110.30 | 7.80 | 0.88 |
| FSA-35 | | 8.50 | 13.05 | 4.55 | 1.47 |

| DDH | | From (m) | To (m) | Length (m) | Au (ppm) |
|---|---|---|---|---|---|
| FSA-37 | | 2.70 | 15.42 | 12.72 | 1.50 |
| | Includes | 11.50 | 15.42 | 3.92 | 3.48 |
| FSA-39 | | 1.90 | 17.30 | 15.40 | 0.78 |
| | Includes | 4.50 | 8.78 | 4.28 | 1.79 |
| FSA-40 | | 11.91 | 15.10 | 3.19 | 4.77 |
| | and | 84.55 | 86.87 | 2.32 | 3.48 |
| FSA-43 | | 84.43 | 146.75 | 62.32 | 1.59 |
| | Includes | 84.43 | 87.73 | 3.30 | 17.92 |
| FSA-47 | | 48.75 | 49.36 | 0.61 | 12.27 |
| FSA-48 | | 54.08 | 89.30 | 35.22 | 1.44 |
| | Includes | 54.08 | 64.79 | 10.71 | 2.44 |
| FSA-50 | | 58.00 | 78.05 | 20.05 | 2.20 |
| | Includes | 58.00 | 65.05 | 7.05 | 4.60 |
| FSA-53 | | 102.60 | 170.85 | 68.25 | 1.78 |
| | Includes | 133.70 | 144.00 | 10.30 | 5.75 |
| | and | 184.00 | 203.10 | 19.10 | 0.69 |
| FSA-55 | | 12.55 | 17.00 | 4.45 | 1.17 |
| | and | 24.45 | 33.52 | 9.07 | 0.61 |
| | and | 62.00 | 73.00 | 11.00 | 0.79 |
| | and | 98.22 | 124.80 | 26.58 | 2.48 |
| | Includes | 100.00 | 109.50 | 9.50 | 2.03 |
| | Includes | 111.50 | 124.00 | 12.50 | 3.63 |
| | and | 198.97 | 202.59 | 3.62 | 2.06 |
| FSA-57 | and | 119.97 | 120.52 | 0.55 | 43.52 |
| FSA-58 | | 12.91 | 26.11 | 13.20 | 2.24 |
| FSA-60 | | 77.00 | 92.70 | 15.70 | 1.32 |
| FSA-62 | | 0.15 | 9.79 | 9.64 | 1.49 |
| | and | 20.00 | 24.62 | 4.62 | 1.31 |
| FSA-63 | | 5.00 | 7.85 | 2.85 | 2.06 |
| | and | 132.50 | 144.56 | 12.06 | 2.27 |
| | Includes | 143.75 | 144.56 | 0.81 | 26.11 |
| FSA-64 | and | 54.26 | 60.73 | 6.47 | 1.06 |
| | and | 90.50 | 104.00 | 13.50 | 2.16 |
| FSA-66 | | 45.95 | 47.57 | 1.62 | 7.80 |
| FSA-68 | | 42.97 | 48.06 | 5.09 | 2.35 |
| | and | 63.76 | 69.25 | 5.49 | 0.93 |
| | and | 96.23 | 106.40 | 10.17 | 2.54 |
| | and | 129.09 | 130.00 | 0.91 | 7.65 |
| FSA-71 | and | 25.73 | 37.62 | 11.89 | 0.81 |
| FSA-77 | | 122.63 | 123.35 | 0.72 | 8.15 |
| FSA-78 | | 31.28 | 41.60 | 10.32 | 4.20 |
| | and | 45.25 | 51.53 | 6.28 | 3.07 |
| | and | 62.87 | 71.83 | 8.96 | 4.85 |
| FSA-79 | | 120.25 | 174.00 | 53.75 | 2.18 |
| FSA-80 | | 30.60 | 32.51 | 1.91 | 5.22 |
| | and | 45.65 | 59.75 | 14.10 | 2.42 |
| FSA-81 | | 141.59 | 196.45 | 54.86 | 0.89 |
| | and | 220.34 | 237.83 | 17.49 | 2.05 |
| FSA-82 | | 140.26 | 156.76 | 16.50 | 1.03 |
| FSA-83 | | 137.63 | 146.20 | 8.57 | 1.58 |

| DDH | From (m) | To (m) | Length (m) | Au (ppm) |
|---|---|---|---|---|
| and | 150.90 | 159.71 | 8.81 | 0.76 |
| and | 177.54 | 193.92 | 16.38 | 1.68 |
| FSA-84 | 178.75 | 234.00 | 55.25 | 3.81 |
| FSA-87 | 207.10 | 258.00 | 50.90 | 1.44 |
| Includes | 207.10 | 217.86 | 10.76 | 5.93 |

### 10.1.3 Logging and Sample Layout

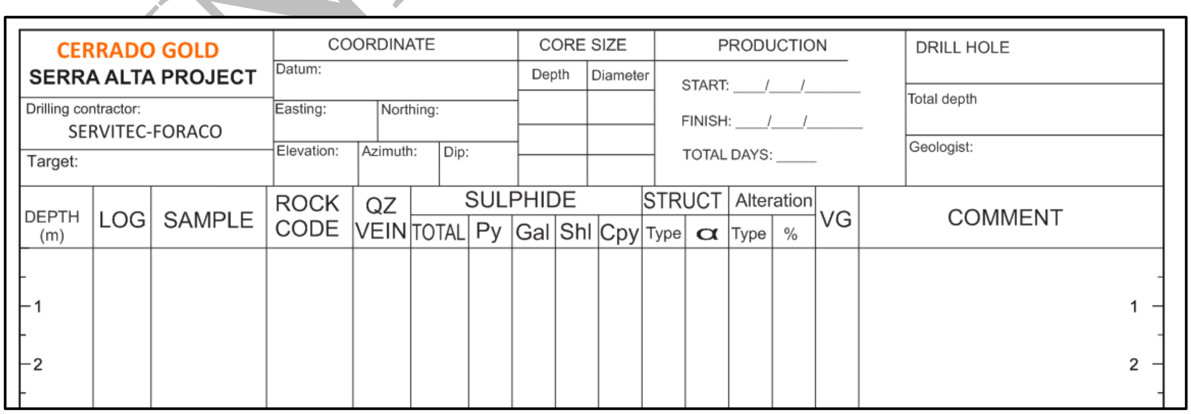
Core is delivered to the core shed at the end of each shift, or first thing in the morning, by the drillers. Upon arrival the core boxes are checked for correct labelling and placement of the from/to footage blocks for the drilled intervals. A quick log is then made for daily "flash reports" to management.

The core is photographed while wet, both prior to logging, and after being sawn and sampled.

Drill holes are logged by the geologist on a paper logging form (Figure 10.3) using the legend and standard codes shown on Figure 10.4. The Serra Alta granite is logged with a series of alteration codes (GRA = granite with low/no alteration, protolith, GRB = granite weakly altered with chlorite, GRC = potash altered pink granite, GRD = altered red granite, intensely fractured, iron altered and GRN = unclassified granite, from Kinross logs). Type examples of each rock are available for reference at the core shed. It is hoped that the use of standard alteration codes will help in the geological modelling of the deposit.

In addition to the standard naming conventions of Figure 10.4 detailed descriptions of the interval are made emphasizing the amount of sulphides, presence of quartz veins, granite classification, observable oxidation, possible structures and hydrothermal alteration minerals such as, epidote, chlorite, sericite, tourmaline, as well as the presence of visible gold.

**Figure 10.3**
**Drill Log Header**


CERRADO GOLD
SERRA ALTA PROJECT
COORDINATE
Datum:
Easting: Northing:
Elevation: Azimuth: Dip:
CORE SIZE
Depth Diameter
PRODUCTION
START: ___/___/______
FINISH: ___/___/______
TOTAL DAYS: _____
DRILL HOLE
Total depth
Geologist:
Drilling contractor: SERVITEC-FORACO
Target:

| DEPTH (m) | LOG | SAMPLE | ROCK CODE | QZ VEIN | SULPHIDE TOTAL | Py | Gal | Shl | Cpy | STRUCT Type | α | Alteration Type | % | VG | COMMENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | | 1 |
| 2 | | | | | | | | | | | | | | | 2 |

Source: Cerrado 2019.

**Figure 10.4**
**Serra Alta Logging Legend**

| CERRADO GOLD SERRA ALTA PROJECT | COORDINATE | | | CORE SIZE | | PRODUCTION | DRILL HOLE |
|---|---|---|---|---|---|---|---|
| | Datum: | | | Depth | Diameter | START: ___/___/______ TOTAL DAYS: _____ | |
| Drilling contractor: SERVITEC-FORACO | Easting: | Northing: | | | | FINISH: ___/___/______ TOTAL DEPTH: _____ | GEOLOGIST: |
| Target: | Elevation: | Azimuth: | Dip: | | | | |

## GEOLOGICAL DESCRIPTION CODES

**ROCK CODE**

| TYPE | CODE | GRAPH |
|---|---|---|
| LDF | Landfill | |
| SOI | Soil | |
| TOB | Saprolite | |
| FSAP | Fine Saprolite | |
| CSAP | Coarse Saprolite | |
| MIU | Mafic Intrusive Unit | |
| MVU | Mafic Volcanic Unit | |
| ACD | Acid Dike | |
| MD | Mafic Dike | |
| FV | Felsic Volcanic | |
| VCU_TF | Tuff | |
| VCU_BR | Volcanic Breccia | |
| GRA | Granite «carijó» | |
| GRB | Granite «mesclado» | |
| GRC | Granite «salmão» | |
| GRD | Granite «vermelho» | |
| GRN | Granite | |
| MGR | Fine Granite | |
| QZV | Quartz Vein | |
| MLZ | Milonite | |
| QTZ | Quartzite | |
| SST | Sandstone | |

**WEATHERING**

| TYPE | CODE |
|---|---|
| Not Present | 0 |
| Low Frequency | 1 |
| Medium Frequency | 2 |
| High Frequency | 3 |

**QZ VEIN**

| TYPE | CODE |
|---|---|
| Not Present | 0 |
| Low Frequency | 1 |
| Medium Frequency | 2 |
| High Frequency | 3 |

**TOTAL SULPHIDES**

| TYPE | CODE |
|---|---|
| Trace | 0 |
| Low | 1 |
| Medium | 2 |
| High | 3 |

**SULPHIDES**

| TYPE | CODE | UNIT |
|---|---|---|
| Pyrite | py | 0 - 100% |
| Calcopyrite | cpy | 0 - 100% |
| Galene | gal | 0 - 100% |
| Spharelite | sph | 0 - 100% |

**STRUCTURE**

| TYPE | CODE | CORE ANGLE |
|---|---|---|
| Quartz Vein | qzv | 0 - 90º |
| Foliation | sn | 0 - 90º |
| Shear Zone | zc | 0 - 90º |
| Breccia | brc | 0 - 90º |
| Isotopic | iso | 0 |
| Fault | f | 0 - 90º |
| Fracture | fr | 0 - 90º |
| Lower Contact | lct | 0 - 90º |

**MAJOR ALTERATION**

| TYPE | CODE | UNIT |
|---|---|---|
| Chorite | chl | 0 - 100% |
| Calcite | cal | 0 - 100% |
| Epidote | ep | 0 - 100% |
| Sílica | si | 0 - 100% |

**VISIBLE GOLD**

| TYPE | CODE | UNIT |
|---|---|---|
| NO | 0 | 0 |
| Fine | 1 | < 0.35mm |
| Medium | 2 | 0.35mm to 0.7mm |
| Coarse | 3 | > 0.7mm |

Source: Cerrado 2019. GRA = granite with low/no alteration, GRB = granite weakly altered with chlorite, GRC = potash altered pink granite, GRD = altered red granite, intensely fractured, iron altered, and GRN = unclassified granite, from Kinross logs.

For the mineralogy noted above, the following detailed descriptions are made:

- Degree of weathering, extent and relative amount,
- Presence of visible gold, noting the footage of occurrence, size, shape, number of spots/flecks, mode of occurrence and associated mineralogy.
- Lithological classification of the core.
- Hydrothermal alteration minerals present.
- Primary structures and tectonic effects on the rock types noting: :
  - dip angle and arrangement of foliation,
  - dip and thickness of quartz veins,
  - dip and thickness of breccias and shear zones,
  - dip, fill type, shape and description of the walls of faults and fractures,
  - graphical presentation of structure and lithology on the logging form using pre-defined symbols.

Samples are laid out by the logging geologist and detailed descriptions are made of each. All granite is sampled, and sampling extends for 5 to 10 m into wall rock. The standard sample length is 1 m in hydrothermally altered granite, but sampling does not cross lithological or alteration boundaries. The minimum sample length used is 30 cm. In unaltered granite and unmineralized wall rock the standard sample length is 2 m.

During logging a reference cut line is marked on the core indicating the orientation of the saw cut to be made when sampling. The beginning and end of each sample is also marked on the core and the core box.

Once logging is complete the paper logs are transcribed to an electronic database to which the assay results can later be appended. The database is backed up to a portable hard drive on a regular basis.

10.1.3.1 Density Determination

Cerrado is using Archimedes principle to determine the density of core samples. A piece of core is systematically collected every 10 samples and its density determined. The dry core sample is weighed (m1), then is totally immersed in distilled water and weighed again (m2) (see Figure 10.5). The density (ρ) is determined with the following formula:

$$\rho = \frac{\mathrm{m1}}{m_1 - m_2}$$

**Figure 10.5**
**Density Determination Equipment**

## 10.2 SUMMARY AND INTERPRETATION OF RESULTS

Cerrado's work at Serra Alta has been ongoing for one year now initial modelling and interpretation of the drilling results has been completed. It has become apparent that relogging of the historical core using the new granite alteration codes (GRA, GRB, GRC, GRD and GRN) was necessary before modelling or interpretation began in earnest. This has now been completed.

The current drilling clearly shows a number of gold mineralized intercepts in the altered granite.
There are no significantly higher grade intervals in the drill results received so far.

Core recovery is generally quite good in fresh rock (Figure 10.6). Therefore, no drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results are known to be present.

**Figure 10.6**
**Mineralized and Altered Granite Showing Good Recovery**

Source Micon, 2018.

## 10.3 CONCLUSIONS

The QP has examined the logging procedures used and described above. In the opinion of the QP, Cerrado personnel have used industry standard best practices in the collection, handling and management of drill core and assay samples.

The QP is not aware of any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results presented in this report.

# 11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

## 11.1 HISTORICAL SAMPLING

The Verena (VML and VMC) and Kinross drill programs used fire assay determination for gold analysis of samples using ½ core, sawn on site. The sample size analysed (aliquot) was 50 g. This method involves crushing the entire sample, pulverizing between 250 and 300 g, then subsampling 50 g for fire assay (ref: AuFA50 - FA/AA 50g - Au (5ppb)) performed at SGS-GEOSOL Belo Horizonte laboratories.

The final analysis of the weight of gold recovered in the assay can be by atomic absorption spectroscopy (AAS). A QA/QC protocol was employed for the Kinross sampling. Rocklabs certified reference materials (CRMs, SH24, SE19 e SF12) were inserted as standards and limestone samples inserted as blanks. The acceptable limits for standards was set at +/- 2 standard deviations and for the blanks 0.038 au g/t.

The Kinross blank sample and CRM control charts are shown in Figure 11.1 and Figure 11.2.

**Figure 11.1**
**Kinross Blank Control Charts**

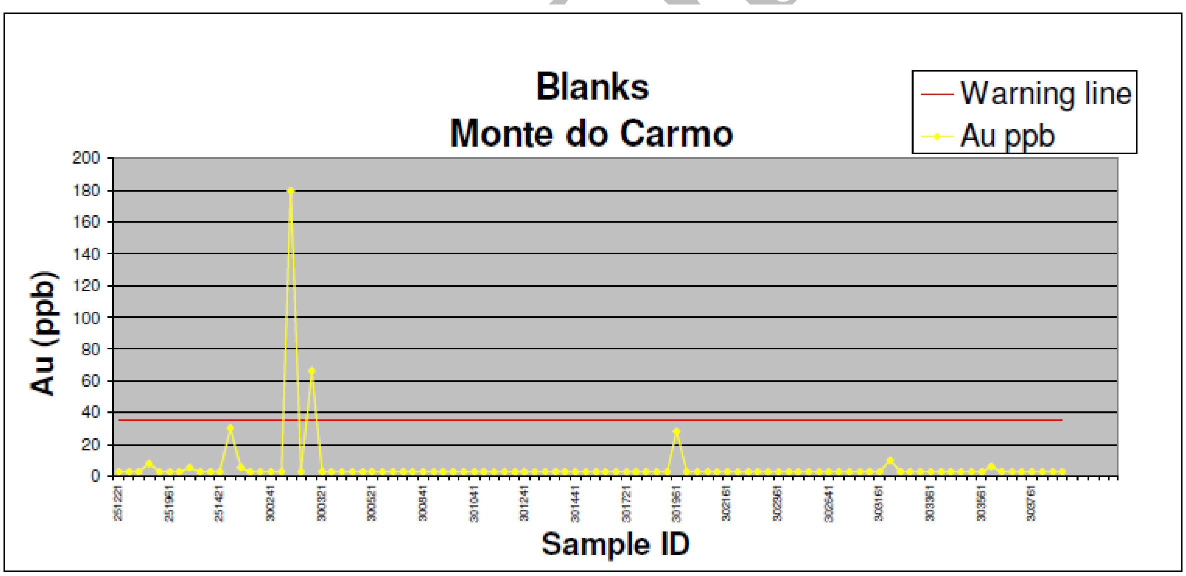
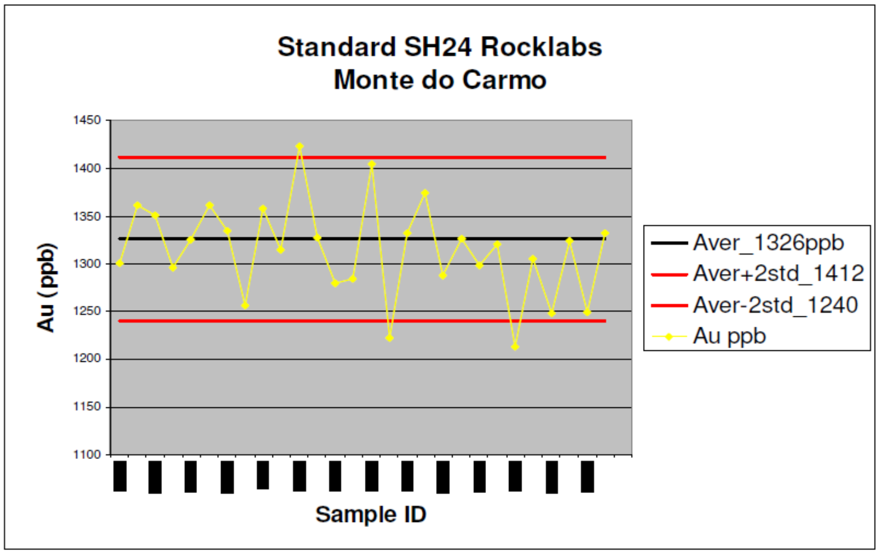
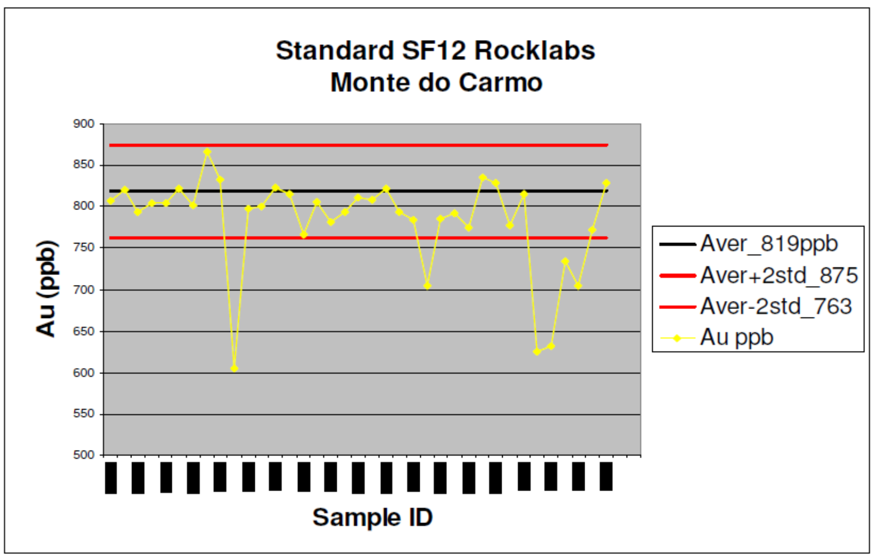
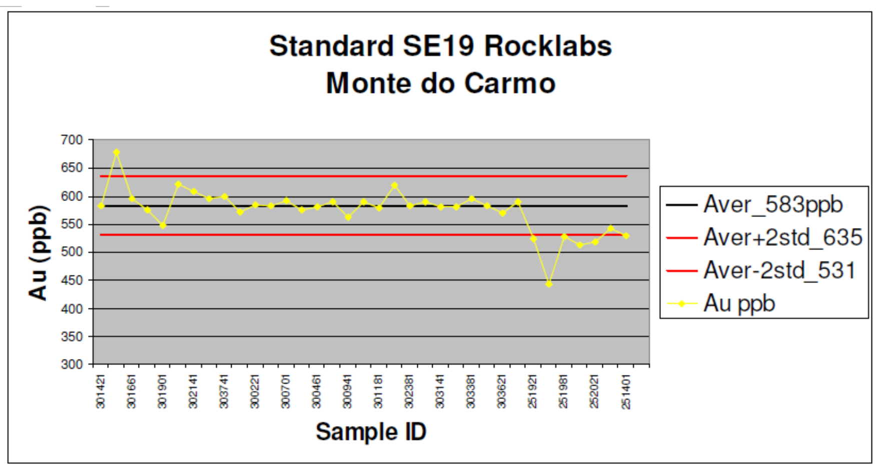


**Figure 11.2**
**Kinross CRM Control Charts**



Paranapanema is reported to have analyzed its samples using only an AAS determination. This was a somewhat less expensive method in relatively common use in the 1970s and 1980s. It involved dissolution of the sample pulp in acid and determination of gold content of the resulting liquor by AAS after MIBK collection. In this method sample aliquot size usually varied from 1 g up to about 20 g, depending on technique. The method had several disadvantages in that a 1 g sample was far too small to accurately subsample the pulp and 20 g was often too large to fully digest in the acid, thereby failing to release all of the gold. These analyses were performed in Paranapenema's own laboratory (ETMGN) using an unknown aliquot size.

In its Corporate Finance Manual, Appendix 3D (https://www.tsx.com/resource/en/544) The TSX Venture Exchange (TSX-V) places restrictions on the use or disclosure of the results of precious metal analyses by non-fire assay techniques, or results from an analysis by a non-Canadian laboratory.

This requires each news release, shareholder report or other public communication which includes such analyses to contain the following information:

- the analytical method used to obtain the reported results;
- the name of the laboratory at which the analyses were conducted; and
- the results of any fire assay check program or the intention to conduct a fire assay check program at an independent laboratory. All results of a fire assay check program are to be published in a timely manner.

The TSX-V can require an Issuer to undertake a fire assay check program at a Canadian laboratory if the reported results are, in the TSXV's opinion, inconsistent with historic results from the property, the geological environment or other pertinent factors.

Since most large laboratories are now multi-national, it has been Micon's experience that companies such as SGS, ALS and others are accepted as "Canadian".

There have been a couple of checks of the PNP assays by MSM and Cerrado using ¼ of the remaining core. The first was by 30 g fire assay (MSM) and the latter by screen metallics fire assay (Cerrado). For the MSM reassays the individual results varied significantly but, on average, the gold grade increased by 29.6%. For the Cerrado re-assays, again the results were variable, but the average grade dropped from 1.04 g/t Au to 0.80 g/t Au.

MSM staff are also concerned that the PNP geologists may have been selective in their choice of which half of the core was bagged for assaying during sampling. This also has the potential for creating a bias.

The QP would not be comfortable using these AAS results in a mineral resource estimate.

The Kinross drilling employed a quality assurance/quality control (QA/QC) program. It is not certain that Paranapanema or Verena had a QA/QC program.

## 11.2 CERRADO SAMPLING

### 11.2.1 Sampling Procedures

The following procedures were used by Cerrado during sampling:

- All samples are marked and numbered on the core boxes respecting the limits defined by the geologists (lithological or alteration contacts) during core logging.
- At the end of each sample interval two sample tags, with sample numbers marked, are stapled to the core boxes.
- The core was then sawn by Cerrado employees using a diamond sawn blade with the saw-cut location following the cut line marked by the geologist.
- After sawing, the left half of the core was placed into a numbered plastic sample bag with one of the sample tags (both using the same number). The other half core was returned to the box. (The other sample tag remains in the box).
- Quarter core duplicate, blank and standard samples are inserted into the sample number sequence at planned intervals.
- The small plastic sample bags are placed into a larger rice bag (5 to 10 samples) and sealed for shipment to the laboratory.

Cerrado has been inserting blanks, standards and quarter-core duplicate samples into its sample stream since drill hole FSA-05. One control sample is placed every 10 samples so that there is one of each type every 30 samples. Cerrado is using a dirty limestone sourced from local quarry as a blank. The standard samples (Certified Reference Materials or CRMs) used were commercially sourced from ITAK (Instituto de Tecnologia August Kekulé) up to the time of the QP's site visit. At that time Cerrado was about to switch to using CRMs from Canadian Resource Laboratories (CRL).

Once sealed, the samples are taken by company truck to Palmas where they are put on commercial transport for shipment to SGS' sample preparation laboratory in Goiania.

The samples were shipped to the laboratory, with sample submission forms specifying the size and contents of the batch and the procedure code and instructions for preparation and analysis.

### 11.2.2 Analyses

All samples from the Monte do Carmo project were assayed using the metallic screen fire assay technique (SGS reference FAASCR_150). In this method 1 kg coarse crushed material is subsampled and milled to -150 mesh. The material is screened and the plus fraction is fire assayed for gold and duplicate assays are performed on the minus fraction. For Cerrado the coarse fraction was analyzed by 50 g fire assay and the minus fraction was assayed in duplicate with 50 g pulps. Final gold determination was with AAS finish. The results of the different assays are combined mathematically to produce a calculated assay result.

The samples were prepared at SGS in Goiania or at Vespasiano in Minas Gerais. Analysis was performed at SGS Vespasiano.

In situations where gold occurs within the sample as dispersed nuggets, particularly if the average grade is relatively low, screen metallics fire assaying is often a more appropriate analytical technique.

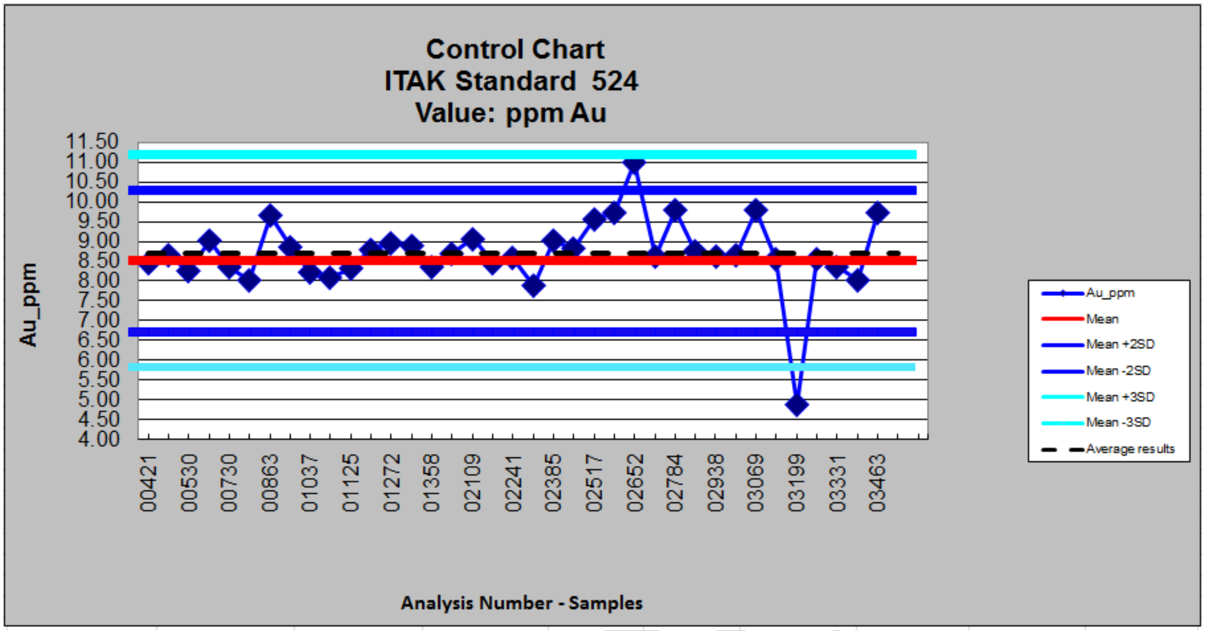
There is no relationship between SGS and Cerrado other than a business one for contract analytical services. No Cerrado employees or directors took part in the sample preparation or analyses other than the cutting and bagging of half core.

## 11.3 QUALITY ASSURANCE/ QUALITY CONTROL

Cerrado tracks the results of its blank, duplicate and CRM assays on industry standard control charts. The CRM control charts showed the accepted value of the standard as well as warning lines at the 2 and 3 standard deviation (SD) level as determined by the round robin assaying protocol which certified the materials. Any sample result falling outside of the 3 SD warning line, or 2 samples in a row outside of the 2 SD line, are usually considered to be failures requiring follow-up with the laboratory with possible reassays required.

At the time of the QP's visit only a few results had been populated into the charts. A more recent Cerrado control chart is shown in Figure 11.3

**Figure 11.3**
**Example Cerrado CRM Control Chart**




Source Cerrado, 2018

10% of the analyzed samples were sent to ALS Global's sample preparation laboratory in Goiania for cross check analyses by screen metallics with AAS finish. Final analysis was performed at ALS Global's laboratory in Lima, Peru (ALS reference Au-SCR21AA).

There is no relationship between ALS Global and Cerrado other than a business one for contract analytical services.

## 11.4 Conclusions and Recommendations

The QP has reviewed the analytical and QA/QC methods employed by Cerrado and Kinross at Serra Alta and finds them suitable for a modern gold exploration program. The QP is satisfied with the adequacy of the sample preparation, security, and analytical procedures employed and concludes that they have resulted in data suitable for use in a mineral resource estimate.

The analytical technique employed in the assaying of core by PNP is considered inadequate for modern gold exploration. Determination of gold by AAS is subject to errors introduced by incomplete digestion of the samples and/or inadequate aliquot size. The QP recommends that the PNP AAS sampling results not be used for mineral resource estimation. The portions of the remaining half core which could be salvaged were resampled and assayed using the current Cerrado protocols.

# 12.0 DATA VERIFICATION

During its site visit the QP went to three of the Giant Quartz Veins targets to examine exposures of mineralization.

At the VM vein there were three active milling sites where garimpeiros were processing material from small pits and underground workings. At one milling site the workers took the mill apart and showed the QP some gold collected from their mining and milling activity.

At the Magalhaes 1 vein location an abandoned garimpo was examined and gold- and galena-mineralized quartz float was found.

At Serra Alta, the QP examined very extensive, abandoned bandeirante and garimpeiro workings over a significant width and strike length. It was obvious that considerable effort, over a long period of time, was expended to make these excavations. The obvious conclusion is that enough gold was recovered to justify the effort.

The QP also reviewed fresh drill core from the hydrothermally altered granite at Serra Alta. The alteration, veining (Figure 10.6) and mineralization with pyrite, galena and sphalerite were clearly visible. Several small specks of visible gold were also noted.

While examining drill core the QP collected four quarter-sawn duplicate samples for assay upon return to Canada. The samples were analyzed by ALS Global in Sudbury, Ontario. Sample preparation was performed using method PREP 31-D. The samples were analyzed in duplicate using a 50 g fire assay with AA finish (code Au AA26) and by the screen metallics method (code Au SCR24). The results are presented in Table 12.1.

**Table 12.1**
**Micon Check Samples**

| Hole | From (m) | To (m) | Original Assay (Au g/t) | Reassay | | |
|---|---|---|---|---|---|---|
| | | | | Au SCR 24 | Au AA26 | Au AA26 Dup |
| FSA-23 | 47.0 | 47.7 | 13.92 | 0.53 | 0.21 | 0.33 |
| FSA-23 | 58.0 | 58.5 | 14.87 | 5.27 | 2.63 | 2.65 |
| FSA-23 | 61.0 | 61.5 | 24.32 | 4.79 | 1.29 | 1.5 |
| FSA-23 | 71.0 | 71.5 | 11.45 | 5.58 | 2.58 | 2.43 |

The results have confirmed the presence of gold in the core, albeit at lower grades than from the original samples. The results also indicate that for 75% of the time the screen metallics assay was significantly higher than the 50 g fire assay, thereby justifying the use of screen metallics assays. The difference between the original and reassays is likely explained by the random and unequal distribution of gold nuggets within the core.

The QP is satisfied that the presence of gold has been demonstrated at the Monte do Carmo project site. Further exploration is justified. The QP is also satisfied with the adequacy of the sample preparation, security and analytical procedures employed, excluding those by

PNP, and concludes that they have resulted in data suitable for use in a mineral resource estimate.

The QP is satisfied with the adequacy of the data for the purposes used in this Technical Report.

## 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

There has been no metallurgical test work completed on the Serra Alta Deposit.

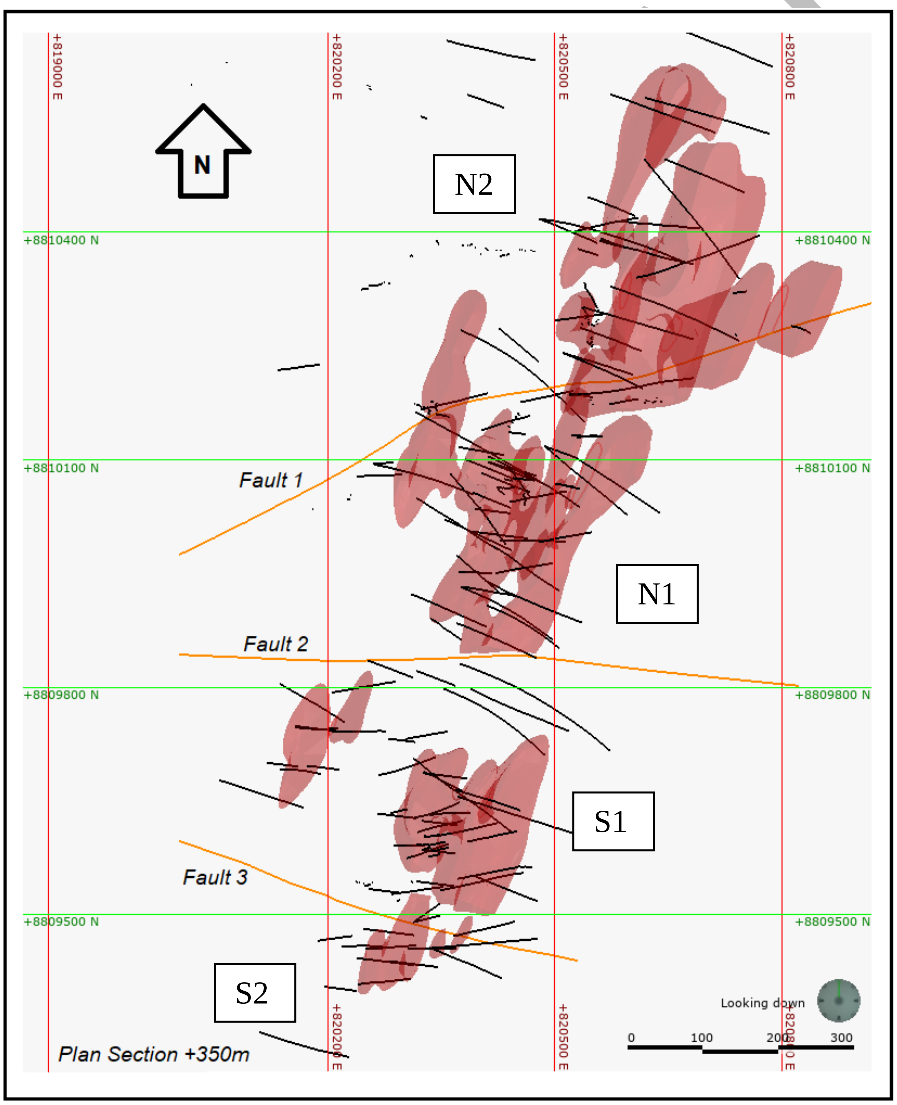
Very small to small scale gravity plants have been used by MSM, VML and Rio Tinto to process mineralization from Serra Alta and some of the veins at the Giant Quartz Veins targets. While records of tonnes processed and gold recovered have been reported, no reliable metallurgical test work, recovery or metallurgical balance data are known to exist.

# 14.0 MINERAL RESOURCE ESTIMATES

## 14.1 GENERAL DESCRIPTION

The Serra Alta Deposit resource estimate has been prepared in conjunction with Cerrado technical staff. Micon revised the initial mineralized shell model received from the project site staff. The deposit has been divided into four fault-bounded mineralized zones, North 1 (N1), North 2, (N2), South 1 (S1), and South 2 (S2). The four zones, located along strike from each other, contain clusters of quartz veinlets. Grade interpolation will be affected by zone offsets of the major faults and so the zones have been separated. Figure 14.1 shows the location of the four interpreted envelopes constructed by Cerrado and modified by Micon.

**Figure 14.1**
**Serra Alta Deposit Mineralized Zone Locations**




Source: Micon, 2019

The Serra Alta Deposit has been estimated assuming both surface and underground mining scenarios.

## 14.2 MINERAL RESOURCE ESTIMATE DEFINITION AND PROCEDURE

The current mineral resource estimate for the Serra Alta Deposit has been prepared following the CIM standards and definitions, as required under NI 43-101 regulations. The standards and definitions are as follows:

> *Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.*
>
> *"A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction."*
>
> *"The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. "*
>
> *"Material of economic interest refers to diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals."*
>
> *"The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of Modifying Factors. The phrase 'reasonable prospects for eventual economic extraction' implies a judgment by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. The Qualified Person should consider and clearly state the basis for determining that the material has reasonable prospects for eventual economic extraction. Assumptions should include estimates of cutoff grade and geological continuity at the selected cut-off, metallurgical recovery, smelter payments, commodity price or product value, mining and processing method and mining, processing and general and administrative costs. The Qualified Person should state if the assessment is based on any direct evidence and testing."*
>
> *"Interpretation of the word 'eventual' in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron, potash deposits and other bulk minerals or commodities, it may be reasonable to envisage 'eventual economic extraction' as covering time periods in excess of 50 years. However, for many gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to much shorter periods of time."*

### 14.2.1 Inferred Mineral Resource

*"An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity."*

*"An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration."*

*"An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101."*

*"There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource."*

### 14.2.2 Indicated Mineral Resource

*"An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit."*

*"Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation."*

*"An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve."*

*"Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the project. An Indicated Mineral Resource estimate is of sufficient quality to support a Pre-Feasibility Study which can serve as the basis for major development decisions."*

### 14.2.3 Measured Mineral Resource

*"A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit."*

*"Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation."*

*"A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve."*

*Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity and distribution of data are such that the tonnage and grade or quality of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability of the deposit. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.*

## 14.3 Supporting Data

The Serra Alta Deposit database was provided to Micon by Cerrado. It is comprised of 141 drill holes and 402 channel samples, totaling 20,207 m of drilling and 887 m of channels, containing a total of 15,304 samples. This database was the starting point from which the gold mineralized shell envelopes (wireframes) were modelled.

For the purposes of mineral resource estimation, Micon used only the data contained within the wireframes. The effective number of drill holes and samples used were 88 drill holes and 118 channels totalling 4,115 m of sampling.

The channels used came from surface trenches. They were helpful in the interpretation of the mineralized envelopes at or near surface.

### 14.3.1 Cerrado Data Verification

Cerrado personnel have spot checked the surveyed collar locations for a number of older drill holes. No significant errors were reported.

The electronic drill hole database provided by MSM was checked for logical errors in its entries using LeapFrog Geo software. No errors were detected.

### 14.3.2 Topography

The project topographic model was provided by Cerrado in the form of a digital terrain model (DTM), included as part of the Leapfrog Geo files. The DTM was of sufficient quality to be used for the pit optimization which constrained the reported mineral resources.

### 14.3.3 Geological and Mineralogical Data

The Serra Alta Deposit geology and mineralization styles are discussed in detail elsewhere in this report. The mineralization has been interpreted to occur in north-northeast trending pods within the granite, which contain frequent, narrow, cross-cutting ladder veins. The pods have been modelled based on a combination of veining intensity and a 0.1 g/t Au cut-off. Small areas below 0.1 g/t contained within contiguous areas that met the criteria above were allowed to remain.

### 14.3.4 Rock Density

A total of 955 density measurements were provided by Cerrado. Given the relatively even distribution of the data along the mineralization corridor, Micon was able to interpolate density values into the Serra Alta Deposit model. The nearest neighbor method was used for the waste rock density determination and ordinary kriging for the mineralized envelopes. The overall range of density values in the block model for the entire project is from 1.77 g/cm$^3$ to 3.06 g/cm$^3$. Table 14.1 summarizes the density averages.

**Table 14.1**
**Serra Alta Deposit Average Density by Rock Type**

| Deposit Name | Avg. Density Value |
|---|---|
| Mineralized Envelope | 2.60 |
| Sediments (SED) | 2.01 |
| Felsic Volcanics (FV) | 2.62 |
| Granite (GRA) | 2.62 |
| Quartz (QTZ) | 2.64 |

### 14.3.5 Univariate Statistics

Basic univariate statistics were estimated for the entire database at Serra Alta and for the selected intervals inside of the mineralized envelopes. The results are summarized in Table 14.2 and Table 14.3.

**Table 14.2**
**Serra Alta Deposit Global Basic Statistics of Gold - Raw Samples**

| Description | Count/Au (g/t) |
|---|---|
| Count | 15,372 |
| Length | 16,095 |
| Mean | 0.27 |
| Standard deviation | 1.90 |
| Coefficient of variation | 7.04 |
| Variance | 3.61 |
| Minimum | 0.00 |
| Lower quartile | 0.00 |
| Median | 0.01 |
| Upper quartile | 0.04 |
| Maximum | 78.71 |

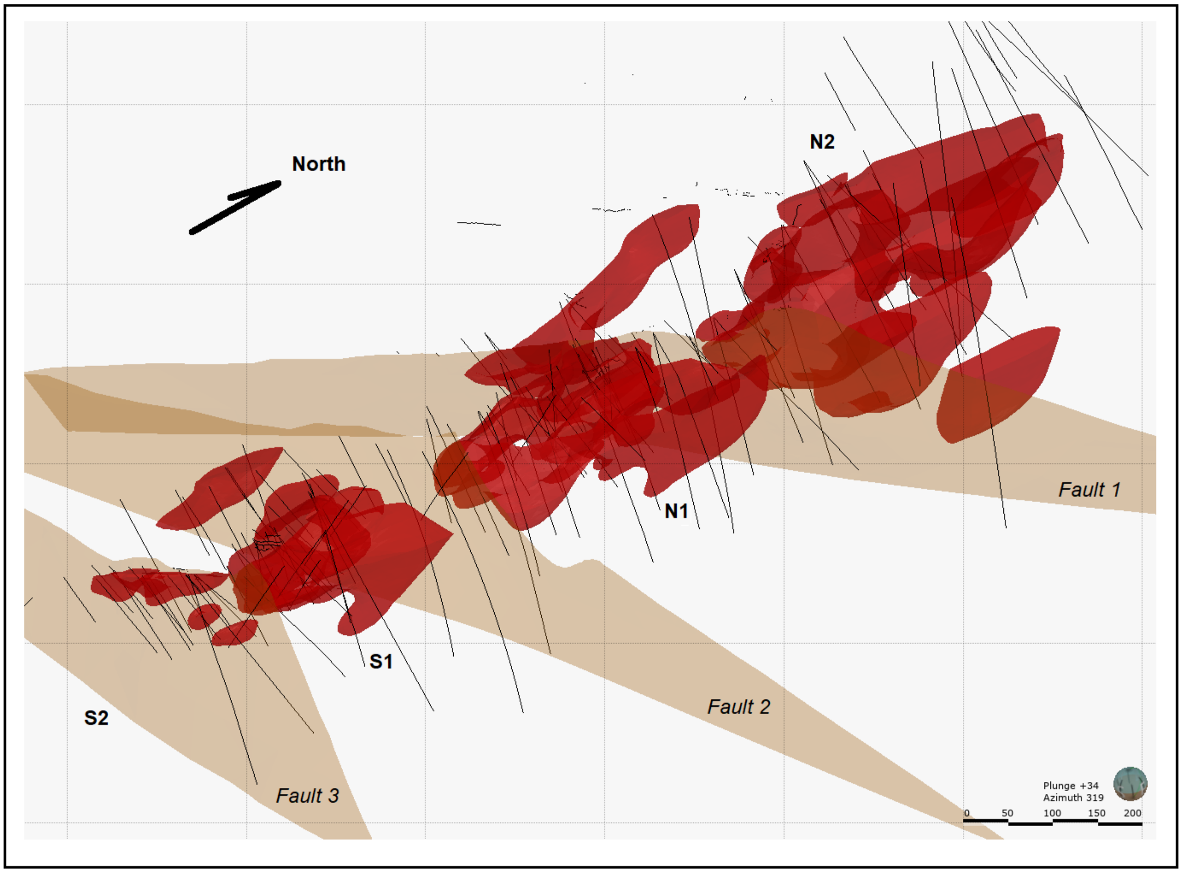
**Table 14.3**
**Serra Alta Deposit Global Basic Statistics of Gold - Raw Samples Within Wireframes**

| Description | Fault-Bounded Mineralized Blocks | | | | |
|---|---|---|---|---|---|
| **Selection** | **Entire Envelope** | **N1** | **N2** | **S1** | **S2** |
| Count | 4,061 | 1,277 | 1,536 | 1,069 | 179 |
| Length | 3,877 | 1,259 | 1,429 | 1,031 | 158 |
| Mean | 0.92 | 0.83 | 1.00 | 0.97 | 0.59 |
| Standard deviation | 3.65 | 2.60 | 4.07 | 4.27 | 2.13 |
| Coefficient of variation | 3.97 | 3.14 | 4.06 | 4.40 | 3.58 |
| Variance | 13.34 | 6.76 | 16.60 | 18.20 | 4.53 |
| Minimum | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| Lower quartile (Q1) | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 |
| Median | 0.10 | 0.13 | 0.11 | 0.05 | 0.04 |
| Upper quartile (Q3) | 0.47 | 0.49 | 0.51 | 0.37 | 0.32 |
| Maximum | 78.71 | 45.35 | 78.71 | 65.87 | 22.77 |

### 14.3.6 Three-Dimensional (3D) Modelling

Cerrado provided Micon with the wireframes of the mineralized envelopes at Serra Alta. Micon and Cerrado technical staff had various video link review sessions and discussions to achieve the final wireframes. Figure 14.2 illustrates the final wireframes for the multiple zones.

**Figure 14.2**
**3D Isometric View of Serra Alta Deposit Envelope**




Source: Micon, 2019.



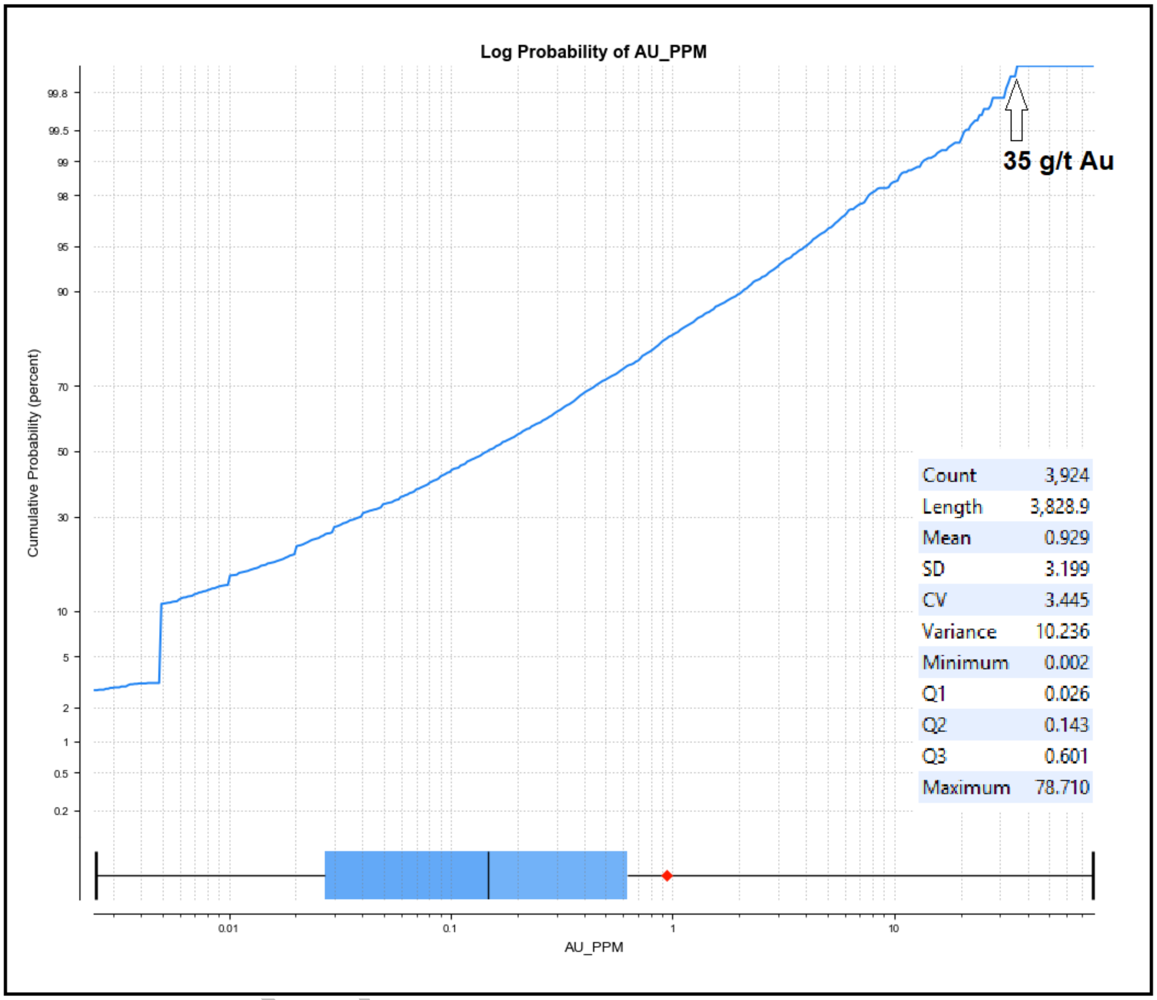
The 3D model was adjusted to remove small isolated wireframe pods informed by a single drill hole.

### 14.3.7 Data Processing

#### 14.3.7.1 Grade Capping

All outlier assay values were carefully analyzed, individually by zone, and globally, using log probability plots. It was decided to cap based on the entire envelope given the assumption that the Serra Alta Deposit is formed by a single mineralizing event and the zone offsets are the result of post mineral faulting, and not different geological domains. Figure 14.3 shows the probability plot of 1-m composites for the entire Serra Alta Deposit (within the wireframes).

**Figure 14.3**
**3D Isometric View of Serra Alta Deposit Envelope**




Source: Micon, 2019.

In order to identify true outliers, the data was assessed after compositing to constant intervals. This was done to avoid potential short sample bias should shorter samples be taken near visible gold in core. Table 14.4 summarizes the capping grades used and the number of samples capped.

**Table 14.4**
**Serra Alta Selected Capping Grades on 1.0-m Composites**

| Entire Deposit | Max. Grade (Au g/t) | Capping Grade (Au g/t) | Capped Composites | Total Composites |
|---|---|---|---|---|
| Gold Mineralized Envelope | 78.71 | 35.00 | 6 | 3,924 |

#### 14.3.7.2 Compositing

As noted above, the selected intercepts for the Serra Alta Deposit were composited to 1.0-m equal length intervals. The composite length selected was based on the most common original sample length. Table 14.5 summarizes basic statistics of the composited data.

**Table 14.5**
**Summary of the Basic Statistics for 1.0-m Composites**

| Description | Uncapped Composites | | | | | Capped Composites | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Selection | Entire Envelope | N1 | N2 | S1 | S2 | Entire Envelope | N1 | N2 | S1 | S2 |
| Count | 3,924 | 1,275 | 1,469 | 1,023 | 157 | 3,924 | 1,275 | 1,469 | 1,023 | 157 |
| Length | 3,829 | 1,252 | 1,416 | 1,010 | 151 | 3,829 | 1,252 | 1,416 | 1,010 | 151.21 |
| Mean | 0.93 | 0.83 | 1.01 | 0.99 | 0.61 | 0.91 | 0.83 | 0.97 | 0.95 | 0.61 |
| Standard deviation | 3.2 | 2.27 | 3.47 | 3.9 | 1.52 | 2.80 | 2.27 | 2.86 | 3.39 | 1.52 |
| Coefficient of variation | 3.44 | 2.74 | 3.44 | 3.94 | 2.47 | 3.10 | 2.74 | 2.95 | 3.57 | 2.47 |
| Variance | 10.24 | 5.17 | 12.02 | 15.18 | 2.3 | 7.85 | 5.17 | 8.20 | 11.50 | 2.30 |
| Minimum | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| Lower quartile (Q1) | 0.03 | 0.04 | 0.03 | 0.02 | 0.02 | 0.03 | 0.04 | 0.03 | 0.02 | 0.02 |
| Median | 0.14 | 0.17 | 0.17 | 0.09 | 0.1 | 0.14 | 0.17 | 0.17 | 0.09 | 0.10 |
| Upper quartile (Q3) | 0.6 | 0.63 | 0.69 | 0.48 | 0.48 | 0.60 | 0.63 | 0.69 | 0.48 | 0.48 |
| Maximum | 78.71 | 25.45 | 78.71 | 65.87 | 10.82 | 35.00 | 25.45 | 35.00 | 35.00 | 10.82 |

### 14.3.8 Variography

Variography is the analysis of the spatial continuity of grade for the commodity of interest. In the case of Serra Alta Deposit the analysis was done on each individual vein zone using down-the-hole variograms and 3D variograms, in order to define the best parameters to interpolate grade.

Variography must be performed on regular coherent shapes with geological continuity support. First, down-the-hole variograms were constructed for each zone, to establish the nugget effect to be used in the modelling of the 3D variograms. Figures 14.4 to 14.7 show a summary of the gold variography within the four fault-delineated zones.

**Figure 14.4**
**Serra Alta Deposit Zone N1 Variography**

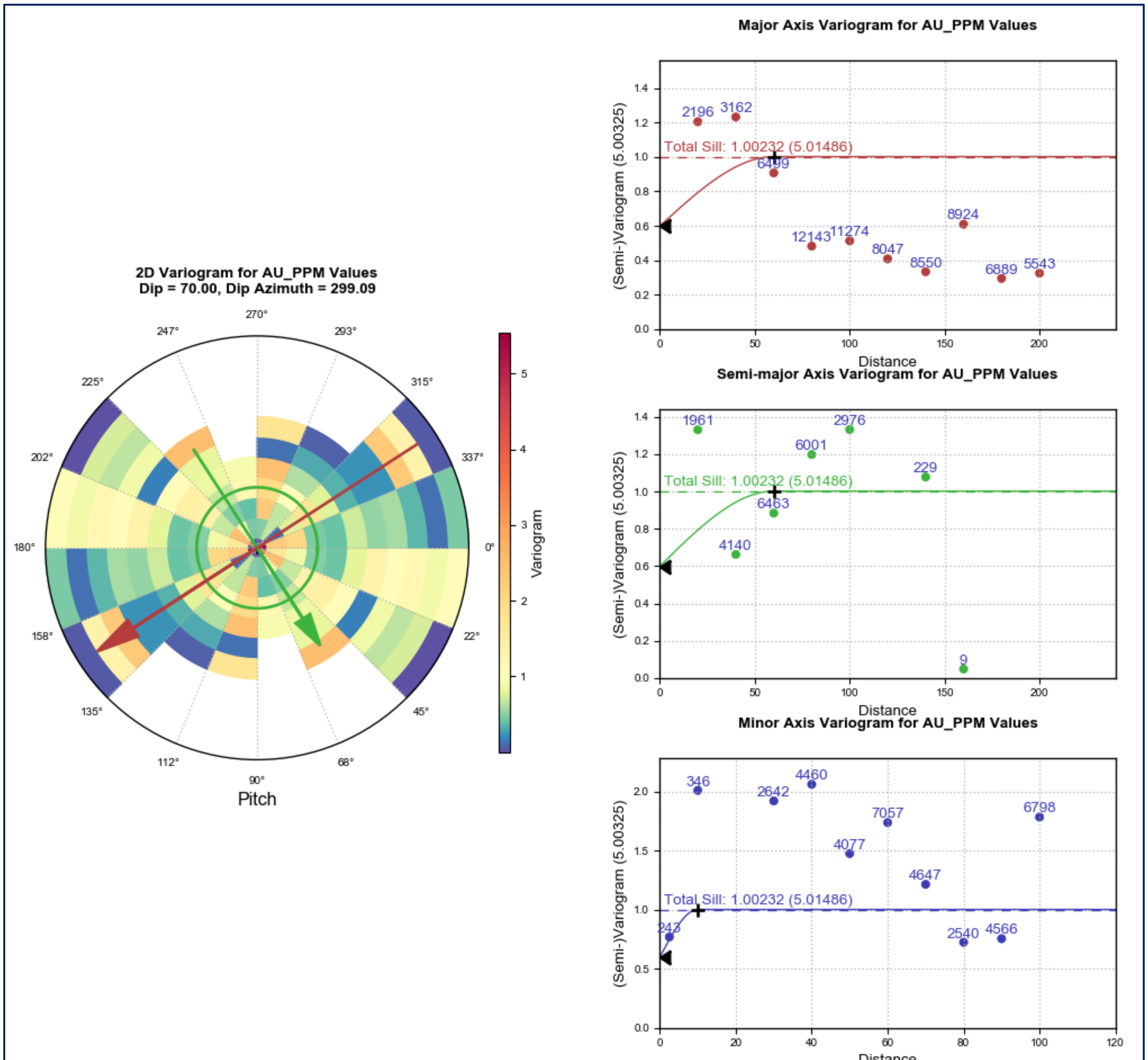


**Figure 14.5**
**Serra Alta Deposit Zone N2 - Variography**

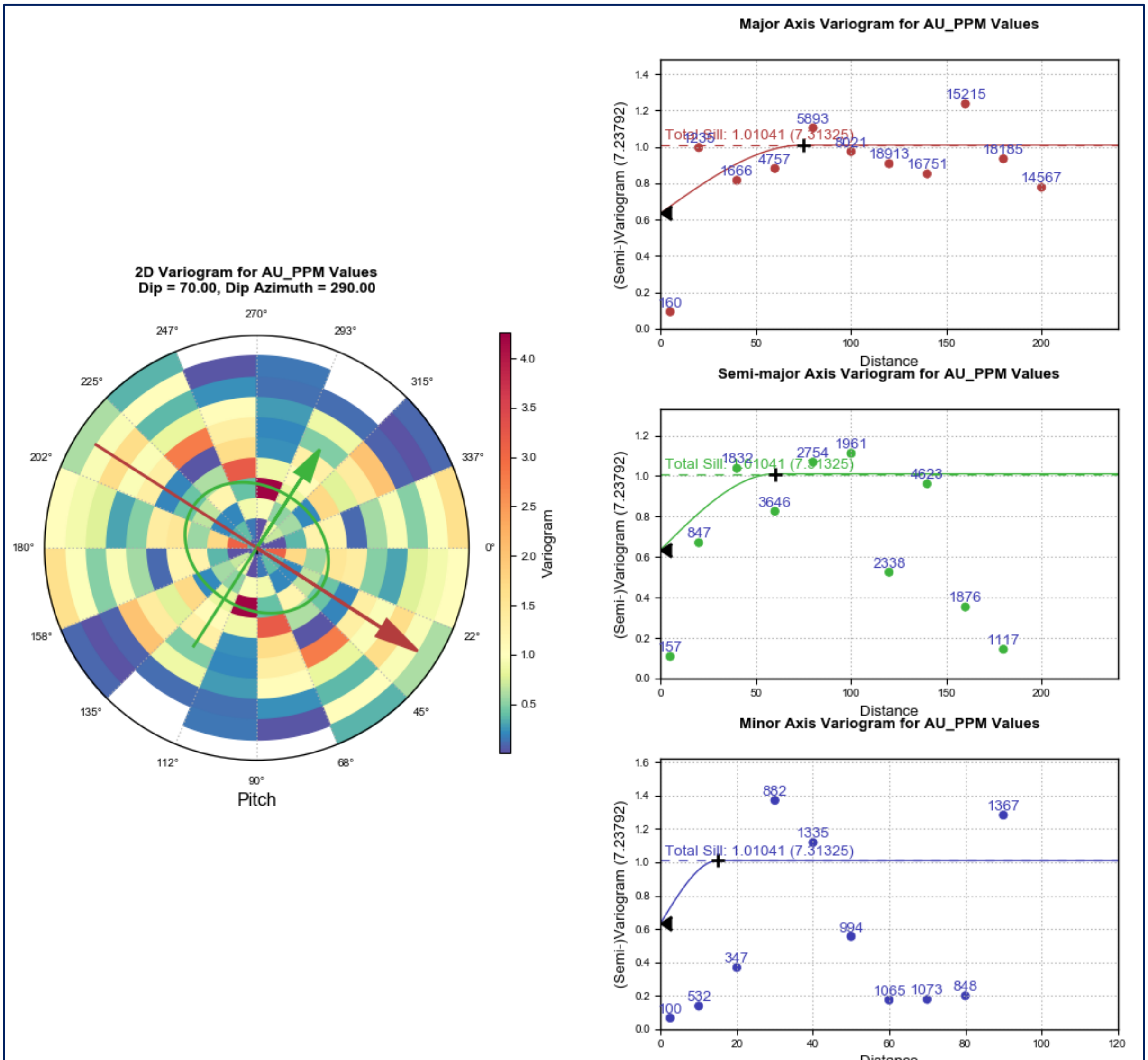


**Figure 14.6**
**Serra Alta Deposit Zone S1 - Variography**

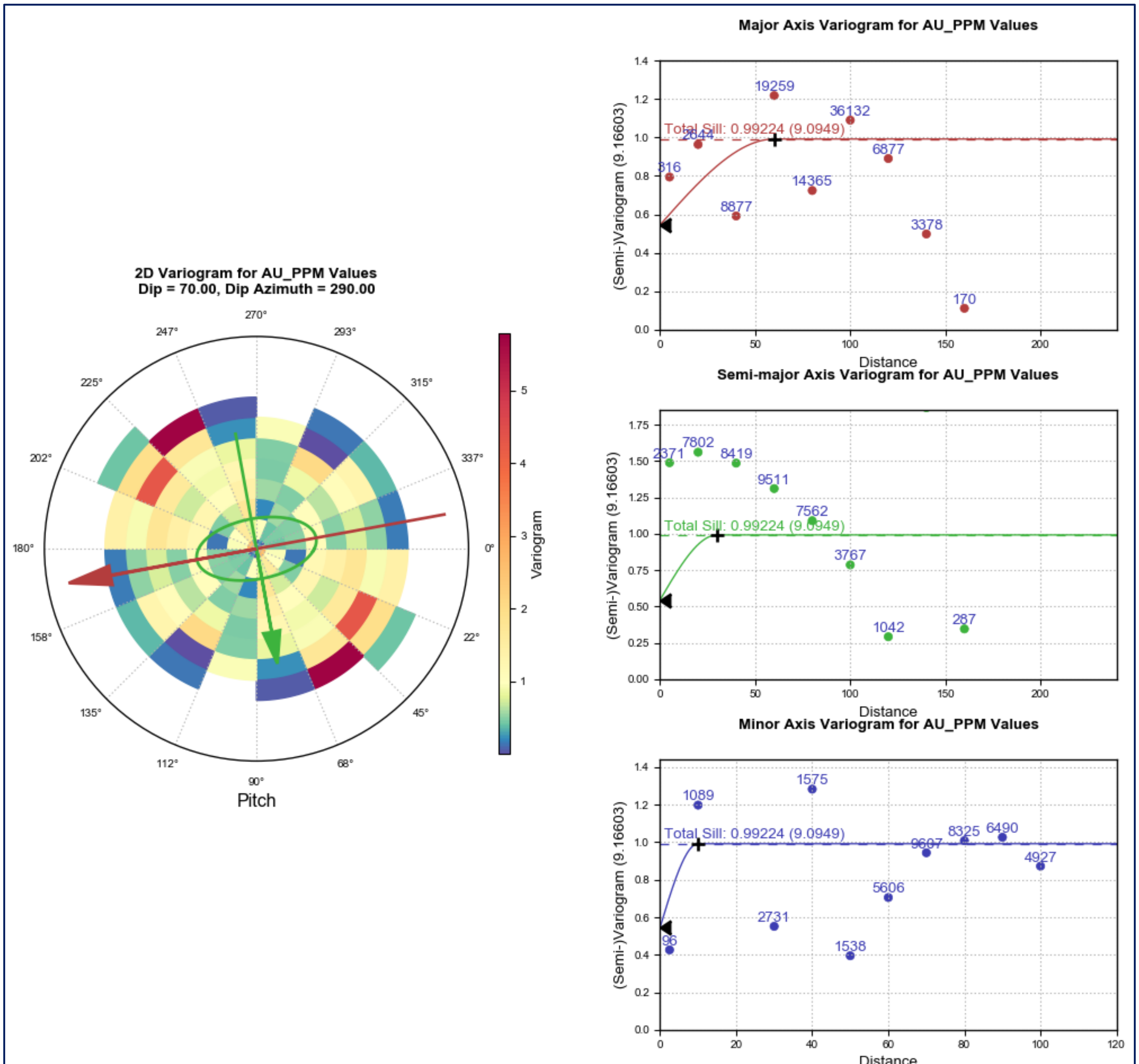
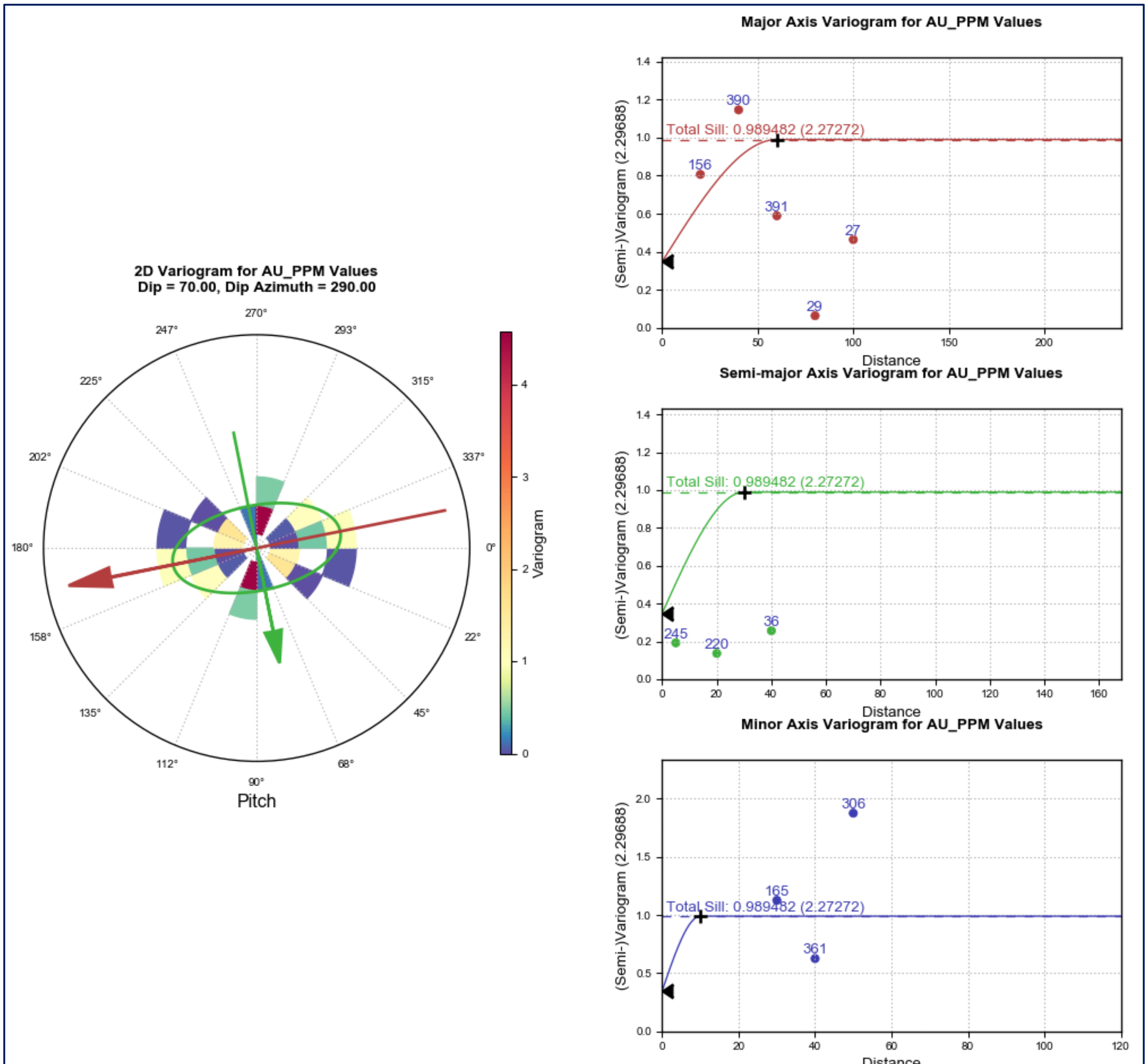


**Figure 14.7**
**Serra Alta Deposit Zone S2 - Variography**




Variogram were successfully modelled for the 4 zones, thereby supporting the use of ordinary kriging (OK) interpolation methods. The ranges modelled varied from 60 to 75 m and were used to establish the search parameters employed. Further detail is discussed in Section 14.4.2, Search Strategy and Interpolation.

### 14.3.9 Continuity and Trends

The Serra Alta Deposit presents a predominant bearing and dip with a well-defined broad geometry. This is supported by the geology, grades, historic bandeirante and garimpeiro workings, as well as enough drill hole intercepts to give the confidence on their continuity along strike and down dip. On average the deposit model has a 27º strike and -70º northwest dip.

## 14.4 MINERAL RESOURCE ESTIMATION

The mineral/element of economic interest at Serra Alta gold. The estimate of tonnes and grade was performed using solely Leapfrog Geo/EDGE software.

### 14.4.1 Block Model

A single block model was constructed to contain the vein zone codes, gold grades and density. A summary of the definition data of the block model is shown in Table 14.6.

**Table 14.6**
**Serra Alta Deposit Block Model Parameters**

| Description | Serra Alta Block Model (SABM) |
|---|---|
| Model Dimension X (m) | 800 |
| Model Dimension Y (m) | 1,600 |
| Model Dimension Z (m) | 390 |
| Origin X (Easting) | 819,800 |
| Origin Y (Northing) | 8,809,450 |
| Origin Z (Upper Elev.) | 700 |
| Rotation (º) | 25 |
| Parent Block Size X (m) - Across Strike | 2 |
| Parent Block Size Y (m) - Along Strike | 10 |
| Parent Block Size Z (m) - Down Dip | 5 |

### 14.4.2 Search Strategy and Interpolation

A set of parameters were derived from the variographic analysis results to interpolate the composite grades into the blocks. A summary of the Serra Alta Deposit OK interpolation parameters is shown in Table 14.7.

**Table 14.7**
**Ordinary Kriging Interpolation Parameter Summary**

| Zone Code | Pass | Orientation | | | Search Parameters | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Dip Az (°) | Pitch (°) | Dip (°) | Range Major Axis (m) | Range Semi-Major Axis (m) | Range Minor Axis (m) | Minimum Samples | Maximum Samples | Maximum Samples per Hole |
| N1 | 1 | 299 | 147 | -70 | 60 | 60 | 6 | 6 | 12 | 2 |
| N2 | 1 | 290 | 32 | -70 | 75 | 60 | 6 | 6 | 12 | 2 |
| S1 | 1 | 290 | 170 | -70 | 60 | 30 | 6 | 6 | 12 | 2 |
| S2 | 1 | 290 | 169 | -70 | 60 | 30 | 6 | 6 | 12 | 2 |
| All | 2 | Same | Same | Same | x 2 | x 2 | x 2 | 4 | 12 | 2 |
| All | 2 | Same | Same | Same | x 2 | x 2 | x 3 | 1 | 8 | 2 |

### 14.4.3 Prospects for Economic Extraction

This mineral resource has been constrained using both the economic assumptions of surface open pit and underground mining scenarios. The potentially minable portions of the block model are conceptual in nature and are based on single cut-off value of 0.49 g/t Au for surface mining and 1.5 g/t Au for underground mining.

The gold price and operating costs used were supplied by Cerrado. In the QP's opinion the economic parameters used are reasonable. However, they were not developed from first principles. They are taken from similar operations in Brazil and are considered conceptual in nature.

Table 14.8 summarizes the economic assumptions on which the open pittable portion of the resource estimate for the Serra Alta Deposit is based.

**Table 14.8**
**Economic Assumptions for the Conceptual Open Pit Scenario**

| Description | Units | Value Used |
|---|---|---|
| Gold Price | USD$/t | 1200.00 |
| Mining Cost Ore | USD$/t | 1.51 |
| Mining Cost Waste | USD$/t | 1.26 |
| Processing Cost | USD$/t | 10.78 |
| General & Administration | USD$/t | 5.50 |
| Gold Recovery (Metallurgical) | % | 94.00 |
| Slope Angle | Degrees (º) | 45 |

The parameters above were used to calculate the cut-off grade of 0.49 g/t Au for the open pit portion of the Serra Alta Deposit.

### 14.4.4 Underground Mining Potential

Most of the mineral resources reported for the Serra Alta Deposit are within the conceptual open pit. The remainder of the block model, under the pit, was reported at a higher cut-off grade deemed suitable for underground mining, from a ramp, in Brazil.

Assuming an underground mining cost of CDN$40/t and the rest of the parameters shown in Table 14.8, it is considered reasonable to determine that the mineral resources outside of the pit shell can potentially be mined by underground methods at a cut-off grade of 1.5 g/t Au.

The choice of a 1.5 Au g/t cut-off was supported after comparison to the nearby Jacobina mine of Yamana Gold Inc. which reports at a 1.2 g/t Au cut-off. Jacobina is a ramp access gold deposit in Bahia State mining quartz pebble conglomerate zones which are usually steeply dipping. The mining is performed mostly using longhole methods. The rock is estimated to be of similar competency to the unweathered (underground) granite at Serra Alta.

### 14.4.5 Categorization of Mineral Resources

Micon has categorized the present mineral resource estimate at the Serra Alta Deposit in the Inferred category. No Measured or Indicated mineral resources are declared at this time. Further infill drilling will need to be completed before any portion of the mineral resource can be upgrade to higher confidence categories.

## 14.5 MINERAL RESOURCE STATEMENT FOR SERRA ALTA

The mineral resource statement for the Serra Alta Deposit is summarized in Table 14.9.

**Table 14.9**
**Statement of Inferred Mineral Resources for Serra Alta**

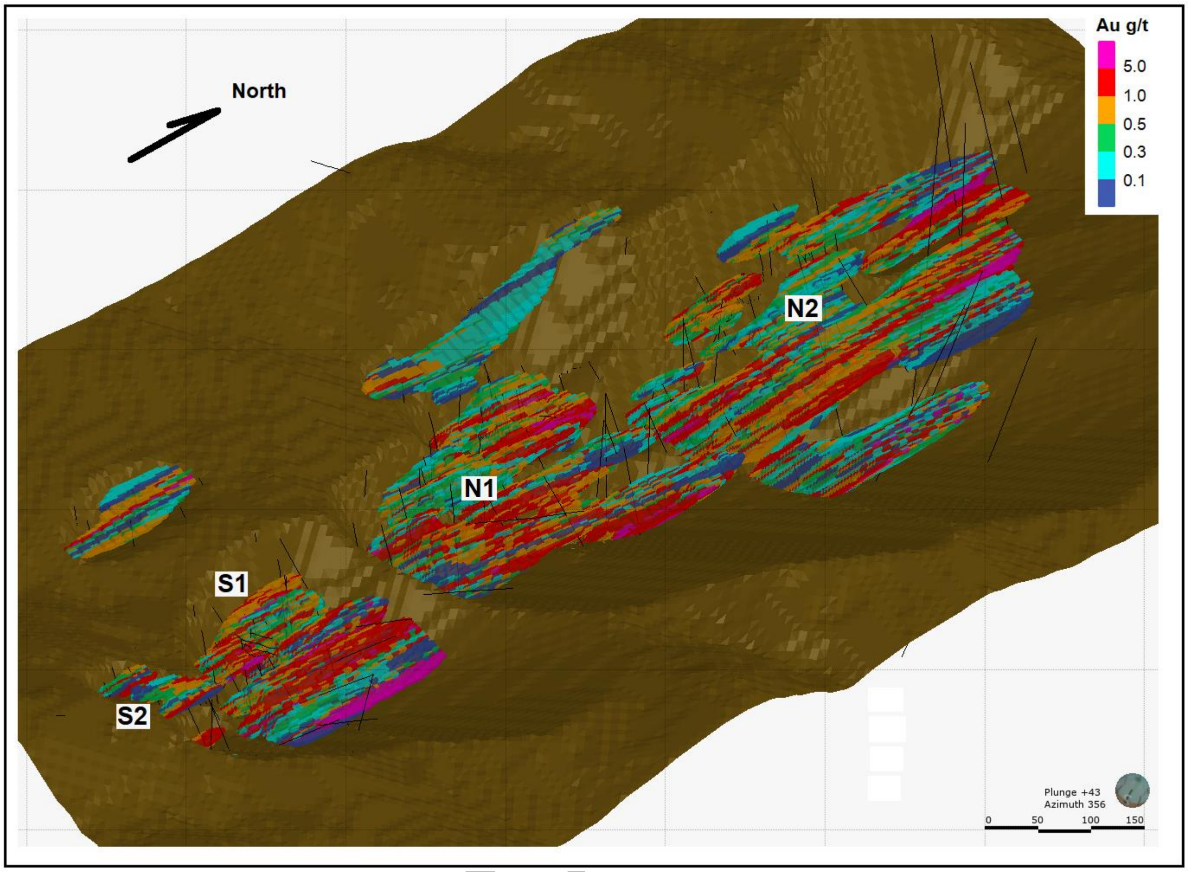
| Mining Method / Cut-Off | Domain | Tonnes (kt) | Grade (Au g/t) | Metal Content (Au oz, '000) |
|---|---|---|---|---|
| Open Pit @ 0.49 g/t Au Cut-off | N1 | 2,865 | 1.43 | 132 |
| | N2 | 7,594 | 1.72 | 420 |
| | S1 | 2,602 | 2.43 | 203 |
| | S2 | 172 | 1.22 | 7 |
| | **Subtotal** | **13,234** | **1.79** | **762** |
| Underground @ 1.5 g/t Au Cut-off | All | 405 | 3.92 | 51 |
| **Pit and Underground** | **Total** | **13,639** | **1.85** | **813** |

Mineral resources which are not mineral reserves do not have demonstrated economic viability. At the present time, Micon does not believe that the Serra Alta mineral resource estimate would be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

Micon considers the resource estimate for the Serra Alta Deposit to have been reasonably prepared and to conform to the current 2014, CIM standards and definitions for estimating mineral resources.

The mineral resources within the pit shells, summarized in Table 14.9 above, are shown graphically in Figure 14.8.

**Figure 14.8**
**Resource Blocks Isometric View**




## 14.6 MINERAL RESOURCE VALIDATION

Micon has validated the block model using both statistical comparisons and visual inspections.

### 14.6.1 Statistical Comparison

The average grade of the composites within each of the mineralized envelopes was compared to the average grade of all blocks therein. Table 14.10 summarizes the results of this comparison.

**Table 14.10**
**1.0-m Composite Grades vs. Block Grades**

| Zone | 1-m Composites | | | Block Model | | |
|---|---|---|---|---|---|---|
| | Nº of Comps | Total Length (m) | Au (g/t) | Nº of Blocks | Volume ($m^3$) | Au (g/t) |
| N1 | 1,275 | 1,252 | 0.83 | 23,911 | 2,391,100 | 0.82 |
| N2 | 1,469 | 1,416 | 1.01 | 64,543 | 6,454,300 | 0.99 |
| S1 | 1,023 | 1,010 | 0.99 | 19,507 | 1,950,700 | 1.37 |
| S2 | 157 | 151 | 0.61 | 1,474 | 147,400 | 0.72 |

The average composite grades and block grades compare reasonably closely, however, for those veins with few samples, the difference tends to be somewhat higher.

### 14.6.2 Visual Inspection

The model blocks and the drill hole intercepts were reviewed interactively in three-dimensional mode within LeapFrog to ensure that the blocks were honouring the drill hole data. The agreement between the block grades and the drill intercepts of the Serra Alta Deposit was deemed to be satisfactory.

### 14.6.3 Swath Plots

The average gold grades of the block model and the informing 1-m composites were compared in a profile along the strike (a swath plot). Figures 14.9 and 14.10 show the swath plots for the North and the South Zone pairs.

## 14.7 RESPONSIBILITY FOR ESTIMATION

The mineral resources presented in this report have been prepared under the direction of B. Terrence Hennessey, P.Geo., of Micon International Limited. The estimates have been prepared with the assistance of Ing. Alan J. San Martin MAusIMM(CP).

**Figure 14.9**
**N1 and N2 Swath Plot - 1-m Composites vs Block Grades**

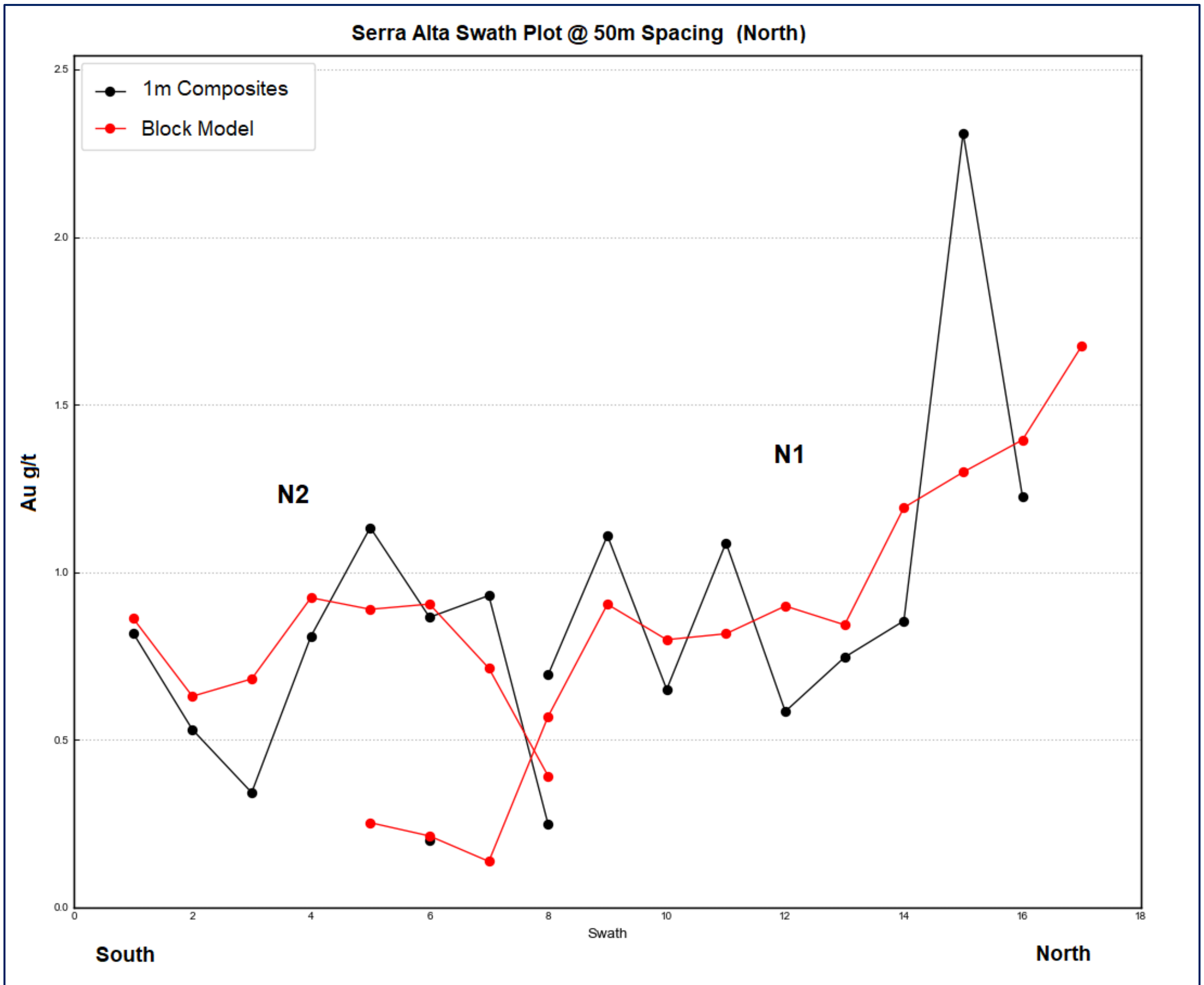
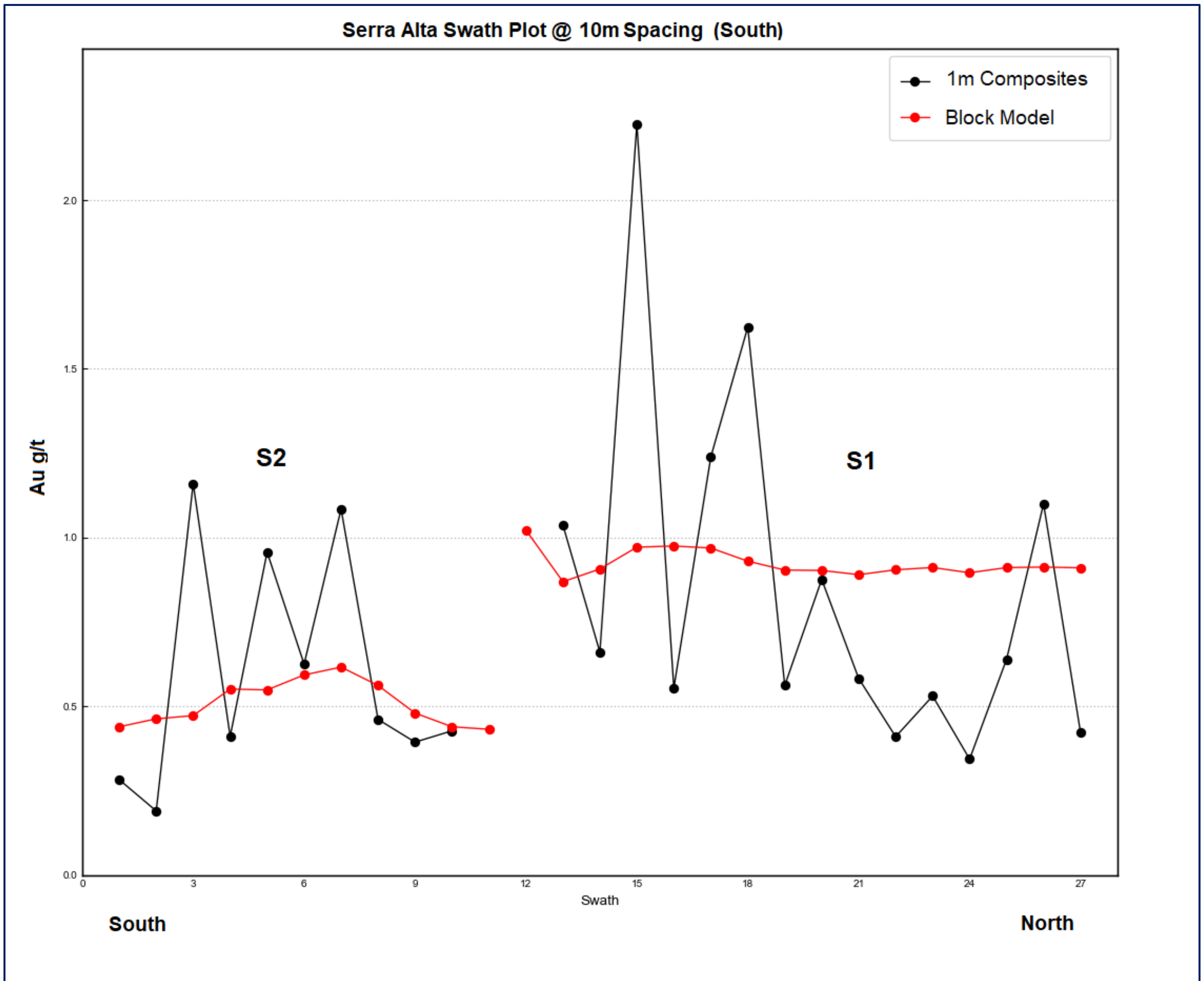


**Figure 14.10**
**S1 and S2 Swath Plot - 1-m Comps vs Block Grades**



## 15.0 MINERAL RESERVE ESTIMATES

There have been no NI 43-101-compliant mineral reserve estimates prepared at this time for the Monte do Carmo project.

# 16.0 ADJACENT PROPERTIES

There are no adjacent properties which affect the opinions offered in this report.

# 17.0 OTHER RELEVANT DATA AND INFORMATION

## 17.1 DEPOSIT GRADE

Given the apparently large size of the Serra Alta Deposit, the possible existence of more than one sub-corridor of mineralization and the number of older drill holes with questionable assays it is difficult at this time to estimate the ultimate approximate size and grade at Serra Alta.

From 2012 to 2017 MSM operated a small mill with gravity recovery and reported a processed tonnage of 60,361 t at a recovered grade of 1.508 g/t Au. Of this material it is reported that 54,354 t came from the South Block, 33 t from the Central Block and 5,943 t from the North Block. It is believed that most of the material processed came from the eastern-most sub-corridor of mineralization currently identified.

Figure 17.1 shows a close-up view of the surface of one of the tailings piles near the Serra Alta mill site. The material here is coarse sand with occasional pebbles, indicating that the mill was not completely effective in grinding the ore processed. Given this, it is considered likely that the recoveries of gold were relatively poor.

Due to financial constraints, MSM did not routinely collect head and tail samples while the mill was in operation. A consulting firm is reported to have completed a one-day recovery test after cleaning the mill and processing ore with frequent head and tail samples. This is reported to have given a 23% recovery and has not been confirmed by the QP. However, the QP notes that this is only one day's results in five years of operation.

MSM has presented tables showing estimated head grades for the life of the project using an assumed 23% and 35% recovery that show relatively high estimated head grades in the areas mined. The QP is reluctant to rely on these limited data. However, even if a recovery of 50% or 60% is applied, the head grade of the material mined would have been around 3 g/t Au.

If a large amount of material of this grade could be proven up it would make an attractive open pit target and may even have chutes of mineralization of sufficient grade to be mined underground.

Although it is obvious that recent production on a moderate scale has occurred at Serra Alta, the QP has not verified any of the production claims made by MSM. The QP cautions that the analysis above is not to be regarded as a mineral resource estimate for Serra Alta. It is the QP's opinion, however, that it is justification for an exploration program at the deposit.

**Figure 17.1**
**Serra Alta Tailings Showing Coarse Grind**

Source: Micon 2018. Note scale card in photo.

# 18.0 INTERPRETATION AND CONCLUSIONS

## 18.1 GIANT QUARTZ VEINS - GENERAL

One of the veins visited by the QP, the Verena vein, was being actively mined by at least three groups of garimpeiros at the time of the QP's visit. They were using small crushers and grinding machines, to recover the gold. The other veins visited were not being actively mined but had been within the last decade or so.

Total mineralized widths were generally 1 to 4 m at the workings visited, although locally they could be somewhat higher. Distances between the veins were typically at least 300 to 400 m and occasionally in excess of 1 km.

At Verena and Magalhaes 1, two of the three large quartz veins visited by the QP, the grade of the veins is believed to be low, estimated at about 2 g/t Au by MSM staff. However, the sheared wall rock on either side is of much better grade and the garimpeiros preferentially process only that material. MSM personnel estimate that the grade of the wall rock must be at least 7 to 8 g/t Au for the garimpeiros to operate successfully.

Grades of the quartz veins are reported to be too low for the garimpeiros to process. Total grade over the full mineralized width (vein plus sheared wall rock) is partially a function of the vein width, which is effectively internal dilution. The wider the quartz vein, the lower the overall grade.

Total tonnage potential at each vein is likely to be relatively low and the distance between veins will make it difficult to fully share infrastructure should mining commence. Small-scale open pits may be possible with ore trucked to a central location. Mercury contamination from previous garimpeiro operations may also be an issue.

Given the above, the QP concurs with Cerrado's decision to concentrate exploration effort on the Serra Alta Deposit where the potential for size is considered to be much greater. However, limited further exploration at the Giant Quartz Veins is considered to be justified.

## 18.2 SERRA ALTA - GENERAL

Traversing the Serra Alta portion of the property to visit mineralized exposures, the QP was struck by the extensive development of historical mine workings (bandeirante workings), more recent garimpos and the bulk sample small open pits completed by MSM. The historical workings are reported to date back over 200 years. The garimpeiros were reportedly bought out a number of years ago and have moved on. No activity is occurring on the Serra Alta portion of the property other than that conducted by Cerrado and/or MSM.

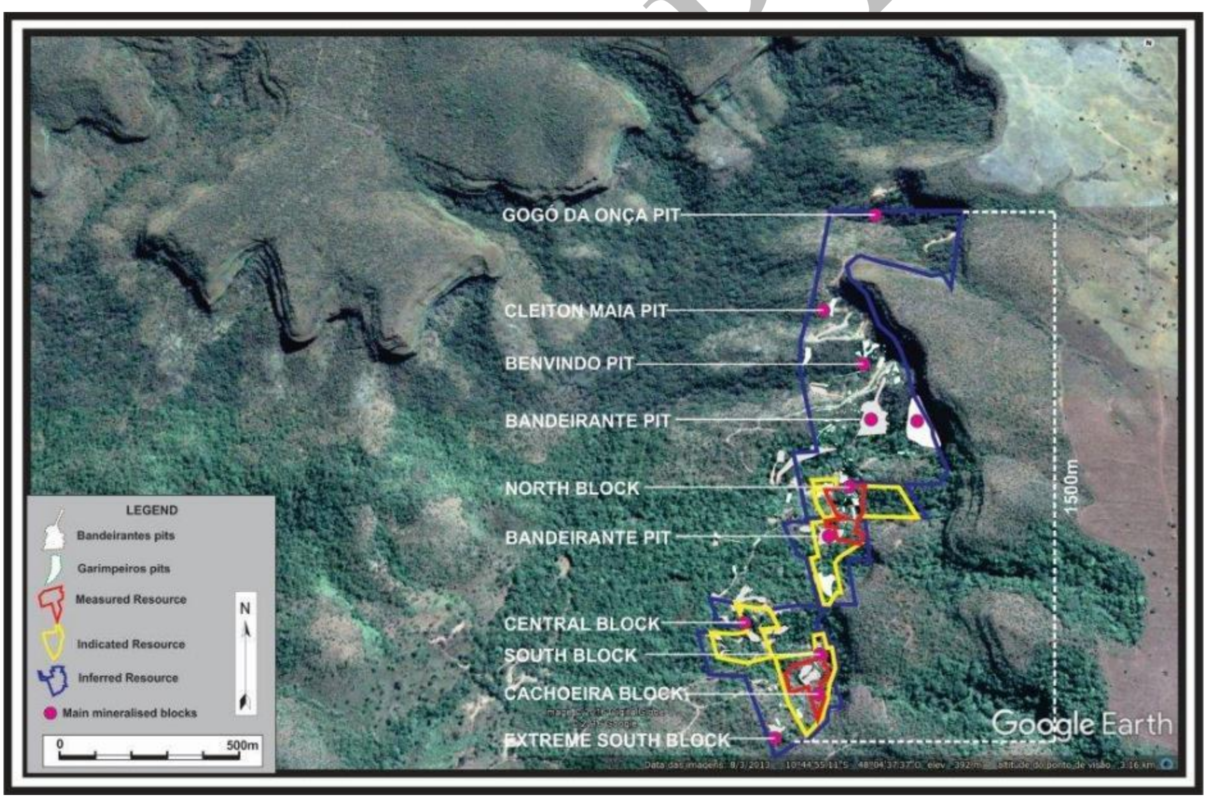
The white patches in the pink granite of Figure 6.1 are the mapped positions of the bandeirante pits and garimpos. Except for the Gogó da Onça pit in the far north, the mapped garimpos stop at the Cleiton Maia pit (Figure 6.1 and 18.1). During the site visit, it was clear that they extended beyond this, close to the north property limit. They appear over a width of at least 200 m, and possibly 300 m, and a strike length of at least 1,500 m. Within this corridor, MSM and Cerrado geologists have interpreted three distinct sub-corridors or trends of mineralization. It is possible that the far western trend is composed largely of colluvium shed from the slope and has no immediate bedrock source. However, there are large exposed bedrock sources of veined and altered granite on the eastern side.

Clearly a large amount of mining work, over a wide area, mostly by hand, has been completed at this location over a long period of time. Intuitively this leads to the conclusion that the recovered gold was sufficient to justify the significant effort and expense for that much activity. It is the QP’s opinion that this justifies the expense of an exploration program to more fully test the true grade, depth and width of the mineralization.



The true width of the sub-corridors does not seem to be currently well defined. Figure 18.1 shows the locations of the principal pits and zones at Serra Alta.

**Figure 18.1**
**Satellite Photo of Serra Alta Showing Principal Pits and Zones**




Source MSM, 2018.

## 18.3 CONCLUSIONS

Serra Alta is an interesting gold exploration project with a long history of artisanal mine workings and exposures over significant widths and strike length. The deposit is open along strike in both directions and down dip. The possibility exists that more mineralization will be found under the quartzite and red bed sediments to the immediate east of the known mineralization. However, grades there will likely need to justify underground mining for much of the mineralization due to the significant amount of waste stripping of the overlying sediments, which would be required for an open pit mine.

It is the QP's opinion that further exploration is justified.

The Giant Quartz Veins to the south are rather small tonnage targets and are unlikely to support a mining and milling operation on their own. However, should a mill be built at Serra Alta, they may contribute some mill feed.

The exploration work carried out at Serra Alta is generally being done to accepted industry standards. A few minor recommendations have been made.

### 18.3.1 Current Mineral Resource Estimate

The drilling completed to date, or relogged, resampled and validated, by Cerrado is sufficient to interpret mineralized shells and to estimate an inferred mineral resource for the Serra Alta Deposit.

The mineral resource statement for the Serra Alta Deposit is summarized in Table 18.1.

**Table 18.1**
**Statement of Inferred Mineral Resources for Serra Alta**

| Mining Method / Cut-Off | Domain | Tonnes (kt) | Grade (Au g/t) | Metal Content (Au oz, '000) |
|---|---|---|---|---|
| Open Pit @ 0.49 g/t Au Cut-off | N1 | 2,865 | 1.43 | 132 |
| | N2 | 7,594 | 1.72 | 420 |
| | S1 | 2,602 | 2.43 | 203 |
| | S2 | 172 | 1.22 | 7 |
| | **Subtotal** | **13,234** | **1.79** | **762** |
| Underground @ 1.5 g/t Au Cut-off | All | 405 | 3.92 | 51 |
| **Pit and Underground** | **Total** | **13,639** | **1.85** | **813** |

Mineral resources which are not mineral reserves do not have demonstrated economic viability. At the present time, Micon does not believe that the Serra Alta mineral resource estimate is materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

Micon considers that the resource estimate for the Serra Alta Deposit to have been reasonably prepared and to conform to the current 2014, CIM standards and definitions for estimating mineral resources.

# 19.0 RECOMMENDATIONS

### 19.1.1 Recommendations

In addition to continued exploration at Serra Alta, the QP makes the following recommendations:

- Map the location of the last of the garimpo/bandeirante pits at the north end of the trend and update the map shown in Figure 6.1. This is a useful figure to demonstrate the scale of the mineralized body at Serra Alta.

- Eventually Cerrado should consider switching to electronic core logging, directly to tablets or laptop computers, rather than to paper. There is the potential for error in the required follow up transcription of logs.

- Put multiple columns in the database for first assay and reassays along with a final "accepted assay" column to be used for resource estimation. Maintain a log book of all requested reassays and the reasons for them. This will create an audit trail for any eventual resource review prior to financing mine construction.

- The current blank material being used in the Quality Assurance/Quality Control program is reported to be a dirty limestone from a nearby quarry. This should be switched to a quartz, or unmineralized granite, blank which will react to the assay flux in a manner more similar to the local granite mineralization. It will also clean the sample preparation equipment more effectively, thereby identifying gold carry over between samples.

- The data package for the Canadian Resource Laboratory (CRL) standards came with two sets of round robin assays, one with AAS finish and one with gravimetric finish. They each had a slightly different standard deviation (SD) which is used to establish the failure lines on the control charts. CRL should be contacted to find out which accepted value and SD to use with screen metallics assays, AAS or gravimetric.

- Contact SGS and find out what their sample batch size is and how many positions in it are available to the client. Then submit Cerrado samples in batches to be analyzed together thereby controlling the location of the QA/QC samples and ensuring that Cerrado samples are not mixed in a batch with another company's.

- Eventually, should Serra Alta become an advanced project, consideration should be given to making matrix-matched CRMs (analytical standards) from local mineralization.

### 19.1.2 Serra Alta Exploration Program

Cerrado has initiated an exploration program designed to confirm and expand the gold mineralization at Serra Alta and to follow up other favourable targets from earlier programs. This report proposes to continue that work. This program includes definition drilling and expansion of the areas north, south and along strike of what is referred to as the North Block and South Block and the areas between the blocks.

Also included is the follow up of favourable targets of earlier exploration programs with channel sampling, detailed geological mapping, and sampling of the extensive garimpeiro workings. Part of this program focuses on investigating the area between the North Block and the area immediately north, for a strike length of 1,500 m.

The area between the North and South Blocks is a focus of the drill program in order to explore for additional mineralization along strike, both north and south from the known areas at Serra Alta, as well as those areas in between. The ultimate goal is to produce a database suitable for additional mineral resource estimates. A program comprised of 31,000 m of drilling has been proposed.

A total budget of $6,687,102.78 is proposed by Cerrado for the recommended 2019 exploration program as set out in Table 19.1 below. It is anticipated that this work will be completed over the next year. An additional $2,724,543.62 is budgeted for debt repayment conditions outlined in Section 4.3.

### 19.1.3 Exploration Budget

The proposed exploration program budget for Serra Alta is summarized in Table 19.1 below.

**Table 19.1**
**Proposed 2018 Serra Alta Exploration Budget**

| Monte Do Carmo Project - Exploration | 2019 Total (US$) |
|---|---:|
| Serra Alta | 3,020,511.11 |
| Capitão/Magalhaes + Drilling at Other Quartz Veins | 1,417,655.56 |
| Other Quartz Veins (Field work only) | 6,875.00 |
| Fartura (Field work only) | 10,972.22 |
| Operation Expenses | 1,477,422.22 |
| G&A Expenses | 753,666.67 |
| | |
| **Total** | **6,687,102.78** |

The QP has reviewed the proposed exploration program and finds it to be reasonable and justified. Should it fit with Cerrado's strategic goals, it is the QP's recommendation that the company conduct the proposed exploration program.

The data used in the preparation of this report are current as of November 21, 2018.

MICON INTERNATIONAL LIMITED

*"B. Terrence Hennessey" {signed, sealed and dated}*

B. Terrence Hennessey, P.Geo.
Vice President
Micon International Limited

April 3, 2019

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# 21.0 CERTIFICATES

## B. TERRENCE HENNESSEY

As the author of this report on certain mineral properties of Cerrado Gold Inc., in Tocantins State, Brazil, I, B. Terrence Hennessey, P.Geo., do hereby certify that:

1. I am employed by, and carried out this assignment for:

   Micon International Limited
   Suite 900, 390 Bay Street
   Toronto, Ontario
   M5H 2Y2

   Tel.: (416) 362-5135
   Fax: (416) 362-5763
   e-mail: thennessey@micon-international.com

2. I hold the following academic qualifications:

   B.Sc. (Geology) McMaster University 1978

3. I am a registered Professional Geoscientist with the Association of Professional Geoscientists of Ontario (membership # 0038); as well, I am a member in good standing of several other technical associations and societies, including:

   The Canadian Institute of Mining, Metallurgy and Petroleum (Member).
   Society of Economic Geologists (Fellow)

4. I have worked as a geologist in the minerals industry for over 35 years.

5. I have read the definition of "Qualified Person" set out in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) and, by reason of my education, past relevant work experience and affiliation with a professional association, fulfill the requirements to be a Qualified Person for the purposes of NI 43-101. My work experience includes 7 years as an exploration geologist looking for iron ore, gold, base metal and tin deposits, more than 10 years as a mine geologist in both open pit and underground mines and 20 years as a consulting geologist working in precious, ferrous and base metals as well as industrial minerals.

6. I visited the Monte do Carmo project site in Brazil during the period February 26 to March 2, 2018, to review the results of exploration at site. A second visit was made to the project from September 4 to 8, 2018

7. I am responsible for all sections of the technical report titled "A Mineral Resource Estimate for Serra Alta Deposit at the Monte Do Carmo Project, Tocantins State, Brazil" dated April 3, 2019 (the "Technical Report"). The report has an effective date of December 5, 2018.

8. I am independent of the issuer and all parties involved in this Technical Report, as defined in Section 1.5 of NI 43-101.

9. I have had no prior involvement with the property that is the subject of the Technical Report.

10. I have read NI 43-101 and Form 43-101F1 and the portions of this Technical Report for which I am responsible have been prepared in compliance with that instrument and form.

11. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not be misleading.

Report Date: April 3, 2019
Effective Date: December 5, 2018

Dated this 3rd day of April, 2019 in Toronto, Ontario, Canada.

"B. Terrence Hennessey" {signed and sealed}

B. Terrence Hennessey, P.Geo.