Technical

Report NI 43-101

ANTIOQUIA GOLD LTD.

CISNEROS GOLD PROJECT,

ANTIOQUIA DEPARTMENT, COLOMBIA

NI 43-101 TECHNICAL REPORT ON UPDATED MINERAL RESOURCE ESTIMATE AND PRELIMINARY ECONOMIC ASSESSMENT

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CONTENT

TABLES

FIGURES

PHOTOS

IMPORTANT NOTICE

This notice is an integral component of the Cisneros 2017 Preliminary Economic Assessment (Cisneros 2017 PEA) and should be read in its entirety and must accompany every copy made of the Technical Report. The Technical Report has been prepared using the Canadian National Instrument 43-101 Standards of Disclosure for Mineral Projects.

The Technical Report has been prepared for Antioquia Gold Limited (AGD) by Linares Americas Consulting SAC (LINAMEC). The Technical Report is based on information and data supplied to LINAMEC by AGD and other parties and where necessary LINAMEC has assumed that the supplied data and information are accurate and complete.

This report is a Preliminary Economic Assessment (PEA) and includes an economic analysis that is based, in part, on Inferred Mineral Resources. Inferred Mineral Resources are considered too speculative geologically to have the economic considerations applied to them that would allow them to be categorized as Mineral Reserves, and there is no certainty that the results will be realized. Mineral Resources are not Mineral Reserves as they do not have demonstrated economic viability. The results of the PEA represent forward-looking information. The forward-looking information includes metal price assumptions, cash flow forecasts, projected capital and operating costs, metal recoveries, mine life and production rates, and other assumptions used in the PEA. Readers are cautioned that actual results may vary from those presented. The factors and assumptions used to develop the forward-looking information, and the risks that could cause the actual results to differ materially are presented in the body of this report under each relevant section.

The conclusions and estimates stated in the Technical Report are to the accuracy stated in the Technical Report only and rely on assumptions stated in the Technical Report. The results of further work may indicate that the conclusions, estimates and assumptions in the Technical Report need to be revised or reviewed.

LINAMEC, have used their experience and industry expertise to produce the estimates and approximations in the Technical Report. Where LINAMEC has made those estimates and approximations, it does not warrant the accuracy of those amounts and it should also be noted that all estimates and approximations contained in the Technical Report will be prone to fluctuations with time and changing industry circumstances.

The Technical Report should be construed in light of the methodology, procedures and techniques used to prepare the Technical Report. Sections or parts of the Technical Report should not be read or removed from their original context.

The Technical Report is intended to be used by AGD, subject to the terms and conditions of its contract with LINAMEC. Recognizing that Cisneros has legal and regulatory obligations, LINAMEC has consented to the filing of the Technical Report with Canadian Securities Administrators and its System for Electronic Document Analysis and Retrieval (SEDAR). Except for the purposes legislated under provincial securities laws, any other use of this report by any third party is at that party's sole risk.

1.0 SUMMARY

1.1 INTRODUCTION

Linares Americas Consulting S.A.C. (LINAMEC) was retained by Antioquia Gold Ltd. (AGD) to prepare an update of the Mineral Resource Estimate and Preliminary Economic Assessment (PEA) for the Cisneros gold project (the Project) located in the Department of Antioquia, Colombia.

The Cisneros 2017 Preliminary Economic Assessment (Cisneros 2017 PEA) has been prepared for AGD by LINAMEC and presents the results of underground sampling, exploration drilling, mineral resource estimation, and mine planning on the Guaico and Nus zones for the redevelopment of the Cisneros Gold Project. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

This new resource estimate incorporates the results of 14 drillholes drilled in 2016-2017 in the area known as “Guayabito Sur”, totalling 2,689.92 m and 992 channel samples taken in the underground workings of the Guaico Mine. The mineralized structures, updated with new data are: Nus, Guaico, Footwall-03, Footwall-05, Vega and La Manuela-01. The other areas, Guayabito North and Papi, remain unaltered.

1.2 PROPERTY DESCRIPTION, OWNERSHIP AND HISTORY

The property is located 55 km to northeast of Medellin and 2 km east of the town of Cisneros in the Department of Antioquia, Colombia. The Cisneros Property consists of 5,794.08 ha on eleven (11) concessions in the municipalities of Santo Domingo, Cisneros and Yolombo, centered at 75º08’25” W longitude and 06º32’35” N latitude. Antioquia Gold Ltd. holds a 100% interest in these mineral concessions.

The property was previously held by Am-Ves Resources Ltd. (Am-Ves) of Alberta. High American Gold Ltd. (now Antioquia Gold Ltd.) took over Am-Ves in a reverse takeover in 2008 and in March 2009 the two companies amalgamated to become Antioquia Gold Ltd. (Antioquia). A due diligence study and preliminary exploration program was conducted by Am-Ves in 2007 before its takeover by Antioquia. Moose Mountain Technical Services prepared a NI 43-101 Technical Report dated February 6, 2008 and updated it in December 6, 2010, Linares Americas Consulting (LINAMEC) prepared a NI 43-101 Technical Report on Resource Estimation dated October 14, 2013 and a NI 43-101 Technical Report on Updated Mineral Resource Estimate dated July 16, 2017.

1.3 GEOLOGY & MINERALIZATION

The Cisneros Project lies within the Antioquia Batholith, that is lithologically homogeneous with little variation from one place to another. The normal facies have a tonalite to granodiorite composition.

The Cisneros deposit is a porphyry related mesothermal lode-gold vein system. Gold is the primary economic metal. Mineralization occurs in narrow structural envelopes that are called "veins" in this report. There are three principal gold zones with known resources, Guaico (NNE), Nus (EWE) and Guayabito (NE). They consist of various simple vein structures and complex veins (Guayabito Zone).

The Cisneros Project area is transected (and geologically partitioned) by a set of regionally extensive East-West faults and NNE-SSW tensional faults, both are pre-mineral, see Figure 7-3.

1.4 MINERAL RESOURCE ESTIMATE

The current mineral resource estimate (Antioquia Gold Ltd. Cisneros Gold Project, Antioquia Department, Colombia NI 43-101 Technical Report Update on Mineral Resource Estimate and Preliminary Economic Assessment, September 2017) is an update to the July 2017 resource estimate accompanied by a technical report prepared by LINAMEC and utilized ordinary kriging as the estimation methodology on a more extensive database. The resource for the Guayabito Deposit and the Papi Deposit, remains unaltered from 2013 and were estimated using inverse distance cubed (ID3) interpolation methodology.

The main objective was to publish revised mineral resource estimates for the Guaico Vein, Footwall-03 Vein, Footwall-05 Vein, Vega Vein, La Manuela Vein, Nus Vein and Guayabito Sur veins. This updated resource estimate integrates 992 new channel samples taken in the underground workings in Guaico Mine. The mineral resources have been defined taking into account the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves. The Mineral Resource Estimate has an effective date of September 24, 2017, that is the cut-off date for information used in the estimation. Mineral resources that are not reserves do not have demonstrated economic viability. Tables 1-1, 1-2 and 1-3 contains the summary of mineral resource estimates for the Cisneros Properties.

Table 1-1
Total Measured Resource Estimates for Cisneros Deposits

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	200,877	3.548	22,916
Guaico	GCO	26,464	7.529	6,406
Footwall-05	GCFW5	13,596	9.759	4,266
Footwall-03	GCFW3	11,919	7.561	2,898
La Manuela-01	MNL_1	1,133	5.237	191
Guayabito	GBY	46,370	7.700	11,479
Papi	PAPI	3,592	6.966	804
Total Measured		**303,951**	**5.010**	**48,959**

Table 1-2
Total Indicated Resource Estimates for Cisneros Deposits

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	152,181	3.057	14,958
Guaico	GCO	10,014	8.194	2,638
Footwall-05	GCFW5	9,266	9.819	2,925
Footwall-03	GCFW3	17,745	6.929	3,953
Vega	VEGA	2,132	13.755	943
La Manuela-01	MNL_1	1,088	4.766	167
Guayabito	GBY	211,887	7.268	49,511
Papi	PAPI	20,338	3.345	2,187
Total Indicated		**424,652**	**5.661**	**77,282**

Table 1-3
Total Inferred Resource Estimates for Cisneros Deposits

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	103,445	2.984	9,924
Guaico	GCO	6,069	8.059	1,572
Footwall-05	GCFW5	6,213	12.628	2,522
Footwall-03	GCFW3	11,007	9.171	3,245
Vega	VEGA	5,533	13.364	2,378
La Manuela-01	MNL_1	1,128	3.140	114
Guayabito Sur	GBY-SUR	57,973	7.535	14,044
Guayabito	GBY	232,911	8.075	60,468
Papi	PAPI	111,932	4.201	15,120
Total Inferred		**536,211**	**6.345**	**109,388**

1. Mr. Edgard Vilela, is the Qualified Persons and Chartered Professional for the Mineral Resource estimate. The effective date of the estimate is September 24, 2017.
2. Mineral Resources are reported using a cut-off grade of 2.95 g/t Au for GCO, GCFW3, GCFW5 and MNL_1.
3. Mineral Resources are reported using a cut-off grade of 1.66 g/t Au for NUS and 1.50 for PAPI.
4. Mineral Resources are reported using a cut-off grade of 2.62 g/t Au for GYB-SUR and 2.50 for GYB.
5. Reported Mineral Resources contain no allowances for hanging wall or footwall contact boundary loss and dilution. No mining recovery has been applied.
6. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and metal content.

1.5 MINERAL PROCESSING AND METALLURGICAL TESTING

1.5.1 Metallurgical Testing

During the period 2010 to 2017, several metallurgical test campaigns were carried out with different mineralized materials from the Guayabito and Guaico zone of the Cisneros Project, with the objective of characterizing the mineralization in terms of its disposition to be processed using conventional metallurgical technology.

The main objective of these metallurgical tests was to study the behavior of the mineralization under different working conditions in the processes of size reduction, gravity, flotation and cyanidation of the flotation concentrates. Finally, the direct cyanidation of the head feed was carried out in order to define an optimal scenario to recover the precious metals from the mineralization in the different exploitation zones.

In these metallurgical research campaigns, a number of different mineralized samples have been used to ensure that the results are as representative as possible of the proposed area of exploitation of the Cisneros Project.

The effect of gold grade on recovery is evident in the results of the tests carried out at G&T in 2010. Using combined gravity and flotation processes with head grades of 17.9 g/t gold and 38.1 g/t gold achieved recoveries of 97% and 96%, for Guaico and Guayabito, respectively. Results of tests conducted at Met-Solve in 2015 showed similar recoveries for head grades of 4.94 g/t gold and 5.64 g/t gold for the two mineralized zones.

The effect of particle size on gold extraction can be seen on the similarity of the recovery results of both laboratories, G&T and Met-Solve, shown in Table 13-17, for P_{80} grind size between 100 and 109 microns, it is recommended to perform combined gravity and flotation tests on slightly coarser grind sizes, for example, at P_{80} = 120 to 150 microns, for Guaico, Guayabito and Nus mineralization. It is not recommended to grind to finer sizes

(P_{80} < 100 microns) because this could produce sludge in the feed, that would affect the flotation of sulfides, causing a reduction in gold recoveries.

The effect of flotation time on the Guaico and Guayabito mineralization is very similar, as indicated by metallurgical tests for two composites from Guaico and Guayabito zones, carried out by CMH in September 2013 where the kinetics of both samples were almost identical.

In conclusion, both Guaico and Guayabito have a very similar behavior in the flotation process and the gold associated with the iron sulfides is extracted quickly. The Guaico and Guayabito mineralization has fast kinetics indicating that the use of rougher circuits alone would reach gold recoveries close to 98%.

1.5.2 Mineral Processing

The objective of the metallurgical process is to obtain gravity concentrates and flotation concentrates in a plant with a capacity of 500 tonnes per day (tpd). The plant will be composed of a single production line in two conventional processes; gravity followed by flotation to obtain sulphide concentrates with gold contents.

The process route involves a dry section consisting of crushing (primary and secondary stages) and milling and a wet plant comprising gravity concentration, flotation and filtration of concentrates where gold is to be recovered.

The process plant has been designed to operate 347 days per year and treat 500 tonnes of mineral daily. The average head grade is estimated to be 6.43 g/t gold. An overall recovery of 90% is anticipated. Resources have been estimated at 784,763 tonnes with a life-of-mine (LoM) of 5.0 years. A mineral stockpile of 19,402 tonnes, resulting from the preparation of the stopes in the Guayabito and Guaico-Nus areas, will be maintained for the commissioning of the plant.

1.6 MINING METHOD

AGD, has identified two mining units under evaluation for future exploitation, Guaico-Nus Mine and Guayabito Mine. The Guaico-Nus Mine is currently accessed by the Guaico portal and decline (4.5 m x 4.5 m and 12% gradient), and the Guayabito Mine is accessed by a portal and decline (4.5 m x 4.5 m and 12% gradient).

At the time of the site visit, the underground workings in Guaico-Nus mine had 5.3 km of development, mainly declines, drifts and cross-cuts. In the Guayabito Mine, the mine portal is complete and the main decline is 110 m long. The excavation is continuing in both mines.

The underground mining methods, selected for AGD are Cut & fill (C&F) and Longhole Open Stopping (LHOS). Mining method selection was determined primarily by deposit geometry and geomechanical features. C&F mining was the preferred mining method for the Guaico and Guayabito veins and longhole stoping for the Nus mineralized structure.

1.7 POTENTIALLY ECONOMIC RESOURCES

The potential production estimate for the Cisneros Project is based on the updated Mineral Resource Estimate Cisneros 2017 PEA. A total of 784,763 t with 6.43 g/t Au were estimated. Measured, Indicated and Inferred Resources were considered for the financial evaluation. The following assumptions were used to estimate Economic Mineral Resources:

- The potential Economic Mineral Resources are inclusive in reported Mineral Resource Estimate for Cisneros 2017 PEA.
- Specific cut-off was calculated for Guaico, Nus and Guayabito structures. A cut-off of 2.95 g/t Au for Guaico, 2.62 g/t Au for Guayabito and 1.66 g/t Au for Nus was estimated.
- Metal price, productions, selling cost and recovery were considered as a major factor for the cut-off calculation.
- The gold price used in the financial evaluation was US$1,250/oz that corresponds to the average value for the last six months on the London Metal Exchange, this value was agreed with those responsible for AGD.
- Mining, processing and selling based in a preliminary internal mine plan for the Cisneros Project include:
  - unit cost for mine activities,
  - vertical and horizontal development for mineralization,
  - direct cost for mill and concentrate,
  - maintenance and overhead for mine and plant cost assuming 3,000 milled tonnes per month.
- General and administration cost and sustaining cost were not considered on the cut-off estimation.
- Guayabito Sur structures and Papi veins were not included. The Guayabito Sur structures need to be reinterpreted together with Guayabito North veins, and the inferred resources from Guayabito Sur have poor confidence. Papi veins are far away from Guaico and need more studies.
- Mineral resources 30 m below the topographic surface are not considered. Pillars 9 m in width along production levels, are considered to be left.
- Potential economic mineral resource includes 7,500 tonnes with 5.1 g/t Au contained in the historical stockpile, mineralization sourced from mine developments up to September 30, 2017 from Guaico Mine that includes mineralization from the Nus structure.
- A total of 784,763 T and 6.43 g/t Au of mineral resources was estimated. The summary of the Potential Economic Mineral Resources for the Cisneros PEA 2017 are shown in Table 1-4.

- Note that the economic assessment includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

Table 1-4 Potential Economic Mineral Resources
Measured & Indicated Resources

Deposit Name	Tonnage	Au g/t	Au oz
Nus Structure	258,704	3.337	26,848
La Manuela and Guaico Veins	68,408	8.125	17,287
Guayabito Norte System Veins	189,239	7.345	43,235
Total Measured & Indicated	**516,351**	**5.440**	**87,370**

Inferred Resources

Deposit Name	Tonnage	Au g/t	Au oz
Nus Structure	75,800	2.984	7,035
La Manuela and Guaico Veins	21,946	10.210	6,969
Guayabito Norte System Veins	170,666	8.075	42,865
Total Inferred	**268,412**	**6.812**	**56,870**

Note: Resources in Table 1-4 include all resources used in the economic assessment including inferred resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

1.8 PROJECT INFRASTRUCTURE

The Cisneros Project infrastructure and services are designed to support the operation of a 500 tpd mine and processing plant, operating on a 24 hour per day, 7 days per week basis. It is designed for the local conditions and rugged topography.

The major infrastructure of the project is located in the Guayabito and Guaico areas. The exception being the Tailing Storage Facilities (TSF) and tailing pipeline. The TSF is located 9.5 km from Guayabito portal at the El Hormiguero site. The tailing pipeline runs from Guayabito to the El Hormigero site.

The processing plant is located 300 m away from the Guayabito portal entrance. The plant site includes major components of the project as such as the mill, gravity and floatation plant, tailings facilities, electrical substation, facilities for domestic and industrial residual water treatment amongst others. The infrastructure includes: external and internal roads, electricity supply, water supply, workshops, warehouse, offices, laboratories, reagent plant, and camps, amongst other facilities.

1.9 ENVIRONMENT AND PERMITTING

AGD currently operates the Guaico Mine and Guayabito Mine, which are located in the same area as the proposed Cisneros Project. Guaico and Guayabito presently operate under individual environmental licenses granted by the regional environmental authority of the department of Antioquia, CORANTIOQUIA previously known as CORNARE.

Environmental studies for the Guaico Project began in 2010 with baseline studies. Physical (abiotic), biotic, social, economic, and cultural baselines have been characterized for the Project using primary information gathered in the field, and secondary information from official sources such as Government records. Field studies and data gathering for the baseline studies were undertaken between 2011 and 2013. Baseline environmental and monitoring studies have been conducted to support the ongoing operation and the *Estudio de Impacto Ambiental* (EIA) application.

The environmental license for the Guaico Project was granted on April 10, 2013 for the duration of the underground exploitation of gold veins in the Project by *Corporación Autónoma de las Cuencas de los Ríos Negro – Nare* (CORNARE).

The Guayabito Project will be developed in mining titles 5671 and 4556, which have a granted area of approximately 184 ha, and where, for the last eight years, AGD has been dedicated to the development of the geological exploration, by means of several diamond drilling campaigns from 2009 to the present.

Since the 2010, AGD has undertaken environmental impact studies performing base line recognition emphasizing the biological aspects and the interaction with the local communities. During the same year, a surface geophysical survey was carried out. Throughout the subsequent years, AGD continued exploration initiatives and its interactions with the communities and municipal authorities.

On December 2015, AGD hired PI ÉPSILON S.A.S. to carry out the study and designs of the infrastructure facilities of the project, the studies for the deposit zones and complementary studies for the Environmental Impact Assessment (EIA) corresponding to the Guayabito Project.

The socio-economic characterization has identified that the majority of the inhabitants within the area of influence of the project lack formal employment opportunities with access to the system of benefits and social security established by the Colombian legal system.

According to the applicable mining laws and regulations of CORNARE, it was assigned the management, administration and promotion of the renewable natural resources within the territory of its jurisdiction and by means of an evaluation it granted to the Guayabito Project, in the Municipality of Santo Domingo - Antioquia, the following approval:

"CORNARE Environmental License No. 131-0870-2016 of October 26, 2016, for the development of the mining project of metallic minerals, precious and semiprecious stones, called Guayabito Deposit to be developed in the Jurisdiction of the Municipality of Santo Domingo - Antioquia, covered under the mining titles N ° HFPB-01 and HHNL -05".

1.10 CAPITAL AND OPERATING COSTS

The total pre-production and sustaining capital cost estimated for the Cisneros project is US$75.6 Million (M) and includes expenses from 2014 to 2018. Pre-production capital cost is US$61.5M and the sustaining capital cost is US$14.1M. A 15% contingency was considered for all costs.

Total operating cost (OPEX) is estimated at US$85.97 Million for an average of US$109/tonne milled.

1.11 PRELIMINARY ECONOMIC ANALYSIS

Both pre-tax and post-tax cash flow models have been developed for the Cisneros project. Capital expenses prior to 2017 are included but use a book value of US$11.89 Million for tangible assets and US$8.8 Million for intangible assets as indicted in the audited financial statements of Antioquia Gold for 31-Dec-2016.

The results show that the project has a pre-tax internal rate of return (IRR) of 24.0% and a pre-tax net present value (NPV) of $23.7M and a post-tax IRR of 18.7% and a post-tax NPV of $16.7 M. Table 1-4 and Table 1-5 show the results of the economic model. All costs are in 3rd quarter (Q3) 2017 US Dollar with no allowance for inflation.

Table 1-5
Cash Flow Analysis

Descriptions	Discount Rate	Units	Pre-Tax CF Value	Post-Tax CF Value
Non Discounted Value		US$(M)	33.54	25.58
Internal Rate of Return (IRR)		%	24.00	18.70
NPV At	0%	US$(M)	33.54	25.58
	5%	US$(M)	23.71	16.75
	7%	US$(M)	20.32	13.70
	10%	US$(M)	15.73	9.58
Project Payback Period		**Years**	**2.60**	**3.20**

Table 1-6
Sustaining Cash Costs Summary

Expenses	US$(M)	Unit Cost US$/oz
On Site Mining Cost	74.61	506.5
On Site Mining G & A Cost	11.30	76.7
Royalties	7.06	47.9
Social and Permit Cost	5.60	38.0
Smelting, Refining and Transport	9.74	66.1
Cash Cost	**102.71**	**697.3**
Closure Cost	1.55	10.6
Sustaining Capital	14.05	95.4
All-in sustaining costs AISC	**118.31**	**803.2**
Pre-production Capital expenses	50.56	343.3
All in costs AIC	**174.47**	**1,146.5**

1.12 QUALIFICATIONS AND ASSUMPTIONS

This report is considered by Linares Americas Consulting S.A.C. to meet the requirement of a Technical Report as defined in Canadian NI 43-101 guidelines for a preliminary economic assessment (PEA). There is no guarantee that the Cisneros Project will be placed into production as this is contingent on successfully obtaining all the requisite consents, permits or approvals, regulatory or otherwise.

This preliminary economic assessment is preliminary in nature and includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. The quantity and grade of reported inferred mineral resources in this preliminary economic assessment are uncertain in nature and there has been insufficient exploration to define these inferred mineral resources as an indicated or measured mineral resource and it is uncertain if further exploration will allow conversion to the measured and indicated categories or that the measured and indicated mineral resources will be converted to proven or probable mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability; the estimate of mineral resources in this preliminary economic assessment may be materially affected by higher operating costs, lower metal prices, lower process recoveries, environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues.

2.0 INTRODUCTION

Antioquia Gold Ltd. (AGD) holds 100% of the mineral rights to the Cisneros gold properties in the Cisneros area of Antioquia, Colombia, see Table 4-1.

LINAMEC was retained by Antioquia in September 15, 2017 to conduct a preliminary economic assessment of the Cisneros property (Cisneros 2017 PEA), supervise the latest core logging of the drill programs, the QA/QC protocols, undertake an updated resource estimate for the Cisneros deposit and, finally, to prepare this technical report that is compliant with NI 43-101.

Mr. Edgard Vilela, visited the property from September 11th to 27th, 2017 and examined the Guaico and Guayabito Sur deposits outlined within the Cisneros property. During the site visit, sufficient opportunity was available to examine several rock exposures, conduct a general overview of the property, mapping, geochemistry and core logging and observe the condition of stored cores and reject samples which are in fair conditions.

Based on his experience, qualifications and review of the site and resulting data, the author, Mr. Vilela is of the opinion that the exploration to date has been conducted in a professional manner and that the quality of data and information produced from the efforts meet with acceptable industry standards. The work has been directed and supervised by qualified geologists. In preparing this report the author has followed proper methodology and procedures and exercised due care consistent with the intended level of accuracy using his professional judgment.

While actively involved in the preparation of the report, LINAMEC had no direct involvement or responsibility in the collection of the data and information or any role in the execution or direction of the work programs conducted for the project on the property or elsewhere. Much of the data has undergone thorough scrutiny by project staff as well as the data verification procedures of LINAMEC.

2.1 EFFECTIVE DATE

The effective date of this Technical Report and Preliminary Economic Assessment is September 24, 2017.

2.2 ABBREVIATIONS, UNITS AND CURRENCIES

A list of abbreviations that may appear in this report is provided in Table 2-1. All currency amounts are stated in Colombian Pesos (COP) or US dollars (US$, USD). Quantities are stated in metric units, as per standard Canadian and international practice, including metric tonnes (tonnes, t) and kilograms (kg) for weight, kilometres (km) or metres (m) for distance, hectares (ha) for area, percentage (%) for copper grades, and gram per tonne (g/t) for gold and silver grades. Wherever applicable, imperial units have been converted to the International System of Units (SI units) for consistency (Table 2-1).

Table 2-1
Units of Measure, Abbreviations, Acronyms

Abbreviation or Symbol	Unit or Term
'	minute (plane angle)
"	second (plane angle) or inches
o	degree
ºC	degrees Celsius
3D	Three-dimensions
A	ampere
a	annum (year)
ABA	Acid base accounting
ac	acre
Acfm	actual cubic feet per minute
ADR	Adsorption-desorption-recovery
AIC	All-in Cost
ALS	ALS laboratory
ALT	Active layer thickness
AISC	All-In sustaining cost
amsl	above mean sea level
AN	Ammonium nitrate
ARO	Acid rock drainage
ASTM	American Society for Testing and Materials
As	Arsenic
Au	Gold
AGD	Antioquia Gold Ltd.
B	billion
Ba	Barium
BD	Bulk density
Bi	Bismuth
Bt	billion tonnes
BTU	British thermal unit
BV	Best values
BV/h	bed volumes per hour
C	Carbon
Ca	Calcium
CAPEX	Capital Expenditure
CDN	CDN Resource Laboratories Ltd
CF	Cash flow
cfm	cubic feet per minute
CI	Confidence Interval
CIM	Canadian Institute of Mining and Metallurgy
CM	Construction management
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
CMH	Consorcio Minero Horizonte
COP	Colombian Peso
CORNARE	Corporación Autónoma Regional de las Cuencas de los Rios Negro y Nare
CORANTIOQUIA	Corporación Autónoma Regional del Centro de Antioquia
cP	centipoise
Cr	Chromium
CRM	Standards or certified reference materials
ct	carat

Abbreviation or Symbol	Unit or Term
cu	Consolidated-undrained
Cu	Copper
CV	Coefficients of variation
C.V.	The standard deviation divided by mean
d	day
d/a	days per year (annum)
d/wk	days per week
dB	decibel
dBa	decibel adjusted
DDH	Diamond drill hole
DGPS	Differential Global Positioning System
DMS	Dense Media Separation
dmt	dry metric ton
DSHA	Deterministic seismic hazard analysis
DWT	dead weight tonnes
EA	Environmental Assessment
EDA	Exploratory Data Analysis
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
EP	Engineering and procurement
EMP	Environmental Management Plan
EPM	Empresas Públicas de Medellín E.S.P.
ERO	Explosives Regulatory Division
EWP	Engineering work packages
Fe	Iron
FEED	Front End Engineering Design
FEL	Front-end loader
FS	Feasibility Study
ft	foot
ft2	square foot
ft3	cubic foot
ft^3/s	cubic feet per second
g	gram
G&A	General and Administration
g/cm^3	grams per cubic centimeter
g/L	grams per litre
g/t	grams per tonne
GA	General arrangements
Ga	billion years
gallon	US Gallon
GJ	Gigajoule
GPa	gigapascal
gpm	gallons per minute (US)
GSI	Geological Strength Index
GTZ	Glacial Terrain Zone
GW	gigawatt
h	hour
h/a	hours per year
h/d	hours per day
h/wk	hours per week
ha	hectare (10,000 m^2)
ha	hectare
HBZ	Health buffer zone

Abbreviation or Symbol	Unit or Term
HCT	Humidity cell test
HG	High-grade
Hg	Mercury
HK	Hypabyssal kimberlite
HLEM	Horizontal loop electro-magnetic
HLF	Heap leach facility
HLF	Heap leach facilities
hp	horsepower
HPGR	High-pressure grinding rolls
HQ	Drill core diameter of 63.5 mm
Hz	hertz
ICP-MS	Inductively coupled plasma mass spectrometry
ID3	Inverse Distance Power 3
IDEAM	Colombian Government's Institute of Hydrology, Meteorology and Environmental Studies
in	inch
in^2	square inch
in^3	cubic inch
INGEOMINAS	Instituto Colombiano de Geología y Minería
IP	Induced polarization
IRR	Internal! rate of return
IQNET	The International Certification Network
JV	Joint venture
K	hydraulic conductivity
k	kilo (thousand)
kg	kilogram
kg/h	kilograms per hour
kg/m^2	kilograms per square metre
kg/m^3	kilograms per cubic metre
KIM	Kimberlitic indicator mineral
km	kilometre
km/h	kilometres per hour
km^2	square kilometre
kPa	kilopascal
kt	kilotonnes
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
kWh	kilowatt hour
kWh/a	kilowatt hours per year
kWh/t	kilowatt hours per tonne
L	litre
L/min	litres per minute
l/s	litres per second
LINAMEC	Linares Americas Consulting S.A.C.
LDD	Large-diameter drill
LG	Low grade
LGM	Last glacial maximum
LME	London Metal Exchange
LOM	Life of mine
m	metre
M	million
Mn	Manganese
m/min	metres per minute

Abbreviation or Symbol	Unit or Term
m/s	metres per second
m2	square metre
m3	cubic metre
m^3/h	cubic metres per hour
m^3/s	cubic metres per second
Ma	million years
MAAT	mean annual air temperature
MAE	Mean annual evaporation
MAGT	mean annual ground temperature
m.a.s.l.	meters above sea level
mamsl	metres above mean sea level
MAP	mean annual precipitation
masl	metres above mean sea level
Mb/s	megabytes per second
mbgs	metres below ground surface
Mbm^3	million bank cubic metres
Mbm^3/ a	million bank cubic metres per annum
mbs	metres below surface
mbsl	metres below sea level
mg	milligram
mg/L	milligrams per litre
min	minute (time)
ML	Metal leaching
ml	millilitre
mlb	millions of pounds
mm	millimetre
Mm^3	million cubic metres
MMSIM	Metamorphosed Massive Sulphide Indicator Minerals
MMTS	Moose Mountain Technical Services
mo	month
Mo	Molybdenum
MPa	megapascal
MPEI	Mechanical, piping, electrical, and instrumentation
MRE	Mineral Resource Estimation
Mt	million metric tonnes
MVA	megavolt-ampere
MW	megawatt
NA	Non-acidic
NaCN	Sodium cyanide
NAG	Net acid generation
NHLF	North Heap Leach Facility
Ni	Nickel
NI 43-101	National instrument 43-101
Nm^3/h	Normal cubic metres per hour
NQ	Drill core diameter of 47.6 mm
NPV	Net Present Value
NSR	Net of Smelter Return
OP	Open pit
OPEX	Operational Cost
OSA	Overall Slope Angles
oz	Troy ounce
oz/dmt	Troy ounce per dry metric tonne
P.Geo.	Professional Geoscientist

Abbreviation or Symbol	Unit or Term
PA	Potentially acidic
Pa	pascal
PACP	Potentially Acidic Contact Water Ponds
PAG	Potential Acid Generating
Pb	Lead
PDF	Probability density functions
PEA	Preliminary Economic Assessment
PEP	Project Execution Plan
PFS	Preliminary Feasibility Study
PGA	Peak horizontal ground accelerations
PGE	Platinum group elements
PLA	Project Labour Agreement
PLC	Programmable logic controllers
PM	Project management
PMF	probable maximum flood
pp	Pre-production
ppb	parts per billion
ppm	parts per million
PSHA	Probabilistic seismic hazard analysis
WTP	Wastewater treatment plant
DWTP	Domestic wastewater treatment plant
IWTP	Industrial wastewater treatment plant
psi	pounds per square inch
QA	Quality Assurance
QA/QC	Quality assurance/quality control
QC	Quality control
QFP	Quartz-Feldspar Porphyry
QMP	Quality Management Plan
QP	Qualified Persons
RC	Reverse circulation
RMA	Reduction-to-Major Axis
RMR	Rock Mass Rating
ROM	Run-of-Mine
rpm	revolutions per minute
RQD	Rock Quality Designation
RTP	Reduction to Pele
S	Sulfur
s	second (time)
S.G.	specific gravity
Scfm	standard cubic feet per minute
SEM	Scanning electron microscope
SFD	Size frequency distribution
SG	specific gravity
SGS	SGS laboratory
t	tonne (1,000 kg) (metric ton)
t	metric tonne
tia	tonnes per year
t/d	tonnes per day
t/h	tonnes per hour
TCR	Tatal core recovery
TOS	Total dissolved solids
TSF	Tailing storages facility
TMF	Tailings management facility
tph	tonnes per hour

Abbreviation or Symbol	Unit or Term
ts/hm^3	tonnes seconds per hour metre cubed
ucs	Unconfined compressive strength
us	United States
US$	United States Dollars
USGS	United States Geological survey
UTM	Universal Transverse Mercator
V	volt
VEC	Valued ecosystem components
VMS	Volcanic massive sulphide
VSA	Vuggy silica alteration
VSEC	Valued socio-economic components
w/w	weight/weight
WAD	Weak acid dissociable
wk	week
wmt	wet metric ton
WRD	Waste rock dump
WSF	Waste storage facility
WTP	Water Treatment Plant
XRD	X-ray diffraction
Zn	Zinc
µm	microns
µm	micrometre

3.0 RELIANCE ON OTHER EXPERTS

LINAMEC prepared this technical report for AGD. The quality of information, conclusions and estimates contained herein are based on industry standards for engineering and evaluation of a mineral project. In preparing this report, the authors hereof have followed methodology and procedures and exercised due care consistent with the intended level of accuracy using their professional judgment.

This report is intended to be used by AGD, subject to the terms and conditions of its contract with LINAMEC.

Parts of this report, relating to the legal aspects of the ownership of the mineral claims, rights granted by the Government of Colombia and environmental and political issues, have been prepared or arranged by AGD. While the contents of those parts have been generally reviewed for reasonableness by the author for inclusion in this technical report, the information and reports on which they are based have not been fully audited by the author.

4.0 PROPERTY DESCRIPTION AND LOCATION

The Cisneros project area consists of eleven properties with a total area of approximately 5,793.54 ha. The project area is 55km northeast of Medellin and 2km west of Cisneros at approximately 75°08'25" W Longitude and 6032'35" N Latitude, see Figure 4-1. The project area is in the department of Antioquia, and lies partially within the municipalities of Cisneros, Yolombo and Santo Domingo on the main route that leads north from Medellin to the Caribbean coast via the Magdalena River. The properties underlie numerous small villages and towns, including La Quiebra, El Limon, Santiago and Bareño. The properties are held as concessions for gold, silver and related minerals.

Figures 4-2 and 4-3, shows the eleven properties which constitute the Cisneros project area. Table 4-1 summarizes the property concession numbers, ownership status and areas. Table 4-2 lists the mining concessions that are in the process of being transferred to AGD. The concessions are in good standing and a legal opinion from a Colombian based legal firm has confirmed the titles.

Surface ownership is held privately by numerous individuals for agricultural use. Colombian law allows for exploration on private lands with notification of the surface landowners and reasonable compensation for surface disturbance caused by exploration activities. To date AGD has negotiated access and drill platform locations with individual land owners to compensate for any disturbance or loss of crop. As the company used a man portable drill rig there has been little disturbance.

Parts of this report, relating to the legal aspects of the ownership of the mineral claims, rights granted by the Government of Colombia and environmental and political issues, have been prepared or arranged by AGD. The content of those parts have been generally reviewed for reasonableness by the authors for inclusion into this report.

Table 4-1:
Concession Areas

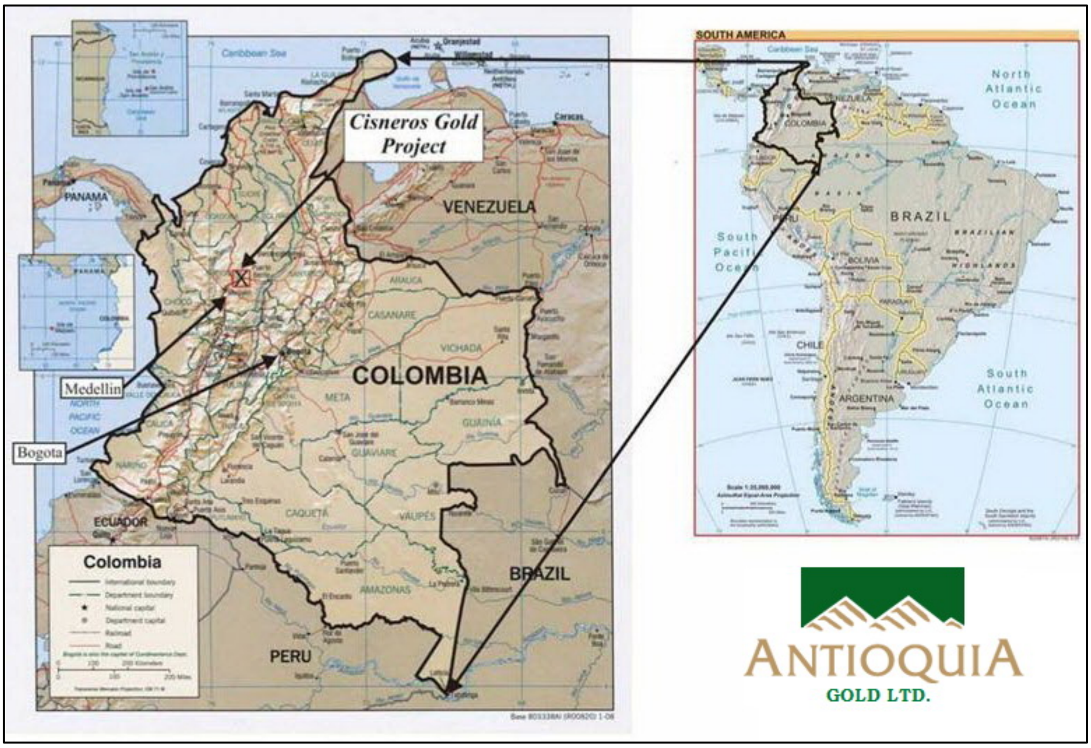
Mining Concessions	Area (ha)	Municipality	Ownership Status
ILD 14271	103.7162	Santo Domingo y Cisneros	100%
1498	20.3134	Santo Domingo	100%
7175	35.6778	Santo Domingo	100%
4556	4.7340	Santo Domingo	100%
5671	178.3500	Cisneros y Santo Domingo	100%
7175B	2.2000	Santo Domingo	100%
7342	4,964.9944	Santa Rosa de Osos, Cisneros, Santo Domingo y Yolombo	90%
7342B	277.9024	Santo Domingo	100%
5419	42.4500	Santo Domingo	100%
Total	**5,630.3382**		

Table 4-2:
Mining Concessions in the process of transfer

Mining Concessions	Transferred Area (ha)	Municipality	Transferor Company	Ownership Status
7342	4,964.9944	Santo Domingo y Cisneros	Negocios Mineros S.A.	10%
6187B	13.9460	Santo Domingo	Gramalote Colombia LTD	100%
6195	150.0000	Santo Domingo	Gramalote Colombia LTD	100%
Total	**5,128.9404**			

Certain types of exploration activity require a land use permit (easements), negotiated with the owner of the land, prior to conducting work on a mineral property. If drilling requires water, the company would need to aquire a permit for accessfrom the environmental authority. If large trees need to be removed, the company would also need a permit. To date, AGD has been working on agricultural lands mainly planted with sugar cane.

Figure 4-1:
Project Location Map



The current and future operations of AGD, including exploration, development and commencement of production activities on this property require such permits. Other permits governed by laws and regulations pertaining to development, mining, production, taxes, labor standards, occupational health, waste disposal, toxic substances, land use, environmental protection, mine safety and other matters, may be required as the project progresses.

At this time no environmental liabilities have been identified on the property.

Since 2013, AGD has finalized an agreement with Gramalote Colombia Limited ("Gramalote") to acquire two key mining concessions totalling 163.94 hectares contiguous with its Guayabito property. This strategic acquisition essentially fills in previous gaps between the Company's Guayabito, Santo Domingo, La Manuela, Pacho Luis and Guaico properties and will allow for optimized mine development at Guayabito. Gramalote has already delivered to Antioquia all technical information from their exploration activities on the concessions. The area acquired is shown in Figures 4-2 and 4-3.

Figure 4-2:
Cisneros Properties with New Acquisition

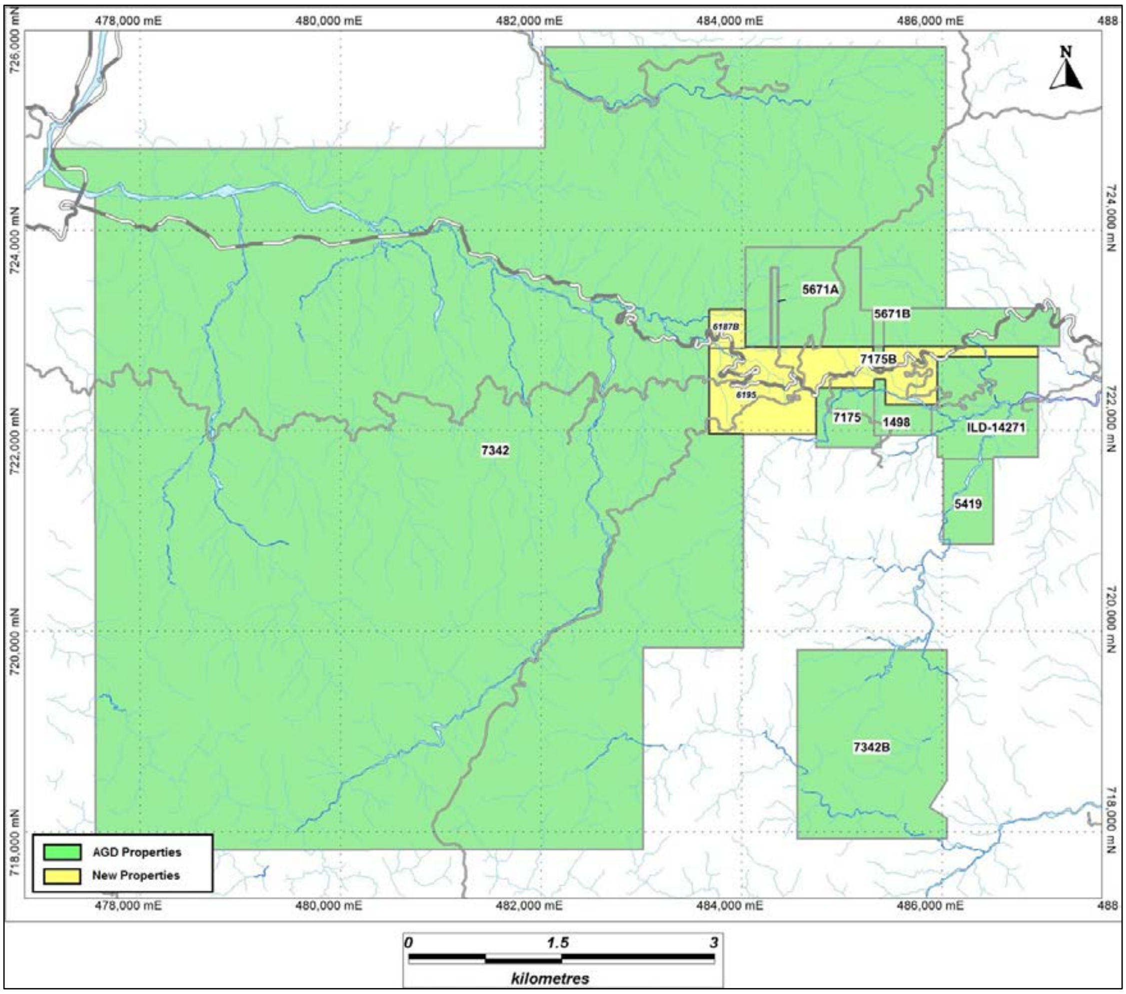
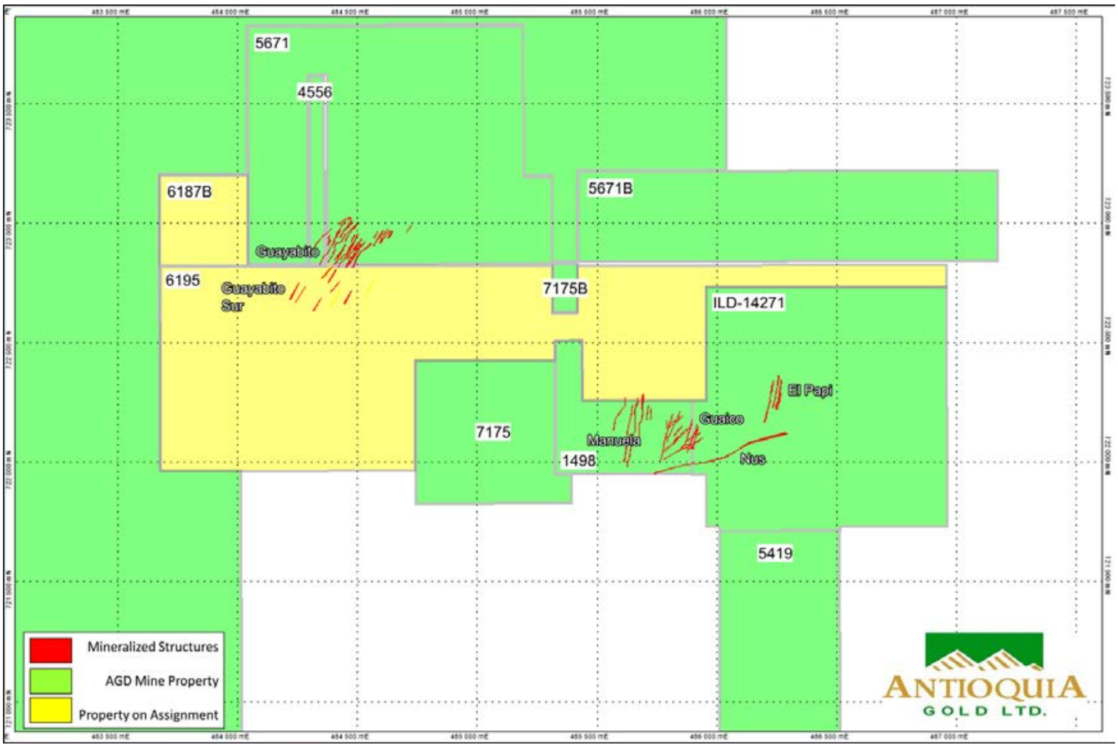


Figure 4-3:
Cisneros Properties with New Acquisition (Detail)



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

The Cisneros project area extends north and south of the main paved road (Highway 62) connecting Cisneros (population 7,000) in the east and Santiago to the west in the middle of the project area. It is 55km northeast of the city of Medellin (population 3,821,797). There is a non-operational narrow gage railway connecting Medellin and Cisneros.

In the southwest corner of the Guayabito property there is an old road that accesses the largest underground workings in the area although it is used only for foot traffic at this time. As well, there is a good access road in the eastern part of the Guayabito property that accesses the highest part of the property and the north side. There is also an access road connecting Highway 62 to the village of El Limón and provides access to the Pacho Luis concession.

There are also old roads connecting the Manuela concessions 7175 and 1498 to Highway 62. Access to the northern portion of the Santo Domingo concession is via Highway 62 and the road to Bareño which accesses the area near Mina Sur America. The southern portion of the Santo Domingo concession area is accessed via the road between the villages of Santo Domingo and San Roque and Santo Domingo and Santiago. In addition, there are numerous walking trails to access farms, artisanal tunnels and fields throughout the concessions which serve well as access routes and can be easily upgraded for movement of exploration equipment.

The climate is tropical with elevations ranging between 1,200m and 1,800m above sea level, the temperature is very pleasant. Transportation service to the area is provided daily by bus companies Coopetransa and Coonorte from the city of Medellin. There are several hotels in Cisneros. The property is crossed by a three-phase power line whose service could be affected by electrical storms in the winter season. Water is abundant with all three drainages on the property flowing year round. The project area has a (CLARO) signal for cellular phones. Internet, fax and scanner services can be obtained in the municipality of Cisneros.

The National Police have a permanent presence in the urban area of Cisneros. As well, the Army has a permanent base and performs continuous patrols in the region.

The project area is mountainous with many of the western slopes being used as sugar cane plantations. To a lesser extent coffee is grown at higher elevations. The western slopes are gentle and there are three main drainage gullies trending to the west-southwest. The main river bisecting the project area is the Nus River.

6.0 HISTORY

The Cisneros project area has a long history of gold mining and exploration with over a hundred years of small scale artisanal mining. To date, at least 62 underground exploration workings have been located in the Cisneros project area, 49 of which are on Antioquia's properties. Historically, a portion of the western slope of the Guayabito property was hydraulically mined for placer gold. Since that time several shafts and adits have been driven into the hillsides following veins carrying gold.

Placer operations exist today along the rivers throughout the Santo Domingo land block. There is no official record of the amount of gold production from the Guayabito property or the Cisneros area in general. No reserve estimates have been completed for any of the Cisneros properties.

Am-Ves (Antioquia's predecessor) completed two phases of exploration on the Guayabito property in 2007: a limited due diligence sampling program as well as a preliminary exploration program of geological mapping and sampling. The due diligence program included the collection of seven samples while 221 samples were collected during the mapping/sampling program (217 samples were analyzed for gold, while four samples were collected for gold and silver extraction testing).

Moose Mountain Technical Services (MMTS) was retained by Am-Ves in 2007 to assist with the evaluation of the Guayabito property, to recommend an exploration program and to prepare a Technical Report compliant with NI 43-101 (the Instrument) and Form 43-101, F1. MMTS recommended a sequence of activities focused on further defining and tracing the surface, or near surface, expression of mineralized structure identified (in artisanal mine workings and on surface) during the previous investigations of the property. Detailed geological mapping of known mineralized structures and of the alteration and mineralization was recommended. Trenching, channel sampling (rock saw) and ground geophysics were also recommended to trace and sample structures and their associated mineralized zones. With information from this new exploration a geologic model could be developed and targets could be defined for drilling,if warranted,.

In October, 2008, Antioquia acquired the four La Manuela concessions and entered into an agreement with Grupo de Bullet to acquire a 90% interest in the two Bullet concessions which Antioquia named the Santo Domingo properties. In March, 2010, the Pacho Luis concession was acquired and in August 2010 the Troncocito block was acquired to fill in a missing sliver of land within the Guayabito prospect area.

Based in part on MMTS's recommendations, Antioquia completed geological mapping and geochemical surveying programs at Cisneros. In all, AGD completed systematic geochemical sampling that included rock, soil and stream sediment samples. AGD also completed geophysical surveys (magnetometer and IP) on three of their prospects and are currently completing ground magnetometer and VLF magnetometer surveys on two of the prospects.

A due diligence and preliminary exploration program was conducted by Am-Ves in 2007 before its takeover by Antioquia. Moose Mountain Technical Services prepared a NI 43-101 Technical Report dated February 6, 2008 and updated it on December 6, 2010. Linares Americas Consulting S.A.C. prepared a NI 43-101 Technical Report in support of a Resource Estimate dated October 14, 2013.

On October, 2015, AGD finalized an agreement with Gramalote Colombia Limited ("Gramalote") to acquire two key mining concessions totalling 163.94 hectares contiguous with its Guayabito property.

Mine development in the Guaico Zone, started on October 14, 2015.

Since 2013, AGD has continued with geological mapping, geophysical surveys, rock sampling, soil sampling, trenching sampling and underground channel sampling.

In 2016, AGD completed the drilling of eleven drill holes in the Guayabito South area to explore new potential targets within the recently acquired concessions. Results were positive with the intersection of sixteen new mineralized structures, however, some of these structures are the southern extensions of recognized Guayabito North system veins.

Finally, a total of 48,118.16 m of diamond drilling was completed by AGD on the Cisneros Project between 2008 and September, 2017 in order to evaluate the gold deposits. However, for this resource update, 14 new drill holes were included for modeling the Guayabito South area and 992 underground channel samples were included to update the resource of Guaico area, mainly the Nus, Guaico and La Manuela veins, in compliance with NI 43-101 protocols.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGY

The northern Andean cordillera in Colombia has been uplifted by the subduction of the Nazca oceanic plate beneath the Guiana Shield along with interaction with the Caribbean plate to the north. The region has been tectonically active from the Mesozoic through to the present. Subduction has created magmatic island arcs that have since accreted to the continental margin in generally north-south oriented belts. These magmatic arc terrains host the majority of the precious metal mineralization in Colombia (Cediel et al, 2003). See Figure 7-1 for lithotectonic and morphostructural map.

Figure 7-1:
Lithotectonic and Morphostructural Map of the Cisneros Project Area

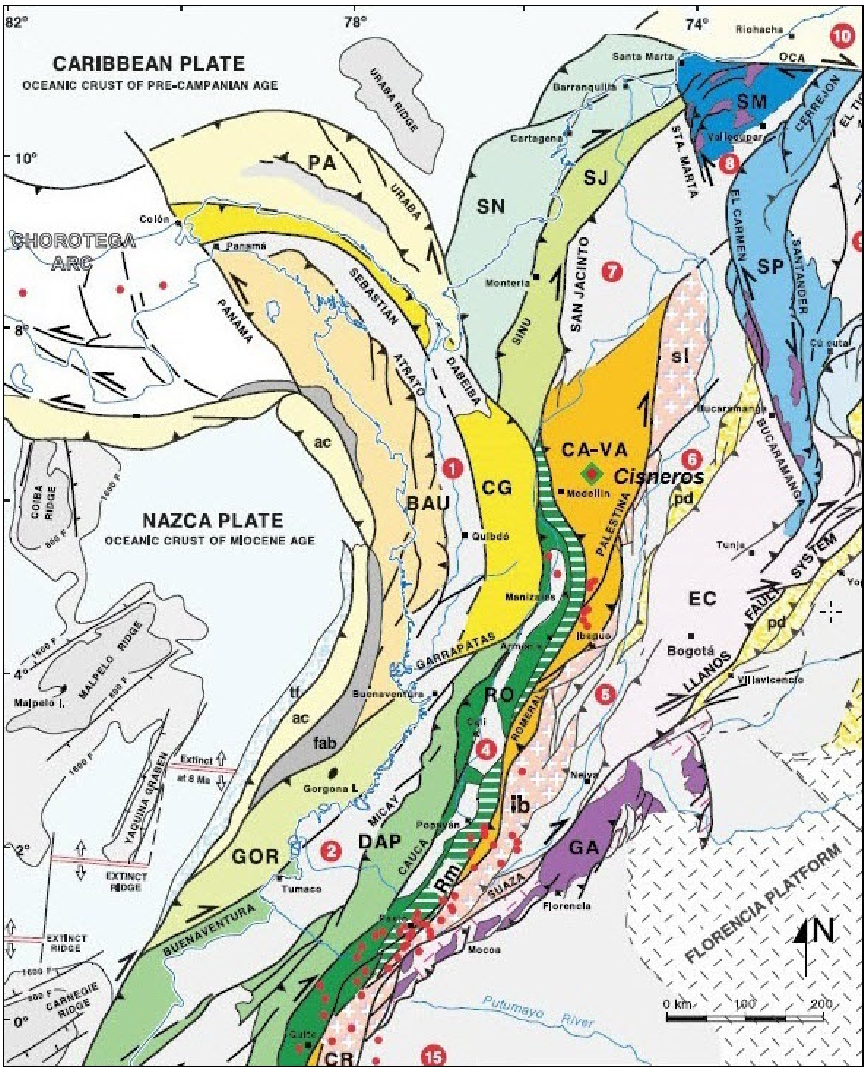


Figure 7-1. Lithotectonic and morphostructural map of northwestern South America. GS = Guiana Shield; GA = Garzon massif; SP = Santander massif-Serrania de Perija; ME = Sierra de Merida; SM = Sierra Nevada de Santa Marta; EC = Eastern Cordillera; CO = Carora basin; CR = Cordillera Real; **CA-VA = Cajamarca-Valdivia terrane**; sl = San Lucas block; ib = Ibague block; RO = Romeral terrane; DAP = Dagua-Pinon terrane; GOR = Gorgona terrane; CG = Canas Gordas terrane; BAU = Baudo terrane; PA = Panama terrane; SJ = San Jacinto terrane; SN = Sinu terrane; GU-FA = Guajira-Falcon terrane; CAM = Caribbean Mountain terrane; Rm = Romeral melange; fab = fore arc basin; ac = accretionary prism; tf = trench fill; pd = piedmonte; 1 = Atrato (Choco) basin; 2 = Tumaco basin; 3 = Manabi basin; 4 = Cauca-Patia basin; 5 = Upper Magdalena basin; 6 = Middle Magdalena basin; 7 = Lower Magdalena basin; 8 = Cesar-Rancheria basin; 9 = Maracaibo basin; 10 = Guajira basin; 11 = Falcon basin; 12 = Guarico basin; 13 = Barinas basin; 14 = Llanos basin; 15 = Putumayo-Napo basin. Source: Cediel et al, 2003

Using the lithotectonic terminology and descriptions from Cediel et al. (2003), the basement rocks of the Cisneros Project are related to the emplacement of the Paleozoic Cajamarca-Valdivia terrane (CA-VA), and the Mesozoic San Lucas (sl) and Ibague.

The Cisneros Project is located within the Paleozoic Cajamarca-Valdivia terrane (CA-VA). The Cajamarca-Valdivia terrane is composed of an association of pelitic and graphite-bearing schists, amphibolites, intrusive rocks, and rocks of ophiolitic origin (olivine gabbro, pyroxenite, chromitite, and serpentinite), which attain greenschist through lower amphibolite metamorphic grade. Geochemical analyses indicate these rocks are of intraoceanic-arc and continental-margin affinity (Restrepo-Pace, 1992). They form a parautochthonous accretionary prism of Ordovician-Silurian age, sutured to the Chicamocha terrane in the north and directly to the Guiana Shield in the south, and along with the Triassic-Jurassic San Lucas and Ibague blocks form a discontinuous belt along the Chicamocha-Cajamarca-Valdivia suture. They are dominated by composite metaluminous, calc-alkaline, dioritic through granodioritic batholiths (Antioquia Batholith) and associated volcanic rocks, generated on a modified continental basement composed of the Chicamocha and Cajamarca-Valdivia terranes. These blocks formed thermal axes during the Triassic-Jurassic and subsequent basement swells, locally affecting sedimentation during the Cretaceous. The southern extension of this belt is found in the Cordillera Real (CR), which contains the Abitagua and Zamora Batholiths of broadly granitic and dioritic composition, respectively. These Jurassic metaluminous plutons intrude the suture between the Loja terrane and the Guiana Shield (Litherland et al., 1994).

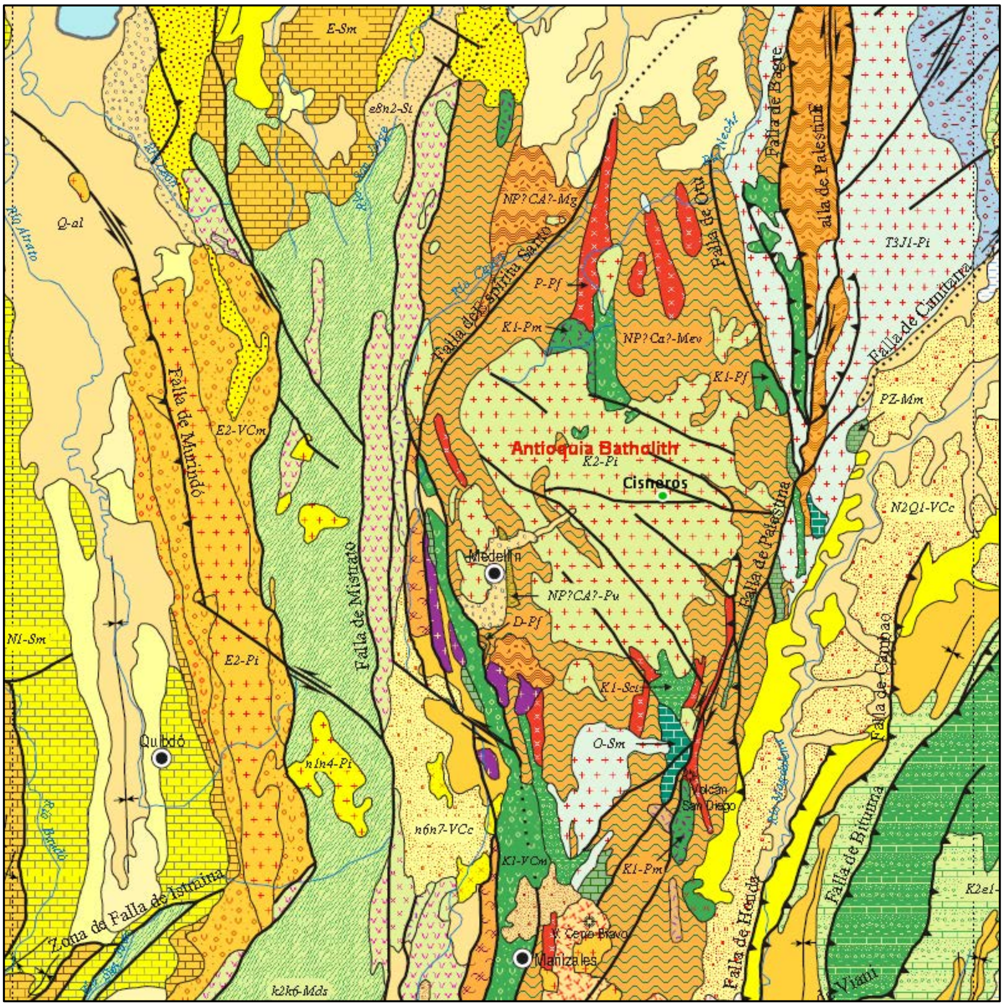
7.1.1 Antioquia Batholith

The Antioquia batholith covers an area of 7,221 km^2 and its satellite bodies a further 322 km^2. In the center and eastern part of the department it is characterized as having lithologic homogeneity with little variation from one place to another. The normal facies have a tonalite and granodiorite composition with subordinate facies of felsic and gabbroic composition. The age of the Antioquia batholith ranges from 63 to 90 Ma, determined by several dating methods (K-Ar, Rb-Sr and U-Pb), and belong to the Turonian period of the Late Cretaceous.

The felsic facies appear mainly in residual blocks near Yali, between Amalfi and Yolombo, Santo Domingo and the Nare River and between Maceo and La Susana. The rock is medium to coarsely crystalline, leucocratic, hypidiomorphic to xenomorphic and of granodiorite to quartz mozonite composition. This facies is less resistant to weathering than normal and therefore it is rare to find fresh rock blocks. Although the contacts between different facies are not always clear, petrography and field relations indicate that they are gradational and in many places the residual blocks of the different facies appear to be intimately mixed.

The shape of the batholith is trapezoidal, unlike other large plutons that extend in the regional tectonic direction, and it is characterized by its petrographic and petrochemical homogeneity. It has discordant contacts with the country rocks which have a contact aureole of variable extent and magnitude consisting of pyroxene-hornblende to albite-epidote-hornblende facies. Very little deformation can be attributed to its intrusion; there are no changes in the shape or intensity of the country rock’s deformation. The intrusive rock does not deflect the regional folding but instead truncates it and for that reason the pitch on the metamorphic or sedimentary rocks of San Luis varies little if at all as it approaches the contact with the intrusive rock, see Figure 7-2.

Figure 7-2:
Regional Geology – Antioquia Geological Map



Q-al	Quaternary, Flood (*Q-al*)	E2-Pi	Eocene, Plutonic intermediate (*E2-Pi*)
Q-t	Quaternary, Terrace (*Q-t*)	K2-Vm	Upper Cretaceous, Volcanic mafic (*K2-Vm*)
Q2-Vm	Quaternary, Volcanic mafic (*Q2-Vm*)	K2-Pi	Upper Cretaceous, Plutonic intermediate (*K2-Pi*), Antioquia Batholith
N2Q1-VCc	Pliocene-Pleistocene, Volcanoclastic continental (*N2Q1-VCc*)	k2k6-Mds	Upper Cretaceous, Dynamic Regional Metamorphism (*k2k6-Mds*)
n6n7-VCc	Miocene-Pliocene, Volcanoclastic marine (*n6n7-VCm*)	K1-Sctm	Lower Cretaceous, Sedimentary transitional marine-continental (*K1-Sctm*)
n3n7-Sc	Miocene, Sedimentary continental (*n3n7-Sc*)	K1-VCm	Lower Cretaceous, Volcanoclastic marine (*K1-VCm*)
n3n7-St	Miocene, Sedimentary transitional (*n3n7-St*)	K1-Pm	Lower Cretaceous, Plutonic mafic (*K1-Pm*)
e8n2-St	Oligocene- Miocene, Sedimentary transitional (*e8n2-St*)	J1J2-VCct	Jurassic, Volcanoclastic continental transitional (*J1J2-VCct*)
N1-Sm	Miocene, Sedimentary marine (*N1-Sm*)	T3J1-Pi	Triassic- Jurassic, Plutonic intermediate (*T3J1-Pi*)
n1n4-Pi	Miocene, Plutonic intermediate (*n1n4-Pi*)	T-Pi	Triassic, Plutonic intermediate (*T-Pi*)
E-Sm	Eocene, Sedimentary marine (*E-Sm*)	P-Pf	Permian, Plutonic felsic (*P-Pf*)
e6e7-VCm	Upper Eocene, Volcanoclastic marine (*e6e7-VCm*)	NP?CA?-Mev	Neo-Proterozoic-Cambrian, Metamorphic green schist (*NP?CA?-Mev*)
E2-VCm	Eocene, Volcanoclastic marine (*E2-VCm*)	NP?CA?-Mg	Neo-Proterozoic-Cambrian, Metamorphic granulite facies (*NP?CA?-Mg*)

7.2 PROJECT GEOLOGY

7.2.1 Structural Settings

The regional structural settings are formed by four types of structures with characteristics of formation and expression that allow them to be differentiated from each other. These types of structures are: shear zones, intrusion faults, transform (strike-slip) faults and topographic alignments.

- **Shear zones**: appear in several places inside the Antioquia Batholith, The Cristales and Sofia faults are the most well known and have the greatest extension. These were identified by Feininger in 1972. The two structures have a N45ºW direction and cross the Nus River between Cisneros and San José del Nus towns. Feininger, postulated that the formation of these structures is related to the cooling of the Antioquia Batholith and classifies both, as cooling failures.
- **Intrusion faults**: are faults formed by the stresses caused by the intrusion of a magma. In this area, the main structures of this type are Balseadero and Monteloro (Feininger, 1972), both have NW trends and extend over approximately 30 kilometres. These structures, unlike shear zones, are not restricted to the Antioquia Batholith since they also affect the adjacent rocks.
- **Transform (strike-slip) faults**: The Palestinian Fault, with a length of 390 kilometres and a N20ºE direction, is the most important fault in the region. This fault has a great geomorphological expression and is an active fault (INGEOMINAS, Atlas de amenaza sísmica de Colombia). The fault passes approximately 55 kilometres from the project area and is associated with a large deformation zone or megabreccia, with dextral (right-lateral) movement showing displacement of up to 22.7 kilometres (Feininger, 1972).
- **Topographic alignments**: In the area, important geomorphological alignments can be identified by means of radar images and aerial photographs. The most important alignments are those that control the courses of the Ponce (NE direction) and Nus (EW direction) Rivers. Other alignments, with a north-west direction and lengths over 20 kilometres, have been mapped but are unnamed.

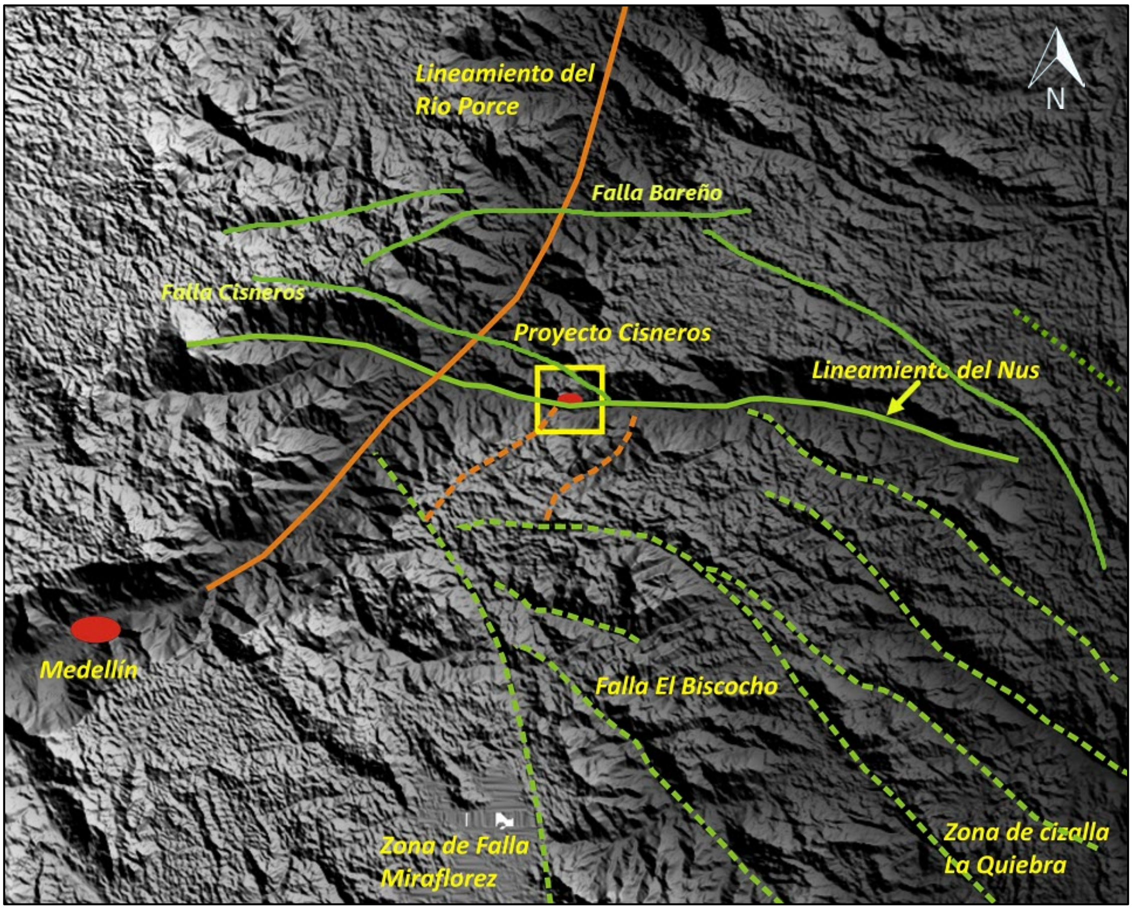
Other regional structures indicated on the Geological Map of Antioquia of INGEOMINAS as inferred faults are: Bizcocho Fault, Miraflores Fault, Caldera Fault and Nare Fault, all of which are restricted to the Antioquia Batholith, with directions between N10ºW to N45ºW and lengths greater than 25 kilometres.

The gold mineralization, in the project area, is regionally related to the lithological unit denominated "Antioquia Batholith" and to the interaction of 2 fault systems, one of them with an approximate N-S direction, represented by the Palestine Fault and Miraflores Fault, and the other system with a NW-SE direction represented by the Monteloro, Nare, Balseadero El Bizcocho and Caldera faults, see Figure 7-3.

Relative movements between 2nd order regional structures, result in the formation of N-S faults, 3rd order shear zones and shear zones with 90° average azimuth. These two directions are also observed at the Cisneros Project and define the local structural settings with important economic mineralization, as will be seen below.

Cisneros is a gold vein deposit, with veins located and controlled by three main structural-lineaments such as Cisneros, Nus and Bareño faults systems which are hosted within the Antioquia Batholith. (See Figure 7-4, for the Structural-Model Map below and the Exploration Section).

Figure 7-3:
Main Regional Structures at the Cisneros Project

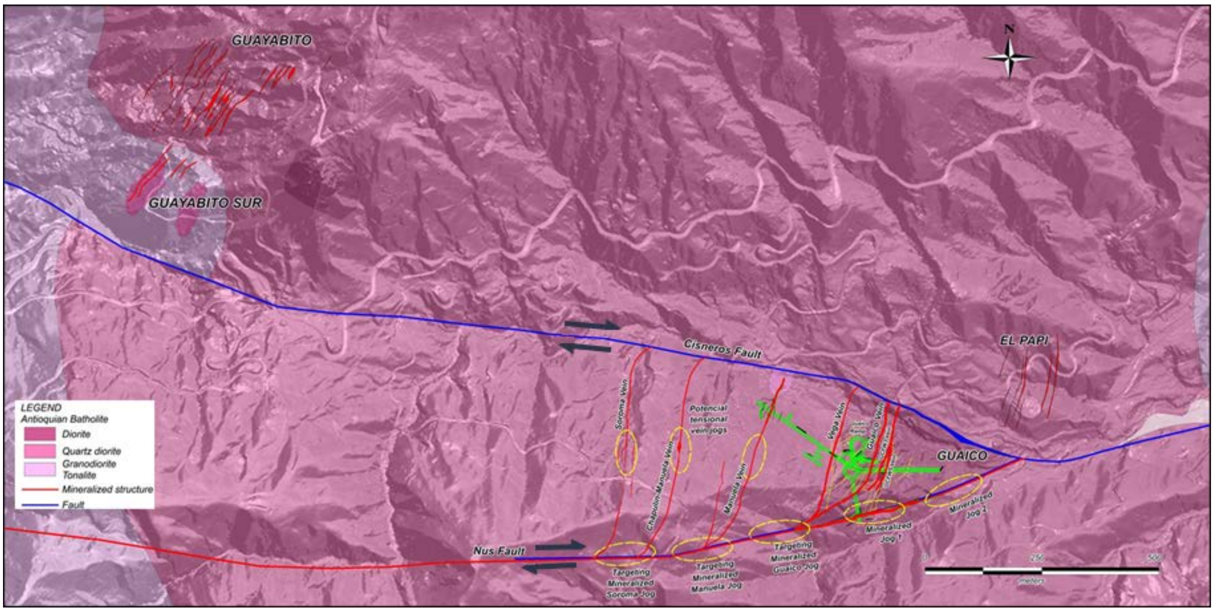


Two dike systems, different in composition, cut the intrusive rocks, acid dikes (aplites) and mafic dikes, neither of which are mineralized. One system is related mainly to shear zones, while the other is associated with second order geological structures.

At the local scale, four geological structures (faults) contain the gold mineralization, the main direction is approximately E-W with associated shear zones, also with an E-W trend, and third order shear zones with an approximate N-S azimuth, generated by the relative motions between these four faults, see Figure 7-4. Therefore, these structures contain the distinctive features to identify important economic mineralization in the area.

Locally, four faults with approximate E-W azimuth define three "Structural Blocks" (Block 0 would be located north of Block 1 and Block 5 would be located south of Block 4). A fifth fault was defined by photogeology, but has not been verified in the field.

Figure 7-4:
Structural Map of Cisneros, E-W Faults



7.3 DEPOSIT MINERALISATION

Mineralization at the Cisneros Project is structurally controlled and gold is associated with shear zones, breccias and veins. The main directions of the structures are between 10º - 30º (Guaico Structures) and between 70º -90º (NUS Structures). The host rocks are mainly granodiorite, quartz-diorite and tonalite. Hydrothermal alteration of the host rock is narrow around the veins, with phyllic, propylitic and potassic alteration being the main alteration, but these are not a significate characteristic.

The minerals present are: gold, pyrite, chalcopyrite, quartz, carbonates, chlorite, sericite, potassium feldspar, heulandite, bismuthinite, galena, sphalerite and molybdenite. However, the order of events (paragenesis) is not yet defined.

Native gold and electrum (alloy of gold and silver) show anhedral, subangular to subrounded forms and sizes between 0.001 to 0.082 mm. Gold appears as inclusions in pyrite and chalcopyrite or in veinlets associated with chalcopyrite and bismuthinite.

Based on mineral associations, gold mineralization occurred in two stages. In the first stage, gold is associated with chalcopyrite and in pyrite veinlets, in the second stage, veins of chalcopyrite, bismuthinite and gold cut the pyrite veinlets.

8.0 DEPOSIT TYPES

The Guaico and Guayabito occurrences can be classified as a mesothermal lode-gold deposit (Hodgson, 1993). *"Mesothermal gold deposits are mostly quartz-vein-related, gold only deposits with associated carbonatized wall rocks. They occur in low to medium-grade metamorphic terranes of all ages, but only in those that have been intruded by granitoid batholiths.*

The deposits are characterized by a high gold/silver ratio, great vertical continuity with little vertical zonation, and a broadly syn-tectonic time of emplacement. They are commonly associated with pyrite, arsenopyrite, tourmaline and molybdenite. Mineralization may occur in any rock type and ranges in form from veins, to veinlet systems, to disseminated replacement zones. Most mineralized zones are hosted by and always related to steeply dipping reverse- or oblique-slip brittle-fracture to ductile-shear zones. In mechanically anisotropic host-rock sequences, the shear zones typically are controlled by pre-existing anisotrophies like volcanic flow contacts, dykes and early veins. Shear zone dilation is commonly the result of interference between intersecting sets of shear zones and is part of bulk inhomogeneous flattening in the seismogenic regime of the crust where fluid pressure varied cyclically between sub-lithostatic and supra-lithostatic.

On a regional scale, the deposits occur in prograding arc-trench complexes in association with major transcrustal fault zones, linear belts of fluviatile to shallow-marine sedimentary rocks, and small felsic alkali and trondhjemitic intrusions, a co-spatial assemblage of structures and rocks that developed after the main period of accretions-related contractional deformation, but before much of the metamorphism and penetrative fabric. Ore fluids are CO_2 rich and have been variously attributed to magmas, metamorphic devolatilization of supracrustal rocks and mantle degassing; the most current opinion favours devolatilization of subcreted volcanic and sedimentary rocks, with modification by interaction with the crustal column between the sites of fluid generation and ore deposition".

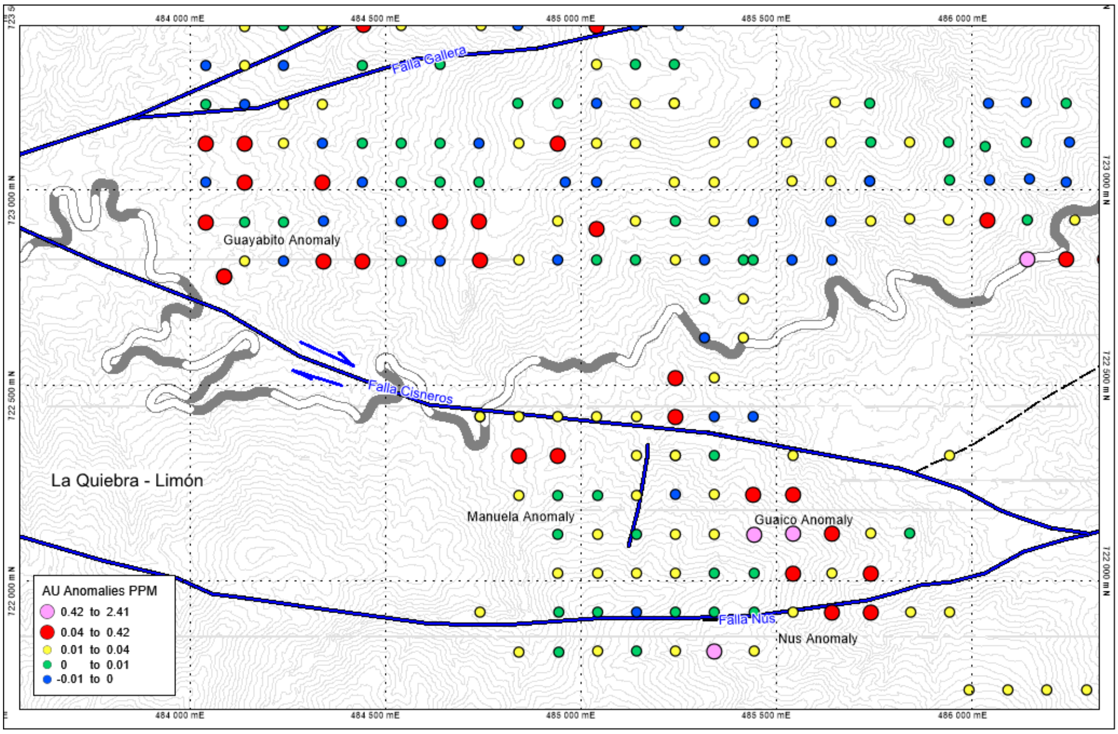
LINAMEC agrees with the deposit type and model previously postulated by Moose Mountain Technical Services (2010), "*Update on Exploration Cisneros Gold Project Internal Report"* and it seems appropriate for the Cisneros occurrences to be classified as a porphyry related gold vein deposit.

9.0 EXPLORATION

Past exploration on the Cisneros property consisted of reconnaissance mapping, structural and alteration mapping, geochemical sampling, geophysical surveying and the completion of several drilling programs from 2007 up to 2017. The metres drilled to date total 47,118.16 m of diamond drill holes (DDH) basically located at the La Quiebra-El Limon sector where four major gold vein systems including Guayabito, Guaico and Nus-Papi have been identified by AGD geologists for hosting gold mineralisation, see Figures 7-3 and 7-4.

Recent geological and structural mapping has increased the knowledge of the structures in the area that control the gold vein systems, dominant E-W structures such as Bareño and Nus faults as well as the WNW-ESE Cisneros-Fault, see figures 7-3 and 9-1. (See 7.2.1: Structural Setting for more detail,).

Figure 9-1:
Soil Sampling Programs – Au Anomalies in La Quiebra – El Limón Sector



Associations of gold with all other elements listed were tested and results shown in Table 9-5. Generally, it can be stated that there is only a weak association between gold and other elements in the soil samples. The best correlation is between gold and silver, with selenium showing the second best correlation, followed by lead and arsenic. Silver is weakly associated with both mercury and selenium, while arsenic and antimony are closely associated.

The following summary is contributed by Robert J. Casaceli, Consulting Geologist and technical expert: *"A review of the total field ground magnetic survey data compiled by Claude Robillard in the Guayabito - Colina area shows the presence of numerous structures that are oriented E-W, N-S to N 35° E, and N 40° W. Areas of intersection of these interpreted structures provide several targets for vein-type gold mineralization and several dipole-type anomalies that are coincident with these structural intersections may be indicative of higher concentrations of sulphides. This method can be an especially* *useful exploration tool when used together with soil geochemistry and structural surface mapping to select drill targets for vein-type gold deposits."*

The Guayabito prospect is located north of an old artisanal mine and the objective in drilling this prospect is to define and trace the north-south trending structures (one of which can be seen in the Guayabito mine to the south). To date, 33 holes totalling 5,875.00 m have been drilled on this prospect (included the 14 drill holes, drilled in Guayabito Sur in the 2016-2017 period).

Table 9-1:
Univariate Statistics - All Soil Samples

Statistic	Au (ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Mo (ppm)	Bi (ppm)	Ni (ppm)	Zn (ppm)
Population[1]	417	417	417	417	417	417	417	417
Minimum[2]	2.5	0.1	1.0	4.0	0.5	0.1	2.0	16.3
Maximum	4,956.0	1.5	27.0	918.2	28.0	26.0	24.0	134.9
Mean	54.39	0.14	3.74	59.14	1.2	0.34	6.96	58.99
Std. Dev.	326.23	0.14	3.41	97.99	2.03	1.61	2.87	17.74
CV[2]	6.00	0.96	0.91	1.66	1.70	4.74	0.41	0.30

__Note__: 1 = The "all" soils samples set includes one sample with a "?" for soil horizon. 2 = The values reported as below detection limit have been reset as 2.5 ppb for Au, 0.1 ppm for Ag, 1.0 for As, 0.5 ppm for Mo and 0.1 ppm for Bi. 2 = CV is the standard deviation/ mean.

Table 9-2:
Univariate Statistics - B Horizon

Statistic	Au (ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Mo (ppm)	Bi (ppm)	Ni (ppm)	Zn (ppm)
Population	73	73	73	73	73	73	73	73
Minimum[1]	2.5	0.1	1.0	7.3	0.5	0.1	4.0	27.0
Maximum	154.0	0.5	11.0	174.2	9.0	5.0	20.0	134.9
Mean	8.70	0.11	4.80	33.96	0.75	0.17	7.64	64.55
Std. Dev.	23.61	0.06	3.34	24.09	1.17	0.57	2.92	19.01
CV[2]	2.71	0.51	0.69	0.71	1.57	3.43	0.38	0.29

__Note__: 1 = The values reported as below detection limit have been reset as 2.5 ppb for Au, 0.1 ppm for Ag, 1.0 for As, 0.5 ppm for Mo and 0.1 ppm for Bi. 2 = CV is the standard deviation/ mean.

Table 9-3:
Univariate Statistics - B and C Horizon Mixed

Statistic	Au (ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Mo (ppm)	Bi (ppm)	Ni (ppm)	Zn (ppm)
Population	169	169	169	169	169	169	169	169
Minimum[1]	2.5	0.1	1.0	4.0	0.5	0.1	2.0	23.3
Maximum	4,956.0	1.1	27.0	918.2	28.0	26.0	24.0	119.5
Mean	54.07	0.14	3.63	67.22	1.36	0.42	7.37	60.55
Std. Dev.	385.14	0.12	3.74	120.38	2.86	2.20	3.17	16.50
CV[2]	7.12	0.85	1.03	1.79	2.1	5.23	0.43	0.27

__Note__: 1 = The values reported as below detection limit have been reset as 2.5 ppb for Au, 0.1 ppm for Ag, 1.0 for As, 0.5 ppm for Mo and 0.1 ppm for Bi. 2 = CV is the standard deviation/ mean.

Table 9-4:
Univariate Statistics; C Horizon

Statistic	Au (ppb)	Ag (ppm)	As (ppm)	Cu (ppm)	Mo (ppm)	Bi (ppm)	Ni (ppm)	Zn (ppm)
Population	169	169	169	169	169	169	169	169
Minimum[1]	2.5	0.1	1.0	4.0	0.5	0.1	2.0	23.3
Maximum	4,956.0	1.1	27.0	918.2	28.0	26.0	24.0	119.5
Mean	54.07	0.14	3.63	67.22	1.36	0.42	7.37	60.55
Std. Dev.	385.14	0.12	3.74	120.38	2.86	2.20	3.17	16.50
CV[2]	7.12	0.85	1.03	1.79	2.1	5.23	0.43	0.27

Note: 1 = The values reported as below detection limit have been reset as 2.5 ppb for Au, 0.1 ppm for Ag, 1.0 for As, 0.5 ppm for Mo and 0.1 ppm for Bi. 2 = CV is the standard deviation/ mean.

Table 9-5:
Correlation Coefficient: Soil Samples

Metal One	Metal Two	Correlation Coefficient All Soil Samples
Au	Ag	0.57
Au	As	0.05
Au	Ba	0.1
Au	Ca	0.1
Au	Cu	0.24
Au	Fe	0.01
Au	Mn	0.04
Au	Mo	0.04
Au	Ni	0.08
Au	Pb	0.09
Au	Hg	0.02
Au	Zn	0.02

The La Manuela prospect, located near the north central part of the middle La Manuela property, was drilled to verify the continuity of N-S and E-W structures on the prospect. To date eight holes have been drilled for a total of 1,799.57 m.

The objective of drilling the Guaico/Nus prospect at the southeast corner of the middle La Manuela property is to follow the Guaico structure in a N/S direction and the Guaiquito and Nus structures in an E-W direction.

In any case, the three principal vein deposits at Cisneros are the Guayabito vein system which hosts more than 60% of the gold mineralisation, the Guaico vein system and the Nus - Papi vein systems.

9.1 EXPLORATION POTENTIAL

The continuous district scale exploration programs (stream sediment, rock and pan samples) completed systematically in 2015 (4,324 collected samples) by AGD geologists covering the entire Cisneros properties within the Santo Domingo claims identified six additional potential mineralized gold systems: Bareño, Santa Gertrudis, Cucurucho, Los Planes Monte-Bello, Alto La Cumbre and Guayabito Sur sectors which should be explored in detail. The geochemical pattern of anomalies encountered for Au, Cu and As are very similar to the La Quiebra- El Limón System where the four gold vein deposits of Guayabito, Guaico, Nus and Papi are located. The potential mineralization of these six sectors is very promising and they remain unexplored at depth. Figure 9-1 below shows the soil sampling programs and gold anomalies.

The exploration target for the Cisneros project area is orogenic lode gold deposits also known as mesothermal vein deposits. Numerous examples of this type of deposit are known throughout the world including the Campbell Red Lake deposits in Ontario, the Bralorne deposit in British Columbia and the Parcoy deposit in Peru. To date, exploration studies have demonstrated that the vein systems on the Cisneros properties have all the attributes of an orogenic vein gold deposit including, but not limited to, association with major structural breaks, quartz-carbonate vein association, low-sulphide assemblage with pyrite, chloritic and sericitically altered wall rocks.

9.2 UNDERGROUND EXPLORATION PROGRAM

After installation of surface infrastructure from October of 2015 to February of 2016, an underground exploration program was initiated in February 2016 for the Guaico Mine over recent development comprising ramps, drifts (largely along veins), cross-cuts, raises and other underground access. The objectives of the program were to verify the present geological model, ascertain geometry of mineralization, continuity, grade and gold recovery, gather detailed information to assist in the validation of future resource estimation, and complete engineering evaluation in regard to rock mass conditions, hydrogeology, and stopping. The underground exploration program is a typical advanced evaluation process for a vein type deposit such as Guaico.

AGD, continued the program of systematic sampling of the underground openings, including the Guaico Vein, Footwall-03 Vein, Footwall-05 Vein, La Manuela-01 Vein and Nus Vein, sampling included 992 channel samples over 2,783.57 m and 3,415 assay samples. The channel samples were collected along an average 2 m spacing and 0.80 m average width across the drifts and ramps.

The present updated mineral resource estimation (MRE) is based on the 2013 MRE, plus the channel sample database, with a cut off date of September 24, 2017 and thus does not include subsequent sampling programs that are currently underway at multiple underground development workings in the Guaico Mine, see Figure 9-2 for location of samples.

The underground mapping, at 1:200 scale, is continuing for the main structures Guaico, Nus, Vega, Footwall-03, Footwall-05 and La Manuela in addition to secondary structures. This information has been used to define new volumes and to help interpretation, see Figure 9-3 for Underground Mapping of Guaico Mine.

Figure 9-2:
Location of Underground Channel Samples by Vein

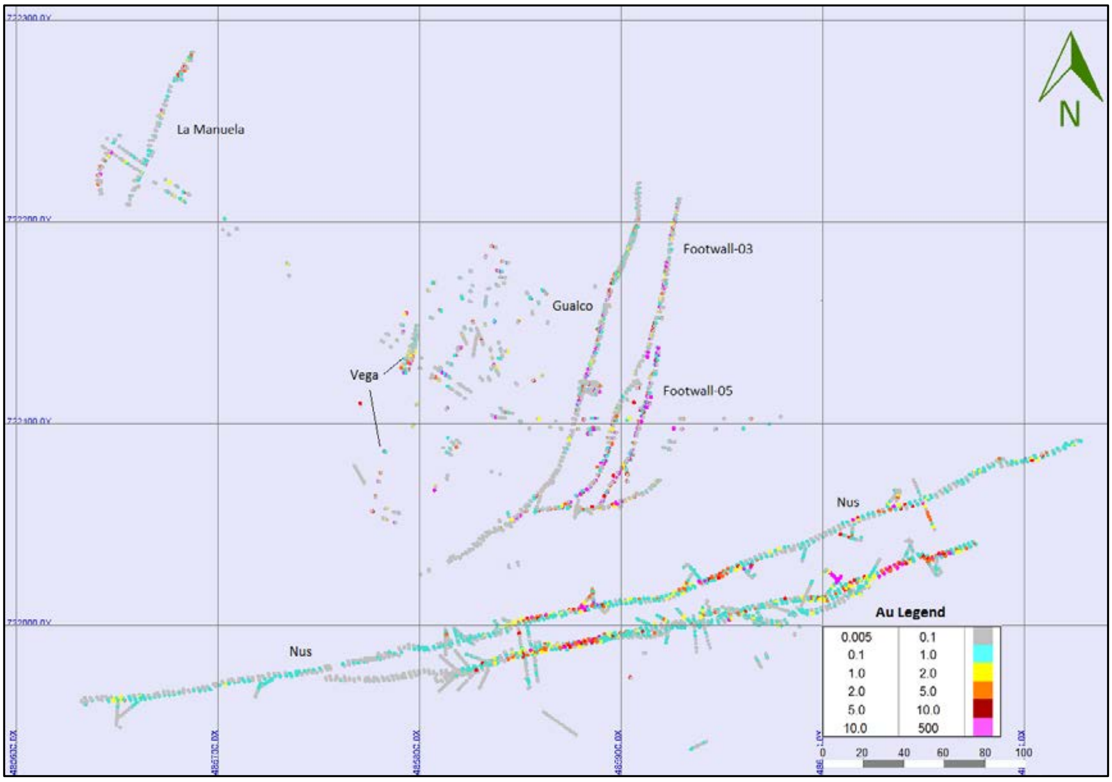
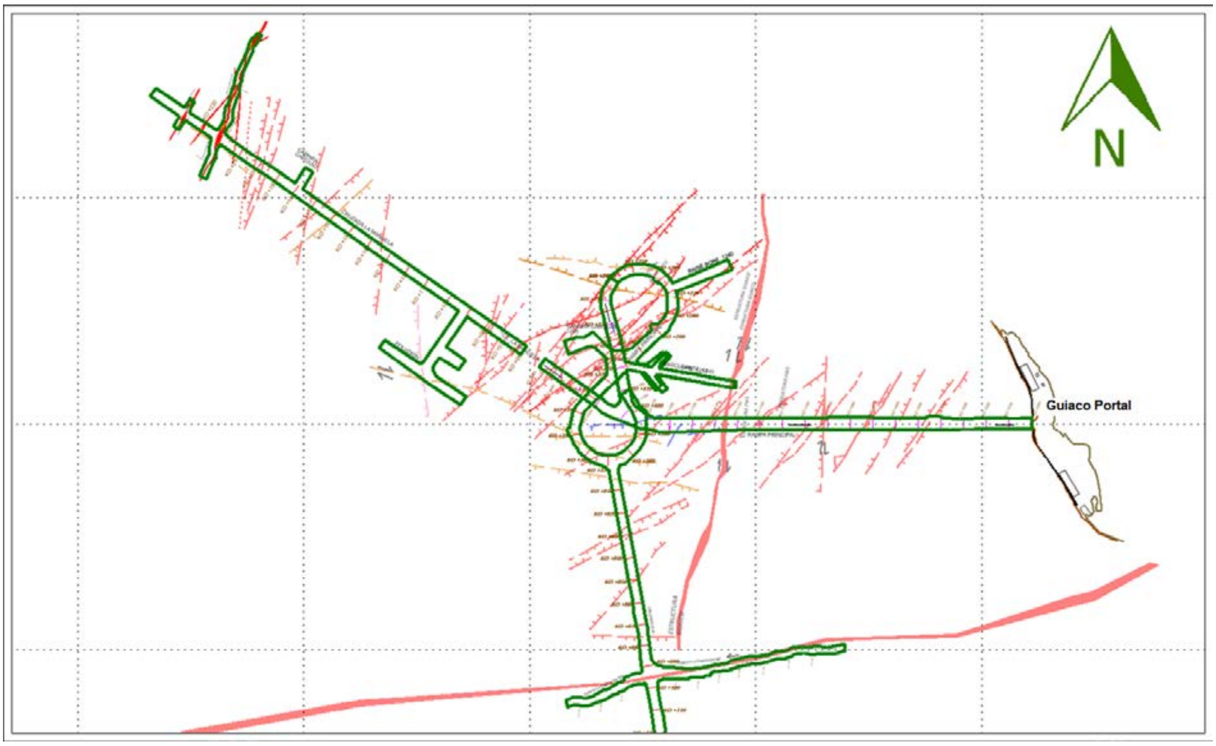


Figure 9-3:
Underground Mapping – Guaico Mine



10.0 DRILLING

From 2016 to 2017, AGD completed 14 drillholes totalling 2,689.92 m in the area known as “Guayabito Sur”. Drilling was designed to explore a new target to the South of the Guayabito area, to confirm the extension of recognized veins or find new mineralized structures and to increment the resources in the Guayabito area (see Table 10-1 for drill hole collar information and Figure 10-1 for a drill hole location map).

The 2016-2017 drilling campaign, started on May 18, 2016 and concluded on September 15, 2017. All the drillholes were orientated to the south-east (118º to 125º azimuth) and drilled with dips from -45º to -63º to SE with different total lengths (see Table 10-1 for details).

The collar coordinates, for all 2016-2017 drillholes, were surveyed using a Leica Flexline TS06 plus Total Station by AGD's Surveyor. Only the hole collars were surveyed after the rig had moved. No collar orientations (azimuth and dip), were determined by surveying while the rods were in the hole. The deviation of holes was surveyed by Smart Drilling S.A.S. Downhole surveys were carried out with multi shot Reflex Ez-Trac with Reflex Ez-Com.

The collar of GYB16-093 hole was located by LINAMEC geologist using a GPS during a site visit, as part of the verification process, see Photo 1.

Table 10-1:
2016 Drilling Program - Guayabito Sur Area

Drillhole No.	East UTM	North UTM	Elevation	Azimuth	Dip	Length (m)
GYB16-090	484334.61	722667.54	1555.83	120	-45	110.10
GYB16-091	484216.39	722714.21	1482.40	120	-50	278.00
GYB16-092	484320.93	722699.32	1539.92	120	-50	150.00
GYB16-093	484381.48	722732.18	1549.56	120	-50	150.00
GYB16-094	484153.63	722775.10	1479.62	120	-50	220.80
GYB16-095	484362.44	722794.07	1539.07	120	-50	150.40
GYB16-096	484348.34	722767.17	1532.72	120	-50	159.92
GYB16-097	484289.44	722796.23	1513.37	120	-50	100.85
GYB16-098	484352.74	722830.91	1533.18	120	-50	103.60
GYB16-099	484259.84	722777.29	1494.46	120	-50	166.15
GYB16-100	484225.72	722762.44	1479.54	120	-50	100.10
GYB17-101	484194.09	722802.49	1481.58	118	-59	450.00
GYB17-102	484247.99	722877.07	1499.01	120	-50	350.00
GYB17-103	484260.60	722631.75	1500.75	125	-63	200.00

Figure 10-1:
Location Map of Drillholes - Guayabito Sur

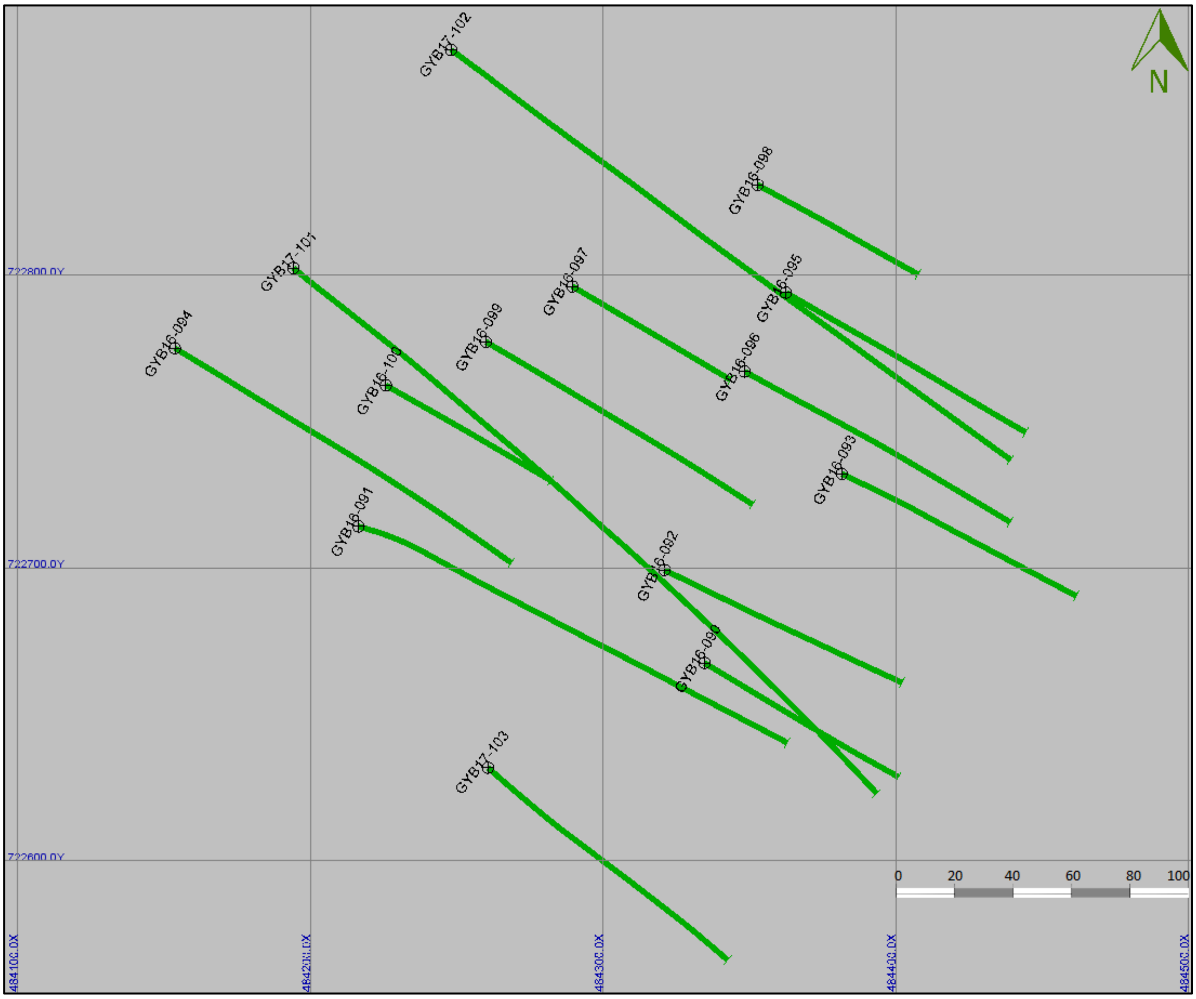


Photo 1: Collar Monument of GYB16-093 at Guayabito Sur Area

Table 10-2, shows a selection of intersections through the main resource zones to illustrate typical grades and widths of the Guayabito Sur mineralized area.

Table 10-2:
Guayabito Sur Significant Intercepts – 2016 Drilling Campaign

Hole-ID	From	To	Length*	Au g/t	Ag g/t	Cu ppm
GYB16-091	49.00	50.13	1.13	4.830	3.08	770.0
GYB16-091	72.15	76.21	4.06	15.444	10.74	3360.0
GYB16-091	220.30	221.78	1.48	3.740	0.07	3.0
GYB16-093	72.00	73.60	1.60	26.938	47.94	6875.0
GYB16-093	147.80	149.65	1.85	10.180	4.31	1160.0
GYB16-094	175.40	179.40	4.00	13.090	5.89	457.0
GYB16-094	112.20	114.05	1.85	5.490	2.50	875.0
GYB16-095	8.80	12.17	3.37	75.580	34.70	6383.0
GYB16-095	23.45	24.95	1.50	3.640	6.89	960.0
GYB16-095	55.07	57.54	2.47	31.441	31.24	1039.0
GYB16-096	31.00	32.08	1.08	3.270	5.77	892.0
GYB16-096	104.20	106.15	1.95	6.160	8.67	791.0
GYB16-096	120.20	122.25	2.05	4.500	6.80	1051.0
GYB 16-097	58.40	58.80	0.40	5.495	0.80	22.2
GYB 16-098	92.20	93.30	1.10	4.400	4.10	475.0
GYB 16-099	122.26	122.46	0.20	12.400	5.70	458.8
GYB 16-099	162.16	163.60	1.55	2.200	2.50	422.6
GYB17-102	267.10	110.90	1.95	28.868	13.204	1705

* The lengths are down hole intersections and not true widths.

A total of 48,118.16 m of diamond drilling has been undertaken at Cisneros since 2008, mainly located at the La Quiebra-Limón sector where four major gold vein systems, Guayabito, Guaico, Nus and Papi have been identified by the AGD's geologists as hosting gold mineralisation. All exploration drill programs (several phases) performed since 2008 to 2017 are listed below in Table 10-3:

Table 10-3:
Cisneros – Drilling Campaigns

Period	m
2008-2009:	3,929.76
2010	9,397.33
2011	18,987.55
2012	13,113.60
2016-2017	2689.92
Total	**48,118.16**

AGD, has completed several phases of drilling campaigns on the Cisneros project area using several drilling contractors such as Energold Drilling Corp. of Vancouver, Logan Drilling, and recently Smart Drilling and Major Drilling (see Photo 4). Man-portable core drills were used because of the rugged topography and dense vegetation of the land. The main drill targets to date are the Guayabito and Guaico vein deposits as well as Nus, Papi, Chapulin and Manuela.

The main drilled target is the Guayabito deposit, located north of an old artisanal mine The objective in drilling these veins was to outline north/south trending structures (one of which can be seen in the Guayabito mine to the south). The second promising target is the Guaico deposit followed by the Nus-Papi deposits located at the southeast corner of the middle La Manuela property. The Guaico vein-structure trends in a N/S direction towards the Papi veins and is structurally connected with the Nus system (E/W direction). The Chapulin and Manuela vein systems are still being evaluated and the cores are being re-logged. Thirteen holes totaling 868.95 m were drilled on the Chapulin prospect and 1,100 m at the Manuela system. Potential remains high at depth for further drilling phases.

Core logging, systematic samplingof core cut by a diamond saw, storage of cores and bagging samples for sending to international labs was carried out by AGD´s geologists following NI 43-101 protocols (QA/QC, etc.) as described in Chapter 11, see Photos 2 and 3. Finally, several systematic geologically interpreted cross-sections were developed for each drillhole in order to outline the modeling of the mineralized vein systems.

Photo 2: Core Warehouse at the Cisneros Project

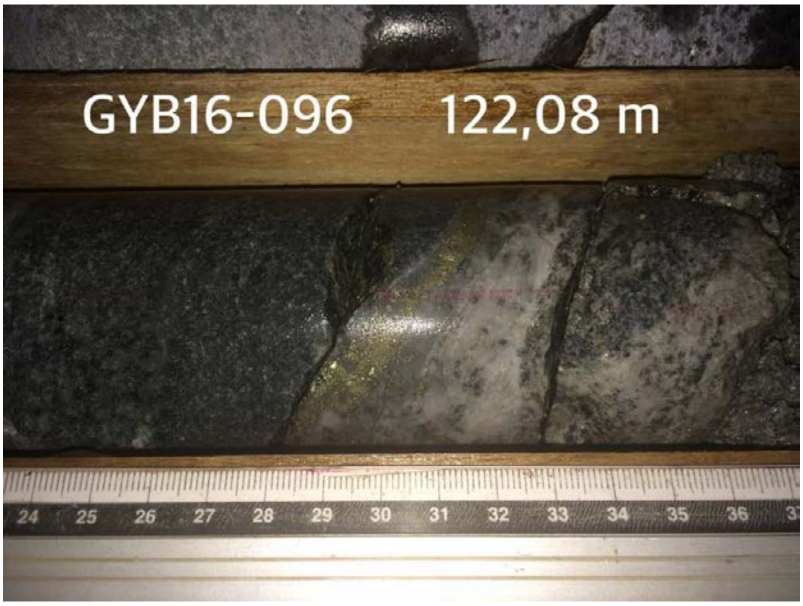


Photo 3:.Drillhole GYB16-096, cte-py-qtz veinlet @5.25 g/t Au, 11.3 g/t Ag, hosted in a tonalite with weak propylitic alteration.

Photo 4: Drill Rig – Guayabito Sur Area (2016)

11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 DRILL CORE SAMPLE PREPARATION

All drilling campaigns between 2009 and 2017 utilized diamond drilling. Drill core sampling at Cisneros has changed dramatically since the initial program in 2009 because the style/type of gold mineralization occurring at Cisneros was not well understood in the initial drill programs. This led to sampling methods that did not best capture and isolate the occurrence of gold and how the gold occurs with respect to the alteration halo that hosts the gold bearing structures.

The sampling programs employed at Cisneros and initiated during the second drill program in 2010 were designed to better isolate/sample the gold host (structure) and to accurately sample the footwall and hanging wall of the gold host (structure). The following summary describes the sampling methodologies employed at Cisneros 2009 – 2017.

- All recovered drill core was sampled during the 2016-2017 drill program. The length of samples taken was determined by the geologist logging the drill hole and typically ranged from 0.25 – 2.0 m in length.
- A sample number was assigned to the designated sample interval, the range (from and to) defined by the geologist logging the drill hole, and the range (from and to) of the sample along with corresponding remarks (logging as described above) was captured and entered in the drill log. The range and sample number was also marked on the core box.
- Mineralized structures were identified and the associated alteration halo (footwall, hanging wall to use mining terminology) isolated, and then the desired sample intervals were marked.
- Samples were taken outside of the alteration halo in either 0.5 m or 1.0 m lengths at the geologist's discretion.
- In narrow structures i.e. mineralized veinlets and veins <0.1 m in drill core width – the author has encouraged Antioquia personnel to sample the veinlets/vein and accompanying alteration halo in its entirety. This often results in samples 0.3 m in sample width (this is not a problem with NQ or HQ core; there is still plenty of sample weight to provide for a good analysis).
- Once the logging and sampling intervals were completed by the geologist the drill core was delivered to the geotechnician and all core boxes belonging to each drill hole were photographed before the cutting/sampling of the drill core. The photography was performed again for all split/sampled drill core.
- Drill core was cut in half (symmetrically) by diamond saw and after cutting the core boxes go to the sampling area where the sample (half of the split core) was packed in a clear heavy-duty plastic sample bag, weighed and coded for delivery. The other half of the cut core is retained in its core box and stored at the on-site company warehouse.
- The samples were packed in large shipping bags (average of 7 samples per bag); a delivery report was made and submitted to the laboratory along with samples maintaining chain of custody until delivery. Antioquia personnel typically shipped samples and drove samples to delivery points once per week or when the drill hole was completed.

This more disciplined approach to sampling will result in:

- A better understanding of the mineralizing controls and distribution of gold.

- Better enable the interpretation of mineralized lenses and zones and therefore provide a better interpretation of the deposit(s) as a whole.
- Possible enhancement of gold grade over better defined mineralized zones and lenses.
- More precise grade data and better defined mineralized widths to incorporate into modelling and mine design.
- More precise determination of internal dilution, halo grades and gold content of the immediate host rock thus enabling more accurate use of rock immediately adjacent to mineralized rock in resource estimation.

11.2 CHANNEL SAMPLE PREPARATION

The channel sampling was performed by technicians under a geologist's supervision. The samples were collected directly into a coarse plastic bag. Sample positions were chosen by the geologist and surveyed, typically in both sides of ramp walls or every two to three metres in a drift. One sample was generally taken across the full width of the mineralized structure (see Photo 5). All relevant data such as dip, structure, lithology mineralogy, size of sample etc. was logged into a book similar to the drill hole logging forms. Each sample was double wrapped with a ticket inserted into the bags for recording purposes. Once the sample was taken, it was sent to the sample preparation shed to await transport and the logging data was entered into the Access database system. All channels were surveyed using a total station; underground sampling data are stored in the database as pseudo drill holes to facilitate 3D modeling.

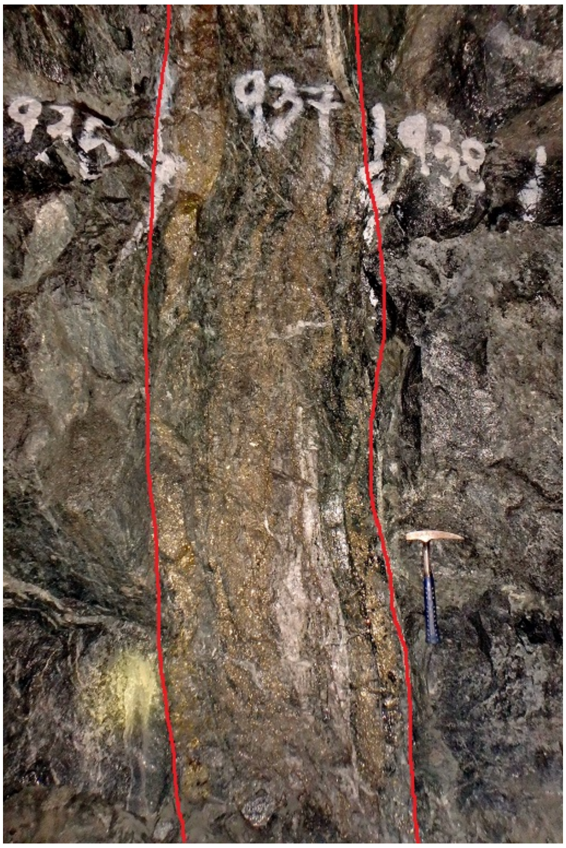


Photo 5: Guaico Vein – 1172 Level with Channel Samples Numbers

11.3 BULK DENSITY DETERMINATIONS

To establish bulk densities for the Cisneros Project MRE update, 177 samples were collected to assign individual density values to each mineralized structure, Table 11-1 show the number of samples and bulk density average value by vein.

The samples were submitted to SGS Laboratory in Medellin for Specific Gravity (SG), Bulk Density (BD) and Moisture determinations, SG is determined by weighing a sample in air and in water, and it is reported as a ratio between the density of the sample and the density of water. The BD is the density of a material in weight per unit volume, and it is determined by the weight of the sample and the volume of water the sample displaces. Calculations for BD were corrected for water temperature and the density of the wax coating.

Table 11-1
Bulk Density Values by Veins Used for MRE

Structure	Bulk Density g/cm^3	Specific Gravity	Moisture	BD Samples	Assays Samples	%
NUS	2.763	2.826	0.892	51	846	6.0%
GCO	2.812	2.885	1.037	30	439	6.8%
GCFW3	2.781	2.955	1.265	46	280	16.4%
GCFW5	2.778	3.159	1.822	29	162	17.9%
GYB	2.823	2.928	0.319	13	660	2.0%
Wall Rock	2.958	2.959	1.071	8		

11.4 QUALITY ASSURANCE AND QUALITY CONTROL

A QA/QC program was initiated in 2009 the details of which and the Antioquia QA/QC program in general will be discussed later in Chapter 12 of this report.

All of the AGD samples in the mineral resource database have been submitted with standard reference materials to control assay accuracy and, depending on the program, have included twin samples, coarse crush duplicates and pulp duplicates to control sampling, sub-sampling and analytical precision.

An independent check assaying program has also been used to demonstrate the reproducibility of the assaying carried out in the primary laboratory and to help establish assaying accuracy.

11.5 DATABASES

The Cisneros drilling data is currently stored in an Access database. The upload of drill data (assay, survey, and logging) to the Access database is performed manually and the data verification on data input is conducted visually. The assay certificates are stored in their original formats (*.CSV, *.XLS, *.PDF) and geological logs are recorded on paper by hand, manually entered in the Access form.

Starting in 2016, the Guaico's channel sample data were stored in the Access database; several tables and queries were created for storage and management of the information related to channel samples (see Figure 11-1 for the Access Database Objects).

The database, for the Cisneros 2017 PEA, consists of 110 DDH's and 8,567 assay records, and 1,130 channels and 3,952 assay records. The total of composite data sums 14,849 (See Table 11-2 for detailed information).

Table 11-2
MRE Databases Used for the Cisneros 2017 PEA

Zone	DDH's	Meters	Assays	Composites
Guaico–Nus	96	18,389.78	7,719	8,859
Guayabito Sur	14	2,689.92	848	1,367
Total	110	21,079.70	8,567	10,226
Zone	**Channels**	**Meters**	**Assays**	**Composites**
Guaico-Nus	1,130	3,285.82	3,952	4,623

Figure 11-1:
Guaico Sample Channels - Access Database Objects

11.6 SAMPLE SECURITY

Each day the drill core samples are transported from the drilling platform in wood boxes properly marked with the drill hole and box number to the core shed, guarded by AGD personnel. Each box is carefully sealed with lids and nails and placed in a backpack for transportation on foot (see Photo 6) until placed on a 4x4 truck for transportation to the core shed. The samples are accompanied by the respective custody documents, duly completed and signed. Once the core trays are laid out on tables, the nails and lids are removed in preparation for logging and core photographs.

Photo 6: Transportation of Core Boxes in Backpacks

The core samples are measured (marked-up), logged, and labelled following the internal procedures that have been endorsed by outside consultants. These samples are then cut and packed into size 8 double plastic bags, which were previously marked with stickers showing a sample number assigned by the geologist. Before the batches are sent to the laboratory, geologists and technicians prepare a batch checklist to track the movement of the material, identify the number of samples, batches, and quality control (QC) samples, with its type, and the sack number. At this stage, the checklist must be signed by the geologists, security guard, and the driver of the vehicle. When this process is completed, the batches are then sent to Medellin. Here, the warehouse foreman receives the batches from the driver, and must check against the batch checklist, and sign to verify the contents of the batches. The foreman is the individual responsible to hand deliver each of the samples to the ALS Medellin laboratory.

Upon delivery, the ALS shift supervisor verifies that all samples as specified in the laboratory request sheet are the same as delivered, then signs for their receipt. These samples are logged in the internal system called “Webtrieve” (used globally by ALS clients) and assigned a work order number known as the internal way lot. Every time a sample goes through this process, it is followed by the system indicating its progress.

The samples go through an initial preparation process at ALS Colombia (crushed, split, and pulverized) and the pulp is sent to ALS Peru (as defined below) in Lima. This pulp is packed in a paper bag and coated with plastic, then sent in heavy gauge cardboard boxes with ALS tape and coded security straps, which identifies those boxes if any that have been opened during transit between ALS Medellin and ALS Peru by customs. The leftover pulp and coarse rejects are sent to the AGD warehouse in Itagui within 45 days of the date of issue of the certificate.

LINAMEC has reviewed the entire sample chain of custody at Cisneros, from the drilling of the samples to the receiving of final analytical results. LINAMEC is of the opinion that the in-house AGD Custody Control systems in place are of industry standard and are adequate and appropriate for use in Mineral Resource and Reserve estimation.

11.7 ANALYTICAL LABORATORIES

Until 2011 all sampled drill core was sent to SGS Labs for analysis. Assaying protocol at SGS remained the same as the 2009 procedure, Fire Assay (FAS5515) on all samples for Au, gravimetric finish on samples >5,000 ppb Au along with 38 element Inductively Coupled Plasma Optical Emission Spectroscopy (ICP12B) on all samples through to the end of the first phase of drilling in 2010. In an effort to reduce costs, the value of continuing with the 38 multi-element assaying was brought into question, as such the second phase of drilling only used the FAS5515 assay method on all samples, and a gravimetric finish on all samples >5,000 ppb Au.

In 2011, due to slow turnaround of assay results, the decision was made to switch from SGS Labs to Acme Labs S.A. in an attempt to expedite the delivery of assay results. The same sampling, cutting and sampling handling protocols were maintained, but all samples were delivered to the Acme Labs S.A. sample preparation lab in Medellin.

During 2011 and 2012 drilling, select samples of high-grade gold were analyzed by Metallic Assay at Acme Labs (G6ME). The metallic assay process and the presence of coarse gold at Cisneros was discussed in the 2013 technical report prepared by LINAMEC.

The samples of the 2016 drilling campaign in the Guayabito Sur Area and the underground channel samples from the Guaico Mine, were submitted to ALS Minerals Medellin Colombia, for mechanical preparation and then shipped for analysis to the ALS certified assay laboratory in El Callao, Peru (ALS Peru).

Currently, for the 2017 campaigns (underground channel sampling and DDH drilling), the samples are being sent to the SGS Laboratory in Medellin, because this laboratory has, inside its facilities, one area for mechanical preparation and another for chemical analysis, that include Atomic Absorption Spectroscopy (AAS) and Inductively Coupled Plasma Mass Spectrometry (ME-MS61) assay devices. This makes for a faster turnaround time for assay results. However, one issue is that SGS laboratory's ISO 9001:2008 certification is out of date (valid to March 25, 2016).

11.8 SAMPLE PREPARATION & ANALYSIS

11.8.1 Sample Preparation

Sample preparation of the 2016 samples was conducted in the ALS Minerals facility in Colombia ("ALS Colombia") located at Bodegas San Bartolome Bodega 3, Carrera 48B No 99 Sur-59, La Estrella, Medellin. ALS Colombia is independent from AGD.

Sample preparation is the most critical step in the entire laboratory operation. The purpose of preparation is to produce a homogeneous analytical sub-sample that is fully representative of the material submitted to the laboratory. The sample is logged in the tracking system, weighed, dried and finely crushed to better than 70% passing a 2 mm (Tyler 9 mesh, US Std. No. 10) screen. A split of up to 1,000 grams is taken and pulverized to better than 85 % passing a 75 micron (Tyler 200 mesh) screen. This method is appropriate for rock chip or drill samples.

11.8.2 Sample Analysis

After preparation at ALS Colombia, the samples are then shipped for analysis to the ALS certified assay laboratory in Lima, Peru (ALS Peru).

- At ALS, gold analyses were performed utilizing the Au-AA24 (50g sample) fire assay method with Atomic Absorption completion. When the gold detection exceeded 10 ppm Au the sample was then subjected to Au-GRA22 method analyzing 50g split of sample by fire assay and completion with gravimetric finish.
- In addition, Au assaying for 48 elements (ME-MS61) Inductively Coupled Plasma Mass Spectrometer (ME-MS61) analysis was performed on each sample.

11.8.3 Laboratory Independence and Certification

ALS Peru is independent from AGD and has the following accreditation: ISO 9001:2008 certification by IQNET, The International Certification Network, for chemical analysis of geological samples and products of its industrial processing chemical analysis of environmental samples from the mining and energy industries.

ISO/IEC 17025:2005 Accreditation by the Standards Council of Canada as a Testing Laboratory.

11.9 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Quality Assurance (QA) concerns the establishment of measurement systems and procedures to provide adequate confidence that quality is maintained. Quality Control (QC) is one aspect of QA and refers to the use of control checks of the measurements to ensure the systems are working as planned. The QC terms commonly used to discuss geochemical data are:

- Bias: the amount by which the analysis varies from the correct result.
- Precision: the ability to consistently reproduce a measurement in similar conditions.
- Accuracy: the closeness of those measurements to the “true” or accepted value.
- Contamination: the transfer of material from one sample to another.

LINAMEC has carried out an evaluation of the QA/QC samples for the 2016-2017 drilling campaign and underground channel sampling program applying our own templates. The present evaluation is only for review of gold. LINAMEC has prepared several kinds of graphics for QA/QC sample evaluation.

11.9.1 Standard Samples Review

Standards (or certified reference materials, CRM) are samples prepared by certified labs under special conditions, used to estimate the assay accuracy of the sample batch. Three CRM’s supplied by CDN Resource Laboratories Ltd. (CDN) were used during the 2016-2017 drilling and channel sampling campaigns on the properties of the Cisneros Project to evaluate ALS and SGS laboratories. The accepted Best Values (BV) or certified values and their corresponding Confidence Intervals (CI) are presented in Table 11-2.

Table 11-2
List of Certified Reference Materials

Code	Assay No.	ALS	SGS	BV Au (g/t)	C.I.
CDN-CM-11A	43	15	28	1.014	0.008
CDN-CM-12	45	17	28	0.686	0.006
CDN-CM-17	37	11	26	1.370	0.010

For evaluating the standard samples, control charts were constructed for each Au standard. The values reported for the inserted standard samples were plotted in a time (or pseudo-time) sequence. Lines corresponding to *BV, 1.05*BV+CI, 0.95*BV-CI* and *AV±2*SD* were also plotted (*BV*, *CI*: Best Value and Confidence Interval at the 95% confidence level, respectively, calculated as a result of round-robin tests; *AV*, *SD*: average (mean) value and standard deviation, respectively, calculated from the actual assay values of the inserted standards).

In principle, the standard value had to lie within the *AV±2*SD* boundaries to be accepted. Otherwise, the value was qualified as an outlier. The analytical bias was calculated as:

$$Bias\ (\%) = (AV_{eo}/BV) - 1$$

where, AV_{eo} represents the average recalculated after the exclusion of the outliers. The bias values are assessed according to the following ranges: good, between -5% and +5%; reasonable, with care, from -5% to -10% or from +5 to +10%; unacceptable, below -10% or above 10%.

Figures 11-2 to 11-4 shows the main Control Chart of Standards for ALS and SGS laboratories

Figure 11-2:
Control Chart Standard for CDN-CM-11A – Au (g/t)

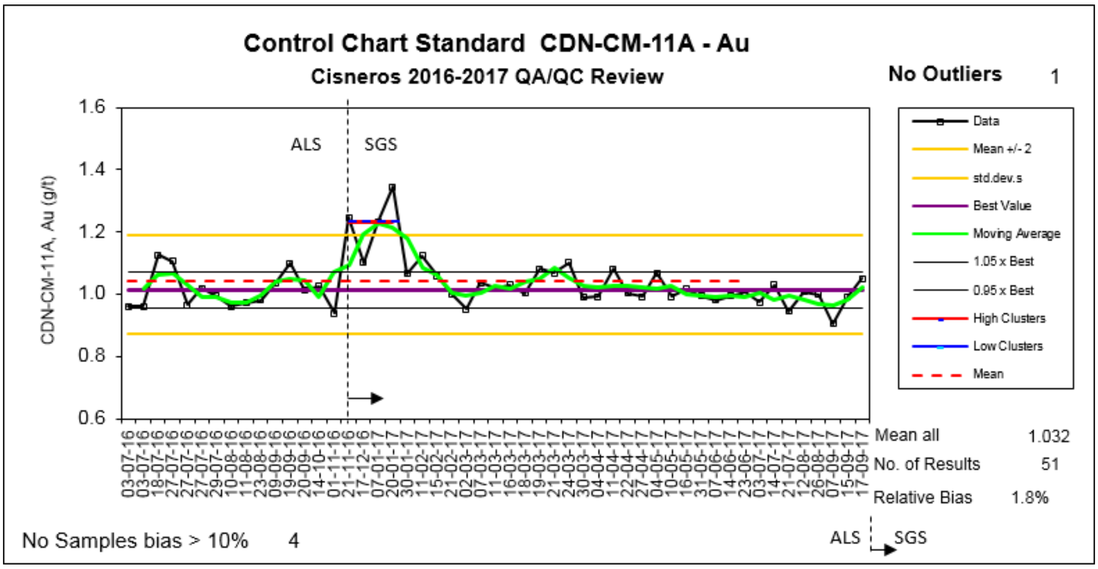


Figure 11-3:
Control Chart Standard for CDN-CM-12 – Au (g/t)

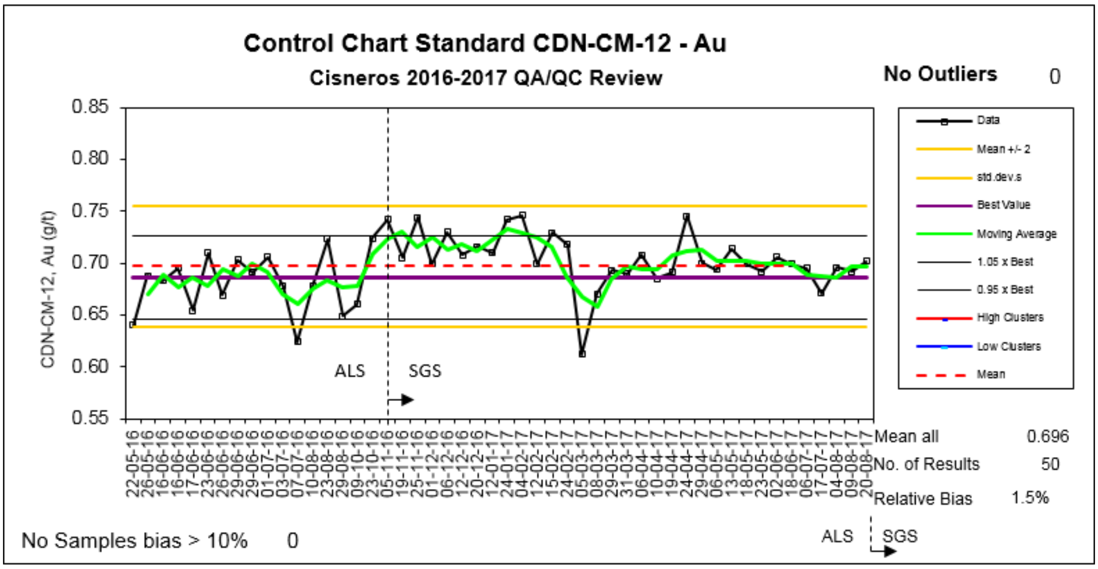
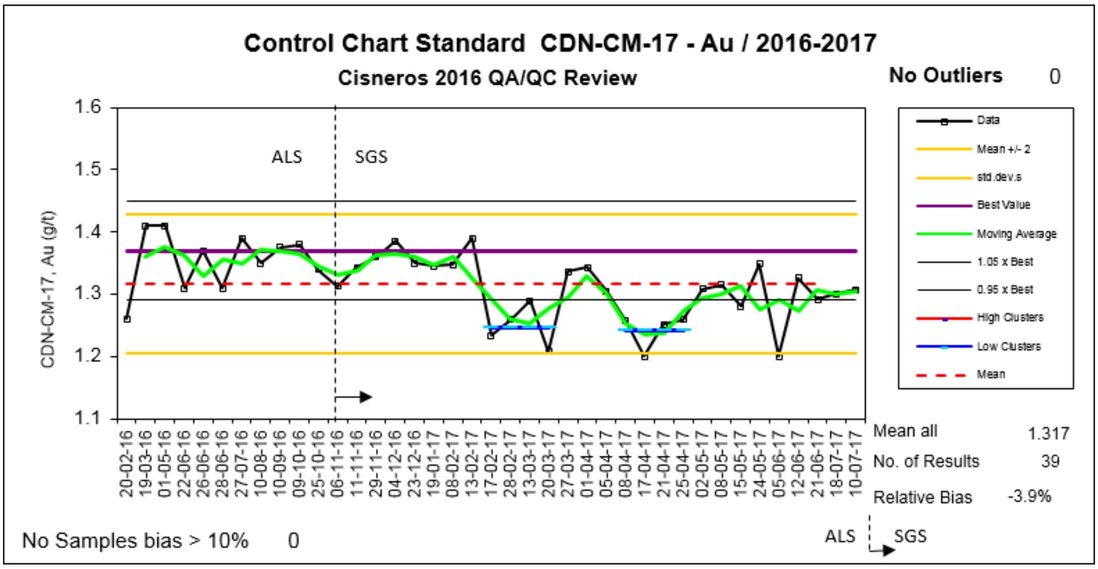


Figure 11-4:
Control Chart Standard for CDN-CM-17 – Au (g/t)



Conclusions

The review of CRM's charts exhibits reasonable relative bias (<10%) and only one outlier for the CDN-CM-11A standard for gold and can be assumed to be accurate and precise in both ALS and SGS laboratories. As such, the authors consider the analytical results to be suitable for inclusion in the Cisneros 2017 PEA.

12.0 DATA VERIFICATION

The database audit covers only the new data collected by Antioquia Gold (AGD) during the 2016-2017 drilling campaign performed in the Guayabito Sur area and the data collected in the Guaico Mine during the underground sampling channels program 2016 to 2017, that constitute the new data used to update the estimates of the mineral resource, in both Guayabito Sur area as Guaico Mine. The old data (2009 - 2013) were audited for the Resource Estimation of the Cisneros Project in 2013 (Cisneros Technical Report NI 43-101, prepared by LINAMEC SAC for Antioquia Gold Ltd.).

LINAMEC has audited the data coming from:

- Collar coordinates
- Down hole survey (dip and strike)
- Channel sample coordinates
- Underground geological mapping
- Geological logs, and
- Assay reports

In the audit process geological logs were scanned and compared with the data in the Access database. LINAMEC was provided with assay reports from ALS and SGS laboratories, collar survey reports, down hole survey reports and field drilling reports for its audit.

See Table 12-1 for audited databases of the Guaico Mine and Guayabito Sur area.

Table 12-1
Audited Databases – Exported from GEMS

Zone	Channels/Holes	Meters	Assays	Composites
Guaico – Nus Mine	1,130	3,285.82	3,952	4,623
Guayabito Sur	14	2,689.92	848	1,367
Total	1,003	4,473.49	4,075	4,217

The new data were exported for audit purposes directly from the projects created in GEMS®, that were used for the updated resource estimation and reporting of the Cisneros 2017 PEA.

Two projects were created in GEMS® for modelling and resource estimation, Guaico and Guayabito Sur respectively. The Guaico database is comprised of 96 drillholes with 18,389.78 m and 7,719 assays records. The Guaico database for underground channel sampling contains 1,130 channels and 3,952 assay records, total assays inside veins equal 1,975 (50.0%). The Guayabito Sur database for drillholes consists of 14 new DDH's with 2,689.92 m and 848 assay records; the assays around and in the veins total 90 assay records (10.6%); the total composite assay data equals 1,367.

12.1 INDEPENDENT VERIFICATION

To verify the results of gold grades for the Guaico channel sampling program, LINAMEC and AGD randomly selected 99 pulps (4.6% of channel sample assays). The samples were analyzed by SGS Colombia (45 samples) and ALS Peru (54 samples). The results indicate the analytical precision and accuracy of the SGS laboratory are comparable to

ALS. Results are shown as X-Y dispersion graphs using the Reduction-to-Major Axis (RMA) method (Sinclair, 1999), which offers a non-biased adjustment on both series of results. This mathematical procedure treats both series as independent.

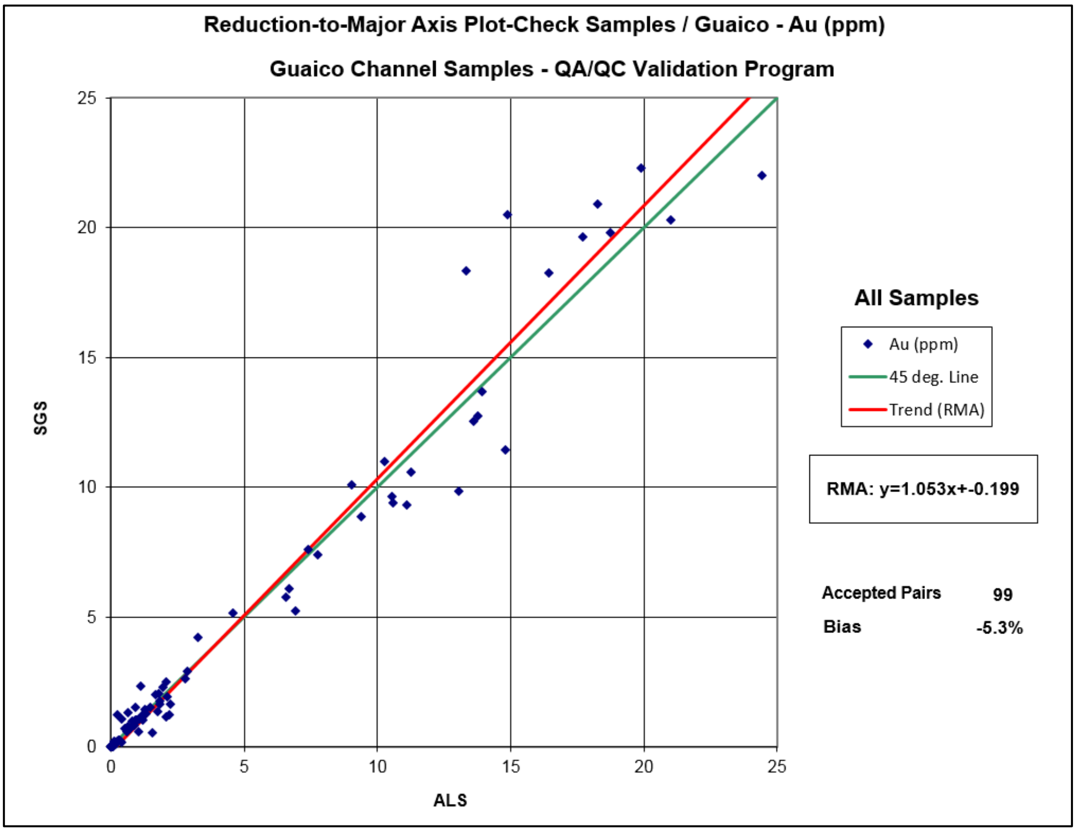
LINAMEC's conclusion, based on the results obtained in the verification of gold grades from the channel sampling program, is that the assays are acceptable to be used in the mineral resource update, the bias of RMA for Guaico channel samples is less than 10%. RMA statistics for the Guaico Mine are presented in Table 12-2 and plotted in Figure 12-1.

Table 12-2
Accuracy of ALS Relative to SGS for Gold on the Basis of Check Assays

Guaico Channel Samples - RMA Parameters - All Samples								
Element	R^2	N (total)	Pairs	m	Error (m)	b	Error (b)	Bias
Au (ppm)	0.9838	99	99	1.053	0.013	-0.199	0.941	-5.3%

Guaico Channel Samples - RMA Parameters - Outliers Excluded								
Element	R^2	Accepted	Outliers	m	Error (m)	b	Error (b)	Bias
Au (ppm)	0.9829	96	3	1.003	0.021	0.007	0.713	-0.3

Figure 12-1:
RMA Plot Check Samples for Au in Guaico Mine (ALS vs. SGS)



To validate the new assay data, from channel sampling and DDH core sampling programs, 80 samples were sent for external control to Inspectorate Service Peru (ISP) in Lima, which acted as a secondary laboratory. The samples were assayed for Au. The

RMA plots indicate a good fit for Au between SGS Medellin and ISP Lima, reflected in the high values of the coefficient of determination R^2 for Au (0.9996), not excluding outliers, and acceptable relative biases (1.8%) (See Table 12-3 and Figures 12-2).

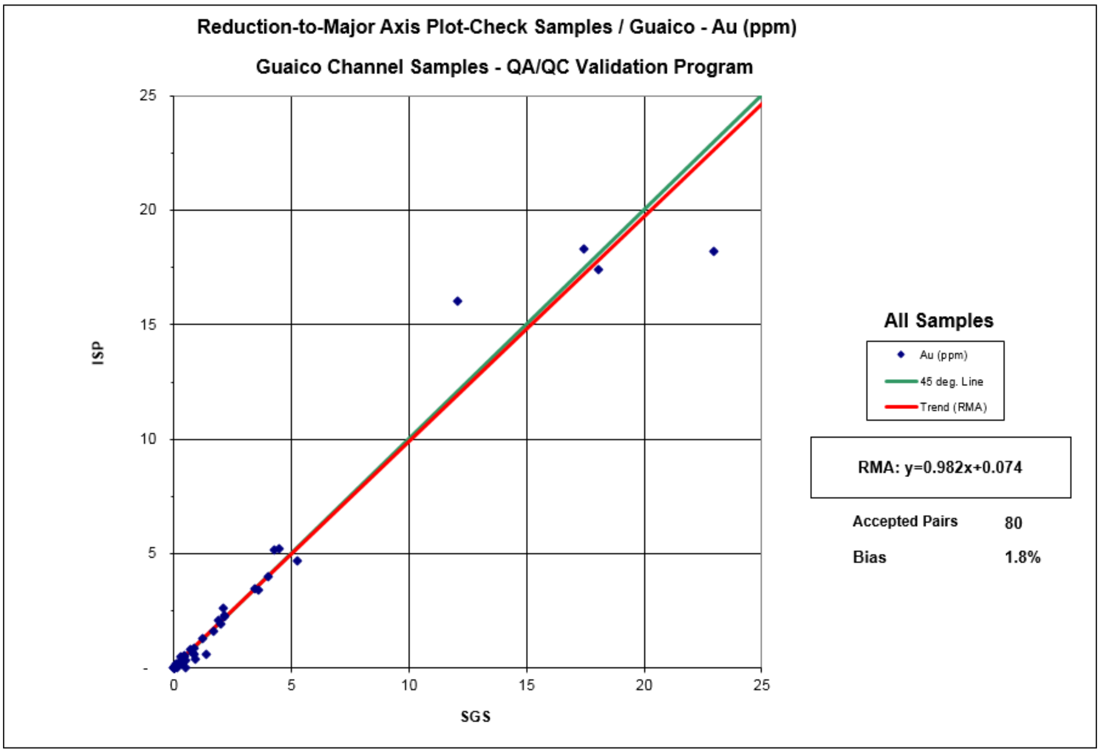
LINAMEC concludes, based on the results obtained in the verification of gold grades from channel sampling program that the accuracy of SGS as compared to ISP, is adequate for the gold assays to be used in the mineral resource update.

Table 12-3
Accuracy of SGS Relative to ISP for Gold on the Basis of Check Assays

Guaico Channel Samples - RMA Parameters - All Samples								
Element	R2	N (total)	Pairs	m	Error (m)	b	Error (b)	Bias
Au (ppm)	0.9996	80	80	0.982	0.002	0.074	0.971	1.8%

Guaico Channel Samples - RMA Parameters - Outliers Excluded								
Element	R2	Accepted	Outliers	m	Error (m)	b	Error (b)	Bias
Au (ppm)	0.9933	76	4	1.014	0.009	-0.019	0.118	-1.4%

Figure 12-2:
RMA Plot Check Samples for Au in Guaico Mine (ALS vs. SGS)



12.2 COMMENTS ON SECTION 12

LINAMEC, considers that the current drilling and sampling procedures undertaken by AGD are adequate for use in the mineral resource estimation. No major deficiencies or problems were found in the verification and audit procedure.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Since 2010, several metallurgical campaigns have been carried out with different mineralized materials from the Guayabito and Guaico zone of the Cisneros Project, with the objective of characterizing the mineralization in terms of its disposition to be processed using conventional metallurgical techniques.

The main objective of these metallurgical tests was to study the behavior of the mineralization under different working conditions in the processes of size reduction, gravity, flotation and cyanidation of the flotation concentrates. Finally, direct cyanidation of the head material was carried out. The aim of the tests was to define an optimal scenario to recover the precious metals from the mineralization contained in the different exploitation zones.

In these metallurgical campaigns, a series of different mineralized samples has been used to ensure that the results are as representative as possible of the potential exploitation area of the Cisneros Project.

13.1 PRELIMINARY METALLURGICAL TEST ONE (February, 2008)

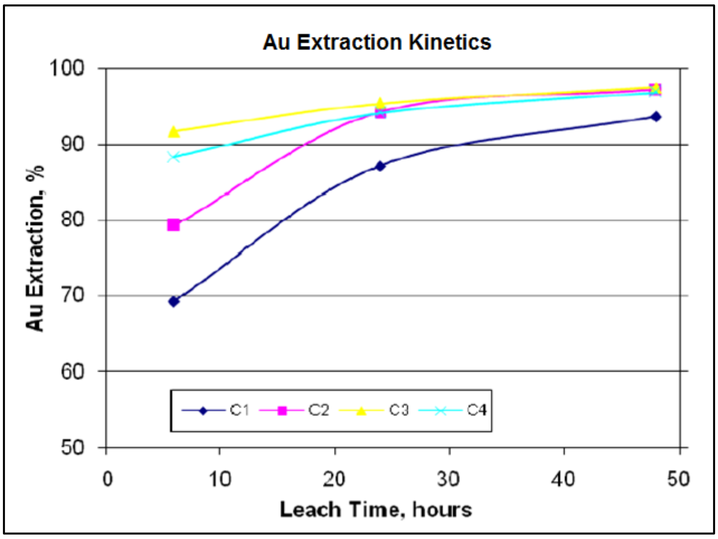
Four samples from Guayabito area were collected by Moose Mountain Technical Services for preliminary cyanidation testing as part of a due diligence report done for Am-Ves Resources Inc. in 2007. The samples included two rock samples from the dump (low-grade as the mined material is hand sorted) at the mouth of the Guayabito exploration tunnel and two tailings samples from the small processing facility on site.

The rock samples were numbered 41804 and 41805, while the tailings samples were numbered 41809 and 41810. The results of the test work are included in Table 13-1, and show high gold and silver extraction values. Figure 13-1 shows the kinetics of the gold extraction.

Table 13-1
Leach Test Data

Test No.	Sample ID	Measured Head		Calculated Head		Extraction		Residue		Reagents Consumption	
		Au (g/t)	Ag (g/t)	Au (g/t)	Ag (g/t)	Au (%)	Ag (%)	Au (g/t)	Ag (g/t)	NaCN (kg/t)	Lime (kg/t)
C-1	41804	1.26	1.5	1.4	2.7	93.6	81.5	0.09	0.5	0.41	0.36
C-2	41805	0.82	2.9	1.07	3.0	97.2	67.1	0.03	1.0	0.36	0.41
C-3	41809	11.31	19.5	11.22	18.2	97.5	69.8	0.28	5.5	0.51	7.82
C-4	41810	13.07	19.0	12.49	16.6	96.9	61.5	0.39	6.4	0.50	6.69

Figure 13-1:
Gold Extraction Kinetic Curves



13.2 PRELIMINARY METALLURGICAL TEST TWO (August, 2010)

A shipment of 11 samples containing approximately 56 kg of coarse crushed samples was received at **G&T Metallurgical Services Ltd.** for use in this test program. Metallurgical testing was carried out on four composite samples from Guaico, Guayabito, Sur America and Papi. The lab work commenced in late July of 2010 and was completed by August 2010.

The chemical and mineral content of mineralization are key characteristics that influence process performance. Secondary minerals such as copper can influence reagent consumptions and metallurgical performance in a cyanidation process. The chemical and mineral content of the four composite samples are discussed below in greater detail.

The Papi and Sur America results are only informative, since these deposits are not part of the present Cisneros PEA 2017 technical report.

13.2.1 Chemical Content

The chemical content of the four composite samples was determined using standard analytical techniques. The results are displayed below in Table 13-2.

Table 13-2
Chemical Content

Sample	Assay - percent or g/tonne					
	Cu (%)	Fe (%)	Ag (g/t)	Au (g/t)	S (%)	C (%)
Guaico	0.25	6.9	7	17.9	1.3	0.63
Guayabito	0.01	6.6	20	33.1	5.51	0.15
Sur America	<0.001	3.7	1	2.93	3.44	<0.01
Papi	0.41	13.9	23	43.5	12.7	0.02

The chemical content of the four composites was variable. Gold content ranged from 3 to 44 g/tonne. Copper in the four composites was detected at between <0.001 and 0.4 percent.

The Sur America composite contained the lowest amounts of feed gold, copper, silver and iron while the Papi composite contained the highest feed gold, copper, silver and iron content.

13.2.2 Mineral Content

The mineral content of the four composite samples was determined by bulk mineral analysis (BMA) using QEMSCAN. The results of this analysis are displayed below in Table 13-3.

Table 13-3
Mineral Content

Minerals	Guaico	Guayabito	Papi	Sur America
Chalcopyrite	0.82	0.02	0.89	0.00
Bornite	0.00	0.00	0.06	0.00
Chalcocite/Covellite	0.01	0.00	0.13	0.00
Pyrite	1.91	9.64	24.9	6.29
Iron Oxides	0.93	0.35	4.03	0.63
Quartz	12.9	72.1	27.5	74.7
Chlorite	22.3	3.71	3.70	0.72
Feldspars	17.8	1.80	15.0	2.55
Muscovite	13.8	9.25	16.3	9.52
Amphibole (Hornblende)	14.8	0.66	2.85	0.60
Epidote	6.03	0.01	0.01	3.29
Garnet	1.23	0.50	0.76	0.20
Calcite	2.27	0.35	0.05	0.00
Sphene	2.04	0.49	0.50	0.41
Apatite	0.52	0.21	0.30	0.05
Others	2.64	0.44	2.90	0.99

The mineral content of the four composites was also highly variable; pyrite was the dominant sulphide mineral in all four samples, ranging in value from 2 to 25 percent of the sample mass. The Papi composite had relatively high levels of chalcocite/covellite. These minerals are soluble by cyanide and will likely increase the cyanide consumption in a leach process.

The silicate minerals in the sample were dominated by quartz. Considerable amounts of chlorite, muscovite and feldspars were also detected in these composite samples. The Guaico composite also contained high levels of amphibole. The abundance of mineral species as reported for the Guayabito and Guaico composite samples does not affect their amenability to recovery by gravity and flotation.

13.2.3 Laboratory Results

A series of gravity concentration tests, cyanidation and open circuit batch cleaner flotation tests were conducted on each of the four composites to assess the potential for gold recovery. Table 13-4 below displays a summary of the results obtained by each method, for the four composites tested.

Table 13-4
Gold Performance by Method

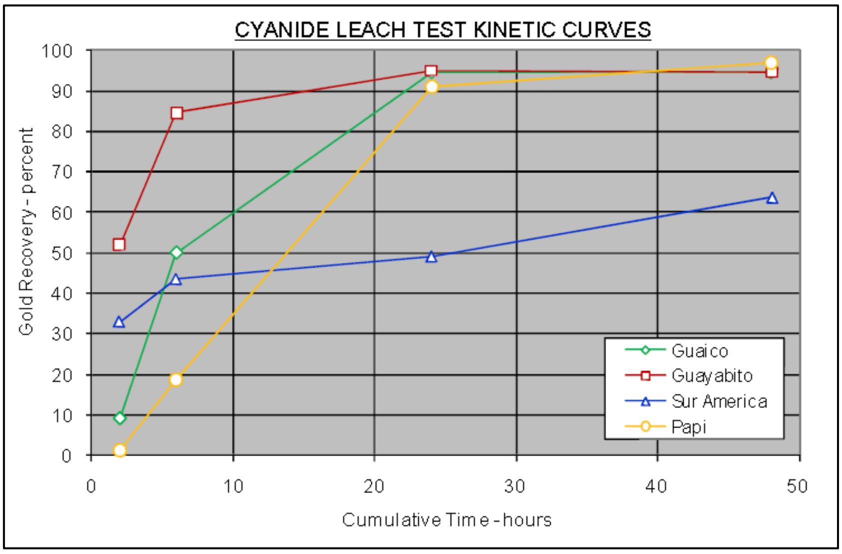
Composite	Head Au g/t	Gravity Concentrate			Leach		Flotation		
		Mass %	Grade Au g/t	Recovery %	Grade Au g/t	Recovery %	Mass %	Grade Au g/t	Recovery %
Guaico	17.9	0.7	1194	42	9	94	3.5	578	97
Guayabito	38.1	0.3	3680	26	16	95	9.9	408	96
Sur America	2.98	0.5	97	14	1	64	7	50	91
Papi	43.5	1.1	2073	48	25	97	24.3	143	88

Note: The head grades are higher than the average grade calculated for Guaico, Guayabito and Papi, this test work is preliminary and unlikely to be representative of the recovery of the deposits as a whole.

All composites except the Sur America composite are amenable to gravity recovery at a nominal primary grind size of 100 µm K80. For these three composites, gold was between 26 and 48 percent recovered to the pan concentrate, grading between 1,194 and 3,680 g/t Au. These concentrates contained between 0.3 and 1.1 percent of the feed mass.

The composites for Guaico, Guayabito and Papi, also responded well to cyanidation. After 48 hours of contact time, gold was between 94% and 97% extracted to solution following a nominal primary grind size of 100 µm K80. The cyanide consumption of the Papi composite, however, was considerably higher than the Guaico and Guayabito composites due to relatively high levels of chalcocite/covellite. Figure 13-2 show the kinetic curves for gold recovery.

Figure 13-2:
Cyanide Leach Test Kinetic Curves



13.3 PRELIMINARY METALLURGICAL TEST THREE (September, 2013)

Two composite samples of 20 kilograms each, labeled as Guaico and Guayabito, were prepared from the coarse rejects of diamond drilling campaigns of the Cisneros Project and sent to CMH's laboratory for their metallurgical characterization. The following tests were carried out on each sample:

- Direct flotation without gravity.
- Gravity concentration, flotation and cyanidation.

- Direct cyanidation.

Two tests of gravity concentration followed by flotation, were carried out for each of the composites. Both tests produced good results. During the first test recoveries of 76.53% and 59.48% were achieved for Guaico and Guayabito, respectively with flotation increasing the recovery to 98.34% and 96.88% for a P_{60}[1] -200 mesh grind size. See Table 13-5 for gold recovery by method of the Test 1.

Table 13-5
Test 1 - Gold Recovery Performance by Method

Composite	Head Au g/t	Gravity Concentrate			Flotation		
		Weight %	Grade Au g/t	Recovery %	Weight %	Grade Au g/t	Recovery %
Guaico	6.13	2.98	157.35	76.53	6.49	21.81	98.34
Guayabito	6.00	2.28	156.45	59.48	6.00	37.39	96.88

In the second test for a P_{80}[2] -200 mesh grind size, recoveries of the mixed concentrate (gravity + flotation) were 97.79% for Guaico and 96.77% for Guayabito were obtained. When these concentrates were subject to cyanidation, recoveries of 93.93% and 97.18% were obtained with total recovery of 91.85% for Guaico and 94.04% for Guayabito (including the gold recovery obtained during cyanidation of the flotation concentrates). See Table 13-6 for the results obtained for Test 2 and Figure 13-3 and Figure 13-4 for the kinetic curves of gold extraction for Guaico and Guayabito.

Table 13-6
Test 2 - Gold Recovery Performance by Method

Composite	Head Au g/t	Gravity Concentrate			Flotation			Leach	
		Weight %	Grade Au g/t	Recovery %	Weight %	Grade Au g/t	Recovery %	Head Au g/t	Recovery %
Guaico	5.26	2.00	175.44	65.58	6.47	26.70	97.79	61.90	93.93
Guayabito	6.72	1.88	234.44	69.23	5.06	34.62	96.77	88.73	97.18

Two tests of direct flotation were carried out, without a previous stage of gravity concentration, the first to make a flotation kinetic and the second to obtain a bulk concentrate. These tests gave the best gold recoveries for both Guaico and Guayabito, 98.43% and 98.34% respectively, the results of these tests can be seen in Table 13-7. Figure 13-5 shows the flotation kinetic curves for Guaico and Guayabito.

Table 13-7
Flotation Without Gravity Gold Recovery

Composite	Head Au g/t	Weight %	Grade Au g/t	Recovery %	Ratio
Guaico	5.26	11.54	50.38	98.43	8.67
Guayabito	6.72	11.00	57.44	98.34	9.09

[1] P_{60} = Aperture through which 60% of the product will pass

[2] P_{80} = Aperture through which 80% of the product will pass

Figure 13-3:
Guaico Cyanide Leach Test Kinetic Curve

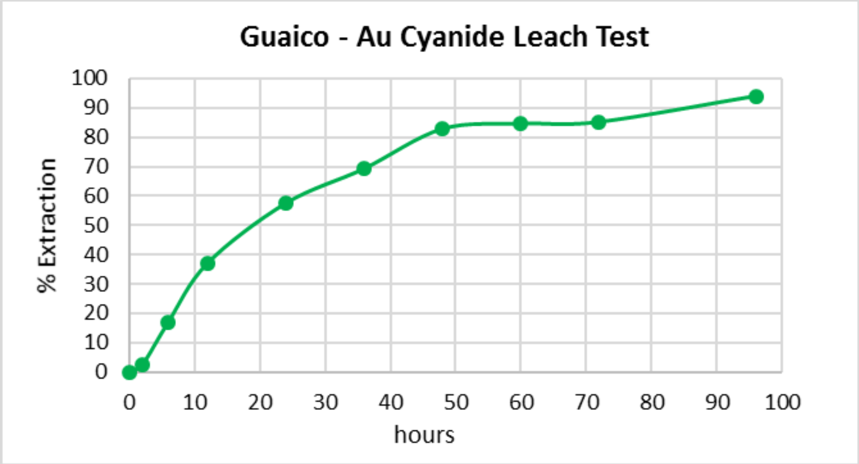


Figure 13-4:
Guayabito Cyanide Leach Test Kinetic Curve

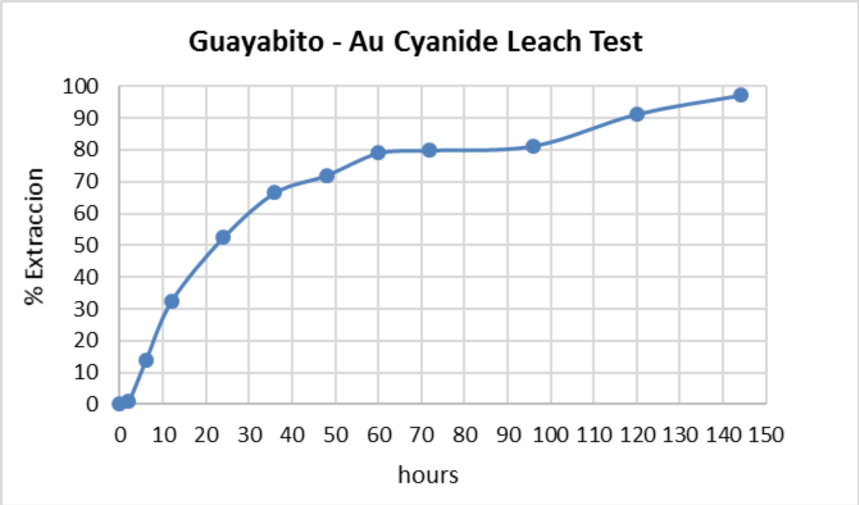
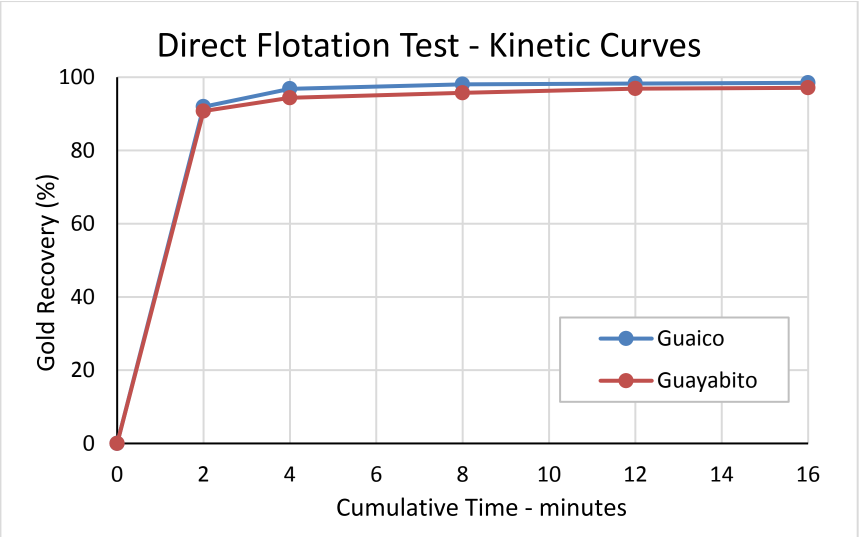


Figure 13-5:
Direct Flotation Test - Kinetic Curves



13.4 PRELIMINARY METALLURGICAL TEST FOUR (April, 2015)

Met-Solve Laboratories was contracted by Antioquia Gold to provide gravity, flotation and leaching test work on three samples (GYB_LG, GCO_LG and HG_Comp). All three samples achieved favorable gravity recovery of gold ranging between 50.8% and 67.1%.

The samples GYB_LG and GCO_LG correspond to duplicates of the samples sent to the CMH laboratory in 2013 (test three), with very similar recovery percentages in both tests, the percent variations are -0.30% and -0.07% for Guaico and Guayabito, respectively. The sample HG_Comp, was prepared with coarse rejects from DDH's drilled at both Guaico and Guayabito, the objective of this composite was to produce a sample with a high grade close to 10 Au g/t.

The gravity concentrate was leached at low cyanide levels (0.3 g/L NaCN) for a duration of 48 hours. In all three samples, good gold recovery (87.6% - 99.3%) was achieved by cyanide leaching of the gravity concentrate. The higher grade sample (HG_Comp) was re-leached and yielded an additional 10.0% of gold, produce an overall recovery of 97.6%.

The flotation tests were very successful with gold recoveries ranging between 96.7% to 97.9%. A verification leach at higher cyanide levels (2.0 g/L) on flotation concentrate achieved recoveries ranging from 87.8% - 92.5%. Figure 13-6, shows the cyanide leach kinetic curve for the HG_Comp gravity concentrate.

The test work on each of the three composites was conducted according to the flowsheet presented in Figure 13-6. Tables 13-8, 13-9 and 13-10 shows the summary of results for each test of the composite samples. Figure 13-7 shows the kinetic curve for the cyanide leach process performed on a high grade composite from a gravity concentrate.

Figure 13-6:
Test Work Flowsheet

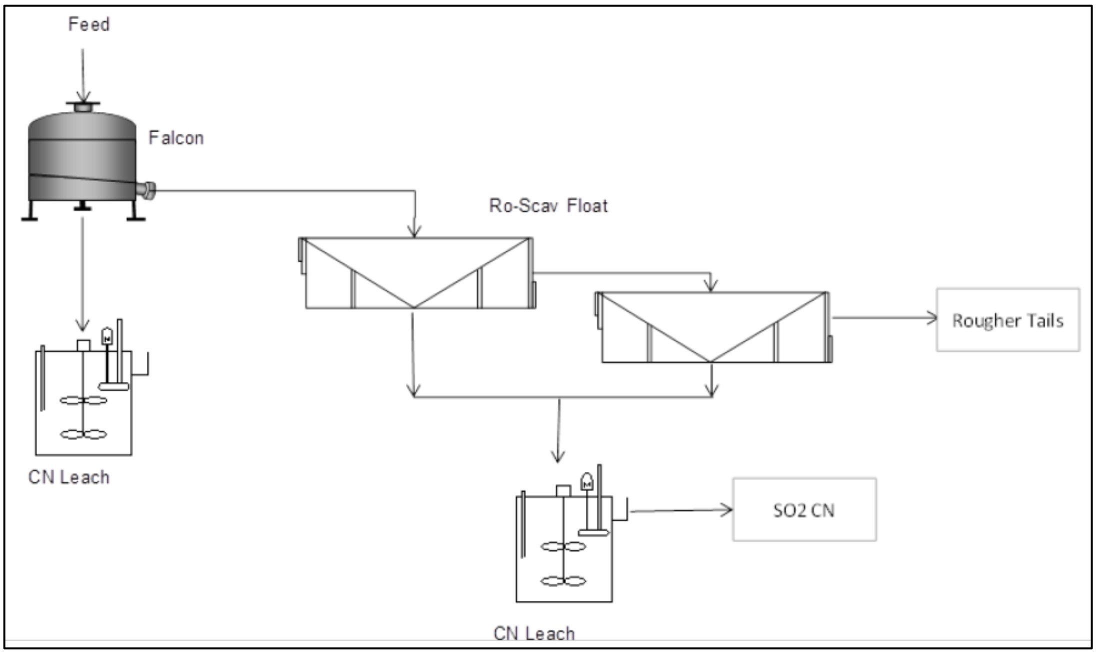


Table 13-8
Stage Gravity Results (based on duplicate tail assays)

Gravity	GCO_LG	GYB_LG	HG Comp
Recovery (%)	55.70	49.40	66.70
Concentrate Mass(%)	3.33	3.25	3.53
Concentrate (g/t Au)	94.40	75.10	160.10
Calc. Head (g/t Au)	5.64	4.94	3.48
Gravity Tails (g/t Au)	2.59	2.59	2.93

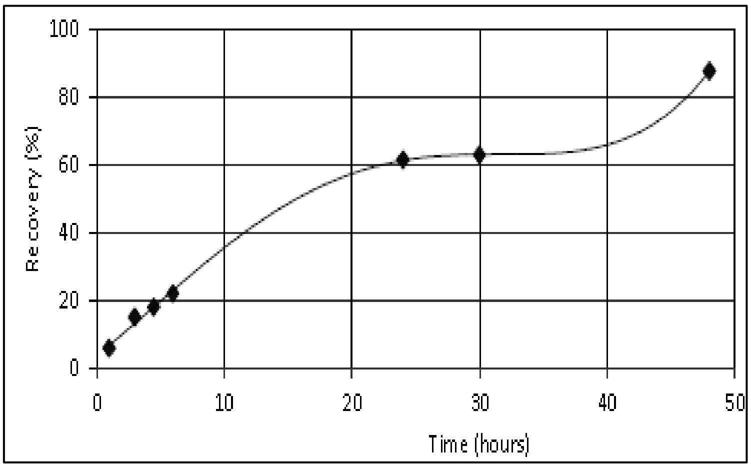
Table 13-9
Flotation Summary

Flotation	GCO_LG	GYB_LG	HG Comp
Recovery (%)	97.50	96.70	97.90
Concentrate Mass (%)	5.70	4.00	10.00
Concentrate (g/t Au)	25.30	64.50	54.50
Calc. Head (g/t Au)	1.52	2.64	5.59
Flotation Tails (g/t Au)	0.04	0.09	0.13

Table 13-10
Cyanide Leach on Gravity Concentrate

0.3 g/L NaCN	GCO LG	GYB LG	HG Comp	HG Re-Leach
Recovery (%)	99.3	96.7	87.6	81.0
Calc. Head (g/t Au)	94.4	75.1	160.1	19.9
Leach Tails (g/t Au)	0.69	2.46	19.86	3.80
Cu in Pregnant (ppm)	150.60	156.30	225.30	199.30
CN Consumption (kg/t)	0.85	0.82	1.21	1.11

Figure 13-7:
Cyanide Leach Kinetic Curve for HG Comp Gravity Concentrate



13.4.1 Physical Characterization

Limited physical characterization was performed. A value of 14.1 kWh/t (12.8 kWh/st) was obtained from a single Bond Ball Work Index (BBWi) test carried out on a mixed GYB/GCO composite sample indicating that this is medium-hard.

Measured specific gravities for Guayabito and Guaico mineral samples were reported to be 2.72 and 2.83, respectively. Also, natural pH measurements indicated values of 8.01 and 8.23 for Guayabito and Guaico mineral samples.

13.5 PRELIMINARY METALLURGICAL TEST FIVE (August, 2017)

AGD submitted to CMH metallurgical laboratory a 30 kg composite sample from the Nus mineralized structure to perform a gravimetric – flotation test; Table 13-11 shows the results of this test.

Table 13-11
Nus Gravity– Flotation Test

Products	Weight (%)	Au g/t	Recovery (%)
Head	100	2.86	
Concentrate	10.74	25.68	96.56
Tails	89.26	0.11	

The Nus mineralization responds well to floatation and allows production of a concentrate that represents a gold recovery of 96.56%, despite having a low head grade of 2.71 g/t Au.

13.6 METALLURGICAL TEST WORK SUPPORTING 2017 PEA

Metallurgical test work involving gravity concentration, flotation and flotation concentrate cyanide leaching were conducted on three (3) samples representing Guaico, Guayabito and Nus mineralized zones. The following sections are a compilation and discussion of the results of two metallurgical tests carried out in September 2013 (metallurgical test three for Guaico y Guayabito) and August 2017 (metallurgical test five for Nus) both performed in the CHM Laboratory (read the cautionary note at the end of this chapter).

13.6.1 Direct Flotation Test Work

Direct flotation tests were conducted on composite samples representing the Guaico, Guayabito and Nus mineralized zones. Tests were carried out with similar operating parameters to evaluate and compare their amenability to these recovery methods.

Results shown in Table 13-12, Table 13-13 and Table 13-14, indicate that samples sourced from the three mineralized zones (Guaico, Guayabito and Nus) were amenable to flotation, reflected in the high recoveries achieved. Recoveries reported were 98.34% and 98.43% from Guaico and Guayabito composite samples, respectively. Concentration ratios for Guaico and Guayabito mineral samples were 8.67 and 9.09, respectively.

Table 13-12:
Flotation Test Results for Guaico Mineral Sample

Stream	Weight (%)	Grade (g/t, Au)	Recovery (%)	Concentration Ratio
Head – assayed	-	5.26	-	-
Head - calculated	100.00	5.91	-	-
Concentrate	11.54	50.38	98.43	8.67
Tails	88.46	0.11	-	-

Table 13-13:
Flotation Test Results for Guayabito Mineral Sample

Stream	Weight (%)	Grade (g/t, Au)	Recovery (%)	Concentration Ratio
Head – assayed	-	6.72	-	-
Head - calculated	100.00	6.43	-	-
Concentrate	11.00	57.44	98.34	9.09
Tails	89.00	0.12	-	-

Table 13-14:
Flotation Test Results for Nus Mineral Sample

Stream	Weight (%)	Grade (g/t, Au)	Recovery (%)	Concentration Ratio
Head – assayed	-	2.71	-	-
Head - calculated	100.00	2.86	-	-
Concentrate	10.74	25.68	96.56	9.31
Tails	89.26	0.11	-	-

Despite the low gold head grade (2.71 g/t) reported for the Nus sample, a strong flotation recovery was obtained (96.56%) while showing a concentration ratio of 9.31. This indicates a similar behaviour to that shown by Guayabito and Guaico samples which in turn poses no further complexity in treating the gold bearing ores in accordance with the proposed process flowsheet.

13.6.2 Gravity Concentrate and Flotation Test Work

A series of tests consisting of gravity concentration followed by flotation of the gravity tailings were carried out on samples corresponding to mineralized zones Guaico and Guayabito (test three). These tests were preceded by grinding tests to optimize the milling time to reach the target grind size. Only one recovery test through a combination of gravity and flotation was performed on the Nus mineral sample (test five).

Concentration by gravity was conducted on a laboratory gravity centrifugal concentrator fed with mineral slurry at a density of 20% solids. Both streams, gravity concentrate and tailings were assayed to determine gold content. Gravity tailings are further processed by flotation.

Results shown in Table 13-15 and Table 13-16 indicate strong gravity recoveries for both mineral samples (65.58% and 69.23% for Guaico and Guayabito, respectively) which suggests the presence of coarse free gold. Similarly, gravimetric tailings were amenable to flotation which indicates the occurrence of gold in association with sulphur species. Overall recoveries for Guaico and Guayabito samples are reported to be 97.79% and 96.77%, respectively.

Table 13-15:
Combined Gravity-Flotation Test Results for Guaico Sample

Stream	Weight (%)	Grade (g/t, Au)	Recovery (%)		Concentration Ratio	
			Partial	Cum.	Partial	Cum
Head – calculated	100	5.36		-	-	-
Gravimetric concentrate	2.00	175.44	65.58	65.58	49.90	-
Gravimetric tailings	98.00	1.88				-
Flotation concentrate	6.47	26.70	32.21	97.79	15.16	-
Tailings concentrate	91.53	0.13	-	-	-	-
Mixed concentrate	8.47	61.70	-	97.79	-	11.81

Table 13-16:
Combined Gravity-Flotation Test Results for Guayabito Sample

Stream	Weight (%)	Grade (g/t, Au)	Recovery (%)		Concentration Ratio	
			Partial	Cum.	Partial	Cum
Head – calculated	100	6.36		-	-	-
Gravimetric concentrate	1.88	234.44	69.23	69.23	53.22	-
Gravimetric tailings	98.12	2.00				-
Flotation concentrate	5.06	34.62	27.54	96.77	19.39	-
Tailings concentrate	93.06	0.22	-	-	-	-
Mixed concentrate	6.94	88.73	-	96.77	-	14.41

13.7 IMPLICATIONS OF THE METALURGICAL TESTWORK

The following metallurgical implications are highlighted based on the results of the gravimetry and flotation tests:

13.7.1 Effect of Au Grades on Recoveries

The effect of the gold grade on the recoveries reached is evident in the results of the tests carried out at G&T in 2010, with a combined gravimetric and flotation processes, where recoveries were 97% and 96%, with gold head grades 17.9 g/t and 38.1 g/t Au for Guaico and Guayabito, respectively. In tests conducted at Met-Solve in 2015, similar results were obtained for head grades of 4.94 g/t and 5.64 g/t Au for both mineralized zones. The results of these two tests are shown in Table 13-14.

Table 13-17:
Metallurgical Testwork Performed by G&T and Met-Solve Laboratories

Test Laboratory	Zone	P_{80} microns	Calculated Head (Au g/t)	Used Process	Recovery Au (%)
G&T	Guaico	100	17.9	Grav + Flot.	97
	Guayabito	100	38.1	Grav + Flot.	96
Met-Solve	Guaico	109	5.64	Grav + Flot.	97.5
	Guayabito	109	4.94	Grav + Flot.	96.7

13.7.2 Effect of Particle Size on Gold Extraction

The effect of particle size on gold extraction can be seen in the similarity of the recovery results of the G&T and Met-Solve laboratories, shown in Table 13-17, for the particle size

P_{80} 100 microns (G&T) and 109 microns (Met-Solve). Based on these results, it is recommended to perform combined gravimetric and flotation tests in slightly coarser grinding sizes, for example, at P_{80} = 120 to 150 microns, for the Guaico, Guayabito and Nus mineral samples. The larger the particle size, the shorter the grinding time and the lower the power consumption. It is not recommended to grind in finer sizes (P_{80} < 100 microns) because mud could be produced in the feed, which would affect the flotation of sulfides, causing a decrease in gold recoveries.

13.7.3 Effect of Flotation Time on Gold Extraction

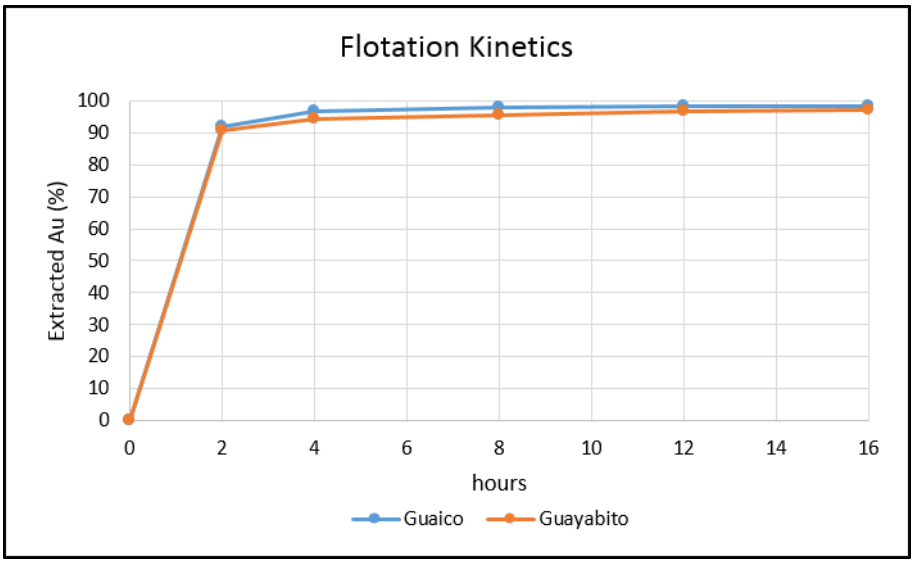
The effect of the flotation time on the Guaico and Guayabito ores is very similar, as can be deduced from the metallurgical tests for two composites carried out by CMH and reported in the MEMORANDUM No: LM-030-13 dated September 2, 2013. In the tables and graphs that accompany this document it can be clearly seen that the kinetics of both samples are almost identical. Figure 13-8, combines both curves and these almost overlap.

The conclusion for the visual comparison of both curves in Figure 13-8, is that both ores have a very similar behavior in the flotation process and that the gold associated with the iron sulfides is extracted quickly in the flotation process. The ores of Guaico and Guayabito, have fast kinetics, indicating that it is sufficient to use rougher circuits to reach gold recoveries close to 98%.

These findings agree with results obtained in the mineralogical characterization of ores from the Guaico and Guayabito areas, showing free gold associated with iron sulphides.

The reagents used in the flotation are standard for the flotation of the pyrites (PAX Z-6, Aerofloat, MIBC, lime and copper sulphate).

Figure 13-8:
Kinetic Flotation Curves for Guaico and Guayabito Zones



13.8 Cautionary Note

The metallurgical test works carried out in the Consorcio Minero Horizonte (CMH) Laboratory, for Metallurgical Test Work Three and Metallurgical Test Work Five, are not independent tests because CMH is the principal shareholder of Antioquia Gold Limited

(AGD). However, the results for the Guaico and Guayabito samples (Metallurgical Test Work Three), were validated by sending duplicates to an independent laboratory (Met-Solve Laboratories, Metallurgical Test Work Four, April 2015). The results of gold recovery percentages were very similar with percentage variations of -0.30% and -0.07% for Guaico and Guayabito, respectively. The delivery of sample duplicates of Metallurgical Test Work Five (from the Nus deposit) to an independent laboratory for validation, is pending.

14.0 MINERAL RESOURCE ESTIMATE

14.1 KEY ASSUMPTIONS/BASIS OF ESTIMATE

The Mineral Resource Statement presented herein represents the updated Mineral Resource estimate prepared by LINAMEC for the Cisneros Gold Project in accordance with the Canadian Securities Administrators' National Instrument 43-101.

The Mineral Resource Estimates (MRE) prepared by LINAMEC utilized a total of 110 drill holes, included 14 new drill holes drilled by AGD in 2016-2017 and 1,130 underground channels, sampled between 2016 and 2017. The resource estimate was completed by Mr. Fernando Linares MEng, (MAusIMM), Principal Resource Geologist with Linares Americas Consulting S.A.C. and Mr. Edgard Vilela P. Geo and MAusIMM (CP), who have reviewed pertinent geological information in sufficient detail to support the data incorporated in the Mineral Resource Estimate. Mr. Vilela is an Independent Qualified Person and Australian institute of Mining and Metallurgy (AUSIMM) Chartered Professional as defined under NI 43-101CP. The effective date of the Mineral Resource statement is September 24, 2017.

This estimation approach was considered appropriate based on a review of a number of factors, including the quantity and spacing of available data, the interpreted controls on mineralization and the style of mineralization. The estimation was constrained within mineralized geological-grade interpretations that were created with the assistance of AGD's geologists.

14.2 GEOLOGICAL MODELS

High-grade precious metal mineralization at Cisneros is largely confined to vein domains which comprise a complex array of one or more veins, veinlets and fracture-related wall-rock disseminations. The vein domains are referred to by the shorthand name "veins" in this report. Such vein domains have very large strike and dip extents compared to their horizontal widths.

Cisneros is comprised of several mineral deposits:

1. Guaico Domain including:
   a. Guaico
   b. Guaico Footwall-03
   c. Guaico Footwall-05
   d. Vega
2. Guayabito Domain Including:
   a. Guayabito Norte, 22 veins (not updated).
   b. Guayabito Sur.
3. NUS Domain Including:
   a. Nus vein
4. La Manuela Domain Including:
   a. La Manuela-01 vein
5. Papi Domain (not updated).

For locations of the mineral deposits, see figures 7-3, 9-2 and 14-1.

The resources at Guayabito Norte, or simply Guayabito, and the Papi Deposit, remain unaltered since the mineral resource estimate in 2013. The Guayabito MRE includes 22 veins and brings the largest quantity of gold ounces to the Cisneros Project. Both deposits ware interpolated using Inverse Distance Power 3 (ID3) for gold only and reported in this updated MRE.

Where available, underground channel samples were incorporated into the data set and provide detailed grade information through the extents of the underground openings sampled. The issue of mixed sample supports, (channel vs. drill hole) and number and variability of samples in the database is addressed locally before mineral resource categories are identified. The database, for the present MRE update, consists of 110 DDH's with 8,567 assay records, and 1,130 channels with 3,952 assay records. The total of composite data sums 10,226 records.

For modelling of the main mineralized structures, LINAMEC used GEMS, while AGD geologists use Surpac. The modelling was based upon information obtained from drill hole and channel sampling databases, which compiles the different lithological, mineralogical, structural and alteration characteristics in the Guaico Domain.

The topographic surface is based on a LIDAR (*Laser Imaging Detection and Ranging*) survey provided for Airborne Solutions International to AGD.

14.3 SOLID MODELLING

For Guaico deposit, five new 3D solids (veins) were created using Leapfrog Geo 4.0 software, the attributes modelled were gold grades and the width of sample channels; this methodology allows an adjustment of the mineralized structures and avoids an overestimation of the volumes. AGD's geologists validated and finished the solids using Surpac software.

Leapfrog uses implicit modelling to create a 3D geological solid. An Implicit Model is a continuous mathematical representation of an attribute across a volume. It has an infinitely fine resolution. Creating tangible surfaces from this model is a separate and secondary step and is independent of the creation of the Implicit Model. Implicit modelling uses radial basis functions (RBFs) to model grade shells, lithology boundaries, faults or surfaces.

Implicit modelling generally has three distinct parts:

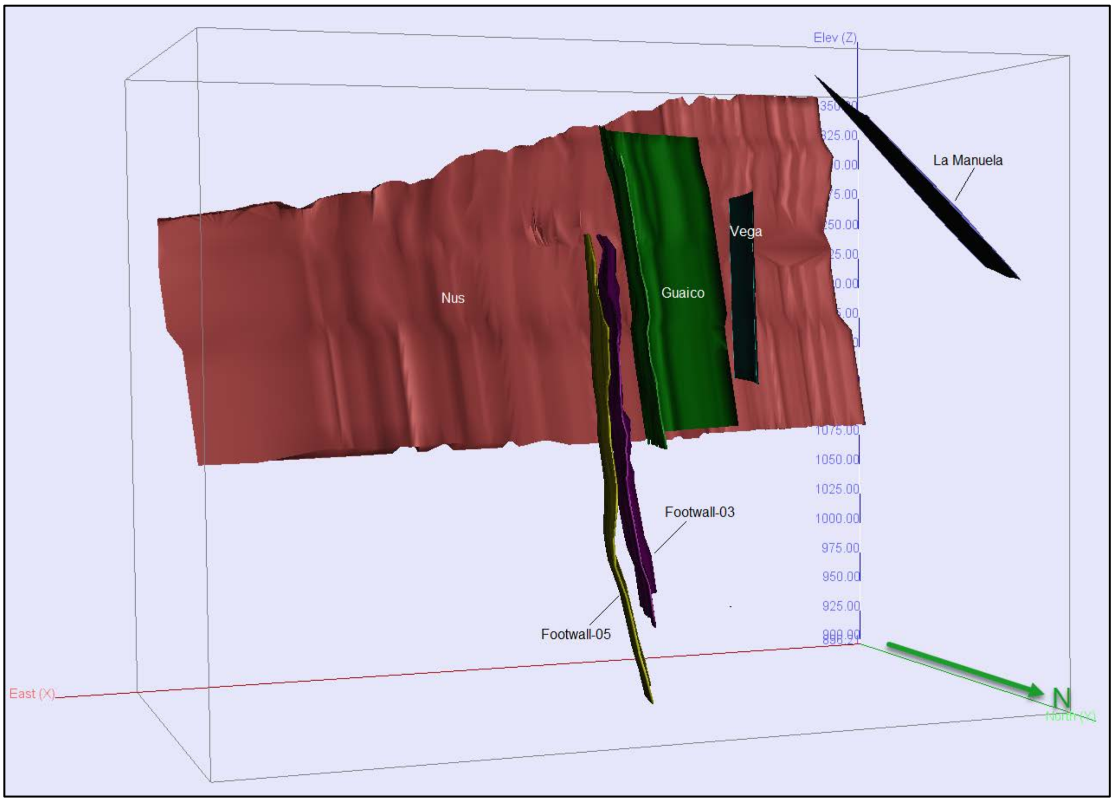
1. Organize the data into an appropriate format (error free database).
2. Generate a continuous, volumetric model (the implicit model).
3. Output one or more surfaces contained in the model.

The Leapfrog solids were edited in Surpac software by AGD geologists, drawn on horizontal plan-views 10 m apart, to produce the final solid-veins that were used like hard contacts in the interpolation process. Inside these solids mineralization zones were defined, considering composited gold values of the intercepts of the DDH's and channels within the modeled structures. The Guaico and NUS domain veins were encoded for use in Leapfrog Geo and GEMS. The following mineralized structures were modelled with Leapfrog software and Surpac software (Table 14-1). Figure 14-1 shows the 3D modelled mineralized structures at the Cisneros Property.

Table 14-1
Data Used to Model Mineralized Structures

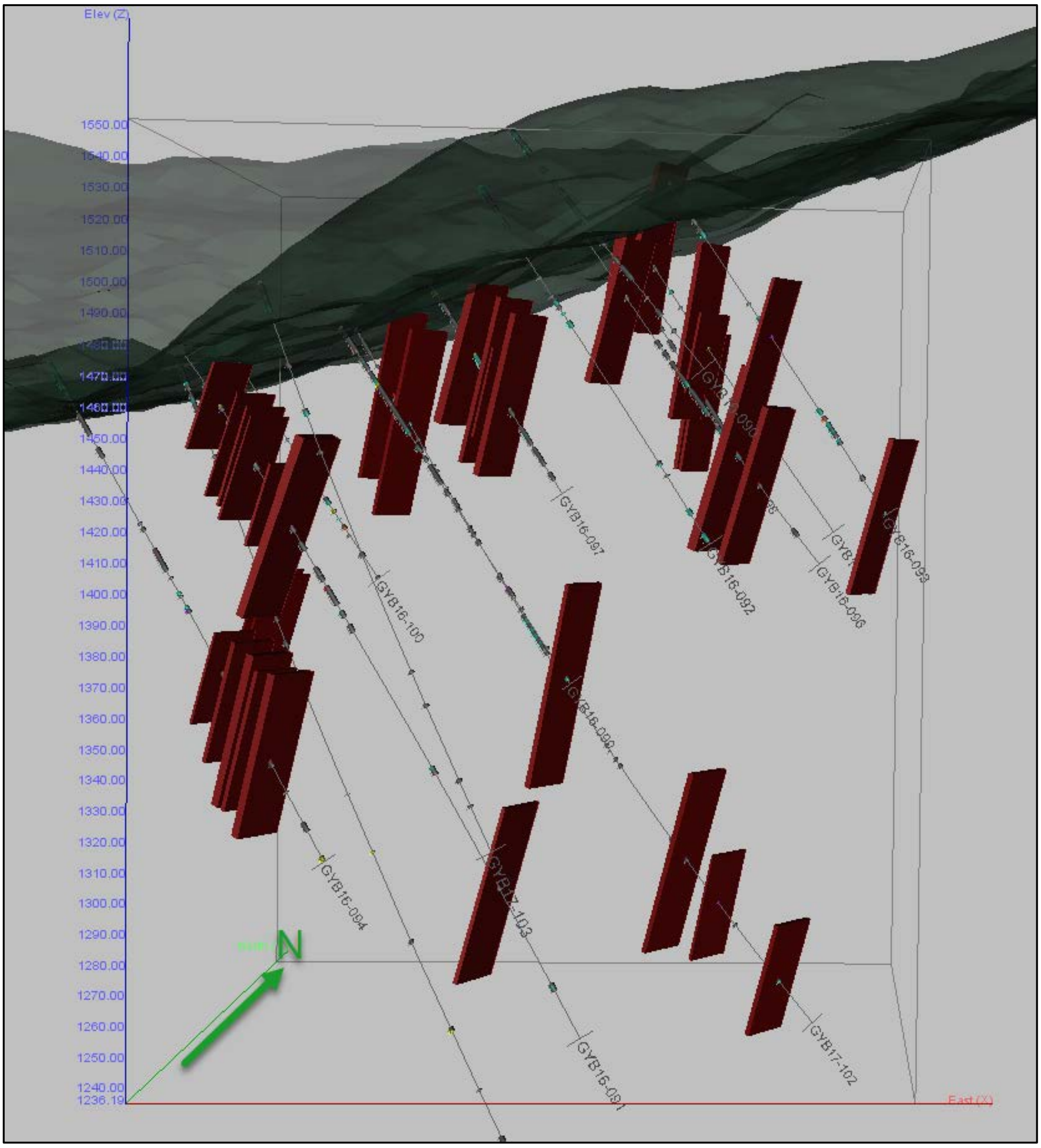
Vein	Rock Code	Rock Type	Channel Samples	DDH Samples	Total Points
NUS	NUS	130	1,228	184	846
Guaico	GCO	100	334	105	439
Footwall-03	GCFW3	101	201	74	280
Footwall-05	GCFW5	103	117	49	162
Vega	VEGA	181	32	1	33
La Manuela-01	MNL_1	191	63	4	67
TOTAL			**1,975**	**417**	**2,392**

Figure 14-1:
3D Modelled Veins at Guaico - Nus Deposits



A set of 11 cross-sections were used for modelling the solids in the Guayabito Sur area, using a traditional interpretation in sections, A total of 37 new solids were created by extrusion and named as Guayabito-Sur 1 to 37 (GYBS). These solids are parallel to the strike and dip of Guayabito Norte with an azimuth of 30º and a dip of -85º NW, see Figure 14-2. These veins are probably the southern extension of the Guayabito veins.

Figure 14-2:
Guayabito Sur Modelled Solids by Extrusion with DDH's



14.4 EXPLORATORY DATA ANALYSIS (EDA)

LINAMEC did a complete statistical analysis of the Cisneros Project data for assays, composites and capped composites. This statistical analysis of the composites was used to set the capping value by domains and veins with enough data to produce reliable statistics. The capped composite data were utilized in the interpolation process and resource estimation.

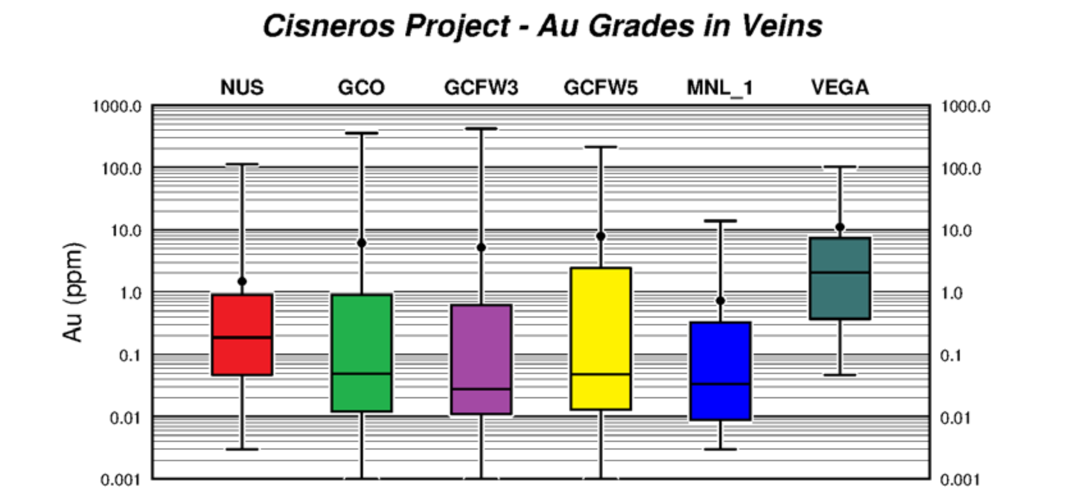
The EDA results are useful to validate the resource estimate by comparing the average of gold grade composites against block model values. The statistical tools used were histograms, probabilistic plots and box plots. The histograms and boxplots are accompanied by descriptive statistics which provide the mean and coefficient of variation. The coefficient of variation (CV) is the standard deviation divided by the mean and is a measure of relative variability. Typically, most disseminated gold deposits show coefficients of variation around 1.0 to 2.0. Where higher values occur, they may indicate a mixture of populations with widely varying means.

14.5 SUMMARY STATISTICS – ASSAYS

Raw data (assays) statistics based on the mineralized veins are shown in the boxplot of Figure 14-3 for NUS, Guaico (GCO), Guaico Footwall-03 (GCFW3), Guaico Footwall-05 (GCFW5), La Manuela-01 (MNL_1) and Vega (VEGA).

The CV for Footwall-03 Vein and Guaico Vein have the highest values of 5.92 and 4.73, respectively (see Figure 14-3), due mainly to a mix of background population with mineralized population, this is clearly visible in the probabilistic plot for Footwall-03 and Guaico Veins, (see Figure 14-7 for Guaico Vein).

Figure 14-3
Boxplot for Cisneros Veins – Raw Data



	NUS	GCO	GCFW3	GCFW5	MNL_1	VEGA	
Number of data	1412	439	275	166	67	33	Number of data
Mean	1.4967	6.1466	5.2214	7.8829	0.7302	11.1421	Mean
Maximum	112.85	355.0	416.91	214.4	13.78	102.44	Maximum
Upper quartile	0.9155	0.911	0.6139	2.4035	0.3264	7.3424	Upper quartile
Median	0.1867	0.0486	0.028	0.048	0.034	2.0438	Median
Lower quartile	0.047	0.012	0.011	0.013	0.009	0.3713	Lower quartile
Minimum	0.003	0.001	0.001	0.001	0.003	0.047	Minimum
Variance	23.8181	845.482	954.781	653.395	3.8196	605.698	Variance
CV	3.2607	4.7306	5.9179	3.2426	2.6763	2.2088	CV
Skewness	12.2097	9.0081	10.9782	5.8339	4.0438	3.0828	Skewness

*Coefficient of variation (CV) = standard deviation divided by the mean.

Figure 14-4 shows the histogram of gold assay grades for the Nus Vein. The histogram has a log-normal distribution with a mean of 1.497 g/t Au and a CV of 3.26. Figure 14-5 shows a Cumulative Probability Plot with a remarkable inflexion at about 15 ppm Au.

Figures 14-6 and 14-7 show a histogram and probabilistic plot, respectively for the Guaico Vein. The curve of the probabilistic plot shows at least, three populations: one population is the background population at <0.02 g/t Au, a mineralized population occurs between 0.02 to 10.0 g/t Au, this population has a log normal distribution, and a high grade population (greater than 10 g/t Au).

Figure 14-4
Weighted Gold Assay Histogram, NUS Vein

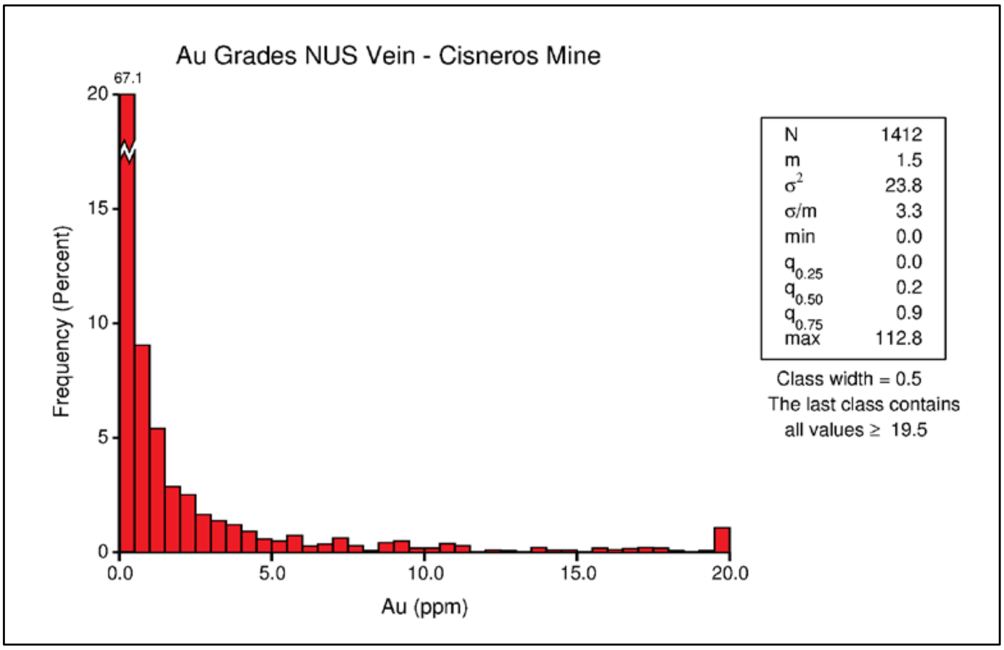


Figure 14-5
Cumulative Probability Plot Gold All Points, NUS Vein

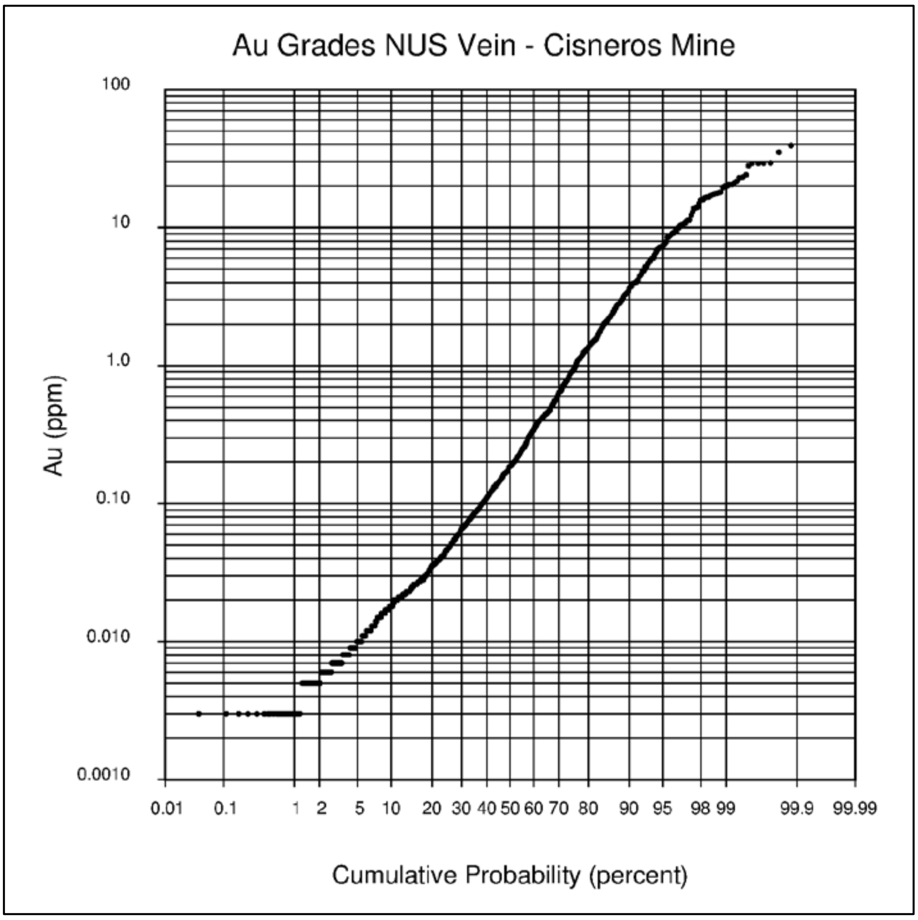


Figure 14-6
Weighted Gold Assay Histogram, Guaico Vein

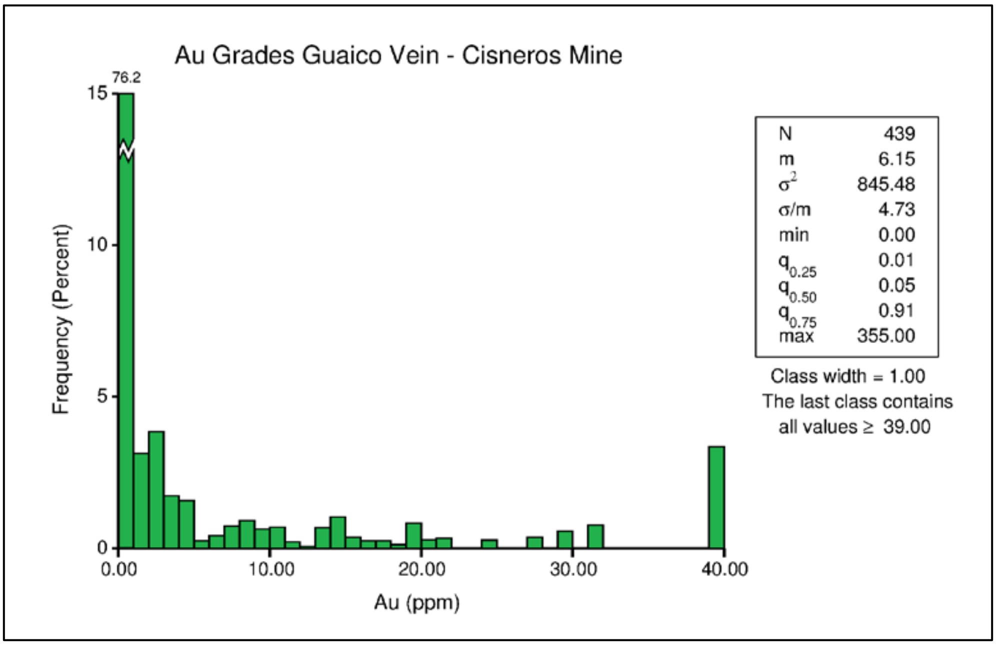
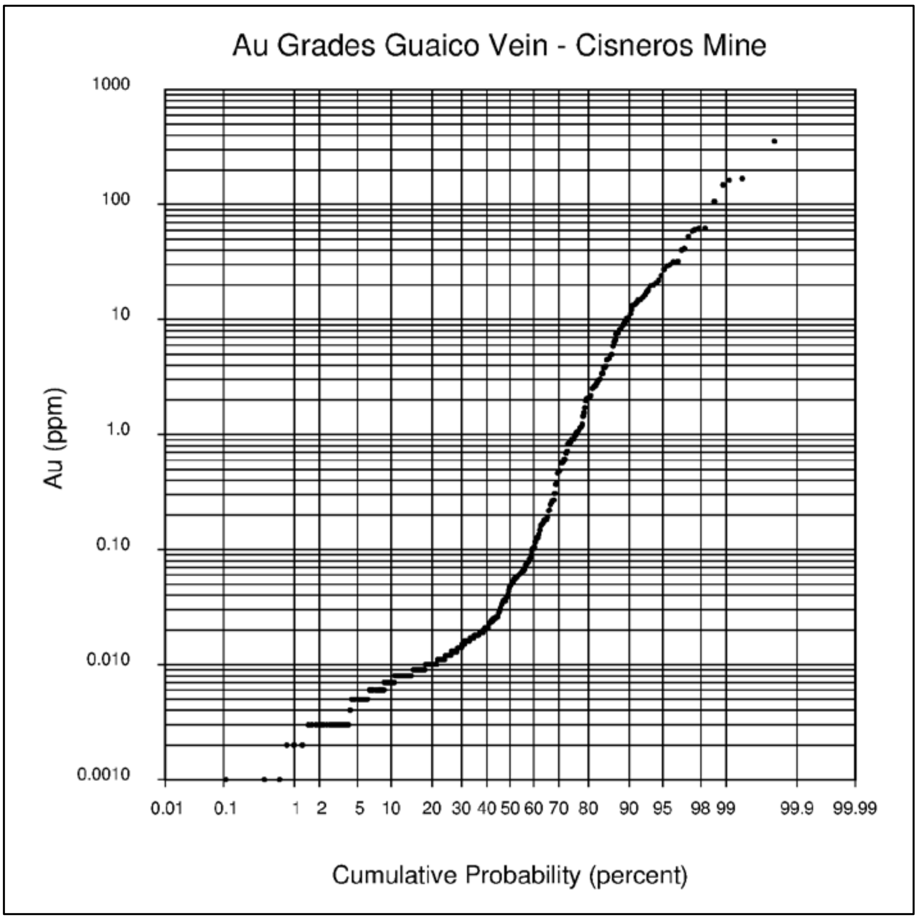


Figure 14-7
Cumulative Gold Probability Plot, Guaico Vein



14.6 SUMMARY STATISTICS – COMPOSITES

LINAMEC, composited the assays from Guaico, Footwall-03, Footwall-05, Vega and La Manuela-01, into 0.80 m intervals for grade interpolation and subsequent exploratory data analysis. For the Nus mineralized structure, the assay data were composited into 2.0 m intervals. The composite datasets were completed using the Geovia GEMS mining software package.

The global effect of the compositing produces negligible effect to the total length and mean grade. A decrease in the sample variance is noted as a natural effect of compositing. The composite files were used for all statistical, geostatistical and grade estimation studies. For the Guaico area (five veins), the majority of the sampling used 0.5 m sample intervals, with a small number of sample lengths ranging from 0.5 m to 3 m and mean lengths equal to 0.76 m, see Figure 14-8 for Sample Length Histogram for the Guaico Vein. For the Nus mineralized structure, the majority of the sampling used 1.0 m sample intervals, with a small number of sample lengths ranging from 0.1 m to 3.2 m and mean lengths equal to 1.0 m (see Figure 14-9 for sample length histogram for the Nus mineralized structure).

This statistical analysis of the composite data was used to set the capping value by zone and veins with enough amounts of data to produce reliable statistics. The capped composite data were utilized in the interpolation process and resource estimation. The statistical tools used were histograms, probabilistic plots and box plots.

Composite statistics for the updated veins of the Cisneros Property are summarized in the boxplot of Figure 14-11, which displays graphically the statistics of each vein and permits comparison of them all together.

Figure 14-8
Sample Lengths Histogram – Guaico Vein

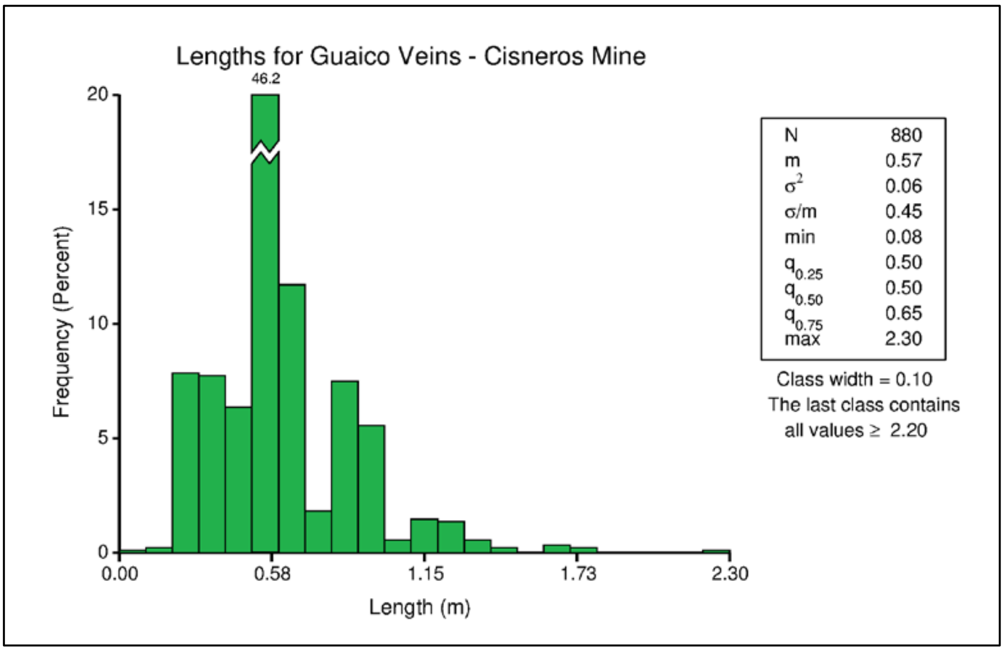


Figure 14-9
Sample Lengths Histogram – Nus Mineralized Structure

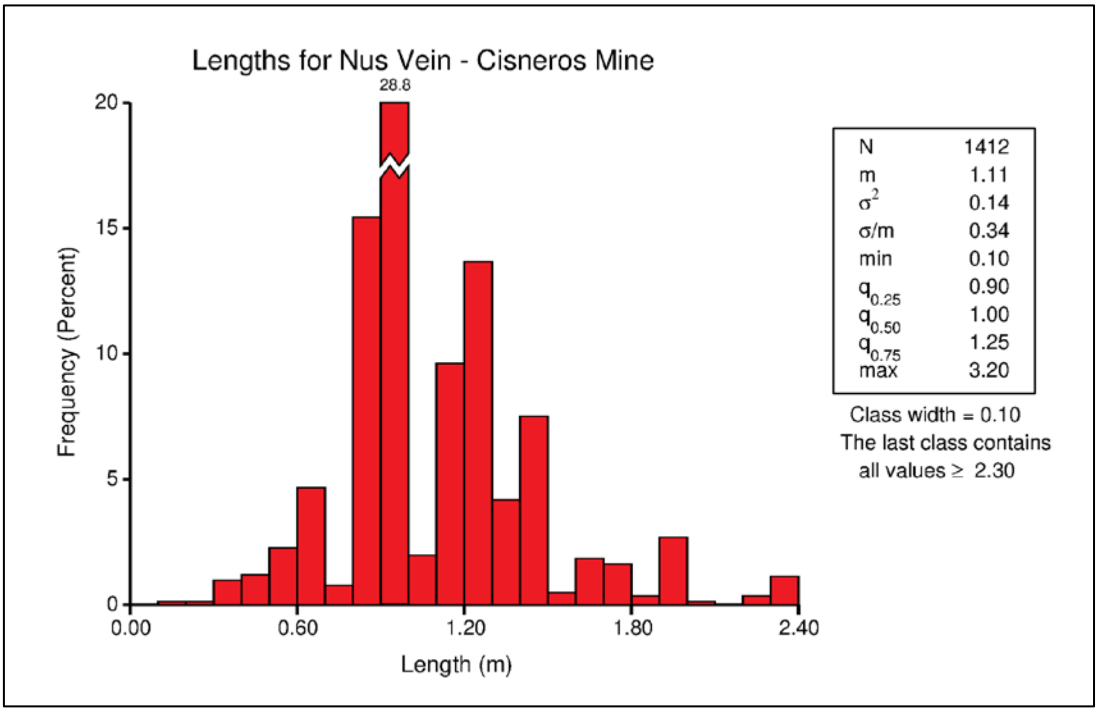
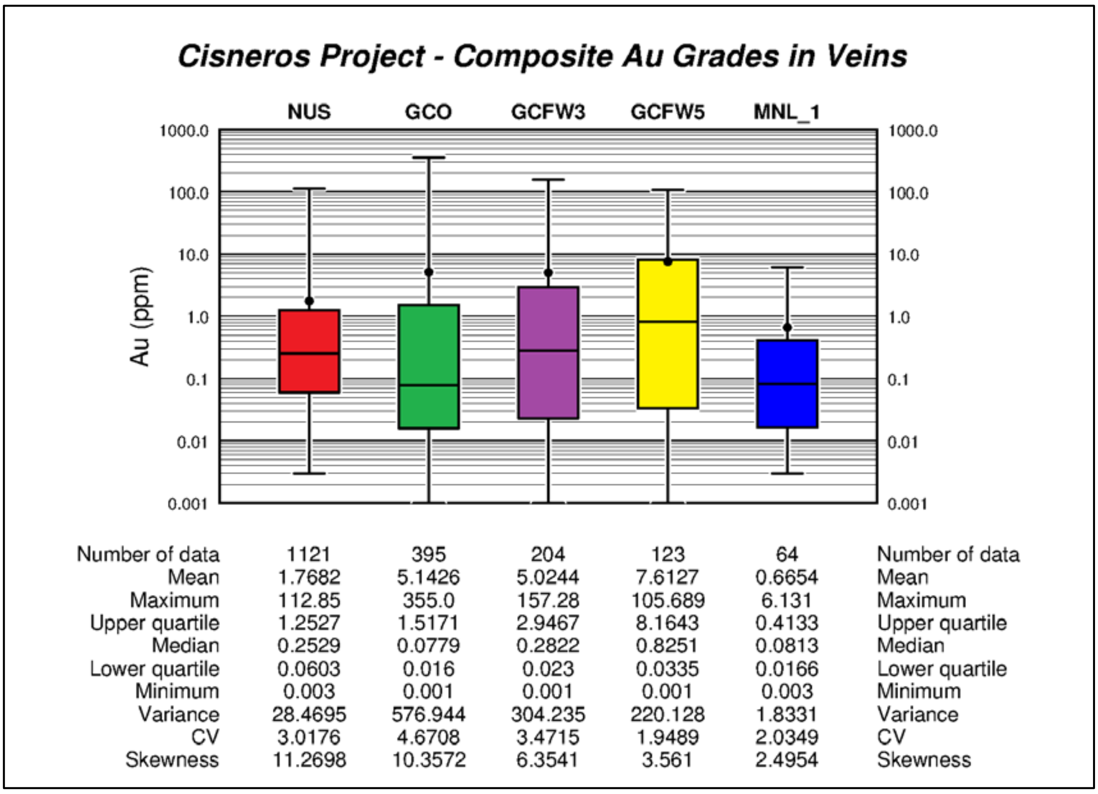


Figure 14-10
Boxplot for Cisneros Veins – Composite Data



14.7 GRADE CAPPING/OUTLIER RESTRICTIONS

High-grade capping (cutting) was determined for each vein. The composite data for each of the veins generally had a positively skewed grade distribution characterized by differences between mean and median grades, and moderate to high coefficients of variation (CV, standard deviation/mean). The CV is a relative measure of skewness and values greater than one can often indicate distortion of the mean by outlier data.

The requirement for high-grade caps was assessed via a number of steps to ascertain the reliability and spatial clustering of the high grade composites. The steps completed as part of the high-grade cap assessment included:

- A review of the composite data to identify any data that deviate from the general data distribution. This was completed by examining the cumulative distribution function.
- A review of summary statistics comparing the percentage of metal and change in CV caused by the high-grade cuts.
- A visual 3D review to assess the clustering of the higher-grade composite data.

Based on the review, appropriate high-grade caps were selected for each zone. The application of high-grade caps resulted in relatively few data being capped. The capping has resulted in a minor reduction in the mean grade except for the Guaico vein, where the capping of 31 outlier values resulted in a 32.9% reduction in the mean grade. The capping was required to reduce the amount of metal which would be artificially added during the estimation process in these zones.

Graphical analysis of Figure 14-11, shows at least, six mixed populations, with log normal distributions, possibly due to multi-phase mineralization or erratic mineralization with a high nugget effect, the high CV of 4.67 indicates this variability. The capping value, for the Guaico Vein System, was set at 12 g/t Au, which corresponds to the upper inflexion of the probabilistic curve (blue line in Figure 14-11).

The Cumulative Probability Plot for composited gold values of the Nus mineralized structure, shows a log normal distribution with an inflexion at 9.5 g/t Au. Nus has a more homogeneous distribution of gold grades, reflected in a lower CV value (3.02). The capping value for the Nus Vein was set at 9.5 g/t Au (see Figure 14-12).

Figure 14-11
Composite Au Grades Cumulative Probability Plot, Guaico Vein

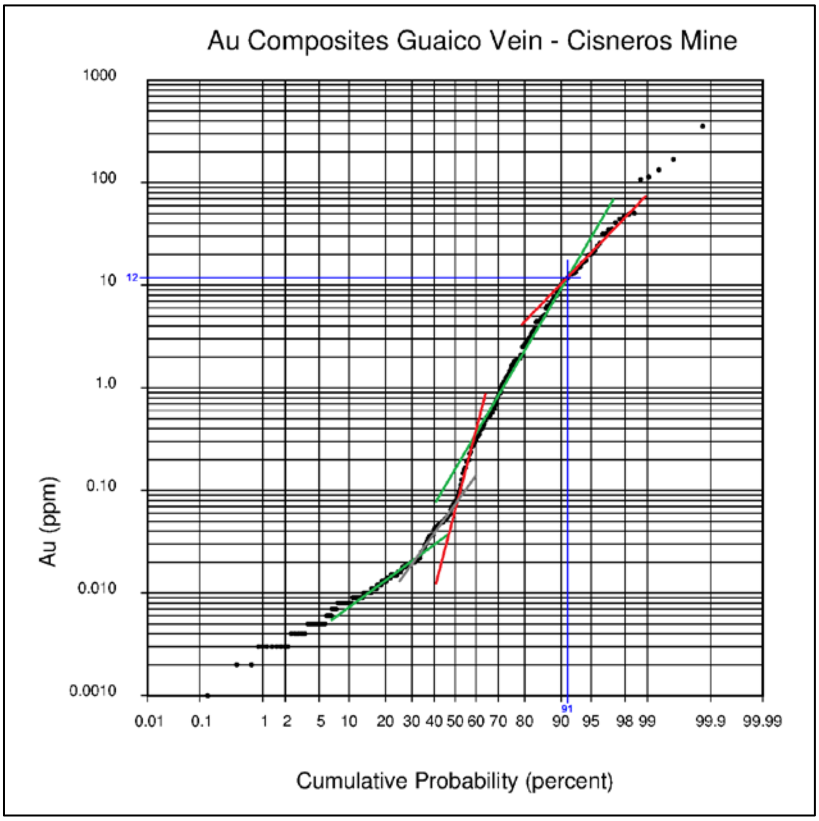
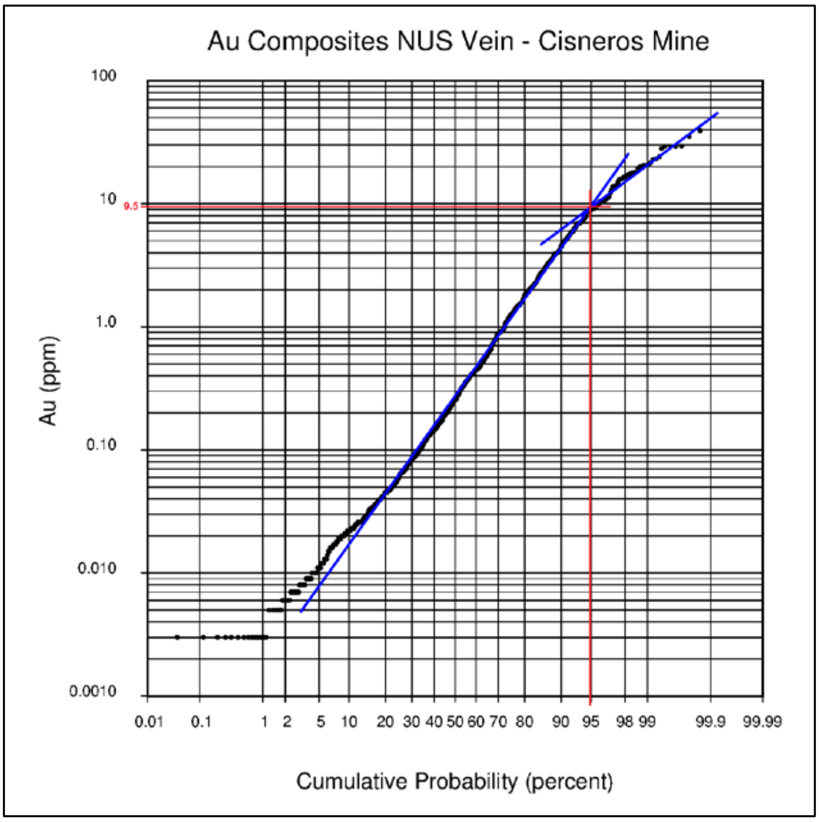


Figure 14-12
Composite Au Grades Cumulative Probability Plot, Nus Vein



14.8 DENSITY ASSIGNMENT

Density determinations, as described in Section 11.3, were used in the mineral resource estimate. The Cisneros database contains 177 bulk density measurements. Average bulk density values were used by veins for the NUS, Guaico and Guayabito systems.

The importance of dry bulk density as one of the three key parameters in the estimation of resources and reserves should not be overlooked. Poor estimates of density can easily have the same impact on resource tonnage as the errors inherent in the interpretation and modelling of the geometry of mineralized zones.

LINAMEC considers that using different density values for individual veins is a good practice and there are sufficient measures of density to estimate tonnage in the present MRE.

14.9 VARIOGRAPHY

Experimental correlograms were calculated and modelled using the GEMS geostatistical tool for the NUS mineralized structure, Guaico Vein, grouped NNE veins (GCO, GCFW3, GCFW5 and VEGA). General aspects of the variography are:

- Experimental correlograms were calculated from capped 2 m composite data for Nus and 0.8 m for Guaico.
- Down hole and directional correlograms were generated.
- Variogram orientations reflected obvious trends for strike, dip and thickness in the data.
- Variograms were modelled with a nugget effect and one spherical structure.

The modelled normalized variogram for the NUS mineralized structure, is shown in Figure 14-13, with a range of 40 m at a direction of 78.75º and $\gamma(h) = 0.30$ nugget effect.

Figure 14-14 shows the normalized variogram for Guaico Vein, with a range of 30 m at a direction of 20º and a 0.65 nugget effect.

Figure 14-13
Modelled Variogram for Au in NUS Mineralized Structure

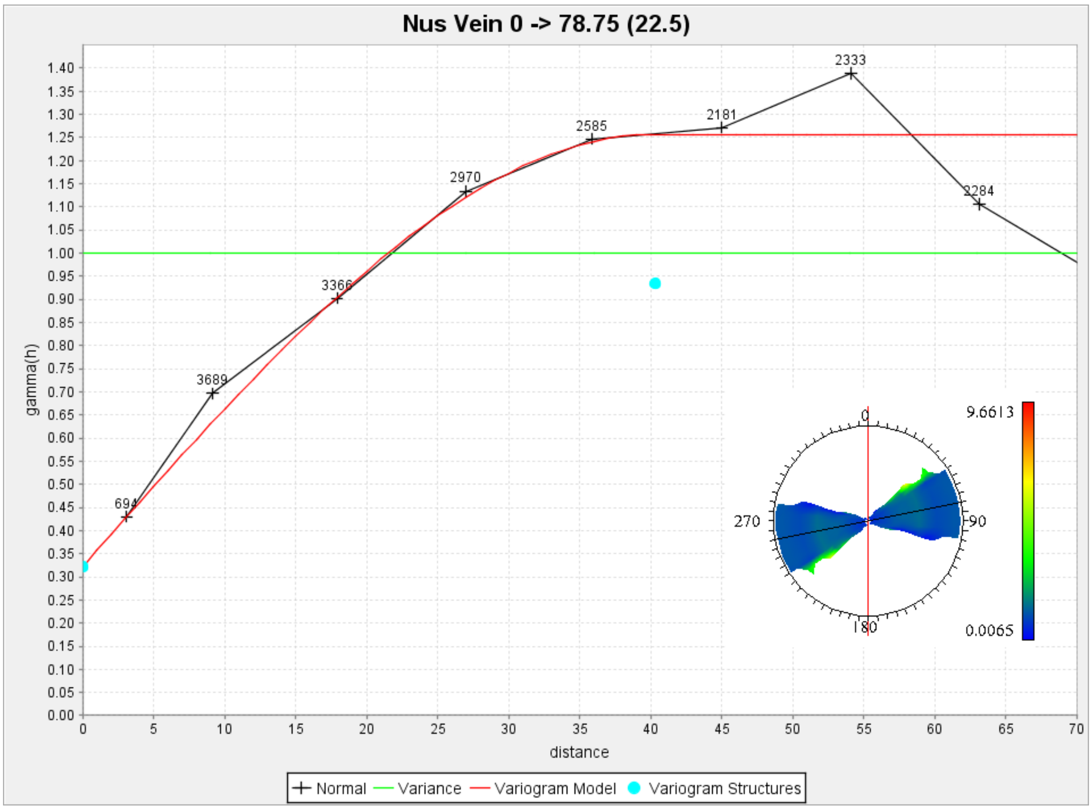
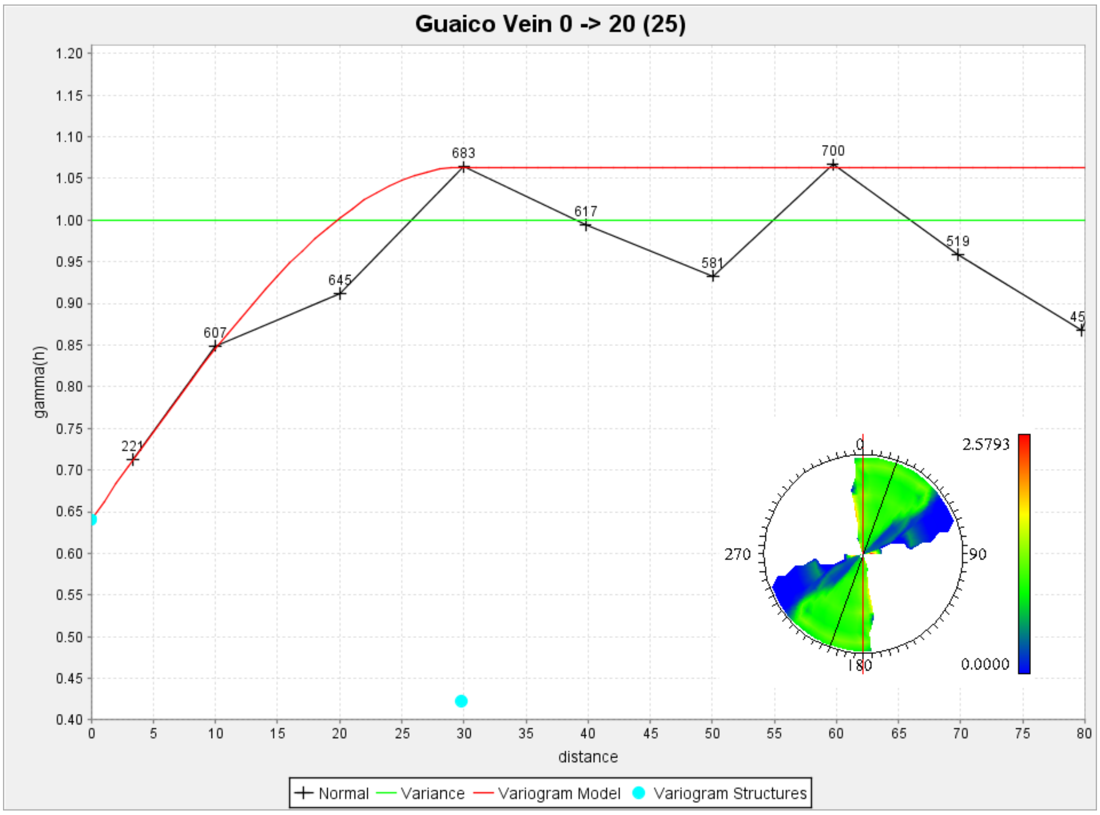


Figure 14-14
Modelled Variogram for Au in Guaico Vein



14.10 ESTIMATION AND INTERPOLATION METHODS

Three block models were created in GEMS to generate and enable grade estimation, mine planning and mine design. A first parent block model with a size of 2m x 2m x 2m, was selected to adjust the Nus mineralized structure with volume calculation of the interpreted wireframe model. A second parent block model with a size of 2m x 0.8m x 2m, was selected to adjust Guaico, Footwall-03, Footwall-05, Vega and La Manuela veins with volume calculations of their interpreted wireframes models. A third parent block model with a size of 2m x 0.8m x 2m, was created to calculate volumes, tonnages and Au grades of the extruded wireframe solids (see figure 14-15 for block model geometries).

Ordinary kriging (OK) was the interpolation method used for the Guaico Zone and Nus Vein. Inverse distance cubed (ID3) and nearest neighbor (NN) were used for verification of the block model. The sample search strategy was based upon analysis of the variogram model anisotropy, mineralization geometry and data distribution for each vein in the Guaico Zone and Nus vein.

For interpolation of Guayabito, inverse distance cubed (ID3) was used and nearest neighbor (NN) was used for verification of the block model in 2013. The same methodology was used for the Guayabito Sur solid for interpolation and resource estimation in the present block model for the Cisneros 2017 PEA.

During estimation runs, each block model was coded with the number of composites selected, kriging variance, block variance, which were later used in the determination of the resource classification.

Figure 14-15
Block Model Geometry for Guaico, Nus and Guayabito

Workspace name:	Guiaco	Workspace name:	Nus	Workspace name:	Guayabito
Number of blocks		Number of blocks		Number of blocks	
Columns:	400	Columns:	500	Columns:	250
Rows:	560	Rows:	400	Rows:	400
Levels:	300	Levels:	500	Levels:	280
Origin and rotation		Origin and rotation		Origin and rotation	
X:	485950	X:	485440.373	X:	484362.795
Y:	721726.513	Y:	721638.528	Y:	722442.603
Z:	1420	Z:	1700	Z:	1650
Rotation:	80	Rotation:	10	Rotation:	60
Block size		Block size		Block size	
Column size:	2	Column size:	2	Column size:	2
Row size:	0.8	Row size:	2	Row size:	0.8
Level size:	2	Level size:	2	Level size:	2

14.11 BLOCK MODEL VALIDATION

14.11.1 Volumetric Validation

A comparison between the measured volumes of the solids generated during the geological modelling and the volume of mineralization in the block model was carried out and indicated that the volume of mineralized blocks in the block model corresponds well with the volume of the mineralized wireframes.

14.11.2 Block Model Comparison against Drill Data

A detailed validation of the OK and ID3 estimate was completed for each zone and included both an interactive 3D and statistical review. The validation included a visual comparison of the input data against the block model's grade in plan and cross section. It also included a review of the distribution of recorded estimation controls including search pass, average sample distance, number of contributing samples and drillholes.

A spatial comparison of the mean grade of the input composites against the block model's grade was also made. The models were divided into slices by directions (NNE and RL) and average grades calculated for the various domains. Similarly, the composite averages and de-clustered composite averages were also computed. Examination of these plots indicated that the models were appropriately honoring the input data and trends.

14.11.3 Visual Checks

Estimated block grades and composite grades were compared visually in plain view and showed a good agreement, refer to Figure 14-16 through Figure 14-19. The updated model was also visually compared with the 2013 model. The two models agreed very closely with each other in areas where no new drillhole composites had been included. In areas where new drilling has been included, the observed changes in grade were consistent with the new composite grades.

Figure 14-16:
Block Model for Nus Vein

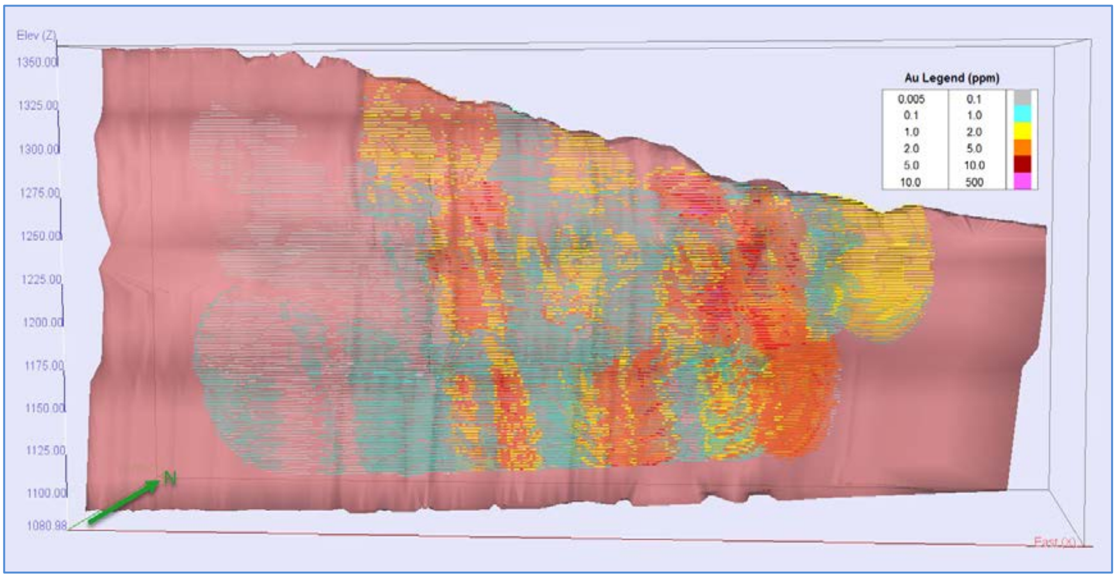


Figure 14-17:
Nus Mineralized Structure, 1236 RL - Composite Points plus Block Model

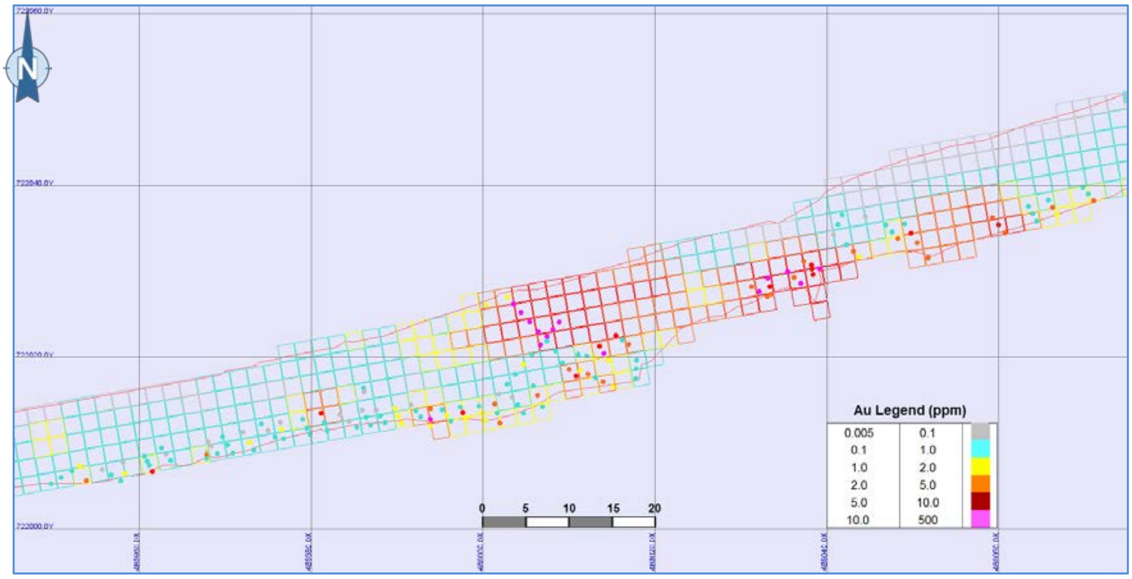


Figure 14-18:
Block Model for Guaico Vein

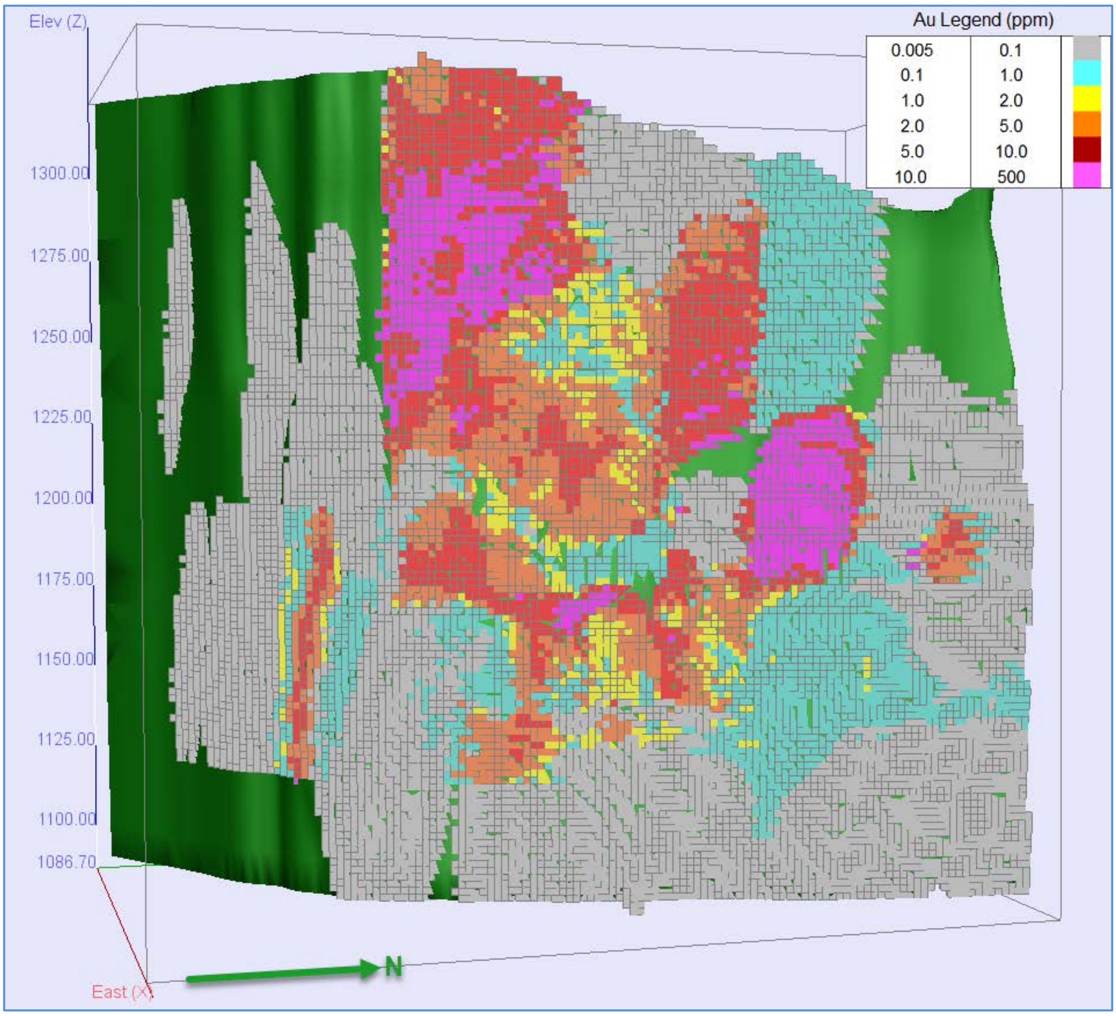
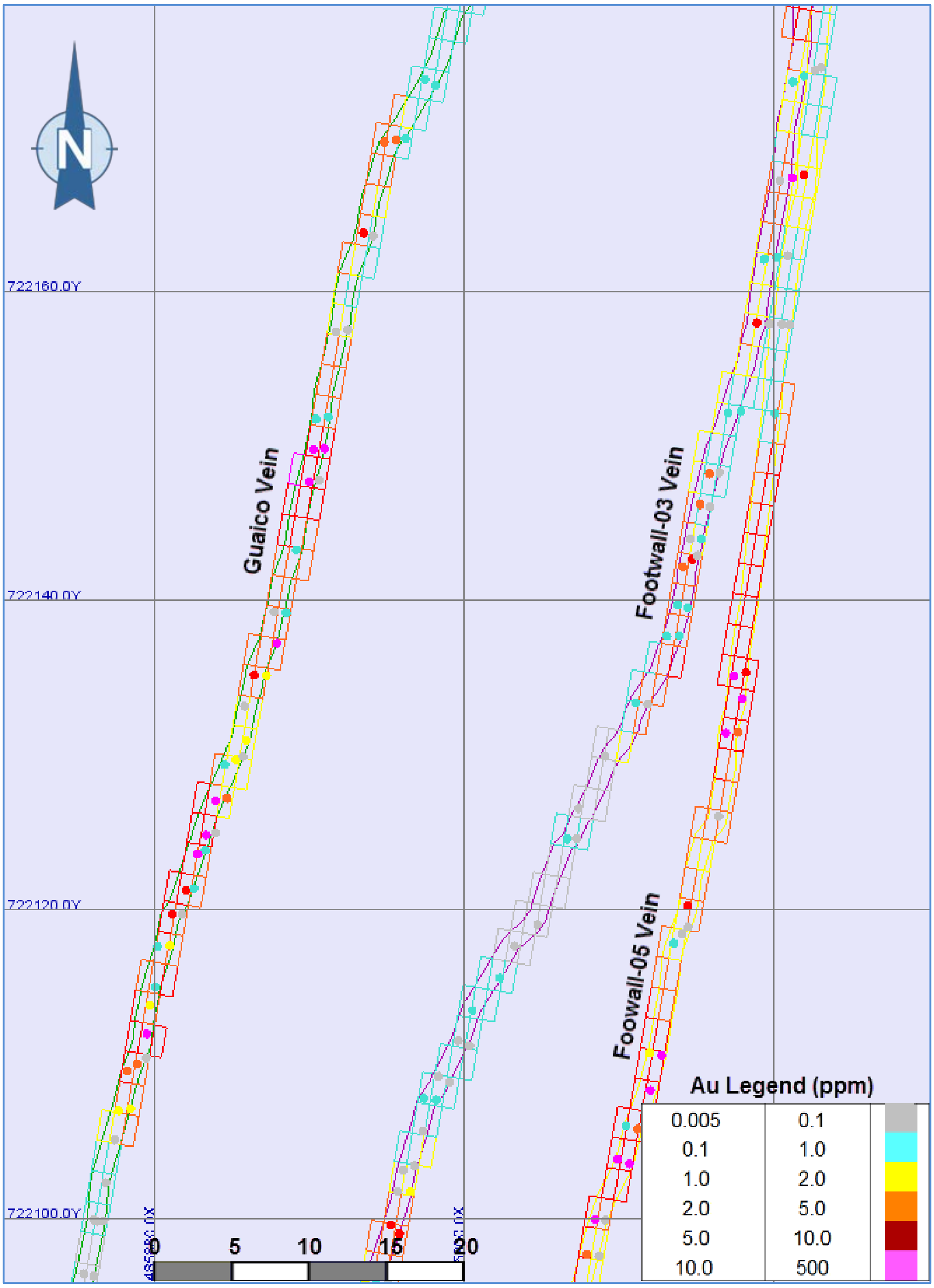


Figure 14-19:
Guaico Area Veins, 1160 Level - Composite Points plus Block Model



14.12 CLASSIFICATION OF MINERAL RESOURCES

The Mineral Resource estimates for the Cisneros Project conform to the requirements of the CIM Definition Standards (2014) and comply with the codes of Canadian National Instrument NI 43-101. The criteria used to categorize the Mineral Resources include the robustness of the input data, the confidence in the geological interpretation including the continuity of all structures and grades within the mineralized zones, the distance from data and the amount of data available for block estimates within the respective mineralized zones.

For the resource classification, the number of composites used to evaluate each block was considered. These parameters are evaluated and the result is recorded in a field named "RESOURCE" and used for resource classification.

Measured, Indicated and Inferred Mineral Resource confidence categories have been assigned to blocks in the block model using criteria generated during validation of the grade estimates, with detailed consideration of the CIM (2014) categorization guidelines. A summary of the criteria considered and confidence level are listed in tables 14-2 and 14-3.

Measured resources take 2/3 of the range; indicated resources reach the whole range. Finally, inferred resources take the whole range plus 50% of the range. The criteria for resource categorization are summarized in the following tables:

Table 14-2
Summary of Criteria Categorization of Resource for Nus Vein

Distance (m)	No. of samples	Resource Code	Resource Category
0 – 30	>=3	501	Measured
0 – 45	>=2	502	Indicated
0 - 60	1	503	Inferred

Table 14-3
Summary of Criteria Categorization of Resource for Guaico Zone Veins

Distance (m)	No. of samples	Resource Code	Resource Category
0 – 20	>=3	501	Measured
0 – 30	>=2	502	Indicated
0 - 40	1	503	Inferred

All resources for the Guayabito Sur Area were classified as Inferred, due to only 113 composites of 0.80 m length available to assign grades to the block model.

14.13 REASONABLE PROSPECTS OF ECONOMIC EXTRACTION

Mineral Resources are reported above a cut off grade of 1.5 g/t Au for the NUS Vein and above a cut off of 2.7 g/t for Guaico, GCFW3, GCFW5, VEGA and MNL_1. The resources are defined within three-dimensional geological wireframes initially constructed with Leapfrog Geo and then edited with Surpac software by AGD's geologist to constrain the gold mineralization in the Mineral Resource estimate to zones defined by mineralized diamond drill core and underground channel samples. Mineral Resources above these cut off grades are believed to have reasonable prospects for economic extraction, based on mineralization continuity, shape and distribution inside the veins.

14.14 MINERAL RESOURCE STATEMENT

The updated mineral resources for the Cisneros Properties, above cut off grade, for all mineralized structures consists of 728,603 tonnes of Measured + Indicated Resources with an average grade of 5.389 g/t Au (see Table 14-7) and 536,211 tonnes of Inferred Mineral Resources with an average grade of 6.345 g/t Au (see Table 14-6).

All Mineral Resources were estimated by Mr. Fernando Linares, principal geologist with Linares Americas Consulting S.A.C. using the Canadian Institute of Mining (CIM) Standards on Mineral Resources and Reserves, Definitions and Guidelines prepared by the CIM Standing Committee on Reserve Definitions. The Resource Estimation was reviewed and validated by Mr. Edgard Vilela, independent consultant and have an effective date of 24 September 2017. Tables 14-4 to 14-8, contain the MRE by deposit name and category Table 14-7, shows the measured and indicated MRE. The tables include the resources estimated in 2013 for Guayabito and Papi deposits to obtain the global mineral resource estimate for the Cisneros Property.

Table 14-4
Total Measured Resource Estimates for the Cisneros Deposits

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	200,877	3.548	22,916
Guaico	GCO	26,464	7.529	6,406
Footwall-05	GCFW5	13,596	9.759	4,266
Footwall-03	GCFW3	11,919	7.561	2,898
La Manuela-01	MNL_1	1,133	5.237	191
Guayabito	GBY	46,370	7.700	11,479
Papi	PAPI	3,592	6.966	804
Total Measured		**303,951**	**5.010**	**48,959**

Table 14-5
Total Indicated Resource Estimates for the Cisneros Deposits

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	152,181	3.057	14,958
Guaico	GCO	10,014	8.194	2,638
Footwall-05	GCFW5	9,266	9.819	2,925
Footwall-03	GCFW3	17,745	6.929	3,953
Vega	VEGA	2,132	13.755	943
La Manuela-01	MNL_1	1,088	4.766	167
Guayabito	GBY	211,887	7.268	49,511
Papi	PAPI	20,338	3.345	2,187
Total Indicated		**424,652**	**5.661**	**77,282**

Table 14-6
Total Inferred Resource Estimates for the Cisneros Deposits

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	103,445	2.984	9,924
Guaico	GCO	6,069	8.059	1,572
Footwall-05	GCFW5	6,213	12.628	2,522
Footwall-03	GCFW3	11,007	9.171	3,245
Vega	VEGA	5,533	13.364	2,378
La Manuela-01	MNL_1	1,128	3.140	114
Guayabito Sur	GBY-SUR	57,973	7.535	14,044
Guayabito	GBY	232,911	8.075	60,468
Papi	PAPI	111,932	4.201	15,120
Total Inferred		**536,211**	**6.345**	**109,388**

Table 14-7
Total Measured + Indicated Mineral Resource Estimates for the Cisneros Project

Deposit Name	Code	Tonnage	Au g/t	Au oz
Nus	NUS	353,058	3.337	36,640
Guaico	GCO	36,478	7.711	8,749
Footwall-05	GCFW5	22,861	9.783	6,957
Footwall-03	GCFW3	29,665	7.183	6,628
Vega	VEGA	2,132	13.755	912
La Manuela-01	LMN1	2,221	5.006	346
Guayabito	GYB	258,258	7.345	59,003
Papi	PAPI	23,930	3.888	2,894
Total Measured + Indicated		**728,603**	**5.389**	**122,129**

1. Mr. Edgard Vilela, is the Qualified Persons and Chartered Professional for the Mineral Resource estimate. The effective date of the estimate is September 24, 2017.
2. Mineral Resources are reported using a cut-off grade of 2.95 g/t Au for GCO, GCFW3, GCFW5 and MNL_1.
3. Mineral Resources are reported using a cut-off grade of 1.66 g/t Au for NUS and 1.50 for PAPI.
4. Mineral Resources are reported using a cut-off grade of 2.62 g/t Au for GYB-SUR and 2.50 for GYB.
5. Reported Mineral Resources contain no allowances for hanging wall or footwall contact boundary loss and dilution. No mining recovery has been applied.
6. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and metal content.

14.15 SENSITIVITY OF MINERAL RESOURCES TO CUT-OFF GRADE

Table 14-8, summarizes the mineral resource at several cut-off grade intervals for the Guaico Vein. The total resources were reported above a cut-off grade of 2.70 g/t Au. The corresponding Tonnage – Grade curve is shown in Figure 14-20.

Table 14-9 summarizes the mineral resource at several cut-off grades intervals for the Nus Vein. The total resources were reported above a cut-off grade of 1.50 g/t Au. The corresponding Tonnage – Grade curve is showed in Figure 14-21.

Table 14-8
Guaico Vein – Sensitivity of Mineral Resources to Cut-off Grade

Low Cut-off	High Cut-off	Volume	Density	Tonnage	Au g/t	Au oz
0.0	**0.5**	24,974	2.880	71,924	0.073	168.47
0.5	**3.0**	6,358	2.880	18,311	1.507	887.02
3.0	**5.0**	3,407	2.880	9,813	4.030	1,271.30
5.0	**8.0**	3,766	2.880	10,846	6.023	2,100.36
8.0	**10.0**	2,115	2.880	6,091	9.100	1,781.88
10.0	**12.0**	1,090	2.880	3,140	10.842	1,094.64
12.0	**14.0**	1,702	2.880	4,903	12.927	2,037.83
14.0	**20.0**	477	2.880	1,374	15.365	678.62
20.0	**1000**	31	2.880	90	20.000	58.10

Figure 14-20:
Grade and Tonnage Distribution for Guaico Vein

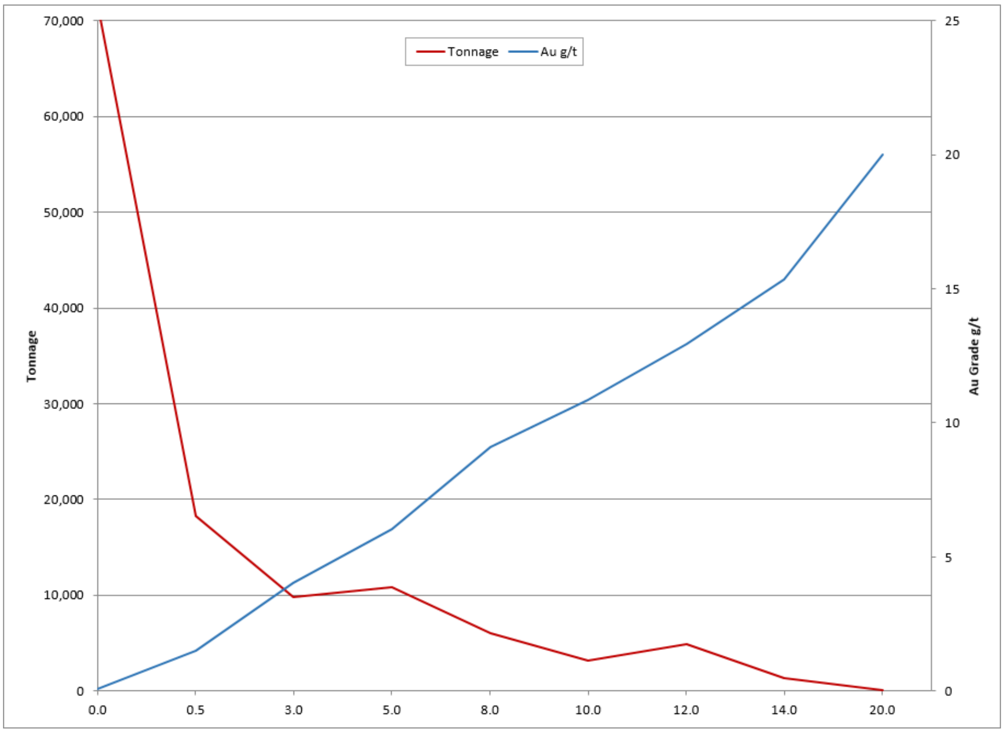
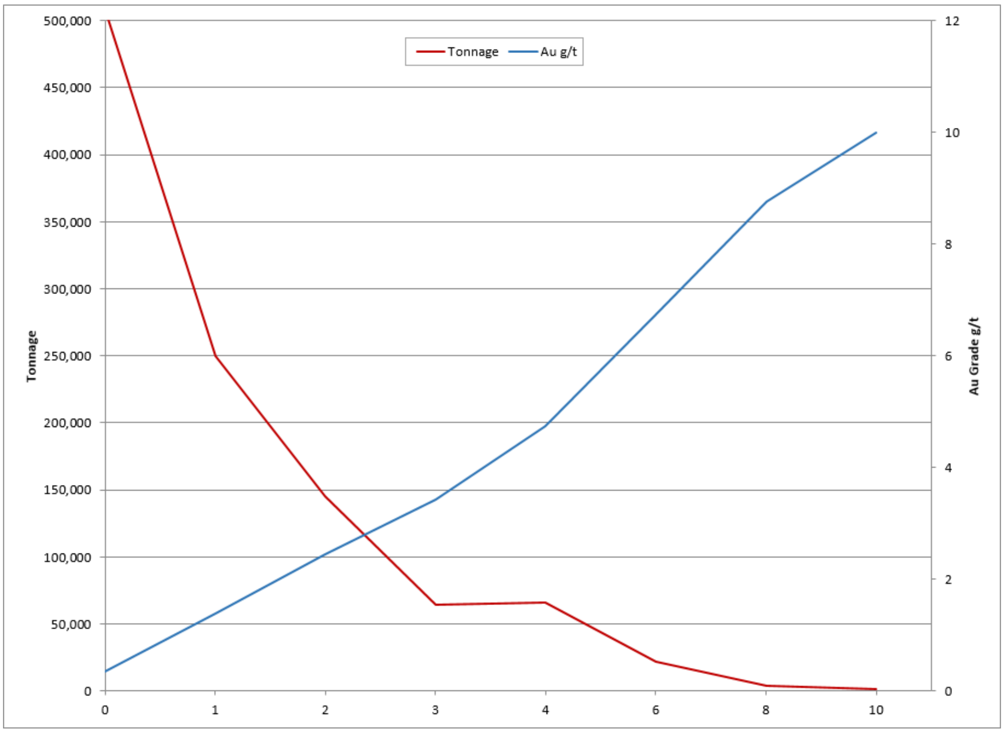


Table 14-9
Nus Vein – Sensitivity of Mineral Resources to Cut-off Grade

Low Cut-off	High Cut-off	Volume	Density	Tonnage	Au g/t	Au oz
0.0	**1.0**	182,932	2.780	508,552	0.348	5,688
1.0	**2.0**	89,877	2.780	249,857	1.393	11,192
2.0	**3.0**	52,378	2.780	145,611	2.440	11,423
3.0	**4.0**	23,010	2.780	63,967	3.435	7,065
4.0	**6.0**	23,876	2.780	66,375	4.749	10,135
6.0	**8.0**	7,795	2.780	21,671	6.740	4,696
8.0	**10.0**	1,470	2.780	4,086	8.768	1,152
10.0	**1000**	541	2.780	1,503	10.000	483

Figure 14-21:
Grade and Tonnage Distribution for Nus Vein



15.0 MINERAL RESERVE ESTIMATES

There are no mineral reserves categorized for the Cisneros Project.

16.0 MINING METHODS

16.1 INTRODUCTION

AGD has identified two mining units to evaluate for future production potential: Guaico-Nus Mine and Guayabito mine. The Guaico-Nus Mine is currently accessed by the Guaico portal and decline (4.5 x 4.5 m and 12% gradient) and the Guayabito Mine is also accessed by a portal and decline (4.5 x 4.5 m and 12% gradient). A process plant is located 200 metres away from Guayabito and 6.0 kilometres by road from the Guaico-Nus portal. The proposed site of the tailings facility storage (TFS) is 9.5 kilometres away by road from the Guayabito Mine at the El Hormiguero site.

Horizontal and vertical underground development already completed for the Guaico-Nus and Guayabito Mine consist of 5.3 kilometres of mine infrastructure including 5.2 kilometres at the Guaico-Nus mine and 110 metres of decline at the Guayabito Mine (See Table 16-1).

Table 16-1
Underground Mine Infrastructure at Guaico-Nus and Guayabito Mine

Assumptions	Length (m)	Section Width(m)	Section Height(m)
Decline	1,106	4.5	4.0
Access ramp decline	798	3.0	3.0
Drift and draw point	1,846	2.7	3.0
Cross and Bypass	1,270	4.0	4.0
Ore pass/Fill pass	140	1.5	1.5
Service raise	76	1.8 (diam.)	-
Vent raise	136	2.4 (diam.)	-
Total	**5,372**		

The underground mining methods, selected for AGD are cut & fill (C&F) and Longhole Open Stopping (LHOS). The selection of the mining methods was determined primarily by deposit geometry and geomechanical features (see Table 16-2 and Table 16-3). Cut and fill mining is the preferred mining method for the Guaico and Guayabito veins and longhole mining for the Nus mineralized structure. The mining methods are discussed in detail in Section 16.5.

16.2 DEPOSIT CHARACTERISTICS

The deposits at the Guaico Mine and the Guayabito Mine consist of narrow vein systems. The vein systems with potential to be exploited in the Guaico Mine are: Guaico, Footwall-03, Footwall-05 and La Manuela-01. The Guayabito Mine includes the Guayabito North and Guayabito South vein systems. Veins are narrow and sub-vertical and form a tabular type deposit.

Nus is a wide mineralized structure (5 m to 8 m width), that is emplaced in a shear zone of the regional Nus Fault. Low grade gold mineralization occurs disseminated, in veinlets and in patches with propylitic alteration, associated with pyrite and chalcopyrite.

Deposit characteristics are summarized in Table 16-2.

Table 16-2
Underground Mine Characteristic at Guaico-Nus and Guayabito Mines

Assumptions		Guaico	Nus	Guayabito
a)	Geometry of the deposit	Tabular	Tabular	Tabular
b)	Thickness of mineralization	Minor to 1 m	Between 5 - 8 m	Minor to 1 m
c)	Inclination	75° - 85°	80°	75° - 85°
d)	Depth below the surface	50 - 430 m	50 - 280 m	50 - 210 m
e)	Distribution of Au grades	From 4.5 g/t to 7.5 g/t	From 1.7 to 3.5 g/t	From 2.5 to 7.7 g/t

16.3 GEOTECHNICAL ANALYSIS AND RECOMMENDATIONS

16.3.1 Geomechanical Characterization

Geotechnical designs and recommendations contained in the Cisneros 2017 PEA are based on the results of on site investigations and geotechnical assessments completed by Mr. Vallejo on behalf of AGD in 2016. The assessments included: geotechnical drilling and logging, oriented drill core measurements, laboratory testing of rock core samples, rock mass characterization, structural geology interpretations, pillar stability analyses, excavation and ground support design.

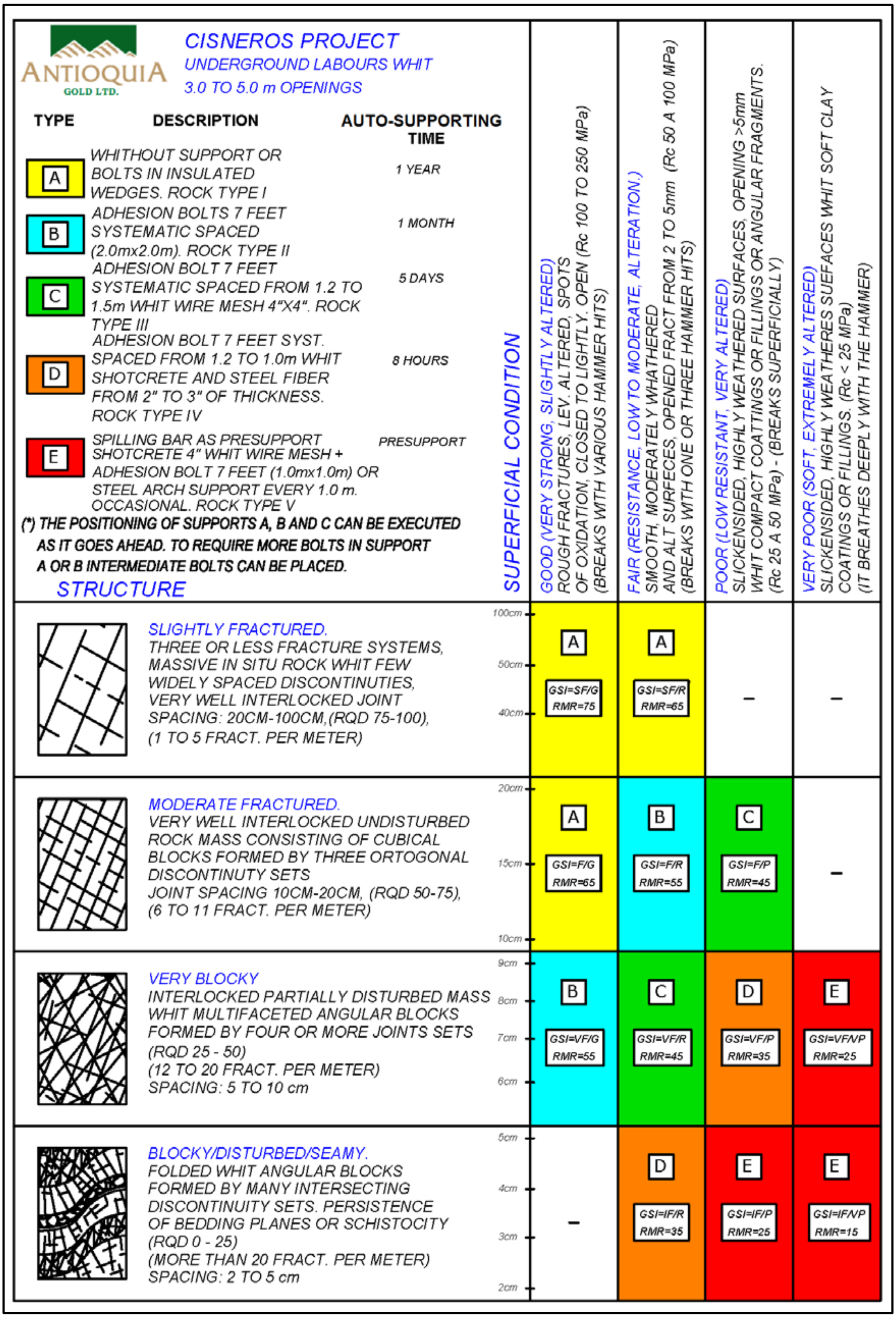
Geotechnical mapping and Schmidt rebound hammer rock testing of the underground workings was carried out to provide information on structural geology and elastic properties. The geotechnical performance of excavations in the mine was also reviewed. The PEA study site investigations were supplemented by a review of historical reports and inclusion of data collected during previous drilling campaigns.

16.3.2 Rock Mass Properties

Studies of rock mass quality at the Cisneros Project indicate that the rock has good and excellent quality with a moderate presence of groundwater. The geomechanical studies have focused on the Guaico and Nus zones and include the following activities:

- Geomechanical logging of 822 m of core from two diamond drill holes across the Guaico and Nus deposits.
- Laboratory core sample strength testing including:
    - 47-point load strength tests (PLT),
    - 02 triaxial compressive strength (TCS),
    - 08 Brazilian tensile strength (BTS) and
    - 18 uniaxial comprehensive strength tests (UCS).
- Geomechanical mapping of existing underground workings and documentation of excavation stability and,
- Rock mass classification of core logging data made according to
    - quotient between joint roughness rating (Jr) and joint alteration rating (Ja) (*Q* index = Jr/Ja) of Barton et al (1974),
    - the Rock Mass Rating (RMR) of Bieniawski (2014) and
    - the Geological Strength Index (GSI) of Hoek and Marinos (2000).

Figure 16-1:
Geological Strength Index (GSI) Chart (From Vallejo, C. 2000)



Vallejo (2000) modified the qualitative GSI index of Hoek et al. (1998) and proposed a new chart for the identification of rock mass types for underground support and stabilization for the Guaico and Guayabito mines. The chart used to identify the rock mass type is shown in Figure 16-1. Table 16-3 and Table 16-4 show the new classification system for underground support type from Vallejo (2000).

Table 16-3
Support and Stabilization Types (From Vallejo, C. 2000)

GSI Index	Code	RMR Index	Q Index	Support Type
Slightly Fractured / Good	(SF/G)	75	50	A
Slightly Fractured / Regular	(SF/R)	65	12	A
Moderately Fractured / Good	(F/B)	65	12	A
Very Fractured / Good	(VF/G)	55	5	A
Moderately Fractured/Regular	(F/R)	55	5	A
Very Fractured / Regular	(VE/R)	45	1	B
Moderately Fractured / Poor	(F/P)	45	1	B
Intensely Fractured / Regular	(SF/R)	55	0.4	C
Very Fractured / Poor	(VE/P)	55	0.4	C
Intensely Fractured / Poor	(IF/P)	25	0.1	D
Very Fractured / Very Poor	(VF/VP)	25	0.1	D
Intensely Fractured / Very Poor	(IF/VP)	15	0.05	D

16.3.3 Ground Support

Considering the current conditions of the temporary and permanent workings and opening sizes of 3 metres to 5 metres, it is expected that five types of support will be used at the Cisneros Project. The support types follow the recommendations made by Vallejo (2016, internal report) and take into account the Norwegian tunneling method proposed by Barton (2002). Table 16-4 show detailed specifications for ground support.

Table 16-4
Rock Mass Type for Underground Supporting (From Vallejo, 2010)

Rock Type	Support Type	Ground Support
I	Type A	Stop helical bolting, cemented and tensioned with resin or cement grout Used to stabilize wedges.
II	Type B	Helical bolting, cemented and tensioned with resin or cement grout distributed 1.5 m x 1.5 m. A row of 4 bolts and 5 bolts. Occasional wire mesh. Advance of 3.5 m.
III	Type C	Helical bolting, cemented and tensioned with resin or cement grout distributed 1.0 m x 1.0 m. A row of 7 bolts and 8 bolts. Fiber-reinforced shotcrete with wire mesh 10 cm opening. Labor’s advance: 3.5 m.
IV	Type D	Helical bolting, cemented and tensioned with resin or cement grout distributed 1.0 m x 1.0 m. A row of 7 bolts and another of 8 bolts. Fiber-reinforced shotcrete with wire mesh 5 cm opening. Labor’s advance: 2.4 m.
V	Type E	Spilling bar as a support of the helical bolting, cemented and tensioned with resin or cement grout distributed 1.0 m x 1.0 m. A row of 9 bolts and 10 bolts. Fiber-reinforced shotcrete with wire mesh 10 cm opening. Labor’s advance: 1.5 m.

16.3.4 Geomechanical Domains

Based on the geologic structural model, surface topography and the geomechanical characterization described above, the Guaico and Nus deposits were divided into three structural - geomechanical domains. The individual domains have similar rock mass quality. These domains were used for developing geomechanical design parameters for the underground mine workings. Geologic structures were identified as the dominant controlling factor for rock quality domains. The following three domains were identified:

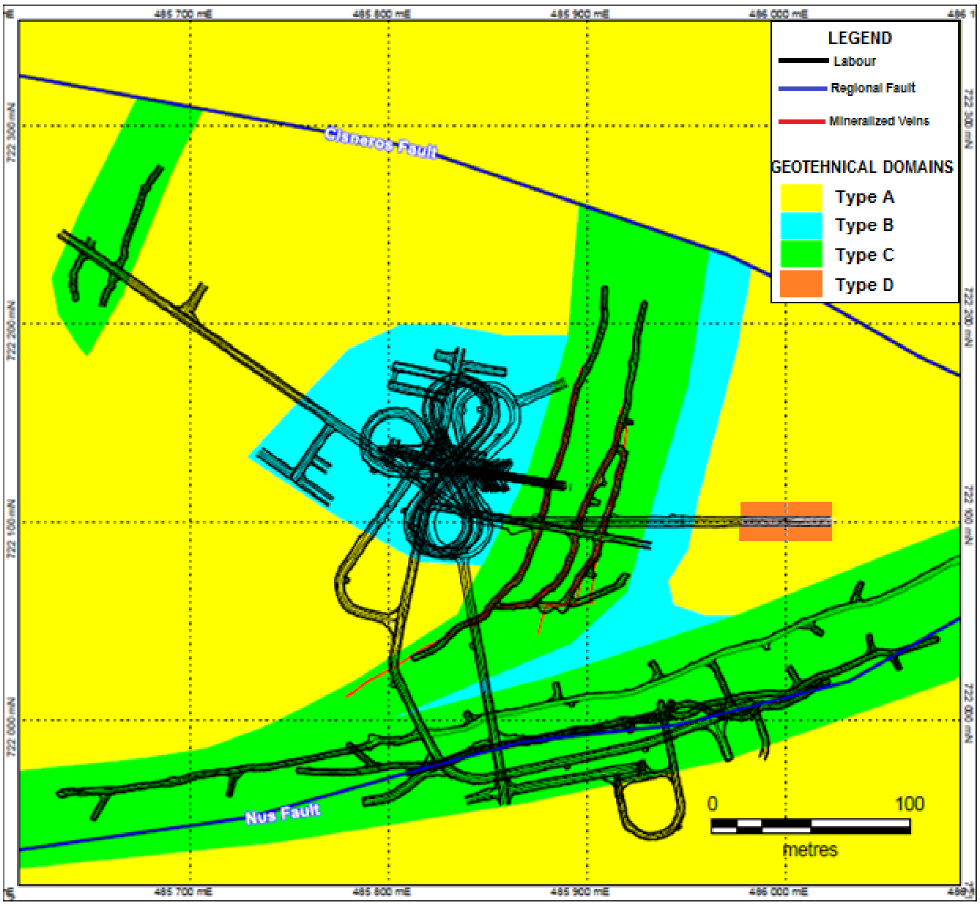
- **Nus Fault Domain:** Structurally controlled by the Nus Fault, approximately 20 m wide. The rock within this domain is typically of poor geomechanical quality, and intensely sheared. The rock strength from UCS tests conducted on core samples is between 25 to 50 MPa with RMR values between 35 and 40. It is classified as Type IV, poor rock with the presence of water.
- **Tensional Vein System Domain:** (Guaico, Footwall-03, Footwall-05 and Vega veins), the RMR for these veins vary between 45 to 55, the RMR for the host rock is 60. The rock strength from UCS tests is between 50 and 100 MPa and moderately resistant. The GSI is blocky and the surface quality (Q) is fair. The rock mass classification (RMC) determined from total ratings is Type II – III. The domain is controlled by tensional veins. There are also discontinuities parallel to the axis of the underground workings and sub-parallel high-angle structures, that form slabs filled with carbonates, chlorite and sericite. Water dripping into veins and host rock is regularly observed.
- **Batholithic Domain:** The rocks of this domain have good to very good geomechanical quality, and are classified as Type I-II rock. The GSI is slightly fractured, very resistant rock. The RMR ranges from 55 to 7. The UCS test values range from 100 to 230 MPa. Fracture density is 3 to 6 fractures per linear meter. The joint planes are sub-vertical and transverse to the axis of the workings. Locally the joints have millimeter openings and are sealed with carbonates and quartz. In the underground workings intermittent water is frequently observed dripping mainly in veins. In general, the rocks of this domain have good geomechanical properties.

Table 16-5 shows the ratings for the main domains in the Cisneros Project that correspond to the domains of tension veins and the Nus Fault domain denominated as type C and the Batholith as domain types A and B. Figure 16-2 show the domains at the Guaico - Nus Mine.

Table 16-5
Rock Mechanics Characteristics at Guaico-Nus and Guayabito Mine

Zone	Item	Guaico-Guayabito	Nus
Mineralized Zone	RMR	30-40/45-55 /65-75	35-40/40-45
	Rock Type	Type VI-A/III-A, III-B/II-A, II-B)	Type IV/III
	Rock Strength	30-50 MPa	25-50 MPa
Hanging Wall	RMR	70 - 74/60	70 - 74
	Rock Type	Rock Type II-A	Rock Type II-A
	Rock Strength	120-140 MPa	120-140 MPa
Footwall	RMR	70 - 74/60	70 - 74
	Rock Type	Rock Type IIA	Rock Type IIA
	Rock Strength	120-140 MPa	120-140 MPa

Figure 16-2:
Geotechnical Domains on Guaico-Nus Mine



16.3.5 Stope Design Recommendations

The preferred mining method for the Nus domain is Long Hole Open Stopping (LHOS) with sub levels spaced 15 metres from sill to floor. Regular quality rock is expected in the hanging walls and is predicted to be stable under LHOS mining. Blasting is planned in vertical slices of 12 metres maximum height and 8 metres length with a variable thickness between 10 and 15 metres.

Overhand cut and fill (C&F) with a mechanized system will be the preferred method for the tensional vein domain (Guaico Vein, Vega Vein, Footwall-03 Vein, and Footwall-05 Vein). Open spaces are planned to be backfilled with waste rock or alternatively, hydraulic tailing sands can be used.

16.3.6 Stopping Backfill Specifications

Waste rock for backfill is expected to come from mine development or additional blasting of the hanging wall after selective mining of the narrow veins. No estimation of the particle size has been made for the waste material resulting from blasting to be used to fill voids.

16.3.7 Mine Infrastructure and Offset Distances

The mining infrastructure will include two main ramp systems, one in the Guaico zone and the other in the Guayabito zone. The recommended offset distance from ramp to stope is 50 metres. Other mine infrastructure includes pumping ponds, ventilation rooms, electrical substations and, eventually, dining areas along the various underground levels and sublevels. An underground workshop is not contemplated initially, but may be included as mining progresses. Powder magazines will be situated inside the mine at a safety radius of at least 100 m from any other mining infrastructure as regulated by the Colombian Armed Forces.

It is recommended that underground infrastructure be located in the batholithic domain which is geomechanically competent to slightly disturbed. The basement rock is good to excellent, with Type I and Type II geomechanical properties. The pillars are planned at double the section length, from 8m to 10m and rock bolt support may be required in isolated wedges. The GSI qualification is blocky (slightly fractured) and the rock is moderately resistant with a RMR from 65 to 75. The self-supporting time estimate is one year.

16.4 HYDROGEOLOGY ANALYSIS AND RECOMMENDATIONS

A recent conceptual hydrogeological study for the Guaico site, (Servicios Hidrogeológicos Integrales SAS, March 2017) supported by geomechanical and structural information from the actual mining progress and calculation of permeability in massive fractured rock was undertaken in order to assign hydraulic parameters to the hydrogeological units identified in the study area. Results indicated the existence in Guaico of a hydrogeological saprolite unit with medium to high potential confirmed by the presence of water. A second unit of medium to high hydrogeological power corresponds to areas of rock in a highly fractured state but where the presence of water has not yet been confirmed. It is considered highly likely that both units have a hydraulic connection that makes them behave as a single hydrogeological unit.

In Guayabito, the available studies are based on the conceptualization of the hydrogeological model carried out in August 2016 by Servicios Hidrogeológicos Integrales SAS. The conclusions also indicate the presence of two subsoil units with important hydrogeological potential:

1. The saprolite with a transition horizon and the fractured rock that underlies it. According to the behavior of the piezometric level it is inferred that these units are hydraulically connected and acting as a single aquifer unit, whose hydrodynamic behavior would be predominantly free. In some piezometer readings the two levels are saturated while in others only the underlying rock is saturated.
2. The fractured rock at depth which is isolated from the saprolite by sections of non fractured rock, and may present a different hydrodynamic behavior (possibly flow under pressure).

16.4.1 Ground Water Flow direction

Considering the structural analysis carried out, a predominant direction for all structures analyzed is not observed. The orientation of structures has two main directions: to the NW and to the NE. In local structures and faults, the angles are generally high with a tendency to an EW orientation, which is consistent with the flow of groundwater. As for the drainages, it is observed that the Nus river appears to be controlled by the Cisneros and Nus faults. The course of the drainages tend to run to the West-Northwest, the same as the Cisneros fault.

16.4.2 Hydrogeologic Modelling Results

The result of the hydrogeological model for Guaico during the projected seven-year scenario of mine development, shows that the flow rate for the first year is 7.22 litres per second (l/s), reaching a maximum flow of 35.9 l/s in the seventh year.

The most sensitive parameter generating the largest change in the flow rate is the groundwater rainfall-recharge that has an average of 4,050.5 mm/year. The pumping and recirculation systems inside the mine must be guaranteed to be closed not to produce leaks and must avoid the input of external flows into the mine. Likewise, the water storage ponds inside the mine must be controlled and be waterproofed so that they do not become recharge zones. In the Guayabito area, the studies of expected flows for the development of the project have not yet been estimated.

16.5 MINING METHOD

16.5.1 Longhole Open Stopping (LHOS)

The Nus structure is suitable for mining by Long Hole Open Stopping. This method is suggested because of the low to intermediate mining cost, the geotechnical conditions of the rock mass, the geological shape and width of mineralized body and the grade distribution prevalent on the Nus structure.

The 12-metre-long blast holes have been planned by benches from the upper to the lower sublevel. Blast holes will be drilled parallel to the vein's dip along the entire defined block and following a regular pattern. The aim of the first sequence is to create a free face by blasting and mucking activities. (See Figure 16-3, Figure 16-4 and Figure 16-5).

According to the final stope design, the longhole mining cycle will begin with blasting the drop raise to provide a free face for the first longhole round and initial empty volume for blasted swell. Production blasting will begin at the stope end and retreat to the access. Once the stope is entirely mucked, the filling of the panel from the upper sublevel to the lower sublevel begins using the 3.0 m x 3.0 m ramp contemplated in the design (see Figure 16-6).

16.5.2 Cut and Fill Stopping (C&F)

The preferred mining method for Guaico is a variant of cut and fill, using vertical drillholes for selective mining due mainly to the thickness of veins, rock mass conditions of the host-rock and grade distribution of the Guaico veins (Footwall-3 and Footwall-5).

The main advantage of this method is that it allows selective mining, thereby reducing dilution and increasing mining recovery. Drilling and blasting will be done in two rounds. In the first round only mineralized material is fired, with a minimum width of 0.80 m while in the second round, the waste rocks are fired at 1.20 m width, (see Figure 16-7 to Figure 16-11).

Blast hole drilling, to produce horizontal slices, will be drilled parallel to the vein's dip (70°) with drillholes having a 3.0 m length and 51 mm diameter. Optimal blasting should produce free faces and help control dilution. Waste material will be used as backfill in the stopes. Considering a 50% swell factor for waste rock, it would be enough to backfill a 2.7 m high cut along the 80 m stope. Selective drilling, blasting, mucking and loading is a repetitive cycle up to the end of the stope.

Figure 16-3:
Step One: LHOS Down Drill

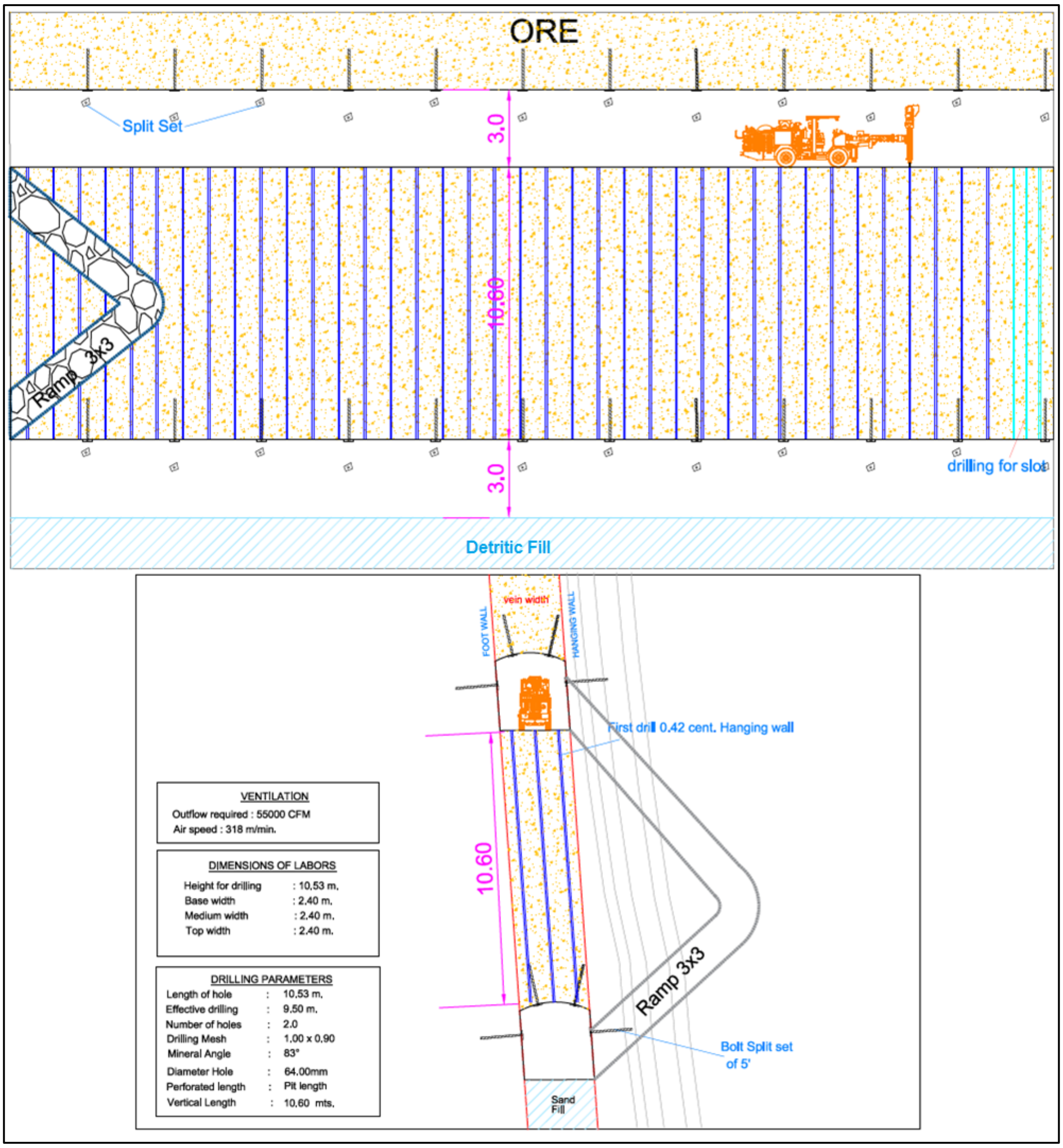


Figure 16-4:
Step Two: LHOS Blasting and Mucking

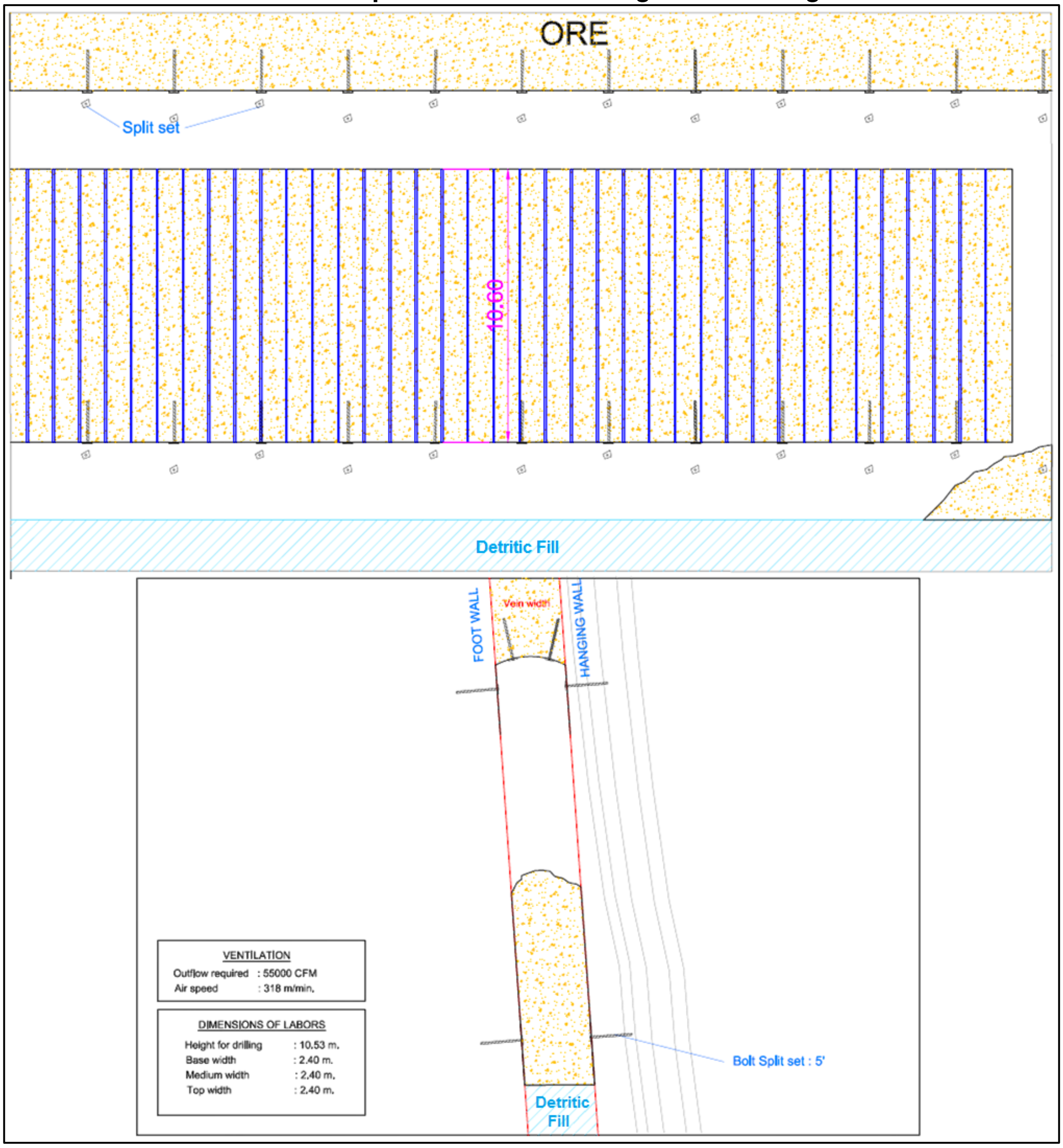


Figure 16-5:
Step Three: LHOS Blasting and Mucking a Second Cycle

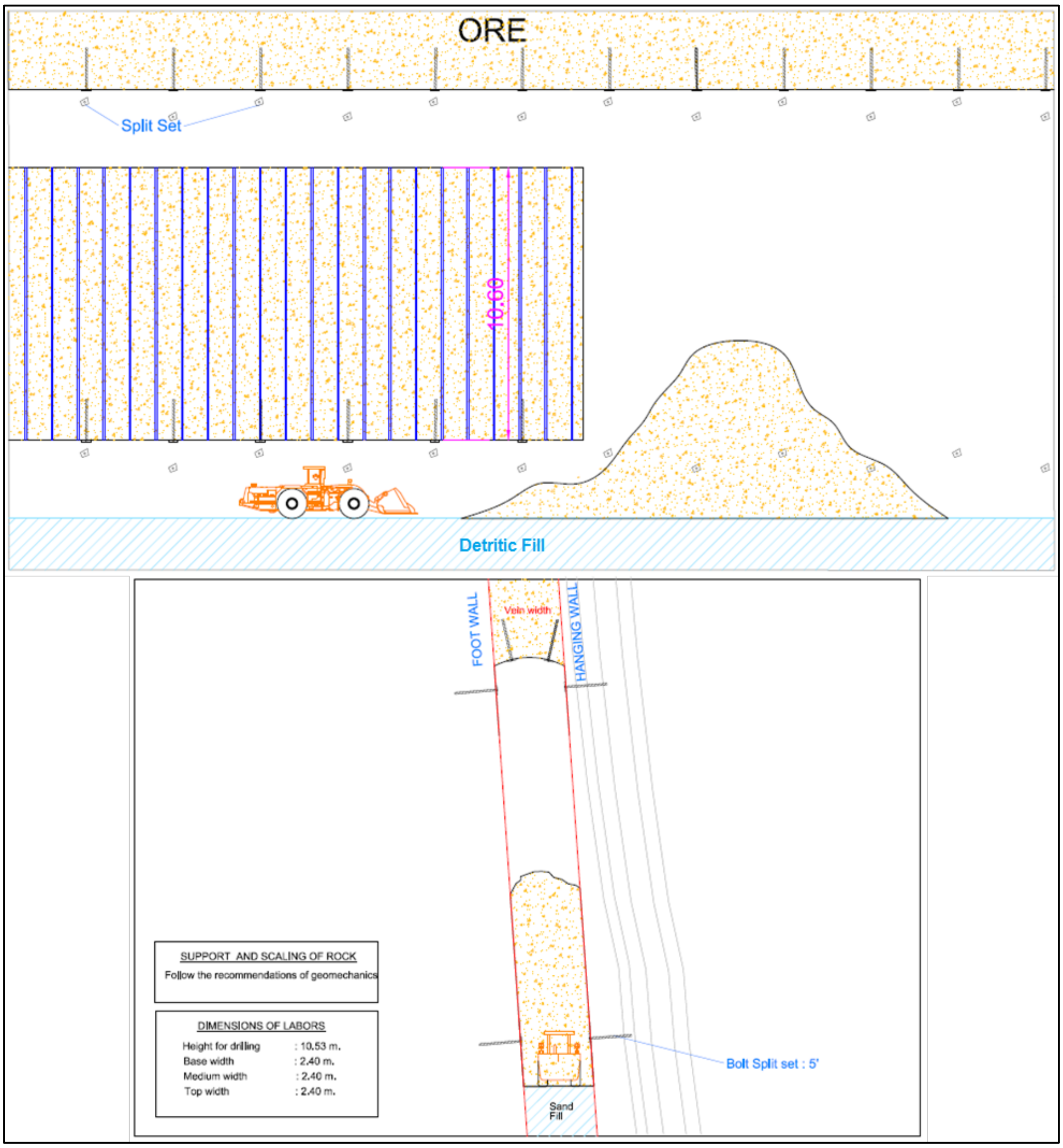


Figure 16-6:
Step Four: LHOS Stope Backfill

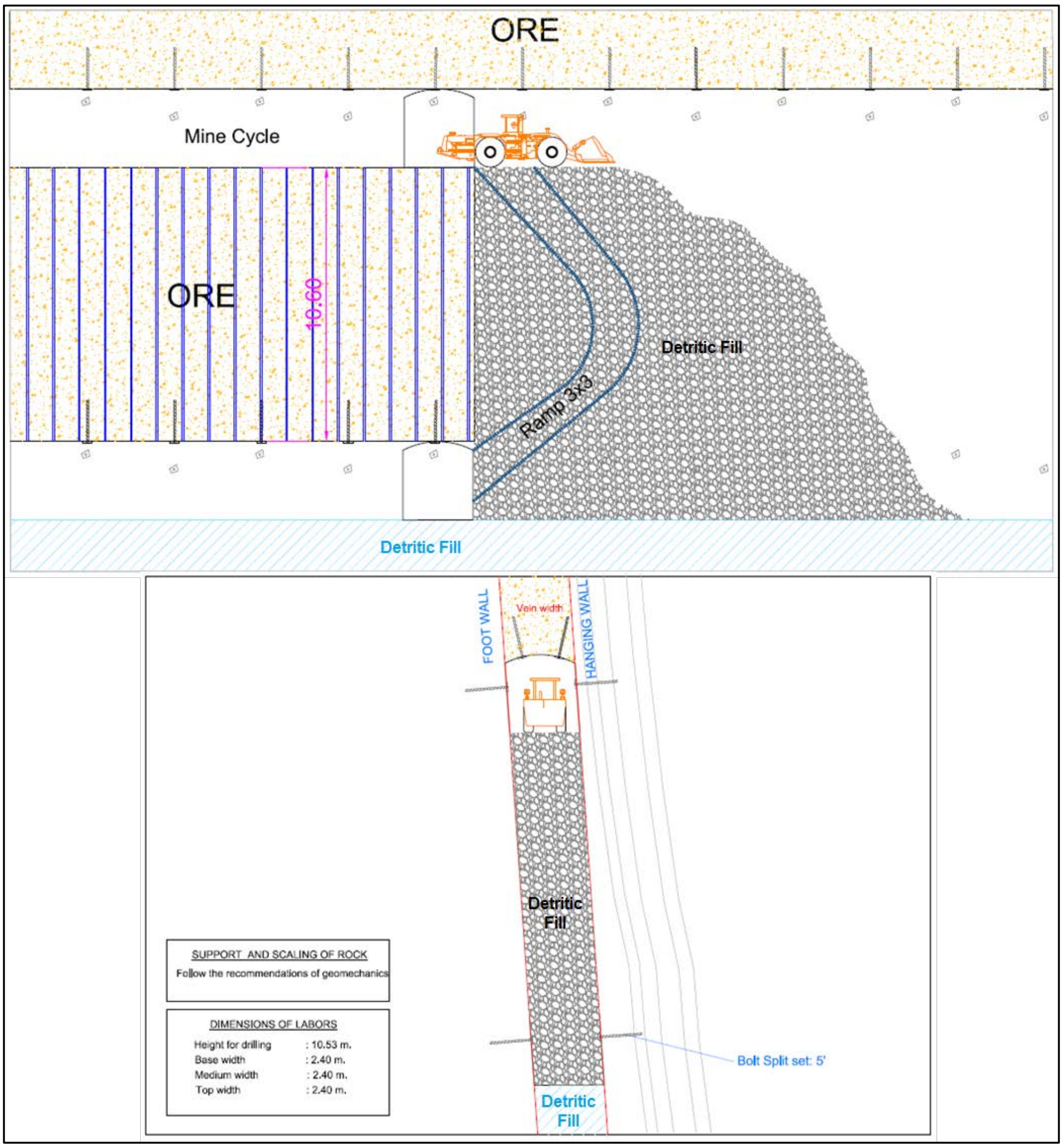


Figure 16-7:
Step One Overhand C&F Mining - Vertical Drill (Back Stopping)

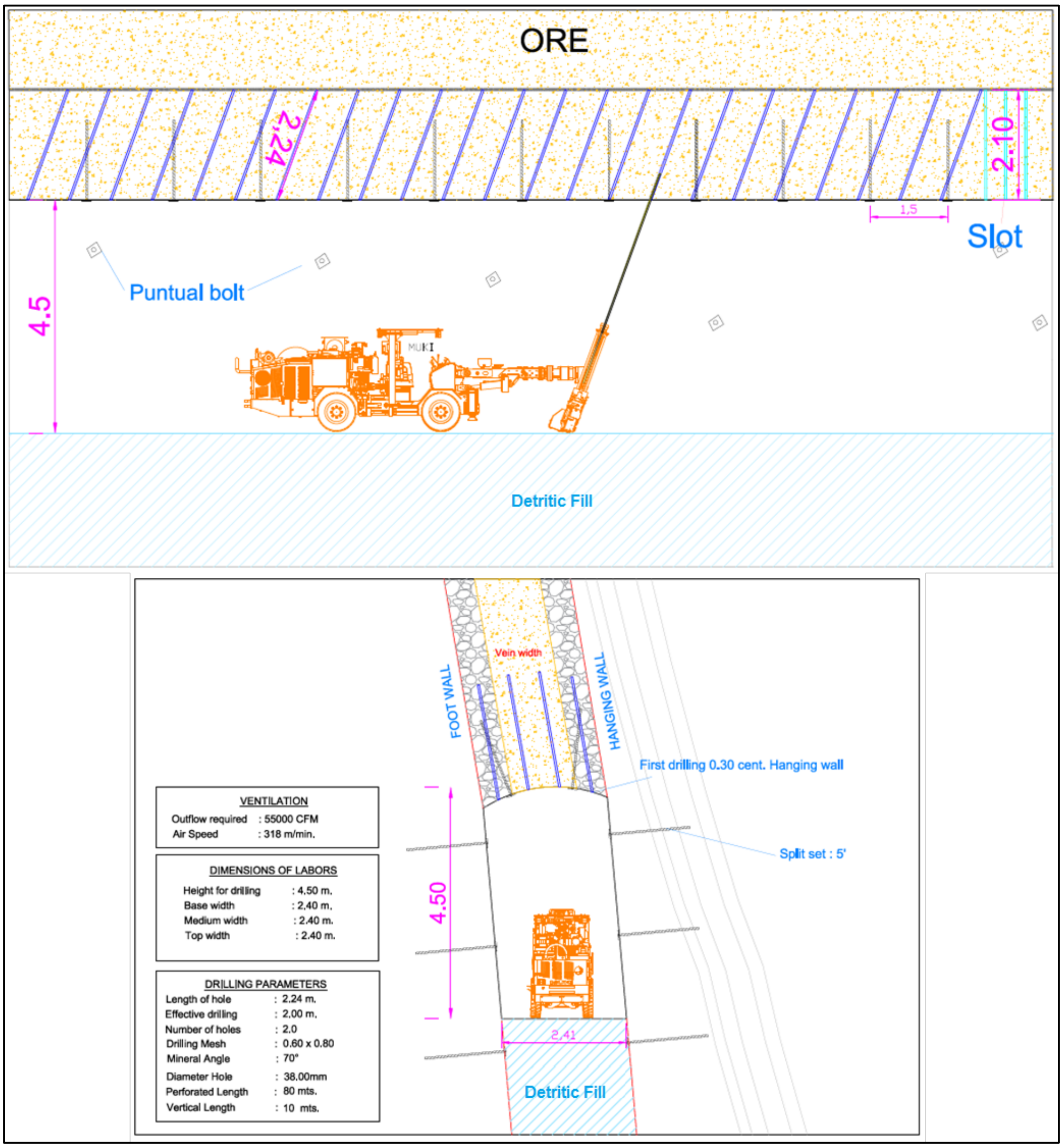


Figure 16-8:
Step Two Overhand C&F Mining - Ore Blasting

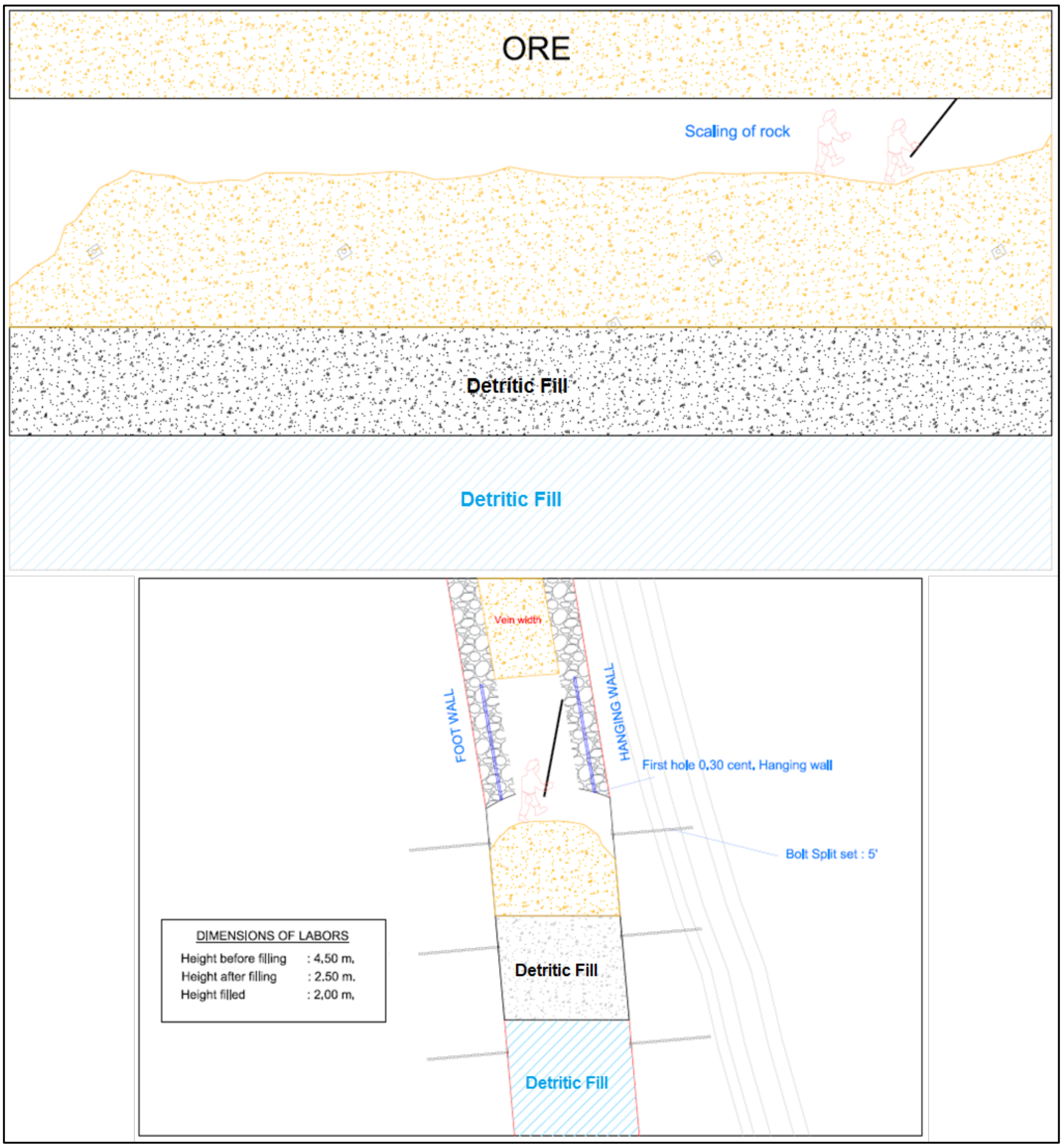


Figure 16-9:
Step Three Overhand C&F Mining - Waste Blasting

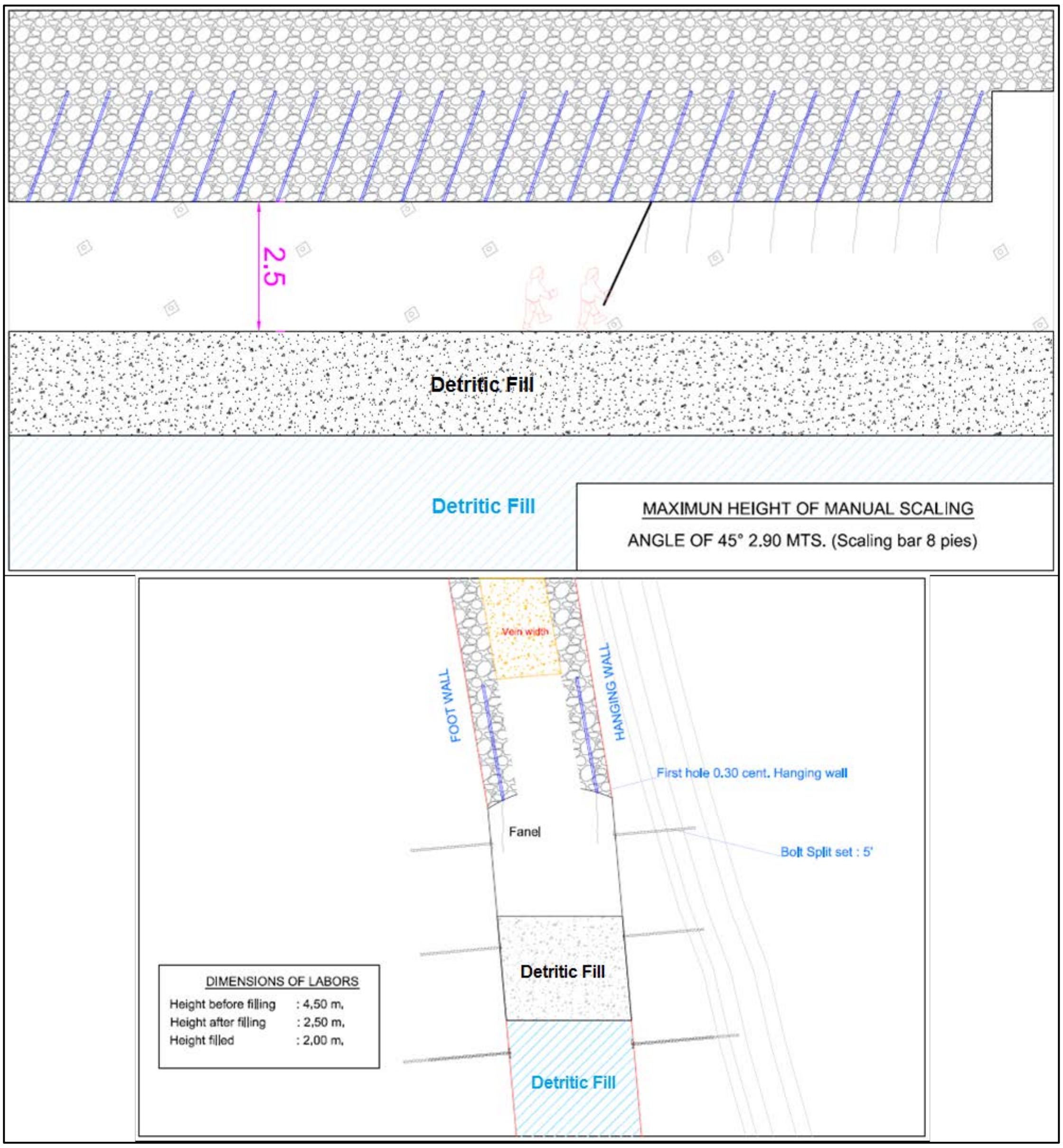


Figure 16-10:
Step Four Overhand C&F Mining - Waste Blasting

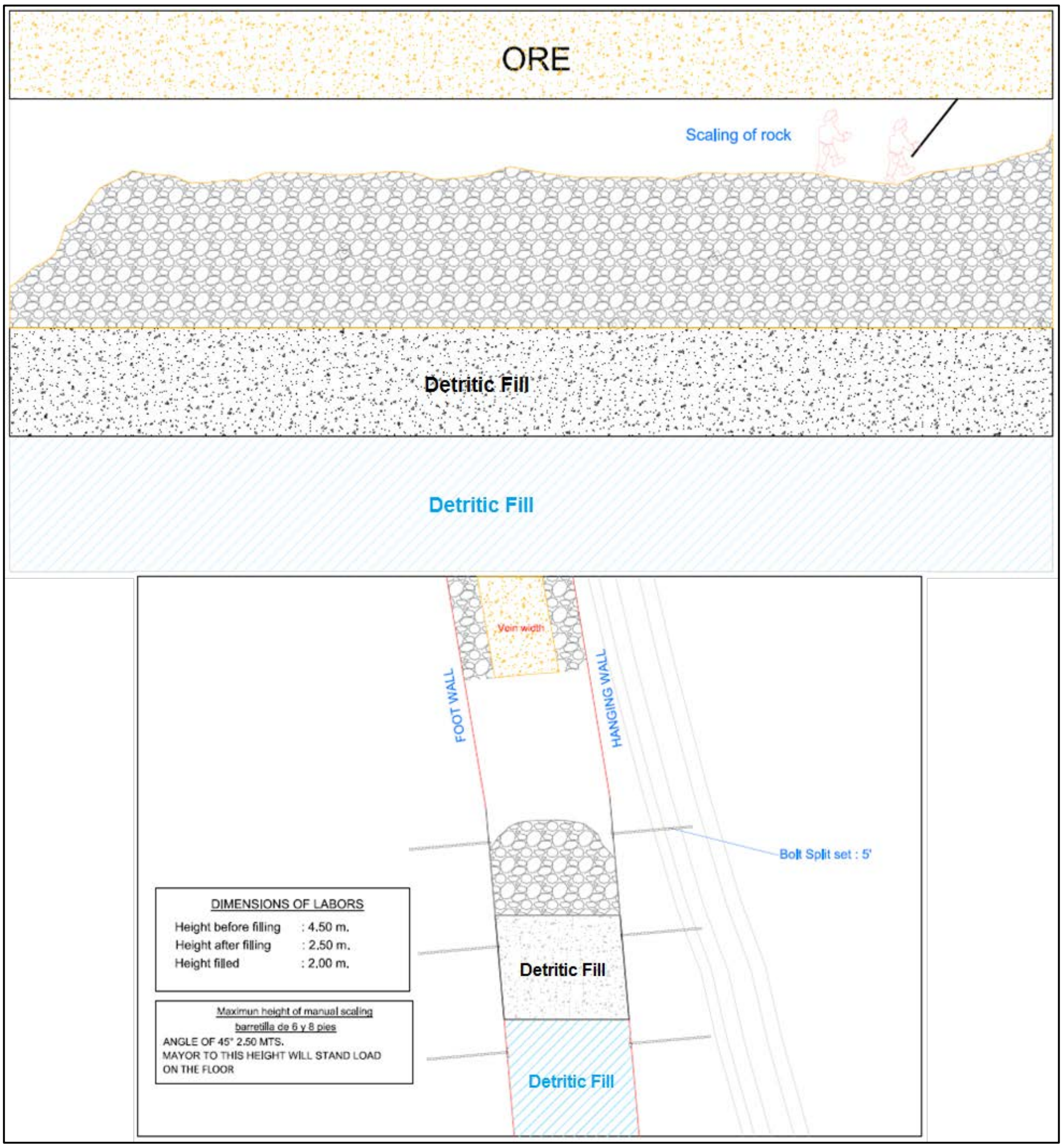
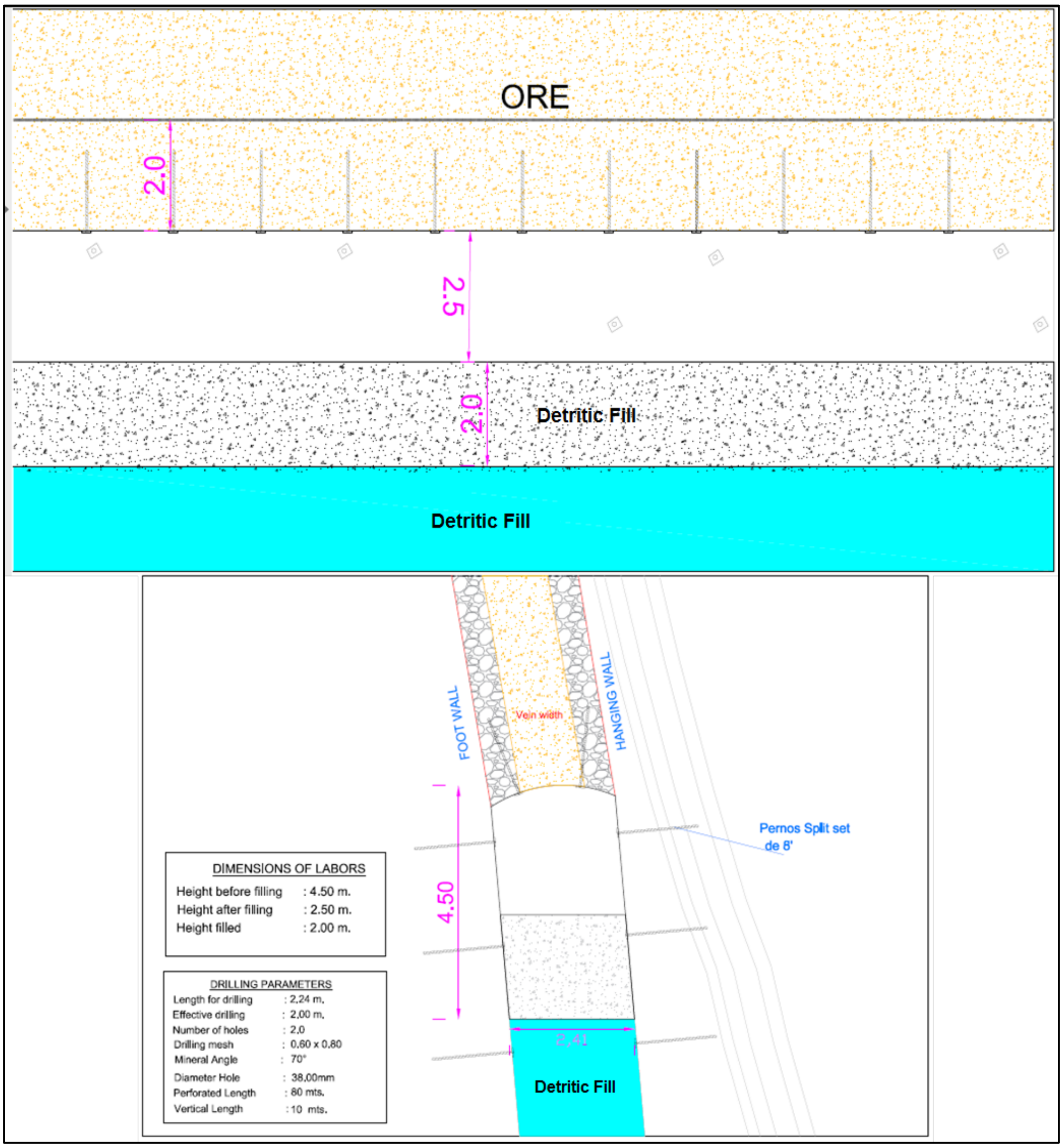


Figure 16-11:
Step Five Overhand C&F Mining - Ground Support and Backfilling



16.6 MINING DILUTION AND RECOVERIES

Dilution and mining recovery factors are very dependent on the mining method.

16.6.1 Cut and Fill Mining

Preliminary assumptions for the cut and fill mining (C&F) method is that it is a selective mining process. The dilution for veins lower than 0.8 m width was not considered as part of the block modelling process for veins on the Cisneros project. Block models are diluted to 0.8 m and no additional dilutions were considered for the mine plan in these preliminary evaluations.

The mining recovery factor is dependent on the results of rock mechanics studies. For every 100 vertical metres it is suggested to leave a nine metre horizontal pillar which is dependent on the vertical extent of each vein's geometry. Table 16-6 shows the dilution and mining recovery factor for C&F mining based on specific calculations that were considered for dilution and mining recovery factors during mine plan scheduling.

Table 16-6
Mining Recovery Factor for Cut and Fill mining

Assumptions	Guaico Veins	FW3 Vein	FW5 Vein
Dilution on veins < to 0.8 m thickness	0%	0%	0%
Mining Recovery Factor	96.7%	93%	93.3%

16.6.2 Longhole Open Stoping Mining

A mining recovery of 92% is assumed for the longhole open stoping method. The mining recovery factor is dependent on rock mechanics recommendations. For every 100 vertical metres it is suggested to leave a nine metre horizontal pillar which varies depending on the vertical extension of the vein geometry.

LINAMEC recommends that specific rock mechanics studies be undertaken to validate pillar width and distributions for the mine design.

16.7 MINE DESIGN

16.7.1 Level Access Design and Layout

On typical veins, the design and access plan to the production levels consist of the construction of a secondary access ramp with a section of 3.0 metres x 3.0 metres from the main ramp. The secondary ramp starts at a gradient of + 1% and an average length of 15 metres with the slope decreasing to -15% until it intersects the mineralized structure. The vertical offset distance between each ramp access is 15 metres.

On the Nus zone from a ramp of 3.0 metres x 3.0 metres the mineralized body is accessed by a 3.0 x 3.0 metre section access ramp and a 2.7 metres x 3.0 metre drift along mineralization as shown in Figure 16-12.

16.7.2 Access

Given that the direct distance between the Guaico and Guayabito vein systems is 1.7 km, the Guaico and Guayabito mines will have independent entrance portals, with dimensions of 4.5 metres x 4.5 metres. The first 10 metres of decline will have a slope of -5% and the rest of the ramp will have a slope of -12%.

16.7.3 Development Types

The following underground mine workings are planned for development in the Guaico and Guayabito mines:

- Main access ramps or declines: These constitute the main infrastructure of the operations and allow for deepening of the mine. Typical dimensions are 4.5 metres x 4.0 metres and the maximum and minimum slopes will be +/- 12%. As shown in the Figure 16-13.

Figure 16-12:
Major Infrastructure Mine Design for Nus

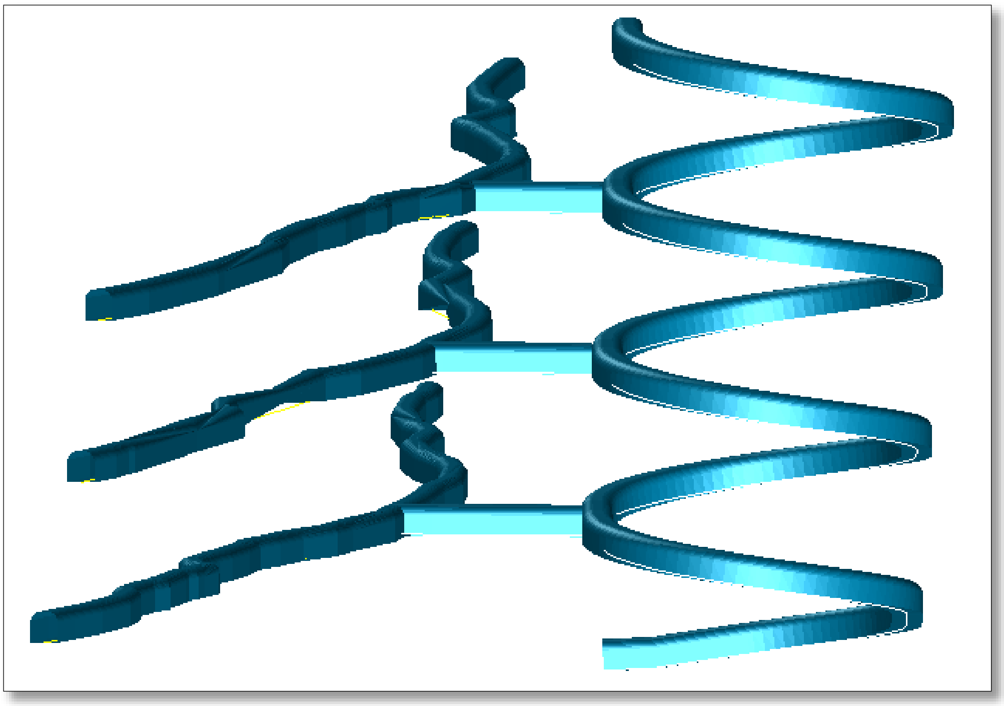


Figure 16-13:
Main Decline - Infrastructure Mine Design for Guaico

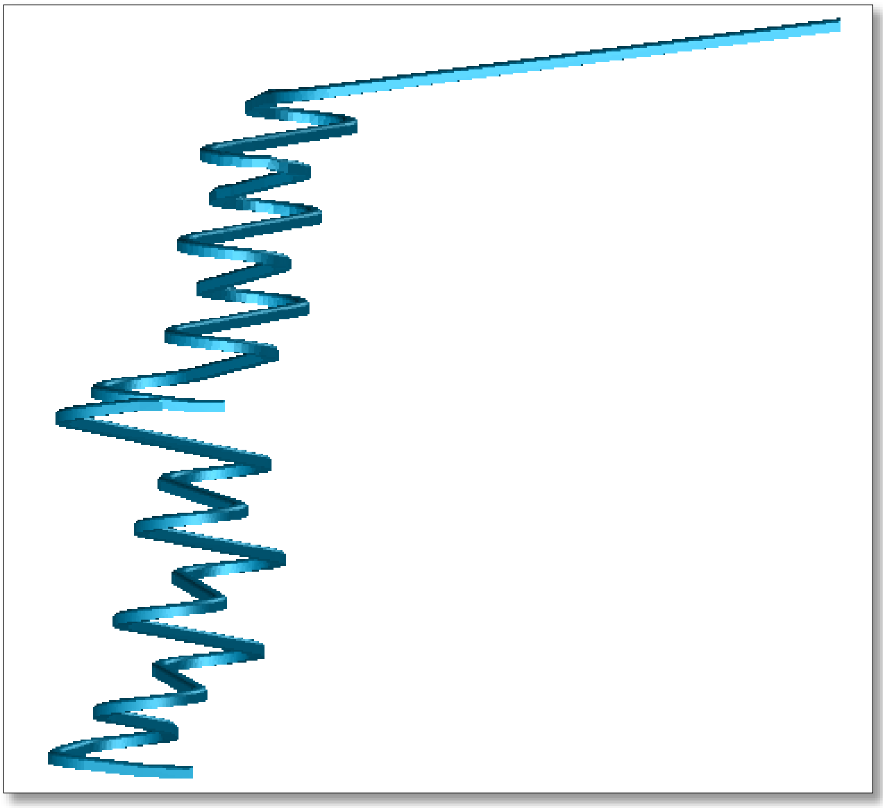


**Figure 16-14:
Secondary Access Ramp and Draw Point Designed for Guayabito**

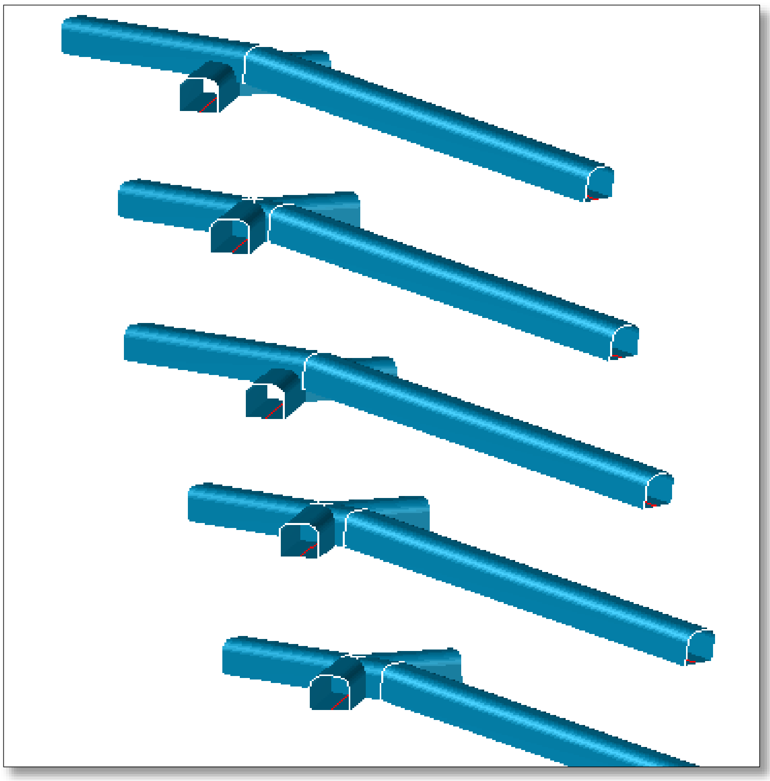
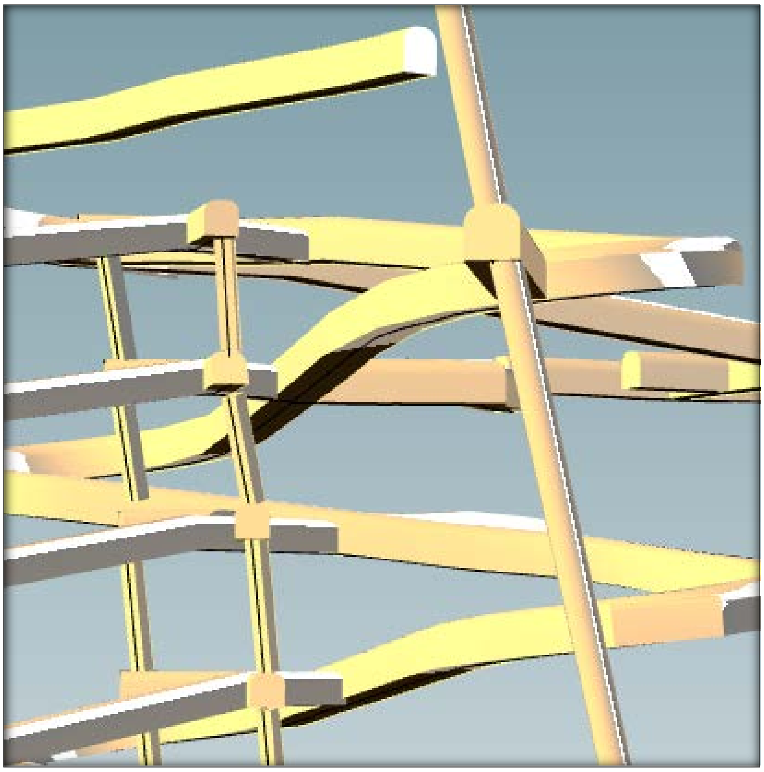
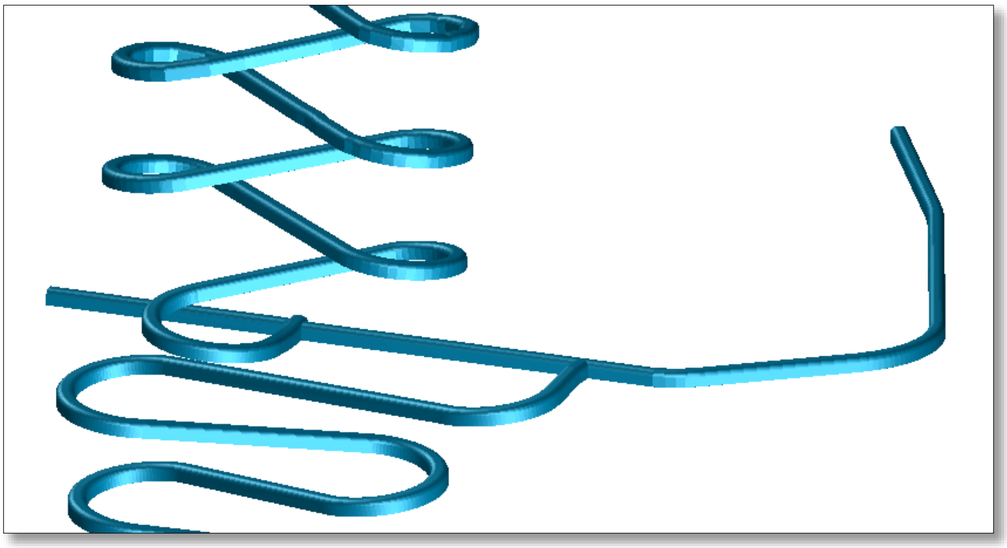


**Figure 16-15:
Ore Pass and Ventilation Raise**



- Secondary access ramps: permit direct access to the mineralized body with dimensions of 3.0 metre x 3.0 metre and gradients around ± 15% (Figure 16-14).
- Ore pass and fill pass: primary transport system in the mining operation that allows the descent of mineralized material from a higher level to a lower one. The dimensions for this infrastructure will be 1.5 metre x 1.5 metre.
- Ventilation raise: consists of a 2.4 metre diameter raise drilled by a raise boring machine. These raises allow an open circuit for air ventilation (Figure 16-15).
- Bypass: built every 100 metres parallel to the vein dip (close to vertical) to accommodate the mining infrastructure required such as the main pumping chambers, ventilation chambers and everything related to the services and auxiliary work needed inside the mine. The dimensions of these underground workings will be 4.0 metres x 4.0 metres and the maximum and minimum slopes will be ± 1% (Figure 16-16).

Figure 16-16:
Main Intersection Declines and Bypass at Guaico Mine



16.8 MINE SERVICES

16.8.1 Mine Ventilation

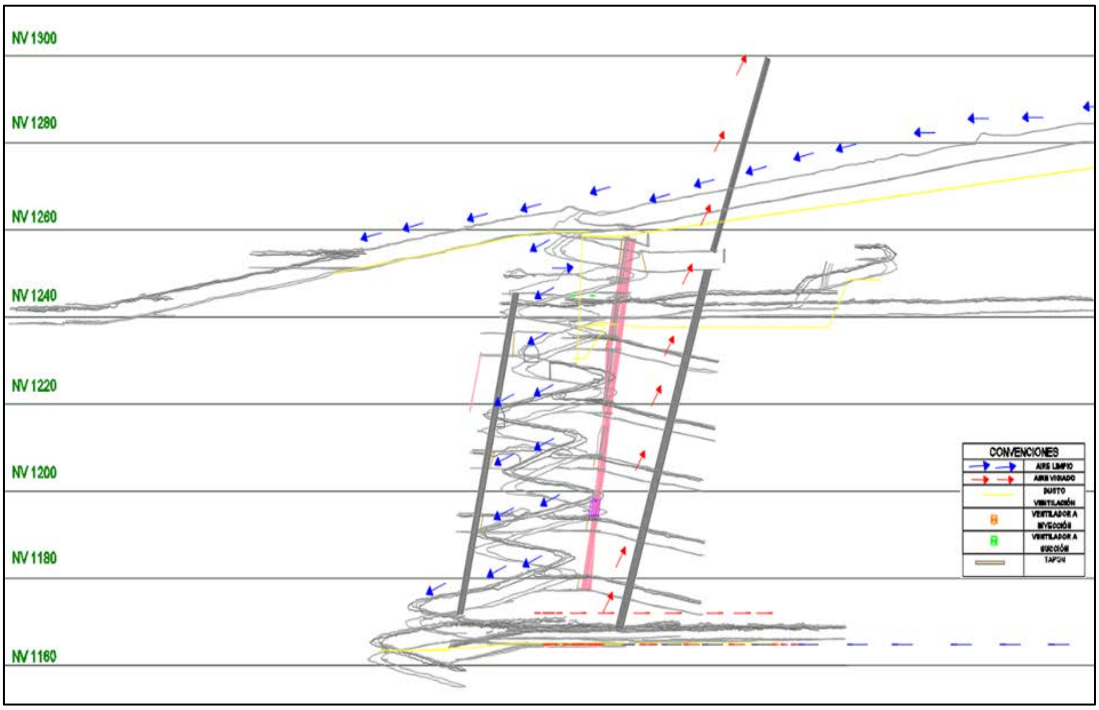
The ventilation network for Guaico and Guayabito mines are supported by raises that connect with the surface. Clean air input is through the main access and air exits through the 2.4 metre diameter ventilation raises that create an open circuit to the surface.

Extractor fans are the primary means to produce and control the ventilation airflow. Fans are projected to be on every main level as the mine gets deeper and will redirect the air flow through ventilation raises. Ventilation doors are the typical way to control the air flow within the various mine areas. This kind of control is expected to be used in the Guaico and Nus workings as the mining intensity increases.

The auxiliary air fan systems will supply air to the ends of drifts, declines, sublevels, etc. The fans will work intensely on the main ramp and development drifts. The capacity of these fans will be a function of the air requirements and the injection length. These auxillary air systems, basically consist of a fan and duct. The usual choice is an in-line axial fan. The pressure and quantity of air from the fan must be commensurate with the resistance offered by the duct and the airflow required.

For development on the Guaico mine, the actual requirement based on mine equipment is 200,000 cfm, for personnel 5,500 cfm and for blasting 5,800 cfm. Figure 16-17 illustrates the ventilation flow in the Guaico mine.

Figure 16-17:
Ventilation Flow Design for Guaico Mine



16.8.2 Water Supply

The water required for the activities at the Guaico mine is taken from the Nus River as licensed by the Colombian environmental authority and is relayed by pipeline to a reservoir located in the upper part of the portal. For the Guayabito mine two permits are available for water requirements sourced from Los Pomos creek and La Gallera creek. Additional water available from dewatering of underground mine workings will also be used. A peak water demand of 7 (litres per second (l/s) is expected for mine activities, with a calculated average water demand of 2 l/s for each of the mines.

16.8.3 Mine Dewatering

A temporary pump system will be used during construction of the main decline at the Guaico/Nus and Guayabito mines to pump the water to an industrial water treatment plant located near both portals.

The treatment plant is ready at Guaico and under construction at the Guayabito portal. The decline gradient is negative for both underground operations for the life of the mine and water must be collected by ditches and gravity. Dewatering will consist of a series of stationary pumps located at stations every vertical 15 metres with powers ranging from 10-25 HP.

Main pumping stations are planned to be at the 1160 level. These main stations will have pumps up to 125 hp that will send the water directly to surface with no auxiliary pumps. See Figure 16-18 for the provisional dewatering network and Figure 16-19 for the final dewatering network for the Guaico mine.

Figure 16-18:
Provisional Dewatering Network for Guaico Mine

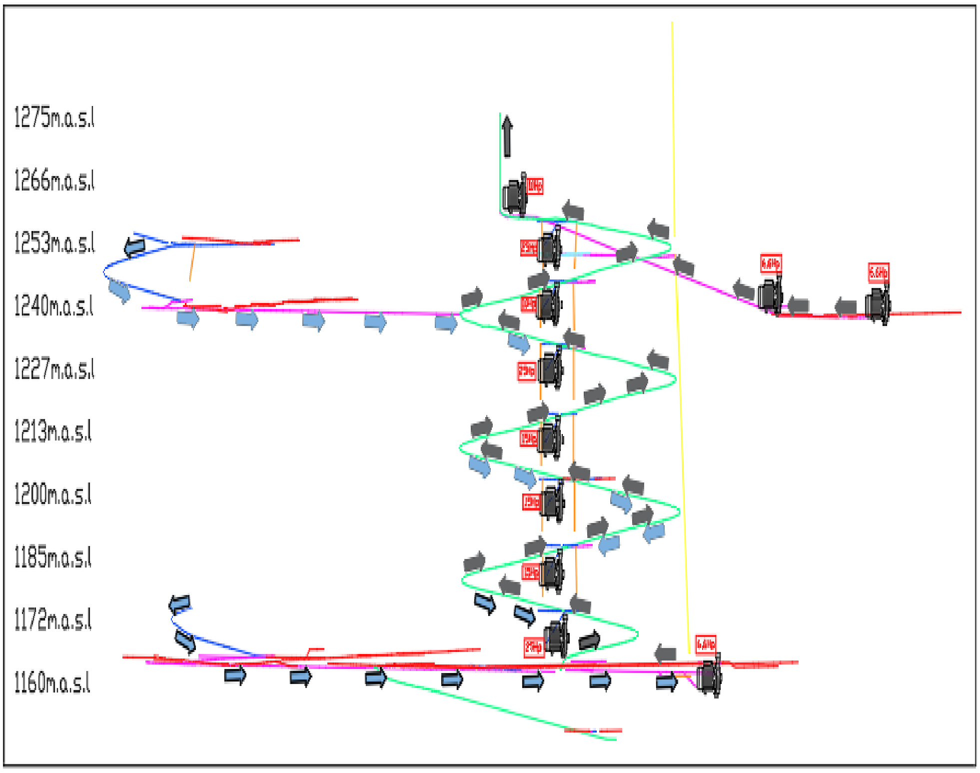
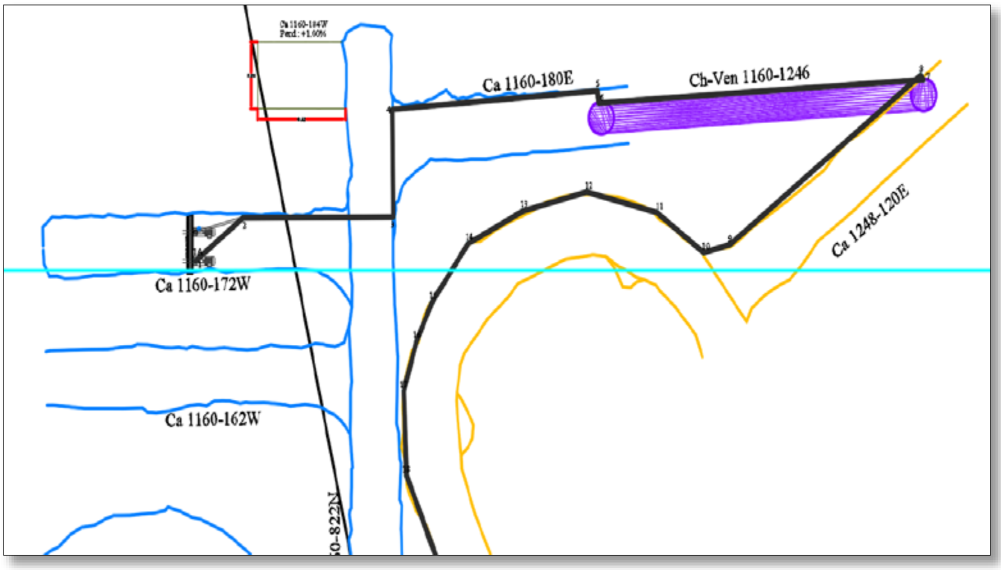


Figure 16-19:
Final Main Dewatering Network at Guaico Mine



The pumping room will have a dewatering pond, sedimentation tanks, sludge pump and sludge drying rooms that will allow for an internal pre-treatment of the water from the mine and an adequate maintenance of the infrastructure. It will also have a second backup pump that will allow for maintenance and contingencies.

All water coming from the pumping station will reach the industrial water treatment facility located at surface. Following the treatment, part of the water will be recirculated to the mine for use in the mining activities and the surplus will be discharged to surface sources as authorized by the environmental authority (La Esperanza creek for the Guaico mine and El Higuerón creek for the Guayabito mine).

16.8.4 Electrical Distribution

The Guaico mine is currently powered by a 13,200-volt public power line and it is connected to the power line of Empresas Públicas de Medellin (EPM) and connected to a 500 KVA substation (13.2 KV/460 volts). Inside the mine, there is a mobile substation of 500 KVA, (13,200/460) for a total installed capacity in this unit of 1,000 KVA.

The load capacity provided by the network operator (EPM) is 2,000 KVA, which will be distributed 1,500 KVA inside the mine as the demand increases, plus 500 KVA in a platform at the surface, for a total of 2000 KVA.

The energy for the Guayabito Mine, which is just beginning operations, will be supplied by a 13.2kv public power line owned by EPM which is 600 m away from the future main electrical substation. These substations will supply energy to the plant, mine and facilities and consist of a 2,000 KVA transformer (13,200/480 volts) for the plant and a mobile substation of 500KVA (13,200/480) volts for the mine.

16.8.5 Compressed Air

To supply the compressed air needs of the mines, each of them will have a compressor located initially near the portal that will inject compressed air through a 3-inch diameter HDPE pipeline to the working faces. Additional boosters will need to be installed as necessary.

16.8.6 Workshop

Both the Guaico and Guayabito mines will have their respective workshop areas. In both cases these facilities will initially be located on the surface for overall services and maintenance of mine equipment. Future evaluations may design an underground workshop. The main areas will be:

- Heavy machinery washing area.
- Repair area.
- Electrical and mechanical workshop.
- Oil and lubricant area.
- Warehouse.

Additionally, in the Guayabito sector where the processing plant will be located, there will be a main warehouse for the supply of materials, spare parts and lubricants for process plant operations.

16.9 UNIT OPERATIONS

16.9.1 Drilling

There are four principal drilling devices selected for Guaico and Guayabito:

- Electric-hydraulic jumbos for development. Two-booms and a single boom, are planned for large dimension development rounds, and smaller development headings.

- Raise Boring Machine used for all conventional raise boring, down reaming and box holing needs.

- Jackleg Drills, for underground support installation and general-purpose drilling, and

- Mucking rock loader (air rock loading machine) for C&F production drilling.

Jumbo drilling rates vary from 50m/h to 70m/h depending on the hardness of the rock. Raise boring rates vary from 0.4m/h to 0.5m/h and Jackleg drilling rates vary from 16m/h to 20m/h.

16.9.2 Blasting

Blasting crews will be trained and certified for explosive use in Colombia. ANFO and emulsion cartridges are the explosives that will be used. Accessories for blasting consist of boosters, detonators, shock tube, detonation cord among other auxiliary supplies.

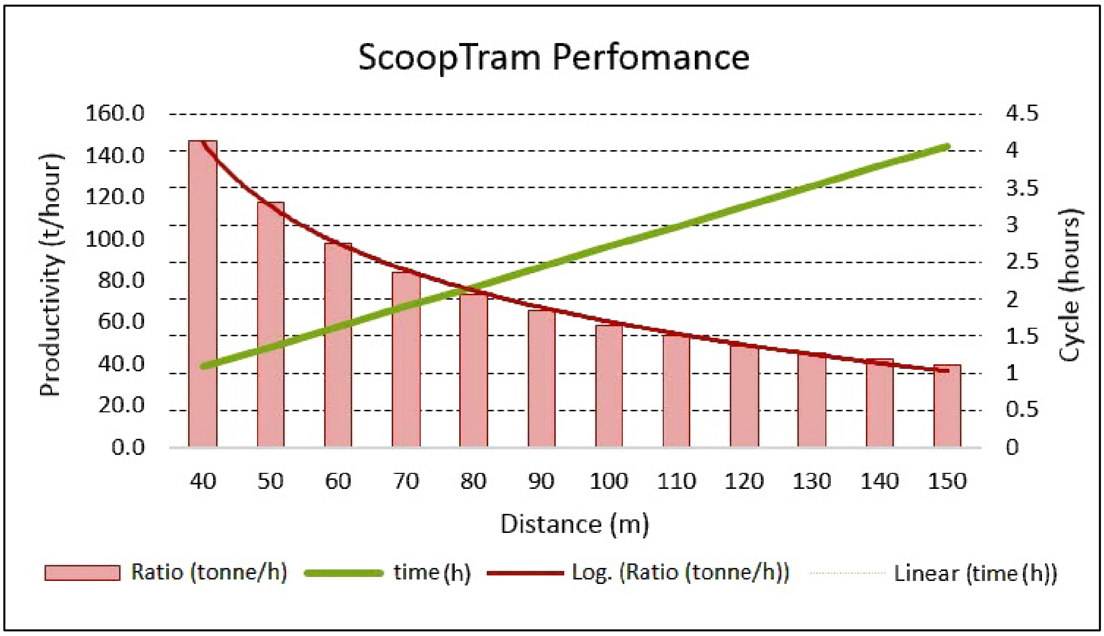
Bulk explosives are stored in secure underground and surface powder magazines in accordance with current Colombian explosives regulations. The blasting crews will pick up the estimated explosives and accessories during each shift and return any excess to the magazines as necessary.

16.9.3 Mucking

Mucking is expected to be done by secondary entry or draw point using scooptrams and It will be fully outsourced.

Planned loading equipment consists of a scooptram with a 6.8 tonne bucket capacity. The recommended scooptram performance is to accumulate waste rock in loading rooms located 200 metres apart, which means a cycle of 4.5 hours (38% of total time). The rest of the shift cycle can be used for loading trucks (57% of cycle). See Figure 16-20 for scooptram performance.

Figure 16-20:
Scooptram R1300 cycle Guaico Mine



16.9.4 Hauling.

Haulage will be by conventional low-profile Caterpillar 730 underground mining articulated trucks with a 28 tonne capacity (the number of trucks will be increased according to the increase in production over time), the nominal payload of this equipment is 28 metric tons. All material dispatching will be done through the ore pass openings that are connected with the bypasses, then the material is loaded directly onto the articulated trucks by means of the hoppers and is hauled to the surface.

16.9.5 Backfill

The backfill is very dependent on the mining method. Cut and fill mining will supply waste material directly from additional blasting of the hanging wall and more than 90% of the backfill is expected to be from this source. The remaining material required will have to be sourced from detrital material produced by mine development through a fill pass raise connected to a secondary access ramp. Longhole open stopping mining will use detrital material as in the cut and fill mining. Backfilling is expected to work from the upper sub-level to the lower sub-level.

16.10 MINE EQUIPMENT

All underground mining equipment needed to meet the requirements of the mine plan is summarized in Table 16-7 for major equipment and Table 16-8 for secondary equipment.

16.11 MINE PERSONNEL

Personnel required for the mining operation includes owner and mining contractors. Owner personnel consist of management and a minimum staff for technical support. Most of the personnel are contractors and include staff, workforce and maintenance people. Detailed estimates of personnel required are showed in table 16-9 to 16-12.

Table 16-7
Major Equipment for Underground Mine

Major Equipment	Guaico Mine	Guayabito Mine
Jumbo 2 Booms S2D (Atlas Copco)	1	1
Jumbo 1 Boom S1D (Atlas Copco)	1	1
Scooptram 3.5 yr^3 bucket capacity	2	1
Telehandler	1	1
25 Tonne Dump Truck Cat730	2	2
Bulldozer	1	
Backhoe loader	1	1
Micro Mucking rock loader	1	1
Scooptram 2.0 yr^3 bucket capacity	1	1
Shotcrete Machine	1	1

Table 16-8
Secondary Equipment for Underground Mine

Secondary Equipment	Guaico Mine	Guayabito Mine
Ventilation fans	5	3
Electric compressor 400 cfm	1	1
Compressed Air Storage Tanks	1	1
Submersible pumps	4	4

Stationary pumps	10	10
Electric substation 400 kVA	1	1

Table 16-9
Mine Management

Area	Number
Camp	2
Security	1
Geology	9
Mine	16
Metallurgical	46
Environmental	5
Social	4
Health and Safety and Administration	6
Total	**89**

Table 16-10
Mining Contractor Mine Staff

Position/Supervisor	Total	Guaico Mine	Guayabito Mine
Director	1	0.5	0.5
Resident Engineer	1	0.5	0.5
Shift Mining Engineer	6	1.5	1.5
Supervisor	6	2	2
Cost control	4	2	2
Surveyor	2	1	1
Surveyor helpers	4	2	2

Table 16-11
Mining Contractor Mine Operators

Position	Total	Guaico Mine	Guayabito Mine
Foreman	6	3	3
Pipe master	10	5	5
Jumbo operator – Miner I	10	5	5
Scoop tram operator	10	5	5
Telehandler Operator	6	3	3
Jumbo operator – Miner II	10	5	5
Jackleg Operator - Miner I	10	5	5
Jackleg Operator – Miner II	10	5	5
Services Ground support	6	3	3
Dumper Operator	10	5	5
Truck Operator	10	5	5
Miner Services Miner	10	5	5
Mine Water Pump	8.	4	4

Table 16-12
Maintenance and Supporting Mining Contractor Overhead

Auxiliary Services	Total	Guaico Mine	Guayabito Mine
Administrator	1	0.5	0.5
Warehouse administrator	2	1	1
Warehouse auxiliary	4	2	2
Driver	6	3	3
Camps auxiliary	8	4	4
Sustaining	**Total**	**Guaico Mine**	**Guayabito Mine**
Coordinator HSE	1	0.5	0.5
Coordinator Environmental	1	0.5	0.5
Supervisor HSE	6	3	3
Water plant operator	6	3	3
Environmental Helpers	4	2	2
Mechanical Maintenance	**Total**	**Guaico Mine**	**Guayabito Mine**
Mechanic Supervisor	1	0.5	0.5
Lead Mechanic	1	0.5	0.5
Welder	4	2	2
Mechanic	8	4	4
Hydraulic Mechanic	6	3	3
Lube Operator	4	1	1
Wheel Operator	4	1	1
Electrician	4	1	1
Auto Electrician	4	1	1
Electrical Maintenance	**Total**	**Guaico Mine**	**Guayabito Mine**
Electric Engineer	1.	0.5	0.5
Technical electrician	10	5	5
Total	**226**	**106.5**	**106.5**

16.12 MINE PRODUCTION SCHEDULE

16.12.1 Potentially Economic Resources

The Cisneros Project mine potential mill feed estimate was based on the updated mineral resources. A total of 728,603 tonnes at a grade of 5.389 g/t Au of measured plus indicated resources and 526,211 tonnes at a grade of 6.345 g/t Au of inferred mineral resources were considered for the financial evaluation. The following assumptions were used as the criteria to estimate these economic mineral resources:

- The potential economic mineral resources comprising the mill feed are included in the reported mineral resources.
- Specific cut off grades were calculated for the Guaico, Nus and Guayabito structures. Cut-off grades of 2.95 g/t Au for Guaico, 2.62 g/t Au for Guayabito and 1.66g/t Au for Nus were estimated.
- Metal price, production and selling cost and recovery were considered as the major factors in the calculation of cut off grade.
- Gold price assumptions are no more than the average value for the last six months as indicated by the price fixes of the London Metal Exchange with input and agreement of the Cisneros project engineering team.
- Mining, processing and selling costs based on a preliminary internal mine plan for the Cisneros Project includes:

- o unit cost for mine activities,
- o vertical and horizontal development,
- o direct costs for mill and concentrate,
- o maintenance and overhead costs for mine and plant assuming 3000 tonnes per month milled.

- General and administration cost and sustaining cost were not considered in the cut off grade estimation. Detailed assumptions for the cut off grades are shown in Table 16-13.
- Guayabito Sur structures and Papi veins were not included. These require more development that is economically not viable in comparison with current tonnage. In addition, the Papi veins are far away from Guaico and need to cross the Cisneros fault.
- Mineral resources within 30 metres of surface are not considered. A pillar of nine metre width along each level will be left behind. Both of these reduce the initial resources.
- The potential economic mineral resource includes a historical mineral stockpile reported to contain 7,500 tonnes grading 5.1 g/t Au. The mineralized material was sourced from mine development up to September 30, 2017 on the Guaico and Nus mines (See Table 16-14).

Table 16-13
Cut off Grade Estimation for Potentially Economic Mineral Resources

Item	Unit	Guayabito Value	Guaico Value	Nus Value
Gold Price	US$/oz	1,250	1,250	1,250
Payable Metal	%	97.625	97.625	97.625
Deductions	US$/oz	29.69	29.69	29.69
Selling cost - Assay , Transport, Refining & Insurance	US$/oz	75.97	75.97	75.97
Royalties @ 3.74% metals payable minus selling cost	US$/oz	42.80	42.80	42.80
Net Gold price	US$/oz	1101.5	1101.5	1101.5
Production Unit Costs				
Mining Cost	US$/ore mined tons	42.68	47.96	27.94
Mining - Development Ore	US$/ore mined tons	29.41	35.14	12.71
Processing Cost	US$/ore milled tons	14.05	14.05	14.05
General & Administration				
Total Cost	US$/ore milled tons	86.14	97.15	54.70
Metallurgical Recovery	%	93.0	93.0	93.0
Cut off Grade	**Au g/t**	**2.62**	**2.95**	**1.66**

Table 16-14
Stockpiled Mineral Resources at Guaico-Nus Mine and Guayabito Mine

Mine/Structures	Tonnes	Au g/t
Guaico veins	3,371	7.0
Nus structure	4,078	3.5
Total Stockpiled	7,439	5.1

- A total of 785,000 tonnes grading 6.43 g/t Au of mineral resources was estimated. The summary of the potential economic mineral resources up to the Cisneros 2017 PEA are shown in Table 16-15.

Table 16-15
Potential Economic Mineral Resources

Measured & Indicated Resources

Deposit Name	Tonnage	Au g/t	Au oz
Nus Structure	258,704	3.337	26,848
La Manuela and Guaico Veins	68,408	8.125	17,287
Guayabito Norte System Veins	189,239	7.345	43,235
Total Measured & Indicated	**516,351**	**5.440**	**87,370**

Inferred Resources

Deposit Name	Tonnage	Au g/t	Au oz
Nus Structure	75,800	2.984	7,035
La Manuela and Guaico Veins	21,946	10.210	6,969
Guayabito Norte System Veins	170,666	8.075	42,865
Total Inferred	**268,412**	**6.812**	**56,870**

- Note that the economic assessment includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

16.12.2 Life of Mine Plan (LoM)

The Guaico-Nus and Guayabito mine schedules were optimized using MineSched software and a mine plan was produced on a yearly basis. Development available at the time of this report on the Guaico-Nus mine was the main input and included updated block model data and mining productivities for assumed stopes (Table 16-16) and rate of development (Table 16-17).

Table 16-16
Single Stope Productivities at Guaico-Nus and Guayabito Mine

Mining Method	Ore Tonnes/Day
Long Hole Open Stopping (LHOS)	250
Cut and Fill (C&F)	65

Table 16-17
Development Rates for Scheduling at Guaico-Nus and Guayabito Mine

Development	Section Width (m)	Section Height (m)	Advance Rate (m/day)
Decline	4.5	4.5	5
Crosscut, By-Pass, Loading Chambers.	4	4	5
Secondary Ramp, Draw Point to Ore Pass and Fill Pass	3	3	5
Drift	2.7	3	5
Conventional Raise	1.5	1.5	1
Raise Boring	2.4 Ø		5

The planned start of mine production is in the second quarter of 2018. The Guaico and Guayabito vein areas are planned to be mined by cut and fill and the Nus structures by longhole open stoping. The mining rate is expected to average 15,000 tonnes/month.

Results of the proposed production on a yearly basis over the life of mine are shown in figures 16-22 to 16-25 and Table 16-17 to Table 16-18.

Table 16-18
Mine Scheduling for Cisneros 2017 PEA

Mined Schedule		Units	2017	2018	2019	2020	2021	2022	Total
Nus	Total Ore Mined	k-tons	4	53	52	79	94	30	313
	Au Grade	g/t	3.45	3.04	3.60	3.82	2.98	2.85	3.30
Guaico	Total Ore Mined	k-tons	3	25	43	21	0	0	92
	Au Grade	g/t	7.03	8.20	9.42	9.19	0.00	0.00	8.95
Guayabito	Total Ore Mined	k-tons		57	93	94	92	44	380
	Au Grade	g/t		9.31	8.60	8.78	7.89	7.03	8.39
Total	Total Ore Mined	k-tons	7	135	188	194	186	74	785
	Au Grade	g/t	5.06	6.64	7.40	6.80	5.41	5.33	6.43
Processing Schedule		**Units**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Total**
	Total Ore Milled	k-tons	0	142	175	175	175	117	785
	Au Grade	g/t	0.00	6.56	7.40	6.84	5.66	5.36	6.43
	Au Recovery	%	0%	93%	93%	93%	93%	93%	93%
	Recovered Au	k-oz	0	28	39	36	30	19	151

Figure 16-21:
Life of Mine Extraction Sequence - Front 3D View, Guayabito Mine

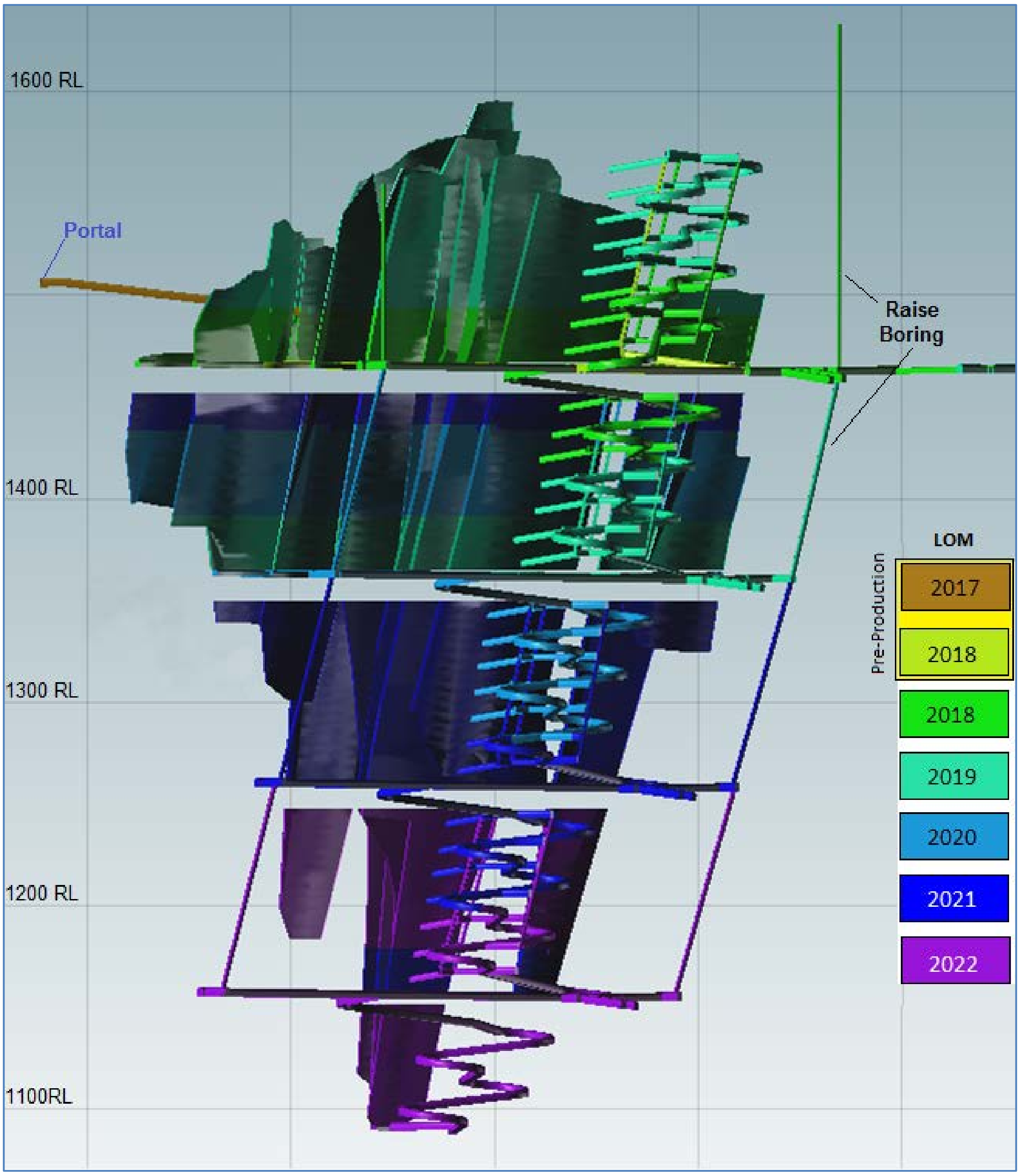


Figure 16-22:
Life of Mine Extraction Sequence - Top 3D View, Guayabito Mine

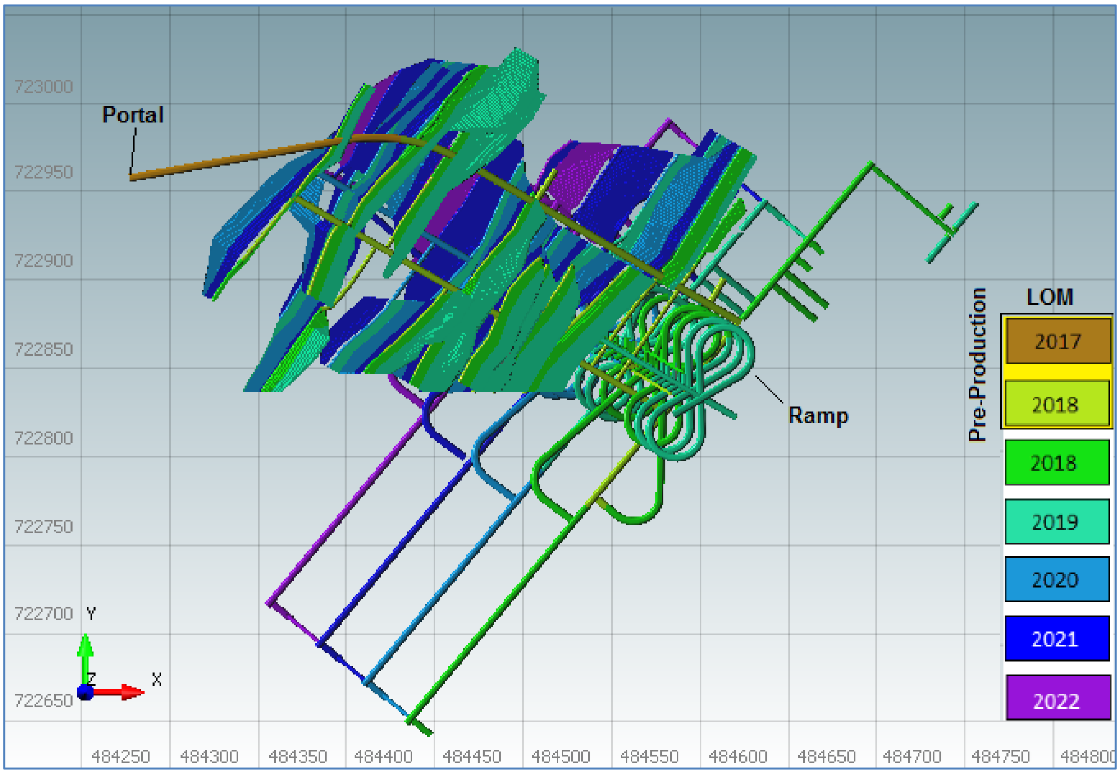


Figure 16-23:
Life of Mine Extraction Sequence - Front 3D View, Guaico Mine

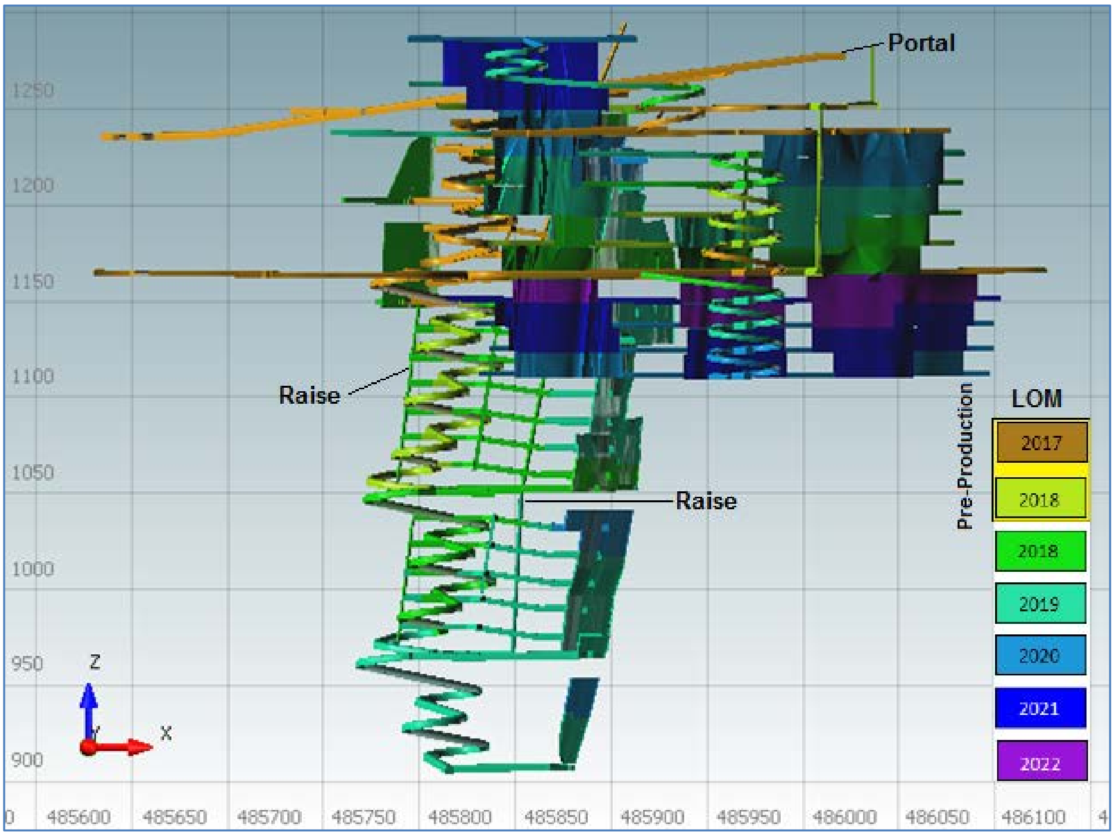


Figure 16-24:
Life of Mine Extraction Sequence - Front 3D View, Guaico Mine

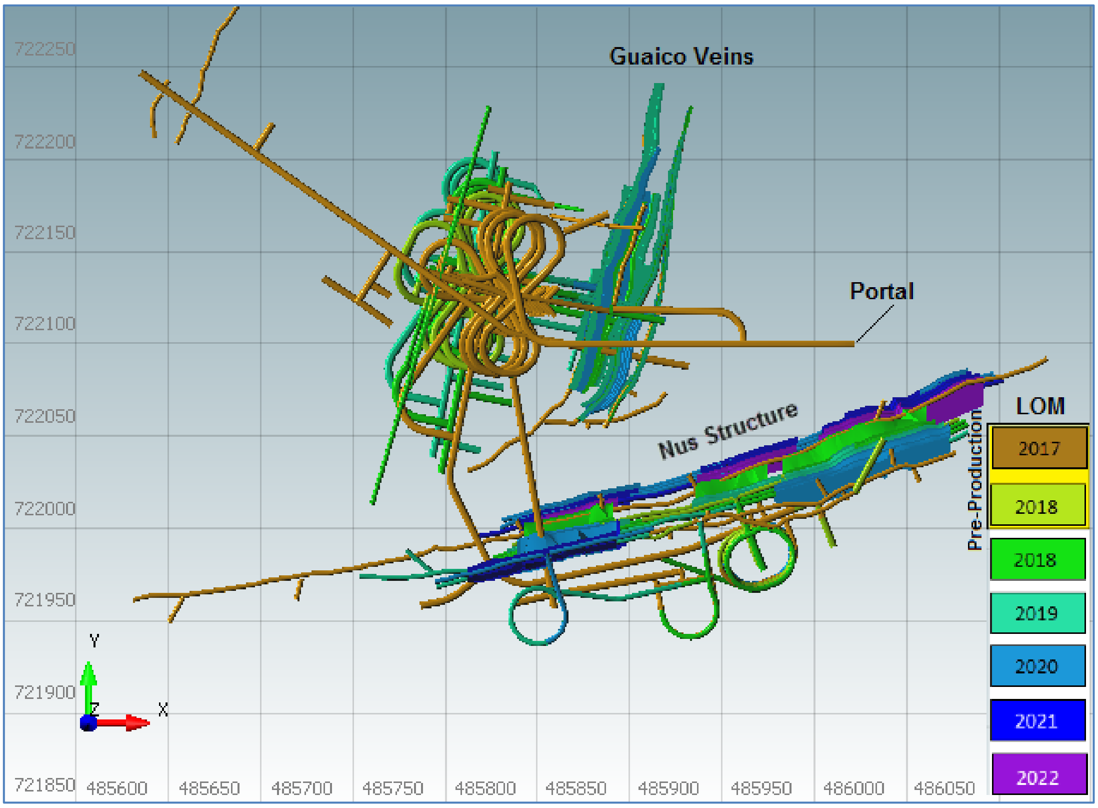
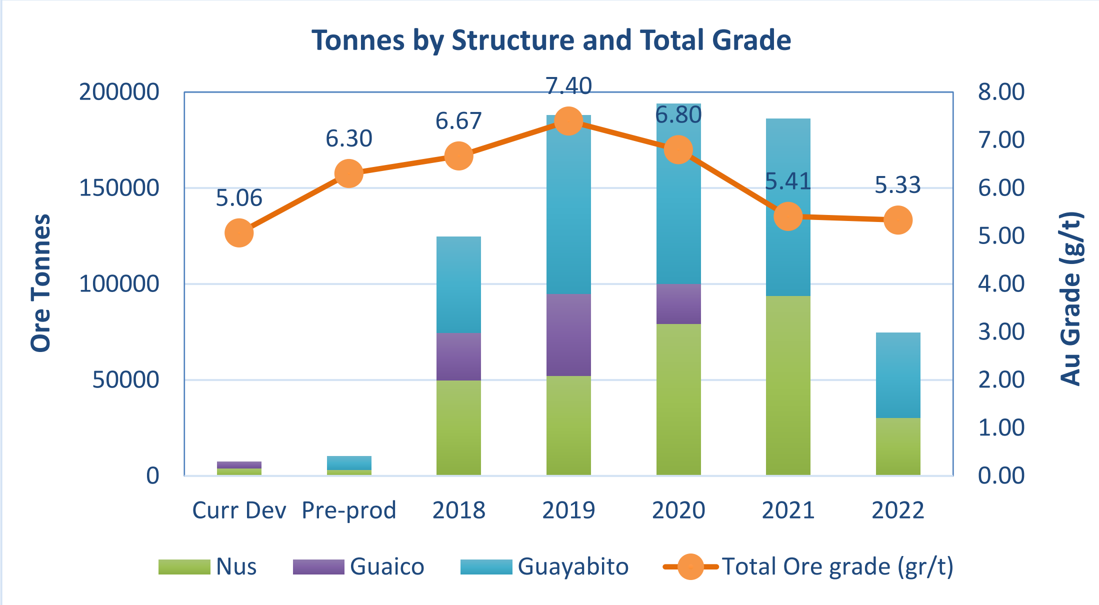


Table 16-19
Scheduling by Pre-Production, Production and Development

Item	Units	2017	2018	2019	2020	2021	2022	LoM
Pre-Production Ore Mined								
Guaico mine	ktons	3.0	0.0	0.0	0.0	0.0	0.0	4.0
Nus mine	ktons	4.0	3.0	0.0	0.0	0.0	0.0	7.0
Guayabito mine	ktons	0.0	7.0	0.0	0.0	0.0	0.0	7.0
Total	ktons	7.0	10.0	0.0	0.0	0.0	0.0	18.0
Development Ore Mined								
Guaico mine	ktons	0.0	2.0	1.0	0.0	0.0	0.0	3.0
Nus mine	ktons	0.0	4.0	3.0	9.0	3.0	0.0	18.0
Guayabito mine	ktons	0.0	4.0	2.0	2.0	1.0	2.0	12.0
Total	ktons	0.0	10.0	5.0	11.0	4.0	2.0	32.0
Production Ore Mined								
Guaico mine	ktons	0.0	23.0	42.0	21.0	0.0	0.0	86.0
Nus mine	ktons	0.0	46.0	50.0	71.0	91.0	30.0	287.0
Guayabito mine	ktons	0.0	46.0	91.0	91.0	91.0	42.0	362.0
Total	ktons							785.0
Total Ore Mined								
Guaico mine	ktons	3.0	25.0	43.0	21.0	0.0	0.0	92.0
Nus mine	ktons	4.0	53.0	52.0	79.0	94.0	30.0	313.0
Guayabito mine	ktons	0.0	57.0	93.0	94.0	92.0	44.0	380.0
Total	ktons	7.0	135.0	188.0	194.0	186.0	74.0	785.0
Gold Grade Mined								
Guaico mine	g/t	7.0	8.2	9.4	9.2	0.0	0.0	8.9
Nus mine	g/t	3.4	3.0	3.6	3.8	3.0	2.8	3.3
Guayabito mine	g/t	0.0	9.3	8.6	8.8	7.9	7.0	8.4
Average	g/t	5.1	6.6	7.4	6.8	5.4	5.3	6.4
Milled Production								
Total Ore Milled	ktons		142.3	175.0	175.0	175.0	117.4	785.0
Au Grade	g/t		6.6	7.4	6.8	5.7	5.4	6.4

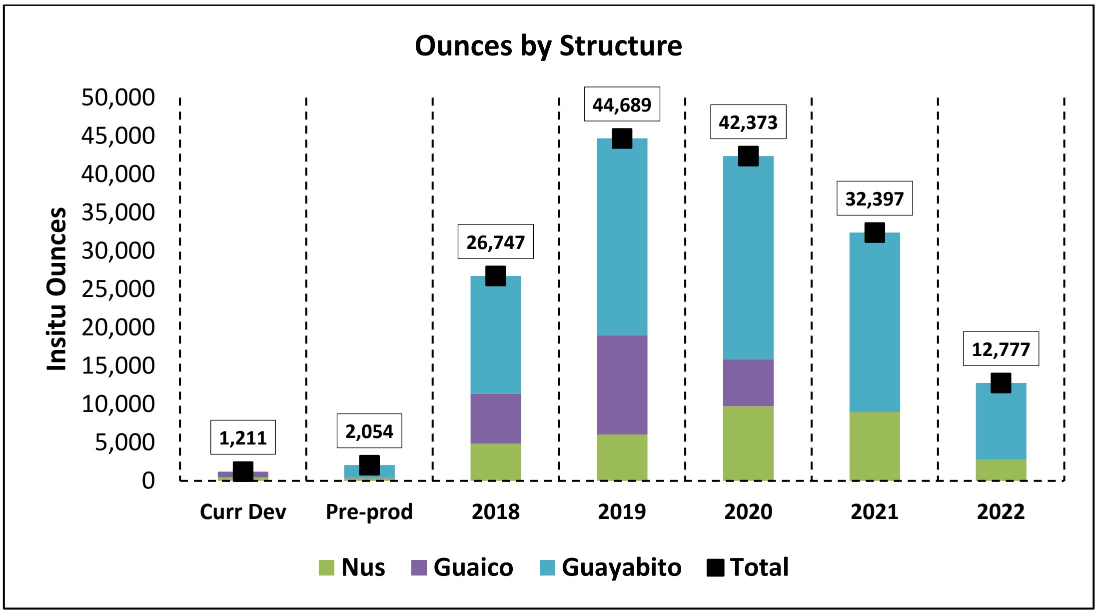
The gold grade is 5 g/t to 7.5 g/t. The Nus structure is low grade but contributes 40% of the production. Figure 16-25 shows detailed gold grade and tons mined by structure on a yearly basis.

Figure 16-25:
Yearly Mining Production by Structure



Mined ounces (in-situ) will increase from 27 koz in 2018 to 44 koz in 2019, and then decrease gradually for the remaining mine life. The production start year is 2017 for Guaico-Nus and the second quarter of 2018 for Guayabito. Figure 16-26 shows the detailed in situ ounces produced by structure on a yearly basis.

Figure 16-26:
In-situ Ounces Produced Yearly by Structure



A total of 30,000 metres of development is planned, including vertical and lateral development, ore pass and fill pass and service shaft but does not include raise boring. The ore pass and fill pass use the primary haulage system projected between levels and allows handling of mineralized material and waste. The provision for raise boring is 1,500 metres and it is used for the ventilation shaft at a typical diameter of 2.4 metres. Table 16-18 and Table 16-19 show the mine development scheduling on a yearly basis.

Table 16-20:
Length of Mine Development Scheduling on Production Stage

Item	Units	2018	2019	2020	2021	2022	Total
Guaico Mine	m	840	1,004	1,281	269	0	3,395
Nus Mine	m	2,515	1,999	89	0	0	4,603
Guayabito Mine	m	2,544	2,622	2,460	2,772	2,512	12,909
Total	**m**	**5,899**	**5,625**	**3,829**	**3,040**	**2,511**	**20,907**

Table 16-21:
Length of Mine Development Scheduling on Pre-Production Stage

Item	Units	2017	2018	Total
Guaico Mine	m	1,512	823	2,334
Nus Mine	m	3,902	1,150	5,052
Guayabito Mine	m	156	1,675	1,831
Total	**m**	**5,570**	**3,648**	**9,218**

17.0 RECOVERY METHODS

17.1 INTRODUCTION

The objective of the metallurgical process is to obtain gravity and flotation concentrates in a plant with a capacity of 500 tonnes per day (tpd). The plant will be composed of a single production line in two conventional processes namely gravity followed by flotation to obtain sulphide concentrates containing gold.

The process path involves a dry section consisting of crushing (primary and secondary stages) and milling and a wet plant comprising gravity concentration, flotation and filtration of concentrates where gold is recovered.

The process plant has been designed to operate 347 days per year and treat 500 tonnes of material daily. The average head grade is estimated to be 6.43 g/t Au. An overall recovery of 90% is anticipated. Resources have been estimated at 784,763 tonnes with a life-of-mine (LoM) of 5.0 years. A stockpile of 19,402 tonnes resulting from the development of stopes in the Guayabito and Guaico-Nus areas will be maintained for the commissioning of the plant,

The general flow chart of the plant process consists of four sections to produce gold concentrates. These include primary and secondary crushing, grinding and gravity, flotation and concentrate filtration. Figure 17-1 shows a general process flowchart while the main process equipment is listed in Table 17-1.

Figure 17-1:
Conceptual Process Flowchart

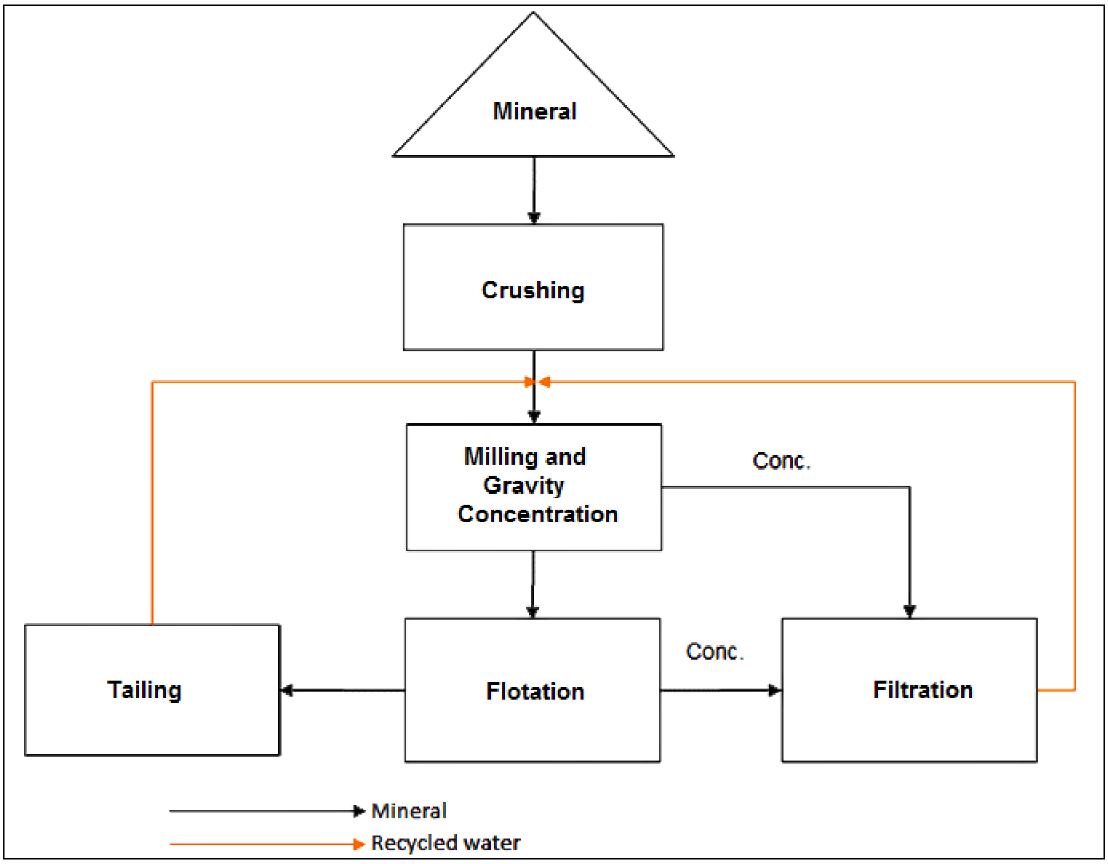


Table 17-1:
List of Main Process Equipment

Equipment	Qty	Characteristics
Primary crushing		
Jaw crusher	1	20 in x 32 in
Secondary crushing		
Secondary screen	1	6 ft x 16 ft
Cone crusher	1	3 ft
Milling and classification		
Mill	1	8 ft x 10 ft
High-frequency screen	1	1.2 m x 3.6 m
Gravity concentrators	2	80 t/h
Cyclones	3	D-10, 2 (operating),1 (stand-by)
Flotation		
Conditioning tank	1	1.7 m x 1.7 m
Rougher cells	4	1.5 m^3/min
Scavenger cells	4	1.5 m^3/min
Cleaner cells	10	0.5 m^3/min
Filtration		
Conditioning tank	1	3.5 m x 3.5 m
Press filter	1	M800 x 800

17.2 PROCESS DESCRIPTION

17.2.1 Primary and Secondary Crushing

The underground mineralized material will be fed to a coarse chute of 150 tonnes capacity using dump trucks of 25 m^3 capacity and will pass through a hopper with a grill of 8 inches (200 mm) before entering the crushing circuit. The material will be extracted from the bottom of the hopper by means of a vibrating grizzly with rails of 2" (50 mm) that classifies the load into coarse and fine. The coarse fraction (> 2") feeds a 20" x 32" jaw crusher while the fines (< 2") are fed into the product of the jaw crusher.

This product will be moved by means of a conveyor belt to a 6' x 16' double-deck vibrating screen. The upper floor of the screen will be composed of mesh with a 68 mm opening, while the lower floor mesh will have a 39 mm opening. The over-sizes of the upper floor of the vibrating screen will be sent to a conical crusher, while the fine material will be sent to the fine's chute. The product of the conical crusher will be returned to a conveyor belt to pass through the vibrating screen again in closed circuit.

The crushing circuit will have a dust suppression system located at the points of transfer between belt and equipment, in order to control the emission of suspended fine particles produced in the process of size reduction.

17.2.2 Grinding and Gravity

The material coming from the crushing stage, will be extracted from the stockpile by means of two belt feeders (one operating and the other on standby) then it will be unloaded in a conveyor belt that will feed a ball mill of 8'x10' diameter.

The product of the ball mill discharges to a high-frequency screen (HFS) that will have 1.6 mm opening panels. The coarse material of the HFS (> 1.6 mm) will be sent to the pump drawer, while the fines (< 1.6 mm) will feed two semi-continuous gravity concentrators (one operating and one on stand-by).

The gravity concentrates will be sent as a final product to the dispatch of concentrates, while the tails will be discharged to the pump drawer where the coarse material of the HFS will be collected to feed the cyclone nest (D10).

The cyclone nest will consist of three cyclones of 10" diameter (two operational and one on standby), which will generate two products: coarse and fines. The fines from the overflow, will be sent to the flotation circuit with particle size <106 μm, while the coarse material of the underflow, will be returned to the ball mill with (diameter 8'x10'), thus, closing the circuit

Belt 1, will have a scale to weigh the tonnes processed each hour. In the unloading zone of the belt an automatic sampler will take samples of the mineral for grade analysis. Also, in the cyclone overflow line, there will be an automatic sampler for sampling of pulps that will be analyzed in the mine's laboratory.

17.2.3 Floating and Filtering of Concentrates

In this stage, mineral flotation produces sulphide concentrates with gold content. The description of the process is as follows:

1. The overflows of the cyclones D10 are sent to a conditioning tank of 10' x 10' dimensions where the overflow feeds a rougher flotation circuit.
2. The rougher tails consisting of a bank of 4 cells of 1.5 m^3 capacity each are discharged to the scavenger stage, while their concentrates are sent to the cleaner stage.
3. The scavenger flotation consists of 4 cells of 1.5 m^3 capacity each, where their concentrates will be joined with the cleaner flotation tails, which return by pumping to the conditioning tank, while their tails are sent to the tailings.
4. The flotation cleaner consists of a bank of 6 cells of 0.5 m^3 capacity each, where tails are returned to the conditioner and the concentrates are discharged to the recleaner flotation.
5. The flotation cleaner II is composed of a bank of 4 cells of 0.5 m^3 capacity each, where tails are returned to flotation cleaner I, while concentrates are sent to the concentrate filter press.
6. Additionally, in the line of tails and final concentrates, there will be two automatic samplers to sample pulps that will be sent to a chemical laboratory for analysis of gold and silver.
7. The flotation concentrates are sent to a 10 'x 10' holding tank which is fed by two pulp pumps (one operating and the other on standby) to a membrane filter press, which filters the pulp and discharges the concentrate with a humidity percentage of approximately 10-15%.
8. The water obtained in the filtration stage is sent to a recovered water tank and returns to the plant circuit.

17.2.4 Reagents

Reagent plants, located close to the flotation circuit, provide for the mixing and supply of the necessary reagents for flotation and flocculants for thickening.

The reagents are prepared with fresh water for reagents PAX, A-3418, lime slurry and copper sulphate. The detail of the preparation and consumption of reagents is presented in Table 17-2

Table 17-2:
Details of Preparation and Consumption of Reagents

Reagents	Dosage (g/t)	Preparation (%)	Mill (g/t)	U/F Cyclones (g/t)	Conditioner (g/t)	Scavenger (g/t)
MIBC	50	100%	0	0	35	15
PAX	120	10%	15	30	50	25
A-3418	10	100%	2	0	5	3
Cal	500	15%	500	0	0	0
Cu sulfate	50	10%	0	10	30	10

17.2.5 Services

All floatation cells are forced air and dedicated blowers supply manifold air for the flotation cells. Raw water is pumped to a raw water dam. Filtration and treatment plants use the raw water to produce a range of water qualities as required for potable water, gland seal water, fire water and process water usage. Distribution systems for each water type are included, ensuring delivery of sufficient quantity at the required pressure.

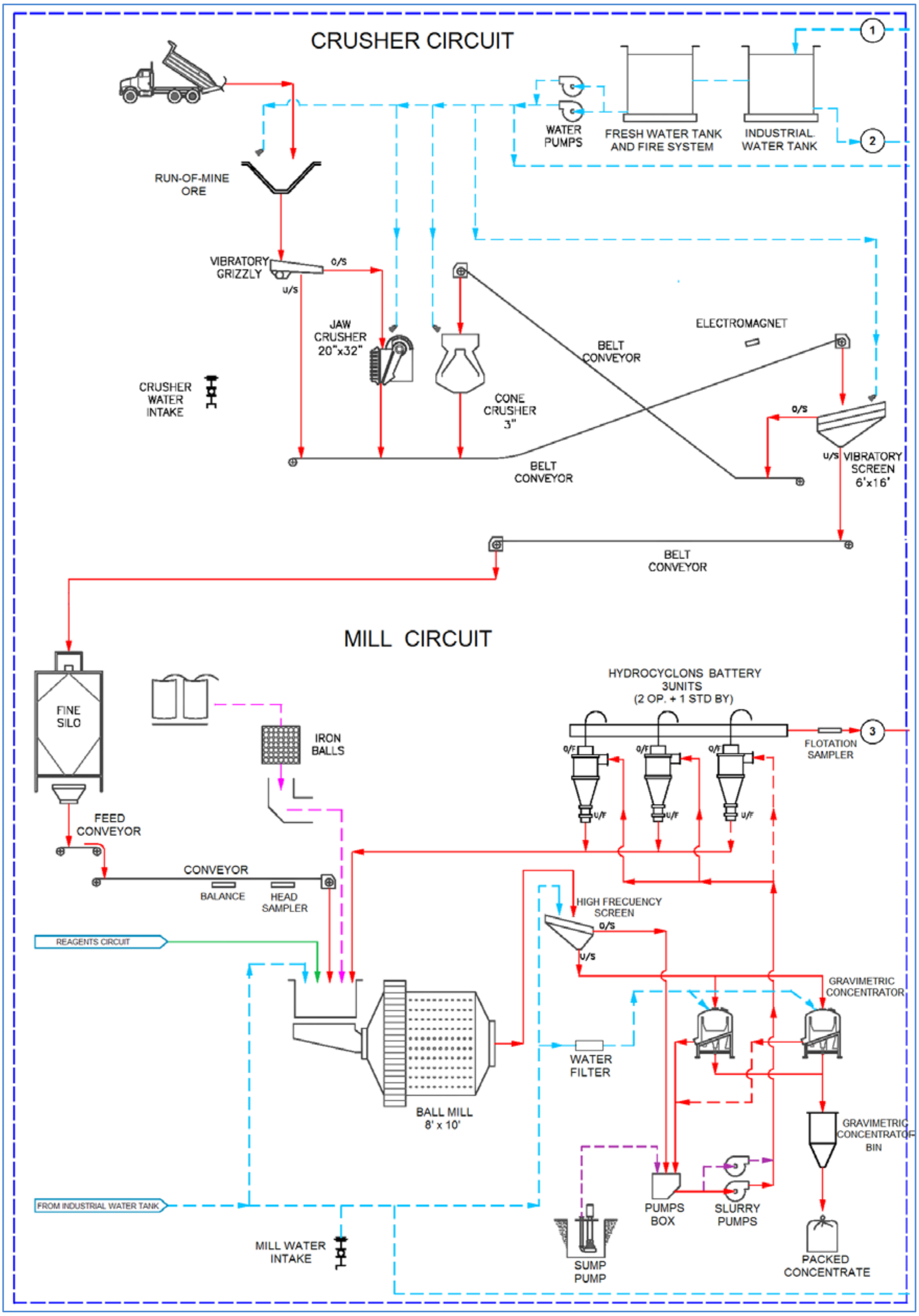
The following services are required for the operation of process plant:

- **Air**: all blowers and compressors are equipped with inlet filters to keep dust out of the environment.
- **Low Pressure Air**: for the flotation circuit there will be two low pressure blowers (one operating and one on standby) for rougher, scavenger and cleaning circuits.
- **High Pressure Air**: for instrumentation air, there will be two compressors (one operating and one on standby) that will be used for the instruments. The concentrate filtration stage will also have a compressor.
- **Water Supply**: fresh water requirement of the process will be 11 m^3/h. The remaining water required for the process will be obtained from the recirculation of water that comes mainly from the water in the strainer, filtration of concentrates and from contribution of run-of-mine (ROM) water.

17.2.6 Flow Diagrams

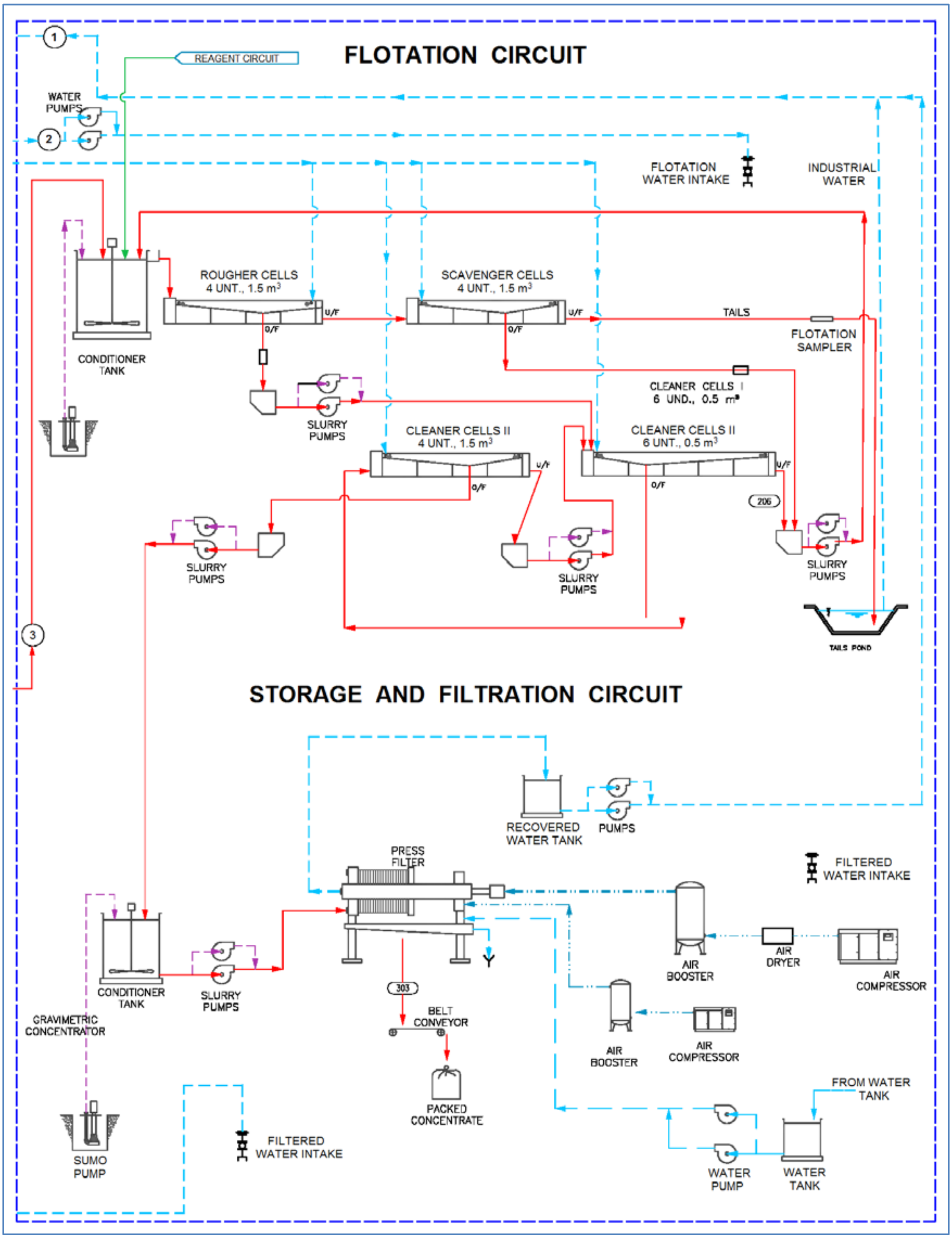
The flow diagram for the crushing and milling circuit is shown in Figure 17-2.

Figure 17-2:
Crushing and Milling Circuit



The flow diagram for flotation, filtration and concentrate storage is showed in Figure 17-3.

Figure 17-3:
Flotation, Filtering and Concentrates Storage Circuit



17.3 CAPITAL AND OPERATING COST ESTIMATION

A summary of the capital expenditure for the processing plant is shown in Table 17-3.

Table 17-3:
Capital Costs (CAPEX) Summary

Item	Cost (US$M)
Concentrator plant	14.2
Equipment	6.8
Structures	0.8
Construction	6.6
Tailings storage facility	2.6
Tailings pipe/duct	1.4
Facilities	3.3
Ancillary services – water treatment plants (WTPs) and water management systems (potable, fresh, recycled, sewage)	0.5
Commissioning	0.6
Sub-total	**22.5**
Contingency	3.4
Total	**25.9**

A summary of the operating costs for the process plant is shown in Table 17-4.

Table 17-4:
Capital Costs (CAPEX) Summary

Item	Cost (US$M)
Labour	2.71
Reagents and consumables	1.65
Energy	6.89
Ancillary services	0.34
Maintenance consumables	1.32
Sub-total	12.91
Costs G&A	
G&A	6.02
Total	19.1

18.0 PROJECT INFRASTRUCTURE

The Cisneros Project infrastructure and services are designed to support the operation of a 500 t/d mine and processing plant, operating on a 24-hour day, 7 day per week basis. It is designed for the local conditions and rugged topography.

The major infrastructure of the project is located in the Guayabito and Guaico areas with the exception of the Tailings Storage Facility (TSF) and tailings pipeline. The TSF is located 9.5 kilometres from the Guayabito portal at the El Hormiguero site. A tailings pipeline runs from Guayabito to the El Hormigero site.

The main facilities in the Guayabito area are listed in Table 18-1and shown in Figure 18-1. The main facilities in the Guaico area are listed in Table 18-2.

Table 18-1
Main Infrastructure at Guayabito

Facility	Current Status
Guayabito portal and mining labors	Portal ready and 110 m of decline built
Process plant	Under excavation
Electrical substation	Under excavation
Mine waste dump	Construction ready. Under usage for material rejected from excavation
Wastewater treatment plant (WTP)	Under construction.
Industrial wastewater treatment plant (IWTP)I	Under construction.
Fuel oil station	Projected on plans.
Guayabito portal access to crusher locations	Under construction.
Other access and truck parking lot area	Some access are under construction others are projected on plans.
Potable water treatment plant (PWTP).	Under construction
Workshop and Main Warehouse.	Projected on plans.
Laboratory	Projected on plans.
Process Plant	Under excavation.
Tailing Storage Facilities(TSF)	No activity yet

Note: September 16 to 19, 2017 is the date of current status the date of LINAMEC's site visit.

18.1 INTERNAL AND EXTERNAL ACCESS

The Guaico portal is connected by an internal unpaved access road connected with the public Medellin – Puerto Berrio highway, with a total length of 2.2 km. The demand for internal access is dependent on the location of the process plant and the proximity to the Guayabito portal. Locally, the project access designs include internal roads that connect the main facilities with the ancillary facilities, as shown in Figures 18-1 and 18-2.

The distance between the Guayabito portal and the Guaico portal is 6.5 km and they are linked by 4 kilometres of paved road and 2.5 kilometres of gravel road.

Figure 18-1:
Main Facilities and Internal Access at Guayabito Area

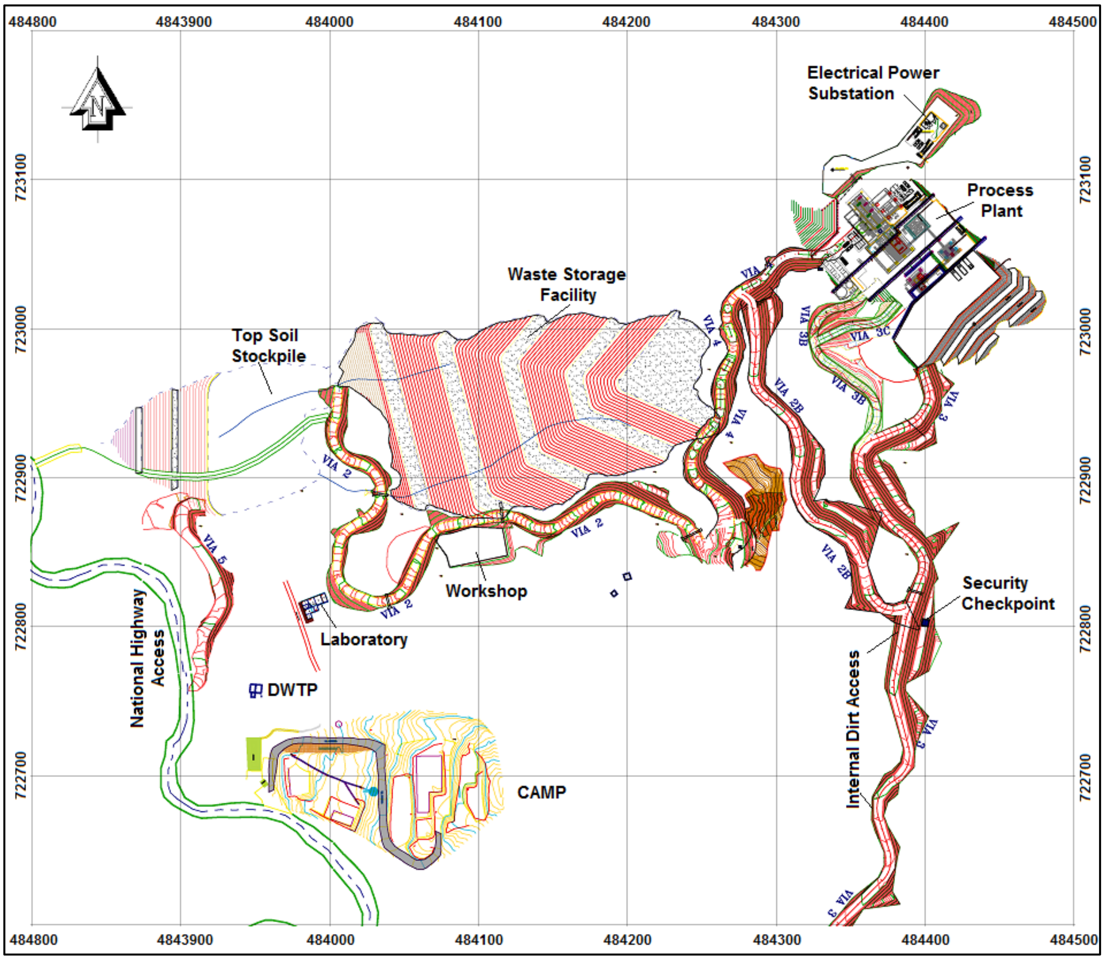
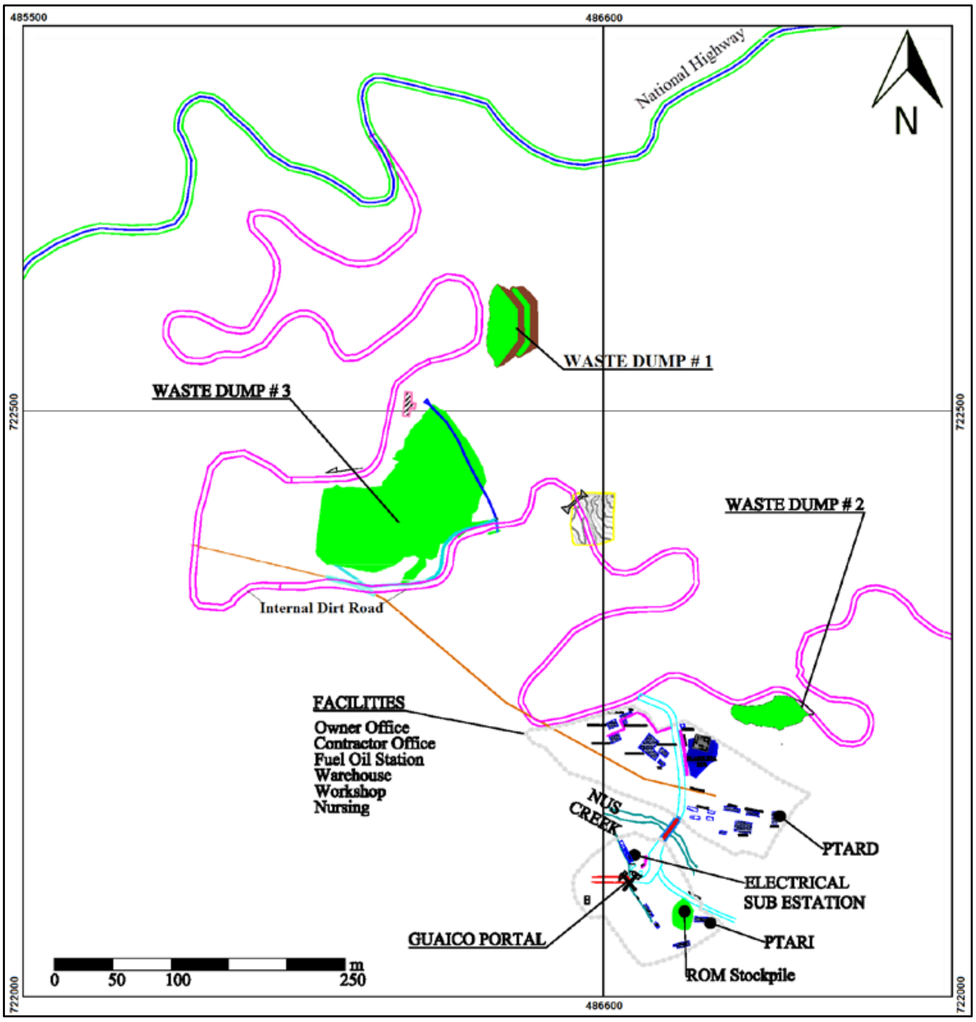


Table 18-2
Main Infrastructure at Guaico

Facility	Current Status
Guaico portal and mine workings	Portal area is ready. Underground workings have 5,262 m ready
Electrical substation.	Ready, future expansion planned
Domestic wastewater treatment plant (DWTP).	Basic construction is ready
Industrial wastewater treatment plant (IWTP)	Basic construction is ready
Waste dump No 1 at Guaico	Ready and in use
Waste dump No 2 at Guaico	Ready, 200,000 m^3 in use
Waste dump No 3 at Guaico	43,000 m^3 in use
Office, dining room and medical office	Ready and in use
Ore rom at Guaico Portal	Ready and in use
Workshop	Provisional construction is ready
Warehouse	Provisional
Authorized Water capitation	Ready (>1 lt/s)
Contractor offices	Ready and in use

Figure 18-2:
Main Facilities and Internal Access at Guaico Area



18.2 SITE GEOTECHNICAL CONDITIONS

The geotechnical conditions for the process plant, tailings pipeline and TSF have been investigated to a level sufficient for a preliminary economic assessment. The existing site investigations comprise, diamond drill holes, soil pit excavations, seismic surveys (seismic tomography, seismic refraction (ReMi) and multi-channel analysis (MASW)), geotechnical permeability and penetration field tests and reconnaissance investigations. Table 18-3 summarizes the geotechnical investigations carried out. Figure 18-3 shows the location of the geotechnical studies.

Table 18-3
Investigation Activities to Subsurface Evaluation

Investigation Activity	Quantity
Excavation of Soil Pits	20
Diamond Drill Holes	14
Seismic Refraction Surveys (ReMi)	6
Seismic Tomography Surveys	11
Multichannel Analysis Surveys (MASW)	5

Interpretation: The Figure 18-4 is an interpretation of the soil profile in the TFS area from seismic refraction surveys. There is a layer of material with very low geomechanical characteristics (gray material) that must be removed entirely from the foundation of the structure. The natural fill material is underlain by bedrock. The materials that make up the abutments of the dam have geomechanical properties acceptable for the purpose of dam construction.

Figure 18-3:
Geotechnical Evaluation Activities

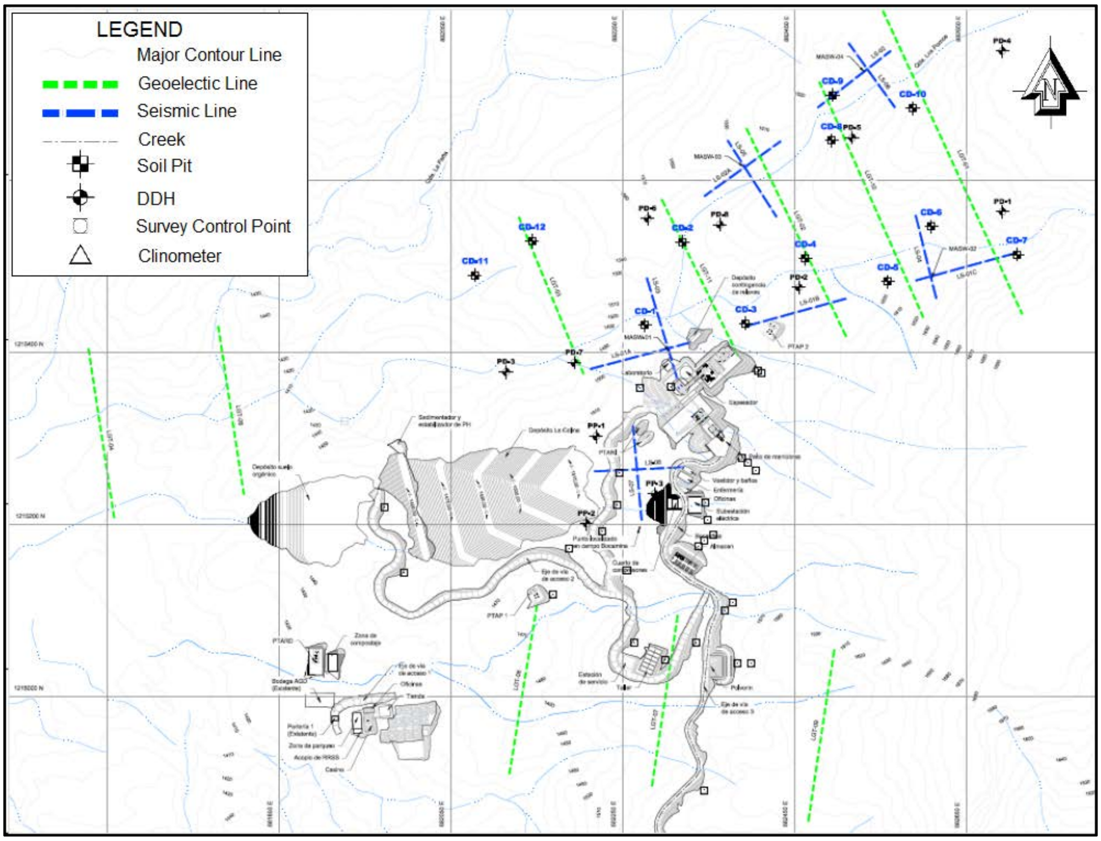
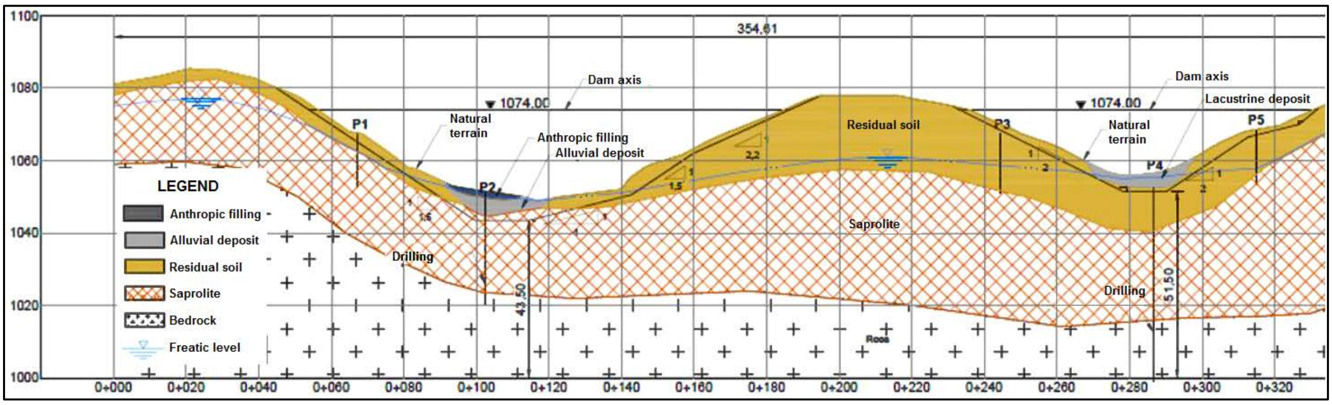


Figure 18-4:
Interpreted Geotechnical Profile



18.3 PROCESS PLANT

The process plant is 300 metres from the Guayabito portal and is where all the mineralization from the Guaico and Guayabito mines will be processed. The major infrastructure comprising the process plant foundation is over saprolite, with predominantly exposed soil-rock to be stabilized along the slope using iron mesh, bolt, shotcrete and a drainage system consisting of a ditch to technical specifications (See Photo 7). Foundations for major equipment such as the crusher and mill area are expected to be cement or concrete piles.

Photo 7: Slope Stabilization in Plant Site

Major infrastructure in the plant process area includes crushers, mill, gravity, flotation cells, filtration areas and a tailings pumping station. Additional infrastructure includes reagents plant, assay laboratory and office. See Figure 18-5 for distribution of the areas in the process plant.

A laboratory will be used for the chemical analysis of samples generated during processing such as during flotation and concentrate filtering. The structure will include a sample preparation room, fire test area, wet analysis laboratory, instrumentation, offices, restrooms and electrical panels. Air treatment units, cabinets and counters, dust hoods, drying ovens, extraction hoods and air filtering will also be part of the equipment.

18.4 TAILINGS STORAGE FACILITY (TSF)

The TSF is located 10 kilometres from the entrance portal in the area known as El Hormiguero. The TSF will occupy an area of 7.27 hectares covered with vegetation (trees, bushes and grass), see Photo 8, with water running through a stream, see Photo 9. The projected capacity for the TSF is 900,000 m^3.

18.4.1 Tailings Pipeline

Tailings will be piped out in a slurry form to the dam's pond, where solids settle to the bottom and the water rises to the top. The tailing pipeline will connect the process plant of Guayabito with the El Hormiguero TSF. The pipe will have a length of 10 km, and a 100-metre-wide corridor. See Figure 18-6 for a simplified flow chart of the tailing transport and distribution system.

Photo 8: El Hormiguero Tailing Storage Facilities Area

Photo 9: Running Water on TSF Area

Figure 18-5
500 TPD Process Plant Design with Main Parts

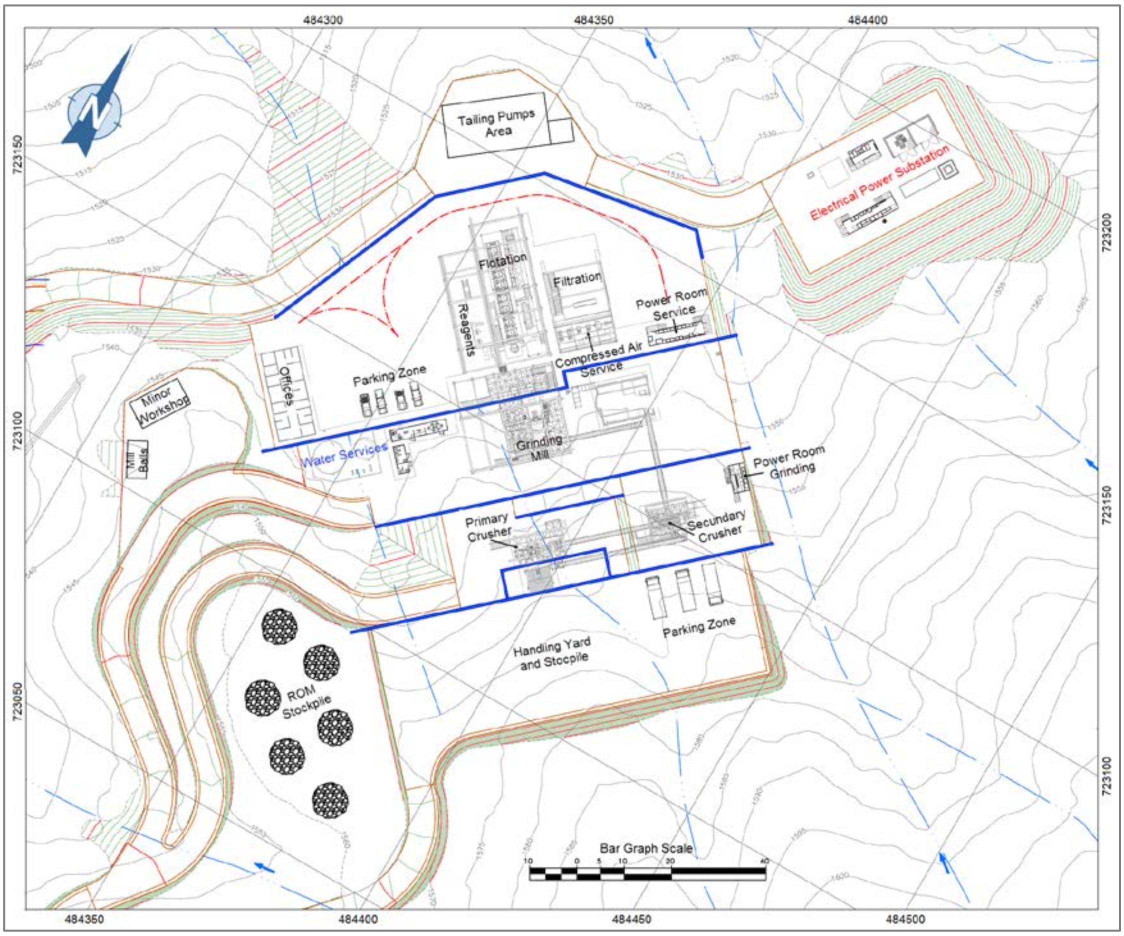
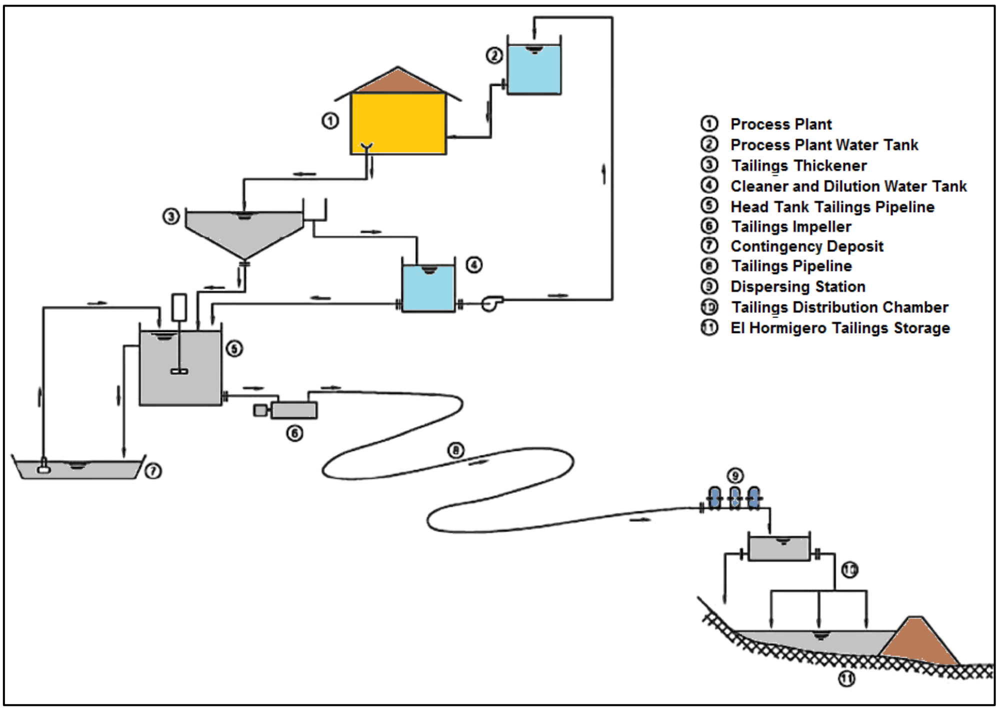


Figure 18-6
Simplified Flow Chart of the Tailing Transport and Distribution System



18.4.2 Tailings Dam

A tailings dam will be built to store by-products of mining operations after separating the mineralized material from the gangue. Three conceptual designs were made for tailings dam development over the life of mine.

- Stage 1: will cover 1-year capacity of tails production.
- Stage 2: two additional years' capacity and
- Stage 3: expands the capacity to four years more.

Figure 18-7 shows a cross section of the tailings dam.

Figure 18-7
Tailing Mixed Dam Section

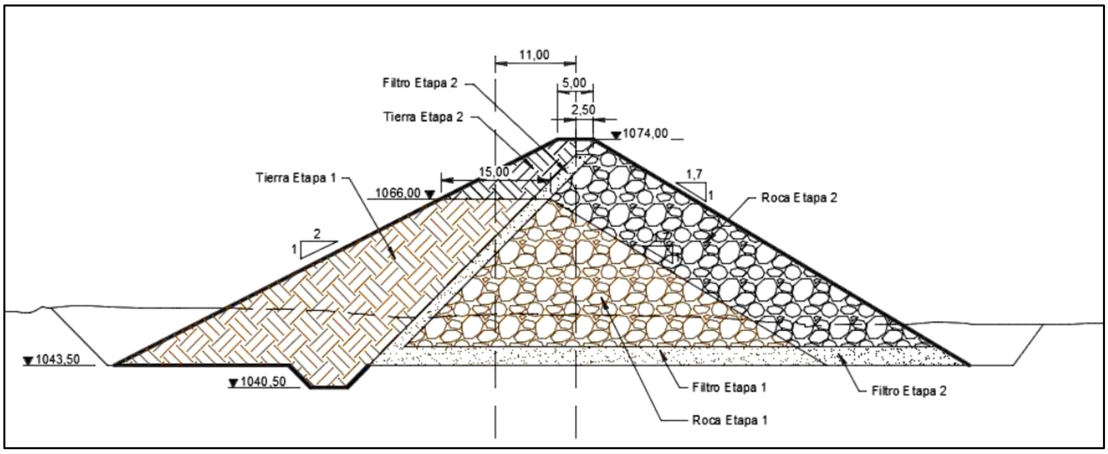


Photo 10: Waste Storage Facilities at Guayabito Area

18.5 WASTE STORAGE FACILITY

Waste storage facilities at the Guaico site consist of 3 areas for waste material, named Waste Dump No 1, Waste Dump No 2 and Waste Dump No 3. The dumps have variable capacity but are useful to dispose waste from the Guaico mine development (see Figure 18-2).

A waste dump area is located at the Guayabito site for disposal of waste from excavations, coming construction activities and waste from development of the Guayabito Mine. See figure 18-1 for locations. See Photo 10 for actual mine waste dump in Guayabito area.

18.6 POWER

The energy supply for the Cisneros project comes from a 13.2kv public power line which is 600 metres away from the future location of the main electrical substation. The public power line is connected to a power line of Empresas Públicas de Medellin (EPM). This substation will supply energy to the plant, Guayabito mine and additional infrastructure. It consists of a 2,000 KVA transformer, 13200/480 volts for the processing plant, a mobile substation of 500KVA, 13200/480 volts for mine requirements and an additional capacity of 225 KVA for facilities.

The Guaico mine is currently powered by a 13.2 kV public power line and it is connected to a power line of Empresas Públicas de Medellin (EPM) and a 500 KVA 13.2 kV /460-volt substation. Inside the mine, there is a mobile substation of 500 KVA, 13200/460 volts for a total installed capacity of 1,000 KVA.

The load capacity provided by the network operator (EPM) is 2,000 KVA, which will be distributed 1,500 KVA inside the mine as the demand increases plus 500 KVA at surface, for a total of 2,000 KVA.

18.7 WATER SUPPLY

The main demand of water for Cisneros Project is for the processing plant which will have a requirement of 9.2 m^3/hour (2.55 l/s) of fresh water. The water supply is provided from the IWTP plant. The requirement of fresh water by the process and camps will be 11 m^3/h as shown in Table 18-3, the remaining water required from the processing will be obtained from the recirculation of the water that comes mainly from the tailing storage facility, filtration of concentrates and contribution of water from mine runoff.

Table 18-4
Demands of Fresh Water

Requirements	Flow rate (m^3/h)
Fresh water for plant process	9.19
Fresh water for camp	1.81
Recovered from Tailing Fresh water	34.55
Filtered Fresh water	1.39

The water required for the activities at the Guaico mine is taken from the Nus River as licensed by the environmental Colombian authority and transported by pipeline to a reservoir located in the upper part of the portal. For the Guayabito mine two permits are available for water requirements from the Los Pomos and La Gallera creeks. Additional water from dewatering of the underground mine will also be used. A demand peak of 7 l/s is expected from mine activities with an average demand of 2 l/s for each of the mines.

18.8 OFFICES AND DINING ROOM

In the Guaico area there are two groups of modular office buildings. The first group of offices include an engineering office, meeting room, storage, health and safety room and dining room. The second group of modular buildings is occupied by contractor personnel. The office space allocated is enough for the currently planned staff and will be optimized in detail during the production phase.

The offices in the Guayabito area occupy a small space in the drill core storage facility. The construction of new modular offices is in progress, according to plan.

18.8.1 Site Security

The Guaico and Guayabito sites have security facilities that include a main entrance security building, site fencing and guard posts at entrances to each property. The entire site will be fenced with chain-link fencing, and any potential access points from local community trails will have provisions for access control.

18.9 WORKSHOP

Both Guaico and Guayabito mines will have workshop areas. In both cases these facilities will be located on the surface for the service and maintenance of mine equipment. Future evaluations may locate the workshops inside the mines. Additionally, in the Guayabito sector where the processing plant will be located, there will be a main warehouse for the supply of materials, spare parts and lubricants for plant activities. The areas that make up the workshop are:

- Heavy machinery washing area.
- Repair area
- Welding shop
- Electrical and mechanical workshop.
- Oil and lubricants area.
- Warehouse.
- Lubrication workshop and
- Tire change workshop

18.10 CAMPS AND SITE ACCOMODATIONS

Operational camps and associated facilities include a dining room, single and shared modular bedrooms, topical and recreational areas. These accommodation facilities will be used initially for construction contractors and later for administrative and operations personnel.

This operational camp has been designed to house a maximum of 60 people over a period of 5 years and will cover an area of approximately 5,000 m^2. The camp will consist of modular prefabricated structures.

18.11 UTILITIES

18.11.1 Wastewater treatment facilities WTP, IWTP and DWTP

The project has a series of facilities that allow for the management and control of runoff water, rainwater and potential infiltrations, in order to ensure the physical and chemical stability of the facilities and avoid possible contamination of surface or groundwater. These include a diverse water treatment plant, a domestic residual treatment plant DWTP, an industrial residual treatment plant IWTP, and a residual water treatment plant WTP.

Domestic residual water treatment from camps are expected to be treated by residual treatment plant DWTP. The management and control of this domestic water**,** will be carried out for the base camp. The proposed treatment system contemplates the use of a septic tank with disposal field, an absorption well, a gravel filter or other system that allows the proper handling of wastewater. Domestic residual water treatment systems will be built before the base camp.

The first stage of the wastewater treatment system utilizes a grease trap where effluent passes through the selected septic structure, in which the digestion and decanting processes are carried out by means of a percolating fixed bed digester (anaerobic filter) for the final decomposition of organic matter. Finally, the filter effluent passes through an infiltration field and discharges into the soil through a series of conveniently located ditches where the water is further filtered allowing its oxidation and final disposal.

The underground mine will have a drainage system that will be designed to capture infiltrated water from the mining process and redirect it to the industrial residual treatment plant IWTP. This system consists of drainage channels installed in the floor of the tunnels, which will be directed to the lowest point of each level and pumped to the main level of the tunnel. At this level, the flow is directed by pumping to the main sedimentation system inside the mine, followed by pumping by stationary electric pumps, to the mine water sedimentation basin and from there to the recirculation pumping tank, which are on the surface and outside the mine. Finally, it will be pumped to a IWTP that will be located on the surface near the processing plant which will recirculate and distribute the water already treated to the different operational areas of the project.

The residual water treatment plant WTP allows the management of water in contact with waste deposits and the tailings deposit. It consists of drainage systems, control ponds and collection ponds.

18.11.2 Domestic Residual Solids Management

The domestic residual solid, industrial waste and toxic waste, generated by the plant, will be temporarily stored in a warehouse. Suitable areas will be designated for the storage of common residual domestic solid, which will be produced in accordance with the development of life in mining operations.

18.11.3 Potable Water Supply

The project plans a potable water treatment plant to process the water from the Nus River.

19.0 MARKET STUDIES AND CONTRACT

The plans for the Cisneros Project are to produce a gold concentrate using gravity and a flotation circuit. No contractual arrangements for concentrate trucking, port usage, shipping, smelting or refining exist at this time. There are no contracts in place for the sale of gravity and flotation products. It is assumed that the concentrate produced at the Cisneros Project would be marketed to international smelters in Europe. No deleterious elements have been identified or considered at this time. Table 19.1 shows the terms used in the economic analysis.

Table 19-1
Selling Cost Assumptions Used in the Economic Analysis

Assumptions	Unit	Value
Au payable	%	97.625
Metallurgical deduction	Oz/dmt	0.03
Concentrate Moisture content	%	10
Concentrate transport (Insurance, handling port, Sea Freight)	US$/oz	60.5
Refining Charge	US$/oz	5.0
Concentrate assays	US$/oz	17.9

Source: AGD

19.1 ROYALTIES

Royalty payments are calculated at 3.74% of the Net Smelter Return as an average value from preliminary cash flow analysis for the Project.

The average value for royalties consider:

- 3.2% as the Colombian law equivalent of 4% of 80% price published by LME.
- 1% agreement with AM-VES (concessions 5671A and 5671B), applied over 4% of 80% price published by LME.
- 1.75% over Net Smelter Return agreement with Gramalote (concessions 6195 and 6187B).

19.2 METAL PRICES

The gold price used in the projected cash flows is US$1,200/oz. based on the historical value for the gold price from 2007 to 2017.

A currency exchange rate of COP:US$2930 is used for the projected cash flow tables. The COP:US$ exchange rate estimate used in the economic analysis is based on the September 2017 9-month average price sourced from the International Monetary Fund.

Table 19-2
Metal Price and Exchange rate used in the Economic Analysis

Assumptions	Unit	Value
Au Price	US$/oz	1,200
Exchange Rate	NA	2,930

Source: AGD

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

The environmental studies, permitting and social impact assessments were carried out individually for Guaico and Guayabito that are separated by 1.7 kilometres.

To understand the Colombian's territorial terms, used in this chapter, it is necessary to know that Colombia is a unitary republic composed of thirty-two departments which are themselves composed of a grouping of municipalities and these municipalities are sub-divided into *corregimientos* (districts) and the districts further sub-divided into *veredas* (villages).

20.1 GUAICO ENVIRONMENTAL STUDIES AND ISSUES

20.1.1 Background

The environmental impact assessment, for the Guaico mining license is located in the municipality of Santo Domingo in the department of Antioquia within the Nus River basin.

The geomorphology of the terrain is controlled by intrusive rocks of the Antioquia Batholith, with expressions of relief characterized by a flat to undulated topography except in the areas that are affected by geological faults, where the topographic features are strongly marked. The local geomorphology is characterized by a series of hills, gorges and dendritic drainage, partially covered by lithological units of quaternary age.

Soils have been classified into two associations:

1. Poblanco Association (PO): formed by soils, gravels and rocks located in the flood plains of the Nus River.
2. Yarumal Association (YA) located over the entire local area of influence and comprised of degraded soils with rock exposed by erosive action, generally these are poorly evolved soils.

The project is located in a transition zone, between the tropical rainforest (bh-T) and the premontane rainforest (bh-PM) and the premontane per-humid rainforest (bmh-PM), according to the classification system of Holdridge (1987).

Drainage is restricted to the upper portions of the Nus River basins, to the east and Quebrada Santiago, to the west. The main tributaries are the Guadualejo, La Despensa, La Chorrera, La Cascada, Socorro and Santa Barbara. The area is between 1,300 and 1,600 metres above sea level (masl) and has a temperature ranging from 18ºC to 30ºC.

The basin of influence has an approximate area of 1249.95 ha. Within the basin three main micro-basins have been identified, corresponding to three main tributaries: La Chorrera, La Cascada and La Esperanza.

Fauna: 77 species of birds were recorded, among them are one endemic species Colombian guacharaca, (*Ortalis columbiana*) and two almost endemic species Batará Carcajada *(Thamnophilus multistriatus)* and Scrub Tanager *(Tangara vitriolina)*.

20.1.2 Summary of Environmental Studies Conducted

The Environmental Impact Study (EIS) for the Guaico area, has the title: **"Explotación Subterránea de Oro en Veta – Municipio de Santo Domingo"** and was carried out by

Merceditas Corporation in November 2011. The following chapters were used in the preparation of this report:

- **Chapter 3**: Area of Influence, Abiotic Component, Biotic Component and Social Component.
- **Chapter 6**: Environmental Assessment.
- **Chapter 8**: Environmental Management Plan.
- **Chapter 9**: Tracing and Monitoring Plan.

20.1.3 Environmental Issues

Possible environmental issues that could materially affect the ability to extract the mineral resources relating to the current development/operations were determined to be as follows:

- Review of Environmental and Social Reports.
- High level risk assessment of material issues by the identification and listing of issues that could have an impact on mineral resource extraction. These probable issues included:
  - permitting,
  - legal non-compliance,
  - highly sensitive environmental/social features and
  - spatial/geographical features.
- Categorisation of risk is as follows:
  - **None** – issue will not impact mineral extraction;
  - **Low** – issue is unlikely to affect mineral extraction, and would only result in disruption or delay for a short (less than one week) period of time and is easily mitigated;
  - **Medium** – issue is likely to affect mineral extraction, would result in a moderate (1 week to 1-month) disruption or delay and can be mitigated;
  - **High** – issue is highly likely to affect mineral extraction, would result in extensive (>1 month) disruption or delay to mineral extraction and cannot easily be mitigated.

20.1.4 Seismic Hazard

An area's seismic hazard is given by the frequency and force of its earthquakes (seismicity) and is defined as the probability in a given area and in a certain interval of time of an earthquake occurring that exceeds a certain threshold of intensity, magnitude or peak ground acceleration (PGA)[3].

The Colombian normative NSR-10, classify the zones of seismic hazard as follows:

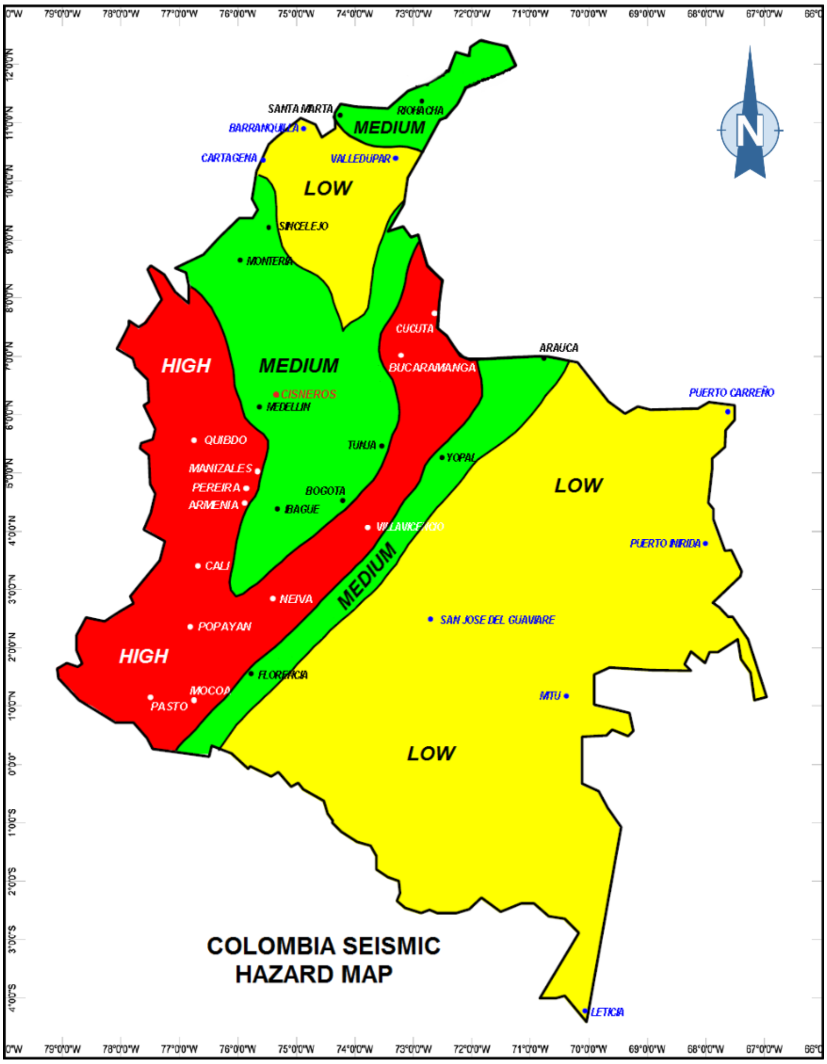
1. **Low Seismic Hazard Zone:** defined for those regions where the probability that a seismic event does not exceed a PGA of 0.10g. Approximately 55% of Colombian territory is included in this hazard zone.
2. **Moderate Seismic Hazard Zone**: defined for regions where probability exists of reaching PGA values greater than 0.10g and less than or equal to 0.20g. Around 22% of the territory is included in this area.

3 PGA is equal to the maximum ground acceleration that occurred during earthquake shaking at a location, and is expressed in g (gravity) as a decimal or percentage, in m/s^2 (1 g = 9.81 m/s^2).

3. **High Seismic Hazard Zone:** defined for those regions where very strong earthquakes are expected with PGA values greater than 0.20g. Approximately 23% of Colombian territory is included in this zone of high seismic threat.

Based on the zoning done by INGEOMINAS in relation to the seismic hazard in the Colombian national territory, the area of the municipalities of Cisneros, Yolombo and San Roque is classified as a Medium Seismic Hazard Zone (see Figure 21-1), defined based on the probability of seismic movements occurring with the potential to cause loss of human lives and damage to infrastructure and civil works in these municipalities.

Figure 20-1:
Colombian Seismic Hazard Map



20.1.5 Risk Analysis at the Local Level

Seismic Hazard: the municipality of Cisneros is located in an area of seismic hazard with values of peak ground acceleration, PGA = 0.20g, this value locates the areas of Title 1498 and concessions ILD-14271 and H7175 in a zone of medium seismic hazard.

Threat by flood or torrential floods: The most recent event occurred in the winter of 2011 and affected the municipality of Santo Domingo and part of the municipality of Cisneros due to the damming of the Nus River by a landslide that occurred in the upper part of the basin that repressed the channel causing the overflow of the river that flooded 8 neighborhoods of the municipality of Santo Domingo, (El Colombiano, 2011).

Threat by anthropic activities: The areas degraded by mining are the most critical, both those located in the floodplains and those in the alluvial terraces of the Nus, Cauca and Nechí rivers and some tributaries, which cover a total of 42,823 hectares, (Corantioquia, 2006). The risk analysis, at the local level, has determined that the threat levels, in the Department of Antioquia (according to INGEOMINAS) are the following:

- Earthquake with strong (I > VII), medium to low intensity (I).
- Volcanic ash with medium to low level.
- Slow and sudden floods with high level.
- Hurricanes categories from 3 to 5, high level risk.

20.1.6 Waste, Tailings, Monitoring and Water Management

Environmental, social and health baseline data collection and ongoing monitoring has been carried out within the study area since 2011. In summary, this includes the following:

20.1.6.1. Precipitation and Water Flow Stations

The Guaico EIS used the hydro-climatic information registered monthly in the hydro-meteorological stations of the Colombian Government's Institute of Hydrology, Meteorology and Environmental Studies (IDEAM). The flow water data were obtained from the records of the Caramanta Station.

Precipitation data, in the study area, was taken from the following seven IDEAM stations: Gabino, Guayabito, NusGjaExpEl (El Nus Experimental Farm), San Pablo, San Roque, Santo Domingo and Yolombó. The evapo-transpiration data were taken from the records of the Guayabito station. The IDEAM's stations remain active and the data recorded are publicly accessible on the Internet.

20.1.6.2. Air Quality

The air quality is monitored in order to estimate concentrations for substances determined as pollutants i.e. particulate matter, sulfur dioxide and nitrogen oxides. The monitoring lasted 10 days with filter changes every 24 h. The samples were analyzed in the laboratory of CONHINTEC, which is certified by the IDEAM through Resolution 1174 of 2010.

For the monitoring of air quality, two sampling stations were used, the first was located in the urban part of the village El Limón and the second station was located in an area of fish ponds, in the La Manuela sector. The location of the stations is due to the identification of the places where the air currents enter the project in the El Limón sector.

20.1.6.3. Noise quality

The evaluation of the sound emission, within the project area, was carried out by CONHINTEC S.A. in the village El Limón, which has very little urban influx and in which the noise levels vary little during the week. In accordance with resolution 067 of 2006 of the Ministry of Environment, Housing and Territorial Development, the environmental noise measurement periods are:

- **Diurnal**: from 07:01 to 21:00 h.
- **Nocturnal**: from 21:01 to 07:00 h.

One hour measurements were taken, distributed throughout the day and night in each of the periods to obtain average noise levels. Results indicate that average noise levels reported for day time (51.1 dB) are lower than the noise level standard of 55 dB stipulated in resolution 0627-2006. The average value reported at night (52.5 dB) is higher than the standard value for night time of 45 dB.

20.1.6.4. Water quality

Sampling was carried out during two campaigns, on June 30 and August 8, 2011, for physicochemical and microbiological analysis. The water samples were divided into three groups:

1. Samples of surface water, analyzed in the Acuazul Laboratory.
2. Groundwater samples analyzed in the Acuazul Laboratory.
3. Water samples for heavy metal analysis, analyzed in the Environmental Quality Laboratory of CORANTIOQUIA.

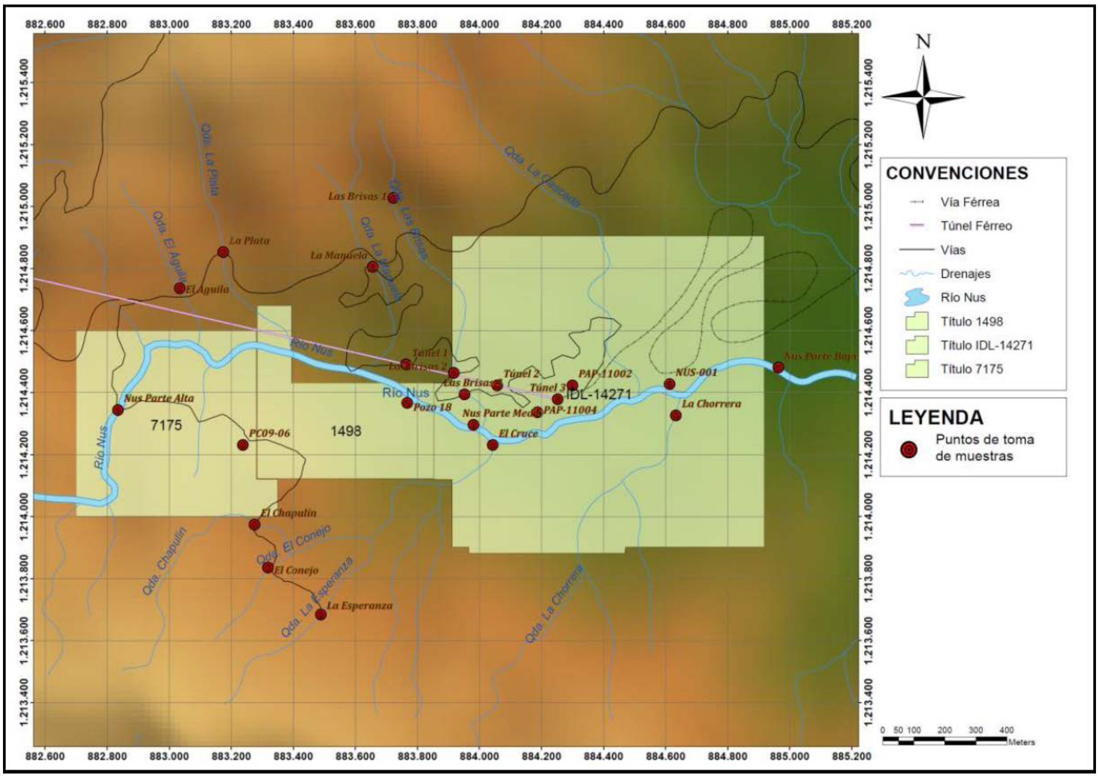
Both laboratories are certified by IDEAM under the standard ISO/IEC 17025 of 2005.

In total, 26 water samples were taken at 22 different points, see Table 20-1 for point locations and sample types and Figure 20-2 for their geographical distribution. The results of the water quality, inside and outside the area of influence, is good to excellent in the 22 points sampled.

Table 20-1:
Water Monitoring Points

Point-ID	North	East	Stream	Sample Type
Tunnel 1	-	-	500 m inside the tunnel of La Quiebra from El Limón	Groundwater
Tunnel 2	-	-	200 m inside the tunnel of La Quiebra from El Limón	Groundwater
Tunnel 3	1,214.38	884.251	Entrance of the La Quiebra tunnel from El Limón	Surface water, Groundwater, Heavy metals
Nus Parte Baja	1,214.48	884.963	Nus River	Surface water, Heavy metals
Nus Parte Media	1,214.30	883.980	Nus River	Surface water, Heavy metals
Nus Parte Alta	1,214.34	882.834	Nus River	Surface water
Las Brisas 1	1,215.03	883.722	Las Brisas Ravine	Surface water
Las Brisas 2	1,214.46	883.917	Las Brisas Ravine	Surface water
Las Brisas 3	1,214.39	883.951	Las Brisas Ravine	Surface water
El Cruce	1,214.23	884.042	La Esperanza Ravine	Surface water
La Esperanza	1,213.68	883.488	La Esperanza Ravine	Surface water
El Conejo	1,213.84	883.318	El Conejo Ravine	Surface water
El Chapulín	1,213.97	883.275	El Chapulín Ravine	Surface water
El Águila	1,214.74	883.033	El Águila Ravine	Surface water
La Plata	1,214.85	883.174	La Plata Ravine	Surface water
La Manuela	1,214.81	883.656	La Manuela Ravine	Surface water
La Chorrera	1,214.33	884.633	La Chorrera Ravine	Surface water
Pozo PC-18	1,214.37	883.767	Exploration hole PC09-18	Groundwater
Pozo PAP-11002	1,214.42	884.299	Exploration hole PAP-11002	Groundwater
Pozo PAP-11004	1,214.34	884.186	Exploration hole PAP-11004	Groundwater
Pozo NUS-001	1,214.43	884.612	Exploration hole NUS-001	Groundwater
Pozo PC09-06	1,214.23	883.237	Exploration hole PC09-06	Groundwater

Figure 20-2:
Location Map of Water Sample Points



20.1.7 Water Management

Water management will be a critical component of the project design in this high run off environment. The most likely avenue for the transport of contaminants into the natural environment will be through surface or groundwater. As such, AGD has developed a water management plan that applies to all mining activities undertaken during all phases of the Cisneros Project. The goals of this management plan will be to:

- provide a basis for management of freshwater on site, especially with respect to changes to flow pathways and drainage areas
- protect ecologically sensitive sites and resources and avoid harmful impacts on fish and wildlife habitat
- provide and retain water for mine operations
- define required environmental control structures
- manage water to ensure that any discharges are in compliance with the applicable water quality levels and guidelines.

Strategies for water management include:

- protecting disturbed areas from water erosion, collecting surface water from disturbed areas and treating it to meet discharge standards prior to release
- minimizing the use of fresh water through recycling of water whenever possible
- monitoring the composition of release water and treating it to remove or control contaminants as required to meet discharge standards
- constructing diversion channels to direct undisturbed runoff away from mining activities.

To date, no freshwater consumption studies have been completed for the Project. The environmental impact assessment (EIA) approved in 2011 needs to be updated with new studies made for the current stage of the project.

The Nus River, with permanent water flow, and its tributaries are the main sources of surface and groundwater entering the project area. The Nus River is also the main drainage.

The nearest control point of the Nus river water flow is the Caramata Station managed by IDEAM, that is located 43 kilometres east of the Guaico Project. The annual flow rate of the Nus River is 19.061 m^3/s, while the flow corrected for the area of direct influence of the project is 17.557 m^3/s.

There are no direct measurements of average annual rainfall in the Guaico project area. The reported data are from the Caramata Station and the reported value, corrected for the project's influence basin, is 3,491.54 mm/year.

20.1.8 Domestic Wastewater Management

The management and control of domestic wastewater carried out for the base camp envisions a proposed treatment system that uses a septic tank with a disposal field, an absorption well and a gravel filter or other system that allows the proper handling of wastewater. The wastewater treatment system will be built before the base camp.

20.1.8.1. Grease trap

The first stage of the wastewater treatment system utilizes a grease trap where effluent passes through the selected septic structure, in which the digestion and decanting processes are carried out by means of a percolating fixed bed digester (anaerobic filter) for the final decomposition of organic matter. Finally, the filter effluent passes through an infiltration field and discharges into the soil through a series of conveniently located ditches where the water is further filtered allowing its oxidation and final disposal.

20.1.9 Management of Mining Residual Waters

The underground workings will intersect fracture systems that will likely deplete groundwater levels locally. However, waterproofing of the fractured areas where such infiltrations occur will reduce the effect on the water table, allowing any depletion to be temporary with an expected recovery of natural levels in a short period of time.

The mitigation of the infiltrations in the underground works will be done in two phases: 1. water seeping through fractures will be captured and channeled to a superficial flow system, minimizing the contact of this water with the mining activity to reduce the contamination risk, and 2. sealing of fractures with concrete to prevent or minimize leaks after extraction of the mineralized material.

20.1.10 Social and Community Related Requirements and Plans

The Northeast Antioquia Region, consists of ten municipalities: Amalfi, Anorí, Cisneros, Remedios, San Roque, Santo Domingo, Segovia, Vegachí, Yalí and Yolombó, 17 corregimientos and 421 villages (veredas), with an area of 8,544 km², representing 13.43% of the total area of the Department of Antioquia. The total population is 169,718 inhabitants, according to the 2005 Census and the demographic density is 19.8 inhabitants per square kilometre. The region is distinctly rural.

Northeast Antioquia has large areas of forests that host a great diversity of wild species, water and a variety of natural resources. These have served for decades as a source of livelihood for the rural population of the region. The artisanal exploitation of gold is the economic basis for many families, but is often the cause of conflicts that can result in the displacement of peasant families and other problems. Recreational and tourist activities are economically important in the region.

The Medellin - Puerto Berrio paved highway, crosses the south of the sub-region and connects Cisneros to Medellin and with the municipality of Puerto Berrio. Most of the roads that connect the municipalities of the region are still bridle paths.

Community and socio-economic impacts of the Project can potentially be very favourable for the region, as new medium-term opportunities are created for local and regional workers. Such opportunities could reduce the migration of people to larger centres. AGD continues to work with groups and members of local communities to maximize benefits through employment and business opportunities, training, and skills development programs.

Using the risk assessment approach outlined in Section 20.1.3, no social or community issues were determined to have a moderate or high risk of material impact on the ability to extract the resources.

20.1.11 Archaeology and Heritage Resources

The EIA prepared by Corporación Merceditas for AGD, has confirmed the existence of archaeological remains in the area. Following the current archaeological legislation, AGD has proceeded with archaeological studies to determine the area of direct influence on the project. The results of the studies have been used to draw up an environmental management plan to determine the actions required to comply with Colombian law and as a prerequisite for the approval and granting of Environmental Licenses.

20.1.12 Environmental Management Plan

The Environmental Management Plan (EMP), contains the necessary measures to prevent, control and mitigate the environmental impacts caused by the activities that will be developed during the construction and operation stages of the Guaico mining project in the biotic, abiotic and socio-economic environment.

The EMP was developed according to the terms of reference established by the Ministry of Mines and Energy and Decree 2820 that regulates Title VIII of Law 99-1993 on environmental licenses. The EMP was structured into eight main programs and twenty-two specific projects, see Table 20-2.

Implementation and execution of the EMP will use color forms, coded by programs and projects, see Figure 20-3.

Table 20-2: Environmental Management Plan Structure

Program	Form	Project
Program 1: Management and Control of Water Resources	MCRA-01	Project 1. Domestic waste water management
	MCRA-02	Project 2. Mine water and rainwater management
	MCRA-03	Project 3. Water supply
Program 2: Air Quality Management and Control	MCCA-04	Project 4. Management and control of gases and particles emission
	MCCA-05	Project 5. Noise management and control
Program 3: Management and Control of Soil Quality	MCCS-06	Project 6. Rehabilitation, Management and Recovery of Lands and Landscaping. (Erosion control)
	MCCS-07	Project 07. Track Maintenance
Program 4: Storage and Handling of Solid Residues and Fuels	MCCS-08	Project 08. Handling of waste
	AMRSC–09	Project 09. Management of special, hazardous and biological waste
	AMRSC–10	Project 10 Management of special liquid waste, fuel and similar
Program 5: Management of Flora and Fauna Resources	MRFF-11	Project 11. Flora management
	MRFF-12	Project 12. Fauna management
	MRFF-13	Project 13. Removal of vegetation cover
	MRFF-14	Project 14. Restoration and compensation of vegetation cover
Program 6: Social and Economic Management	MGSE-15	Project 15. Information, community participation and training for officials.
	MGSE-16	Project 16. Social management plan
	MGSE-17	Project 17. Information about the Project and Environmental Education
	MGSE-18	Project 18 Industrial and occupational safety
	MGSE-19	Project 19. Support for strengthening neighborly ties
Program 7: Social and cultural	SC–20	Project 19. Recovery of cultural memory
Program 8: Rescue and Archaeological Monitoring	RMA–21	Project 20. Archaeological Rescue Proposal
	RMA-22	Project 21. Archaeological Monitoring Proposal

Figure 20-3: Water Sample Points Location Map

Color	Program	Code	Form
	Water Resources and Similar	MCRA-XX	Management and Control Water Resource
	Air and Noise Resources	MCCA-XX	Air Quality Management and Control
	Soil Resource	MCCS-XX	Management and Control of Soil Quality
	Solid Waste and Fuels	AMRSC-XX	Storage and Handling of Solid Residues and Fuels
	Resource Flora, Fauna and Landscape	MFFP -XX	Flora, Fauna and Landscape Management
	Social and Economic Management	MGSE -XX	Management Social and Economic Issues
	Cultural Partner	SC-XX	Recovery of Cultural Memory
	Rescue and Archaeological Monitoring	RMA-XX	Rescue and Archaeological Monitoring

20.2 GUAYABITO ENVIRONMENTAL STUDIES AND ISSUES

The Guayabito Project is an underground gold mining project exploited by a company with Canadian, Peruvian and Colombian origins known as ANTIOQUIA GOLD LTD, (from now on, “AGD”), dedicated to promoting exploration and mining of mineral resource properties.

The Project will be developed within the area of mining titles 5671 and 4556, which have a granted area of approximately 184 ha, and where, for the last eight years, AGD has been exploring, by means of several diamond drilling campaigns.

AGD started the environmental assessment in 2010, performing base line studies emphasizing biological and community aspects. During the same year, a surface geophysical campaign was completed. During the following years, AGD completed geological exploration and continued its work with the communities and municipal authorities.

In December 2015, AGD hired PI ÉPSILON S.A.S. to carry out the study and design of the infrastructure facilities of the project, the studies for the deposit zones and complementary studies for the EIA corresponding to the Guayabito deposit.

20.2.1 Background

20.2.1.1. Location

The Guayabito Project, is located in the northeastern region of the Department of Antioquia, 70 km from Medellin. It is in the jurisdiction of the Corregimiento Santiago, municipality of Santo Domingo, on the eastern slope of the Central Mountain Range, in the jurisdiction of the Regional Autonomous Corporation of the Negro and Nare river basins (CORNARE), Porce-Nus subregion. Guayabito is located at an altitude of 1,975 masl.

20.2.1.2. Area of Direct Influence

The Area of Direct Influence (ADI) of the project includes the municipality of Santo Domingo, the Corregimientos of Porce and Santiago, and in particular the village (*vereda*) La Quiebra and the Malpaso-Guayabito sector.

The ADI contemplates areas that will suffer direct interventions in each one of the following components:

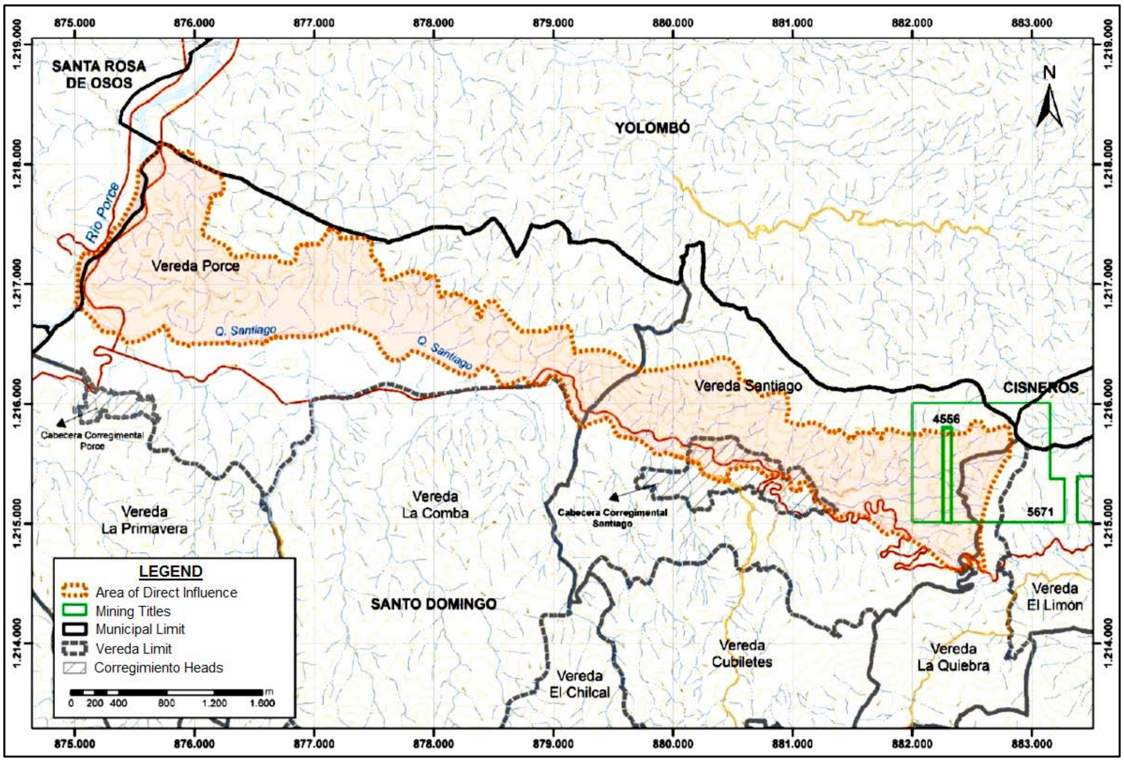
1. physical: geological, geotechnical, agrological, hydrological, hydrogeological, atmospheric, landscape, biological forms, terrestrial and aquatic ecosystems and

2. social: economic and cultural aspects.

The physical and biotic components of the ADI covers the right side of the Santiago Creek, from the tailings pipe to the creek.

The ADI of the social-economical component is delimited by the Corregimientos of Porce and Santiago, which belong to the Santo Domingo municipality, villages of Santiago, La Quiebra (Malpaso-Guayabito sector) and Porce, and its surroundings. See Figure 20-4 for Area of Direct Influence at Guayabito Project.

Figure 20-4:
Area of Direct Influence at Guayabito Project



20.2.1.3. Area of Indirect Influence

The Area of Indirect Influence (AII) for the physical components is defined as the area where the impacts will be perceived in an indirect manner. In general, it is delimited by all of the right side of the Santiago water stream widening up to the area of the tailings disposal site and the sub-basins that make a part of it. The biological component of the AII coincides with this area and widens in some sectors close to the water ridge due to the extension of the biological corridors. The social component of the AII is defined as the entire municipalities of Santiago and Cisneros.

20.2.2 Abiotic (Physical) Baseline

20.2.2.1. Climate

The project area is located in the premontane per-humid rainforest (bmh-PM) located in the eastern part of the department of Antioquia, along the foothills of the Central Range. It includes altitudes between 1,053 masl and 1,796 masl with an average temperature of 21.3 ° C (maximum of 24.3°C and minimum of 18.7°C) where the average annual rainfall of 3,918 mm exceeds the average annual evaporation of 1,192 mm (Guayabito Weather Station).

Guayabito has a bimodal cycle with two rainy seasons:

1. Low rainfall (relatively), between the months of November to March and June to July.
2. High rainfall, in the months of August to October and April to May; the average temperature is 21.33ºC with an average relative humidity of 83.33%.

20.2.2.2. Geomorphology

The Guayabito project area is located in the geomorphological province of the Central Range, in the mountainous region of the east and northeast of Antioquia, where intrusive rocks (granodiorites and tonalites) of the Antioquia Batholith and quaternary deposits of alluvial and colluvial origin occur. In these types of lithologies, variable morphologies have developed including hills and hills with sub-rounded to rounded summits, with long slopes and moderate to high slopes. The low hills are associated with geological formations of fluvial origin (alluvial fans, accumulation terraces and floodplains), associated with the Santiago stream and its effluent. The moderate to steep slopes correspond to denudational and structural geoforms. Residual hills and hillocks, colluvial slopes, rectilinear residual slopes are the main geoforms with lesser relict hills. Locally, landslides, soil creep areas and lateral eroded areas have been identified.

20.2.2.3. Geotechnics

According to the studies performed by PI EPSILON, it was possible to identify a massif composed of a rocky matrix highly resistant to compression and slightly fractured. The rock block stability analysis is controlled by fracture families identified during exploration. Studies aimed at characterization of the massif focussed on the resistance properties of the fractures including their roughness, alteration, fillings, filtration and their geometrical properties such as persistence or continuity, orientation and spacing. With these properties, the stability analysis of the underground workings was performed taking into account their disposition with respect to the orientation of the structures, to finally present a treatment that fits the conditions of the massif.

A geomechanical model of the rock massif and of the general stability of the project area was developed and as a result of this semi-quantitative evaluation, a geotechnical zoning was obtained, where the majority of the area of indirect influence was classified as relatively stable.

20.2.2.4. Seismic Hazard

According to the Colombian seismic design normativity NSR10, the zone is classified as an intermediate threat. This was confirmed by specific seismic studies for the project in which the selected attenuation equations were assessed for the seismogenic superficial sources: Palestina and Espiritu Santo and deep sources: Benioff North Intermediate and Benioff Deep. Results indicate that the seismogenic source of highest impact on the project is the Benioff Deep source and that the Palestina source is the most important superficial source.

20.2.2.5. Soils

In the Area of Indirect Influence (AII), four soil units were mapped, these are:

1. Tarazá (TRa), flat to slightly flat.
2. Yarumal Association (YA), with two phases:
    - One, strongly corrugated and moderately eroded (YAd2) and
    - Two, moderately steep and moderately eroded (YAf2).
3. Yali Association (JDd1) and
4. Girardota Complex (GSb).

In the Area of Direct Influence (ADI), a sampling campaign was made with a sampling grid of 100 m x 100 m, 70 soil samples were taken to analyze the quality and to build soil profiles and relate them with the results of the physical-chemical analysis of the samples. In general, the analyzed soils exhibit low fertility, but with favorable conditions for remediation with the appropriate soil treatment and addition of nutrients.

As part of the soil studies performed in the area of influence of the project the current and potential uses of the land were analyzed. The potential use began from a definition of units and the present agrological sub-classes that predominate in the potential forestry use and the ADI and this was compared to the land uses established by the Scheme of Territorial Organization (EOT) of the Santo Domingo Municipality. Results indicate that in the tailings deposit and tailings pipeline there may be conflict for moderate and light sub-use. However, the sector is considered to be absent of conflict where most of the mining infrastructure will be located.

20.2.2.6. Air Quality

For the characterization of the atmospheric media air quality sampling was performed in four monitoring stations, Lagos de Porce, Bodega, Minas and Picacho. Parameters such as PM10, calculated air quality index (ICA), SO_2, NO, CO and bottom concentration were measured. All the obtained results were below the maximum permitted levels of the Resolution 610 of 2010 of the Ministerio de Ambiente y Desarrollo Sostenible (MADS). The study of the air quality also included the contaminant dispersion model AERMOD. The model concludes that once the productive phase of the project is initiated there is a considerable increase in the carbon monoxide (CO) from 0.61 Mg/year up to 42.3 Mg/year, and nitrous oxides (NOx) from 6.85 Mg/year up to 60.14 Mg/year, mainly due to the gases extracted through the ventilation system.

20.2.2.7. Environmental Noise

To determine the base line levels of environmental acoustics for the project a campaign monitoring the environmental noise in the same locations as the air quality was undertaken. According to Article 5 of the Resolution 627 of 2006, the points were classified as sector D, rural land use destined for agricultural activities according to the EOT of the Santo Domingo municipality.

The results of the measurements of environmental noise, in an ordinary day (Monday to Saturday), indicate that the values for the daytime schedule do not comply with the normal levels. At night time, none of the four measuring points complied with the provisions of the current norm for this type of environment (land use, 45 dB), presenting an increase in noise levels with respect to daytime. In the daytime, the main source of noise is the high traffic that increases at night. A great variety of animal species inhabit the zone, both day and night, that is another source of the noise generated in the zone.

The study included the analysis of vibrations produced by underground blasting. The conclusion is that for the upper three levels of the mine, up to a blasting depth of 70 m, blasting affects the nearest structures. The fundamental frequency (lowest frequency of a periodic waveform) at this depth or maximum speed of vibration, exceeds the limits of the norm and the category of perception is annoying, therefore, a monitoring program must be established in the surface infrastructures near to the exploitation area and in the houses that are close to the mine. For a blast depth greater than 130 m, the maximum vibration speed does not exceed the limits of the norm and the category of perception is imperceptible, therefore, a vibration monitoring program is not required. In addition to these studies, the seismic response of the soil was analyzed with an empirical model.

20.2.3 Water Management

In the area of influence of the project, there is not a source that can be identified as the main feeder for a water treatment system of drinking water. There are only individual water captures in different creeks to fulfill domestic requirements and in a few cases, agricultural requirements.

To assess the water demand, a detailed field inventory of the intakes and discharges of the area of influence for the project was performed, by gauging, location and description of the infrastructure. In terms of water quality, samples of physical, chemical and hydrobiological parameters were obtained, establishing the current normal levels under the parameters of sampling and monitoring of IDEAM by certified laboratories. The sampling points included 15 superficial water locations, 2 water springs, 8 water upwells and 7 piezometers, one point in the entrance to the tunnel of La Quiebra and another at the exit. The results of the water sampling indicate that, at the moment, according to the monitored parameters in the Resolution 631 of 2015, the concentrations of BOD5, COD, TSS, grease and oils are very low, with exception of the limit for heavy metals in the AS-1 point which exceed the limits for arsenic for a mining activity discharge. The microbiological analysis indicates fecal contamination, associated with residual domestic water.

20.2.3.1. Hydrology

The area corresponds to the right margin of the Santiago water stream including the effluent of La Mina, La Guadua, La Colina, La Gallera, Los Pomos, Las Peñas, Congojal, among others. The ADI and AII of the hydrological component defines influence areas of the project and it covers an area from the location of mining infrastructure in the La Colina area to the tailings storage facility (TSF), known as El Hormiguero (The Anthill). The area of influence of the tailings pipeline alignment is also key.

The area of influence of the Project belongs to the great basin of the Nare river and to the great basin Porce-Nus, and from it, the basin of the Santiago ravine. The predominant drainage patterns are dentritic to sub-dentritic in which a slope control exists in the basins of second and third order, producing zones with a certain degree of parallelism.

The most important effluents are La Negra, El Ruby, and El Chilcal creeks that drain to the left margin of the Santiago ravine and La Guadua and Congojal creeks that flow in the right margin of Santiago ravine. Together all of these constitute the project area of influence. In the area of TSF “El Hormiguero” there is a basin whose principal effluent is a nameless creek that flows through the deposit plus another three drainages of second and third order, that deliver water to it, before finally flowing out to the Porce river.

The hydrologic regime of the area of influence was based on the climatological description from registered information in the climatological stations at Guayabito and Nus Granja. The morphological characterization of the basin and its sub-basins was acquired in the IDEAM, and applying the “Tanks Model” the multi-year average flows as well as the minimum flows were simulated for each return period. Calculation of the maximum flows used the synthetic methods of William and Hann, the Soil Conservation Science (SCS) method and the Snyder method, finally obtaining the results for the calculated maximum flows for each return period, for the different basins.

20.2.3.2. Hydrogeology

According to the hydrogeological model and considering the study of the water behavior and its circulation pattern in the geological media, three hydrogeological units were identified for the zone of interest:

1) UH-I defined by the present alluvial deposits.
2) UH-II formed by colluvial deposits, the horizons of residual soil IA, IB, IC and the transition horizon soil-rock IC-IIA.
3) UH-III defined by the fractured rocky massif.

The hydrogeological study allowed the definition of recharge zones by geomorphology. Zones with low recharge potential include those with a higher landscape, with steeper slopes exceeding 22° and the low parts of the basin where the slopes are less than 10° (comprising the major part of the study area). Medium recharge zones correspond to flat areas with slopes between 0°and 10° that are located in the middle part of the basin and in zones with intermediate slopes between 11°and 22° located in the middle and upper areas, located on the right margin of La Mina creek.

The recharge areas with soft slopes where the water can easily infiltrate are located in the upper part of the basin with slopes between 0° and 10°. Results of the underground water sampling permitted an understanding of the hydrochemistry of the water that indicated that the dominant anion is bicarbonate, related to water rich in bicarbonate. This type of underground water is generally associated with flows with short residence time in the underground media.

20.2.4 Biotic Baseline

For the biological media the AII includes the zones of infrastructure and it extends up to Santiago creek to the south, to the north with the water ridge or where the forest cover gets fragmented, to the west and east it extends up to the limit of the works of the project, which represents the geographical limits such as the Medellin-Amalfi road and the water ridge of La Quiebra. The area of the project is located in an ecozone of very humid mountainous forests and in a level of ecosystems that exhibits forests, secondary vegetation, grass and agricultural areas of the Andean lower Oriboma.

In terms of sensitive areas, in the study zone there are not SINAP protected areas nor strategic ecosystems such as AICAS, moors and wetlands, nor areas in the EOT normativity (Santo Domingo Municipality 2002). However, it was found that in the Agreement Nº 205 of the Corporación Autónoma Regional de las Cuencas de los Ríos Negro y Nare (CORNARE) a Forestry Ordering Plan is adopted for the Sub-regions Aguas and Porce Nus of the eastern region of Antioquia as a support action or basic tool of the corporation for the forestry administration and management of the Aguas and Porce Nus regions. These regions are comprised of the municipalities of El Peñol, Guatape, Granada, San Rafael, San Carlos, Concepción, Alejandría, Santo Domingo and San Roque. The forestry agreement also defines the ordering units which include the main basins of the region, the Nare Basin, Samana Norte Basin and Porce Nus Basin which are fundamental to the characteristics and distribution of the forestry resource.

The characterization of the biological media used a land cover map at a 1:10.000 scale produced from an orthophotograph with a 15 cm pixel resolution, taken in June 2016. This produced the finding of the following land cover distributions in the level of ADI and AII.

20.2.4.1. Flora

Characterization of the flora was performed by a statistical inventory which permitted a sampling error of 11,84%. In this sampling 115 lots of 0,02 ha were set, grouped in 23 blocks of 0,1 ha. A total of 3,003 individuals were registered, from which 1,026 are in the fustal (plant or tree with a diameter >20cm) category, which are distributed in 19 families and 138 species. The families with the highest diversity are *Fabaceae, Melastomataceae, Lauraceae* and *Piperaceae*, therefore it was determined that the land cover with highest diversity and structural complexity is the open Forest.

During the sampling eight (8) species were categorized as endangered. *Cnemidaria horrida* and *Cyathea andina* are two species that are reported as endangered on the national level. In a similar way, it was found that in the sampling area *Cedrela odorata* and *Inga mucuna* are in a vulnerable state according to the UINC.

20.2.4.2. Fauna

For the terrestrial fauna, different sources of information and previous studies were reviewed to define the potential species lists of the birds, amphibians, reptiles and mammals.

Field samplings were also made with four (4) land coverages sampled within the area of study: High Open Forest (Ba) located in the sector of El Hormiguero, low Secondary Vegetation (Vsb) and Clean Grass (Pl) in the Bodega sector and the high Secondary Vegetation (Vsa) on the tailings duct. In general, the area with the highest diversity in the four groups is the open forest.

For amphibians and reptiles by means of the visual revealing methodology (REV) nine species of amphibians and eight species of reptiles were registered. One of these species is *Pristimantis penelopus*, an endemic species of Colombia, and it is in the vulnerable category (VU) according to the IUCN (2016).

For the birds two sampling techniques were implemented: observation with binoculars and capture with fog nets. A total of 299 individuals were registered, grouped in 75 bird species, distributed in 14 orders, and 31 families. Two endemic species *Ortalis columbiana* (Guacharaca Colombiana) and *Habia gutturalis* (Habia ceniza) were reported and six migratory species were reported.

For the mammals, indirect registers were made from acoustic records, prints, trails, feces, residues in food, caves, and holes. Direct registers were done such as sightings, fog nets to capture bats and Sherman type collapsible traps to capture small terrestrial mammals alive, as well as the installation of Bushnell type capture cameras. Additionally, informal questions were made (surveys were not performed) to some local people and field assistants about the presence of mammals in the zone. It was found that the mammal community in the ADI is represented by six orders, ten families and 29 species. From the registered species three of them are endangered: *Aotus lemurinus* (marteja, mico nocturno), *Saguinus leucopus* (Tití gris) and *Dinomys branickii* (guagua loba).

20.2.5 Social Baseline

The majority of the inhabitants in the area of influence of the Project, have a common element in that they lack employment opportunities. All the legal conditions are guaranteed based on the labor system and social security regime in Colombia.

In the agricultural sector traditional farmers that own small lots predominate. Also included under this scenario are small livestock owners. The development of the Cisneros Project, is considered important, as a positive dynamic agent in improving the quality of life options for the population inhabiting the area of influence of the project. Since AGD, with its social responsibility policies having as a base the existence of a legally conformed organization, that allows the integration and interaction between community and the company, to benefit the diverse stakeholders that are affected directly or indirectly with the development of the project.

20.2.6 Summary of Environmental Studies Conducted

The Environmental Impact Study (EIS) for the Guayabito deposit, entitled **"Proyecto Cisneros, Yacimiento Guayabito - Estudio de Impacto Ambiental – EIA"** was carried out by the company Pi Epsilon Proyectos de Ingeniería Especializada S.A.S. The different components of this EIA were presented on different dates, from August 2016 to January 2017. The following chapters were used in the preparation of this report:

- **Chapter 3.2:** Characterization of the Project Area - Areas of Influence and Physical Component (October 2016).
- **Chapter 3.3:** Characterization of the Project Area - Biotic Component (August 2016).
- **Chapter 3.4:** Characterization of the Project Area - Social Component (August 2016).
- **Chapter 4:** Demand for Natural Resources (October 2016).
- **Chapter 6:** Environmental Evaluation (January 2017)
- **Chapter 8:** Environmental Management Plan (January 2017)
- **Chapter 9:** Tracing and Monitoring Plan (January 2017)
- **Chapter 13:** Closure Plan (August 2016).

20.2.7 Environmental Issues

Potential environmental problems that could materially affect the ability to extract mineral resources related to the development of current operations, were determined for the area of influence.

Through its ongoing risk assessment and evaluation as part of its Sustainability Management System, AGD has identified the following key risks and management strategies (Table 20-3).

The start-up of the Cisneros Project, Guayabito deposit, being a part of the socio-economic dynamics of the communities located in the ADI of the project is expected to generate positive impacts such as the generation of employment, local development and community organization.

Table 20-3
AGD Risk Assessment and Management

Impact	Measurement	Following and Monitoring
Soil loss, erosive processes and geotechnical instability of embankments	Soil management program, geotechnical stability, stops, blasting and waste	Soil Following and monitoring, geotechnical stability, stops, blasting and waste
Altering of the water quality and quantity, underground and sub-superficial water dynamics	Water management plan, discharges, tailings, dangerous solid wastes and chemical substances	Water, discharges, tailings, dangerous solid wastes and chemical substances, fuels, oils and grease following and monitoring,
Altering of the air quality and noise	Air quality management plan and noise and signaling	Air quality management plan and noise and signaling following and monitoring
Altering the morphology and landscape	Landscape restoration plan	Landscape restoration following and monitoring
Migration Pressure	Migration Flow Program	Migration Pressure following and monitoring
Education	Education program for the personnel and community	Education following and monitoring
Employment Generation	Hiring program for labor, goods and services	Hiring program for labor, goods and services following and monitoring
Changes in the vegetation cover	Compensation by Biodiversity Loss Program, Forestry Exploitation program	Flora, following and monitoring
Impact to flora sensitive species	Forestry Exploitation program Management Program for the sensitive flora species	
Ecosystem fragmenting	Compensation by Biodiversity loss Program	
Impact to terrestrial fauna	Drive away and rescue program for terrestrial fauna (amphibians, reptiles, birds and mammals)	Terrestrial fauna, following and monitoring
Impact to fauna sensitive species	Drive away and rescue program for terrestrial fauna (amphibians, reptiles, birds and mammals)	
Impact on aquatic ecosystems.		Hydrobiological communities following and monitoring

20.2.8 Guayabito Permitting

According to the applicable mining laws and regulations of the “Corporación Autónoma Regional de los Ríos Negro y Nare” (CORNARE), it was assigned the management, administration and promotion of the renewable natural resources within the territory of its jurisdiction. Following an evaluation of the Guayabito Project, in the Municipality of Santo Domingo - Antioquia, the following approvals were granted:

- CORNARE Environmental License No. 131-0870-2016 of October 26, 2016, for the development of the mining project of metallic minerals, precious and semiprecious stones, called Guayabito Deposit to be developed in the Jurisdiction of the Municipality of Santo Domingo - Antioquia, covered under the mining titles No. HFPB-01 and HHNL-05.
- Resolution No. 0763 of April 17, 2017, which partially closes the ban on wild flora species and other determinations are made.

20.3 CLOSURE

Mine closure requirements are regulated by Decree 2041 of 2014. Article 41 describes the steps to be taken. In summary they are:

Three months prior to the finalization of exploitation, the company is to provide a study to the environmental authority which addresses the following:

- Identify site environmental impacts at the time of closure;
- Demolition plan;
- Drawings and plans showing the location of infrastructure for closure;
- All obligations to be fulfilled and work to be completed; and
- The closure plan costs including pending compliance items.

The environmental authority has one month to comment on the closure plan.

When the closure plan is initiated, the company must post an insurance bond to cover the closure costs for the closure period, and for three years following closure completion.

20.3.1 Objectives

The following objectives have been considered for closure planning:

- Compliance with current environmental legislation in the country, adopting environmental protection standards;
- Focus on protecting affected areas after closure, restoring them to a condition similar to pre-mining conditions;
- Environmental protection using techniques and technologies designed for risk control, land stabilization, and physical and chemical discharge containment, with a focus on degradation prevention;
- Public health and safety protection, as well as the environment, from physical and chemical impacts in the area of influence;
- Closure incorporating new technologies that improve environmental reclamation and closure performance; and
- Social management standards compliance for the social, economic, and institutional development of the Cisneros Project area.

20.3.2 Design Standards

The key closure design standards include the following:

- Safety: Dismantling or removing infrastructure and installations that create risk for personal safety. All remaining supplies will be removed from the site, and hazardous waste disposed in accordance with applicable regulations;
- Physical Stability: Topography reconfigured to integrate the terrain and surface drainage with the area, and ensure physical stability of remaining facilities;
- Geochemical Stability: Covers reducing infiltration will be used to minimize seepage from reclaimed facilities and to protect the receiving waters. Ongoing water quality monitoring will ensure chemical parameters meet the water quality requirements; and
- Future Land Use: Facilities will be reclaimed and left in a condition to facilitate future planned use for the area.

At the end of the Cisneros Project's useful life, morphological reconfiguration of the affected land will be carried out as well as installation of the necessary infrastructure ensuring land stability and landscape reclamation.

Based on the social and demographic dynamics verified during the course of the Cisneros Project's useful life, the potential uses of the intervened area will be jointly defined with the community.

20.3.3 Closure Components

Final and permanent closure costs by major facility are summarized below:

20.3.3.1. Underground Mines

- Mine surface facilities salvage and demolition except for the water treatment plant and related facilities;
- Underground mine equipment salvage;
- Sealing mine entrances to prevent unauthorized access; and
- Hydraulic plug installation in the Guaico tunnel to allow mine flooding and reduce water discharge to minimal seepage flow.

20.3.3.2. Filtered Tailing and Waste Rock Storage Facilities

The TSF will be constructed in sequential cells as a series of expansions, and reclamation will occur concurrently with operations. Therefore, most costs of reclamation activities will be realized during the operating period.

20.3.3.3. Water Treatment Plants

Continued operation of a reduced-capacity water treatment plant (WTP) is planned to treat remaining mine flows and TSF waters post site closure.

20.3.3.4. Other

- Retention of roads, bridges, fences, and paths being used by local communities; and
- Disturbed surface area regrading and revegetation.

Geochemical studies have been carried out and include kinetic testing and seepage studies for the TSF estimated flows and water chemistry. It has been determined that both tailing and waste material could have long-term acid drainage generation potential, and therefore seepage will be collected and monitored during closure and post-closure. The closure plan calls for total cover of the TSF to prevent water infiltration and seepage. Seepage not meeting discharge standards would be routed to the WTP prior to discharge. It is expected that the volume of water would be minimal, if any.

Main closure activities considered for the Project are summarized below in Table 20-4.

Table 20-4
Summary of Closure Activities

Facility	Activity
PROGRESSIVE CLOSURE	
Underground Mine	The longhole stoping and cut & fill methods will be utilized; therefore, the majority of stopes will be backfilled during operations.
	Gradual access closure to prevent access, or for ventilation control as mining progresses.
Tailing and Waste Rock Storage Facility	Runoff water ditch maintenance and monitoring.
	Progressive covering with soil material and revegetation.
	Maintenance of drainage structures for collection and treatment.
	Maintaining diversion structures.
	Physical stability monitoring of Facility.
FINAL CLOSURE	
Underground Mine	Facilities and infrastructure dismantling.
	Closure of mine entrances with concrete plugs with drainage pipes.
	Closure of surface openings including raises as required using concrete plugs.
	Warning and cautionary sign posting.
Process Plant	Removal of material to waste disposal facility or TSF.
	Facility wash down and water treatment.
	Empty and neutralize tanks and equipment that may have contained industrial material such as reagents or acid solutions.
	Processing facility dismantling.
	Concrete foundation and structure demolition.
	Land reclamation and revegetation.
	WTP to be maintained during post-reclamation period until acceptable water quality is achieved.
Tailing Storage Facilities	Diversion and contour channels will be maintained for storm-water diversion.
	Cover: Soil cover and revegetation.
	Maintain facility drainage mechanisms until seepage stops.
	Surge and Collection Ponds: Maintain contact water collection ponds
	Slope Movement Protection: Closure design to protect against potential slope instability.
	Access route closure without impeding established travel routes used by local communities.
	Warning and cautionary sign posting.
Water Management Facilities	Mine Water Management: Maintain mine water drainage facilities until discharge flows subside or water standards can be met.
	Process Water Management: Remove all beneficiation plant structures.
	Contact Water Management: Maintain collecting facilities and handle TSF contact water until there are no drainage flows or water standards can be met.
	Rainwater and Runoff Water Management: Diversion and collection ditches for rainwater and surface runoff remain during closure and are maintained during post-closure.
	Ditches collecting storm water runoff from facilities may also be removed if not required during closure or post- closure.
Electrical Supply	Dismantling by an authorized company.
	Substations, electrical power lines, and fittings will be dismantled using procedures and specific electrical industry regulations.
Ancillary	Cleaning and decontamination of facilities and equipment; prevent chemical, fuel or oil spillage.

21.0 CAPITAL AND OPERATING COSTS

This section describes the parameters, exclusions and the capital and operating cost basis of estimates to support the Cisneros 2017 PEA five year mine plan. Unit costs are based on the most recent cost information from AGD's financial department and adjusted where required to fit the mine plan. All monetary figures expressed in this report are in US dollars (US$) unless otherwise stated.

21.1 CAPITAL COST ESTIMATES

The total capital cost estimated for the Cisneros project is US$75.6 million (M) and includes expenses from 2014 to 2018. Pre-production capital cost is US$61.5M and sustaining capital cost is US$14.1M. The capital cost (CAPEX) estimate includes all costs required to develop, sustain, and close the operation for a planned 5-year operating life. The accuracy of this estimate is ±35%

The estimation of the capital costs for the Cisneros project were made based on the budgets and quotations provided by AGD project staff. The capital costs incurred from 2014 to 2016 are actual costs. Details of the total capital costs are showed in Table 21-1.

Table 21-1
Capital Cost Estimates Summary

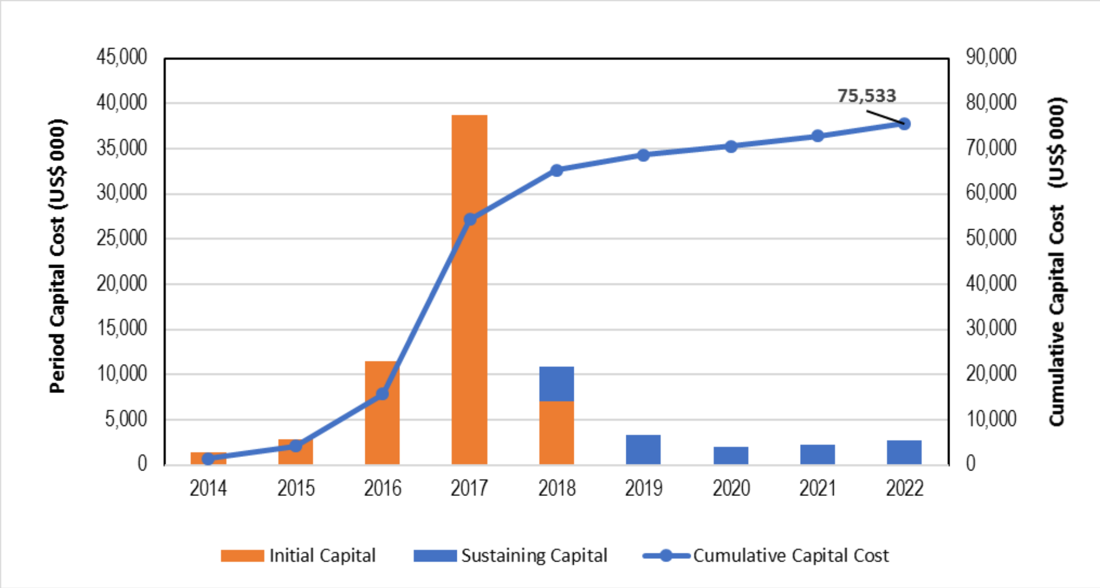
Description	Pre-production (US$'000)	Sustaining (US$'000)	Total Capital (US$'000)
Capex			
Guaico & Nus Mine	16,084	1,640	17,724
Guayabito Mine	4,547	2,370	6,917
Processing Plant and TSF construction	14,554	2,280	16,834
Infrastructure	5,378	469	5,847
Engineering Studies	2,724		2,724
Land Purchases	1,393		1,393
Others		5,459	5,459
Indirect Cost from supporting areas	10,832		10,832
Subtotal	**55,513**	**12,218**	**67,730**
Contingency			
Contingency (15%)	5,970	1,833	7,802
Grand Total	**61,482**	**14,050**	**75,533**

21.1.1 Capital Cost Profile

The capital cost profile for the Cisneros project includes pre-production and sustaining capital. Figure 21-1 presents an annual life of mine capital cost profile including past capital expenses incurred from 2014 to 2016.

For the cash flow model only capital expenses at book value on December 31, 2016 were used. Book value for capital expenses shows an accumulated depreciation of COP 327 Million (US$112k) and amortization of COP 348 Million (US$119.9k) during 2015 and 2016.

Figure 21-1:
Life of Mine Capital Cost Profile



21.1.2 Pre-production Capital Costs

Pre-production capital cost totals US$61.5M and consists of the following phases:

- Expenses incurred from 2014 to 2016 were US$15,714K. These are the actual expenses of the preliminary activities. This information was provided by AGD finance department.
- Future expenses expected during 2017 and from January to March of 2018 total US$45,768K. These expenses are estimated from the budgeting process and include preliminary agreements for Guaico and Guayabito mine development, procurement for major equipment for process plant and include TSF, and electrical substations.

Table 21-2 shows the pre-production capital expenses incurred during 2014 and 2015 and projected over to 2017 and 2018 until end of March 2018. The detailed capital cost of the pre-production Cisneros project to processing plant, tailings storage facilities (TSF) and infrastructure is showed in the Table 21-3.

Table 21-2
Pre-production Capital Cost by Year

Cost	2014 (US$000)	2015 (US$000)	2016 (US$000)	2017 (US$000)	2018 (US$000)	Total (US$000)
Indirect Cost	505	1,506	1,965	4,777	2,079	10,832
Engineering Studies	246	551	1,205	721	0	2,724
Land Purchase	613	191	461	128	0	1,393
Guaico Mine Initial Infrastructure	5	411	5,416	8,068	2,184	16,084
Guayabito Mine Infrastructure	0	0	0	2,641	1,906	4,547
Processing Plant	0	0	1,014	13,540	0	14,554
Infrastructure	8	161	1,455	3,755	0	5,378
Subtotal	1,378	2,820	11,516	33,631	6,168	55,513
Contingency				5,045	925	5,970
Total Cost (US$'000)	**1,378**	**2,820**	**11,516**	**38,675**	**7,093**	**61,482**

Table 21-3
Capital Cost Details of Processing Plant, TSF and Infrastructure

Item	Total Capital (US$'000)
Procurement	
Structure Manufacturing	758
Equipment Procurement	
Mill	624
Crusher	550
Grizzly	170
Gravimetric Concentrator	122
Transformers and Sub stations	1,283
Bridge cranes and monorails	545
Floatation Cells	749
Blowers	155
Conveyor belts	335
Press filter	197
Pulp pump	153
Water pumps	189
Dosing pumps	267
Hydrocyclone	41
Pump drawers	33
Tanks	67
Compressor	45
Tail pump and tank	270
Minor mechanical equipment	246
Electrical & Instrumentation	318
TSF 9.5 Km Pipe, accessories and valves	483
Total Procurement	**7,600**
Construction	
Camp and office (including modules and furniture)	545
Internal access	1,725
Waste dump	330
Medium tension line	267
Mechanical Workshop	49
Main Warehouse	75
Laboratory	294
Processing Plant	
Excavations	985
Piles	1,667
Processing plant specific area	3,927
WTP, IWTP and Fresh water Plant Guaico	181
WTP, IWTP and Fresh water Plant Guayabito	403
Fire system	180
TSF construction	2,567
TSF pipeline construction	1,359
Sub-Total Construction	**14,554**
Commissioning	**560**
Total Cost (US$'000)	**22,714**

21.1.3 Sustaining Capital Costs

Total sustaining capital costs are US$12.2M distributed in expenses required for maintenance of the operation in the underground mine and processing plant. Mine expenses for minor equipment such as fans, pumps, pipelines and electrical wires for the Guaico Mine and Guayabito Mine also form part of the sustaining capital costs. Additionally, the raise boring and capital expenses for backfill is considered sustaining capital.

The replacement of the load-haul equipment is not included in the sustaining capital expenses; these costs are included in the contractor's unit rate of mining cost. Other expenses are the tailing storages facility (TSF) and infill drilling which are about US$670K and US$450K per year, respectively. Details of sustaining capital expenses are shown in Table 21-4.

Table 21-4
Sustaining Capital Cost Details by Year

Sustaining Capex	2018 (US$000)	2019 (US$000)	2020 (US$000)	2021 (US$000)	2022 (US$000)	Total (US$000)
Guaico & Nus Mine Equipment and Accessories						
Fan	170	170	0	170	170	680
Pumps, pipelines and accessories	0	90	90	90	90	360
Electrical substation	150	0	0	0	150	300
Electrical Mining Wire 13.2 kV	0	15	15	15	15	60
Compressor	100	0	0	0	0	100
Chutes	0	35	35	35	35	140
Guayabito Mine Equipment and Accessories						
Fan	200	200	0	0	200	600
Pumps, pipelines and accessories	0	130	130	130	130	520
Electrical Substation	150	150	0	0	150	450
Electrical Mining Wire 13.2 KV	0	15	15	15	15	60
Compressor	100	0	0	0	0	100
Chutes	0	35	35	35	35	140
Back fill process Plant	0	500	0	0	0	500
Total Mine Raise Bore	1,246	656	483	483	483	3,351
Infill drilling	309	450	450	450	450	2,109
Processing Plant						
Maintenance	137	200	200	200	200	937
TSF Facilities	692	138	138	188	188	1,343
Maintenance Internal and External Roads	69	100	100	100	100	469
Subtotal	**3,323**	**2,884**	**1,690**	**1,911**	**2,411**	**12,218**
Contingency	498	433	254	287	362	1,833
Total Cost (US$'000)	**3,821**	**3,316**	**1,944**	**2,197**	**2,772**	**14,050**

The costs for raise boring, required for Guaico and Guayabito mines total US$3.4M. The cost per meter is US$2,195 for total shaft length of 1,527m. Table 21-5 shows detailed sustaining capital expenses for raise boring by mine.

Table 21-5
Sustaining Capital Cost for Raise Bore

Item	Units	2018	2019	2020	2021	2022	Total
Guaico mine	m	243	175	55	55	55	583
Nus mine	m	70	14	55	55	55	249
Guayabito mine	m	255	110	110	110	110	695
Total	**m**	**568**	**299**	**220**	**220**	**220**	**1,527**
Unitary Cost	US$/m	2,195	2,195	2,195	2,195	2,195	
Total	**US$'000**	**1,246**	**656**	**483**	**483**	**483**	**3,351**

21.2 OPERATING COSTS

21.2.1 Mining Operating Cost

The mine operating cost includes the following assumptions:

- Mining operations will be executed by mining contractors.
- Internal budgetary quotations and incurred expenses to cover mining activities for Guaico and Nus mines were the sources for the estimate of operational expenses for future mining activities.
- Drilling, blasting, loading and hauling are based on mining contractor unit labour rates and depends on the mining method. LHOS mining is based on 13 m long hole.
- Unit cost for ground control is to support rock on Guaico and Guayabito mines only. Rock support is not expected to be necessary in the Nus structure.
- Unit cost for hauling, calculated based on hauling distances between Guayabito portal and processing plant (300 m) and between Guaico portal and processing plant (6 km) The unit cost assumed by the contractor is 2.5 km for the Guayabito Mine and 8 km for the Guaico Mine.
- Per person overhead costs for the mine contractor are estimated at US$712/month for 6 people and allocated according to the average level of production on each mine.
- Owner overhead costs are estimated in US$99,200 per month for 43 people which includes the Cisneros project staff.
- Power cost is based on $0.12/kWh. Electrical power consumption has been estimated at 540,000 kWh/month for all underground mining equipment.
- Unit rate from mine contractor for fuel cost is US$2.53/gallon or 7,200 COP/gallon.

The estimated operating cost summary is shown in Table 21-6.

Table 21-6
Estimated Operating Cost Summary

Item	Unit	Guayabito	Guaico	Nus
Drill- Blast-Load and Floor/Hanging Break	$/t mined	15.95	15.95	6.61
Ground Support	$/t mined	10.68	10.68	-
Hauling	$/t mined	1.42	3.78	3.8
Contractor Overhead	$/t mined	3.25	6.17	6.17
Power	$/t mined	4.58	4.58	4.58
Contractor Overhead	$/t mined	6.804	6.804	6.804
Total	**$/t mined**	**42.68**	**47.96**	**27.94**

Estimation of the power cost is shown in Table 21-7.

Table 21-7
Estimation of Underground Mining Power Cost

Items	Unit	Value
Energy Unit Rate	*COP/kWh	360
	USD/kWh	0.12
Tonnes Mined	t/month	14,583
Total Energy	kWh /month	540,000
Power	US$/month	66,804
Total	US$/t mined	4.58

*COP, Colombian Pesos

The mine development unit cost is estimated at US$1,727/m for the Guaico-Nus mine and US$1,694 /m for the Guayabito mine. These items are estimated from the mine contractor's average unit cost and include provision for drilling, blasting, ground control, hauling and mine supervision. Table 21-8 and 21-9 show the detailed items for development costs.

Table 21-8
Cost Distribution for Development by Mine Unit

Activities	Guaico US$/m	Nus US$/m	Guayabito US$/m
Ground Control	113	113	110
Hauling	93	93	85
Overhead	438	438	418
Equipment and Service	218	218	246
Drill, Blast and Loading	865	865	835
Average Development Cost	**1,727**	**1,727**	**1,694**

Table 21-9
Estimation of Development Cost by Mine Unit

Item	Life of Mine US$	Unit Cost US$/milled tonnes
Guaico mine	5,862,561	7.47
Nus mine	7,949,654	10.13
Guayabito mine	21,867,598	27.87
Unitary Cost	**35,679,813**	**45.47**

Life of Mine OPEX is US$64M. Table 21-10 shows detailed mining cost for mine operations.

Table 21-10
Estimation of Mining Cost

Item	Life of Mine US$('000)	Unit Cost US$/mined tonnes
Nus Mine - Direct Stoping Cost		
Drill- Blast-Load and Floor/Hanging Break	1,898	2.42
Ground Support	0	0.00
Haul Mine-Plants	1,087	1.39
Contractor Overhead	1,773	2.26
Subtotal	**4,758**	**6.06**

Item	Life of Mine US$('000)	Unit Cost US$/mined tonnes
Guaico Mine - Direct Stoping Cost		
Drill- Blast-Load and Floor/Hanging Break	1,365	1.74
Ground Support	914	1.16
Haul Mine-Plants	324	0.41
Contractor Overhead	528	0.67
Subtotal	**3,131**	**3.99**
Guayabito Mine - Direct Stoping Cost		
Drill- Blast-Load and Floor/Hanging Break	5,770	7.35
Ground Support	3,863	4.92
Haul Mine-Plants	513	0.65
Contractor Overhead	1,176	1.50
Subtotal	**11,322**	**14.43**
Total - Direct Stoping Cost		
Drill- Blast-Load and Floor/Hanging Break	9,033	11.51
Ground Support	4,777	6.09
Haul Mine-Plants	1,924	2.45
Contractor Overhead	3,477	4.43
Total Direct Stoping Cost	**19,211**	**24.48**
Additional Resource Development		
Guaico mine	5,863	7.47
Nus mine	7,950	10.13
Guayabito mine	21,868	27.87
Sub Additional Cost Development	35,680	45.47
Indirect Stopping Cost		
Owner Overhead	5,655	7.21
Power Cost	3,808	4.85
Subtotal Indirect Stoping Cost	**9,463**	**12.06**
Grand Total Stoping Cost	**64,354**	**82.00**

21.2.2 Mineral Processing

The operating cost of the processing plant includes general labor costs, reagents, energy, auxiliary services and overhead costs. The estimated processing cost includes the following assumptions:

- Average milling rate is 500 tpd for 29 days per month to give total production of 175k tonnes per year.
- Expenses incurred from 2014 to 2016 total US$15,714K. These are real expenses incurred on preliminary activities and correspond to recent historical information from internal data from AGD finance division.
- Estimated manpower and overhead of 37 personnel and salaries of US$39.3K per month.
- Material supply and tools for maintenance have an average annual cost of US$230K. Materials include spare parts for mechanical equipment and instrumentation, pipes, electrical equipment and instrumentation. Tools include grinding discs, welding rods, paint and other items.

- Office support, office maintenance and expenses for training, medical attention, vehicles, personnel protection equipment, insurance fees, permits, security, and social expenses are not included. These are part of the General and Administration (G&A) expenses.
- The power cost of US$6.89 per ton is based on US$51,700 electrical power consumption per month.
- Unit cost of electricity is based on a budgetary rate of US$0.124/kWh, a demand factor of 60% and 696 working hours per month.
- Reagent costs were taken from similar operations (Cori Puno, Peru). The cost used for gravity and flotation reagents is US$1.65 per tonne milled.

Table 21-11 and Table 21-12 show the unit operating cost and the personnel expenses for the processing plant.

Table 21-11
Operating Cost for Processing Plant

Description	Total Cost (US$/tonne milled)
Manpower and Overhead	2.71
Reagents and consumables	1.65
Power	6.89
Supply and auxiliary services	0.34
Maintenance Consumables	1.32
Total Opex	**12.91**

Table 21-12
Personnel Cost for Processing Plant

Process Plant Personnel	Personnel	Salary (US$/month)	Total (US$)
Supervision Staff			
Plant Manager	1	5,000	5,000
Maintenance Supervisor	1	3,000	3,000
Laboratory Chief	1	2,800	2,800
Shift Supervisors	3	2,530	7,590
Production Operators			
Crushing Technicians	2	660	1,320
Mill – Gravimetry Technicians	2	660	1,320
Flotation – Filtration Technicians	2	660	1,320
Chemical Annalists	3	1,100	3,300
Sample Preparation Technicians	3	660	1,980
Supporting personnel	8	660	5,280
Plant Maintenance			
Instrumental Technicians	2	1,080	2,160
Electric mechanical operators	4	700	2,800
Rotating Shifts Personnel	5	700	3,500
Total Personnel Operating Cost (US$/month)			**41,370**
Operating cost per person (14,500 t/month)		**(US$/t)**	**2.85**

21.2.3 General and Administrative Operating Costs

The general and administrative (G&A) operating costs are estimated at US$205K per month for a total of US$3.06 million over the life of mine. Costs for environmental compensation and asset retirement obligation (US$645K) are included in G&A expenses. Details for the estimated G&A costs are shown in the Table 21-13.

Table 21-13
Details of G&A Operating Costs

Sector	Number	Average Expenses US$/month	LoM US$('000)
General & Administrative Operational Expenses			
Meal, Accommodations and General Expenses		36,550	2,083
Security		21,810	1,243
Community and Social		16,666	950
Health and Safety Materials and Services		5,596	319
Environmental monitoring		4,022	229
Other environmental expenses		187	11
La Manuela Easement		5,081	290
Sub Total G& A Operational Expenses		**89,912**	**5,125**
General and Administrative Cost - Labour			
General Manager & Finance & Administration	16	25,976	1,387
Human Resources	3	4,915	251
Corporate Affairs - Legal	3	4,496	229
Logistics	8	9,140	466
IT & Communications	2	2,530	129
Sub-Total Labour Cost	**32**	**47,056**	**2,462**
G&A Office Expenses - Materials, Services and Misc. Supplies			
Misc. And Office Supplies		12,601	**643**
Personnel On Site Transportation		20,404	1,041
Communication		1,781	91
Travel and Accommodations		4,296	219
Consulting		13,443	282
Human Resources		8,987	458
Legal		6,500	332
Sub-Total G&A Office Expenses		**68,011**	**3,065**
Other Expenses			645
Sub-Total Other Expenses			**645**
Total G&A		**204,949**	**11,297**

22.0 ECONOMIC ANALYSIS

22.1 INTRODUCTION

LINAMEC considers that this report meets the requirement of a technical report as defined by Canadian NI 43-101 guidelines for a Preliminary Economic Assessment (PEA). There is no guarantee that the Cisneros Project will be placed into production as this is contingent on successfully obtaining all the requisite consents, permits and approvals, regulatory or otherwise.

Both, pre-tax and post-tax cash flow models have been developed for the Cisneros Project. Capital expenditures prior to 2017 of US$13.2 Million (CAD$17.7 Million) for tangible assets as indicated in the audited financial statements of Antioquia Gold at December 31, 2016 (UHY McGovern Hurley LLP, 2017), were used.

22.2 CASH FLOW RESULTS

The results show that the project has a pre-tax IRR of 24.0% and a pre-tax NPV of $23.7M and a post-tax IRR of 18.7% and a post-tax NPV of $16.7 M. Table 22-1 and Table 22-2 show the results of the economic model. All costs are in third quarter 2017 US dollars (US$) with no allowance for inflation.

Table 22-1
Cisneros Gold Project - Economic Model

Descriptions Input / Output	Units	Value
Financial Input		
Price	US$/oz	1250
Exchange Rate	COP:USD	2910
Discount Rate	%	5.0
Processing Schedule		
Total Resource Milled	k-tonnes	785
Au Grade	g/t	6.4
Au Recovery	%	93
Recovered Au	k-oz	150.9
Payable Au	k-oz	147.3
Capital Cost		
Sustaining Capex	US$M	(12.22)
Capex 2017-LoM	US$M	(39.80)
Total Capex 2017-LoM	US$M	(52.02)
Contingency	US$M	(7.80)
Total Capex 2017-LoM	US$M	(59.82)
Capex previous to 2017	US$M	(13.2)
Pre-Tax CF		
Undiscounted pre-Tax Cash Flow	US$M	33.54
Pre-tax IRR	%	24.0%
Pre-tax NPV	US$M	23.71
Payback	year	2.60
Post-Tax CF		

Descriptions Input / Output	Units	Value
Undiscounted post-Tax Cash Flow	US$M	25.58
Post-tax IRR	%	18.7%
Post-tax NPV	US$M	16.75
Payback	year	3.20

Table 22-2
Cisneros Gold Project Annual Cash Flow Model

		Units	2017	2018	2019	2020	2021	2022	Total LoM
Mined Schedule									**LoM**
Nus	Total Ore Mined	k-tonnes	4	53	52	79	94	30	313
	Au Grade	g/t	3.45	3.04	3.60	3.82	2.98	2.85	3.30
Guaico	Total Ore Mined	k-tonnes	3	25	43	21	0	0	92
	Au Grade	g/t	7.03	8.20	9.42	9.19	0.00	0.00	8.95
Guayabito	Total Ore Mined	k-tonnes	0	57	93	94	92	44	380
	Au Grade	g/t	0.00	9.31	8.60	8.78	7.89	7.03	8.39
Total	Total Ore Mined	k-tonnes	7	135	188	194	186	74	785
	Au Grade	g/t	5.06	6.64	7.40	6.80	5.41	5.33	6.43
Processing Schedule									**LoM**
Total Ore Milled		k-tonnes	0	142	175	175	175	117	785
Au Grade		g/t	0.00	6.56	7.40	6.84	5.66	5.36	6.43
Au Recovery		%	0%	93%	93%	93%	93%	93%	93%
Recovered Au		k-oz	0	28	39	36	30	19	151
Net Smelter Return									
Au Payable		US$M		33.8	47.0	43.4	35.9	22.8	182.9
Refining & Assay Cost		US$M		(0.6)	(0.8)	(0.7)	(0.6)	(0.4)	(3.1)
Transportations & Insurance		US$M		(1.2)	(1.5)	(1.5)	(1.5)	(1.0)	(6.7)
Royalties		US$M		1.3	1.8	1.7	1.4	0.9	7.1
Net Smelter Return		US$M	-	33.3	46.5	42.9	35.2	22.3	180.2
Operating Cost									
Underground Mining		US$M	-	(14.6)	(16.8)	(13.3)	(11.5)	(8.1)	(64.4)
		US$/t	-	102.9	96.1	76.1	65.8	68.6	82.0
Processing		US$M	-	(1.8)	(2.3)	(2.3)	(2.3)	(1.7)	(10.3)
		US$/t	-	12.7	12.9	12.9	12.9	14.2	13.1
General and Administrations		US$M	-	(2.0)	(2.5)	(2.5)	(2.4)	(1.8)	(11.3)
		US$/t	-	14.0	14.4	14.4	13.8	15.7	14.4
Total Operating Cost		US$M	-	(18.4)	(21.6)	(18.1)	(16.2)	(11.6)	(85.9)
		US$/t	-	129.6	123.4	103.4	92.6	98.6	109.5
Closure Cost									
Salvage Value		US$M						0.59	0.59
Closure Cost		US$M						(1.55)	(1.55)
Production Incomes									
Operating Incomes		US$M	-	14.9	24.9	24.8	19.0	9.	93.36
		US$/t	-	104.8	142.3	141.8	108.7	82.8	580.2 8
Capital Cost									
Sustaining Capex		US$M	-	(3.32)	(2.88)	(1.69)	(1.91)	(2.41)	(12.22)
Indirect Cost from supporting areas		US$M	(4.78)	(2.08)	-	-	-	-	(6.86)
Engineering Studies		US$M	(0.72)	-	-	-	-	-	(0.72)
Land purchases		US$M	(0.13)	-	-	-	-	-	(0.13)

	Units	2017	2018	2019	2020	2021	2022	Total LoM
Guaico Mine Initial Infrastructure	US$M	(8.07)	(2.18)	-	-	-	-	(10.25)
Guayabito Mine Infrastructure	US$M	(2.64)	(1.91)	-	-	-	-	(4.55)
Processing Plant	US$M	(13.54)	-	-	-	-	-	(13.54)
Infrastructure	US$M	(3.75)	-	-	-	-	-	(3.75)
Contingency	US$M	(5.04)	(1.42)	(0.43)	(0.25)	(0.29)	(0.36)	(7.80)
Capitalized Pre 2017 Capex	US$M							-
Total Capex	US$M	(38.68)	(10.91)	(3.32)	(1.94)	(2.20)	(2.77)	(59.82)
Depreciation and Amortizations								
Capital Expenditure	US$M	38.68	10.91	3.32	1.94	2.20	2.77	
Depreciation	US$M	-	(10.11)	(12.30)	(12.96)	(13.35)	(13.79)	
Depreciation carried forward	US$M	50.56	51.36	42.38	31.37	20.22	9.21	
Amortization	US$M	(0.35)	(1.77)	(1.77)	(1.77)	(1.77)	(1.41)	
Amortization carried forward	US$M	8.47	6.71	4.94	3.18	1.41	-	
EBIT								
Income after Depr.& Amort.(EBIT)	US$M	(0.35)	3.03	10.83	10.09	3.90	(5.47)	
Taxes and Discount Rate								
Income Taxes Rate	%	34%	33%	33%	33%	33%	33%	
Financial Transaction Tax	%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	
Available Fiscal Credit	US$M	3.51	3.86	0.83	-	-	-	
Taxable Income	US$M	-	-	10.00	10.09	3.90	-	
Income Taxes	US$M	-	-	(3.30)	(3.33)	(1.29)	-	
Financial Taxes	US$M		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Total Taxes	US$M	-	(0.01)	(3.31)	(3.34)	(1.30)	(0.01)	
Net Income after Taxes								
Net Income after Taxes	US$M	(0.35)	3.02	7.52	6.75	2.61	(5.48)	
Working Capital								
Total Working Capital	US$M	0.13					(0.13)	
Discount Rate								
Discount Rate	%	5%	5%	5%	5%	5%	5%	
Income after Depr. & Amort. (EBIT)	US$M	-0.35	3.03	10.83	10.09	3.90	-5.47	
Add Depreciation & Amortization	US$M	0.35	11.88	14.06	14.72	15.11	15.20	
Less Working Capital	US$M	-0.13	0.00	0.00	0.00	0.00	0.13	
Less Capex	US$M	38.68	10.91	3.32	1.94	2.20	2.77	
Cash Flow Before Taxes	US$M	-38.81	3.99	21.58	22.87	16.82	7.09	
Pre-Tax CF (2017 NPV)								
Cash Flow Before Taxes	US$M	-38.81	3.99	21.58	22.87	16.82	7.09	
Cum Pre-tax Cash Flow	US$M	-38.81	-34.81	-13.23	9.64	26.45	33.54	33.54
Pre-tax IRR	%	**24.0%**						
Pre-tax NPV	US$M	**23.71**						
Post-Tax CF (2017 PV)								
Cash Flow After Taxes	US$M	-38.81	3.98	18.27	19.53	15.52	7.08	
Cumulative Post-tax Cash Flow	US$M	-38.81	-34.82	-16.56	2.97	18.50	25.58	25.58
Post-tax IRR	%	**18.7%**						
Post-tax NPV	US$M	**16.75**						

22.3 CASH FLOW ANALYSIS

The following pre-tax and after tax cash flow analysis was completed:

- Net present value (NPV) at 0%, 5%, 7% and 10% discount rate.
- Internal Rate of Return IRR.
- Payback period.

The summary of the results of the cash flow analysis is presented in Table 22-3.

Table 22-3
Cash Flow Analysis

Descriptions	Discount Rate	Units	Pre-Tax CF Value	Post-Tax CF Value
Non Discounted Value		US$(M)	33.54	25.58
Internal Rate of Return (IRR)		%	24.00	18.70
NPV At	0%	US$(M)	33.54	25.58
	5%	US$(M)	23.71	16.75
	7%	US$(M)	20.32	13.70
	10%	US$(M)	15.73	9.58
Project Payback Period		Years	2.60	3.20

22.4 ALL-IN-SUSTAINABLE COSTS

Table 22-4 shows a summary of all LoM costs, cash costs, all-in sustaining cost (AISC) and all-in cost metric (AIC) (Yapo & Camm, 2017). Inclusions of capital expenses from pre-production previous to 2017 are limited only to those able to be depreciated. All capital expenses from 2017 and 2018 and those identified as sustaining capital are included.

Table 22-4
Operating Cost Analysis

Expenses	US$(M)	Unit Cost US$/oz
On Site Mining Cost	74.61	506.5
On Site Mining G & A Cost	11.30	76.7
Royalties	7.06	47.9
Social and Permit Cost	5.60	38.0
Smelting, Refining and Transport	9.74	66.1
Cash Cost	**102.71**	**697.3**
Closure Cost	1.55	10.6
Sustaining Capital	14.05	95.4
All-in sustaining costs	**118.31**	**803.2**
Pre-production Capital expenses	50.56	343.3
All in costs	**147.74**	**1,146.5**

22.5 SENSITIVITY ANALYSIS

Sensitivity analyses are included as part of the economic analysis and allow economic evaluations of changes in metal prices, grades, exchange rates, operating cost and capital cost to determine their relative importance for evaluating investment decisions.

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities to:

- COP/US$ exchange rate
- Gold metal price
- Gold head grade
- Gold metallurgical recovery
- Operating costs, and
- Capital costs

To determine to which of the above items the project is most sensitive, costs were adjusted up and down in 10% increments to see the effect on the NPV with a discount rate of 5%. The value of each sensitivity item, at 80%, 90%, 100% (base), 110%, 120% and 130%, is presented in Figure 22-1 and Table 22-5.

The post-tax NPV is most sensitive to gold grade, metallurgical recovery and price followed by CAPEX, OPEX and less sensitive to exchange rate.

Metallurgical recovery has the highest sensibility and no possibility to increase the NPV to more than US$25.4M (equivalent to 100% recovery) which is impossible under actual and technical conditions.

Figure 22-1:
Sensitivities After-Tax NPV 5%

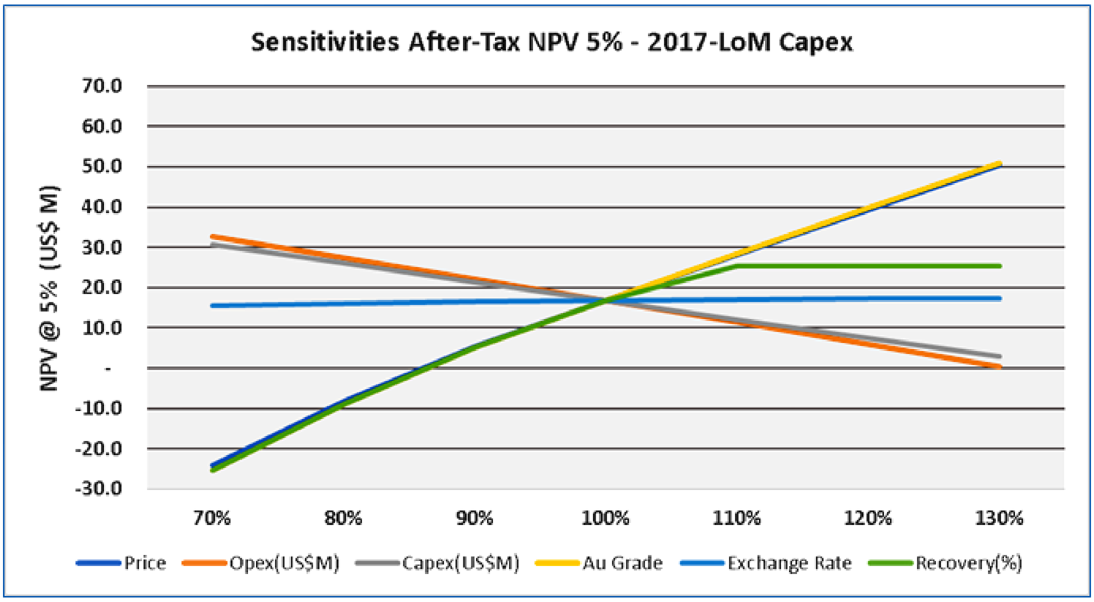


Table 22-5
Cisneros Project Post-Tax @ 5% NPV Sensitivity Analysis

% Variations	Price (US$M)	Opex (US$M)	Capex (US$M)	Au Grade (US$M)	Exchange Rate (COP$/US$)	Recovery (US$M)
70%	-24.2	32.8	30.7	-25.3	15.6	-25.3
80%	-8.3	27.4	26.0	-9.0	16.1	-9.0
90%	5.4	22.1	21.4	5.1	16.5	5.1
100%	16.7	16.7	16.7	16.7	16.7	16.7
110%	28.0	11.4	12.1	28.3	17.0	25.4
120%	39.3	6.0	7.5	39.9	17.2	25.4
130%	50.3	0.4	2.8	51.0	17.3	25.4

A 10% negative variation in metallurgical recovery gives the lowest NPV of US$5.1M similar to a 10% gold grade decrease, which reflects a 70% reduction of NPV. A 20% reduction in price, gold grade or metallurgical recovery makes the NPV negative, while increasing the OPEX or CAPEX 10% has a minor impact compared to decreasing the metallurgical recovery by 10%. This analysis suggests that metallurgical recovery be investigated to confirm the 93% estimated recovery and to increase the certainty of the gold grade of the deposit.

22.6 ECONOMIC CRITERIA

This report is partly based on inferred mineral resources that are considered too speculative to have economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment based on these mineral resources will be realized.

22.6.1 Revenue and NSR Parameters

Annual revenue is determined by applying estimated metal prices to the estimated annual payable metals including metallurgical deductions for each operating year. Sale prices have been applied to life of mine production without escalation or hedging. The revenue is the gross value of payable metals before refining charges and transportation charges. Metal sale prices used in the base case evaluation are US$1,250/ounce of gold.

No contractual arrangements for shipping or refining exist at this time however, the refining terms have been sourced from external gold mining projects and AGD’s internal estimation for cost of transportation and insurance for the Cisneros Project. Revenue assumptions for the Cisneros Project are shown in Table 22-6.

Table 22-6
Basic NSR Parameters for the Cisneros Gold Project

Item	Unit	Value
Gold Price	US$/oz	1250
Payable Gold	%	97.625
Metallurgical deduction	Oz/dmt	0.03
Au Refining Charge (RC)	$/oz payables	5
Moisture content	%	10.0%
Tonnes per truck/shipping container	wmt	28.000
Truck Unit Mine to local Coast	un	5.000
Concentrate Transport		

Item	Unit	Value
Mine to coast storage-Sea freight	US$/wmt	123.6
Escort	US$/wmt	13.0
Handling and port charges	US$/wmt	31.2
Assays charges	US$/wmt	54.95
Insurance	US$/US$1000	5

22.7 NSR CALCULATIONS

The NSR calculations for the Cisneros Project are presented in Table 22-7.

Table 22-7
Basic Cisneros Gold Project NSR Parameters

Item	Units	2018	2019	2020	2021	2022	Total
Total Resource Milled	k-tonnes	142	175	175	175	117	785
Au Grade	g/t	6.6	7.4	6.8	5.7	5.4	6.4
Au Recovery	%	93.0%	93.0%	93.0%	93.0%	93.0%	93.0%
Recovered Au	k-oz	27.9	38.7	35.8	29.6	18.8	150.9
Concentrate Gravimetric	t	1,423	1,750	1,750	1,750	1,174	0
Concentrate Flotation	t	4,403	5,414	5,414	5,414	3,634	183
Concentrate	t	5,826	7,164	7,164	7,164	4,808	32,126
Concentrate Au grade	g/t	149.0	168.1	155.4	128.6	121.8	146.1
Gold Price	US$/oz	1,250	1,250	1,250	1,250	1,250	1,250
Payable Gold	oz	27,246	37,788	34,953	28,923	18,382	147,291
Less metallurgical deduction	oz	175	215	215	215	144	963.8
Moisture content	%	10%	10%	10%	10%	10%	
Local & Ocean Transport	$/t Conc. Proc.	207.4	207.4	207.4	207.4	207.4	
Admin & Assay	$/oz Payable	16.0	16.0	16.0	16.0	16.0	
Treatment and Refining Charge	$/oz Payable	5.0	5.0	5.0	5.0	5.0	
Net Smelter Return							
Au Payable	US$M	33.8	47.0	43.4	35.9	22.8	182.9
Refining & Assay Cost	US$M	-0.57	-0.79	-0.73	-0.60	-0.38	-3.07
Transportations & Insurance	US$M	-1.21	-1.49	-1.49	-1.49	-1.00	-6.66
Royalties	US$M	1.29	1.80	1.70	1.42	0.85	7.06
Net Smelter Return	US$M	33.3	46.5	42.9	35.2	22.3	180.2

22.8 ROYALTIES

Royalty payments are calculated at 3.74% of the Net Smelter Return indicated by the preliminary cash flow analysis for the Cisneros Gold Project.

Average values for royalties include:

- 3.2% under Colombian law. Applied on 4% of 80% of the LME published gold price.
- 1% as indicated in the agreement with AM-VES (concessions 5671A and 5671B). This is also applied on 4% of 80% of the LME published gold price.
- 1.75% Net Smelter Return under the agreement with Gramalote (concessions titles 6195 y 6187B).

22.9 CAPITAL EXPENSES

The capital expenses prior to 2017 are included in the financial analysis but are considered at a book value of US$13.2 Million (CAD$17.7 Million) for tangible assets (mainly for construction).. The book value is taken from the December 31, 2016 audited financial statements and shows accumulated depreciation of COP 327 millions (US$112k) and amortization of COP 348 millions (US$119.9k) occurred during 2015 and 2016.

22.10 TAXES

National companies (i.e. incorporated in Colombia under Colombian law) are taxed on worldwide income. Foreign non-resident companies and local branches of foreign companies are taxed on their Colombian-source income only. The current general corporate income tax (CIT) rate is 34% for FY 2017 and 33% for the following years. This rate is applied to taxable income. Table 22-8 shows the assumptions for tax payable.

Table 22-8
Payable Tax Assumptions

Tax Category	Tax Rate	Note
Corporate Income Tax(CIT)	34% for 2017 33% LoM	Of taxable income
Financial Transaction Tax	0.4%	Of all refining, OPEX, pre-production CAPEX, and sustaining CAPEX Cost

22.11 SALVAGE VALUE

Table 22-9 shows a summary of estimations of the expected resale value after considering the cost of disassembly. These costs are included as a credit to the Project at the end of the mine life. Only selected equipment has been considered for salvage value.

Table 22-9
Salvage Value Estimate

Item	Capital Cost (US$'000)	Estimated Residual Value (%)	Salvage Value (US$'000)
Mill	624	15	94
Crusher	550	15	83
Screen	170	15	26
Gravimetric Concentrator	122	10	12
Transformers and Substations	1,283	15	193
Bridge cranes and monorails	545	0	0
Floating Cells	749	15	112
Blowers	155	0	0
Conveyor belts	335	0	0
Press filter	197	0	0
Pulp pump	153	0	0
Water pumps	189	0	0
Dosing pumps	267	15	40.05
Hydrocyclone	41	15	6.08
Pump drawers	33	15	5.02
Tanks	67	15	10

Item	Capital Cost (US$'000)	Estimated Residual Value (%)	Salvage Value (US$'000)
Compressor	45	15	6.8
Tail pump and tank	270	0	0
Total	**5,795**		**586.6**

22.12 RECLAMATION & CLOSURE

A reclamation and closure expense of US$1.55M has been included in the PEA. Provision for the Guayabito site includes the underground mine, surface buildings, processing plant, El Hormiguero TSF, electrical substation, waste dump and post closure expenses. Guaico estimated closure costs include the mine, waste dump #3 and surface buildings. The main assumption is the number of years over which the closure must be executed to take advantage of a fiscal credit that reduces income taxes. Table 22-10 shows the value for the closure cost considered in the cash flow model.

Table 22-10
Closure Cost Summary

Category	Total Cost (US)
Guaico Site	228,499
Guayabito Site	1,326,198
Additional	-
Total	**1,554,697**

23.0 ADJACENT PROPERTIES

There are no adjacent properties to Cisneros project that have published NI 43-101 technical reports.

24.0 OTHER RELEVANT DATA AND INFORMATION

This section is not relevant to this Report.

25.0 CONCLUSIONS

Geology and Resources

Gold grades were validated using RMA plots, and showed a resulting bias below 10% when comparing pairs of primary laboratory grades (ALS) vs. secondary or testing laboratory (SGS) and vice versa. LINAMEC concluded that these values can be used for resource estimation for Cisneros Deposits.

The block model is basically a “grade model” (grade-shells), which only takes into account the grades in a generic way. It needs to incorporate the geological data (lithology, alteration, structure and mineralized zones) to establish the mineralization controls. The main control is structural.

LINAMEC agrees with the deposit type and model previously postulated by MMTS as it seems appropriated for the Cisneros deposit which could be classified as low to intermediate sulphidation epithermal to mesothermal lode porphyry related gold deposit.

The main resource of the Cisneros Project comes from the Guayabito Area with 22 veins that contribute a resource of 60,468 oz Au to the project.

The diamond drilling executed in the Guayabito South area has intercepted several veins, some of which may be the southern extension of the previously recognized veins in Guayabito North.

Metallurgical Testing and Process Plan

Gold recovery reaches high values close to 97% and 98% for both high grade mineralization (19 to 38 g/t Au) and lower grade mineralization (4 to 5.5 g/t Au) at a P_{80} in the range of 100 to 109 microns.

Gold recovery by gravity was from 49% to 67% with head grades from 5.0 to 5.5 Au g/t, at P_{80} from 100 µm to 109 µm in grinding size.

Gold is found within pyrite as fine inclusions of native gold (10 to 100 microns), partly associated with disseminations and/or bismutinite veinlets. Gold is also observed in chalcopyrite inclusions.

Gold occurs in two forms in the Guayabito and Guaico mineralization: (1) free and associated with sulfides (pyrite) which is easily recovered by gravity and flotation and (2) refractory gold which is found as inclusions within quartz, making up less than 6% of the gold.

Free gold, associated with pyrite is easily recovered by gravity and flotation processes and also by direct flotation (without gravity) at a grind size of 100µm P_{80}, the results show that the direct flotation process reaches high recoveries of gold for all three zones: Guayabito, Guaico and Nus.

The gravity + flotation processes decreases the risk of free gold losses by passing the flows in the flotation banks.

Free gold and that associated with pyrite, is recoverable in the gravity process, this relieves the flotation process by reducing the gold grade in the flotation head.

Both Guaico and Guayabito have a very similar behavior in the flotation process and the gold associated with the iron sulfides is extracted quickly. The Guaico and Guayabito mineralization has fast kinetics indicating that the use of rougher circuits alone would reach gold recoveries close to 98%.

Only one round of physical testing has been done for the different mineralization of the Cisneros Project. The characterization work included work indices (Wi), and abrasion indices (Ai). There is only an isolated Wi datum for a mineralized mixture from Guaico and Guayabito in a proportion of 50/50%, the result was 12.8 kWh/t.

Direct cyanidation process reaches gold recoveries of up to 93%, this value is lower than those achieved by direct flotation and by gravity + flotation from 97% to 98%.

The cyanidation of the gravity concentrates, by involving an extra concentration process, reduces the global recovery of gold to 91.8% for Guaico and to 94% for Guayabito. These values are lower than those reached by gravity and flotation processes.

The cyanidation process, due to the gold recovery achieved, reduces the value of the Cisneros Project ores.

Geotechnical

Geotechnical designs and recommendations contained in the Cisneros 2017 PEA are based on the results of on site investigations and geotechnical assessments completed by Mr. Vallejo on behalf of AGD in 2016.

The rock mass in the Cisneros Project is qualified as rock with good to excellent quality with a moderate presence of groundwater.

Considering the current conditions of the temporary and permanent workings and dimensions of 3 metres to 5 metres, it is expected that five types of support will be used in the Cisneros Project.

The support types follow the recommendations made by Vallejo (2016, internal report) and take into account the Norwegian tunnelling method proposed by Barton (2002).

Underground Mining

AGD has identified two mine units to evaluate for future production potential: Guaico-Nus Mine and Guayabito mine.

The Nus deposit will be mined from underground using long hole open stoping (LHOS) with detritic fill. All stopes will be accessed longitudinally and extracted on a level by level retreat basis. Cut and fill (C&F) mining is the preferred mining method for the Guaico and Guayabito veins. The selection of mining method was determined primarily by deposit geometry and geomechanical features.

Guaico mine development will be accessed via an exploration incline that is currently being developed. This will be followed by the development of the second portal in the Guayabito mine, ramp development, ventilation raises, level accesses and haulage drifts in both mines.

Due to the “non-visual” nature of the mineralization at Nus, diamond drilling will form a significant part of the mine grade control program. Holes will be drilled from planned hanging wall drives prior to ore development on a minimum grid pattern of 15 m by 15 m.

Economic Analysis

The Cisneros Project mill feed estimate was based on the mineral resources. A total of 784,000 tonnes at an average grade of 6.43 g/t Au of the total measured, indicated and inferred mineral resources were considered for the financial evaluation.

Under the assumptions presented in this Report, the Cisneros Project demonstrates positive economics. The after-tax NPV at a 5% discount rate over the estimated Life of Mine (LoM) is US$16.75 million. The after-tax IRR is 18.7%.

Total Capex, from 2017 to the end of mine life is estimated at US$75.6 million, including a 15% contingency.

Calculated LoM, all-in-sustaining cost (AISC) is US$803 per Au ounce. The inclusion of capex cost increases the all-in-cost (AIC) to US$1,150 per Au ounce. The gold base price for all project estimations was US$1250 per ounce.

Estimated LoM for the project is 5 years, assuming that the resources (including inferred resources) can be confirmed and converted to reserves.

Results of the sensitivity analysis demonstrate that the project is most sensitive to variation in metallurgical recovery, gold grade and gold price. Initial capital cost had the least impact on the sensitivity of the NPV. Metallurgical recovery has a higher impact in the viability of the project in that a variation of -10% causes a 70% reduction in NPV.

26.0 RECOMMENDATIONS

Further Studies

The Cisneros 2017 PEA has identified a positive business case and it is recommended that the Cisneros Project be advanced to a pre-feasibility study in order to increase the confidence of the current estimates.

There are a number of areas that need to be further examined and studied and arrangements that need to be put in place to in order to advance the development of the Cisneros Project.

The results of the Cisneros 2017 PEA suggest that further studies should be undertaken, particularly with respect to the mining method and mineral processing.

The following sections summarize the recommended work to be carried out in each of the different aspects of the project.

Geology and Resources

Perform regular internal audit of the geological databases: lithology, alteration, mineral zones and structures to improve and validate the geological and structural interpretation.

Use Leapfrog Geo to re-model old and new mineralized structures and Surpac mining software to update mineral resource estimates.

The Guayabito North system veins must be reinterpreted together with the Guayabito South drilling results to correlate the veins in both areas.

Increase the number of density determinations, taking into account the lithology, alteration halos and veins, to get a proportional number of samples for density determination of each area during underground channel sampling campaigns.

Future drilling campaigns should include determinations of the bulk density together with the regular chemical analysis of samples.

Improve the QA/QC program for future drilling campaigns in the Cisneros Project; this program should cover all activities involved in mineral exploration, geological logging, geotechnical logging, density determination, database inputs, etc.

The QA/QC program, must continue to be conducted by a qualified person as defined by international JORC and NI 43-101 codes.

Update the Cisneros Property to Pre-Feasibility or Feasibility study in accordance with the current work carried out, such as facilities, start of mining activities, construction of metallurgical plant and other investment projects, as recommended by international codes and NI 43-101.

A Pre-Feasibility study for the Cisneros Project will be required to convert mineral resources to mineral reserves. As such it is necessary to increase the resources in the measured and indicated categories by means of diamond drilling campaigns (surface and underground) and underground exploration galleries. Similarly, inferred resources need to be converted to measured and indicated resources before being converted to reserves.

Metallurgical Tests

Metallurgical testwork completed on the Project to date is appropriate to establish the optimal processing route, and was performed using samples that are typical of the mineralization within the Cisneros Project. Recovery factors appear appropriate for the mineralization styles and planned process flowsheet. The process flowsheet is feasible and uses industry standard equipment and techniques.

Further metallurgical tests must be carried out to confirm whether direct flotation or a combined gravity and flotation process is the most suitable process for the treatment of the ores of the Cisneros Project.

A metallurgical test should be carried out using a combination gravity and flotation process for the Nus mineralization. Only one direct flotation test was completed in August 2017, where high recoveries of gold (96.56%) were obtained, despite having a low head grade of 2.86 Au g/t.

The rapid kinetics of flotation, for the Guaico and Guayabito ores, suggest tests should be performed at coarser grinds and analyzing the effect on flotation kinetics. This would have a favorable impact by reducing the capital and operating costs of the processing.

There is little information regarding the physical characterization of the different zones (Guaico, Guayabito and Nus) such as Work Index (Wi), Abrasion Index (AI), natural pH, humidity and specific gravity, it is recommended to perform the respective testwork with representative composite samples of each zone.

Perform one more metallurgical test in a certified laboratory to confirm the high recovery values obtained (96% to 98% of extracted gold) in the past gravity-flotations tests and to test new alternatives like direct flotation and increasing particle grind size.

Perform combined gravity and flotation tests on size fractions between P_{80} = 120 to 150 microns, for Guaico, Guayabito and Nus samples. The larger the particle size, the shorter the grinding time and the lower the power consumption.

The results of the metallurgical test with the Nus composite sample (test number five) carried out in the CMH laboratory must be validated in an independent external laboratory with the duplicate sample.

<u>Economic and Financial Issues</u>

Maintain the rate level of capital expenses as low as possible before proceeding to Pre-Feasibility stage.

Create strategic mine plan scenarios considering extraction of high grade material during the initial stages of the project to mitigate capital expenses.

Planning must be oriented to increase mine value, mining first the Guaico and Guayabito veins and postponing the extraction of Nus mineralization as long as possible. The current Nus average grade is near 3.30 g/t Au and Guaico and Guayabito have grades higher than 8.0 g/t Au.

The Nus deposit is a low mining cost deposit, very dependent on the mining method. As such, it is necessary to perform in-situ Long-Hole Trial Mining Tests to determine the technical and economical viability of the method.

Review and prioritize capex expenses to increase the level of confidence of the resources and increase the certainty of the mineral resources to convert resources to reserves.

<u>Geotechnical</u>

Determine rock strength index by means of Point Load Tests (PLT) in complete samples of diamond drill cores in the present and future drilling campaigns (field test), before geochemical analysis.

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28.0 CERTIFICATES OF QUALIFIED PERSONS

28.1 QUALIFIED PERSONS

Mr. Edgard Vilela, MAusIMM (CP), is a Qualified Person under National Instrument 43-101 Standards of Disclosure for Mineral Projects of the Canadian Securities Administrators. Mr. Edgard Vilela reviewed and approved the scientific or technical disclosure in this report and has verified the data disclosed.

28.2 CERTIFICATES

CERTIFICATE OF QUALIFIED PERSON

a) I, Edgard A. Vilela Acosta, Independent Consultant with LINAMEC S.A.C. Av. Centenario s/n, Block 8 – Dpto. 401, La Molina Lima, Peru; do hereby certify that:

b) This certificate applies to the Technical Report entitled “Antioquia Gold Ltd. Cisneros Gold Project, Antioquia Department, Colombia NI 43-101 Technical Report on Updated Mineral Resource Estimate and Preliminary Economic Assessment” (the “Technical Report”), dated 24 September 2017.

c) I am a Member of the Australasian Institute of Mining and Metallurgy (AusIMM # 992615) and Chartered Professional (CP) and Professional in Mining of the Engineer College of Peru (Registration No. 93802).

d) I graduated with a Bachelor of Science Degree in Mining from the Pontifical Catholic University of Peru in 2000, I have a Diploma in Finances from CENTRUM business school (Peru) in 2007 and a Diploma in Business Administration from Pontifical Catholic University of Peru. I have practiced my profession for 17 years. I have been directly involved in underground operations, mining consulting, resource estimation and assisting in the development of mining projects in Peru, Argentina, Chile, Colombia, Uruguay, Ecuador, and Mexico.

e) I have read the definition of ‘qualified person’ set out in National Instrument 43-101 (“the Instrument”) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I am a Qualified Person as defined in National Instrument 43–101 Standards of Disclosure for Mineral Projects (NI 43–101).

f) I last visited the property from September 11th to 27th, 2017.

g) I am the author of the technical report titled “Antioquia Gold Ltd. Cisneros Gold Project, Antioquia Department, Colombia NI 43-101 Technical Report on Updated Mineral Resource Estimate and Preliminary Economic Assessment”. I am responsible for this report in its entirety.

h) I am independent of Antioquia Gold Inc., as independence is described by Section 1.5 of NI 43–101.

i) I have prepared two previous technical reports, dated October 14, 2013 and 16 July 2017, on the property that is the subject of the Technical Report.

j) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

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

Effective Date: September 24, 2017

Signing Date: February 20, 2018.

Edgard Vilela Acosta, MAusIMM (CP)

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