CANGREJOS GOLD-COPPER PROJECT, ECUADOR

NI 43-101 Technical Report

Prepared for

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1 SUMMARY

This Technical Report provides an updated mineral resource estimate for the Cangrejos Gold-Copper Project (Cangrejos Project) of Lumina Gold Corp. (Lumina) in Ecuador. The report was written by Robert Sim, P.Geo., and Bruce Davis, FAusIMM. Both are independent "qualified persons" (QPs) as defined by Canadian Securities Administrators *National Instrument 43-101 Standards of Disclosure for Mineral Projects* (NI 43-101) and as described in Section 28 (Date and Signature Pages) of this report.

Property Description and Location

The Cangrejos Project is located in southern Ecuador (Figure 4-1), 30 km southeast of the port city of Machala. The UTM coordinates for the Cangrejos Zone are 9614300 North and 633200 East (geographic projection: Provisional South American 1956, Zone 17S). Access to the property is provided by paved and gravel roads. The Cangrejos Project consists of six mining concessions totalling 6,374 ha.

Ownership

The Cangrejos concessions are fully owned by Lumina Gold Corp., through its 100% owned Ecuadorian subsidiary, Odin Mining del Ecuador S.A.

Lumina was named Odin Mining and Exploration Ltd. (Odin) prior to its name change on November 1, 2016.

History

In 1992, Lumina carried out a stream sediment sampling program to locate the source of the Birón alluvial gold deposit that Lumina was mining (69,000 oz Au). It located a number of good gold stream sediment anomalies and staked mineral concessions over these areas. In 1994, Lumina formed the El Joven Joint Venture with Newmont Overseas Exploration Limited (Newmont) to explore the region. Newmont was the operator and carried out an airborne magnetic-radiometric survey and extensive soil and rock geochemical surveys. In 1999, Newmont drilled a large gold-copper soil anomaly and discovered a zone of porphyry-style, gold-copper mineralization (Hole C99-14: 1.57 g/t Au, 0.19% Cu over 192 m) which was subsequently named the Cangrejos Zone. Newmont also discovered another zone of porphyry-style mineralization at Gran Bestia, located 1.2 km northwest of the Cangrejos Zone (Hole C99-06: 1.19 g/t Au over 132 m).

In 2001, Newmont withdrew from the joint venture after a risk and evaluation review of the project suggested that it would not meet corporate requirements. Lumina retained the northern claims which covered the Cangrejos Zone and several other geochemical anomalies. Between 2004 and 2007, it carried out additional stream sediment and soil sampling. From April 2008 to November 2009, the Ecuadorian government imposed a country-wide moratorium on exploration, so no work was done on the property during that time.

In 2010, exploration work continued with additional soil sampling. In 2011 and 2012, drilling tested the extent of the Cangrejos Zone and a gold soil anomaly in the Casique area. In 2014 and early 2015, additional drilling extended the lateral and depth extents of the Cangrejos Zone and tested the El Capitán copper-molybdenum soil anomaly. Based on the historic and 2014 drilling at the Cangrejos Zone, an initial inferred resource estimate of 191.8 Mtonnes at 0.64 g/t Au, 0.8 g/t Ag, 0.10% Cu, 31.2 ppm Mo (using a 0.35 g/t Au equivalent cut-off and a $1,250/oz Au pit shell) contains 4.0 million ounces of gold, 4.6 million ounces of silver, 440 million pounds of copper and 13 million pounds of molybdenum (Brepsant et al., 2017).

In 2017, additional drilling of the Cangrejos Zone discovered a deep, gold-copper zone. The updated resource estimate described in this report is based on these drill results.

Status of Exploration

The Cangrejos Project is an exploration project which has seen extensive, historic geochemical (streams, soils, top of bedrock soils and rocks) surveys and an airborne magnetic-radiometric survey. This work has defined several exploration targets and drilling has outlined mineralized zones at Cangrejos and Gran Bestia.

Geology and Mineralization

The Cangrejos Project is underlain by a Miocene intrusion of dioritic to granodioritic composition. Several breccia zones and pipes occur within this intrusion and many have associated magnetic highs and gold +/- copper soil anomalies. The Cangrejos Zone is a northeasterly trending zone of porphyry-style mineralization which has been defined by widely spaced drill holes. It extends for approximately 1,000 m in a northeasterly direction, has widths ranging from 70 m to 600 m, and has been defined to a depth of at least 600 m. The zone is open to the north, south, west, and at depth.

Mineralization is associated with porphyritic quartz diorite intrusions and hydrothermal breccias. High metal values are due to finely disseminated chalcopyrite, pyrite and minor bornite, molybdenite and pyrrhotite. The host rocks exhibit patchy secondary biotite (potassic) and strong silica-chlorite (propylitic) alteration. Mineralization is associated with a late-stage, calcic-sodic alteration which is characterized by actinolite, chlorite and albite.

At Gran Bestia, porphyry-style mineralization is associated with hydrothermal breccias of diorite and quartz diorite.

Sample Database and Validation

A review of the sample collection and analysis practices used during the various drilling campaigns indicates that this work was conducted using generally accepted industry procedures.

Portions of the data have been validated using several methods, including visual observations and comparisons with the assay results, and direct comparisons with assay certificates. Only the sampling programs conducted by Lumina (2011–2012; 2014–2015 and 2017) were monitored using a QA/QC program that is typically accepted in the industry. Newmont's drill core and sample pulps were resampled to confirm the results from this older campaign of drilling. The similarities between data from all the drilling campaigns (location, style, and tenor) suggest that there is no reason to question the results from the earlier drill programs. It is the QPs' opinion that the database is sufficiently accurate and precise to generate a mineral resource estimate.

Metallurgy

In 1999, Newmont did some in-house metallurgical tests on six composite samples from holes C99-5 (Cangrejos) and C99-6 (Gran Bestia). Newmont's work indicated that the mineralization was difficult to grind. Bottle roll cyanidation tests showed that finely ground material (-200 mesh) has high gold recoveries ranging from 95.3% to 97.5%. Gravity separation tests indicated that there is significant free-milling gold (14% to 35%). Two core composites from drill holes C99-5 and C99-6 were used for preliminary flotation tests. Kinetic data for gold and copper show very good flotation characteristics and overall recoveries were 88.5% to 92.8% for copper and 81.2% to 85.1% for gold (AGRA Simons, 2000). However, the Cangrejos mineralization is not amenable to heap leach or bio-oxidation processing.

In 2015, Lumina carried out additional metallurgical testing on four individual composites and a master composite. The four individual composites were prepared using samples from seven different drill holes from various spatial locations in the Cangrejos Zone and are representative of high and low grade material from the Cangrejos Zone (Plenge, 2015). The master composite contained 0.13% Cu, 0.8 g/t Au, 0.5 g/t Ag, and 37 ppm Mo. The copper-gold concentrate produced from the master composite contained 83% of the copper, 69% of the gold, 57% of the silver, and 72% of the molybdenum. The concentrate assayed 22% Cu, 109 g/t Au, 59 g/t Ag, and 0.53% Mo. Deleterious elements identified in the concentrate were below penalty levels, except for fluorine, which may be at the penalty level for some smelters. Molybdenum levels in the concentrate were high enough to warrant future testing to determine if a separate molybdenum concentrate can be produced.

Flotation, combined with gravity and cyanidation, can be used to recover 83% of the gold. Flotation produces a saleable copper-gold concentrate with recovery of 83% of the copper and 69% of the gold. Cyanidation of gravity concentrates and flotation cleaner scavenger tails recovered in doré increases gold recovery by 14%, resulting in a total gold recovery of 83%. Alternatively, whole-ore cyanidation can be used to process the mineralized materials and recover 92% of the gold and 36% of the silver in doré, but no base metals are recovered.

The 2015 test results demonstrated that the mineralized material can be processed by conventional industrial techniques.

Mineral Resource Estimate

The resource estimate was generated using drill hole sample assay results and the interpretation of a geological model which relates to the spatial distribution of gold, silver, copper and molybdenum. Interpolation characteristics were defined based on the geology, drill hole spacing, and geostatistical analysis of the data. Estimations are made from 3D block models based on geostatistical applications using commercial mine planning software (MineSight® v12.0).

Grade estimates have been made using ordinary kriging into a model with a nominal block size of 10 ×10 ×10 m (L×W×H). Potentially anomalous outlier grades have been identified and their influences on the grade models are controlled during interpolation through the use of top-cutting and outlier limitations. An average density of 2.7 t/m^3 was used to calculate resource tonnage.

The results of the modelling process have been validated using a series of visual and statistical methods. These validation results indicate that the resource model is an appropriate estimation of global resources based on the underlying database.

The resources have been classified by their proximity to sample locations and are reported, as required by NI 43-101, according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May, 2014). Based on the current distribution of drilling, resources in the inferred category include model blocks that are located within a maximum distance of 150 m from a drill hole. Some drill holes have been terminated in appreciable mineralization, and there are many instances where the lateral extents of mineralization have not been defined with current drilling. In these instances, the lateral extents of mineralization have been manually truncated at 100 m from drilling and the depth extent of inferred resources is limited to 50 m vertically below drill holes.

The economic viability of the resource was tested by constraining it within a floating cone pit shell; the pit shell was generated using the following projected economic and technical parameters:

- Metal prices: gold $1,300/oz; silver $18.00/oz; copper $3.00/lb; molybdenum $8.00/lb
- Metallurgical recoveries: gold 83%; silver 60%; copper 82%; molybdenum 65%
- Pit slope: 45 degrees
- Operating costs:
    - Mining (open pit) $3.00/t.
    - Processing $11.00/t.
    - G&A $2.00/t.
- Density: 2.7 t/m^3

Based on the metal prices and recoveries listed here, recoverable gold equivalent (AuEqR) grades are calculated using the following formula:

$$AuEqR = (Au\ g/t*0.83) + (Ag\ g/t*0.60*0.0138) + (Cu\%*0.82*1.580) + (Mo\ ppm/10{,}000*0.65*4.219)$$

The pit shell is generated using a floating cone algorithm based on the recoverable gold equivalent block grades. There are no adjustments for mining recoveries or dilution. This test indicates that some of the deeper mineralization may not be economic due to the increased waste stripping requirements.

The estimate of inferred mineral resources, contained within the $1,300/oz Au pit shell, is presented in Table 1.1. Based on the assumed metal prices and operating costs, and using a formula similar to the one shown here, but excluding the metallurgical recovery factors, the base case cut-off grade for mineral resources is estimated to be 0.35 g/t gold equivalent (AuEq).

Table 1.1: Estimate of Inferred Mineral Resource

Mtonnes	Average Grade					Contained Metal			
	AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
422.7	0.85	0.65	0.11	0.6	24.8	8.8	1,053	8.2	23

Note: Limited inside $1,300/oz Au pit shell. Base case cut-off is 0.35 g/t gold equivalent (AuEq). Mineral resources are not mineral reserves because the economic viability has not been demonstrated.

Conclusions

Based on the evaluation of the data available from the Cangrejos Project, the authors of this Technical Report have drawn the following conclusions:

- At the effective date of this Technical Report (November 6, 2017), Lumina holds a 100% interest in the Cangrejos property.
- The Cangrejos deposit forms a relatively continuous zone of gold-copper-silver-molybdenum, porphyry-style mineralization associated with a sequence of breccias and porphyritic quartz diorite intrusions. The zone extends for approximately 1,000 m in a northeasterly direction, has widths ranging from 70 m to 600 m, and has been defined to a depth of at least 600 m below surface.
- Deep drilling in the centre of the deposit defined a higher grade Au-Cu zone associated with magnetite-rich breccias and calcic-sodic alteration. The Cangrejos mineralization remains open to the north, south, west, and at depth.
- Drilling to date has outlined an inferred mineral resource estimate (at a 0.35 g/t AuEq cut-off) of 423 Mtonnes at 0.65 g/t Au, 0.11% Cu, 0.6 g/t Ag and 24.8 ppm Mo which contains 8.8 million ounces of gold, 8.2 million ounces of silver, 1,053 Mlbs of copper and 23 Mlbs of molybdenum (Lumina, November 2017).
- Preliminary metallurgical work indicates that the mineralization can be processed using conventional methods.
- Historic drill testing of the Gran Bestia gold-copper soil anomaly, located 1.2 km northwest of the Cangrejos Zone, discovered another zone of porphyry-style mineralization.
- There are no known factors related to metallurgical, environmental, permitting, legal, title, taxation, socio-economic, marketing or political issues which could materially affect the mineral resource estimates.

Recommendations

The following work is recommended for this project:

- Proceed with a preliminary economic assessment of the Cangrejos Project. The budget for this study is estimated at $1.0 million.
- Conduct additional drilling (12,000 m) to further assess the strike and depth extents of the Cangrejos Zone. The budget for this work is estimated at $3.6 million.
- Conduct additional drill testing of the Gran Bestia Zone (2,000 m). The budget for this work is estimated at $600,000.

Cautionary Note Regarding Forward-looking Information and Statements

Information and statements contained in this Technical Report that are not historical facts are “forward-looking information” or “forward-looking statements” within the meaning of Canadian securities legislation and the *U.S. Private Securities Litigation Reform Act of 1995* (hereinafter collectively referred to as “forward-looking statements”) that involve risks and uncertainties. Examples of forward-looking statements in this Technical Report include information and statements with respect to: Lumina’s plans and expectations for the Cangrejos Project, estimates of mineral resources, plans to continue the exploration drilling program, and possible related discoveries or extensions of new mineralization or increases or upgrades to reported mineral resources estimates and budgets for recommended work programs.

In certain cases, forward-looking statements can be identified by the use of words such as "budget", "estimates", or variations of such words or state that certain actions, events or results "may", "would", or "occur". These forward-looking statements are based, in part, on assumptions and factors that may change, thus causing actual results or achievements to differ materially from those expressed or implied by the forward-looking statements. Such factors and assumptions include, but are not limited to, assumptions concerning base metal and precious metal prices; cut-off grades; accuracy of mineral resource estimates and resource modelling; reliability of sampling and assay data; representativeness of mineralization; accuracy of metallurgical testwork and timely receipt of regulatory approvals.

Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Lumina to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such risks and other factors include, among others, fluctuation in the price of base and precious metals; expropriation risks; currency fluctuations; requirements for additional capital; government regulation of mining operations; environmental, safety and regulatory risks; unanticipated reclamation expenses; title disputes or claims; limitations on insurance coverage; changes in project parameters as plans continue to be refined; failure of plant, equipment or processes to operate as anticipated; accidents, labour disputes and other risks of the mining industry; competition inherent in the mining exploration industry; delays in obtaining governmental approvals or financing or in the completion of exploration, development or construction activities, as well as those factors discussed in the sections entitled “Risks and Uncertainties” in Lumina’s annual MD&A. Although Lumina and the authors of this Technical Report have attempted to identify important factors that could affect Lumina and may cause actual actions, events or results to differ, perhaps materially, from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended.

There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. The forward-looking statements in this Technical Report are based on beliefs, expectations and opinions as of the effective date of this Technical Report. Lumina and the authors of this Technical Report do not undertake any obligation to update any forward-looking information and statements included herein, except in accordance with applicable securities laws.

2 INTRODUCTION

Lumina commissioned Robert Sim, P.Geo., of SIM Geological Inc. and Bruce Davis, FAusIMM, of BD Resource Consulting Inc., to provide an updated mineral resource estimate for the Cangrejos Zone. Robert Sim and Bruce Davis are both independent "qualified persons" (QPs) within the meaning of National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101). They are responsible for the preparation of this technical report on the Cangrejos Project (the Technical Report), which has been prepared in accordance with NI 43-101 and Form 43-101F1 Technical Report (Form 43-101F1).

Robert Sim visited the site from November 28 to 29, 2017. He inspected drill core from numerous holes and visited a number of drill sites and the core storage facility. Bruce Davis did not complete a visit to the property as it was not required for him to complete the scope of work for which he was retained.

In preparing this Technical Report, the authors relied on geological reports, maps and miscellaneous technical papers listed in Section 27 (References) of this Technical Report.

This Technical Report is based on information known to the authors as of November 6, 2017.

All measurement units used in this report are metric, and currency is expressed in US dollars unless stated otherwise. The currency used in Ecuador is the US dollar.

2.1 Abbreviations and Acronyms

Abbreviations and acronyms used throughout this report are shown in Table 2.1.

Table 2.1: Abbreviations and Acronyms

Description	Abbreviation or Acronym
Cangrejos Gold-Copper Project	Cangrejos Project
copper	Cu
degrees centigrade	^{o}C
digital elevation model	DEM
drill core size (diameter 63.5 mm)	HQ (HTW)
east	E
Environmental Impact Assessment	EIA
Environmental Management Plan	PMA
exploratory data analysis	EDA
Fellow of the Australasian Institute of Mining and Metallurgy	FAusIMM
general and administrative	G&A
Global Positioning System	GPS
gold	Au
gold equivalent	AuEq
gram	g
grams per litre	g/L
grams per tonne	g/t
hectare	ha
inductively coupled plasma	ICP
inverse distance weighted	IDW
kilogram	kg
kilometre	km
kilowatt hours per metric tonne	kWh/mt
length x width x height	L x W x H
litre	L
Lumina Gold Corp.	Lumina
management discussion and analysis	MD&A
metre	m
millimetre	mm
million ounces	Moz
million pounds	Mlbs
million tonnes	Mt
million years	Ma
molybdenum	Mo
National Instrument 43-101	NI 43-101
nearest neighbour	NN
Newmont Overseas Exploration Limited	Newmont
north	N
Odin Mining & Exploration Ltd.	Odin

Description	Abbreviation or Acronym
ordinary kriging	OK
ounce	oz
parts per million	ppm
percent	%
potassium-argon	K-Ar
pound	lb
preliminary economic assessment	PEA
primary environmental licence	PEL
Professional Geoscientist	P.Geo
qualified person	QP
quality assurance/quality control	QA/QC
recoverable gold equivalent	AuEqR
reduced to pole	RTP
rock quality designation	RQD
selective mining unit	SMU
silver	Ag
sodium cyanide	NaCN
south	S
specific gravity	SG
three-dimensional	3D
tonne	t
tonnes per cubic metre	t/m^3
United States dollar	$US
Universal Transverse Mercator	UTM
west	W

3 RELIANCE ON OTHER EXPERTS

The report was prepared by Robert Sim, P.Geo., and Bruce Davis, FAusIMM. They are qualified persons for the purposes of NI 43-101, and fulfill the requirements of an "Independent Qualified Person". The information, conclusions, and recommendations contained herein are based on:

- Mr. Sim's field observations; and
- data, reports and other information supplied by Lumina and other third parties.

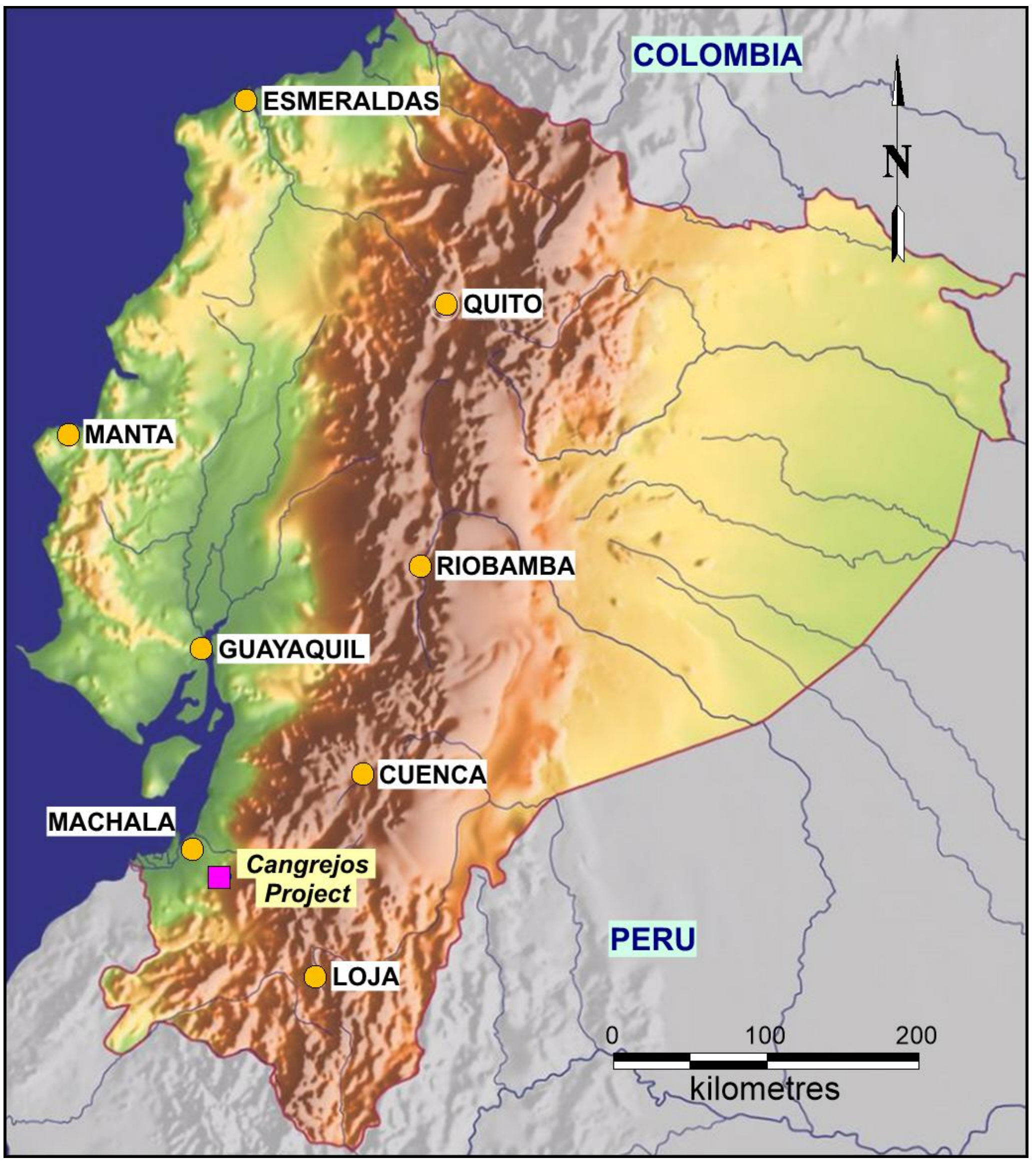
For the purpose of disclosure relating to ownership data and information (mineral, surface and access rights) in this report, the authors have relied exclusively on information provided by Lumina. Lumina conducted a title search of the property on November 2, 2017 with the Ministry of Mines of Ecuador, and all concessions are owned by Lumina and are in good standing. The authors have not researched the property title or mineral rights for the Cangrejos Project and express no legal opinion as to the ownership status of the property.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Cangrejos Project is located in southern Ecuador (Figure 4-1), 30 km southeast of the port city of Machala. Access to the property is provided by paved and gravel roads. The UTM coordinates for the Cangrejos Zone are 9614300 North and 633200 East (geographic projection: Provisional South American 1956, UTM Zone 17S).

Figure 4-1: Location Map



Source: Lumina, 2017

4.2 Land Tenure

The Cangrejos Project consists of six contiguous mining concessions totalling 6,374 ha, all of which are held by Lumina. The concessions are described in Table 4.1 and shown in Figure 4-2.

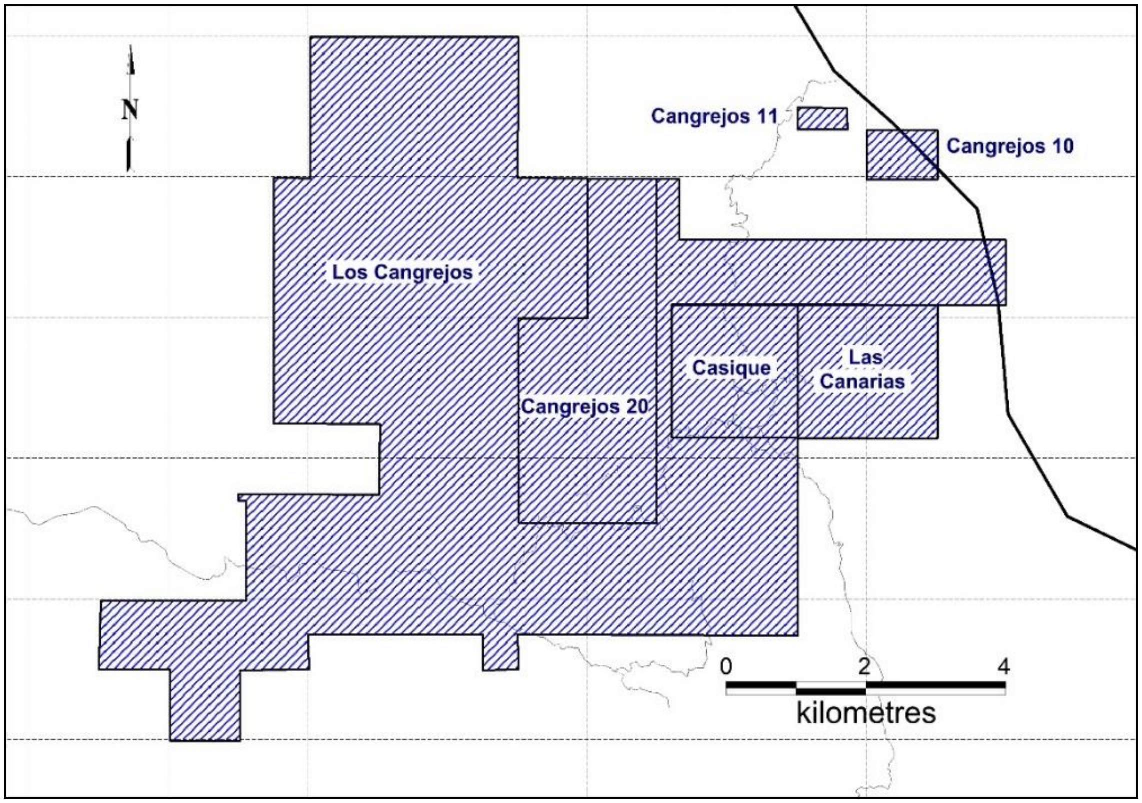
Table 4.1: Mining Concessions Cangrejos Project

File Number	Concession Name	Date of Concession (dd/mm/yyyy)	Date of Registration (dd/mm/yyyy)	Area (ha)	Phase	Date of Expiration (dd/mm/yyyy)
2847	Los Cangrejos	06/08/2001	21/08/2001	4,781	Small Mining	21/08/2022 *
300972	Cangrejos 10	02/07/2004	01/07/2004	70	Advanced Exploration	01/11/2028*
300971	Cangrejos 11	02/07/2004	01/07/2004	21	Advanced Exploration	02/11/2028*
5114	Casique	17/10/2001	07/11/2001	342	Small Mining	20/12/2022*
2649.1	Las Canarias	11/10/2001	05/11/2001	380	Small Mining	12/05/2022*
30000203	Cangrejos 20	29/11/2016	13/12/2016	780	Early Exploration	13/12/2041

* The mining title is valid for 25 years from the date of registration, and it can be renewed for an additional 25 years.

The Cangrejos 20 concession was awarded to Lumina on November 15, 2016 as part of the Ecuadorian government's auction process.

Figure 4-2: Claim Map



Source: Lumina, 2017

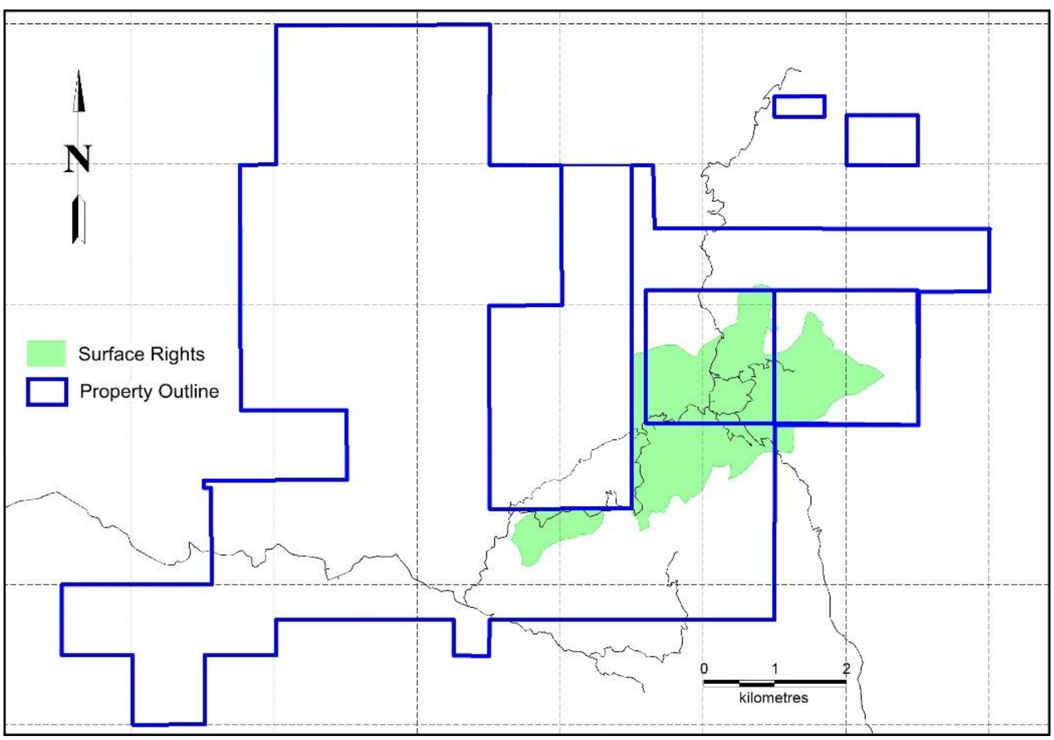
The maintenance of each mining concession requires an annual payment that is due before the 31st of March each year. For 2017, this amounts to $51,291.25 for the six mining concessions. These fees have been paid, and all concessions are in good standing. The small mining concession royalty for the Los Cangrejos concession has been reported as zero, as instructed by the Mining Control Agency.

Lumina also owns the surface rights shown in Table 4.2 and Figure 4-3.

Table 4.2: Land Tenure – Surface Rights (Lumina, 2017)

No.	Previous Owner	Hectares	Location	Date of Registration (dd-mmm-yy)
1	Víctor Manuel Ramírez Román	54	Santa Rosa	10-Apr-07
2	Manuel Abad Ruiz	66.38	Atahualpa	21-Sep-07
3	Carlos Porfirio Tituana	81.2	Santa Rosa	27-Dec-07
4	Juan Antonio Tituana Torres	76	Atahualpa	02-Apr-08
5	Víctor Manuel Ramírez Román	58.75	Santa Rosa	23-May-08
6	Juan Eduardo Venegas / Francisco Soria Venegas	95	Atahualpa	23-Feb-17
7	Francisco Castro Sanchez	46.5	Santa Rosa	28-Dec-16
8	Francisco Castro Sanchez	122	Atahualpa	22-Aug-16
Total Purchased		599.83		

Figure 4-3: Surface Rights



Source: Lumina, 2017

The Cangrejos Project land and mining concessions have no royalties, back-in rights or any other encumbrances that could affect title. There are also no other known impediments that may affect the ability to perform work on the property. There are no significant risks affecting the normal course of business and exploration efforts on the project.

The Cangrejos 20 concession requires a mining easement to proceed with exploration. The process to obtain this easement has been initiated with the Mines Ministry of Ecuador.

4.3 Environmental Regulations and Permitting

The Cangrejos Project holds all the environmental regulatory permits required by law and is in compliance with its obligations under the Ecuadorian Constitution and Environmental Management Law. In 2011, Lumina was granted an environmental licence for advanced exploration for metallic minerals on the main Cangrejos Project concessions. This licence is based on and supported by the Environmental Impact Assessment (EIA) and the Environmental Management Plan (PMA). Documentation demonstrating compliance with PMA must be filed biannually with the Ministry of the Environment. Lumina is up to date on its filings. The Cangrejos 20 concession requires a Primary Environmental Licence (PEL) for early exploration activities. The PEL has been obtained and was registered on January 23, 2017.

Furthermore, in keeping with Article 53 of the Environmental Regulatory Code, Lumina has regularly submitted the corresponding environmental audits for the Cangrejos Project. Recent audits have been reviewed and approved by the Ministry of Environment. In addition to the EIA and PMA, Lumina also filed an application for industrial and domestic water use for exploratory activities, and the Water Authority has provided a licence for such use.

There are two other permits required to continue exploration activities: the “Certificate of Intersection” for the “National System for Protected Areas, Protective Forests and Forest Heritage” and the “Labour Hygiene, Health and Safety Regulations”. Both permits are in good standing. In the first case, the Cangrejos Project is not located within any national forests, protected areas or national parks, and, in the latter, Lumina has obtained updated permits for the project and is in compliance with regulations for health, safety and hygiene administered by the Labour Ministry. These permits are not required for the Cangrejos 20 concession.

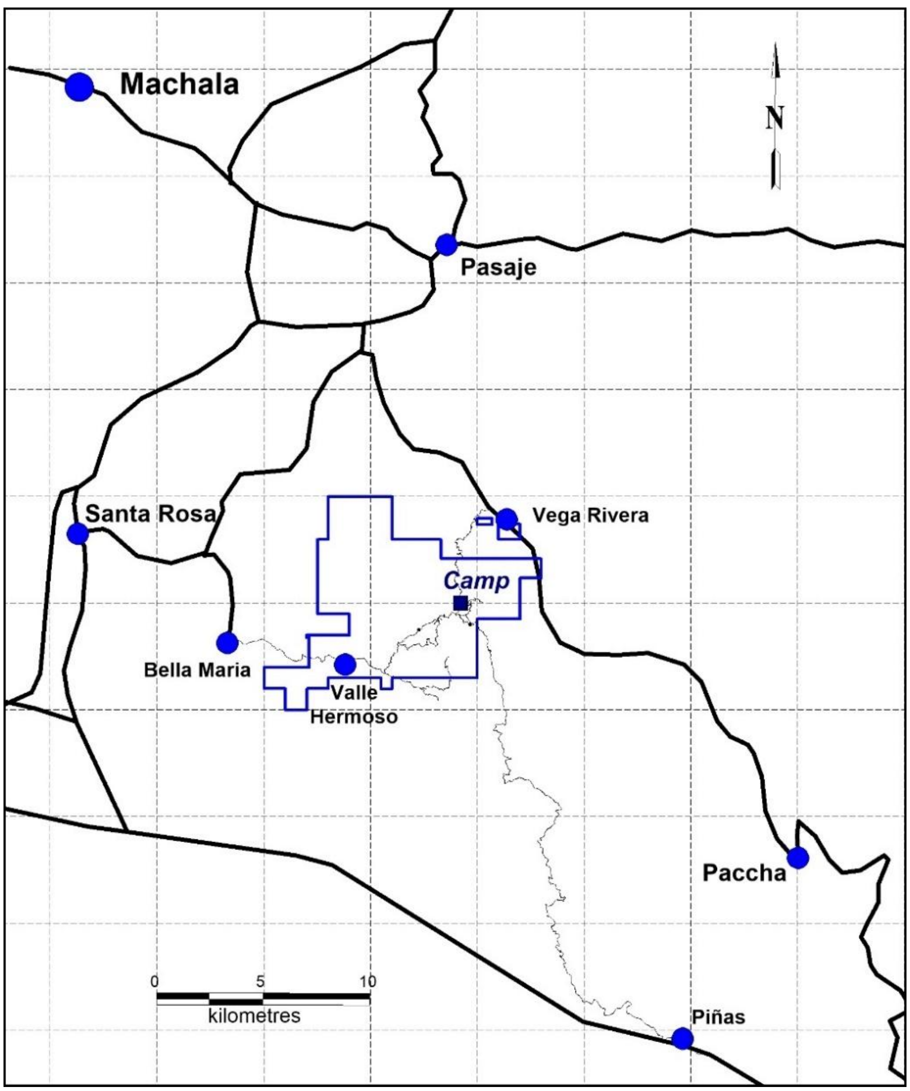
The six mining concessions associated with the Cangrejos Project comply with all Ecuadorian environmental laws and regulations. Lumina has also implemented an effective monitoring system that detects unauthorized mining activity on its concessions. This has resulted in the filing of criminal actions and administrative protective measures, all of which have been resolved in Lumina’s favour. Odin Mining del Ecuador S.A. has no material environmental liabilities as a consequence of these unauthorized mining activities.

5 ACCESSIBILITY, CLIMATE, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Cangrejos Project is located in southern Ecuador, approximately 30 km southeast of the port city of Machala. Access is provided by paved and gravel roads (Figure 5-1). Driving time from Machala to the Cangrejos Project camp via the town of Santa Rosa and the road to Piñas is typically three hours. A trail from the Cangrejos Project camp to the village of Valle Hermosa is a more direct route, but this is currently only a foot trail.

Figure 5-1: Access to Cangrejos Project



Note: Cangrejos Project is outlined in blue.
Source: Lumina, 2017

5.2 Climate

The climate varies from tropical at lower elevations to temperate at higher elevations. The average temperature varies from 21°C to 24°C.The average annual rainfall ranges from 700 mm to 1,400 mm, and there is a distinct rainy season lasting from October to April. However, exploration can be carried out year round.

5.3 Local Resources and Infrastructure

The city of Machala (population ~250,000) is the closest major centre in Ecuador. It can provide basic goods and services for the early stages of exploration and mining. It is located along the Pan-American Highway linking Guayaquil, Ecuador with Lima, Peru. Regular daily flights from Quito, Ecuador arrive at Machala's airport located near the town of Santa Rosa. Puerto Bolivar, located 9 km to the west of Machala, is a major deep-water port used mainly to export bananas.

A field camp and core-logging and storage facility are located on the property. Power at the camp is supplied from the national grid. Internet and phone service to the camp are provided by satellite.

5.4 Physiography

The Cangrejos Project is located in the southeastern hills of the coastal plain. Elevations range between 100 m and 1,370 m above sea level. The topographic relief on the property is moderate. A prominent northwest-trending ridge, Cerro Azul, forms a watershed between Rio Caluguro and Rio San Agustin.

Most of the property is forested with local pastures for farm animals. Away from the mineralized areas, there is minor agricultural activity at lower elevations (cacao, coffee and maize).

6 HISTORY

Previous exploration, disclosure of prior ownership, and changes to ownership at the Cangrejos Project are summarized in Table 6.1. The historic exploration of the property is discussed in greater detail in Potter (2004, 2010).

Results from the drill programs are provided in Section 10 (Drilling) of this Technical Report. To date, no production has occurred at the Cangrejos Project.

Table 6.1: Exploration History of the Cangrejos Project

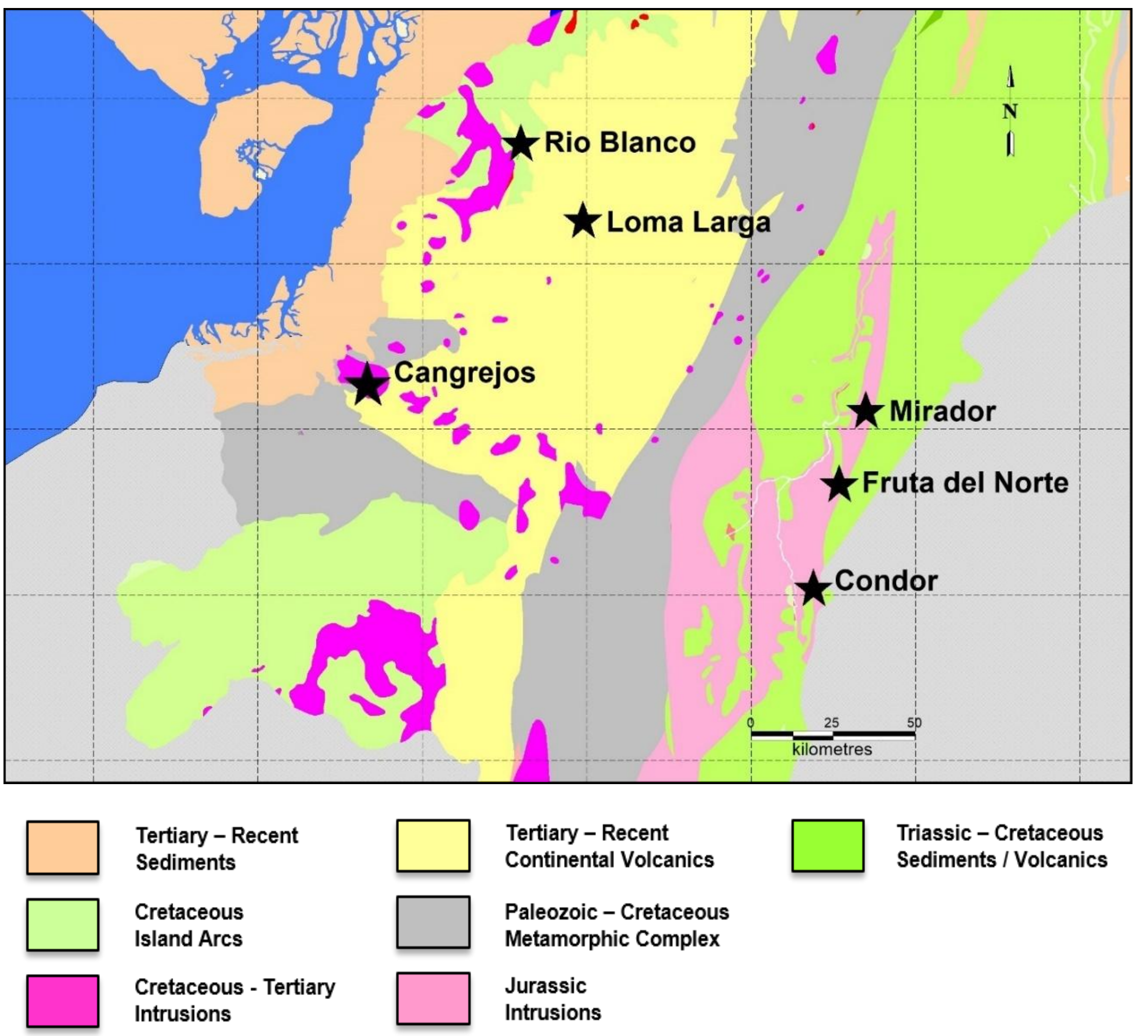
Year	Company	Description
1992	Lumina	Regional stream sediment and geological mapping program to locate the source of the Birón alluvial gold (1987–1995: production, 69,000 oz).
1994	Lumina/Newmont	Formation of “El Joven Joint Venture” to explore stream anomalies with Newmont as the Operator. The Cangrejos Project is located in the northern part of the Joint Venture area.
1994–2001	Lumina/Newmont	Airborne magnetics, radiometrics, soil and rock geochemistry, geological mapping, 29 diamond drill holes (7,509.2 m) on the Cangrejos Project.
2001	Lumina/Newmont	Newmont withdrew from the Joint Venture, and the original 7 concessions were returned to Lumina. Lumina also acquired Newmont’s drill core and exploration data for the Cangrejos Project.
2004	Lumina	Acquired an additional 4 concessions (3,043 ha).
2007	Lumina	Top of bedrock soil sampling, additional stream sediment sampling.
2008–2009	Lumina	The Government of Ecuador imposed a moratorium on exploration; no work done on the project.
2010	Lumina	Top of bedrock, ridge and spur soil sampling.
2011–2012	Lumina	Diamond drill testing of gold soil anomalies at Casique (13 holes, 3,296.1 m) and extent of mineralization at Cangrejos (4 holes, 1,402 m).
2014–2015	Lumina	Diamond drilling to test the strike and depth extent of the Cangrejos Zone (8 holes, 3,189.6 m) and a Cu-Mo-Au soil anomaly at El Capitán (1 hole, 350.15 m).
2017	Lumina	Diamond drilling to infill and test the depth extent of the Cangrejos Zone (15 holes, 7,186.1 m)

7 GEOLOGICAL SETTING

7.1 Regional Geology

The regional geology of southern Ecuador is shown in Figure 7-1. There are several north-south-trending domains of volcanic and sedimentary rocks which accreted onto the Amazon Craton from Late Jurassic to Eocene. These terranes are cut by younger magmatic intrusions which locally host porphyry copper/gold and epithermal gold deposits (shown as black stars in Figure 7-1).

Figure 7-1: Regional Geology



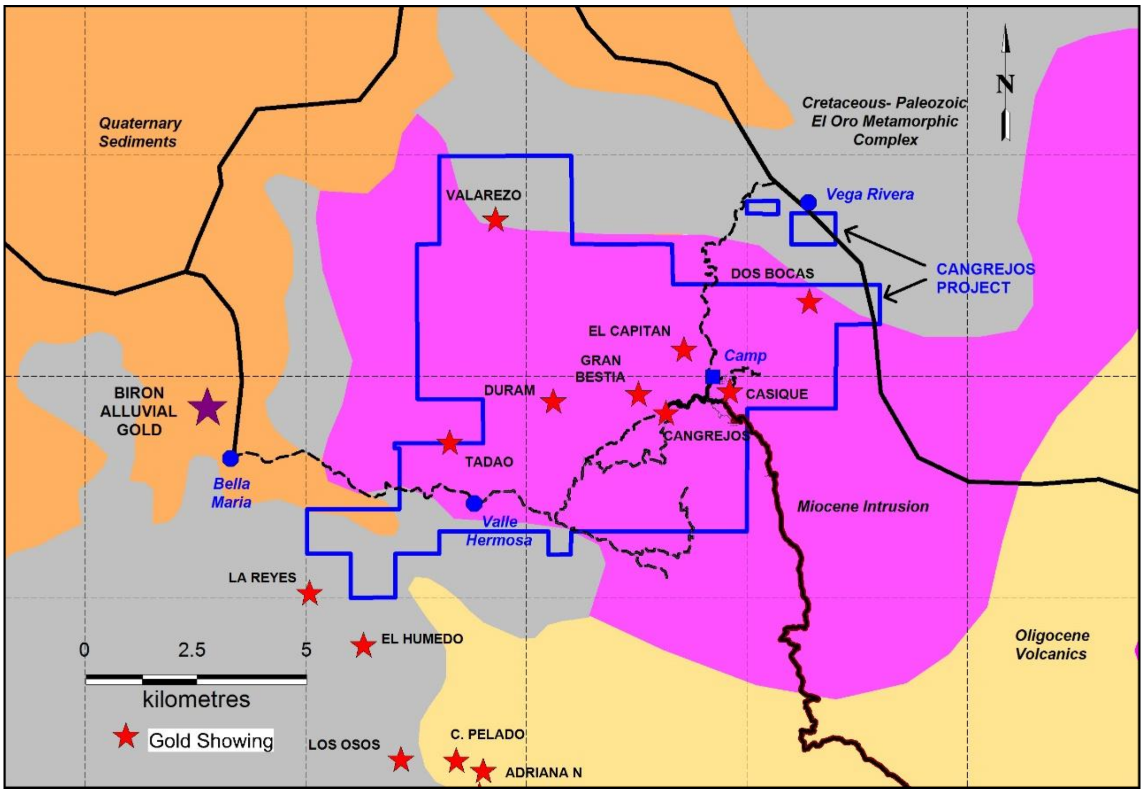
Source: DINAGE, 2001; Lumina, 2017

7.2 Local and Property Geology

A more detailed picture of the geology in the vicinity of the Cangrejos Project is shown in Figure 7-2. Quaternary sediments occur to the northwest in the coastal areas around Machala. Oligocene continental volcanics occur to the east. These two domains are separated by the Late Cretaceous-Paleozoic El Oro metamorphic complex which consists of phyllites, schists, amphibolites, granites and serpentinites.

The Cangrejos Project is largely underlain by a Miocene (K-Ar age – 16.89 and 19.92 Ma [Potter, 2010]) dioritic to granodioritic intrusion (Figure 7-2). Gold showings occur within the intrusion and adjacent volcanic and metamorphic rocks.

Figure 7-2: Local Geology Cangrejos Project

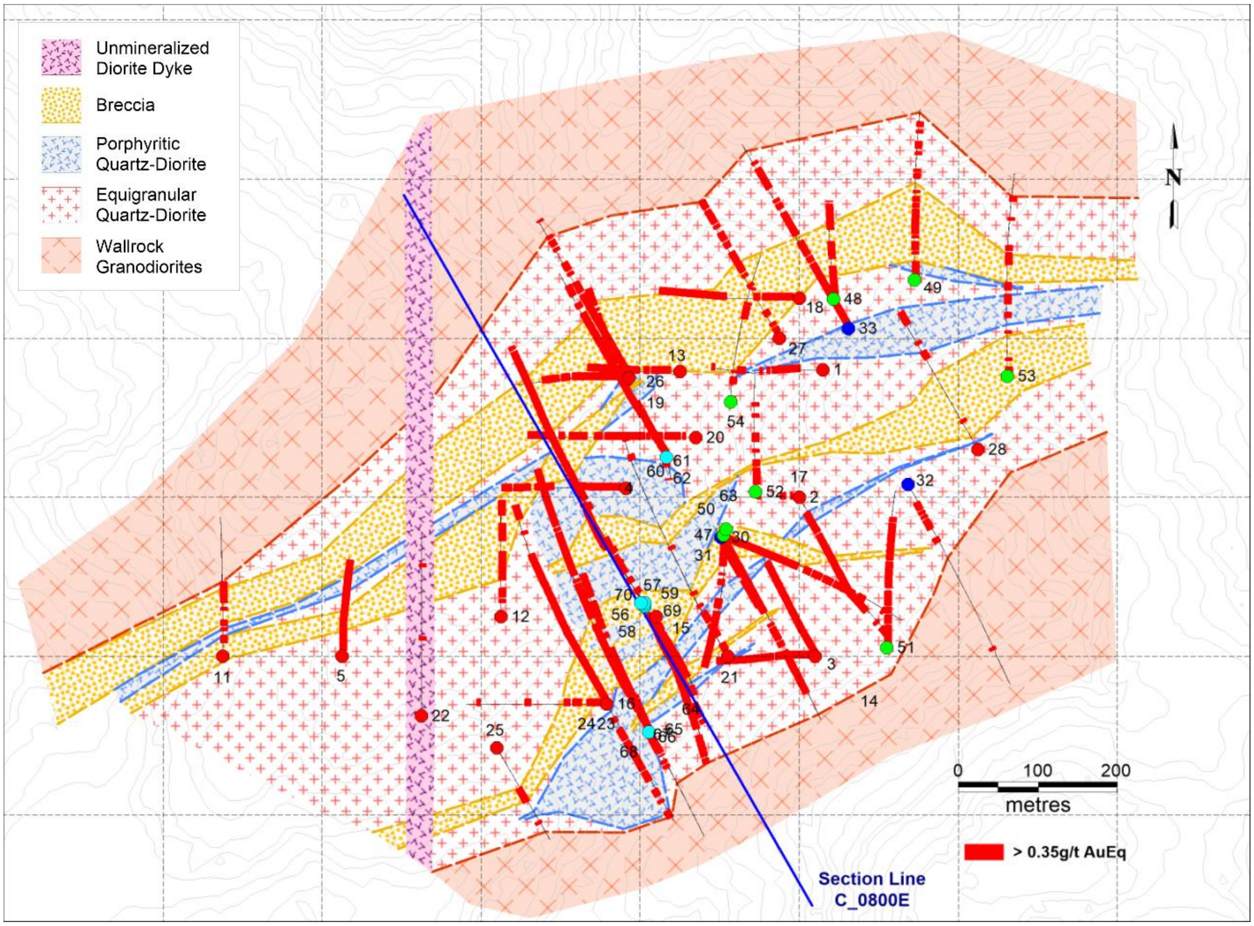


Note: Cangrejos Project is outlined in blue.
Source: CODIGEM/BGS, 1993; Newmont, 2001; Lumina, 2017

7.3 Geology of the Cangrejos Zone

The surface geology of the Cangrejos Zone is not well understood because there is a lack of outcrop exposures. The simplified geological map shown in Figure 7-3 is based primarily on drill hole geological logs and assays. A northeasterly trending, steeply dipping zone of equigranular and porphyritic quartz diorite and hydrothermal breccias hosts the gold-copper mineralization.

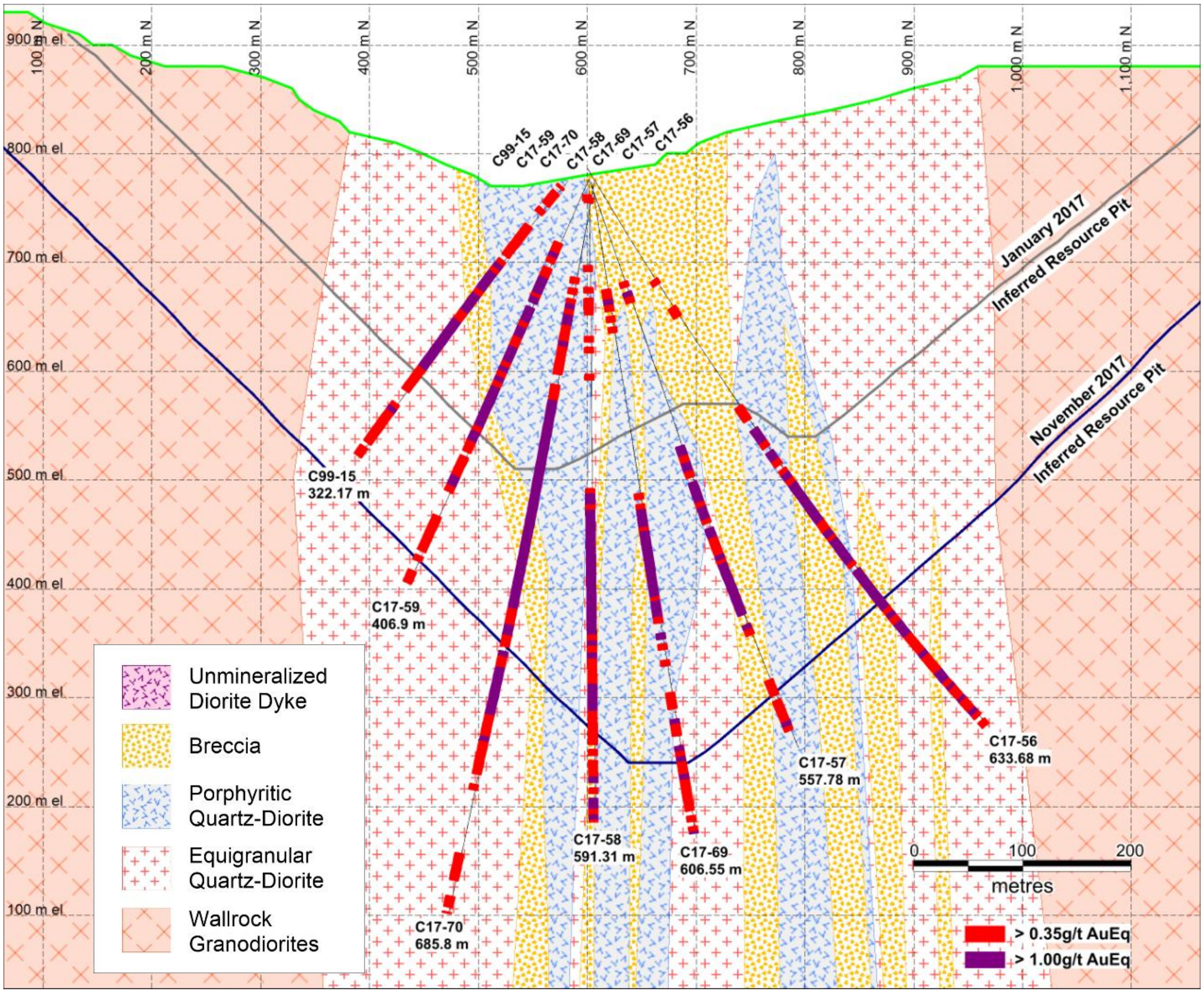
Figure 7-3: Simplified Geology Plan of the Cangrejos Gold-Copper Zone



Note: Newmont (red dots), Lumina 2011–2012 (blue dots), Lumina 2014–2015 (green dots), Lumina 2017 (cyan dots). Vertical cross section shown in Figure 7-4 (blue line).
Source: Lumina, 2017

A vertical cross section across the central part of the deposit is shown in Figure 7-4; the higher grade Au-Cu zone discovered by the recent drilling is highlighted on this figure. The inclusion of the January 2017 and current resource pits in Figure 7-4 illustrate why there has been a significant increase in the overall gold resource.

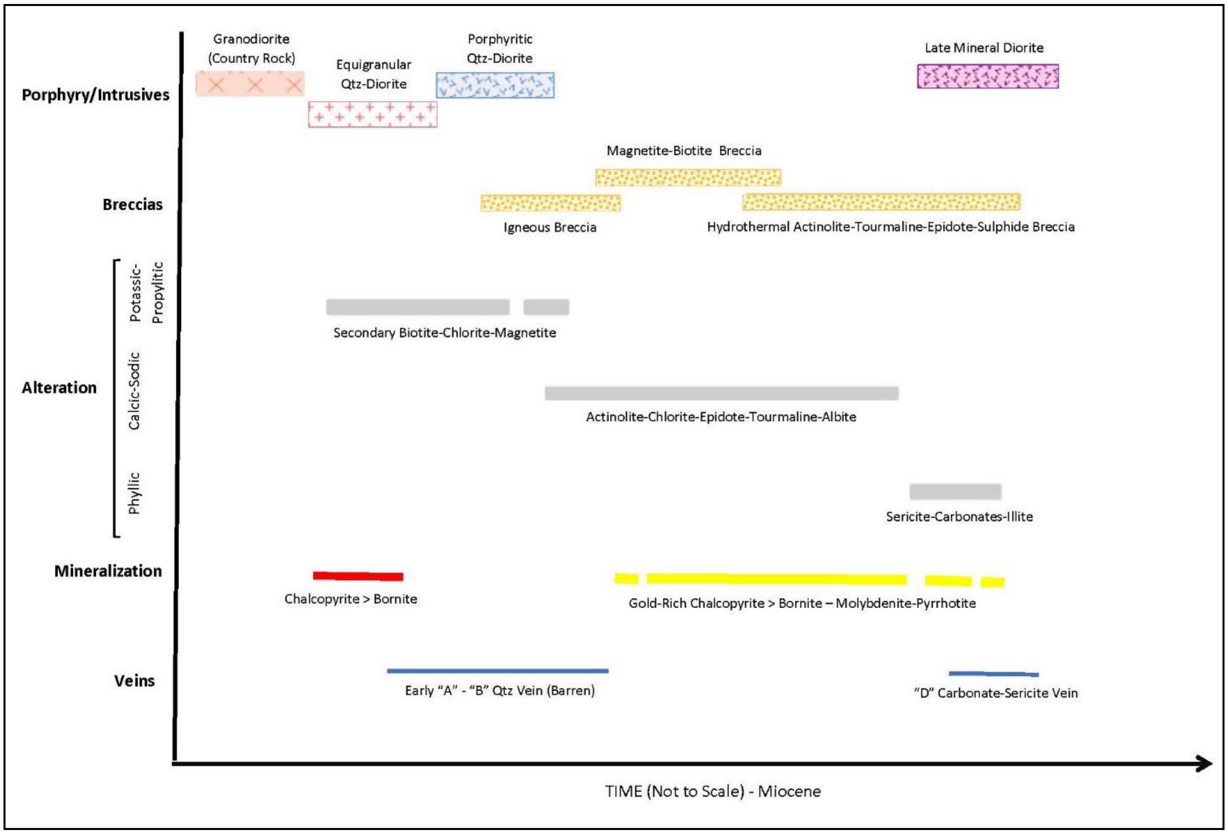
Figure 7-4: Cross Section C_0800E – Cangrejos Zone



Source: Lumina, 2017

A preliminary paragenetic sequence for the lithologies, alteration and mineralization is presented in Figure 7-5 and described in the following paragraphs.

Figure 7-5: Preliminary Paragenetic Sequence



Source: Lumina, 2017

Lithology

The Miocene intrusion that is exposed on most of the Cangrejos Project is comprised primarily of medium- to coarse-grained, unmineralized granodiorite. Equigranular and porphyritic quartz diorite intrusions containing early porphyry “A” type barren quartz veins and hydrothermal breccias intrude the granodiorite and are associated with the gold-copper mineralization. Late, fine-grained diorite dykes, which cut these early intrusions, have no early quartz veins.

There are three types of magmatic and hydrothermal breccias associated with the quartz diorite porphyritic intrusions:

1. Igneous breccia: This unit is pre- and inter-mineralization and can be both clast- and matrix-supported. Subangular to rounded clasts of equigranular quartz diorite occur in a matrix comprised of biotite, minor mafic minerals, and fine-grained igneous material.

2. Hydrothermal breccia: This unit is clast-supported with a matrix comprised of actinolite, albite, chlorite, tourmaline, ±sulphides, and ±carbonates. It resembles a jigsaw breccia where the clasts are the same composition as the adjacent intrusion. The gold and copper mineralization occurs as open-space fillings and veinlets.
3. Magnetite-biotite hydrothermal breccia: Angular to subrounded clasts of quartz diorite occur in a matrix of magnetite and subordinate biotite and quartz. Early quartz veins and chalcopyrite-bornite-pyrrhotite veinlets crosscut this unit. This lithology is associated with some of the highest gold-copper values.

Alteration

The equigranular and porphyritic quartz diorite intrusions exhibit porphyry-style potassic alteration characterized by secondary biotite alteration of the mafic minerals and weakly developed, “A” and “D” type veins. A propylitic alteration phase consisting of chlorite and epidote overprints and is peripheral to the potassic alteration.

A calcic-sodic alteration assemblage overprints the early porphyry alteration events. It is characterized by actinolite replacing hornblende and biotite, albite replacing feldspar crystals and bleaching the matrix, and minor epidote associated with tourmaline and chlorite. Most of the sulphide and gold-copper mineralization is associated with this alteration phase.

Mineralization

Drilling has defined a northeasterly trending, steeply dipping zone of gold-copper mineralization which is commonly associated with the hydrothermal breccias and quartz diorite porphyry (Figure 7-3). Gold-copper values are not restricted to these lithologies and can be found in all units except the late stage dykes.

Most of the mineralization consists of finely disseminated chalcopyrite and pyrite with minor bornite, molybdenite and pyrrhotite. Total sulphide content is generally less than 5%. The 2017 drill program defined a high-grade zone of mineralization (Hole C17-58: 3.69 g/t Au, 0.30% Cu over 126 m (Lumina, 2017)) at depth in the central part of the deposit. This is associated with chalcopyrite and bornite which occur as disseminations, veins and clots in hydrothermal breccias and quartz diorite porphyry. In hole C17-65, native copper is found on fracture surfaces at depths ranging from 142 m to 186 m. This is not very common and probably due to strong oxidation along a fracture zone.

The mineralized zone extends for approximately 1,000 m in a northeasterly direction, has widths ranging from 70 m to 600 m, and has been defined to a depth of at least 600 m below surface. The zone is open to the north, south, west, and at depth.

8 DEPOSIT TYPES

The Cangrejos deposit is a gold-copper, silica-saturated, alkalic porphyry-style deposit. This type of deposit is found along paleo-subduction margins (Carter, 1981; Cox et al., 1987).

Other deposits of note within this family include Cadia, Australia; Bingham Canyon, USA; Andacollo, Chile; and Red Chris, Canada. All of these deposits have the following similar chemical affinities and host-rock provenance:

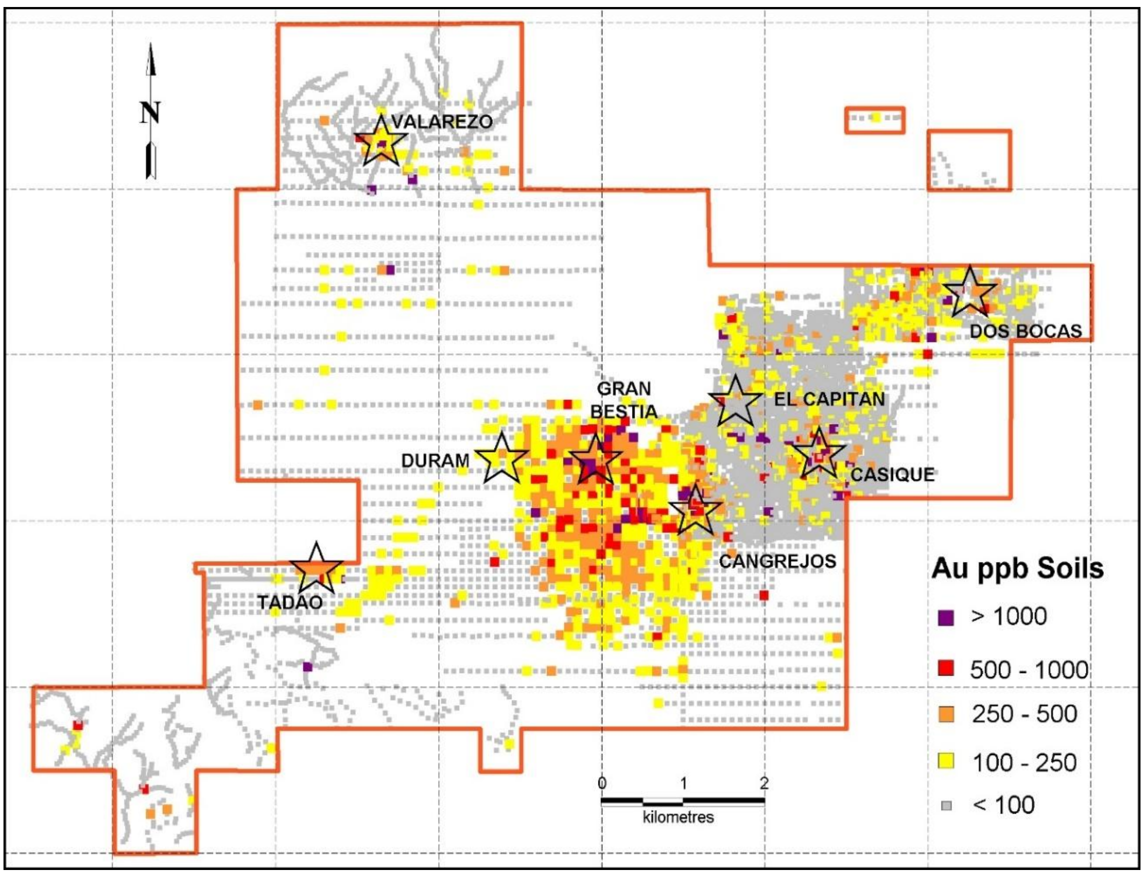
- They are associated with porphyry intrusive rocks that intrude volcanic and sedimentary packages as stocks, plugs, dykes, and dyke swarms.
- Mineralization results from late-stage hydrothermal activity driven by remnant heat from the porphyry intrusion. Thermal gradients within these systems give rise to broadly concentric, although often complexly intermingled, zones of alteration and mineralization. Mineralization is generally low grade and consists of disseminated, fractured, veinlet and quartz stockwork-controlled sulphide mineralization. Deposit boundaries are determined by economic factors that outline the ore zones.
- The distribution of alteration and mineral facies are largely influenced by breccias, dykes, veins, and fracture systems which concentrate and control fluid flow.
- Weathering from percolation of meteoric water can result in the oxidation of the hypogene sulphide mineralization in a portion of the deposit to chalcocite and native copper.

9 EXPLORATION

The property has seen extensive geochemical surveys (streams, soils, top of bedrock soils and rocks). The survey procedures, sampling methodology and analysis of these samples is described in detail by Mayor and Soria (2000) and Potter (2004, 2010). Well-defined gold and/or copper soil anomalies have been defined and are shown in Figures 9-1 and 9-2. A sub-circular, gold-copper soil anomaly with a diameter of approximately 2,700 m occurs in the centre of the property. The Cangrejos and Gran Bestia mineralized zones occur within this area of anomalous gold and copper soil values.

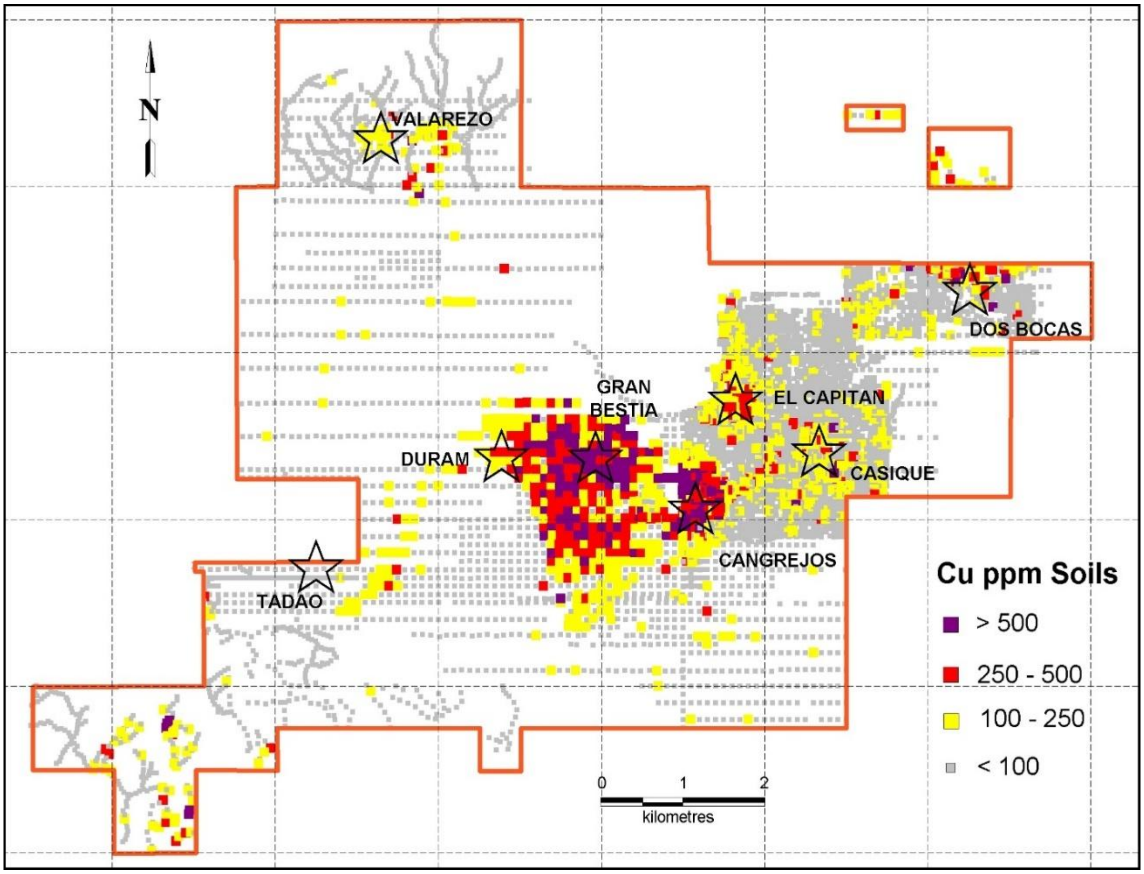
The other mineralized showings on the property also have anomalous gold and copper soil values, albeit somewhat less extensive.

Figure 9-1: Soil Geochemistry – Gold



Note: Cangrejos Project is outlined in orange.
Source: Lumina, 2017

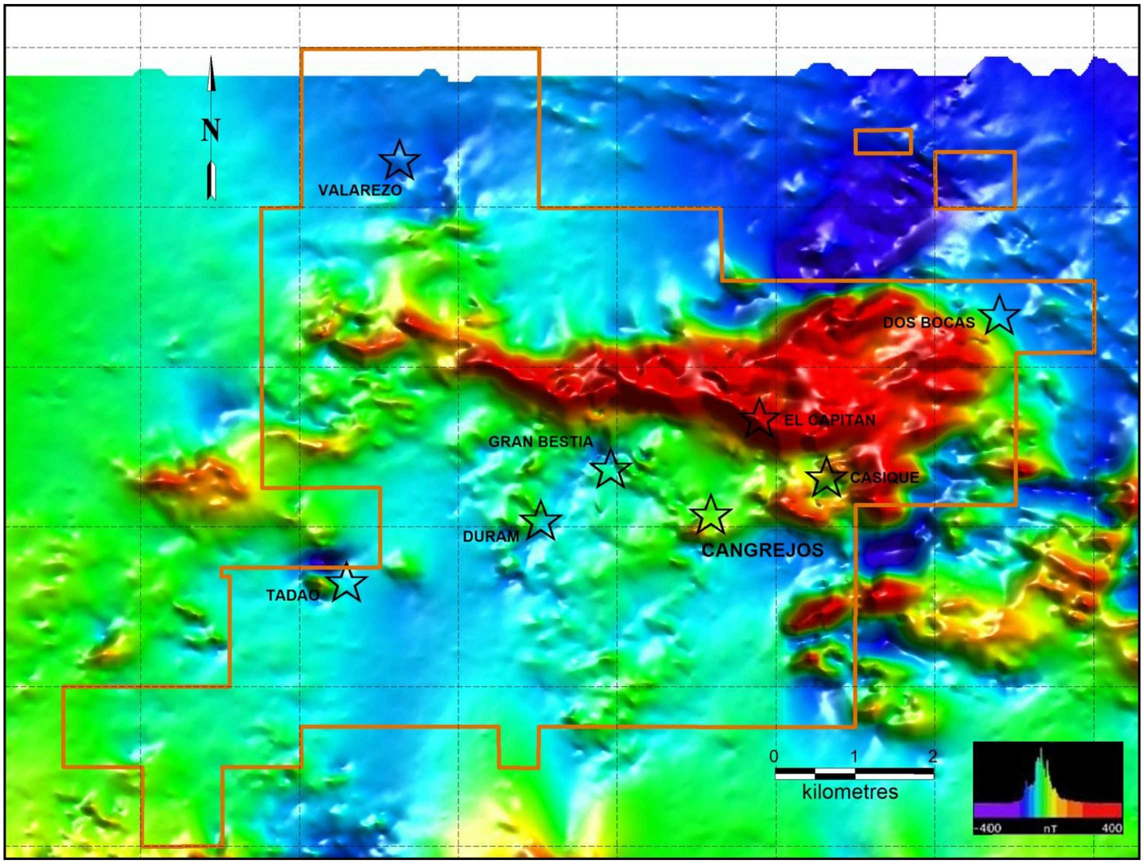
Figure 9-2: Soil Geochemistry – Copper



Note: Cangrejos Project is outlined in orange.
Source: Lumina, 2017

The airborne magnetic survey was used to help define structures. In addition, small circular magnetic highs are interpreted as breccia pipes. The location of exploration targets other than the Cangrejos and Gran Bestia Zones is shown in Figure 9-3 and described in Table 9.1.

Figure 9-3: Exploration Targets – Cangrejos Project – RTP Magnetics



Note: Cangrejos Project is outlined in orange.
Source: Encom, 2007; Lumina, 2017

Table 9.1: Untested Exploration Targets – Cangrejos Project

Target	Geochemistry	Magnetics	Geology
TADAO	Anomalous gold: rocks, soils and local streams	Circular magnetic high	Breccia pipes
DURAM	Anomalous gold, copper: rocks, soils	North-trending series of magnetic highs	Breccia pipes
DOS BOCAS	Anomalous gold, copper: streams, soils, rocks	Several magnetic highs and lows	Unknown
VALAREZO	Anomalous gold, copper, arsenic: rocks, soils	Weak to moderate magnetic anomaly south of the geochemical anomaly	Unknown

10 DRILLING

Potter (2004, 2010) provides a detailed review of the drilling completed by the Newmont-Lumina Joint Venture in 1999 and early 2000 on all concessions except for Cangrejos 20. This program discovered porphyry-style, gold-copper mineralization associated with the Cangrejos Zone.

Initial drilling was carried out in 1999 and 2000 by the Newmont-Lumina Joint Venture. These programs, consisting of 29 holes totalling 7,509.2 m, discovered the porphyry-style, gold-copper mineralization associated with the Cangrejos and Gran Bestia Zones. One hole tested a gold soil anomaly at Casique.

In 2011–2012, Lumina completed a 17-hole (3,698.13 m) program that tested the extent of the Cangrejos Zone and a gold soil anomaly at Casique.

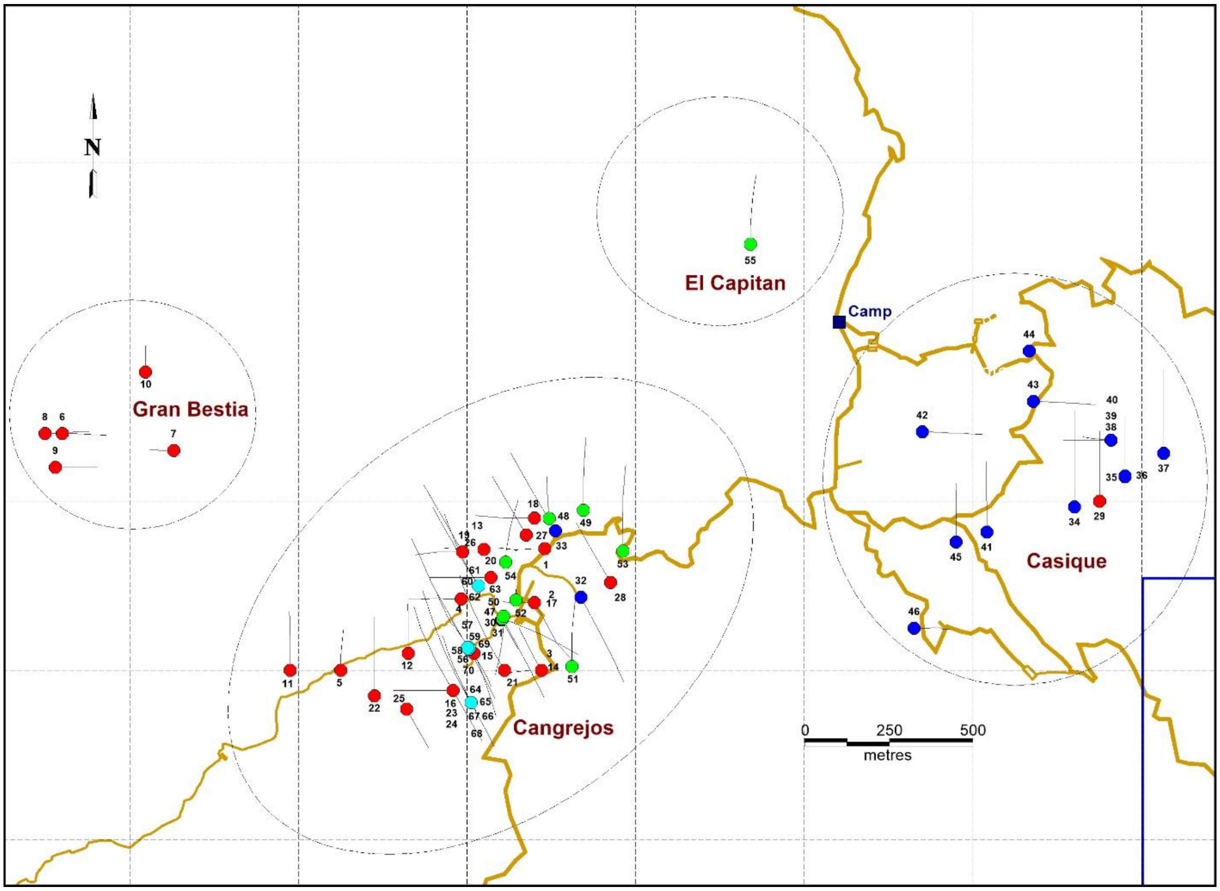
In 2014–2015, Lumina completed another 8 holes (3,188.5 m) on the Cangrejos Zone. This program was designed to test the down-dip and lateral extent of the mineralization and confirm the work previously done by Newmont. One hole (319.65 m) tested a copper-molybdenum soil anomaly at El Capitán.

In 2017, Lumina completed 15 holes (7,186.1m) on the Cangrejos Zone. These holes are part of an infill drill program designed to upgrade the Cangrejos resource from inferred to indicated and to test the depth extent of the mineralized zone.

All drill core from the Cangrejos Project is stored in a dry, secure building at Lumina's field camp, located on the property. The drill core from the Cangrejos 20 claim is stored in Machala at a warehouse owned by the previous concession owner.

Drilling completed on the project is shown in Figure 10-1. All holes have been located using a handheld Garmin 64 GPS unit.

Figure 10-1: Drill Collar Plan Map – Cangrejos Project



Note: Newmont (red dots), Lumina 2011–2012 (blue dots), Lumina 2014–2015 (green dots), Lumina 2017 (cyan dots), and drill roads (brown lines).
Source: Lumina, 2017

10.1 Newmont Drilling (1999–2000)

In 1999–2000, Newmont used Connors Perforaciones S.A. to drill 29 HQ holes totalling 7,509.2 m in the northern part of the El Joven Joint Venture area (Potter, 2004).

Drills were mobilized by helicopter and moved between sites by large crews of local workers. Twenty-three holes (6,237.4 m) tested the Cangrejos gold-copper porphyry zone; 5 holes (977.8 m) tested the gold-copper, porphyry-style mineralization at Gran Bestia; and 1 hole (294 m) tested a gold soil anomaly at Casique.

A Tropari was used to provide down-hole deviation data. This was available for the 1999 drill program but not for the 2000 drill program.

Cangrejos Zone

Hole C99-14 intersected a wide zone of porphyry-style, gold-copper mineralization associated with the soil anomalies (Hole C99-14: 1.57 g/t Au, 0.19% Cu over a core length of 192 m; this may not represent the true width of the zone because additional drilling is required to determine the exact geometry of the mineralized zone).

Additional drilling delineated two sub-parallel northeasterly trending zones: Trinchera (southern zone) and Paloma (northern zone). These zones appear to have steep to sub-vertical dips. The Newmont drilling indicated that the mineralized zones have a lateral extent of 850 m, horizontal widths ranging from 100 m to 250 m and extend to depths of approximately 250 m.

Gran Bestia Zone

Five holes tested a gold-copper soil anomaly in the Gran Bestia area, approximately 1.2 km northwest of the Cangrejos Zone. All holes intersected wide zones of low-grade, gold mineralization associated with intrusive breccias containing fragments of diorite, porphyritic diorite and quartz diorite. The rocks exhibit silica-chlorite alteration with patchy biotite, albite and silica overprints. Sulphide mineralization consisting of pyrite, chalcopyrite and traces of molybdenite occurs in quartz veins and as disseminations. Overall, sulphide content is low (<5%). Hole C99-6 returned values of 1.19 ppm Au over 132 m (based on a 1 ppm Au cut-off) (Lumina, 1999). Due to the widely spaced drilling, the true width of this mineralization is unknown, and additional drilling is required to determine the exact geometry of the mineralized zone.

Casique

One hole (C00-29) tested a gold soil anomaly in the Casique area. A 22 m wide zone with 2.56 g/t Au is associated with a silicified fracture or fault zone (Potter, 2010).

10.2 Lumina Drilling (2011–2012)

In 2011 and 2012, Lumina used Terranova Drilling S.A.C. to drill 17 HQ holes on the Cangrejos Project. A Hydracore 2000 drill was used, and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide down-hole deviation data.

Four holes (1,402 m) tested the extent of the Cangrejos Zone, and the remaining 13 holes (3,296.13 m) tested a gold soil anomaly in the Casique area. The mineralization at Casique is confined to relatively narrow, discontinuous zones related to silicified diorite, hydrothermal breccias, faults or fracture zones.

Significant results from this drill program have been included in several press releases (Lumina; January 2012, April 2012, June 2012). Highlights include the following holes:

- C12-37: 8.96 g/t Au, 0.23% Cu over 6 m
- C12-39: 2.55 g/t Au, 0.18% Cu over 18 m
- C12-40: 1.65 g/t Au, 0.08% Cu over 24 m
- C12-45: 14.2 g/t Au, 0.24% Cu over 2 m

10.3 Lumina Drilling (2014–2015)

In 2014 and early 2015, Lumina used Hubbard Perforaciones S.A. to complete 9 HTW (HQ) drill holes (3,508.15 m) on the Cangrejos Project. A Hydracore 2000 drill was used and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide down-hole orientation data at 50 m intervals.

Eight holes (3,189.6 m) tested the lateral and down-dip extent of the Cangrejos Zone and confirmed the grade as previously defined by Newmont (Lumina, 2015). In addition, one hole (350.15 m) tested the El Capitán copper-molybdenum soil anomaly. It intersected unaltered granodiorite with thin andesite dikes and intrusive breccia zones. No significant mineralization was present.

10.4 Lumina Drilling (2017)

In 2017, Lumina used Hubbard Perforaciones S.A. to complete 15 HTW (HQ) drill holes (7,186.1 m) on the Cangrejos Zone. A Hydracore 2000 drill was used and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide downhole orientation data at 50 m intervals.

This drilling discovered a zone of higher grade gold-copper mineralization associated with hydrothermal breccias which occurs at depth below the resource pit used for the January 2017 resource.

In the authors' opinion, the core handling, logging, sampling and core storage protocols in place on the Cangrejos Project meet or exceed common industry standards, and the authors are not aware of any drilling, sampling or recovery factors that could materially impact the accuracy and reliability of these results.

11 SAMPLING PREPARATION, ANALYSES AND SECURITY

11.1 Newmont Drilling (1999–2000)

Mayor and Soria (2000) and Potter (2004, 2010) describe the sampling procedures used by Newmont. The core was cut in half using a diamond saw and 2 m samples were sent to Bondar Clegg (now ALS Chemex) for sample preparation in Quito and analysis in Vancouver, Canada. Pulps were analyzed for gold using a fire assay procedure with an atomic absorption finish on a 30 g charge. Samples with Au > 0.5 g/t were analyzed for copper, lead, zinc, molybdenum and silver by atomic absorption after a 4-acid digestion.

Newmont also selected some samples for “blaster” gold analysis. This method is similar to conducting a screen metallic gold assay where the coarse (+150 mesh) and fine (-150 mesh) fractions are analyzed for gold. This method tests for coarse gold. The results from the fire assay and “blaster” analyses are similar, which suggests that if coarse gold exists, it is not being liberated in the preparation process employed.

Newmont inserted its own standards every 25 samples to control the analytical quality.

There is no record of any special measures taken to monitor the security of the samples during their transportation to the preparation lab in Quito.

Rejects and pulps from this drill program were stored in a house in Santa Rosa, but most of this material was damaged and is no longer available.

11.2 Lumina Drilling (2011–2012)

Section 11.4 Lumina Drilling (2017) describes core handling procedures that were similar to those used during Lumina’s 2011–2012 drill program.

Drill core samples from the 2011–2012 drill program were assayed by Acme Labs in Vancouver. Samples were prepared at LAC y Asociados Cia. Ltda. (Acme Labs’ preparation lab in Cuenca, Ecuador), and pulps were sent to Acme Labs in Vancouver for analysis. All samples were analyzed for gold using a fire assay technique on a 30 g charge. In addition, a 35-element ICP analysis was done using a 4-acid digestion.

QA/QC samples were inserted on a random basis, but, generally, insertion averaged every 10 samples. These included six certified standards, a blank, and duplicate samples.

During this drill program, 2,563 samples were analyzed: 83 were blanks, 75 were certified reference material, 74 were duplicates, and 2,331 were core samples.

Remaining reject and pulp material from the 2011–2012 drill program was returned to Lumina and is stored in a secure building located at the Cangrejos Project exploration camp.

11.3 Lumina Drilling (2014–2015)

Section 11.4 Lumina Drilling (2017) describes core handling procedures that were similar to those used during Lumina’s 2014–2015 drill program. During this drill program, additional geotechnical information in the form of point-load and density data was acquired. Point-load tests were taken at 5 m intervals and density measurements were taken at 10 m intervals.

Drill core samples from the 2014–2015 drill program were assayed by Acme Labs in Vancouver. Sample shipments were picked up by a representative from LAC y Asociados Cia. Ltda. (Acme Labs' preparation lab in Cuenca, Ecuador), and delivered to its lab in Cuenca where the samples are processed. Approximately 250 g of pulverized material was shipped for analysis at Acme Labs in Vancouver. Certified reference standards, purchased from CDN Resource Laboratories Ltd., were hand-delivered to Acme's lab and inserted into each sample batch. All samples were analyzed for gold using a fire assay technique on a 30 g charge. In addition, a 35-element ICP analysis was done using a 4-acid digestion.

QA/QC samples were inserted after every eight core samples. These include three certified standards (high, medium and low gold grades), a blank, a coarse duplicate and a fine duplicate.

During the 2014–2015 drill program, 2,139 samples were analyzed: 60 were blanks, 60 were certified reference material, 60 were coarse duplicates, 59 were fine duplicates, and the remaining 1,900 samples were drill core.

Remaining reject and pulp material from the 2014–2015 drill program was returned to Lumina and is stored in a secure building located at the Cangrejos Project exploration camp.

11.4 Lumina Drilling (2017)

The core handling and sample procedures described here were used for Lumina's 2017 drill program and Lumina's previous drill campaigns.

The drillers place the HQ drill core in plastic boxes (four rows; total approximately 2.5 m per box). Wooden tags marked with the down-hole depth are placed in the box. Lids are placed on the box and taped shut. The core is then transported by tractor to the nearest road and then trucked to Lumina's core facility at the Cangrejos Project exploration camp. Upon receipt, Lumina field assistants check the depth and record the "FROM_TO" intervals on the outside of the box. Photos are taken of both dry and wet core. Lumina geologists then examine the core and prepare geotechnical and geological logs. The geotechnical log includes: RQD, core recovery, fracture and vein quantity, and vein angles. Point-load tests are taken at 5 m intervals and density measurements are taken at 10 m intervals. For the 2017 drill program, every 10th density sample is shipped to ALS Labs in Lima, Peru for a second density measurement using paraffin-coated samples. This information is entered directly into an Excel® spreadsheet for each hole.

The core is cut in half using a diamond saw. For each 2 m sample, half the core is put into a plastic bag, and the other half is returned to the plastic box and stored on site. Bar-coded sample tags are included in each sample bag, and a duplicate sample tag is stapled into the box. Certified reference standards, purchased from CDN Resource Laboratories Ltd., are inserted into the sample stream. Sample bags are secured with a tamper-proof plastic tag and put into larger mesh sacks which are also tied with a numbered, tamper-proof nylon tie.

These large sample sacks are driven to a secure warehouse in Santa Rosa. When a large batch of samples has accumulated in the warehouse or a drill hole is complete, a representative from Carlos Puig & Asociados S.A. (ALS Labs' preparation lab in Quito, Ecuador) picks up the samples from the secure warehouse and drives them directly to the preparation lab in Quito. The secure tamper-proof plastic tag is checked against a list emailed to the lab. No irregularities were detected in any sample shipment. The samples are then crushed and pulverized.

For each sample, approximately 250 g of pulverized material is placed in a paper craft bag and shipped to ALS, Lima, Peru for analysis. All samples are analyzed for gold using a fire assay technique on a 30 g charge. In addition, a 33-element ICP analysis is done using a 4-acid digestion.

QA/QC samples are inserted after every eight core samples. These include three certified standards (high, medium and low gold grades), a blank, a coarse duplicate and a fine duplicate.

During the 2017 drill program 4,036 samples were analyzed: 112 were blanks, 114 were certified reference materials, 112 were coarse duplicates, 112 were fine duplicates and the remaining 3,586 samples were drill core.

Remaining reject and pulp material from the 2017 drill program has been returned to Lumina and is stored in a dry secure storage warehouse in Quito.

In the authors' opinion, the analytical procedures are appropriate and consistent with common industry practice. The laboratories are recognized, accredited commercial assayers. The sampling has been carried out by trained technical staff under the supervision of a QP and in a manner that meets or exceeds common industry standards. Samples are properly identified and transported in a secure manner from site to the lab.

12 DATA VERIFICATION

12.1 Database Validation

12.1.1 Collar Coordinate Validation

Collar elevation data were validated by comparing GPS field survey elevations with the satellite photo's digital elevation model (DEM). Most elevation differences in the collars were less than one metre.

12.1.2 Down-hole Survey Validation

The down-hole survey data were validated by identifying any large discrepancies between sequential dip and azimuth readings. No significant discrepancies were found.

12.1.3 Assay Verification

All the collars, surveys, geology and assays were exported from Excel® files into MineSight® software. No identical sample identifications exist; all FROM_TO data are either zero or a positive value; and no interval exceeds the total depth of its hole.

To validate the data, the following checks were confirmed:

- The maximum depth of samples was checked against the depth of the hole.
- The less-than-the-detection-limit values were converted into a positive number equal to one-half the detection limit.
- All gold values greater than 0.1 g/t from each drill hole were checked against the original assay certificate.

The core recovery for the 2017 drill program averaged just over 95%. There is no indication that grade is related to core recovery.

12.2 Geological Data Verification and Interpretation

Several geological variables were captured during core logging. The geological data were verified by confirming that the geological designations were correct in each sample interval. This process included the following:

- Examine FROM_TO intervals for gaps, overlaps and duplicated intervals.
- Look for collar and sample identification mismatches.
- Verify correct geological codes.

A geological legend was provided, and it was used to compare the values logged in the database. The geological model was found to be reasonable and adequate for use.

12.3 QA/QC Protocol

A review of the QA/QC protocols was conducted prior to drilling and formalized in a detailed QA/QC manual developed by Lumina. Each drilling phase was reviewed by a QP who was on site during the drill program. The procedures for core processing and the insertion of blanks and standards were examined. The QA/QC program was conducted in accordance with industry best practice as described in Section 11 (Sampling Preparation, Analyses and Security) of this Technical Report.

No quality control issues were discovered with the Lumina (2011–2012) and Newmont (1999–2000) drill programs.

During the 2014–2015 drill program, 2,139 samples were analyzed: 60 were blanks, 60 were certified reference material, 60 were coarse duplicates, 59 were fine duplicates, and the remaining 1,900 samples were drill core. After each batch of analytical results came in, the QA/QC samples were reviewed by a Lumina geologist. Lumina's QA/QC consultant also reviewed the data on a regular basis.

QA/QC monitoring of the gold assays from Lumina's 2014–2015 drill program indicated that the gold assays were apparently biased. Based on Lumina's QA/QC consultant's recommendation, any sample with > 0.1 g/t Au was re-assayed at a second lab. This resulted in 1,215 samples being re-assayed at the ALS Chemex laboratory in Lima, Peru. The re-assay results replaced the original assays in the project database.

During the 2017 drill program, 4,036 samples analyzed: 112 were blanks, 114 were certified reference materials, 112 were coarse duplicated, 112 were fine duplicates and the remaining 3,586 samples were drill core. After each batch of analytical results was released by the lab, the QA/QC samples were reviewed by a Lumina geologist. Lumina's QA/QC consultant also reviewed this data after each batch of results came back from the lab.

Lumina's QA/QC consultant indicated that the results from the 2017 drill program were acceptable and no further action was required.

12.4 Assay Database Verification

All gold values greater than 0.1 g/t Au from Lumina's 2011–2012, 2014–2015 and 2017 drill programs were manually compared to the original assay certificates. No errors were found.

12.5 Conclusion

A sample bias in the gold assays was identified by the QPs during the review of the drill data and assays for the 2014–2015 drill program. This bias was corrected. There were no significant issues with the assays from the other drill programs.

Observation of the drill core during the site visit inspection and validation of the collected data indicate that the drill data are adequate for interpretation.

In the authors' opinion, the database management, validation and assay QA/QC protocols are consistent with common industry practices. Therefore, the database is acceptable for use in this report.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

In 1999, Newmont did some in-house preliminary metallurgical testwork on six composite samples taken from holes C99-5 (Cangrejos) and C99-6 (Gran Bestia) (Major and Soria, 2000). This work included tests for grindability, cyanidation, flotation, gravity and bio-oxidation. The Bond Work index study indicates that the samples are difficult to grind and have energy requirements of 16 to 19 kWh/mt. Ninety-six-hour baseline bottle roll cyanidation tests were completed for -10 mesh composites using 0.5 g/L NaCN and 80% -200 mesh samples with 0.5 g/L and 2.0 g/L NaCN. Gold recoveries ranged from 53.9% to 74.6% for the -10 mesh samples. The -200 mesh samples have higher gold recoveries: 82.1% to 95.1% using 0.5 g/L NaCN and 95.3% to 97.5% using 2.0 g/L NaCN.

Two core composites from drill holes C99-5 and C99-6 were used for preliminary flotation tests. Kinetic data for gold and copper show very good flotation characteristics, and overall recoveries were 88.5% to 92.8% for copper and 81.2% to 85.1% for gold (AGRA Simons, 2000). The Cangrejos mineralization is not amenable to heap-leach or bio-oxidation processing. Gravity separation tests indicate the presence of significant free-milling gold values (14% to 35%).

In 2015, Lumina carried out a metallurgical testing program at Cangrejos on a representative suite of 2014 drill core samples. The testwork was conducted at C.H. Plenge & Cia. S.A. in Lima, Peru and was performed on four individual composites and a Master Composite (Plenge, 2015). The four individual composites were prepared using 870 kg of halved drill core collected from seven different drill holes from various spatial locations in the Cangrejos deposit. These composites are representative of high-grade and low-grade mineralized materials from the Cangrejos deposit.

The Master Composite contained 0.13% Cu, 0.8 g/t Au, 0.5 g/t Ag, and 37 ppm Mo. The copper-gold concentrate produced from the Master Composite contained 83% of the copper, 69% of the gold, 57% of the silver, and 72% of the molybdenum. The concentrate assayed 22% Cu, 109 g/t Au, 59 g/t Ag, and 0.53% Mo. Deleterious elements identified in the concentrate were below penalty levels, except for fluorine which may be at the penalty level for some smelters. Molybdenum levels in the concentrate were high enough to warrant future testing to determine if a separate molybdenum concentrate can be produced.

Flotation, combined with gravity and cyanidation, can be used to recover 83% of the gold. Flotation produces a saleable copper-gold concentrate with recovery of 83% of the copper and 69% of the gold. Cyanidation of gravity concentrates and flotation cleaner scavenger tails recovered in doré increases gold recovery by 14%, resulting in a total gold recovery of 83%. Alternatively, whole-ore cyanidation can be used to process the mineralized materials and recover 92% of the gold and 36% of the silver in doré, but no base metals are recovered.

Test results demonstrate that the mineralized material can be processed by conventional industrial techniques.

14 MINERAL RESOURCES

14.1 Introduction

The mineral resource estimate was prepared under the direction of Robert Sim, P.Geo, with the assistance of Bruce Davis, PhD, FAusIMM. This section of the Technical Report describes the resource estimation methodology and summarizes the key assumptions considered by the QP to prepare the resource model for the gold, copper, silver and molybdenum mineralization at the Cangrejos Project. This is the second estimate of mineral resources for the Cangrejos deposit. The previous estimate of resources had an effective date of January 25, 2017 and is presented in a technical report dated March 6, 2017. In the opinion of the QP, the resource estimate reported herein is a reasonable representation of the mineralization found at the Cangrejos Project at the current level of sampling. The mineral resource has been estimated in conformity with generally accepted CIM *Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines* (November 23, 2003) and is reported in accordance with NI 43-101.

Mineral resources are not mineral reserves and they do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into a mineral reserve upon application of modifying factors.

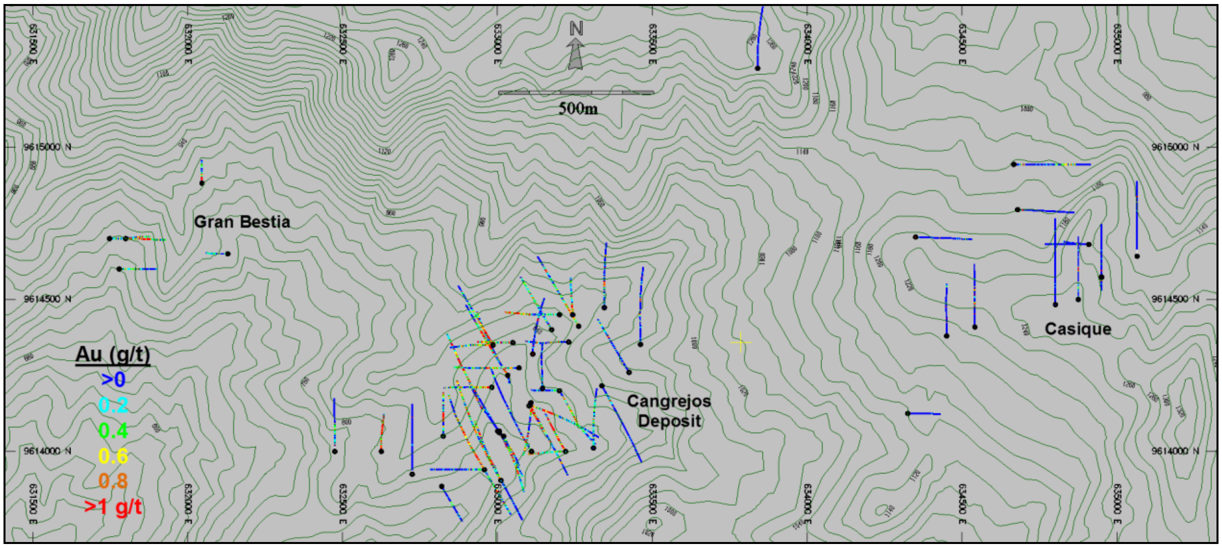
Estimations are made from 3D block models based on geostatistical applications using commercial mine planning software (MineSight® v12.0). The project limits are based in the UTM coordinate system (Provisional South America 1956, Zone 17S) using a nominal block size measuring 10 m x 10 m x 10 m. Drill holes penetrate the Cangrejos deposit at a variety of orientations to depths approaching 750 m below surface. The mineral resource estimate was generated using drill hole sample assay results and the interpretation of a geological model which relates to the spatial distribution of gold, copper, silver and molybdenum. Interpolation characteristics were defined based on the geology, drill hole spacing, and geostatistical analysis of the data. The mineral resources were classified according to their proximity to the sample data locations and are reported, as required by NI 43-101, according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May, 2014).

This Technical Report includes estimates for mineral resources. No mineral reserves were prepared or reported.

14.2 Available Data

Lumina provided the drill hole sample data for the Cangrejos Project on October 15, 2017. This comprised a series of Excel® (spreadsheet) files containing collar locations, down-hole survey results, geologic information and assay results for a total of 70 drill holes representing 22,933 m of drilling. Of these, 50 drill holes, totalling 18,015 m of drilling, test the Cangrejos deposit and contribute to the estimation of mineral resources; 5 holes hit significant gold mineralization approximately 1.2 km northwest of the Cangrejos deposit in a satellite zone referred to as Gran Bestia; and the remaining 15 holes tested for mineralization approximately 1.5 km east of the Cangrejos deposit in an area called Casique. All holes are HQ diamond drill holes. The distribution of gold grades in all drill holes is shown in plan view in Figure 14-1.

Figure 14-1: Plan View of Gold Grades in Drilling

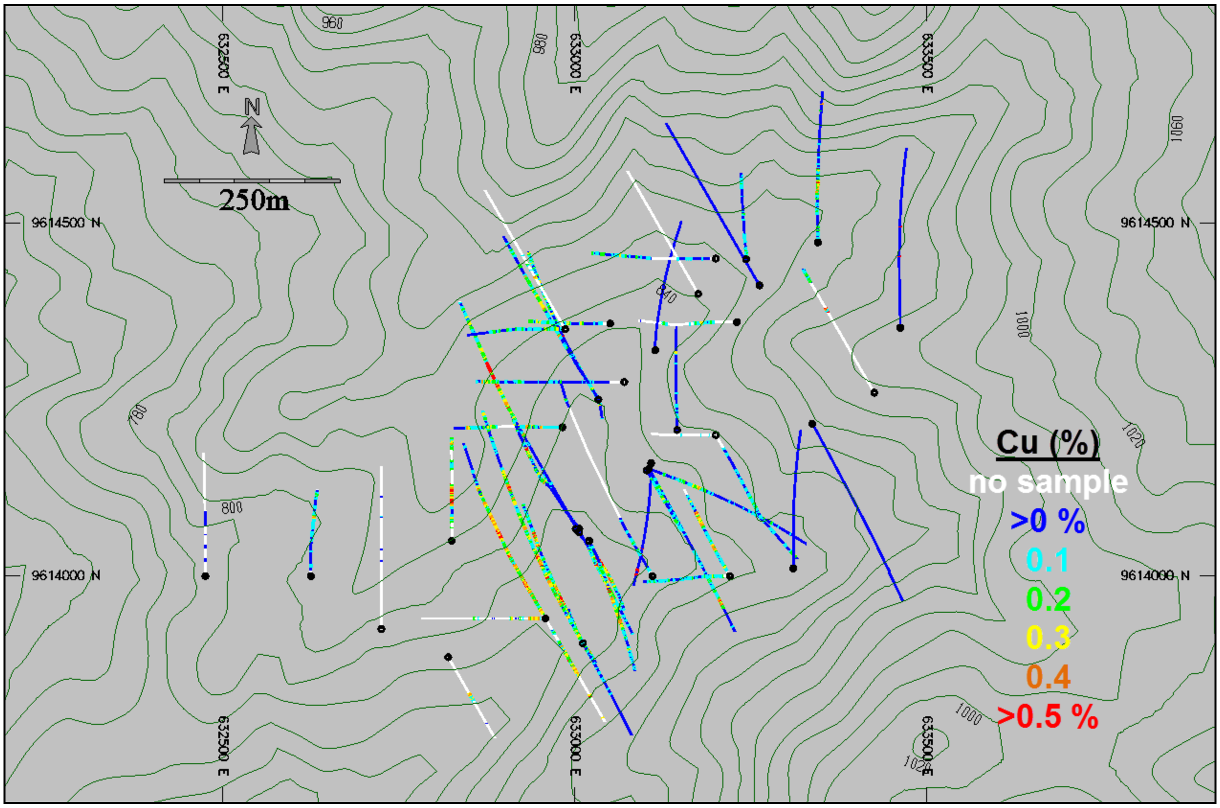


Source: Sim Geological, 2017

There are a total of 11,313 individual samples in the Cangrejos Project database, the majority of which have been analyzed for a variety of elements (as part of a multi-element package). Individual sample intervals range from a minimum of 0.35 m to a maximum of 9 m and average 2 m long, and 96% of the samples in the database are exactly 2 m long. Sample data for gold, silver, copper and molybdenum have been extracted from the main database and imported into MineSight® to develop the resource model.

All core intervals have been analyzed for gold content, but portions of the holes drilled by Newmont in 1999 and 2000 were not analyzed for copper, silver or molybdenum, and, as a result, this information is missing for 15% of the core intervals in the database. The distribution of available copper data, and the distribution of intervals where data is missing, is shown in Figure 14-2 (Note: Silver and molybdenum are also missing in these intervals). The distribution of core intervals where sample data are missing correlates reasonably well with low-grade (Cu, Ag and Mo) zones encountered in the more recent drilling. It is assumed that these intervals were not sampled because they do not show visible signs of significant mineralization. Based on this assumption, core intervals without sample assay results have been assigned default grades as follows: Cu = 0.01%, Ag = 0.1 g/t and Mo = 5 ppm. Resampling and analyzing for these missing elements are recommended if core or sample rejects are available.

Figure 14-2: Plan View of Available Copper Data in Drilling at Cangrejos Deposit Area



Source: Sim Geological, 2017

Specific gravity (SG) data is available for only 23 drill holes that were drilled by Lumina between 2014 and 2017. The volume and distribution of SG data are insufficient to interpolate density values in the block model.

Topographic data was provided in the form of 3D contour lines on 20 m (vertical) intervals. This information has been used to generate a 3D digital terrain surface over the property.

Geologic information, derived from observations during core logging, provide lithology code designations for the various rock units present on the property.

The statistical properties of the data in the vicinity of the Cangrejos resource model, excluding exploration drill holes, are shown in Table 14.1; this table shows the statistics of the initial sample data and for the copper, silver and molybdenum statistics following the assignment of default grades for missing data.

Table 14.1: Summary of Basic Statistics of Data Proximal to the Resource Model

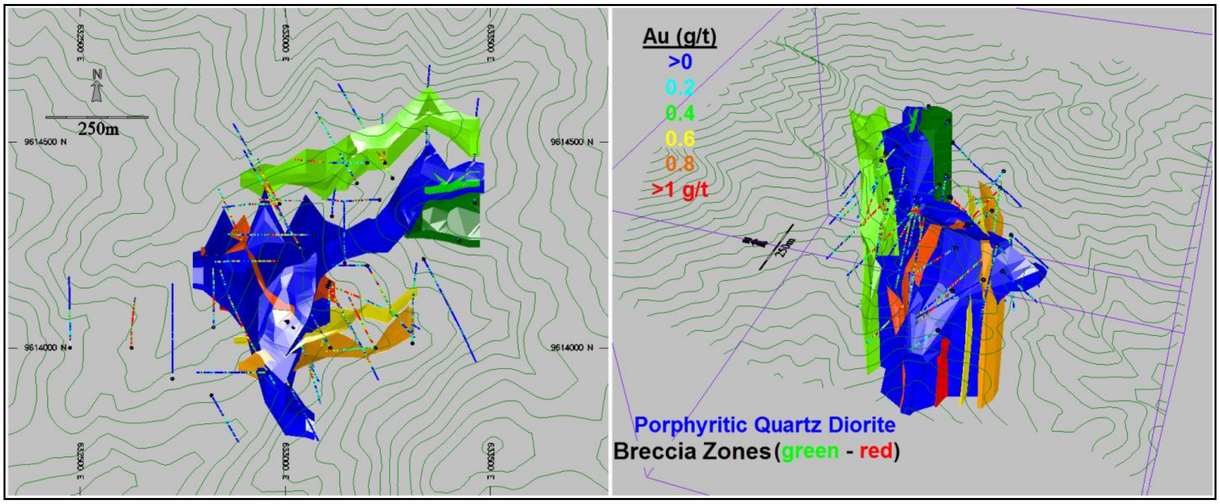
Element	# of Samples	Total Sample Length (m)	Min	Max	Mean	Std. Dev.
Gold (g/t)	8,954	17,795	0.001	16.100	0.535	0.281
Copper1 (%)	7,629	15,129	0	2.38	0.114	0.167
Copper2 (%)	8,954	17,795	0	2.38	0.098	0.158
Silver1 (g/t)	7,629	15,129	0	99	0.78	2.46
Silver2 (g/t)	8,954	17,795	0	99	0.68	2.28
Molybdenum1 (ppm)	7,629	15,129	1	2,696	28	64.9
Molybdenum2 (ppm)	8,954	17,795	1	2,696	24.6	60.4

Note: Original sample data are weighted by sample length. The data used in the above table is restricted to drill holes in the vicinity of the Cangrejos deposit. Values of “1” denote initial sample data. Values of “2” include default grades assigned to missing sample data.

14.3 Geological Model, Domains and Coding

The Cangrejos deposit is interpreted as a gold-copper porphyry deposit. A series of 3D wireframe domains have been interpreted that represent the shape and extent of the porphyritic quartz diorite intrusive and a series of brecciated zones. The distribution is shown in Figure 14-3.

Figure 14-3: Plan and Isometric View of the Porphyritic Quartz Diorite Intrusive and Brecciated Domains and Gold Data in Drilling



Source: Sim Geological, 2017

Other than some thin surficial oxidation where sulphides occur at surface, there are no indications of significant oxidation of the mineral resource. There is relatively little overburden in the area of the mineral resource, and, as a result, no adjustments have been made to account for overburden in the model.

14.4 Specific Gravity Data

There are 1,195 individual measurements for specific gravity (SG) taken from samples in 23 holes drilled by Lumina between 2014 and 2017. SG is measured using the water immersion method (weight in air vs. weight in water) with unwaxed core samples (there is little or no evidence of porosity in the rocks from the Cangrejos Project). During the 2017 drill program, approximately 10% of the samples were sent to ALS Chemex for SG determinations using waxed samples. These results show reasonable comparison with the results obtained by Lumina.

Samples for SG measurement are generally taken at 5 m intervals throughout the length of the holes. SG values range from a minimum of 1.34 to a maximum of 3.74. A series of 13 SG measurements taken over the top 150 m of hole C17-56 are anomalously low (SG <2). It appears there may have been an error in these measurements, and, as a result, they have been removed from the database. The remaining 1,182 SG measurements range from 2.05 to 3.74 and average 2.74.

The density and distribution of SG sample data is considered insufficient to support estimation of density in the block model. As a conservative approach, an average SG of 2.70 has been used to calculate resource tonnage.

14.5 Compositing

Compositing the drill hole samples helps standardize the database for further statistical evaluation. This step eliminates any effect that inconsistent sample lengths might have on the data.

To retain the original characteristics of the underlying data, a composite length was selected that reflects the average, original sample length. The generation of longer composites can result in some degree of smoothing which could mask certain features of the data. A composite length of 2 m was selected for the Cangrejos Zone, reflecting the fact that 96% of the original samples have been selected on 2 m intervals.

Drill hole composites are length-weighted and were generated down-the-hole; this means that composites begin at the top of each hole and are generated at 2 m intervals down the length of the hole.

14.6 Generation of a Gold Probability Shell Domain

A probability shell domain has been generated based on the distribution of gold in the deposit. Indicator values are assigned to 2 m composited sample data based on a threshold grade of 0.15 g/t Au. Probability estimates are made in model blocks using ordinary kriging. A 3D domain was then produced in which the areas inside the probability shell represent areas where there is a >50% probability that the grade will be above 0.15 g/t Au. In areas where gold mineralization is not bounded by drill holes, this shell domain extends for a maximum distance of 200 m from drilling. The probability shell domain tends to be quite large and extensive because the lateral and depth extents of the mineralization have not been defined by the current drilling. The probability shell domain does, however, outline the low-grade zone in the centre of the deposit.

14.7 Exploratory Data Analysis

Exploratory data analysis (EDA) involves the statistical summarization of the database to better understand the characteristics of the data that may control grade. One of the main purposes of this exercise is to determine if there is evidence of spatial distinctions in grade which may require the separation and isolation of domains during interpolation. The application of separate domains prevents unwanted mixing of data during interpolation and, therefore, the resulting grade model will better reflect the unique properties of the deposit. However, applying domain boundaries in areas where the data is not statistically unique may impose a bias in the distribution of grades in the model.

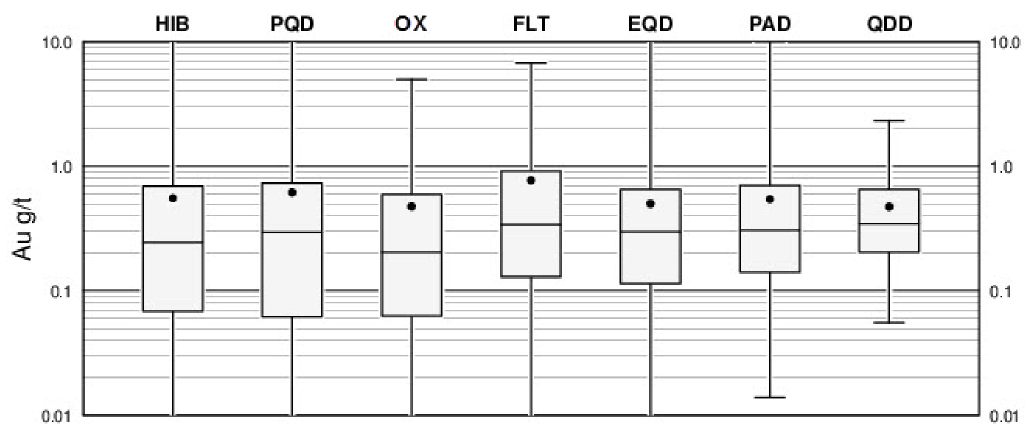
A domain boundary, which segregates the data during interpolation, is typically applied if the average grade in one domain is significantly different from that of another domain. A boundary may also be applied if there is evidence that a significant change in the grade distribution has occurred across the contact.

14.7.1 Basic Statistics by Domain

The basic statistics for the distribution of gold, copper, silver and molybdenum were evaluated by logged lithology codes and between the interested dyke domains shown in Figure 14-3.

The boxplot in Figure 14-4 shows an equal or even distribution of gold between all of the logged lithology types. Similar trends are also found for the distributions of copper, silver and molybdenum. This is an indication that lithology type is not a controlling factor in the distribution of mineralization in the deposit.

Figure 14-4: Boxplots Comparing Gold Sample Data between Logged Lithology Types

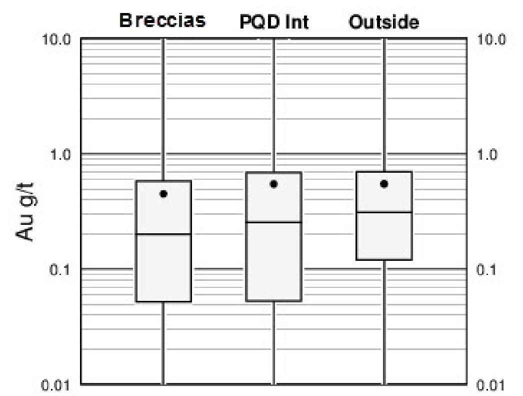


	HIB	PQD	OX	FLT	EQD	PAD	QDD	
Number of data	1456	1582	319	133	5185	150	79	Number of data
Mean	0.557	0.619	0.478	0.774	0.503	0.547	0.476	Mean
Variance	0.75	1.188	0.475	1.165	0.419	0.853	0.156	Variance
Skewness	4.363	5.911	2.756	2.578	4.326	7.389	1.936	Skewness
Coef of Variation	1.555	1.76	1.443	1.395	1.288	1.688	0.828	Coef of Variation
Maximum	12.15	16.1	5.009	6.75	11.61	10.0	2.335	Maximum
Upper quartile	0.695	0.735	0.597	0.92	0.653	0.703	0.65	Upper quartile
Median	0.245	0.295	0.206	0.344	0.298	0.308	0.348	Median
Lower quartile	0.069	0.062	0.063	0.13	0.115	0.142	0.206	Lower quartile
Minimum	0.003	0.003	0.007	0.008	0.001	0.014	0.056	Minimum

HIB – hydrothermal breccia; PQD – porphyritic quartz diorite; OX – oxidized; FLT – fault; EQD – equigranular quartz diorite; PAD – porphyritic andesite dyke; QDD – quartz diorite dyke.
Source: Sim Geological, 2017

The boxplot in Figure 14-5 shows a relatively even distribution of gold between the interpreted porphyritic quartz diorite and breccia domains and the surrounding rocks. Similar results are also found for the distributions of copper, silver and molybdenum. This is an indication that these interpreted domains are not controlling factors in the distribution of mineralization in the deposit.

Figure 14-5: Boxplot Comparing Gold Sample Data in Interpreted Domains

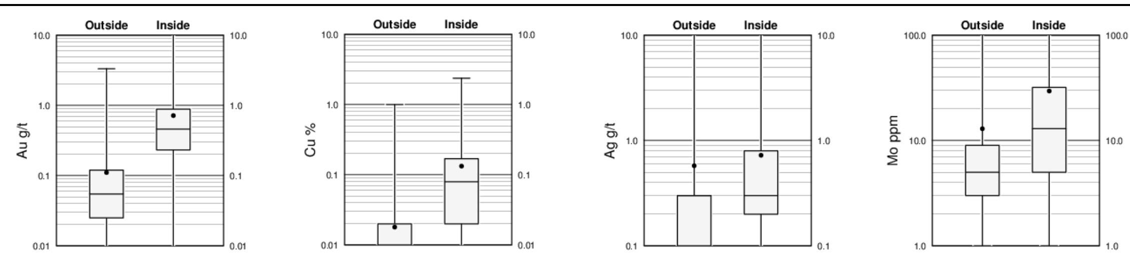


	Breccias	PQD Int	Outside
Number of data	1313	1632	5982
Mean	0.452	0.548	0.55
Variance	0.575	0.734	0.613
Skewness	5.81	4.047	5.886
Coef of Variation	1.676	1.564	1.423
Maximum	12.15	10.0	16.1
Upper quartile	0.579	0.69	0.699
Median	0.201	0.255	0.312
Lower quartile	0.052	0.053	0.121
Minimum	0.003	0.003	0.001

Source: Sim Geological, 2017

Figure 14-6 shows the distributions samples inside vs. outside of the gold probability shell domain. Gold and copper grades are significantly higher inside the shell domain. Although silver and molybdenum grades are higher inside the shell, the differences are not as distinct.

Figure 14-6: Boxplots Comparing Sample Data In/Out of the Gold Probability Shell Domain



	Au Outside	Au Inside	Cu Outside	Cu Inside	Ag Outside	Ag Inside	Mo Outside	Mo Inside
Number of data	2699	6228	2699	6228	2699	6228	2699	6228
Mean	0.111	0.719	0.018	0.133	0.577	0.726	12.965	29.6
Variance	0.038	0.776	0.001	0.03	11.091	2.594	1155.19	4297.84
Skewness	6.497	5.143	10.116	3.171	24.104	32.902	8.432	17.121
Coef of Variation	1.745	1.226	2.088	1.309	5.771	2.218	2.622	2.215
Maximum	3.342	16.1	1.0	2.38	99.0	93.2	627.0	2696.0
Upper quartile	0.12	0.89	0.02	0.17	0.3	0.8	9.0	32.0
Median	0.055	0.46	0.01	0.08	0.3	0.3	5.0	13.0
Lower quartile	0.025	0.233	0.0	0.02	0.1	0.2	3.0	5.0
Minimum	0.001	0.003	0.0	0.0	0.0	0.0	1.0	1.0

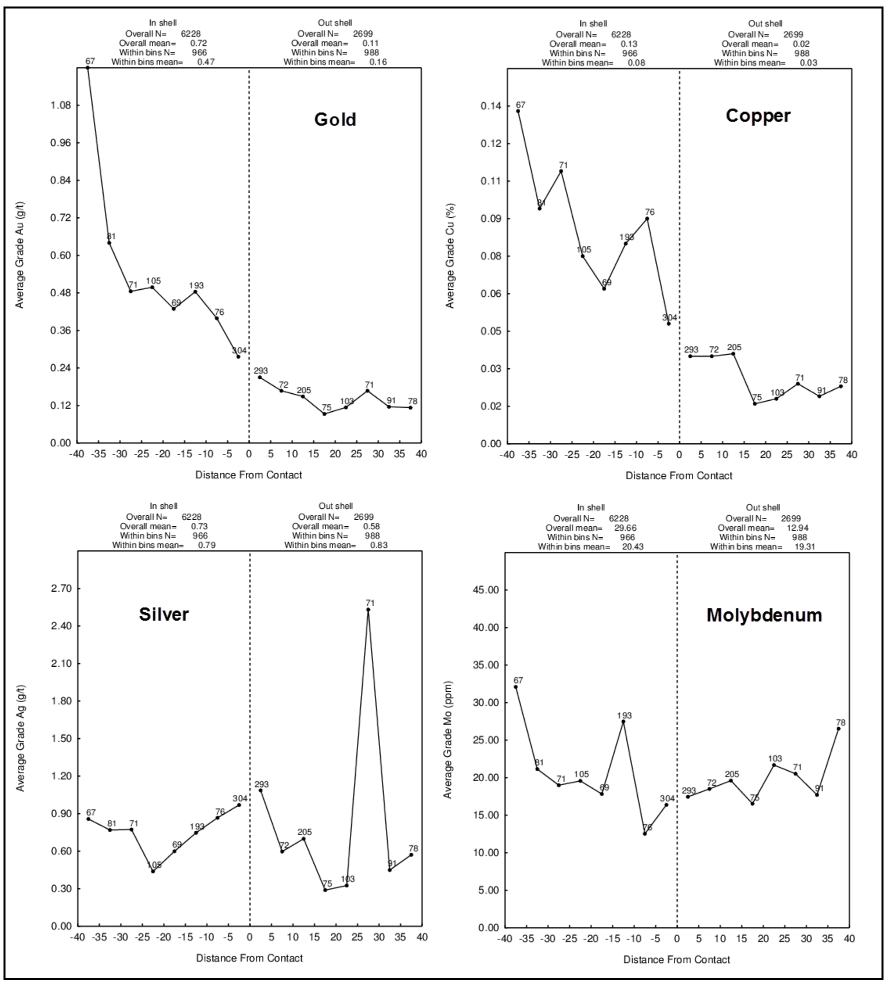
Source: Sim Geological, 2017

14.7.2 Contact Profiles

Contact profiles evaluate the nature of grade trends between two domains: they graphically display the average grades at increasing distances from the contact boundary. Those contact profiles that show a marked difference in grade across a domain boundary indicate that the two datasets should be isolated during interpolation. Conversely, if a more gradual change in grade occurs across a contact, the introduction of a hard boundary (e.g., segregation during interpolation) may result in a much different trend in the grade model; in this case, the change in grade between domains in the model is often more abrupt than the trends seen in the raw data. Finally, a flat contact profile indicates no grade changes across the boundary; in this case, hard or soft domain boundaries will produce similar results in the model.

A series of contact profiles, shown in Figure 14-7, evaluate the nature of gold, copper, silver and molybdenum across the gold probability shell domain boundary. Abrupt changes in grade occur in gold and copper at the domain boundary. There is little evidence of changes in grade for silver and molybdenum.

Figure 14-7: Contact Profiles for Samples Inside vs. Outside Gold Probability Shell Domain



Source: Sim Geological, 2017

14.7.3 Conclusions and Modelling Implications

The results of the EDA indicate that the gold and copper grades within the gold probability shell domain are significantly different than those in the surrounding area, and that the probability shell domain should be treated as a distinct or hard domain during block grade estimations for these elements (Table 14.2). The distribution of silver and molybdenum are not influenced by the probability shell domain, and, as a result, it is not used during grade estimation for these elements.

Table 14.2: Summary of Estimation Domains

Element	Domain	Boundary Type
Gold	ProbShell	Hard
Copper	ProbShell	Hard
Silver	None	None
Molybdenum	None	None

14.8 Evaluation of Outlier Grades

Histograms and probability plots for the distribution of gold, copper, silver and molybdenum were reviewed to identify the presence of anomalous outlier grades in the composited (2 m) database. Following a review of the physical location of potentially erratic samples in relation to the surrounding sample data, it was decided that these would be controlled during block grade interpolations using a combination of traditional top-cutting and the application of outlier limitations. An outlier limitation controls the distance of influence of samples above a defined grade threshold. During grade interpolations, samples above the outlier thresholds are limited to a maximum distance-of-influence of 50 m. The grade thresholds for gold, copper, silver and molybdenum are shown in Table 14.3. Overall, these measures result in a 3% reduction in contained gold, 1% in contained copper, 2% in contained silver and 7% in contained molybdenum in classified blocks in the resource model. The high metal loss for molybdenum is due to a combination of a skewed distribution of data and the spacing of drill holes. These measures are considered appropriate for a deposit with this distribution of delineation drilling.

Table 14.3: Treatment of Outlier Sample Data

Element	Domain	Maximum	Top-cut Limit	Outlier Limit
Gold (g/t)	Inside Shell	16.100	-	9.000
	Outside Shell	3.342	-	1
Copper (%)	Inside Shell	2.38	-	1.50
	Outside Shell	1.00	-	0.30
Silver (g/t)	na	100.0	30	10.0
Molybdenum (ppm)	na	2,696	1,500	600

Note: The table reflects 2 m composited drill hole data.

14.9 Variography

The degree of spatial variability in a mineral deposit depends on both the distance and direction between points of comparison. Typically, the variability between samples increases as the distance between those samples increases. If the degree of variability is related to the direction of comparison, then the deposit is said to exhibit *anisotropic* tendencies which can be summarized with the search ellipse. The semi-variogram is a common function used to measure the spatial variability within a deposit.

The components of the variogram include the nugget, the sill and the range. Often samples compared over very short distances, even samples compared from the same location, show some degree of variability. As a result, the curve of the variogram often begins at some point on the y-axis above the origin: this point is called the *nugget*. The nugget is a measure of not only the natural variability of the data over very short distances but also a measure of the variability which can be introduced due to errors during sample collection, preparation, and the assay process.

The amount of variability between samples typically increases as the distance between the samples increases. Eventually, the degree of variability between samples reaches a constant, maximum value: this is called the *sill*, and the distance between samples at which this occurs is called the *range*.

In this Technical Report, the spatial evaluation of the data was conducted using a correlogram rather than the traditional variogram. The correlogram is normalized to the variance of the data and is less sensitive to outlier values, generally giving better results.

Variograms using the commercial software package Sage 2001© developed by Isaaks & Co. Multidirectional variograms for gold and copper were generated from the distributions of data located inside the gold probability shell domain. The same variograms are used to estimate the grades both inside and outside of the domain. The results are summarized in Table 14.4.

Table 14.4: Variogram Parameters

Element	Nugget	Sill 1	Sill 2	1st Structure Range (m)	1st Structure Azimuth (°)	1st Structure Dip	2nd Structure Range (m)	2nd Structure Azimuth (°)	2nd Structure Dip
Gold	0.450	0.346	0.204	136	289	85	232	137	28
	Spherical			12	147	4	142	307	61
				10	57	3	77	45	4
Copper	0.350	0.344	0.306	44	238	59	1691	318	1
	Spherical			38	298	-17	461	225	66
				22	20	26	126	49	24
Silver	0.479	0.334	0.187	110	116	25	2145	145	0
	Spherical			34	353	49	163	180	90
				7	222	30	160	55	0
Molybdenum	0.350	0.546	0.104	66	43	-17	826	301	-3
	Spherical			28	318	16	201	213	36
				15	89	66	101	27	54

Note: Correlograms were conducted on 2 m composite sample data.

14.10 Model Setup and Limits

A block model was initialized in MineSight®, and the dimensions are defined in Table 14.5. The selection of a nominal block size measuring 10 x 10 x 10 m is considered appropriate with respect to the current drill hole spacing as well as the selective mining unit (SMU) size typical of an operation of this type and scale.

Table 14.5: Block Model Limits

Direction	Minimum	Maximum	Block Size (m)	# of Blocks
X (east)	632200	633900	10	170
Y (north)	9613300	9615000	10	170
Z (elevation)	0	1200	10	120

Blocks in the model were coded on a majority basis with the gold probability shell domain. During this stage, blocks along a domain boundary are coded if more than 50% of the block occurs within the boundaries of that domain.

The proportion of blocks that occur below the topographic surface is also calculated and stored within the model as individual percentage items. These values are used as weighting factors to determine the in-situ resources for the deposit.

14.11 Interpolation Parameters

The block model grades for gold, copper, silver and molybdenum were estimated using ordinary kriging (OK). The results of the OK estimation were compared with the Hermitian Polynomial Change of Support model (also referred to as the Discrete Gaussian Correction). This method is described in more detail in Section 14.12.2.

The Cangrejos OK model was generated with a relatively limited number samples to match the change of support or Herco (*Her*mitian *Co*rrection) grade distribution. This approach reduces the amount of smoothing or averaging in the model, and, while there may be some uncertainty on a localized scale, this approach produces reliable estimates of the recoverable grade and tonnage for the overall deposit.

The estimation parameters for the various elements in the resource block model are shown in Table 14.6. All grade estimations use length-weighted composite drill hole sample data.

Table 14.6: Interpolation Parameters

Element	Search Ellipse[1] Range (m)			# of Composites			Other
	X	Y	Z	Min/block	Max/block	Max/hole	
Gold	500	500	200	5	24	8	1 DH per octant
Copper	500	500	200	5	36	9	1 DH per octant
Silver	500	500	200	5	27	9	1 DH per octant
Molybdenum	500	500	200	5	24	8	1 DH per octant

[1] Ellipse orientation with long axis N-S and W-E and vertical short axis. DH = drill hole.

14.12 Validation

The results of the modelling process were validated using several methods. These include a thorough visual review of the model grades in relation to the underlying drill hole sample grades, comparisons with the change of support model, comparisons with other estimation methods and grade distribution comparisons using swath plots.

14.12.1 Visual Inspection

A detailed visual inspection of the block model was conducted in both section and plan to ensure the desired results following interpolation. This includes confirmation of the proper coding of blocks within the gold grade probability shell domain. The estimated gold, copper, silver and molybdenum grades in the model appear to be a valid representation of the underlying drill hole sample data.

14.12.2 Model Checks for Change of Support

The relative degree of smoothing in the block model estimates were evaluated using the Discrete Gaussian of Hermitian Polynomial Change of Support method (described by Journel and Huijbregts, Mining Geostatistics, 1978).

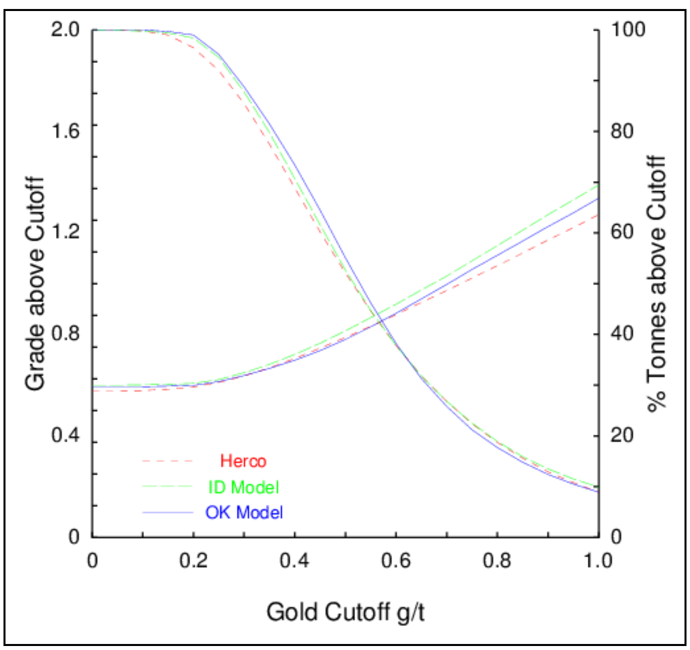
With this method, the distribution of the hypothetical block grades can be directly compared to the estimated (OK) model through the use of pseudo-grade/tonnage curves. Adjustments are made to the block model interpolation parameters until an acceptable match is made with the Herco distribution. In general, the estimated model should be slightly higher in tonnage and slightly lower in grade when compared to the Herco distribution at the projected cut-off grade. These differences account for selectivity and other potential ore-handling issues which commonly occur during mining.

The Herco distribution is derived from the declustered composite grades which have been adjusted to account for the change in support, going from smaller drill hole composite samples to the large blocks in the model. The transformation results in a less skewed distribution but with the same mean as the original declustered samples.

The Herco analysis was conducted on the distribution of gold, copper, silver and molybdenum in the block model and level of correspondence was achieved in all cases.

An example showing the distribution of the gold model is shown in Figure 14-8.

Figure 14-8: Herco Grade/Tonnage Plot for Gold Models



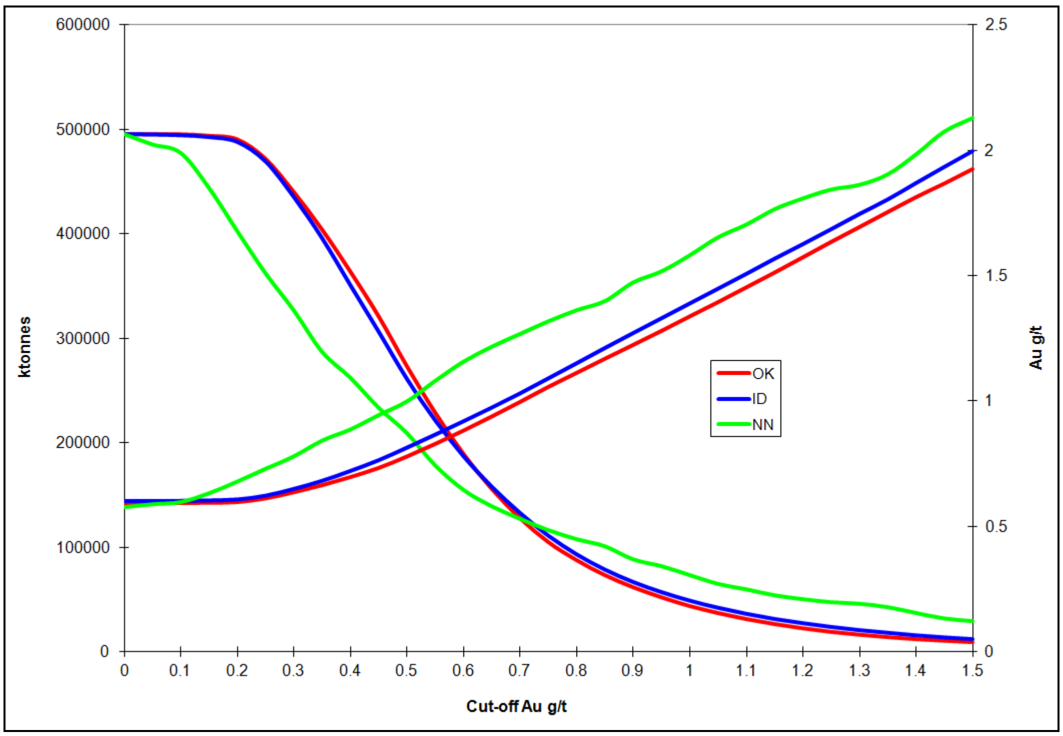
Source: Sim Geological, 2017

14.12.3 Comparison of Interpolation Methods

For comparison purposes, additional models for gold, copper, silver and molybdenum were generated using both the inverse distance weighted (IDW) and nearest neighbour (NN) interpolation methods (the NN model was generated using data composited to 10 m intervals).

Comparisons are made between these models on grade/tonnage curves. An example of the grade/tonnage curves for gold is shown in Figure 14-9. There is good correlation between the OK and ID models throughout the range of cut-off grades. The NN distribution, generally showing less tonnage and higher grade, is the result of the absence of smoothing in this modelling approach. Similar results were achieved with the copper, silver and molybdenum models. Reproduction of the model using different methods tends to increase the confidence in the overall resource.

Figure 14-9: Grade/Tonnage Comparison of Gold Models



Source: Sim Geological, 2017

14.12.4 Swath Plots (Drift Analysis)

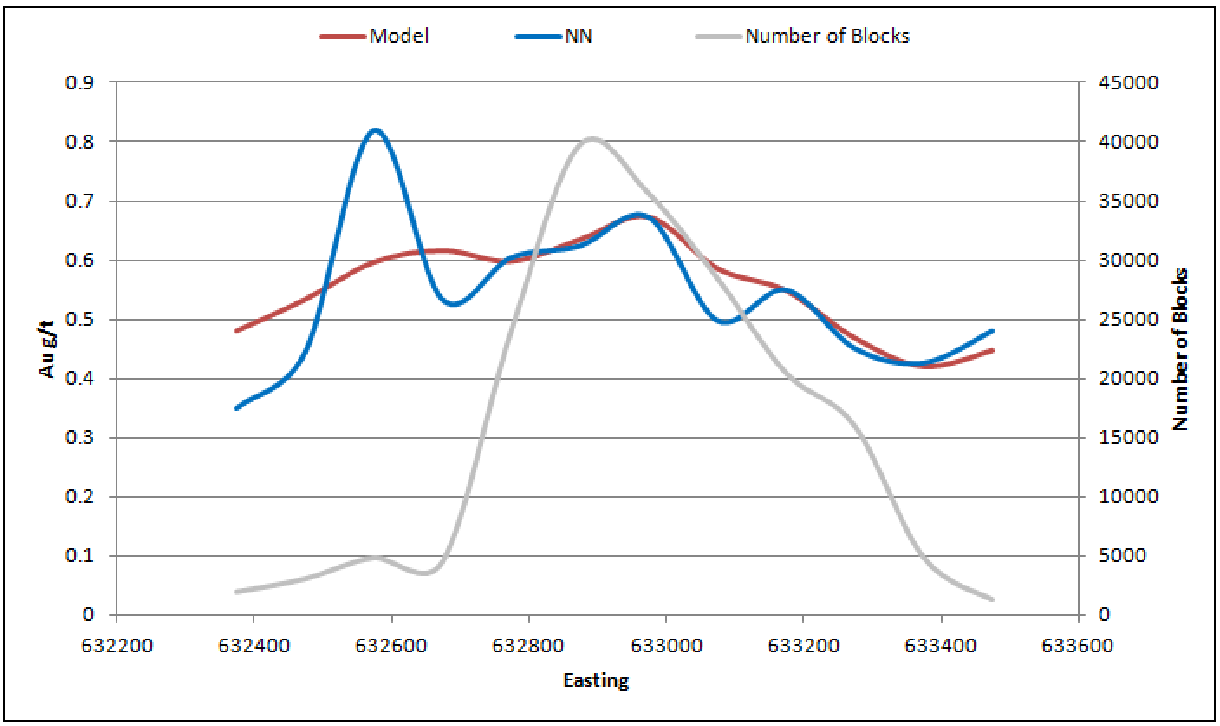
A swath plot is a graphical display of the grade distribution derived from a series of bands, or swaths, generated in several directions through the deposit. Grade variations from the OK model are compared using the swath plot to the distribution derived from the declustered (NN) grade model.

On a local scale, the NN model does not provide reliable estimations of grade, but, on a much larger scale, it represents an unbiased estimation of the grade distribution based on the underlying data. Therefore, if the OK model is unbiased, the grade trends may show local fluctuations on a swath plot, but the overall trend should be similar to the NN distribution of grade.

Swath plots have been generated in three orthogonal directions for all models. An example of the gold distribution in north-south swaths is shown in Figure 14-10.

There is good correspondence between the models in most areas. The degree of smoothing in the OK model is evident in the peaks and valleys shown in the swath plots. Areas where there are large differences between the models tend to be the result of "edge" effects, where there is less available data to support a comparison. Note that the majority of the resource occurs between 632800E and 633400E. The validation results indicate that the OK model is a reasonable reflection of the underlying sample data.

Figure 14-10: Swath Plot of Gold OK and NN Models by Easting



Source: Sim Geological, 2017

14.13 Resource Classification

The mineral resources for the Cangrejos deposit were classified in accordance with the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May, 2014). The classification parameters are defined relative to the distance between gold sample data and are intended to encompass zones of reasonably continuous mineralization that exhibit the desired degree of confidence. These parameters are based on visual observations and statistical studies. Classification parameters are based primarily on the nature of the distribution of gold data as it is the main contributor to the relative value of this polymetallic deposit.

Resources in the indicated category include relatively large volumes that show consistent zones of mineralization and are delineated with drilling spaced at 100 m intervals. There are areas of the deposit where drill holes are spaced at 100 m intervals, but these tend to be clustered and, therefore, do not exhibit the continuity required for resources in this category. At this stage of project evaluation, there are no mineral resources included in the indicated (or measured) categories.

The following criteria were used to define resources in the inferred category.

Inferred Mineral Resources

Mineral resources in this category include model blocks that are located within a maximum distance of 150 m from a drill hole.

A domain has been interpreted that encompasses model blocks that are included in the inferred category. This step ensures consistency of classification across the deposit. Some drill holes have been terminated in appreciable mineralization, and there are many instances where the lateral extents of mineralization have not been defined with current drilling. In these instances, the lateral extents of mineralization have been manually truncated at 100 m from drilling, and the depth extent of inferred resources is limited to 50 m vertically below drill holes.

14.14 Mineral Resources

CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May, 2014) define a mineral resource as:

“[A] concentration or occurrence of solid material of economic interest, in or on the Earth’s crust in such form, grade or quality and quantity, that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.”

The “reasonable prospects for eventual economic extraction” requirement generally implies that quantity and grade estimates meet certain economic thresholds and that mineral resources are reported at an appropriate cut-off grade that takes into account extraction scenarios and processing recovery.

The economic viability of the resource was tested by constraining it within a floating cone pit shell; the pit shell was generated using the following projected economic and technical parameters:

- Mining (open pit) $3.00/t
- Processing $11.00/t
- G&A $2.00/t

• Gold price	\$1,300/oz
• Silver price	\$18.00/oz
• Copper price	\$3.00/lb
• Molybdenum price	\$8.00/lb
• Gold process recovery	83%
• Silver process recovery	60%
• Copper process recovery	82%
• Molybdenum process recovery	65%
• Pit slope	45 degrees
• Density	2.7 t/m^3

Based on the metal prices and recoveries listed here, recoverable gold equivalent (AuEqR) grades are calculated using the following formula:

AuEqR = (Au g/t∗0.83) + (Ag g/t∗0.60∗0.0138) + (Cu%∗0.82∗1.580) + (Mo ppm/10,000∗0.65∗4.219)

The pit shell is generated using a floating cone algorithm based on the recoverable gold equivalent block grades. There are no adjustments for mining recoveries or dilution. This test indicates that some of the deeper mineralization may not be economic due to the increased waste stripping requirements. It is important to recognize that these discussions of surface mining parameters are used solely to test the “reasonable prospects for eventual economic extraction,” and do not represent an attempt to estimate mineral reserves. There are no mineral reserves calculated for the project. These preliminary evaluations are used to prepare a Mineral Resource Statement and to select appropriate reporting assumptions.

The estimate of inferred mineral resources, contained within the \$1,300/oz Au pit shell, is presented in Table 14.7. Based on the assumed metal prices and operating costs, and using a formula similar to the one shown here, but excluding the metallurgical recovery factors, the base case cut-off grade for mineral resources is estimated to be 0.35 g/t gold equivalent (AuEq). The total in-pit tonnage, including ore and waste, is 886.5M tonnes. The distribution of the base case mineral resource within the \$1,300/oz Au pit shell is shown from a series of isometric viewpoints in Figure 14-11.

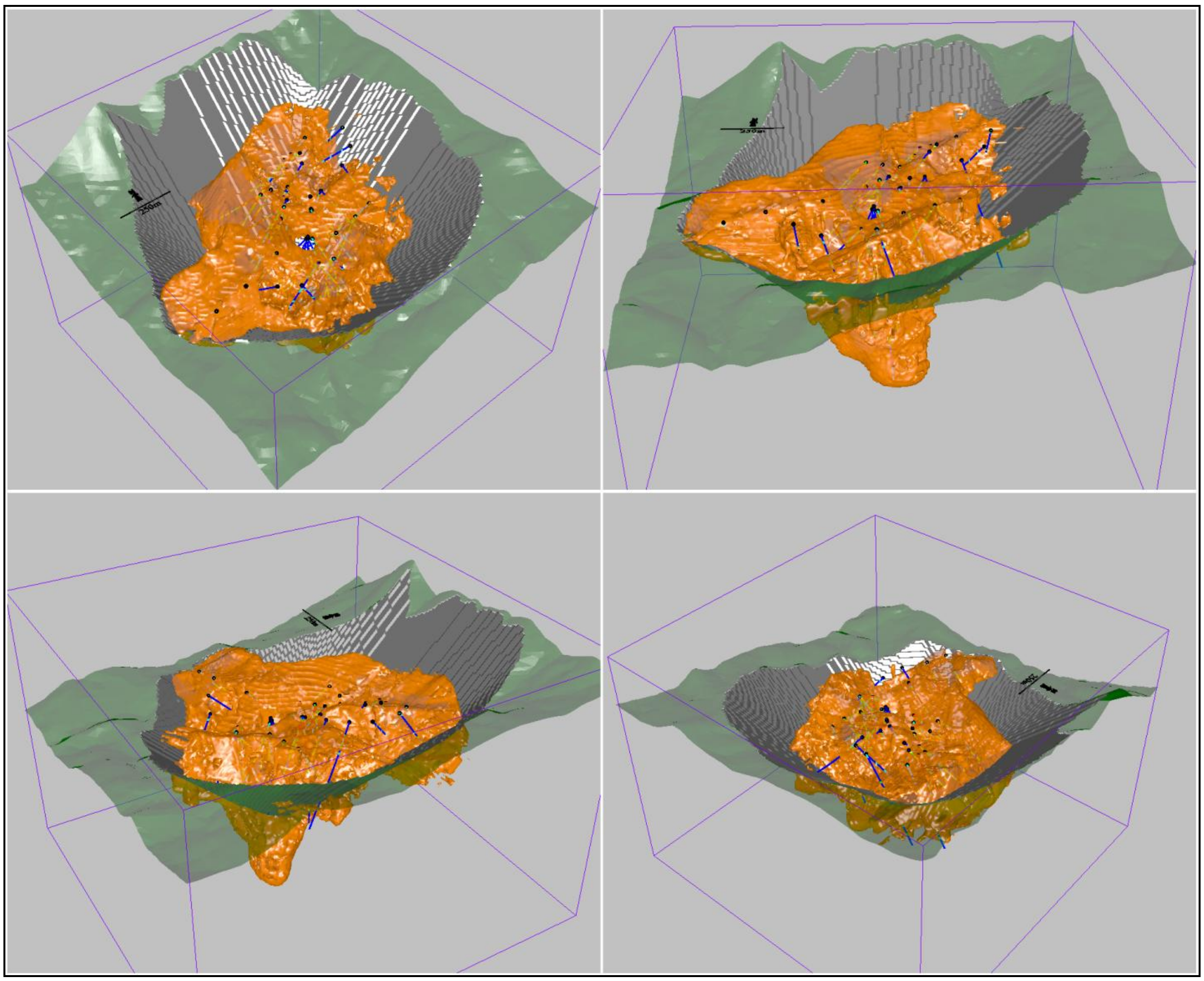
There are no known factors related to environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant factors which could materially affect the mineral resource. Resources in the inferred category have a lower level of confidence than that applied to indicated resources, and, although there is sufficient evidence to imply geologic grade and continuity, these characteristics cannot be verified based on the current data. It is reasonably expected that the majority of inferred mineral resources could be upgraded to indicated mineral resources with continued exploration.

Table 14.7: Estimate of Inferred Mineral Resource

Mtonnes	Average Grade					Contained Metal			
	AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
422.7	0.85	0.65	0.11	0.6	24.8	8.8	1,053	8.2	23

Note: The estimates in the above table are limited inside the $1,300/oz Au pit shell. The base case cut-off grade is 0.35 g/t gold equivalent. Mineral resources are not mineral reserves because the economic viability has not been demonstrated.

Figure 14-11: Isometric Views of Base Case Inferred Mineral Resource



Source: Sim Geological, 2017

14.15 Sensitivity of Mineral Resources

The sensitivity of mineral resources, contained within the $1,300/oz Au pit shell, is demonstrated by listing resources at a series of cut-off thresholds as shown in Table 14.8.

Table 14.8: Sensitivity of Inferred Mineral Resource to Cut-off Grade

Cut-Off AuEq (g/t)	Mtonnes	Average Grade					Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	537.5	0.71	0.55	0.10	0.6	22.4	9.5	1126	10.2	27
0.2	483.0	0.78	0.60	0.10	0.6	23.3	9.2	1097	9.3	25
0.25	458.6	0.81	0.62	0.11	0.6	23.7	9.1	1082	8.8	24
0.3	441.0	0.83	0.63	0.11	0.6	24.3	9.0	1069	8.5	24
0.35	**422.7**	**0.85**	**0.65**	**0.11**	**0.6**	**24.8**	**8.8**	**1053**	**8.2**	**23**
0.4	404.1	0.87	0.67	0.12	0.6	25.2	8.7	1042	7.9	22
0.45	381.9	0.90	0.69	0.12	0.6	25.6	8.4	1010	7.5	22
0.5	357.1	0.93	0.71	0.12	0.6	26.1	8.1	976	7.1	21
0.55	330.3	0.96	0.73	0.13	0.6	26.6	7.8	939	6.8	19
0.6	301.7	0.99	0.76	0.13	0.7	27.2	7.4	891	6.3	18

Note: The estimates in the above table are limited inside the $1,300/oz Au pit shell. The base case cut-off grade used is 0.35 g/t gold equivalent. Mineral resources are not mineral reserves because the economic viability has not been demonstrated.

14.16 Comparison with the Previous Estimate of Mineral Resources

Table 14.9: Comparison of Inferred Mineral Resources

Date	Mtonnes	Average Grade					Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Jan2017	191.8	0.81	0.64	0.10	0.8	31.2	4.0	440	4.6	13
Oct2017	422.7	0.85	0.65	0.11	0.6	24.8	8.8	1053	8.2	23

Note: The base case cut-off grade used is 0.35 g/t gold equivalent. Mineral resources are not mineral reserves because the economic viability has not been demonstrated.

Compared to the previous resource estimate, the tonnage and contained gold have more than doubled as shown in Table 14.9. New drilling completed in 2017 has encountered additional high-grade gold and copper mineralization at depth, and, as a result, the resource limiting pit shell extends to depths exceeding 600 m below surface, some 300 m deeper than the previous resource pit shell. The reduction in average silver and molybdenum grades is, in part, due to the assignment of default low-grade values where sample data is missing.

14.17 Summary and Conclusions

Based on the current level of exploration, the Cangrejos deposit contains an inferred mineral resource of 423 million tonnes at a grade of 0.65 g/t Au, 0.11% Cu, 0.6 g/t Ag and 25 ppm Mo containing 8.8 Moz Au, 8.2 Moz Ag, 1,053 Mlbs Cu and 23 Mlbs Mo.

The Cangrejos deposit remains open to the north, south, west and at depth.

15 MINERAL RESERVES

At present, there are no mineral reserve estimates for the Cangrejos Project.

16 MINING METHODS

This section is not applicable.

17 RECOVERY METHODS

This section is not applicable.

18 PROJECT INFRASTRUCTURE

This section is not applicable.

19 MARKET STUDIES AND CONTRACTS

This section is not applicable.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

Lumina has the necessary permits to conduct the drill programs. Baseline environmental studies are ongoing, and discussions have been initiated with the local communities and government agencies. Refer to Section 4.3 (Environmental Regulations and Permitting) of this Technical Report for additional information.

21 CAPITAL AND OPERATING COSTS

This section is not applicable.

22 ECONOMIC ANALYSIS

This section is not applicable.

23 ADJACENT PROPERTIES

Although there are several gold showings and small mines in the area, none have any published reserves.

24 OTHER RELEVANT DATA

There is no other relevant data or information.

25 INTERPRETATION AND CONCLUSIONS

Based on the evaluation of the data available from the Cangrejos Project, the authors of this Technical Report have drawn the following conclusions:

- At the effective date of this Technical Report (November 6, 2017), Lumina holds a 100% interest in the Cangrejos property.
- The Cangrejos deposit forms a relatively continuous zone of gold-copper-silver-molybdenum, porphyry-style mineralization associated with a sequence of breccias and porphyritic quartz diorite intrusions. The zone extends for approximately 1,000 m in a northeasterly direction, has widths ranging from 70 m to 600 m, and has been defined to a depth of at least 600 m below surface.
- Deep drilling in the centre of the zone defined a higher grade Au-Cu zone associated with magnetite-rich breccias and calcic-sodic alteration. The Cangrejos mineralization remains open to the north, south, west, and at depth.
- Drilling to date has outlined an inferred mineral resource estimate (at a 0.35 g/t AuEq cut-off) of 423 Mtonnes at 0.65 g/t Au, 0.11% Cu, 0.6 g/t Ag and 24.8 ppm Mo which contains 8.8 million ounces of gold, 8.2 million ounces of silver, 1,053 Mlbs of copper and 23 Mlbs of molybdenum (Lumina, November 2017).
- Preliminary metallurgical work indicates that the mineralization can be processed using conventional methods.
- Historic drill testing of the Gran Bestia gold-copper soil anomaly, located 1.2 km northwest of the Cangrejos Zone, discovered another zone of porphyry-style mineralization.
- There are no known factors related to metallurgical, environmental, permitting, legal, title, taxation, socio-economic, marketing or political issues which could materially affect the mineral resource estimates.

26 RECOMMENDATIONS

The following work is recommended for this project:

- Proceed with a preliminary economic assessment (PEA) of the Cangrejos Project. The budget for this study is estimated at $1.0 million.
- Conduct additional drilling (12,000 m) to further assess the strike and depth extents of the Cangrejos Zone. The budget for this work is estimated at $3.6 million.
- Conduct additional drill testing of the Gran Bestia Zone (2,000 m). The budget for this work is estimated at $600,000.

27 REFERENCES

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28 DATE AND SIGNATURE PAGES

CERTIFICATE OF QUALIFIED PERSON
Bruce M. Davis, FAusIMM, BD Resource Consulting, Inc.

I, Bruce M. Davis, FAusIMM, do hereby certify that:

1. I am an independent consultant of BD Resource Consulting Inc., and have an address at 4253 Cheyenne Drive, Larkspur, Colorado USA 80118.
2. I graduated from the University of Wyoming with a Doctor of Philosophy (Geostatistics) in 1978.
3. I am a Fellow of the Australasian Institute of Mining and Metallurgy, Number 211185.
4. I have practiced my profession continuously for 38 years and have been involved in mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 11 and 12 and portions of Sections 1, 2, 3, 14, 25, and 26 of the technical report titled *Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report*, dated December 15, 2017, with an effective date of November 6, 2017 (the “Technical Report”).
7. I have not visited the Cangrejos Project.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of a previous Technical Report titled “Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report” dated January 25, 2017 (execution date March 6, 2017).
10. I have read NI 43-101, Form 43-101F1 Technical Report (“Form 43-101F1) and the Technical Report and confirm the portions of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 15th day of December, 2017.

“original signed and sealed”

Bruce M. Davis, FAusIMM

CERTIFICATE OF QUALIFIED PERSON
Robert Sim, P.Geo, SIM Geological Inc.

I, Robert Sim, P.Geo, do hereby certify that:

1. I am an independent consultant of: SIM Geological Inc. and have an address at 508–1950 Robson Street, Vancouver, British Columbia, Canada V6E 1E8.
2. I graduated from Lakehead University with an Honours Bachelor of Science (Geology) in 1984.
3. I am a member, in good standing, of Engineers and Geoscientists British Columbia, Licence Number 24076.
4. I have practiced my profession continuously for 33 years and have been involved in mineral exploration, mine site geology and operations, mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of the technical report titled "Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report" dated December 15, 2017, with an effective date of November 6, 2017 (the "Technical Report").
7. I visited the Cangrejos Project from November 28 to 29, 2017.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of a previous Technical Report titled "Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report" dated January 25, 2017 (execution date March 6, 2017).
10. I have read NI 43-101, Form 43-101F1 Technical Report ("Form 43-101F1") and the Technical Report and confirm the portions of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 15th day of December, 2017.

"original signed and sealed"

Robert Sim, P.Geo.