

**AURCANA CORPORATION**

**TECHNICAL REPORT ON THE  
LA NEGRA MINE PROJECT  
QUERETARO, MÉXICO**

**MACONÍ, MUNICIPALITY OF  
CADEREYTA DE MONTES, QRO**

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## 1.0 SUMMARY

Aurcana Corporation (Aurcana) owns a controlling interest in Minera La Negra, S.A de C.V. (MLN), a Mexican Corporation that owns and operates the La Negra silver-copper-lead-zinc mine. Aurcana retained Behre Dolbear & Company (USA), Inc. (Behre Dolbear) to estimate mineral resources at Mina La Negra and prepare a Technical Report in compliance with Canadian National Instrument (NI) 43-101 Standards of Disclosure of Mineral Projects. This estimate and report are by Baltazar Solano-Rico, Geol. Eng., Betty Gibbs, E.M., and Robert Cameron, Ph.D., qualified persons in accordance with NI 43-101.

Aurcana Corp. through Minera La Negra, S.A. de C.V. is concessionaire of 9 Titled Mining Concessions covering a total of 4,285.5032 hectares. According to MLN and the information revised by the authors, all claims are in force and free of any liens and encumbrances.

The La Negra Mine is located in the Maconí Mining District, in the State of Querétaro, México, 96 kilometers (km) east-northeast of the State Capital, Querétaro City, and approximately 161 km north-northwest of México City. Coordinates of the location monument of the La Negra Mining claim near the center of the known mineralized area, is at 20°50.1'N latitude and 99°30.9'W longitude (UTM 14Q 2,303,948 m North – 426,443 m East). The property is in the Sierra Gorda, a rugged terrain within the Sierra Madre Oriental, with elevations ranging from 1,900 meters above mean sea level (masl) and 2,700 masl.

Access from Queretaro, State Capital is by a system of paved highways and secondary roads to Maconí, a road distance of 173 km for a drive of approximately 2 hours. From the town of Maconí, there is a 4 km-long gravel road to the plant and office facilities. Aurcana Corp. through Minera La Negra, S.A. de C.V. is the owner of 10 Mining Concessions covering a total of 4,285.5032 hectares.

In 2006, Aurcana Corp. acquired rights to La Negra from Industrias Peñoles, S.A.B. de C.V. (Peñoles) for roughly CAN\$6.0 million with CAN\$3.0 million paid in cash in May 2006 with up to CAN\$3.0 million in work commitments to get the mine in operation. According to Aurcana information, the property is subject to a 2.8% Net Smelter Royalty payable on all concentrates (copper, lead, and zinc) produced by the La Negra operation. No back-in rights or other agreements and encumbrances are known to exist. Capital commitments included the refurbishment of the original Peñoles 800 tonnes per day (tpd) mill and upgrade to 1,000 tpd capacity. By June 2010, it had been expanded to 1,500 tpd and by April 2012 to 2,200 tpd.

Important project-related infrastructure includes a flotation process plant that currently operates at a rate of 2,200 tpd for the production of lead, zinc, and copper concentrates; and 5 tailings dams of which 1 tailings dam is currently operating. Water is obtained from sources underground in the mine and recycled from the tailings dam facilities. Electrical power is obtained from CFE's national grid from the Vizarrón sub-station through a 34 kilovolt (kV) line to the mine facilities.

La Negra is located near the southwestern edge of the Sierra Madre Oriental Mesozoic Foldbelt of Central México within the Cretaceous El Doctor Formation, carbonate unit deposited on a submarine platform environment. Eocene calc-alkaline intrusive rocks intrude the El Doctor Formation and are central to polymetallic skarn mineralization deposit types, such as at La Negra.

Mineralization occurs preferentially near the external edge of a contact zone of metasomatic alteration along a northeast-trending, suite of intrusive dikes and stocks of diorite composition within medium to thick-bedded limestone of the El Doctor Formation. Two northwest trends of intrusive dikes, stocks, and

mineralization have been identified and designated the Maravillas-Bicentenario and San Pedro-Difícultad-Virginia Blanca trends.

Silver and base metal mineralization at La Negra is closely associated with skarn deposits in a number of manto, chimney, vein, and breccia deposits. Mineralization at La Negra may be massive to disseminated in nature and locally complexly folded and irregular. Sulphide minerals of economic interest include galena, sphalerite (the iron-rich variety known as marmatite), chalcopyrite, and at least one silver-carrying mineral, hessite (silver-tellurium sulphosalt mineral). Accessory minerals include andradite-grossularite garnet, hedenbergite, calcite, and quartz with varying amounts of pyrite and pyrrhotite. There seems to be a close association between galena and the hessite, such that silver values report to the lead concentrates.

More than 20 different deposits have been discovered at La Negra, some of the deposits coalesce to form individual bodies. Mantoes and chimneys have comprised the bulk of silver, lead, zinc, and copper mineralization. The deposits include some chimneys that replace beds of La Negra limestone facies. These mantoes vary in size and range from 40 meters to 300 meters in length and from 0.50 meters to 40 meters thick. Vein deposits vary from 80 meters to 120 meters in length, between 10 meters to 60 meters depth, and width from 0.50 meters to 1.20 meters.

Currently, MLN operates a conventional milling and flotation plant capable of operating at 2,200 tpd, producing zinc, lead, and copper concentrates. MLN also operates its own laboratory with well-equipped assay and metallurgical research facilities. The La Negra deposits contain 4 primary marketable metals. Silver is the key metal although the other metals contribute substantially. From January to May 2012, approximately 244,000 tonnes were milled and produced 1,525 tonnes of lead concentrate, 6,259 tonnes of zinc concentrate, and 3,316 tonnes of copper concentrate. Average recoveries for the 5-month period were 84.86% and 81.0% of silver and lead in lead concentrates, respectively; 74.62% of zinc in zinc concentrates; and 70.66% of copper in copper concentrates. These results are considered representative of production at this time.

The mineral resource tonnages and grades were estimated by generating three-dimensional (3D) block models for each deposit.

To consider the contained minerals as a single economic unit, a recovered block value is calculated based on the modeled grade estimates using the metal prices and recoveries shown in Table 1.1.

TABLE 1.1 METAL PRICES AND RECOVERIES USED FOR RECOVERED BLOCK VALUE CALCULATION				
	Silver	Copper	Lead	Zinc
12Q Average Price <sup>1</sup>	\$28.29	\$3.33	\$0.88	\$0.84
Recovery <sup>2</sup>	84.87%	81.02%	74.62%	70.66%

<sup>1</sup>Prices are the averages of the trailing 12-quarter spot prices as of June 30, 2012.  
<sup>2</sup>Recoveries are the average of actual mill recoveries from January through May 2012.

Mineral resource estimates were made in accordance with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) publication “*CIM Definition Standards – for Mineral Resources and Mineral Reserves*” (CIM Definition Standards) prepared by the CIM Standing Committee on Reserve Definitions and adopted by the CIM Council on November 27, 2010 using a recovered block value of US\$40 per tonne as the economic cutoff based on the parameters shown in Table 1.1.

Table 1.2 summarizes the Measured and Indicated Resources and Table 1.3 the Inferred Resources for all deposits at the La Negra Mine Project for all blocks with a minimum recovered value of US\$40 per tonne. The Mineral Resources is inclusive of the current Ore Reserves.

**TABLE 1.2**  
**MEASURED AND INDICATED RESOURCES FOR ALL DEPOSITS AND ALL BLOCKS WITH A MINIMUM RECOVERED VALUE OF US\$40 PER TONNE**  
**(AS OF JUNE 30, 2012)**

<b>Classification</b>	<b>Tonnes (000)</b>	<b>Average</b>				<b>In Situ Metal Quantities (000)</b>			
		<b>Silver (g/t)</b>	<b>Copper (%)</b>	<b>Lead (%)</b>	<b>Zinc %</b>	<b>Silver (oz)</b>	<b>Copper (lb)</b>	<b>Lead (lb)</b>	<b>Zinc (lb)</b>
Measured	11,862	133.42	0.50	0.90	2.60	50,070	130,834	228,825	673,603
Indicated	15,159	130.12	0.41	0.92	2.19	65,026	138,695	310,673	745,060
Measured plus Indicated	<b>27,021</b>	<b>131.31</b>	<b>0.49</b>	<b>0.91</b>	<b>2.36</b>	<b>115,096</b>	<b>269,529</b>	<b>539,498</b>	<b>1,418,664</b>

**TABLE 1.3**  
**INFERRRED RESOURCES ALL BLOCKS WITH A MINIMUM RECOVERED VALUE OF US\$40 PER TONNE**  
**(AS OF JUNE 30, 2012)**

<b>Classification</b>	<b>Tonnes (000)</b>	<b>Average</b>				<b>In Situ Metal Quantities (000)</b>			
		<b>Silver (g/t)</b>	<b>Copper (%)</b>	<b>Lead (%)</b>	<b>Zinc %</b>	<b>Silver (oz)</b>	<b>Copper (lb)</b>	<b>Lead (lb)</b>	<b>Zinc (lb)</b>
Inferred	13,278	126.05	0.42	0.88	2.14	56,501	132,260	263,033	657,370

Currently, Aurcana is mining most of their mill feed from the blocks identified as economic within their Mineral Resource estimate. They determine profitability of a proposed stope based on internally derived economic parameters at the time of stope development. Wardrop Engineering Inc. (Wardrop) published the last CIM standards compatible ore reserve estimate for the La Negra Mine in February 2008 in a technical report titled “*Technical Report on the Mineral Resources and Mineral Reserves of the el Alacrán Deposit of the La Negra Silver, Lead, Zinc, Copper Mine Queretaro, México.*” This report involved estimates of reserves within only the Alacrán deposit. The authors reviewed the Wardrop resource and reserve work, believe it was completed in a manner appropriate for reserve estimation and disclosure pursuant to CIM Definition Standards, and re-estimated the remaining Mineral Reserves at the Alacrán deposit as of March 31, 2013 by deducting the mined out areas. Table 1.4 shows the remaining Proven and Probable Reserves at the Alacrán deposit. The remaining 2008 Wardrop Proven and Probable Reserves are included within the updated Mineral Resources.

TABLE 1.4 REMAINING 2008 WARDROP ALACRÁN MINERAL RESERVES (AS OF MARCH 31, 2013)					
Category	Tonnes (t)	Silver (g/t)	Lead (%)	Zinc (%)	Copper (%)
Proven	114,079	78	0.28	1.47	0.85
Probable	42,747	61	0.21	1.17	0.58
<b>Total</b>	<b>156,826</b>	<b>73</b>	<b>0.26</b>	<b>1.39</b>	<b>0.77</b>

**Note:**  
Remaining 2008 Wardrop Proven and Probable Reserves are included within the Mineral Resources  
Mineral reserve estimates have not been estimated for the newly identified Measured and Indicated resources within the Alacrán deposit or for the other 12 mining areas at the Le Negra Project

Mineral reserve estimates have not been completed for the newly identified Measured and Indicated resources at the Alacrán deposit or for the other 12 mining areas at the Le Negra Project.

Mining at La Negra is conducted using long hole, open stope mining, and room and pillar mining, depending on the morphology, width, and attitude of the mineralization being mined. The mining operations build upon basic mine infrastructure that has been developed through the more than 40 years of history at La Negra. Key features are:

- Four main levels (2100; 2200; 2300; 2400)
- 2000 haulage level
- Two main service shafts (La Negra and El Alacrán)
- Two ramp systems, at surface and underground
- Two main draw shafts to the 2000 level
- Ventilation shafts

Copper, lead, silver, and zinc concentrates produced by MLN are sold under separate contracts.

The authors suggest that the exploration potential at MLN is good. Exploration at La Negra, previously by Peñoles and currently by Aurcana, has replaced and increased the mineralized resources.

The geological exploration model, described in the text, suggests that Carrizal (Zimapán)-type mineralization could be present below the current level of development at La Negra. On the other hand,

the vertical span of mineralization at La Negra is close to 500 meters. Some of the major skarn districts in México, such as Naica and Concepción del Oro, can reach depths to as much as 900 meters. It is concluded that La Negra shows an important exploration potential at depth.

Exploration and development of deposits of this type require extensive direct exploration by means of core drilling, cross cutting, drifting, and development workings.

It is the authors' opinion that an aggressive exploration program is required to continue to keep ahead of production, to assist with mining planning, and to expand the resources and reserves. The recommended 2013 underground exploration program should consist of approximately 15,500 meters of drilling with an estimated budget shown in Table 1.5.

<b>TABLE 1.5</b> <b>2013 UNDERGROUND EXPLORATION BUDGET</b> <b>(15,500 METER DRILLING)</b>		
<b>Item</b>	<b>MX\$</b>	<b>US\$</b>
Wages	7,438,000	611,678
Office Supplies and Materials	732,000	60,197
Drilling Supplies	5,295,000	435,444
Maintenance	2,104,000	173,026
Capital Expenditures	1,800,000	148,026
<b>Total</b>	<b>17,369,000</b>	<b>1,428,372</b>

Currency Conversion – US\$1 = MX\$12.16  
Expenses are primarily incurred in Mexican pesos and the US dollar equivalent value will be subject to the prevailing exchange rate.

## 2.0 INTRODUCTION

### 2.1 GENERAL COMPANY INFORMATION AND SCOPE OF WORK

Aurcana Corporation is a Canadian junior mining company listed on the TSX Venture Exchange, symbol AUN (TSX.V-AUN) and the OTCQX, symbol AUNFF. Based in Vancouver, Canada, the company owns 100% of the Shafter silver mine in Presidio County, Southwest Texas and 99.99% of the Minera Las Negra, S.A de C.V. (MLN), a Mexican Corporation that owns the concession rights for the La Negra silver-copper-lead-zinc mine located in Maconí, Municipality of Cadereyta de Montes, State of Querétaro, México.

Aurcana Corporation, in the person of Mr. Lenic Rodríguez, President and CEO, requested Behre Dolbear & Company (USA), Inc. (Behre Dolbear) to prepare an estimate of the Mineral Resources and a Technical Report in compliance with Canadian National Instrument (NI) 43-101 Standards of Disclosure of Mineral Projects, the Mina La Negra in the State of Querétaro, México. The Mina La Negra (Le Negra Mine) includes the concession of La Negra, La Yegua, Mariana, El Negro, El Patriarca, Diana, Ligia, Macon, Tichi, Aurcana I, Aurcana II, Aurcana III, and El Sol.

The Qualified Person, Mr. Baltazar Solano, M.Sc., carried out the review of:

- 1) The existing database, technical studies undertaken, and historic technical data on the concessions provided by MLN.
- 2) QA/QC protocols and their compliance with NI 43-101 Standards of Disclosure for Mineral Projects.

Mrs. Betty Gibbs, E.M., Qualified Person, carried out the mineral resource estimate and modeling based on the database and geological interpretation provided by MLN.

Dr. Robert Cameron, Ph.D., Qualified Person, carried out an internal review of Mineral Resources and its conformance to CIM definition standards.

According to the proposal presented to Aurcana, the main purpose of this report is twofold.

- 1) To estimate existing Mineral Resources in the La Negra Mine.
- 2) To prepare a Technical Report in accordance to Canadian National Instrument (NI) 43-101 guidelines.

The actual scope of work included the following activities.

- 1) Mineral Resource Estimate Review of Information:
  - Review of geology and mineral deposits, geological model, mineral deposits, mineralization, zoning, and metallurgical implications.
  - Review of mapping systems, plan maps, cross sections, drilling spacing, and continuity of mineralization.
  - Mine geology and sampling review, drilling, sampling, data handling, and QA/QC procedures.
  - Compilation and review of the existing database.

- 2) Mineral Resource Estimate:
  - Review of geological model and geological and mineralization boundaries.
  - Database Review for completeness, integrity, reliability, and database validation.
  - Parameter definition, high grade cutting, definition of grade limits, specific gravity, and cut off definition.
  - Geostatistical analysis and methodology, statistics, variography, grade estimation, kriging, wire frame modeling, of potential mining areas, and volume estimates.
  - Tonnage estimates, classification of resources, and Mineral Resource estimate summary.
- 3) NI 43-101 Technical Report:
  - Mine site visit by the author: mine geology, drill hole QA/QC check sampling and assaying, in an independent, certified laboratory
  - Database compilation, general geology, exploration, sampling, quality control, and general information
  - Mineral Resource estimate
  - NI 43-101 Technical Report

## 2.2 SOURCES OF INFORMATION

For this assignment, an unencumbered, technical review of the known mineral deposits within the La Negra Mine was conducted. The review included the available technical data, geological mapping, and sampling as well as all information generated by the MLN exploration and drilling campaigns of 2006 through 2012; limited information available from the Reyna Mining period, previous activities of Grupo Peñoles (Peñoles), and several papers drawn from previous technical publications. Copies of the MLN exploration and Mineral Resource estimate studies on the properties were made available to the authors.

The technical database provided to the authors and used for the mineral resource estimate, updated as of February 2012, was compiled by MLN from different sources including previous operators and their geological, sampling, and assaying activities.

Detailed sources of information used in this report are included in Section 27.0. A summary list of the main sources follows.

- Minera La Negra, S.A. de C.V., 2011-2012, database and numerous internal reports, PowerPoint® presentations, maps, and cross sections.
- GeoSim Services Inc., 2008, “*Mineral Resource Estimate Monica Deposit, La Negra Mine, Queretaro State, México*”. Report prepared for Aurcana Corporation, by Ronald G. Simpson, P.Geo., March 14, 2008.
- GeoSim Services Inc., 2010, “*Mineral Resource Estimate Maravillas Deposit, La Negra Mine, Queretaro State, México*”. Draft Report prepared for Aurcana Corporation, by Ronald G. Simpson, P.Geo., January 2010.

- Minera La Negra, S.A. de C.V, 2012, Database, various topographic and geologic plan and cross section maps, underground sampling maps, and drill hole log descriptions. Internal unpublished documents of the Geological Department.
- Wardrop Engineering Inc., 2008, Technical Report on the Mineral Resources and Mineral Reserves of the el Alacrán Deposit of the La Negra Silver, Lead, Zinc, Copper Mine Queretaro, México. Report prepared for Aurcana Corporation Inc. & Reyna Mining Engineering, February 2008.

## 2.3 PERSONAL INSPECTION BY QUALIFIED PERSON

The author, Mr. Baltazar Solano, M.Sc., spent 10 days on site in February 2012, March 2012, and April 2012 reviewing:

- The existing database, technical studies, and historic technical data on the concessions provided by MLN.
- Principal geologic characteristics of mineral deposits underground, sampling, diamond drilling, and sample collection procedures as well as core logging, core sampling procedures, and data handling.
- Reviewing the technical database, QA/QC protocols, and the suitability for use of the data units in this report.

The metric system is used throughout this report and the currency used is the United States Dollar (US\$). When units in other systems and other currencies are used, they are identified in the text.

## 2.4 DEFINITIONS AND LIST OF ABBREVIATIONS

Abbreviation	Meaning
\$/t	US\$ per ton
AAS	Atomic Absorption Spectrometry
Ag	Silver
As	Arsenic
CIM	Canadian Institute of Mining Metallurgy and Petroleum
Cu	Copper
Fe	Iron
MLN	Minera La Negra, S.A de C.V.
NSR	Net Smelter Return
Pb	Lead
Peñoles	Grupo Peñoles
QA/QC	Quality Assurance/Quality Control
RMR	Rock Mass Rating
RQD	Rock Quality Data
Sn	Tin
SOP	Standard Operating Procedures
XRF	X-ray Fluorescence
Zn	Zinc

## 2.5 MEASUREMENT UNITS

Abbreviation	Meaning
%	percent
°	Degrees
°C	Degrees Celsius
cm	centimeters
dwt	deadweight tonnes
g	grams
g/cm <sup>3</sup>	grams per cubic centimeter
g/m <sup>3</sup>	grams per cubic meter
g/t	grams per metric tonne
ha	hectares (10,000 square meters)
HP	Horse Power
kg	kilograms
klm <sup>3</sup>	thousands of loose cubic meters
km	kilometers
km <sup>2</sup>	square kilometers
kN	kilo Newtons
k oz	thousand ounces
kW	kilowatts
lb	pound
m <sup>3</sup>	cubic meters
masl	meters above sea level
mm	millimeters
N/m <sup>2</sup>	Newtons per square meter
Mt	Million tonnes
MW	megawatts
oz	Troy ounce
ppm	parts per million
st	short tons
t	tonnes (metric)
tpd	tonnes per day
t/h	tonnes per hour
t/a	tonnes per year
tpd	tonnes per day
CDN\$	Canadian Dollars
US\$	US Dollars
CDN\$/t	Canadian Dollars per tonne
US\$/t	US Dollars per tonne
US\$/st	US Dollars per short ton
wt %	weight percent

### **3.0 RELIANCE ON OTHER EXPERTS**

This report relies heavily on the information produced and provided by Aurcana Corp. and Minera La Negra, S.A de C.V. (MLN) in the form of databases and numerous internal reports, PowerPoint® presentations, maps, and cross sections. Several reports from consultants to MLN were also provided; however, only limited information was found to be of interest from one of the main sources of information, Peñoles, the previous operator of the mine.

The authors have exercised all necessary due care in reviewing the supplied information and believes that the basic assumptions are factual and correct and the interpretations are reasonable.

In regard to the legal title of the mining concessions, the authors were provided with copies of the titles of concession of La Negra, La Yegua, Mariana, El Negro, El Patriarca, Diana, Ligia, Macon, and Tichi and copies of the assessment work maps for the Aurcana I, Aurcana II, Aurcana III, and El Sol mining concession applications recently staked in the State of Querétaro. The authors were also given copy of a letter/certificate of the Mines Public Registry (copy attached in Appendix 1.0) stating La Negra's mining claims validity, tax payments, annual workings report submittal, annual production report submittal, and claim applications pending to be titled, as of October 3, 2011. According to Mexican Mining Legislation, this is the only document that certifies the validity of the claims.

According to discussions with MLN and the information reviewed by the authors, all claims are in force and free of any liens and encumbrances. While the authors believe the information provided by MLN to be correct, they are not qualified to express legal opinion with respect to the property titles, current ownership, and possible encumbrance status, and therefore, disclaim direct responsibility for such titles and status data.

## 4.0 PROPERTY DESCRIPTION AND LOCATION

The Maconí Mining District, in the State of Querétaro, México, is characterized by a cluster of polymetallic deposits (Ag, Pb, Zn, Cu) in limestone replacement, manto, and chimney mineralization. Aurcana Corp. (Aurcana), through its fully owned subsidiary in México, Minera La Negra, S.A. de C.V. (MLN), holds the concession rights of the La Negra Mine.

The mine was discovered and operated by MLN, then part of the Peñoles Industries Group between 1970 and 2000, when the mine was put under care and maintenance due to low metal prices. It has been reported that approximately 6.6 million tonnes (Mt) with an average grade of 169 grams per tonne (g/t) Ag, 1.10% Pb, 2.20% Zn, and 0.48% Cu were mined through this period (Reyna Mining, 2006).

Aurcana Corp., through Minera La Negra, S.A. de C.V., is concessionaire of 10 Titled Mining Concessions covering a total of 4,379.8464 ha in the main subject area.

Currently, Aurcana has the necessary infrastructure and is operating the mine at a rate of 2,200 tonnes per day (tpd) after acquiring the property from Peñoles and implementing a series of expansions from the original capacity of 800 tpd.

### 4.1 PROPERTY LOCATION

La Negra Mine is located near Maconí, Cadereyta Municipality, in the Northeastern part of the State of Querétaro at 96 kilometers (km) east-northeast of the State Capital, Querétaro City and approximately 161 km north-northwest of México City, within the Maconí Mining District and near the border between the states of Querétaro and Hidalgo. Coordinates of the location monument of the La Negra Mining claim near the center of the known mineralized area, are at approximately 20°50.1'N latitude, 99°30.9'W longitude (UTM 14Q 2,303,948 mN – 426,443 mE) between elevations 1,900 mean above sea level (masl) and 2,400 masl in the slopes of the Sierra Gorda on a very steep topography and rugged terrain where 30° slopes are common.

The main access to the mine area is from Querétaro City through the Querétaro-México City Highway 57D to San Juan del Río and passing through Tequisquiapan-Cadereyta-Vizarrón and taking a detour east toward San Joaquín to the paved road to Maconí, for a total of 173 km, an approximate 2 hour drive. From the mine camp at Maconí, there is a gravel road, which is approximately 4 km to the plant and office facilities. Figure 4.1 shows the property location.



Figure 4.1. La Negra Mine location map  
(Microsoft® 2008)

## 4.2 MINERAL TENURE

In 2005, La Negra Mine and facilities were optioned by Reyna Mining S.A. de C.V. (Reyna) through a Letter of Intent (LOI) to acquire 100% from Industrias Peñoles, S.A. de C.V. (Peñoles). The options were later transferred to Aurcana Corp. Aurcana and Reyna signed a LOI under which a joint venture would be formed whereby Aurcana would own 80% interest in La Negra and Reyna the remaining 20%. The purchase from Peñoles included the property, mine, mill, mine camp, infrastructure, permits, and equipment.

In 2006, Aurcana purchased La Negra from Peñoles for roughly CAN\$6.0 million, with CAN\$3.0 million paid in cash in May 2006 with up to CAN\$3.0 million in work commitments to get the mine in operation. Plans called for Reyna Mining and Engineering S.A. de C.V. to refurbish the 800 tpd mill and upgrade it to 1,000 tpd capacity. Concurrently, Reyna would put La Negra's mine infrastructure in good working order (Gold Newsletter, September 2006, Aurcana Corp.). During this period, concessions granted almost doubled the area controlled by MLN.

In 2007, amendments to the original purchase agreement with Peñoles were made to pay the remaining and final payment to Peñoles totaling US\$1.0 million by the issuance of 1,114,631 common shares of the Company.

In August 2009, Aurcana increased its interest ownership of La Negra Mine from the original 80% to 92% and from 92% to 99.86% in February 2012. As a result of a capital restructure of Real de Maconi S.A. de C.V., Real de Maconi holds 99.99% interest (1 share representing a 0.00002% interest is held by a third party) in Minera La Negra S.A. de C.V., which has a 100% interest in the La Negra Mine.

According to Aurcana information, the property is subject to a 2.8% NSR royalty levied on all concentrates (Cu, Pb, Zn) produced by the La Negra operation. No back-in rights or other agreements and encumbrances are known to exist.

## 4.3 MINERAL CONCESSIONS

Aurcana, through Minera La Negra, S.A. de C.V., is concessionaire of 9 Titled Mining Concessions covering a total of 4,285.5032 hectares, as shown in white and blue in Figure 4.2. Mining claims depicted in green are held by others.

Most of these claims were originally staked by the Peñoles Group during their tenure, exploration, development, and mining of the property. Figure 4.3 shows a previous version of Figure 4.2 that depicts the location of the concessions related to the mine infrastructure, mineralization, the 2000 level main access to the mine and the main access road (magenta).

More recently, Aurcana staked the Aurcana I, Aurcana II, Aurcana III, and El Sol claims, covering an extension of 103,170.5021 ha to explore possible targets in the region. The present report makes reference to these areas, for information purposes, but these are not covered nor described in the text and are not part of the same mining concessions. Figure 4.4, Figure 4.5, and Figure 4.6 show the location of these claims.

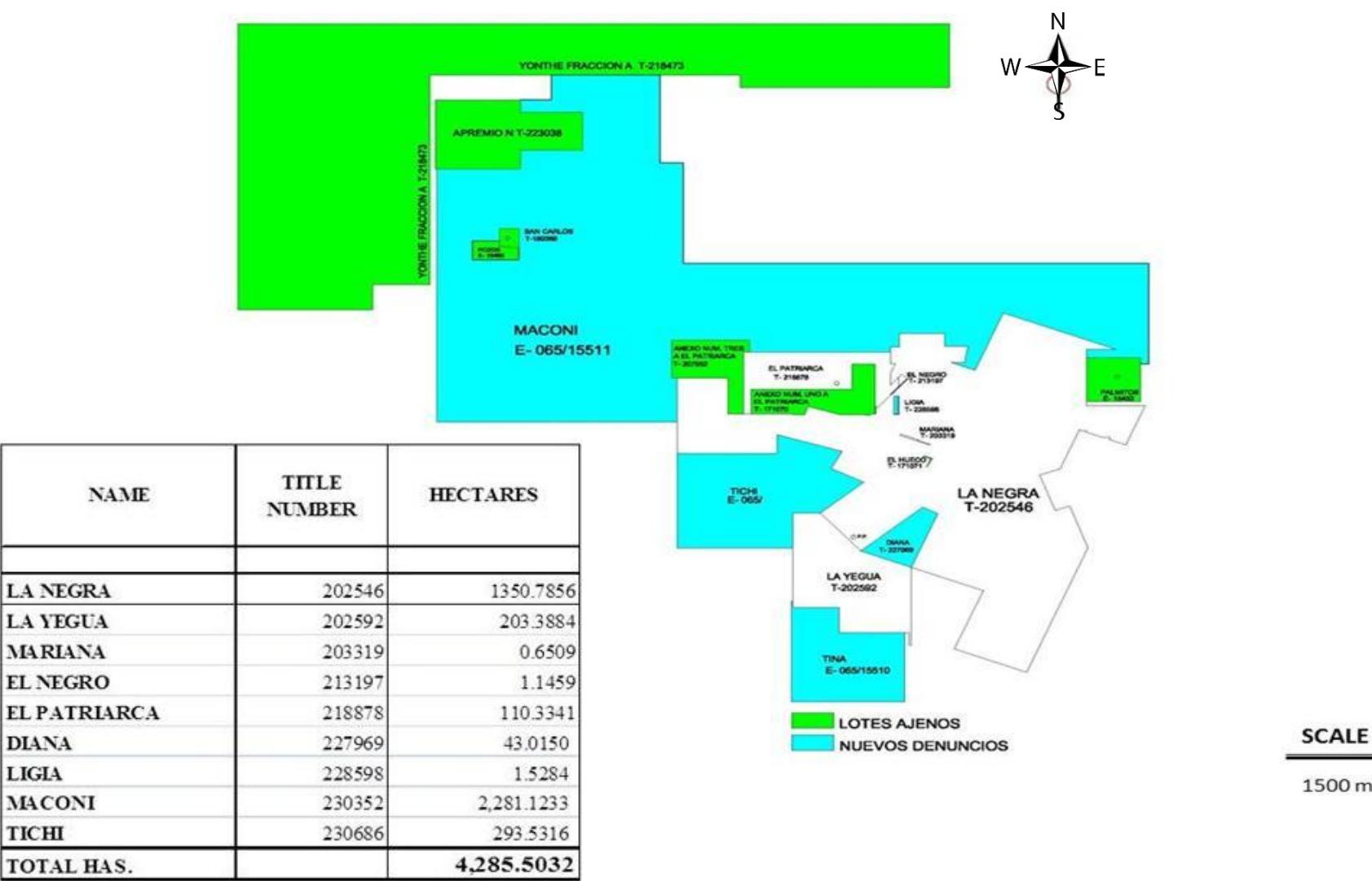


Figure 4.2. Minera La Negra, S.A. de C.V. Mining Concessions in the Maconí District  
 (Auricana/MLN concessions in white and blue, others in green, MLN 2012)

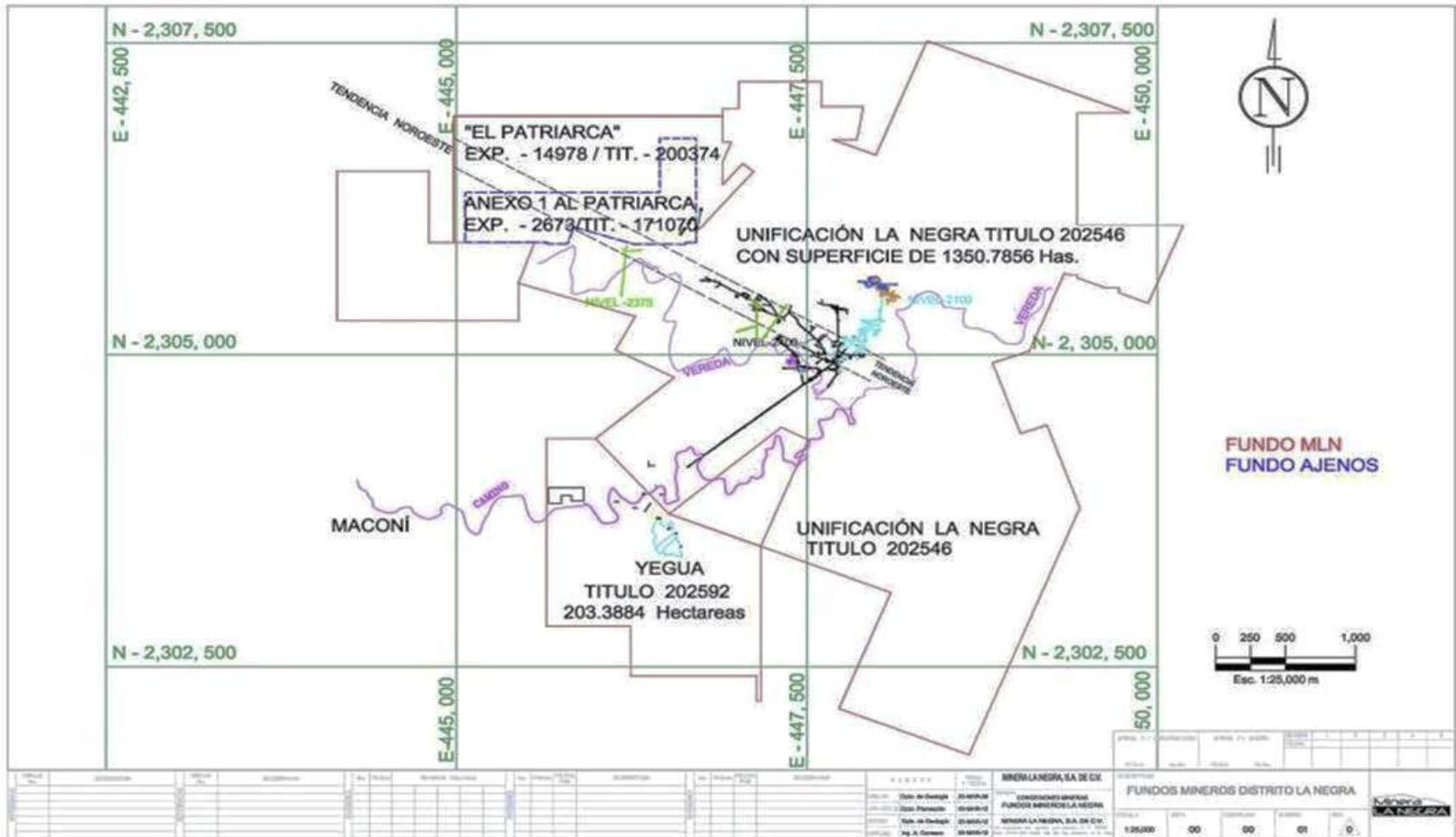


Figure 4.3. La Negra Mine general map showing access road, mine infrastructure, and mining concessions in the Maconí District (MLN, 2012)

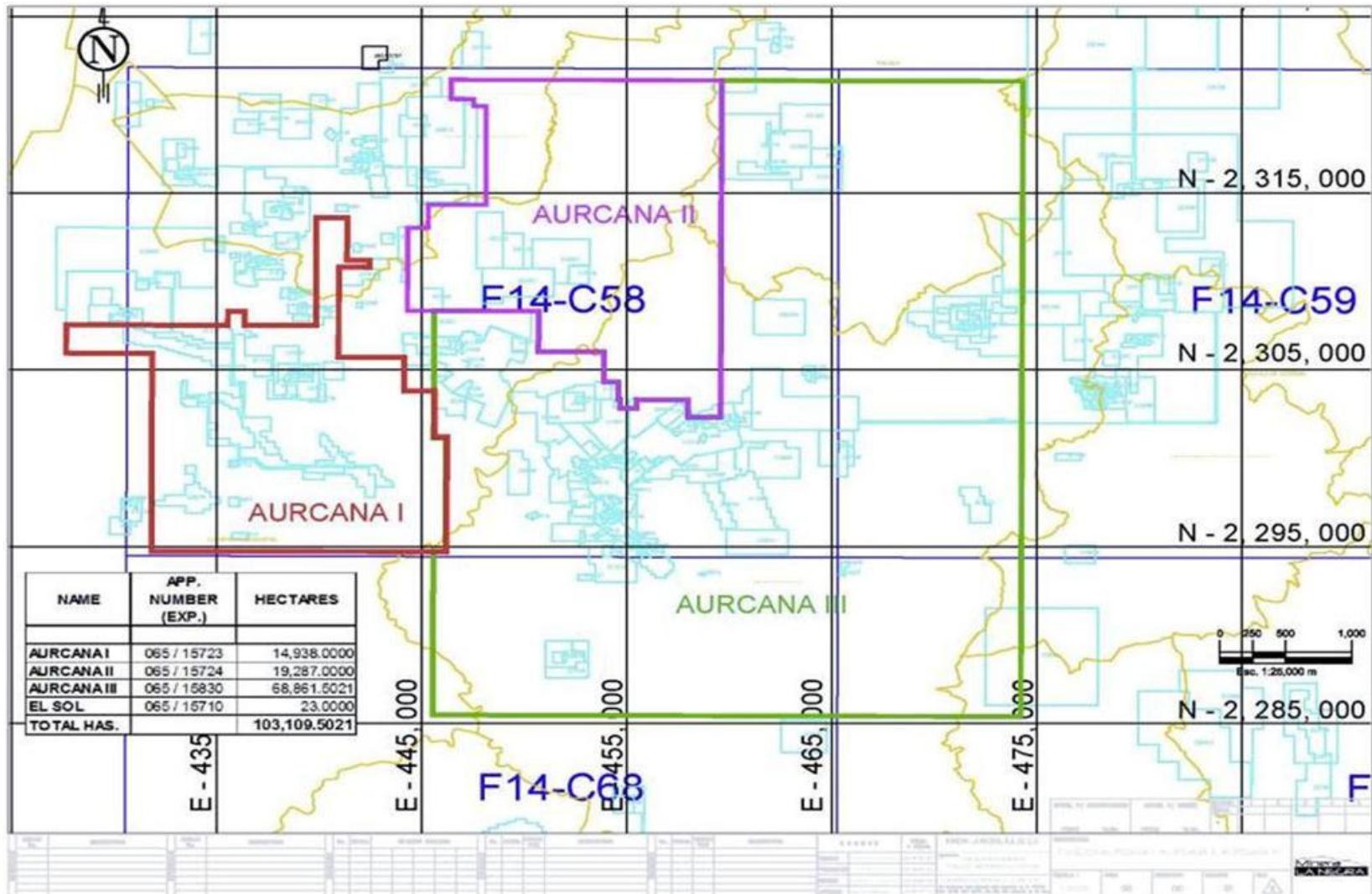


Figure 4.4. Minera La Negra, S.A. de C.V. Mining Applications – Aurcana I and Aurcana II (MLN, 2012)

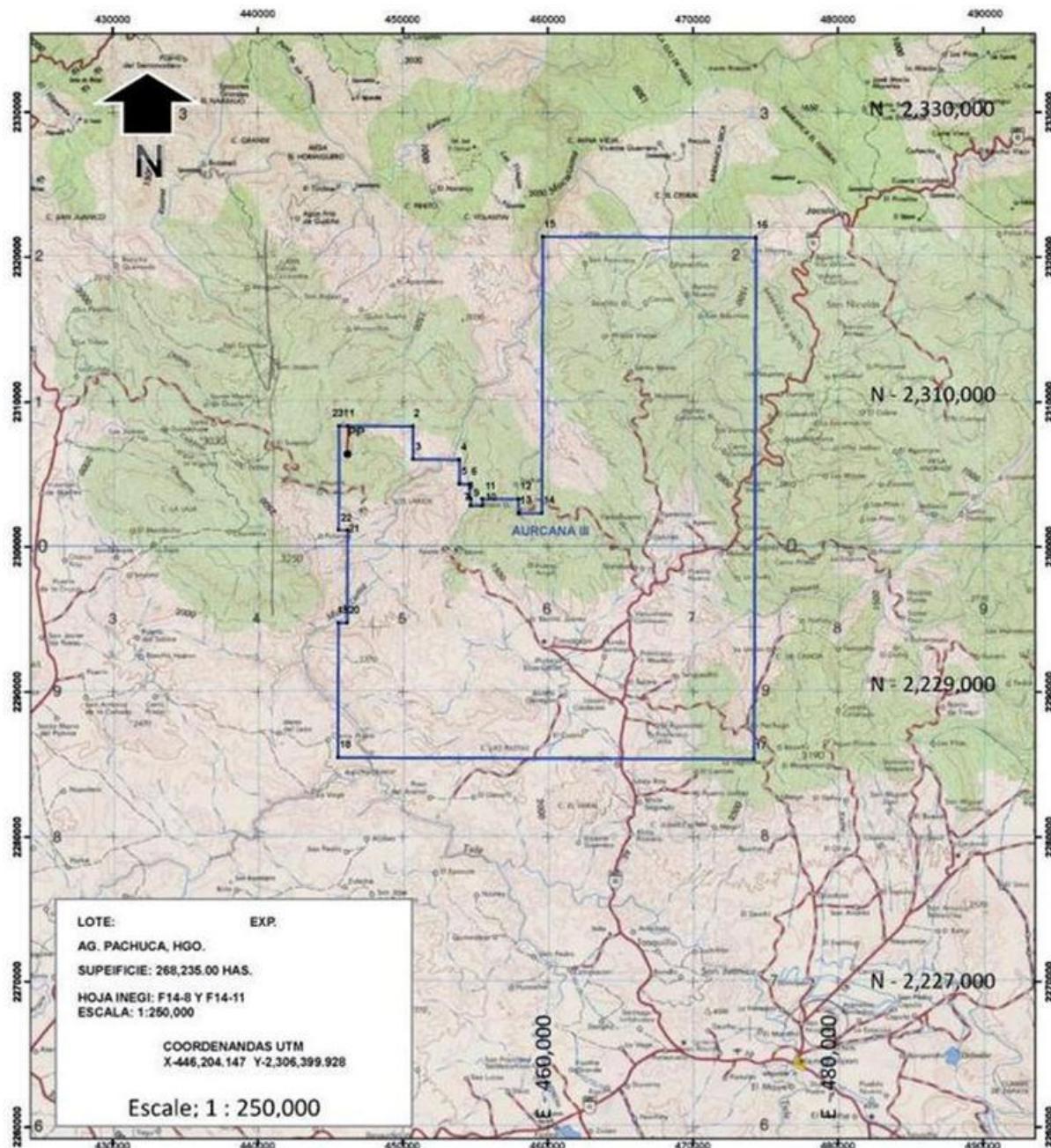
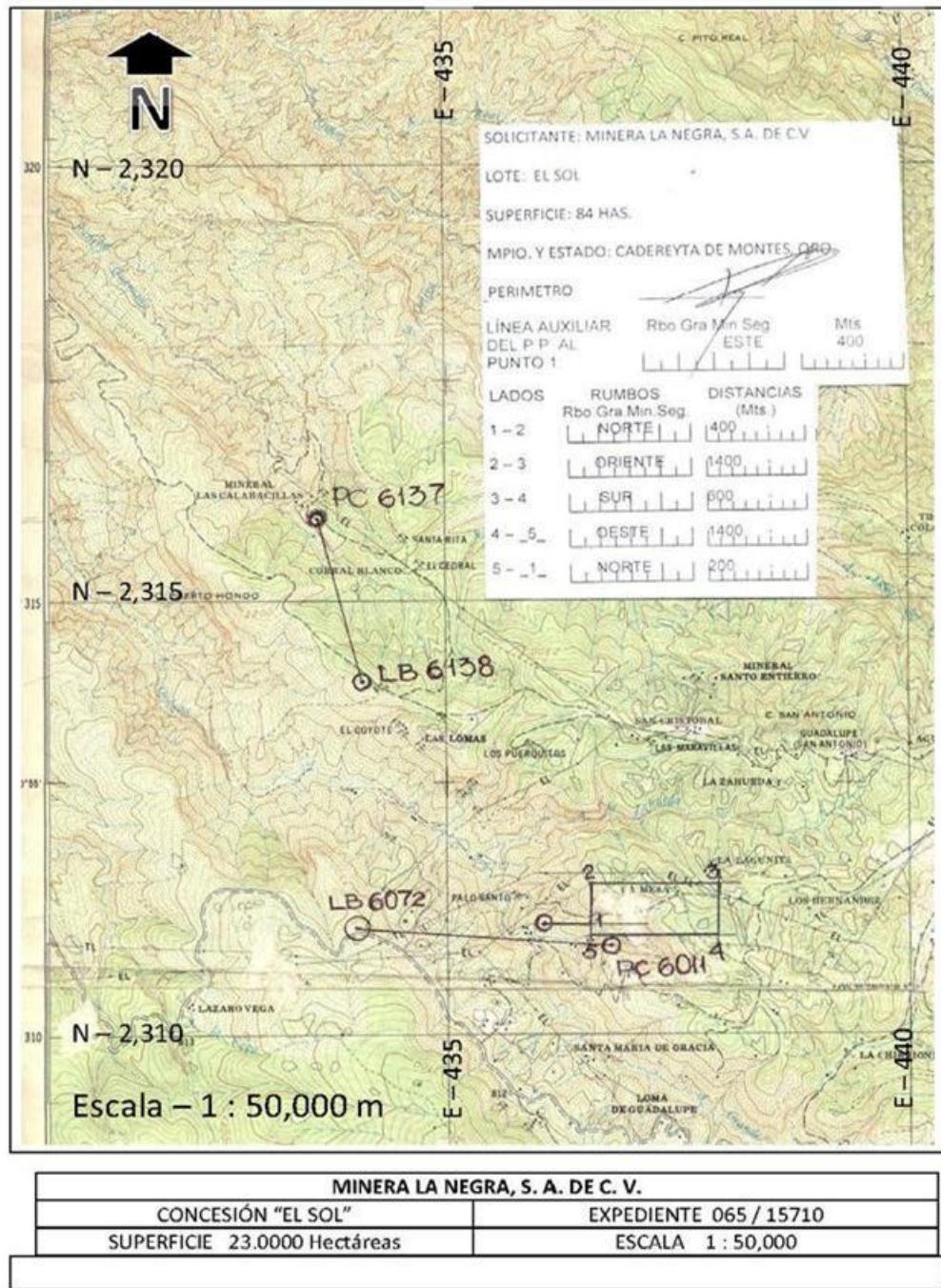


Figure 4.5. Minera La Negra, S.A. de C.V. Aurcana III Mining Concession application (MLN, 2012)



**Figure 4.6. Minera La Negra, S.A. de C.V. El Sol Mining Concession application (MLN, 2012)**

Table 4.1 and Table 4.2 shows general information on the mining concessions including concession name, area (hectares), title granting date, title number, concession granted to, actual owner, type of concession, expiration date, and mining rights (taxes).

TABLE 4.1 MINERA LA NEGRA S.A. DE C.V. (LA NEGRA MINE) MINING RIGHTS AND OBLIGATIONS (VALID MINING CONCESSIONS AND TAX PAYMENTS)							
Name	Title Number	Hectares	Title Granting Date	Granted To	Expiration Date	Mining Rights (Taxes) First Semester 2012	Observations
Aurcana I Frac 1	240734	13,814.0786	06/28/2012	MLNSACV	06/27/2062		
Aurcana I Frac 2	240735	100.1958	06/28/2012	MLNSACV	06/27/2062		
Aurcana I Frac 3	240736	32.2478	06/28/2012	MLNSACV	06/27/2062		
Aurcana II	240737	19,055.9830	06/28/2012	MLNSACV	06/27/2062		
El Sol	238741	20.6454	10/18/2011	MLNSACV	10/17/2061		
La Negra	202546	1,350.7856	12/01/1995	MCSACV <sup>1</sup>	12/19/2032	Paid	Concession Group Head
La Yegua	202592	203.3885	12/08/1995	MCSACV <sup>1</sup>	12/07/2045	Paid	Grouped to 202546
Mariana	203319	0.6509	06/28/1996	MCSACV <sup>1</sup>	06/27/2046	Paid	Grouped to 202546
El Negro	213197	1.1459	03/30/2001	MLNSACV <sup>2</sup>	03/29/2051	Paid	Grouped to 202546
El Patriarca	218878	110.3341	01/23/2003	MLNSACV <sup>2</sup>	01/22/2053	Paid	Grouped to 202546
Diana	227969	43.0150	09/20/2056	MLNSACV <sup>2</sup>	09/19/2056	Paid	Grouped to 202546
Ligia	228598	1.5284	12/12/2006	MLNSACV <sup>2</sup>	11/12/2056	Paid	Grouped to 202546
Maconi	230352	2,281.1233	08/17/2057	MLNSACV <sup>2</sup>	08/16/2057	Paid	Grouped to 202546
Tichi	230686	293.5316	03/10/2007	MLNSACV <sup>2</sup>	02/10/2057	Paid	Grouped to 202546
<b>Total Hectares</b>		<b>37,308.6500</b>					

<sup>1</sup>Minera Capela S.A. de C.V., 2012

<sup>2</sup>Minera La Negra, S.A. de C.V., 2012

TABLE 4.2 MINERA LA NEGRA S.A. DE C.V. (LA NEGRA MINE) MINING RIGHTS AND OBLIGATIONS (APPLICATION FOR MINING CONCESSIONS OBLIGATIONS FOR 2012)							
Name	Application Number (Expiration)	Hectares	Title Granting Date	Granted To	Expiration Date	Mining Rights (Taxes)	Observations
Aurcana III	065/15830	68,861.5021	May 22, 2012				
<b>Total Hectares</b>		<b>68,861.5021</b>					

The authors were informed that most concessions were originally granted to Minera La Negra, S.A. de C.V. or Minera Capela, S.A. de C.V., then part of the Peñoles Group and that all mine concessions are currently valid having complied with all their obligations, including the submittal of annual assessment works and payment of mining rights (taxes) and that all related information and copies of documents are in their files and available, if necessary. It is noted the material is dated August 30, 2001, all rights and obligations of Minera Capela, S.A. de C.V. were transferred on behalf of Minera La Negra, S.A. de C.V.

According to MLN and the information revised by the authors, all claims are in force and free of any liens and encumbrances.

However, the authors are not qualified to express a legal opinion with respect to the property titles, current ownership, and possible encumbrance status, and therefore, have relied upon the representations and information provided by Aurcana.

#### **4.4 SURFACE RIGHTS**

The same document above shows that surface rights are granted by a Temporary Occupation Agreement signed with the Maconí Community, Municipality of Cadereyta, Qro. for as long as the concessions are valid, dated January 23, 1987. A second agreement signed with the Maconí Community, on the same date, grants MLN with Rights-of-Way through their surface properties for as long as the concessions are valid.

#### **4.5 ENVIRONMENTAL AND PERMITTING**

Section 20.0 of this report describes the current environmental and other permitting status at La Negra. Based on the information shown and provided by MLN to the authors, and considering that operations are continuous and normal, there is no reason to believe that major risks and/or possible disruptions on the production at La Negra, derived of permitting failures, may occur. A close follow-up of all permits and on-going environmental monitoring is required to prevent any negative impacts on the operation.

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

### **5.1 LOCATION AND PHYSIOGRAPHY**

The Maconí mining district is located within the Sierra Madre Oriental Physiographic Province, in the central-northern part of the State of Querétaro forming northwest-southeast-trending elongated mountain ranges, basically formed of Mesozoic sedimentary rocks intruded by Lower Tertiary calc-alkaline igneous rocks.

The district is characterized by a rugged, steep topography with common differences in elevation of more than 500 meters. The main physiographic units are the Southern Sierra Gorda de Querétaro, the Maconí Canyon, and the Tolimán Canyon, both subsidiaries of the Moctezuma River. Locally, the highest peak in the region is at approximately 2,700 masl, while the Maconí River is at 1,800 masl with a difference in elevation in the order of 900 meters. As a reference, the main haulage level of La Negra is at 2,000 masl.

### **5.2 PROPERTY ACCESS AND LOCAL INFRASTRUCTURE**

The main access to the mine area is from Querétaro City through the Querétaro-México City Highway 57D to San Juan del Río and passing through Tequisquiapan-Cadereyta-Vizarrón and taking a detour east toward San Joaquín to the paved road to Maconí, for a total of 173 km, an approximate 2 hour drive. From the mine camp at Maconí, there is a gravel road approximately 4 km to the plant and office facilities.

In spite of its isolated location and rugged terrain, La Negra shows a good infrastructure that has been built through a period of 40 years by the state and federal governments, Peñoles and Minera La Negra (Auricana), that includes a paved road to Maconí, water availability at the mine and process plant site, and electrical power.

#### **5.2.1 Local and Public Infrastructure**

- San Joaquín is the largest town close to Maconí, at 21 km with better than elementary services. Local schooling is provided at Maconí through primary basic level while San Joaquín provides secondary and high school equivalent levels. For technical and higher level education, local people have to attend schools at Cadereyta, Ezequiel Montes, or Querétaro, State Capital.
- Health services are provided locally by a first-level health center (SSA/IMSS); for higher-level services, local people have to be transferred to a regional health center and hospital or a local center at Cadereyta.
- Other local municipal services include water and telephone.
- Public transportation is limited to a private bus service from San Joaquín (21 km from Maconí) to Querétaro and other localities. Transportation to San Joaquín has to be privately arranged.
- With a long mining history including that of the neighboring San Joaquín, El Doctor, Vizarrón, and Zimapán Districts, however, the La Negra region is well endowed of

mining workers and technicians, including miners, electricians, mechanics, computer skilled technicians, etc.

- Higher-level professionals are commonly hired in Querétaro, México City, and other places in México.

### 5.3 CLIMATE

Climate in the area varies greatly with the elevation. While the upper parts of the Sierra Gorda, above 2,700 masl, have a temperate to cold climate as the La Negra area; below the 2,300 masl, have a warmer to hot climate. Climates are classified as steppe (dry, semi-hot, with a dry winter) and an annual average temperature of 16.7°C and a maximum of 38°C.

The closest operating weather station to La Negra is located at El Doctor (7 km to the northwest) indicates that the average rainfall for the period 1981 to 2010 is of 796.1 mm falling in about 91 days, mostly during the months of June through October. The maximum 24-hour rainfall, recorded during the same period, is 148.5 mm during the month of August (SMN-CNA, 2012).

It is expected that the average rainfall at La Negra is lower due to its elevation and dry conditions (2,700 masl versus 2,000 masl to 2,300 masl). Under similar physiographic conditions, the now idle CNA's Zimapán weather station, located 10 km to the southeast at 2,075 masl, records an average 445.9 mm of annual rainfall in the period 1971 to 2000 but a maximum 24-hour precipitation of 196 mm in the month of July.

Mine operations at La Negra are not affected by climate phenomena considering that the access road to Maconí is paved and from Maconí to the mine area, a gravel road that is firm and constantly maintained by the Company. Local rock falls affecting the road between Maconí and the San Joaquín Township may occur during the rainy season and temporary flooding of the Maconí River may disrupt access for a few hours.

### 5.4 NATURAL RESOURCES AND VEGETATION

Given the arid conditions of the La Negra area, due to the geographic barrier formed by the Sierra Gorda mountain range that collects most of the water coming from the Gulf of México, vegetation in the area is of desert to semi-desert nature. While the slopes of the La Negra Mountains are characterized by desert bush and cacti like lechuguilla, agave, palmilla, cholla, and varieties of opuntia, larger brush and trees include huizache, pirul, mezquite, sangregado, and palo dulce. The lower parts of the Maconí Canyon, with abundant year-round sources of water, produce a dense tropical vegetation that include casuarina and some domesticated varieties like eucaliptus, jacaranda, bougainville, and fruit trees like fig, peach, lemon, pomegranate, orange, avocado, zapote, and chirimoya.

The most important economic activities in the Maconí District are mining, cattle ranching, limited river bank agriculture, and fruit growing. In the neighboring Vizarrón area, marble production and art crafts are an important source of income, while tourism, minor logging, and limited mercury mining are part of the San Joaquín area economy, 10 km to the northwest.

Land use information in the Cadereyta Municipality indicates that as of the year 2000, there was 94,212 ha in cattle-related activities, 9,770 ha for agriculture, 5,725 ha in forestry uses and 3,393 ha for other uses.

## 6.0 HISTORY

### 6.1 EARLY ACTIVITIES

Archeological evidences of mining activities in the region date back to the 10<sup>th</sup> and 13<sup>th</sup> Centuries BC when cinnabar mining took place for ritual purposes by Otomí and Chichimeca Indians; later between the 4<sup>th</sup> and 7<sup>th</sup> Centuries BC, silver, fluorite, and “green calcite” as well as opal in the 12<sup>th</sup> Century BC were exploited.

During the colonial period and according to a *Cédula Real de 1557*, several silver and lead deposits were discovered that led to the foundation of most of the relevant mining towns of the area, like San Pedro Escanela, El Doctor, San José de Amoles (Pinal de Amoles), Río Blanco, Plazuela, San Joaquín (1682), and Maconí. During the beginnings of 17<sup>th</sup> Century, silver mineralization was discovered and several mines were operated by Spaniards in the Maconí region, with the foundation of the Real de Maconí in 1682 and later administered by the Real de El Doctor in 1742, although mining was not very intensive during this period at the Maconí District.

During the late 1800s and through early 1900s, the properties were owned, explored, and partially mined by the General Consul of Belgium in México, Sr. Víctor Beaurang; and later by Messrs. Oscar and Tomas Braniff by 1900. By 1950, the Compañía Minera Acoma, S. A. acquired and explored the properties without success, passing them to Messrs. Eloy Vallina and Antonio Guerrero.

### 6.2 PEÑOLES TENURE

Peñoles was interested in the area in the early 1930s when it rented a small smelting plant located at the nearby location of El Doctor. In the early 1960s, the properties were acquired by Compañía Minera Peñoles (Peñoles) exploring with geological mapping, sampling, magnetometry surveys, and core drilling that resulted in the discovery of the La Negra and El Alacrán mineralization started development in 1967 and operations in 1971 (Gaytán, 1973). It has been reported that Peñoles mined approximately 6.6 Mt with an average grade of 169 g/t Ag, 1.10% Pb, 2.20% Zn, and 0.48% Cu through this period (Reyna Mining, 2006). Due to its favorable location and mining method, La Negra was one of the most productive, low cost mining units in México at this time. In the year 2000, the mine was put under care and maintenance due to low metal prices.

### 6.3 AURCANA TENURE

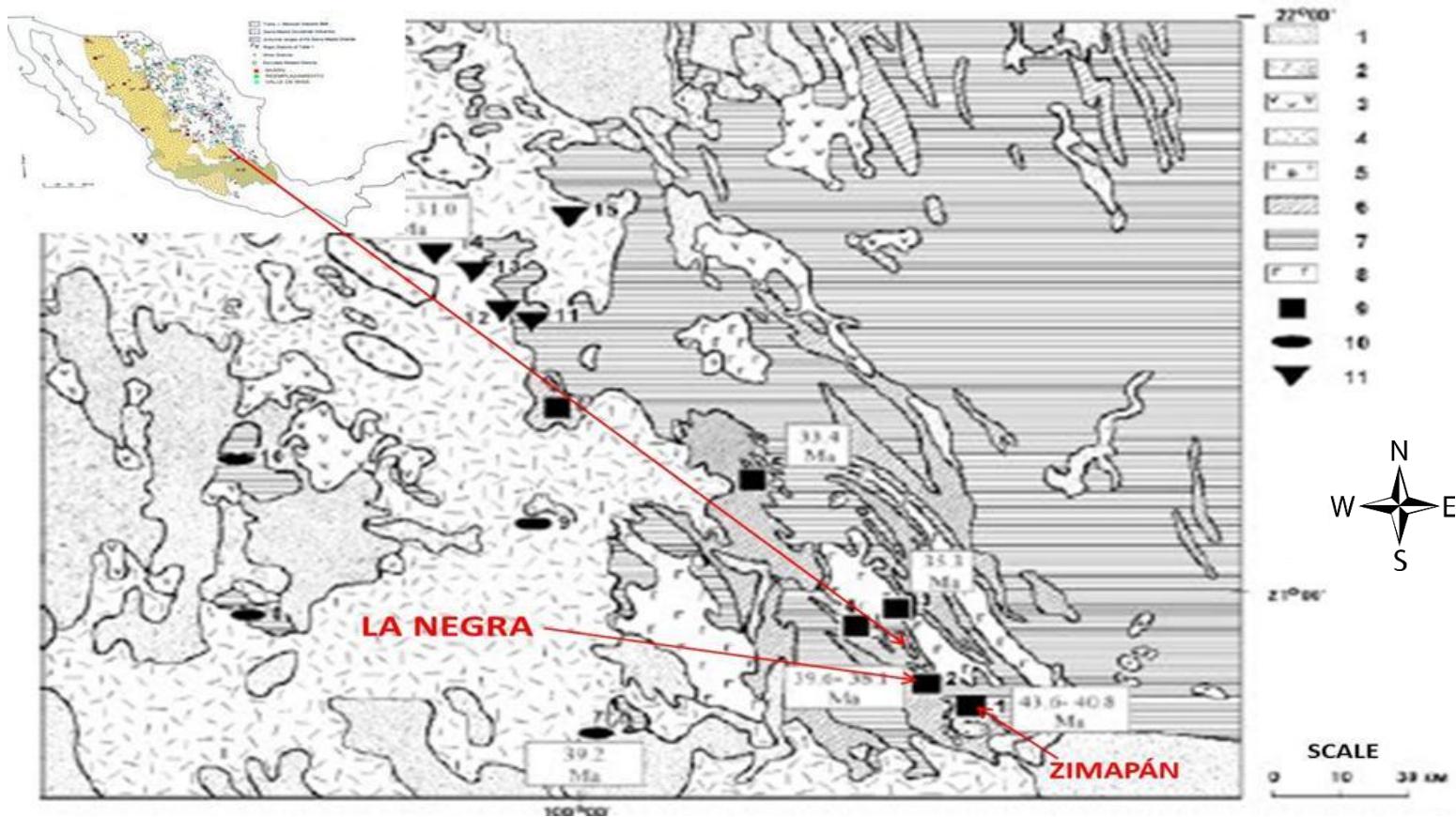
In 2006, Aurcana initiated the preparation of mine, process plant, and facilities to renew mining activities with a 1,000 tpd production rate, later increasing to 1,500 tpd in 2007, based on the mineralization left by Peñoles. Mineral production between 2007 and 2010 by Aurcana's Minera La Negra, from areas of mineralization identified by Peñoles was of approximately 1.0 Mt, as shown in Table 6.1.

<b>TABLE 6.1</b> <b>MINERAL PRODUCTION BY AURCANA BETWEEN 2007 AND 2010</b>					
<b>Year</b>	<b>Tonnes</b>	<b>Ag (g/t)</b>	<b>Pb (%)</b>	<b>Zn (%)</b>	<b>Cu (%)</b>
2007	180,796	70	0.40	1.42	0.77
2008	299,210	68	0.30	1.15	0.75
2009	300,951	98	0.46	1.00	0.57
2010	298,258	76	0.38	1.17	0.48
<b>Total</b>	<b>1,079,215</b>	<b>79</b>	<b>0.38</b>	<b>1.16</b>	<b>0.63</b>

## 7.0 GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 REGIONAL GEOLOGY

La Negra is located near the southwestern edge of the Sierra Madre Oriental Mesozoic foldbelt of Central México. Figure 7.1 shows the two major geologic domains in the area, Tertiary volcanic dominant rocks to the west and Mesozoic miogeosyncline rocks to the east. Figure 7.1 shows the La Negra and Zimapán Districts near their border and near the northern flank of the Trans-Méxican volcanic belt (Lang, et al., 1999; Carrillo, 1990). Locally, La Negra is located within the El Doctor Mesozoic carbonate platform at the southwestern margin of the Sierra Madre Oriental terrain, locally in thrust contact against deeper clastic deposits of the Zimapán Basin. Both areas are characterized by the intrusion of a series of Tertiary calc-alkaline intrusives (Vasallo, 2008).



1. Quaternary layers.
2. Sedimentary miocene.
3. Volcanic andesitic rocks of oligocene.
4. Volcanic felsic rocks of oligocene.
5. Granodioritic rocks of oligocene age.
6. Upper cretaceous sandstones and shales.
7. Lower cretaceous limestones.
8. Upper jurassic vulcanosedimentary rocks.
9. Skarn ore deposits:  
**(1- Zimapán, 2- La Negra)**
3. San Rafael.
4. Maravillas.
5. Rio Blanco.
6. La Aurora (Xichú).
10. Gold-silver vein deposits.
- (7. San Martín.
8. Puerto de Nieto.
9. Santa Catarina.
10. Pozos).
- (11. Fluorite deposits.
- (11. El Sabino.
12. El Capulín.
13. El Refugio.
14. Rio Verde (El Realito).
15. La Valenciana.
16. La Consentida.
17. Las Cuevas).

**Figure 7.1. Simplified geological map of the central part of México, showing the location of La Negra and Zimapán Districts (Vasallo, 2008)**

Both areas contain silver-polymetallic skarn mineralization, which are connected with intrusions of Eocene age in the limestone sediments of El Doctor formation of early-cretaceous age. Plutonic systems are represented by multi-phase intrusions, such as stocks and dikes, which characterize evolution of magmatic systems by middle solution up to felsites. The various displays of metasomatism and mineralization at different stages are connected to separate intrusive phases. The La Negra deposit is connected by intrusion of a granodiorite stocks and quartz-monzonite dikes. The Zimapán deposit is characterized by connection of mineralization with stocks of quartz-monzonite and lamprophyre. Inclusions have high homogenization temperatures with a majority of data ranging between 330-600 °C. Salinity of these inclusions are 33 to 70 weight percent (wt%) total salts (Vasallo, 2008).

The stratigraphy in this area is formed by a thick group of Upper Jurassic shales and calcareous shales of the Las Trancas Formation followed by Lower and Upper Cretaceous limestone and clastic sediments of the Doctor and Soyatal-Mezcala Formations. These formations are unconformably covered by Tertiary volcanic rocks and intruded by a granodiorite-diorite intrusive, also of Tertiary age (Table 7.1).

TABLE 7.1 LA NEGRA MINING DISTRICT – SIMPLIFIED STRATIGRAPHIC COLUMN		
Quaternary		Alluvial Deposits
Tertiary	Eocene – Miocene	Felsic, Andesitic, and Basaltic Volcanic Rocks
		Granodiorite, Diorite Intrusive
		Granodiorite, Diorite Intrusive
Cretaceous	Upper K: Mezcala Fm	Limestone, Argillaceous Limestone
	Upper K: Soyatal Fm	Shale, Sandstone
	Lower K: Doctor Fm	Limestone Cerro Ladrón Facies
		Limestone Socavón Facies
		Limestone San Joaquín Facies
<b>Limestone La Negra Limestone – Mudstone Facies</b>		
Jurassic	Upper: Las Trancas Fm	Shale and greywacke
Source: Fraga, P., 1988		

## 7.2 LOCAL GEOLOGY

The main stratigraphic unit in the mine area is La Negra Facies of the Doctor Formation shown in blue in the map on Figure 7.2, characterized by black shaly-limestone with local chert nodules. This unit forms skarn development (green), in its contact with a diorite-granodiorite body (tan). Mineralized bodies, like the La Negra chimney, are commonly found around several small andesite stocks and dikes that have intruded the lime-mudstone La Negra Facies of the El Doctor Formation.

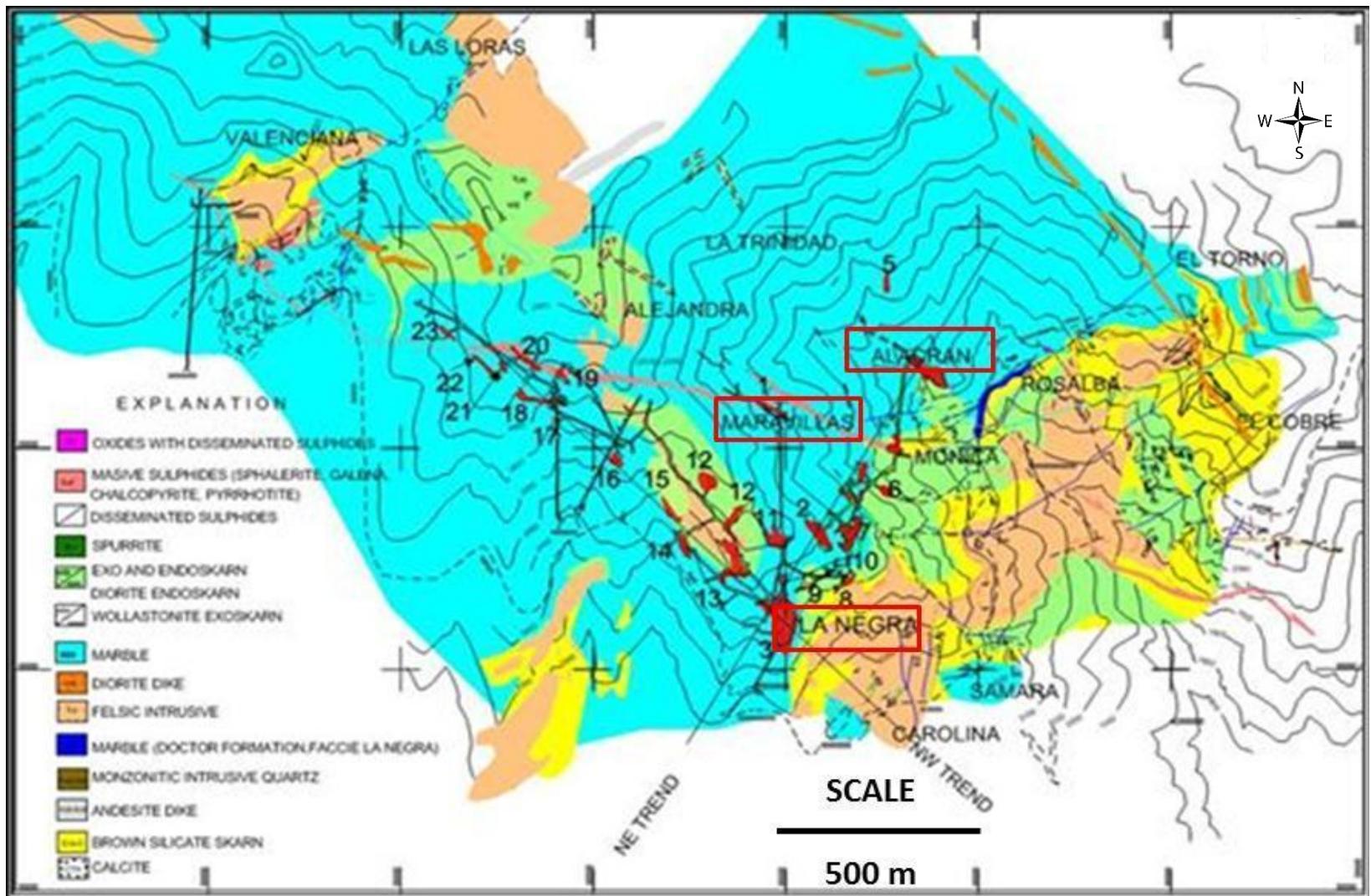


Figure 7.2. Geological map of the La Negra mining district  
(MLN, 2012)

The limestone is folded to different degrees and the axes of the structures are oriented to the northwest. The dioritic stocks commonly show skarn aureole, and in the central part of these skarns, often a rich zone of spurrite [Ca<sub>5</sub>(SiO<sub>4</sub>)<sub>2</sub>(CO<sub>3</sub>)] is found (Vasallo, 2008).

Morrison (1982) has reported that 3 stages of skarn development occurred: (1) Spurrite-Borospurrite skarn at approximately 800°C to 890°C; followed by (2) Hedenbergite skarn along the borders of the intrusive associated to the zone of diopside; (3) Andradite and contemporaneous hematite and wollastonite skarn; and (4) A final stage characterized by orthoclase, quartz, datolite, and/or calcite vein filling with associated sulfides (chalcopyrite, sphalerite, and galena) replacing recrystallized calcite in garnet skarn.

The aureola of metasomatic replacement is characterized by a massive assemblage of grossularite and andradite skarn at the hanging wall of the diorite intrusive (K Ar dating at 38.7 ± 0.08 Ma) followed by a clear contact with wollastonite skarn that is generally unmineralized.

In the central part of the La Negra deposit, several post-skarn rhyolitic porphyry dikes are found. Several andesitic-basaltic porphyritic dikes related to effusive rocks are considered post-mineralization.

### **7.3 GEOLOGIC CONTROLS**

Mineralized bodies at La Negra are closely related to the external boundary of a metasomatic contact zone between a northeast-trending, generally dioritic intrusive and a series of medium to thick-bedded limestones of the El Doctor Formation. A series of minor stocks and dikes follow two northwest-trending zones, along which the Maravillas-Bicentenario and San Pedro-Dificultad-Virginia Blanca mineralized bodies are found (Figure 7.3).

The main controls for the mineralization are (1) Lithological, through the presence of a favorable horizon (El Doctor Formation), locally named La Negra Facies, and (2) Structural, mainly along the limestone-intrusive contact, following limestone bedding and folding (mantos, “chimneys”), and local structures (faults and dikes as veins and tabular deposits) – and also in the intersection of major structures as chimneys (Gaytán, 1973).

### **7.4 MINERALIZED BODIES**

More than 20 different deposits have been discovered at La Negra, some of the deposits coalesce to form individual mineralized zones. Mantos and chimneys have comprised the bulk of silver, lead, zinc, and copper mineralization. The deposits include some chimneys that replace beds of La Negra limestone facies. These mantos vary in size and range from 40 meters to 300 meters length and from 0.50 meters to 40 meters thick. Vein deposits vary from 80 meters to 120 meters length, between 10 meters to 60 meters depth, and width from 0.50 meters to 1.20 meters (Figure 7.4).

Figure 7.5 shows a composite longitudinal section looking northeast with the location of mineral deposits referred to in the text.

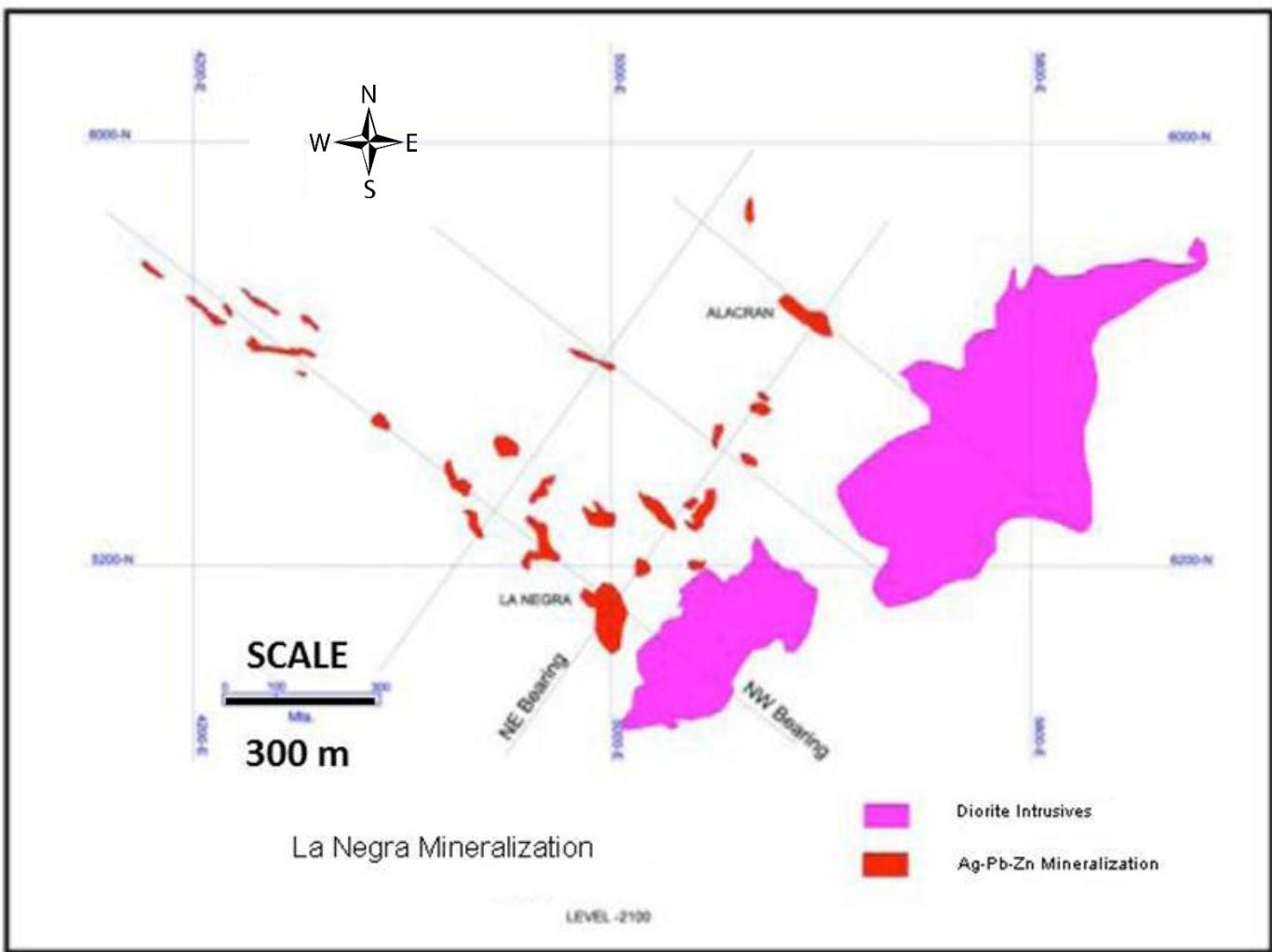


Figure 7.3. La Negra Mine mineralization orientation  
(After Vasallo, 2008)

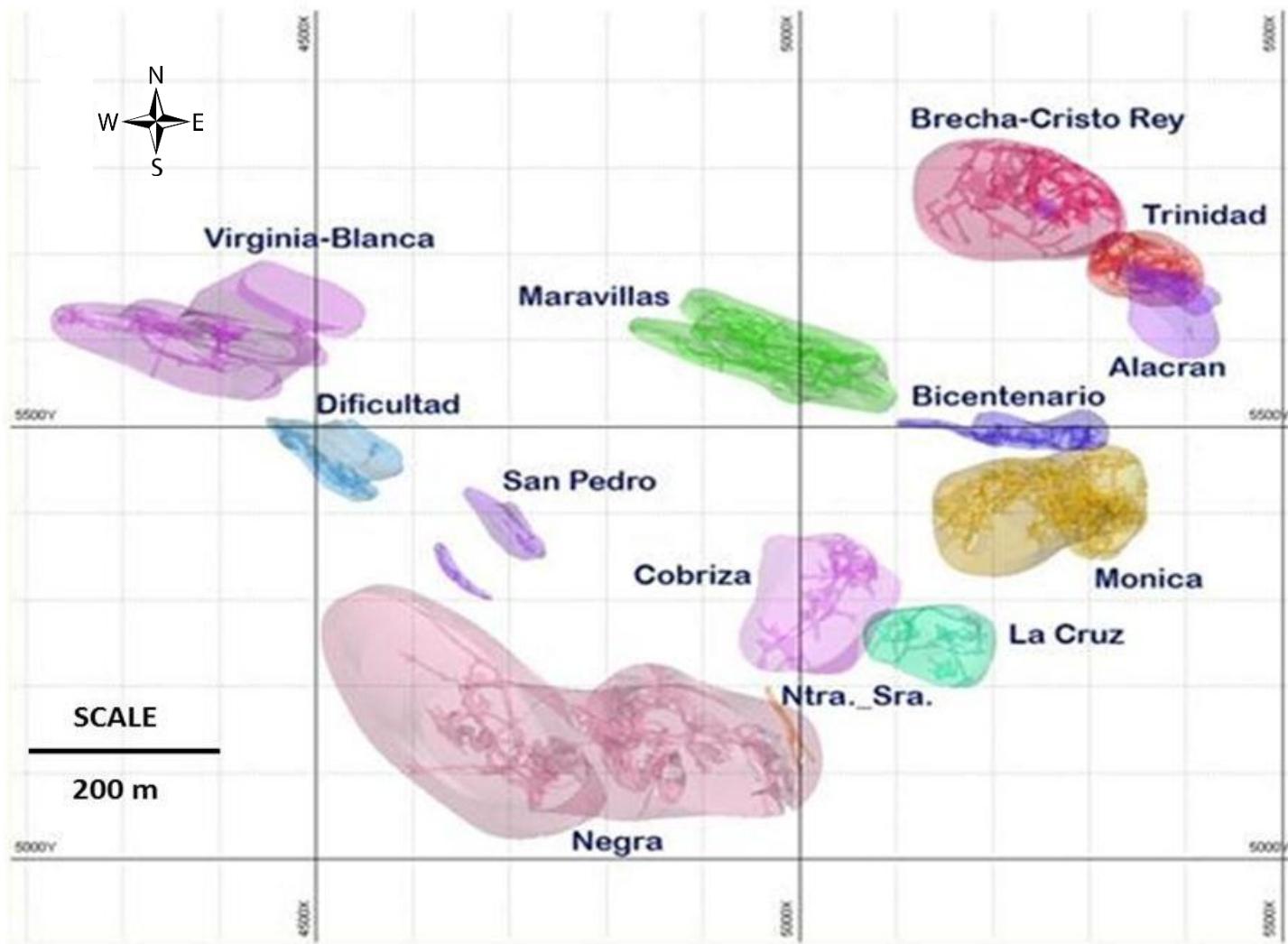


Figure 7.4. La Negra Mine mineralization considered in the 2012 mineral resource estimate (Behre Dolbear, 2012)

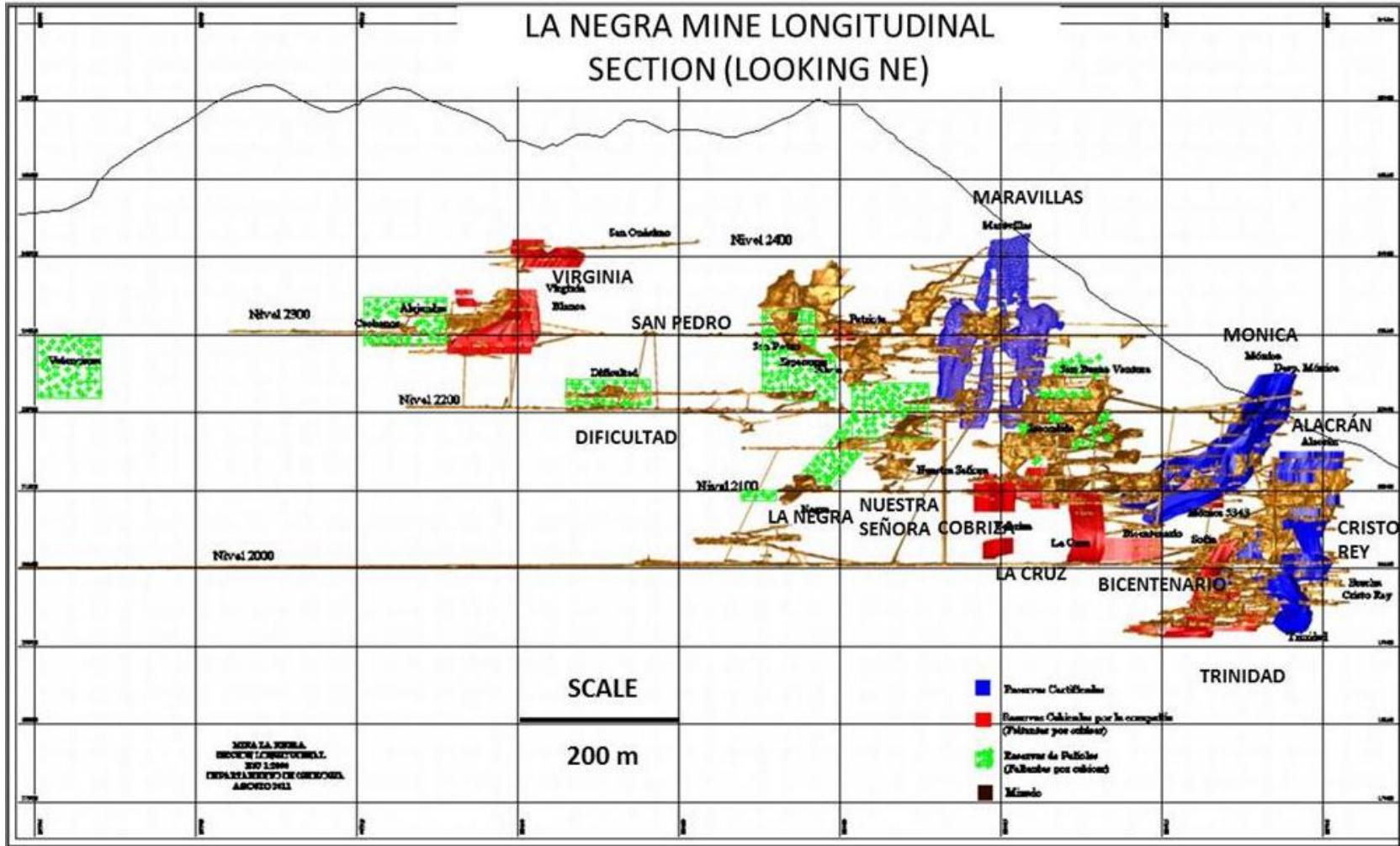
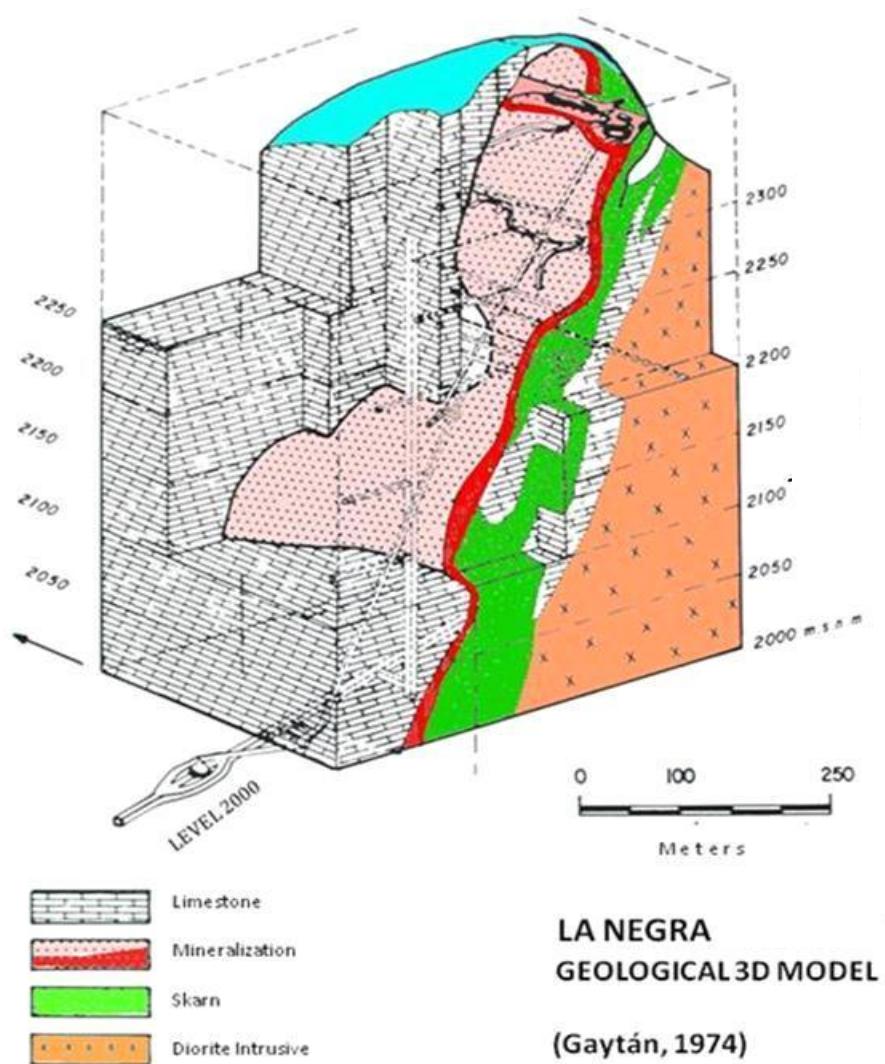


Figure 7.5. La Negra Mine – composite longitudinal section, looking northeast (MLN, 2011)

#### 7.4.1 La Negra

Figure 7.6 shows a three-dimensional (3D) representation of the La Negra deposit as of 1974; however, it clearly depicts the nature and morphology of the deposit as a narrow chimney-like manto resting on top of the skarn aureole that surrounds the main diorite intrusive, in contact with the La Negra limestone. The measurements of the La Negra chimney are reported as 150 meters long, 60 meters wide, and 400 meters deep (Vasallo, 2008).



**Figure 7.6. La Negra Mine geological 3D model  
(After Gaytán, 1974)**

#### 7.4.2 Maravillas, Bicentenario, and Mónica

The Maravillas deposit is an irregular-tabular northwest-trending replacement deposit along the contact of a dike that has been explored and partially mined between 2000 and 2400 levels, while Bicentenario is a smaller, tabular deposit that seems to follow the same trend.

#### **7.4.3 Brecha-Cristo Rey, Trinidad, and Alacrán**

These chimney-like deposits seem to be located following the northernmost northwest-trend. While El Alacrán has almost been mined out between 2150 and 2000 levels, Cristo Rey and Trinidad have been explored at depth to above the 1900 level and mineralization seems to be open at depth.

#### **7.4.4 Virginia-Blanca, Dificultad, Cobriza, San Pedro, Nuestra Señora, and LaCruz**

A series of elongate and chimney-like skarn deposits are closely related to a series of northwest-trending intermediate dikes, following the southernmost structural trend known, generally between the 2200 and 2400 levels. It is likely that the intersection of this trend with the main northeast Alacrán-La Negra trend was the loci for the Cobriza and Nuestra Señora deposits, currently indicated between the 2140 and 2000 levels.

It is important to notice that while the bulk of production has come from the northeast-trend, the Trinidad, Alacrán, Mónica La Cruz, and La Negra deposits have been developed above the 2000 level. Only the Trinidad, Bicentenario, and Breccia Cristo Rey deposits have been explored and partially developed and mined below the 2000 haulage level.

The longitudinal section of Figure 7.6 shows that most other deposits below the 2200 level have not been fully explored. More than 1,200 meters of drift are developed from the face of 2300 level to the northeast-trend. More than 950 meters between La Negra and El Alacrán require more exploration.

### **7.5 TYPE, CHARACTER, AND DISTRIBUTION OF MINERALIZATION**

La Negra is characterized by complex mineralization that varies from massive to disseminated. Minerals of economic interest include galena, marmatite, chalcopyrite, and a silver-carrying sulfosalt and hessite (silver-tellurium sulfosalt) in a garnet and minor calcite-quartz gangue with variable associated pyrite-pyrrhotite. A close association between galena and the silver sulfosalts that report in the lead concentrates is apparent.

The paragenetic sequence defined at La Negra is:

Wollastonite → Diopside → Garnet  
**Replaced by** Pyrrhotite → Pyrite → Arsenopyrite → Marmatite → Chalcopyrite → Galena

Sulfide zoning indicates that lead and silver diminish at depth while zinc remains constant and copper increases at depth (Gaytán, 1973).

### **7.6 METALLURGICAL CHARACTERIZATION**

Numerous process and metallurgical recovery studies have been performed during the more than 40 years of operation. From the mineralogical point of view recent mineral characterization studies, including microscopy and XRF, have updated the type of minerals currently produced in the concentrates, their assemblage, predominance, association, mineral specimen intergrowths, liberation size, and potential refractory properties.

A summary of mineral characteristics is in Table 7.2.

TABLE 7.2 MILL HEADS MINERAL CHARACTERIZATION		
Characterization Sample	Mineral	Composition
Mill Head Composite	Quartz	$\text{SiO}_2$
	Mersinitite	$\text{Ca}_3\text{Mg}(\text{SiO}_4)_2$
	Calcite	$\text{CaCO}_3$
	Galena	PbS
	Pyrrothite	FexS
	Arsenopyrite	FeAsS
	Chalcopyrite	$\text{CuFeS}_2$
	Bornite	$\text{Cu}_5\text{FeS}_4$
	Sphalerite	(Zn,Fe)S

## 8.0 DEPOSIT TYPES

### 8.1 SKARN DEPOSITS

Silver and base metal mineralization at La Negra is closely associated to skarn deposits in a number of manto, chimney vein, and breccia deposits, as described in Section 7.0 of this report. Skarn formation is closely related to the external boundary of a metasomatic contact zone between a northeast-trending, generally dioritic intrusive and a series of medium to thick-bedded limestones of the El Doctor Formation, and to the contact of a series of irregular dikes following a general northwest-trend.

Typical skarn deposits are composed of silicates (pyroxene, garnet, wollastonite, scapolite), hydrosilicates (amphibole, epidote, chlorite), oxides, calcite, fluorite, and others, including sulfides (pyrite, pyrrhotite, sphalerite/marmatite, galena, chalcopyrite molybdenite, arsenopyrite, and others).

Skarn deposits can be classified according to their origin (hydrothermal, metamorphic, emanation skarn), location (endoskarn, exoskarn related to an intrusive body), composition (calcareous, magnesian, silicate rich), and prevailing mineralization (Fe, W, Cu, Zn, Pb, Mo, Sn).

According to this, the La Negra deposits can be classified as continental magmatic-related zinc-copper (silver-lead), calcareous, andradite-grossularite-hedenbergite (mostly) exoskarn deposits.

Typical zoning in these deposits is as follows.

- Pb-Zn Skarn
- Silicified/Silica Rich Intrusive → Garnet Endoskarn (mag-cpy) → Garnet Exoskar → Piroxena (Sl) → Marble Recrystallized/Silicified Limestone → Limestone

### 8.2 LA NEGRA DEPOSITS

The manto and chimney skarn deposits at La Negra extend over 500 meters vertically, between elevations approximately 1,900 masl and 2,400 masl.

Typical mineralization at La Negra varies with elevation with galena, marmatite, chalcopyrite, and a silver-carrying sulfosalt and hessite (silver-tellurium sulfosalt) in a garnet and minor calcite-quartz gangue with variable associated pyrite-pyrrothite. Sulfide zoning indicates that lead and silver diminish at depth while zinc remains constant and copper increases at depth (Gaytán, 1973).

### 8.3 EXPLORATION MODEL

Similar to La Negra, the Zimapán mining district, located 8.2 km to the southeast, is characterized by skarn replacement deposits along the contact of El Doctor limestone and the Tolimán intrusive (Figure 8.1). Skarn is composed of a wollastonite-garnet-quartz assemblage associated to the contact of a monzonite intrusive. Similarly also, at El Carrizal mineralization is associated to Mantoes, chimneys and fracture-controlled zones with predominant pyrite-pyrrothite, sphalerite galena, chalcopyrite, and lead-antimony sulfosalts (Juan Morín, et al., 1986). One of the differences between both mineralized districts is the presence of Spurrite at La Negra.

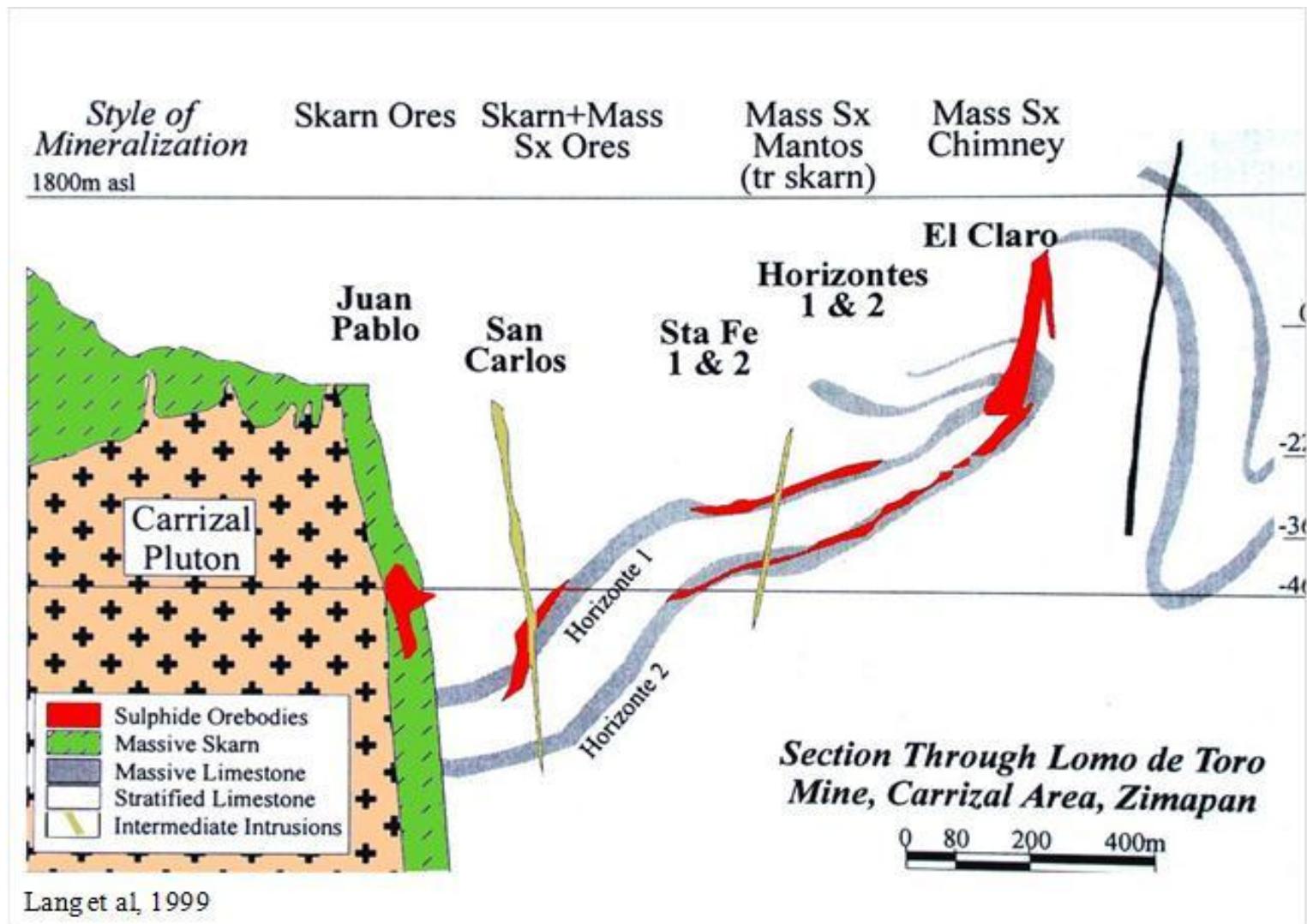
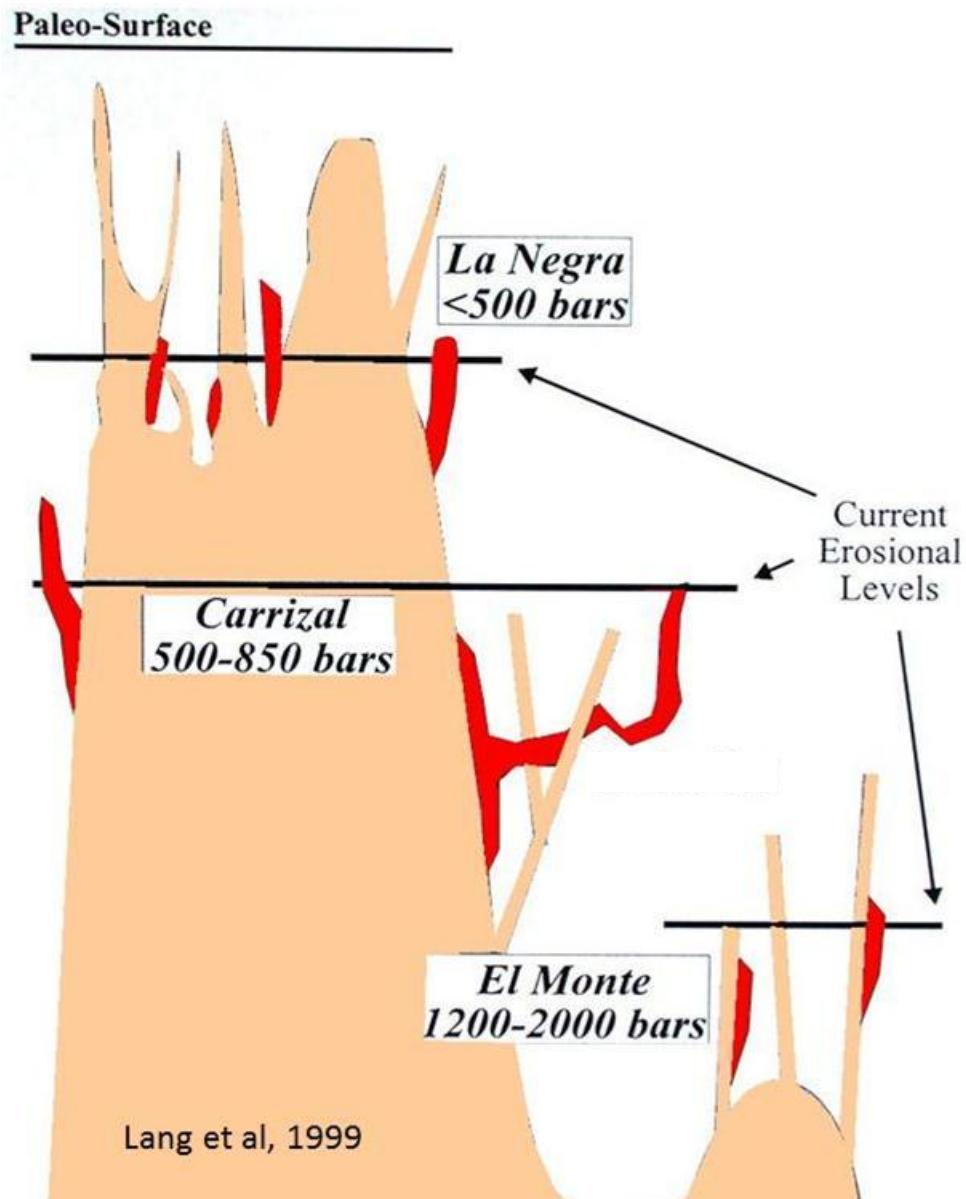


Figure 8.1. Typical cross section through the Carrizal deposit at Zimapán  
(Lang, et al., 1999)

Comparison of mineral paragenesis, control setting, and fluid characteristics between Zimapán and La Negra mineralization shows that both deposits are similar. However, Lang, et al. (1999) reports that there are three different styles of mineralization related to different formation levels at Carrizal and El Monte at Zimapán, in comparison with the La Negra deposit. It seems that the absence of spurrite at Zimapán suggests greater depths of intrusions.

While the El Monte deposit is now exposed at the highest elevation, it was actually formed at the greatest paleo-depth while El Carrizal, at an intermediate depth and La Negra formed closest to the paleosurface (Figure 8.2).



**Figure 8.2. Geological exploration model for the Zimapán and La Negra Districts (Lang, et al., 1999)**

From the discussion above, it has been suggested that Carrizal-type mineralization could be present below the current level of development at La Negra. It is observed that exploration along the northwest-trend is limited to 2200 to 2300 levels.

On the other hand, the vertical span of mineralization at La Negra is close to 500 meters. Some of the major skarn districts in México, such as Naica and Concepción del Oro, can reach as much as 900 meters depth.

It is concluded that La Negra shows an important exploration potential at depth.

## **9.0 EXPLORATION**

### **9.1 MINERA LA NEGRA EXPLORATION**

Surface and underground exploration at La Negra is carried out by the Exploration Department, currently developing a detailed mapping and sampling program at surface focused on the western part of the district to detect possible drilling targets above the Alejandra-Virginia-Blanca deposits, as shown in the map of Figure 9.1.

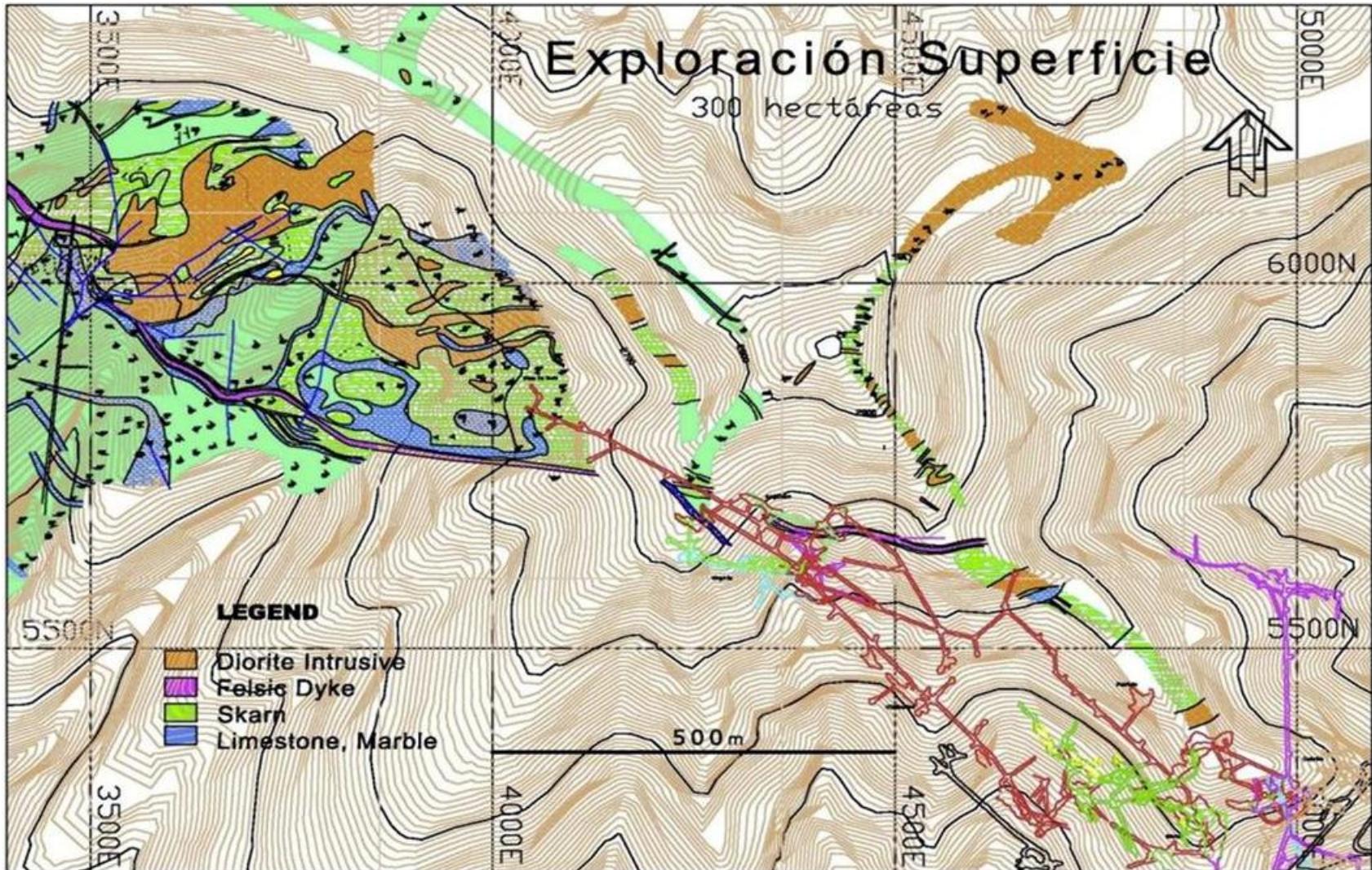
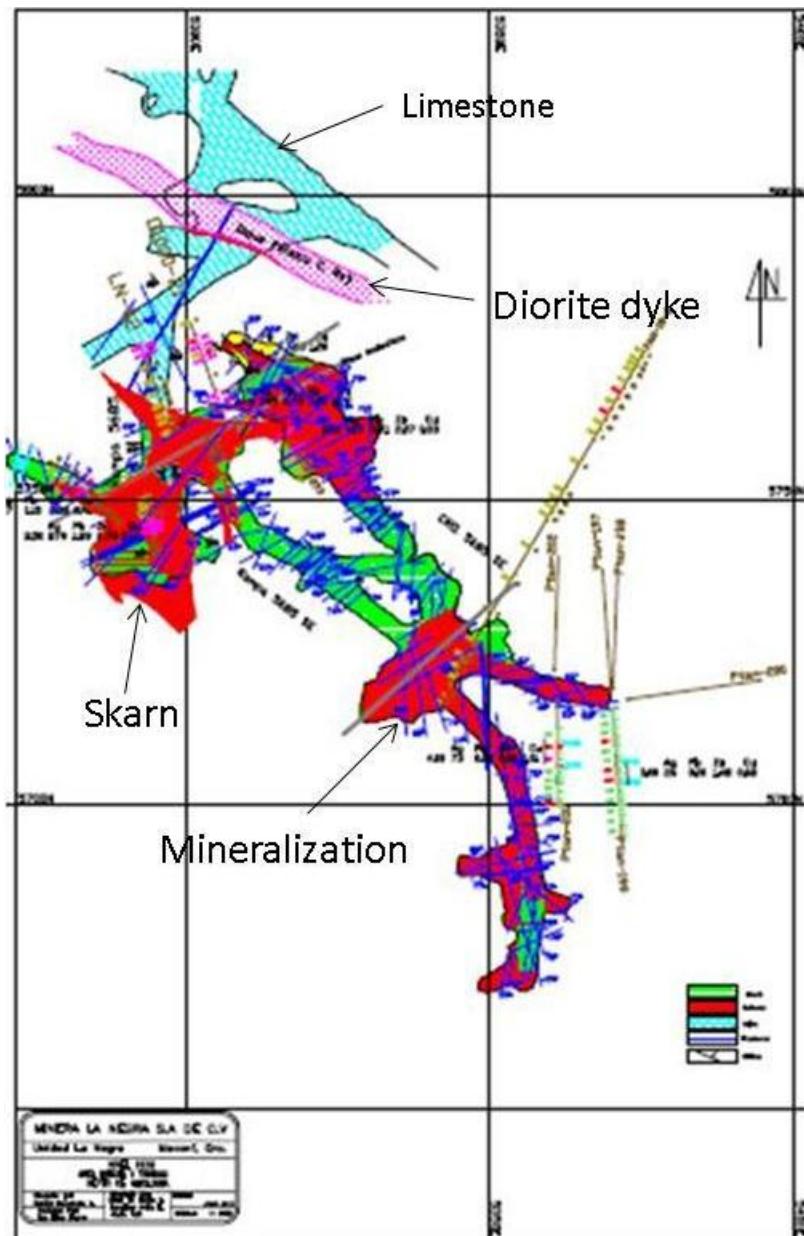


Figure 9.1. Surface geological mapping advances in the northwestern part of the district

Preliminary results indicate similar, favorable geology with skarn development along the contact with intermediate dikes. Some encouraging gold assay results have been found in local oxidation zones and are continuing to be evaluated.

Systematic geological mapping and sampling are carried out underground at exploration, development, and mine faces by channel sampling. Figure 9.2 shows an example of mine level mapping, sampling, and drilling of 1935 level at Cristo Rey.



**Figure 9.2. Examples of geological mapping and sampling at Cristo Rey 1935 level (MLN, 2011)**

Preliminary geological interpretations are made in advance plan maps and sections, and mapping and sampling data are then digitized and added to the geology database and to the Surpac® database.

Based on the additional data, exploration workings, adits, and crosscuts are planned and developed as well as core drilling plans, following in general terms the year's program and budget.

## 9.2 MINERA LA NEGRA EXPLORATION AND SAMPLING PROCEDURES

Exploration generally follows procedures established during the time Peñoles operated the mine, with some modifications and improvements. During the latter part of 2011, MLN started to compile a Manual of Standard Operation Procedures (SOP) that will be contained in a single document about current methodologies for use by the geology department.

In general terms, SOPs include purpose, scope, definitions, detailed procedures, formats used, related regulations, and photographic appendix.

Preliminary SOPs for most exploration activities are being defined and some have been completed, as shown below.

- **Mine sampling**
- Surface sampling
- **Underground surveying**
- Underground core handling
- **Core handling and security in the core house**
- **Core logging**
- **Core cutting and sampling**
- **QA/QC core sampling and control**
- Underground geological mapping
- Surface geological mapping
- Specific gravity measurements
- MLN lab sample reception and control
- **MLN lab sample preparation and analysis**
- **MLN lab QA/QC program and control**
- **MLN lab QA/QC duplicate preparation**
- **MLN lab QA/QC sterile sample preparation**
- MLN lab data handling and reporting

**Note:** **Bold** – Completed  
Others – In process

## 9.3 MINE SAMPLING

The estimate of resources, presented in Section 14.0 of this report, is based on 22,289 channel samples in addition to 16,422 meters of core drill holes collected by Minera La Negra S.A. de C.V. during the period 2006 to February 2012 and by Industriales Peñoles S.A. de C.V. from 1967 to 2000.

The sampling database provides assay information of the 13 deposits considered in this report distributed over an area of 1,300 meters east-west by 900 meters north-south from Brecha-Crisro Rey to the North, to Virginia-Blanca to the West, and La Negra to the south.

Mine sampling follows the SOP. The location, length, and orientation of channel samples is defined by the geologist or trained technician following the local geological mineralized structure. Vertical structures are commonly sampled on the ceiling of the mine workings. Stopes are commonly sampled every cut for production control in parallel channels approximately 3.0 meters apart and samples commonly 2.0 meters long. SOP details sampling procedures (as described in Section 12.1.2 of this report) and safety procedures before, during, and after sampling are also detailed. Sample bags are marked, an ID tag inserted, and the bag tied with a rope; control booklets used at MLN have 3 tags; 1 for the sample bag, 1 for laboratory use (pulps), and 1 for geology control. Samples are taken to the reception area of the lab where a copy of a sample control format is signed and filed along with the sample tag booklet.

The authors made several recommendations to the Company about increasing accuracy in the location and mapping of samples and sample collection. Recommendations were also made about numbering and sample control format to eliminate duplicate sample numbers.

Underground sampling density is considered adequate for block tonnage and grade estimates and controlling grades of the mined materials.

#### **9.4 DRILL HOLE CORE SAMPLING**

The estimate of resources presented in Section 14.0 of this report are based on 16,422 meters of core drill holes in addition to 22,289 channel samples collected by Minera La Negra S.A. de C.V. during the period 2006 to February 2012 and by Industriales Peñoles S.A. de C.V. from 1967 to 2000.

Core drilling is carried out from underground stations either to identify the extension of known deposits or to discover potential areas. In the first case, particularly where body definition is needed, drilling is made with a fan pattern and the spacing of the patterns varies. Block classification is assigned depending upon the drilling spacing, commonly of less than 25 meters.

Core boxes from the underground diamond drilling are taken to the core sample storage facilities. After the reception of a control format, they are placed in order on the logging table to verify continuity and completeness, washed with a brush and water, and box numbering; depths in both the core boxes and depth tags are verified. Recovery is then measured between the depth tags and the core is logged for structural features. Simultaneously, mineralized zones are marked in the core for sampling with distribution and length depending on the mineralization characteristics. Sampled lengths vary between 0.10 meters and 2.0 meters. Marked core is then split with a diamond saw equipment and the half core sampled and placed in plastic bags with the corresponding tag filled with ID data, date, and elements to be analyzed. Additionally, a third tag (attached to the booklet) includes the location, drill hole number, depth of sample, and date. Sample bags are registered in a shipping format that is received and signed in the lab. Elements routinely analyzed are silver, lead, zinc, copper, iron, arsenic, and occasionally antimony and bismuth.

## **9.5 SAMPLING QA/QC PROCEDURES**

Quality control procedures have been established at La Negra in order to assure that assay results received from the lab allow the validation and verification of data that will be used in the mineral resource and ore reserve estimates.

In general terms, approximately 10% of all samples sent to the lab are used for quality control purposes and an additional 5% sent to a second, external laboratory.

A detailed description of QA/QC procedures, as established by MLN, is found in Section 11.0 of this report.

## **9.6 SAMPLE QUALITY**

Several issues about the sampling process were raised during the review of operations.

- Increase accuracy in the location of mine samples
- Closer supervision during sampling
- Change assay ticket booklets from 3 to 4 tags
- Painting sample/channel identification number in the mine
- Core sample collection equipment in the mine
- Increasing the amount of large diameter core versus smaller diameters (*e.g.*, HQ, NQ versus IEW)

The author believes that these observations do not pose a risk or may affect the quality of data derived from the sampling processes. However, it is recommended that these observations are analyzed and the process improved.

It is the author's opinion that the quality of sampling at La Negra is good and results, as derived from their quality and representativeness, have a high degree of confidence.

## **9.7 MINERA LA NEGRA EXPLORATION RESULTS**

Aurcana initiated operations with identified higher grade mineralization left by Peñoles that does not meet the current reporting set under NI 43-101 Standards for Disclosure for Mineral Properties. From 2006 through 2011, Aurcana has produced approximately 1.7 Mt of mineralized material (Table 9.1). Figure 9.3 illustrates areas where new areas of mineralization have been identified as a result of the MLN exploration program.

<b>TABLE 9.1</b> <b>MLN PRODUCTION BETWEEN 2007 AND 2011 – LA NEGRA MINE</b> <b>(MLN PRODUCTION 2007 TO 2011)</b>					
<b>Year</b>	<b>Tons</b>	<b>Ag</b>	<b>Pb</b>	<b>Zn</b>	<b>Cu</b>
2007	180,796	70	0.40	1.42	0.77
2008	299,210	68	0.30	1.15	0.75
2009	300,951	98	0.45	1.00	0.57
2010	422,603	76	0.39	1.17	0.47
2011	505,965	77	0.45	1.34	0.41
<b>Total</b>	<b>1,709,525</b>	<b>78</b>	<b>0.40</b>	<b>1.21</b>	<b>0.55</b>

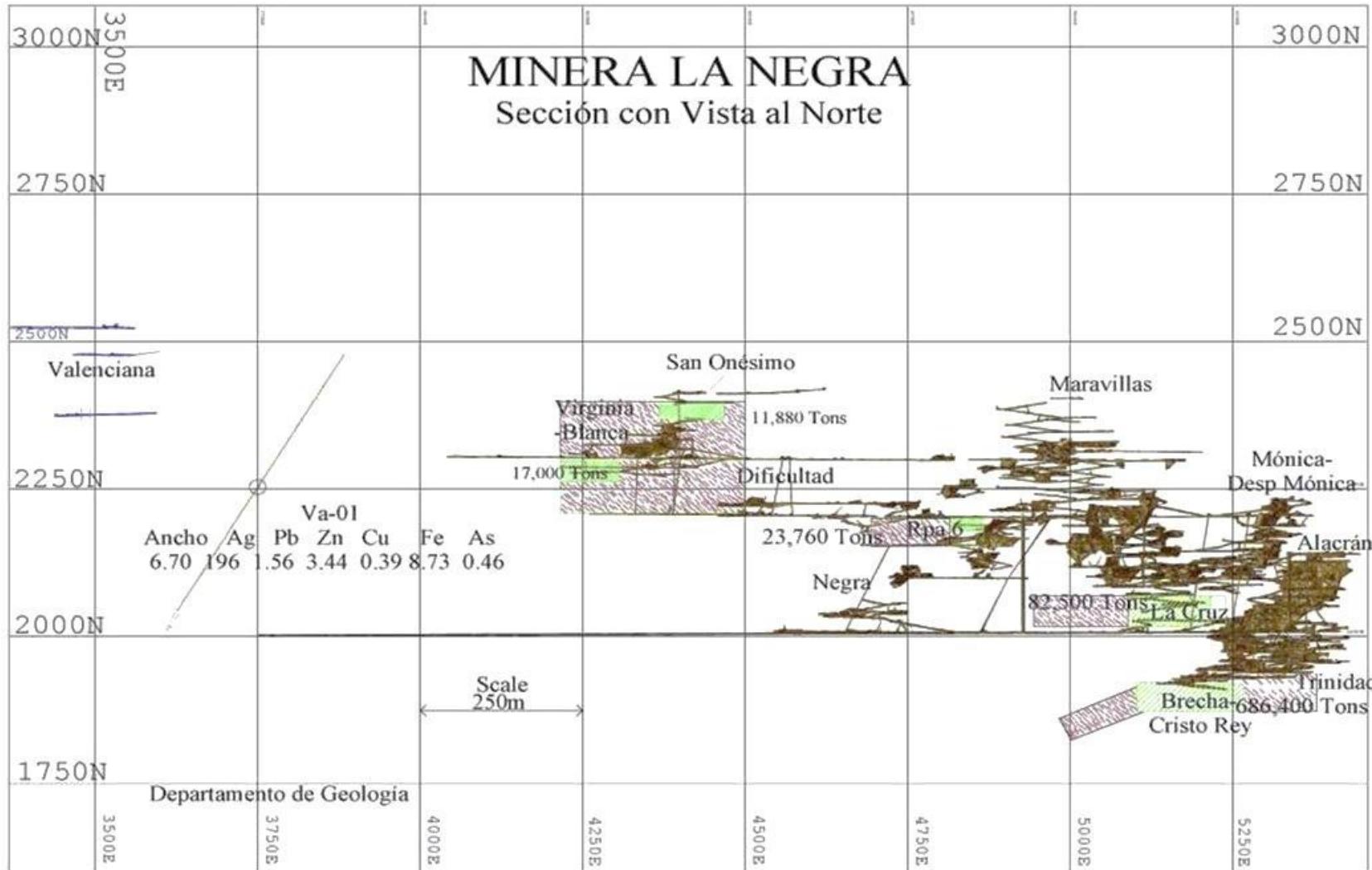


Figure 9.3. New mineralization blocks defined by MLN during 2011 (MLN, 2011)

## 10.0 DRILLING

### 10.1 MLN DRILLING – 2006 TO 2011

During the 2006 to 2008 period, Aurcana realized the need to develop Resources and expand Reserves with an aggressive exploration program of 50,000 meters. Approximately 33,705 meters were drilled between 2007 and 2011 and 12,000 meters per year are planned to be drilled in 2012 and 2013 (Table 10.1).

TABLE 10.1 MLN DRILLING IN THE 2007 TO 2011 PERIOD AND 2012 TO 2013 DRILLING PROGRAM		
Year	Programmed (meters)	Drilled (meters)
2007	-	1,895
2008	-	4,289
2009	4,000	3,774
2010	10,000	10,741
2011	12,000	13,006
<b>Subtotal – Year 2007 to 2011</b>	<b>26,000</b>	<b>33,705</b>
2012	12,000	-
2013	12,000	-
<b>Subtotal – Year 2012 to 2013</b>	<b>24,000</b>	
<b>Total – Years 2007 to 2013</b>	<b>50,000</b>	<b>33,705</b>

The main purpose of this drilling campaign was to increase the quantity of the mineral resources and to improve their confidence in order to replace mineralization being mined. The original intent was to identify sufficient mineral resources and to evaluate increasing production from 1,000 tpd to 1,500 tpd. Most of the drilling planned for 2011 and 2012 was to find extensions of La Negra, Cobrizas (1, 2, and 3), Mónica, Alacrán Cristo Rey-Breccia, La Cruz, Bicentenario, Trinidad, and Maravillas mineralization.

Figure 10.1 shows the distribution of proposed holes for the 2012 drilling programs.

A second objective is the exploration of some isolated targets to indicate potential targets for future detailed exploration and drilling.

### 10.2 MLN DRILLING RESULTS

Typical drilling distribution and results are depicted in several plan and cross section examples from the Cristo Rey, Bicentenario, Cobrizas 2, and Cobrizas 3 in Figure 10.2 to Figure 10.5.

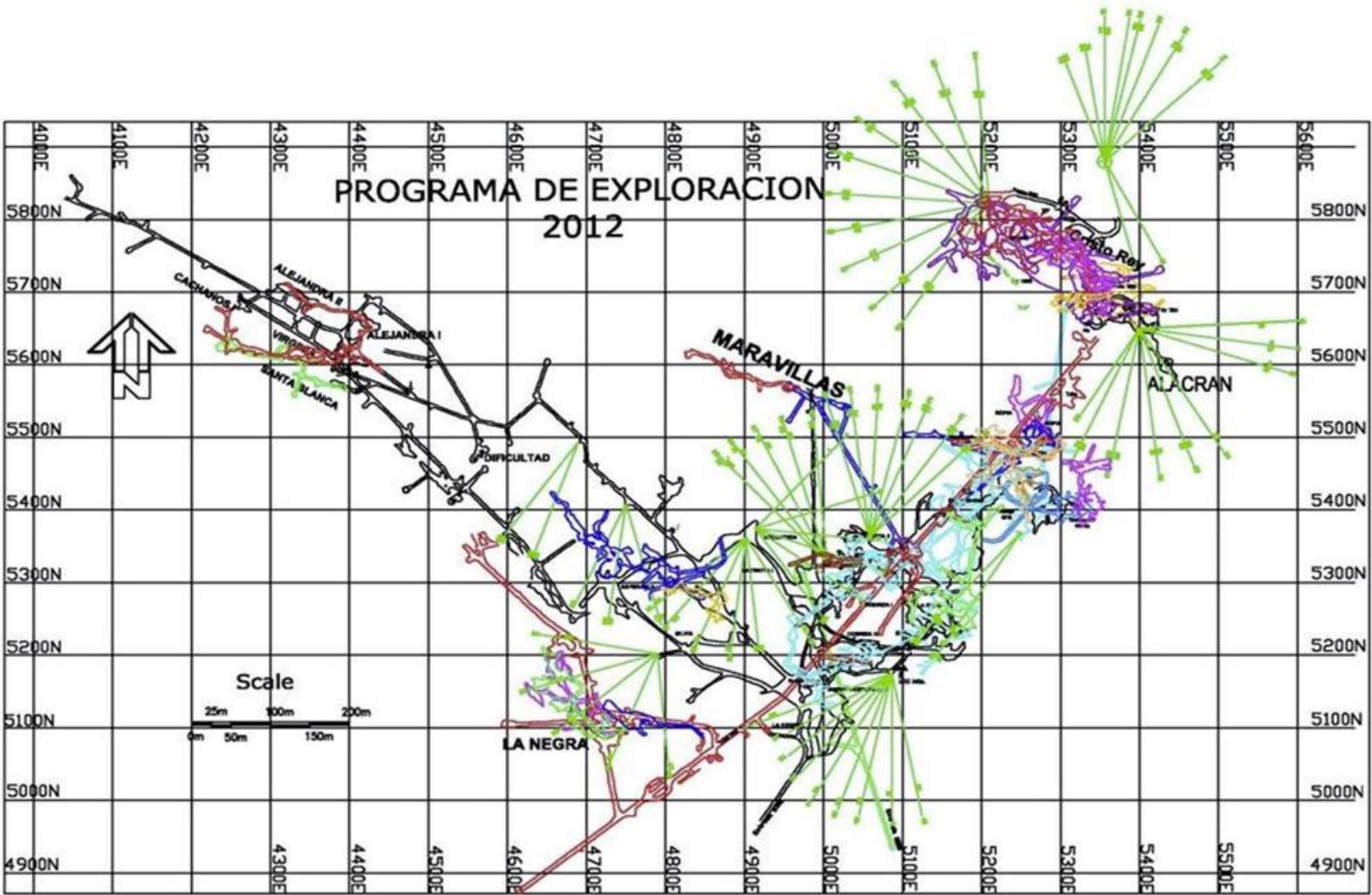


Figure 10.1. La Negra 2012 drilling exploration program (MLN, 2011)

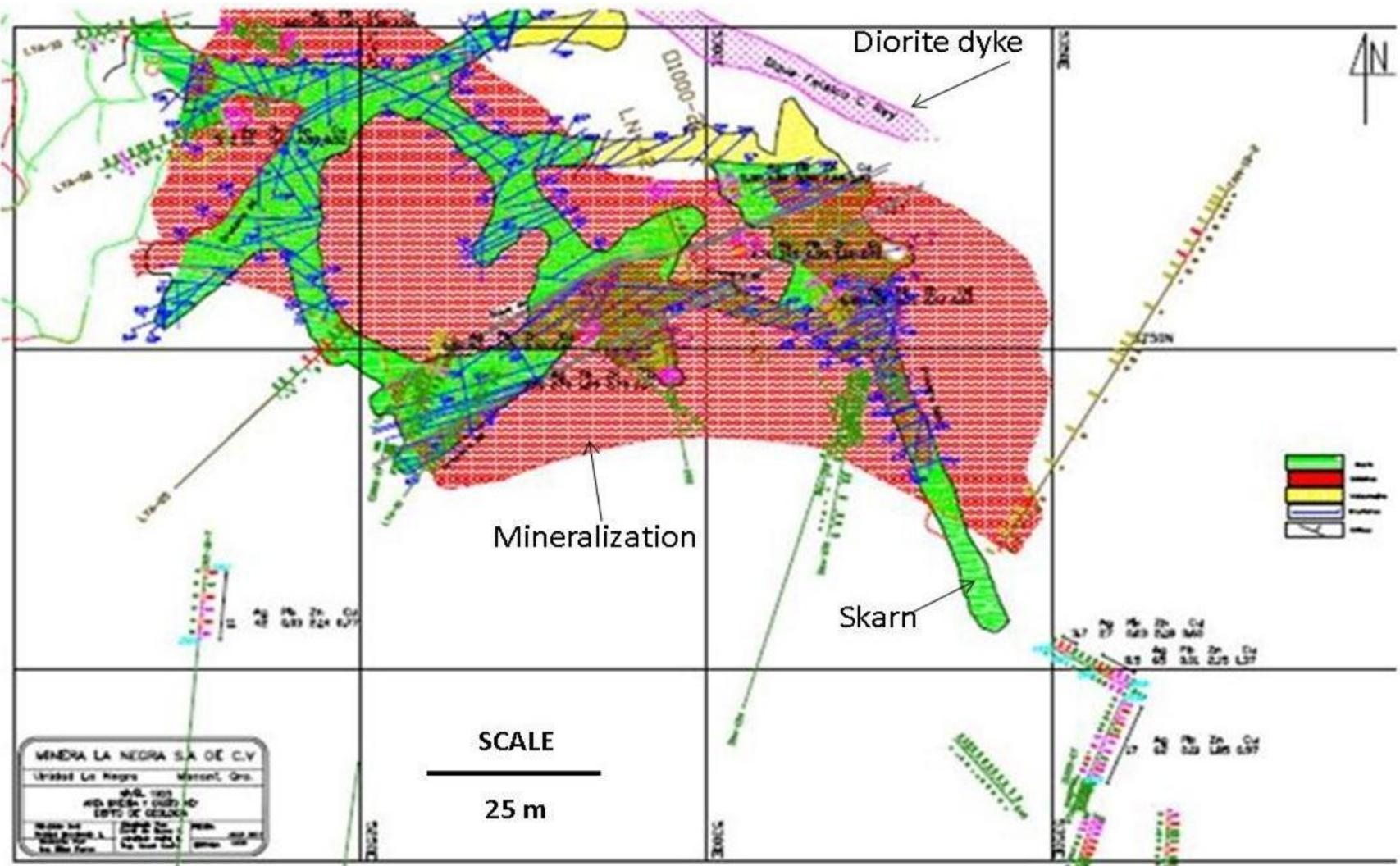
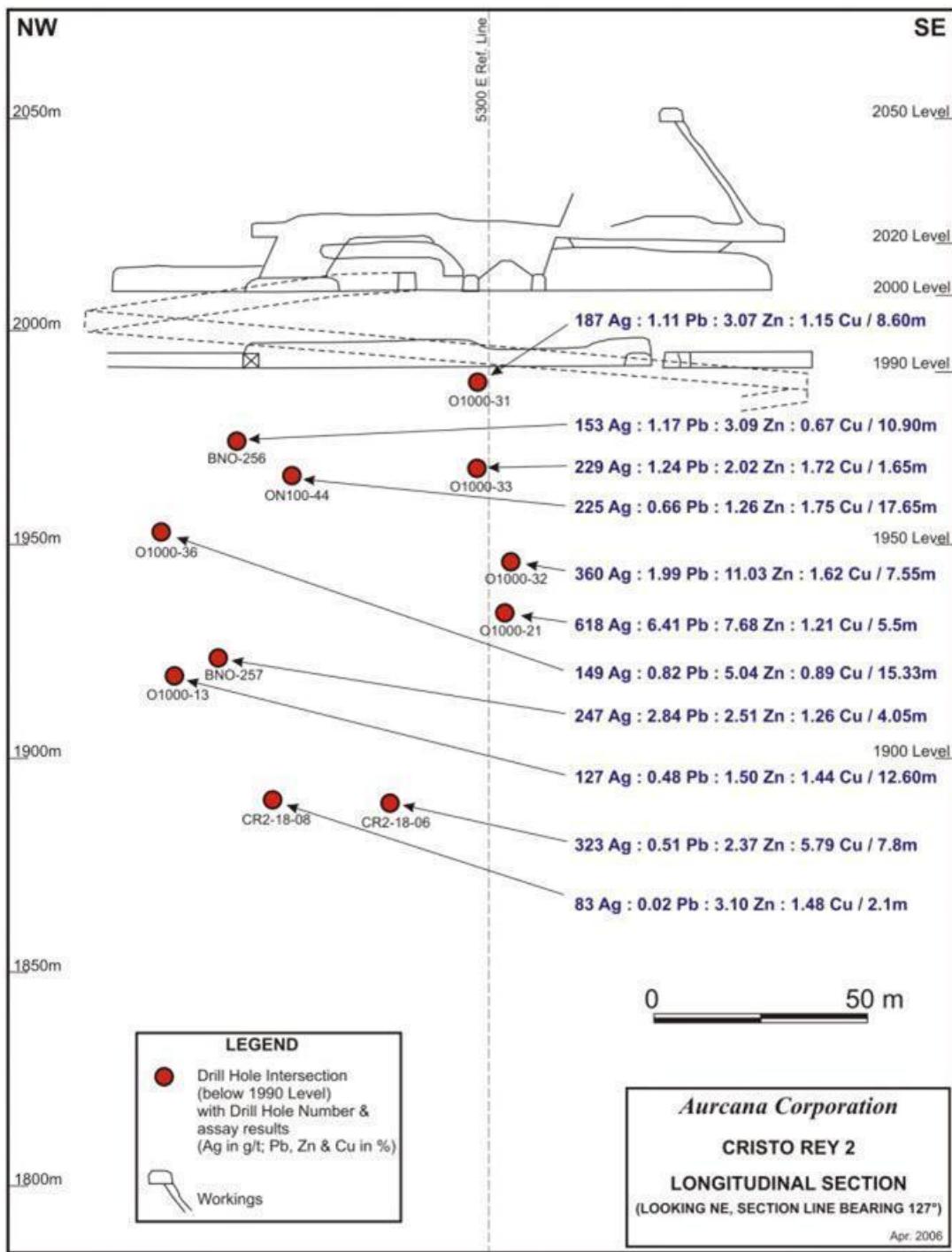


Figure 10.2. Cristo Rey 1925 level geology and drilling results (MLN, 2011)



**Figure 10.3. Cristo Rey longitudinal section showing an example of results of drilling from 1990 level (MLN, 2006)**

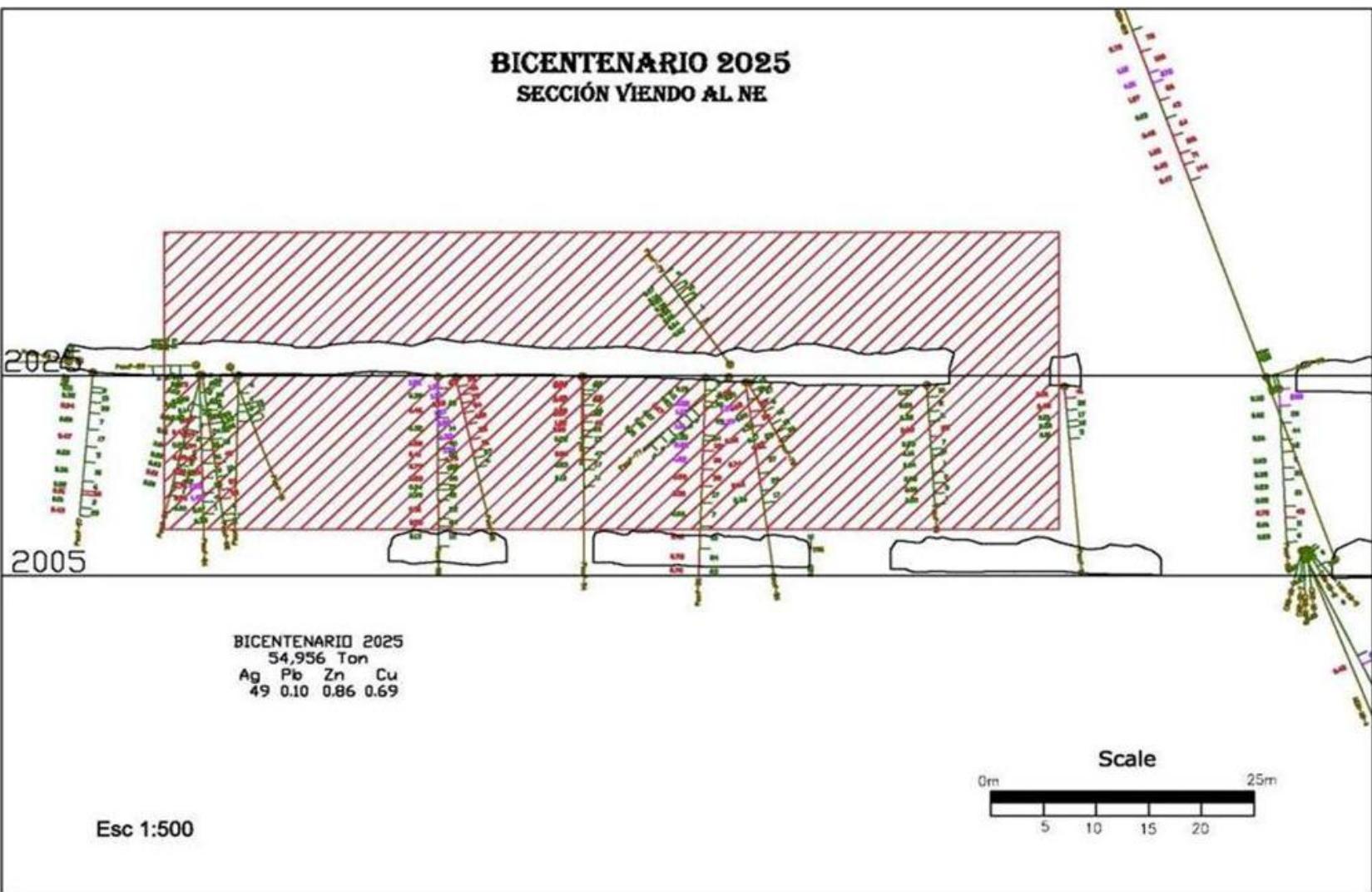


Figure 10.4. Bicentenario 2025 level mineralization showing an example of drilling results (MLN, 2011)

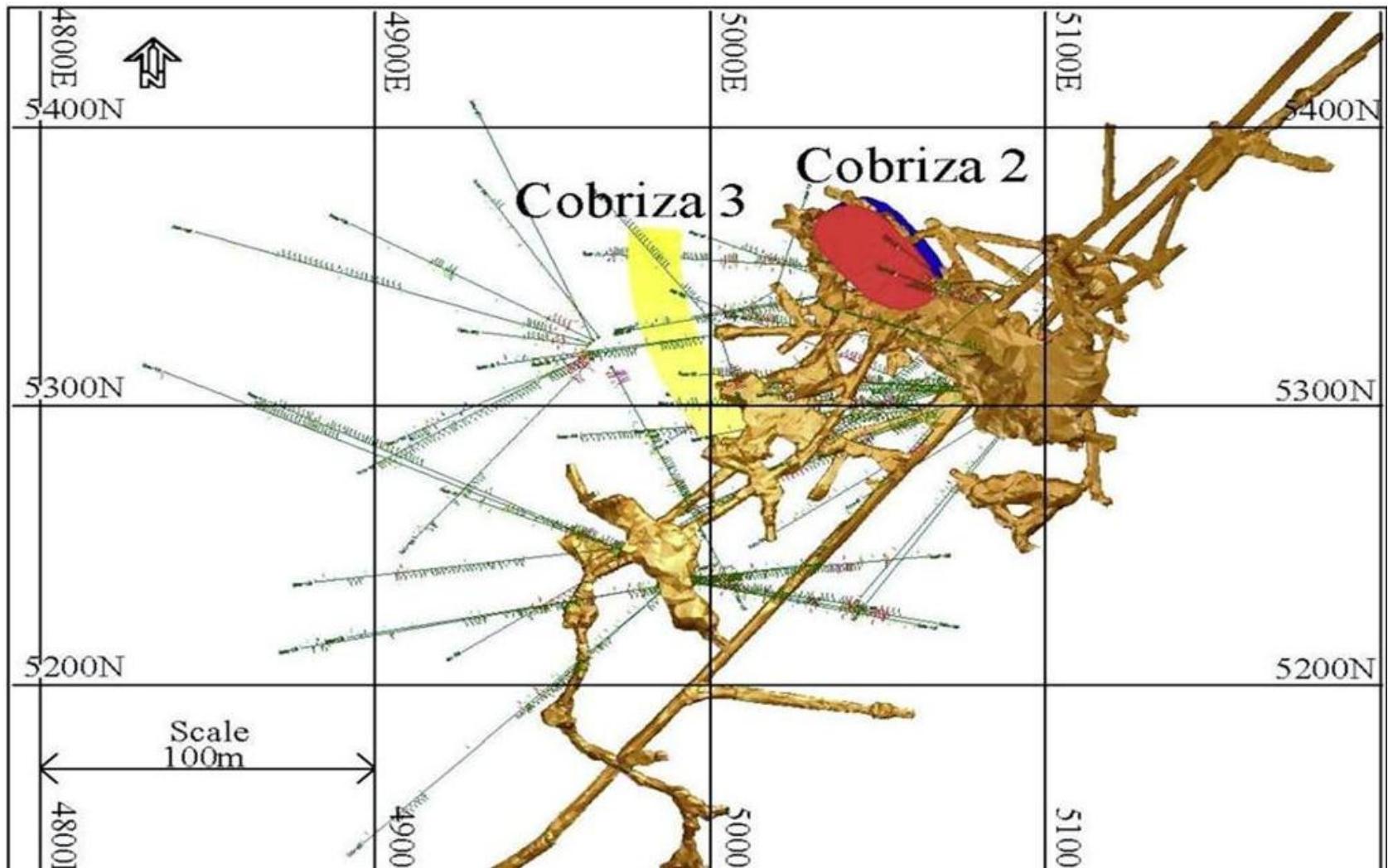


Figure 10.5. Cobriza 2 and Cobriza 3 mineralization; plan map showing exploration drilling (MLN, 2011)

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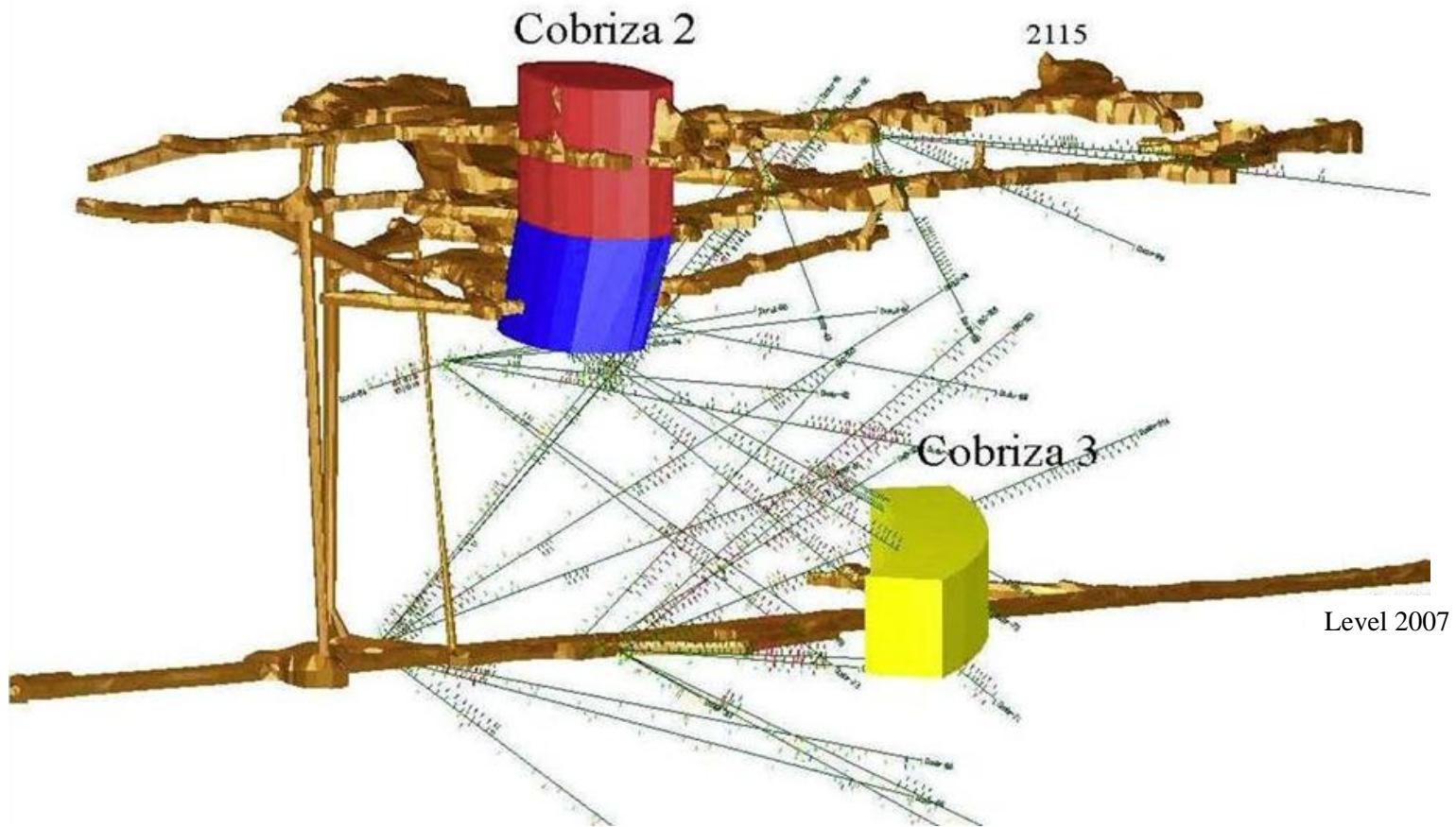


Figure 10.6 Cobriza 2 and Cobriza 3 mineralization; cross section showing exploration drilling  
(MLN, 2011)

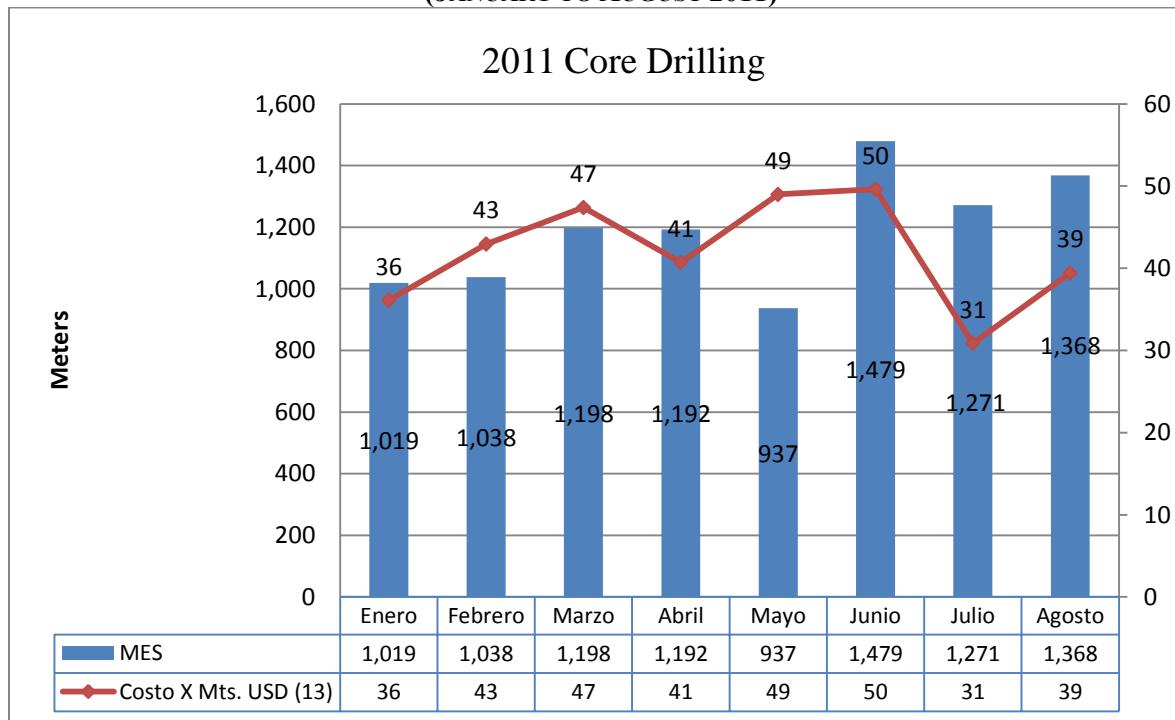
### 10.3 DRILLING PROCEDURES

Core drilling at La Negra is carried out by its own drilling department, currently with 6 drilling equipment with capacities from 40 meters in IEW diameter to 750 meters in NQ diameter (Table 10.2).

TABLE 10.2 MLN DRILLING EQUIPMENT AVAILABLE			
Type of Equipment	Quantity	Diameter	Capacity
JKS Pack Sack	2	IEW	0-40 mts
Diamec 232	2	TT46	0-200 mts
Ingetrol JR-60E	1	BQ	0-200 mts
Longyear LM-55	1	NQ	0-750 mts

The drilling capacity of MLN was slightly over 1,000 meters per month through 2011 (Table 10.3) and larger for 2012, if we consider the recently acquired LY55 equipment for which we have no production information yet (see Section 12.0 for a discussion of sampling procedures and recoveries).

TABLE 10.3  
MLN CORE DRILLING AT LA NEGRA – MONTHLY ADVANCES  
(JANUARY TO AUGUST 2011)



The hardness and massive characteristics of skarn and limestone and to some degree of the diorite intrusive and dikes provide good core recoveries. In the case of mineralized sections, core recovery is also good, commonly over 85% to 90%, although this can be lower in strongly fractured zones, local breccias zones, and strongly altered zones. It is also common that recoveries are lower whenever smaller core diameters are used, *e.g.*, Packsack's IEW (25.4 mm) and to some degree Diamec's TT46 (28 mm). It was

recommended that special care be taken (speed, drilling mud, and additives) when drilling fractured contacts and mineralized zones.

The authors believe that drilling recovery is not a factor that should substantially impact accuracy and reliability of resource and reserve estimates.

## 11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

### 11.1 INTRODUCTION

MLN has established a QA/QC program that includes sample preparation and assay for duplicate and barren samples. The objective is to obtain:

- Assurance in the quality of the sample, its handling and preparation process (QA) in order to obtain, and to be able to demonstrate a desired level of reliability in the assays.
- Quality control in the process (QC) includes the procedures used to obtain a desired level of accuracy and precision in the assays.

### 11.2 QA/QC PROCEDURES

MLN standard procedures for QA/QC control include the use of duplicate, standard, and blank samples. The lab follows specific protocols for the preparation of both types of samples. Routinely, QA/QC samples are inserted in the sampling stream to the lab by the geology department, one barren, duplicate, and standard for every 30 samples or 1 check sample for every 10. The MLN lab also follows an internal verification program by inserting 1 check pulp sample for every 10.

- Barren samples are usually limestone, marble, wollastonite, or quartz samples taken from areas outside the mine area. A 50 kg sample of barren material (Blanks) is provided by the geology department and sent to the laboratory, where it is crushed to minus ¼ inch and sent back to geology where a thoroughly homogenized split is processed following the same protocol and procedures as regular samples and then sent to multiple analysis. Once the sample has proven to be sterile, a split of the pulp is inserted for every 10 samples into the assay stream. In addition, a crushed sample is inserted by the geologists for every 30 samples into the sample stream. Currently, the barren sample comes from a marble bank at Vizarrón, approximately 15 km away from La Negra.
- Duplicate samples are inserted for every 30 samples by adding a second tag with the following number to the sample to be processed and 2 pulps so that the 2 pulps are produced and analyzed. Duplicate pulp samples are also prepared by the lab for internal control and analyzed for each 10 sample interval.

“Standard” samples are also prepared internally by the lab with different mineralized samples provided by the geology department. A 50 kg composite representative sample from all stopes under operation is taken and sent to the laboratory where it is crushed to minus ¼ inch and sent back to geology and a thoroughly homogenized split is processed following the same protocol and procedures as the regular samples and sent to multiple analysis. Average values, after eliminating highest and lower values, are used for the standard; the remaining pulp will be used to be inserted for every 10 samples into the assay stream. In addition, a crushed standard sample is inserted by the geologists for every 30 samples in the sample stream.

### 11.3 INTERNAL MLN QA/QC CONTROL

The MLN labs have a program of internal control by duplicating pulps and re-assaying pulps, as previously mentioned.

A file was created containing the assay results of 323 assay duplicates and 140 repeats between January 2011 and April 2011. Sample values varied between 2.0 g/t Ag and 1,680 g/t Ag, 0.001% Pb and 3.93% Pb, 0.0% Zn and 17.51% Zn, and 0.0% Cu and 12.80% Cu. Table 11.1 shows the average percent variation between pairs of duplicates and repeats with differences of less than 3.5% in all elements of interest, with the exception of copper with a difference of minus 6.3% in repeats but only 0.2% in duplicates.

**TABLE 11.1**  
**AVERAGE PERCENT VARIATION BETWEEN PAIRS OF DUPLICATES AND**  
**REPEAT DIFFERENCES OF LESS THAN 3.5%**

MLN Lab	Number of Pairs	(% Diff)					
		Ag	Pb	Zn	Cu	Fe	As
Duplicates	323	-0.6	-3.3	0.5	-0.2	0.6	-6.2
Repeats	140	-3.5	-1.6	-3.3	-6.3	2.2	1.0

Approximately 20 to 30 pulp samples per month are now sent by the lab for verification at the ALS Chemex certified laboratories in Vancouver for additional external control.

#### **11.4 QA/QC COMMENTS**

Although there is a procedure for the preparation of blank samples, this does not include a detailed description of standard sample preparation and the number of analyses to be made as well as verification in the external labs. It is recommended that blanks be obtained from specialized labs and in the meantime to acquire high purity silica sand to use as a blank.

It was also recommended that standard samples be purchased from a specialized lab, and preferably have the standards prepared with La Negra material at different head grades.

#### **11.5 SAMPLE PREPARATION**

Sample preparation protocols have been established in the lab for mine, core, and other exploration rock samples collected by the geology department plus duplicates and “blank” samples. Before a batch of “exploration” samples are passed, the crushing section is cleaned by crushing and pulverizing barren material, previously assayed.

The MLN laboratory receives mine and surface rock, mineral, and core samples from the geology department in their reception facilities. After checking origin, number of samples, and sample tags received, a copy of the sample list format is signed, samples are placed in a tray and dried at 110°C, passed to the crushing section, and reduced to minus ¼ inch. For every 15 samples, the crushing-pulverizing section is cleaned again with barren material. Every 10 samples are split with a Jones splitter to obtain a duplicate check sample. Once homogenized, a 200-gram sample is passed through a ring centrifugal pulverizer to minus 100 mesh and split. A 100-gram pulp is placed in an envelope, marked with its respective ID number, and sent to the assay section. After every 10 samples, 1 duplicate pulp is obtained.

## **11.6 SAMPLE ANALYSES**

Gold and silver are fire assayed. Fusion of the sample, with a flux, is made in an electric furnace; resulting doré buttons are weighted in electronic balances (Toledo and Sartorius – 0.1 grams to 160 grams precision), silver is dissolved with nitric acid, the gold button left weighted, and calculations of silver and gold weights made.

Lead, zinc, copper, iron, arsenic, bismuth, and antimony are assayed by Atomic Absorption. Pulp samples are dissolved in a mixture of hydrochloric acid and nitric acid (Aqua Regia), dried, and diluted in distilled water. The solution is passed and readings made in one of the two Varian AA 240FI analyzers; a third Perkin Elmer AA equipment is currently not functional. MLN uses 2 calibration standards per element and the corresponding silver, lead, zinc, copper, iron, arsenic, antimony, and bismuth lamps. A regular standard sample from a qualified lab in Canada is inserted with every 15 samples for QC. Readings are made, registered manually in a control book, digitized, and checked by the supervisor before uploading to the MLN intranet for consultation by the geology department. Only 2 lab supervisors have secured access to the database and changes cannot be made externally.

The authors recommend the Company transfer the analyses stored in the AA equipment directly to the assay database to avoid the time-consuming digitizing and potential human errors.

## **11.7 SAMPLE SECURITY**

On a daily basis, mine samples are registered on the chain of custody form and delivered directly to the reception section of the MLN labs.

Core boxes at the drill site are tied-up with rubber bands or rope and are transported daily by the geologist or geology personnel to the core house to be studied and sampled. No core boxes are left on-site for the following day. From the moment the core boxes leave the drill site, they follow a secure path by filling out the chain of custody form that has been received, which is signed by the person in charge at the core house. Later, samples are taken from the core house and delivered to the reception area at the laboratory. In both cases, the chain of custody forms are signed by the receiving party and the form is filed in the geology department. Samples not delivered to the lab remain in the core house premises and are stored in secure areas with limited and locked access, with the geologist in charge.

## **11.8 CONCLUSIONS REGARDING SAMPLE PREPARATION, ASSAYING, AND SECURITY**

It is the authors' opinion that sample preparation, security, and analytical procedures, as followed by the laboratories at La Negra, follow industry standards and are reliable. This assertion is backed by the numerous internal sample checks and the mine's pulps and core sample verification carried out by the authors and described in Section 11.3 and Section 12.0.

Some improvements to the general process can be made and are found throughout the report, as recommendations made to the MLN geology and lab personnel.

## **12.0 DATA VERIFICATION**

La Negra Mine has a long history of exploration and mining activities that dates back to the sixties when Peñoles' Minera La Negra y Anexas, S.A. carried out an extensive exploration and drilling program that resulted in the discovery and partial blocking of the Alacrán and La Negra mineralization. Mining began at La Negra in 1970 and continued through 2000 when metal prices and economic conditions forced the closure of the mine. Further exploration and mining activities have been carried out by Aurcana since taking over in 2007 through the present time.

A review was made of available information derived from previous exploration work. This information included geological and sampling reports, drill logs as well as assay results. Verification consisted of a general review of the geological characteristics for some of the main mineralized areas, spot verification of some drill holes shown by MLN, underground mine checking of geology, and MLN's sampling procedures as well as a review of some mineralized intersections and discussions of detailed sample handling, sampling, and security procedures established by MLN.

### **12.1 MLN OPERATION PROCEDURES**

Minera La Negra has developed a series of SOPs and are in the process of updating and compiling them into a Manual of Exploration Operations.

#### **12.1.1 MLN Exploration Standard Operations Procedures**

SOPs have been established and documented and are in the process of further development by the exploration department of La Negra, as discussed in Section 9.1 of this report.

Some written SOPs follow common industry standards; however, others are still preliminary in nature and are currently being revised and supplemented.

#### **12.1.2 Mine Sampling Verification**

A mine check sampling program was designed and carried out by MLN personnel under the direction of the author for sample verification consisting of a total of 40 samples. Thirty-five of the samples were taken, in most cases contiguous to the original Peñoles' or MLN's channels in 13 mineralized bodies. The number of representative samples selected for each area was proportional to the higher grade resource tonnage estimated internal by MLN, as shown in Table 12.1.

TABLE 12.1 BEHRE DOLBEAR'S MINE CHECK SAMPLING PROGRAM	
Mine Area	Number of Sample
La Negra	5
Maravillas	4
Brecha_N	4
Cobrizas 2	4
Mónica	4
Alacran	3
Bicentenario	3
Santa Luisa	3
Nta Señora	2
San Pedro	2
Despr. De Mónica	2
Cobrizas 1	2
Cobrizas	2
<b>Total</b>	<b>40</b>

A review of current sampling methodology was also undertaken from the sample location and surveying to channel disk cutting, sample taking, recording, transportation, and security to the lab.

In general terms, samples are marked in the walls of the development adits and stope faces, perpendicular to the geological grain and with a spacing in the order of 3.0 meters and variable widths. In the mine, a review of the sampling site is made, the required infrastructure is provided (water, compressed air hoses), the ceiling of the sampling area is secured, and samples are located from the closest surveying point.

The sampling location is washed, samples marked, and a 10 centimeter (cm) wide by 1.0 cm deep channel is cut in the slabs with the help of a Hilti HS200 diamond saw. Samples are cut with a chisel and hammer and collected in plastic bags and a sample tag is inserted in the bag. Finally, samples and sample numbers are painted with spray on the face. Sample slabs are placed in plastic bags, closed with string, and transported daily by the geology personnel directly to the laboratory. The author made several recommendations in the location and mapping of the samples, as well as in the numbering and sample control process.

### 12.1.3 Drilling and Core Sampling Verification

At the time of the site visit, MLN operated 4 diamond coring machines, 1 Diamec 232, 1 Ingetrol JR-60E, and 2 JKS 25 Packsack for short holes. To these, an additional Diamec 232 and 1 Longyear LM-55 have been added. The author saw the operation of the Ingetrol 500 and sample recovery and handling in the operation. It was verified that numbering at the beginning and end of the core boxes, as well as depth markers and recoveries are recorded properly by the operators. Core boxes are tied with a plastic rope and transported by the geology personnel once or twice a day.

The author found the operations adequate but made several observations in the core drilling operation, particularly in the reception and handling of the core sample with the use of a proper collection tool and the filling out of a form on-site before delivery to the core house.

Core sample boxes are received in the core shack and placed for review on a logging table. Verification of box numbering, beginning and end depths as well as completeness, location, and depth intervals of depth markers is made by a technician. Core is tightly assembled, washed, and recovery between markers is measured and registered in the core logging format by the geologist in charge. Geological logging is then made.

RQD measurements are not taken at La Negra, as the host rock is good and stable.

## 12.2 CHECK SAMPLING

Considering the different exploration and operation stages at La Negra, the author carried out several sample checks.

- **Internal MLN Lab Assay Verification** – Verification of pulps remaining in the MLN laboratory
- **Lab Assay Verification** – Verification of pulps remaining in the MLN laboratory versus the ALS Labs
- **Mine Sampling, Sample Preparation, MLN Assay Verification** – Verification of mine channel samples; MLN laboratory versus ALS Labs
- Drill hole core sampling, sample preparation, and MLN assay verification

Overall, 146 samples were re-analyzed at the ALS Chemex labs with the same assay methodology followed by the La Negra lab. Gold was fire assayed in 30 gram pulps with AA finish. Silver, lead, zinc, copper, and arsenic were digested in Aqua Regia and analyzed with AAS (Atomic Absorption Spectroscopy). Sample preparation, ALS Codes, and analytical procedures are found in the Assay Certificate in Appendix 3.0.

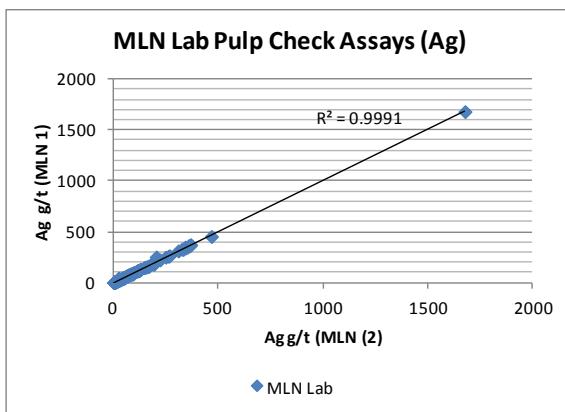
### 12.2.1 Internal MLN Lab Assay Verification

One hundred sixty pulp production samples, analyzed between January and April 2011, were retrieved and re-analyzed by MLN's own lab. Sample control numbers are shown in Table 12.2.

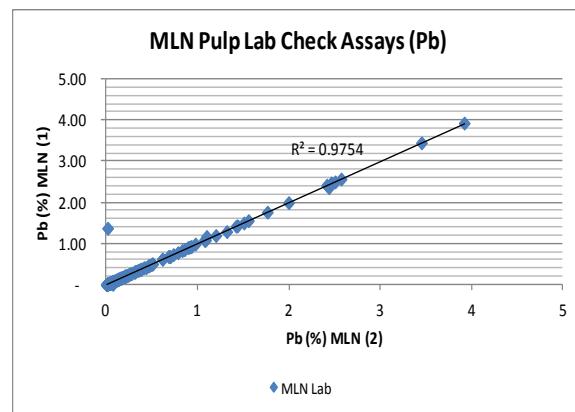
**TABLE 12.2**  
**LIST OF MLN LABORATORY INTERNAL PRODUCTION PULP ASSAY VERIFICATION**

502-1	517-D	1055-D	1971-1	1693-1	1172-1
18791-D	21-D	1571-1	1989-D	2005-D	2303-D
177-1	32-1	799-1	1652-1	1340-1	1180-D
188-1	54-1	967-1	1202-D	1351-D	3505-1
428	486-D	15778-D	1212-1	1362-1	2053-D
230	1551-1	1835-D	1223-D	849-D	2719-1
463	760	1904-1	997-1	2015-1	1191-D
272	772	1589-D	1306-D	1127-D	2212-1
483	488	1907-1	1227-1	854-1	3522-1
493-1	499	977-D	1662-D	876-1	2226
510-D	533-1	1920-1	1667-1	898-1	2313-1
276-D	1001-D	1854-D	2507-D	2117.1	2066-D
2391-1	1011-1	75-1	809-D	2520,D	2324
24796-D	1019-D	97-1	1880-1	1420	2335-D
18512-1	1712	1927-D	1234-D	2609	2346-1
18520-D	904-D	99-D	1892	2022-1	2357-D
18528-1	914-1	348-1	1258-D	1372-1	2367-1
14-D	1024-1	357-1	1730-1	1438-D	2086-1
340-1	925-D	1944-D	1325	1449-1	2381-1
454-1	1607-D	1948-1	1266-1	1460	2393
465-D	1617	2635-D	832-D	1470	2407-1
18534	1628	373	843-1	1481	2254-1
1533	1804-1	385	1290-D	1481-1	2419-D
18552	1047-1	1967	1766-1	1163-D	2429-1
715	1073-D	397	1777-D	1387-1	2440-D
726	1084-1	2644-1	1678-1	1399-D	
736	1830-D	1639-D	1104-D	1492-1	

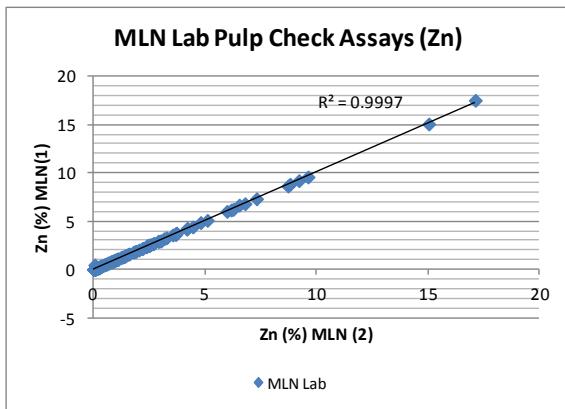
MLN pulp check assay produced similar results for both sets of samples (MLN 1 and MLN 2). The graphs of Figure 12.1 through Figure 12.4 and Table 12.3 show a very good correlation of both sets of pulp samples.



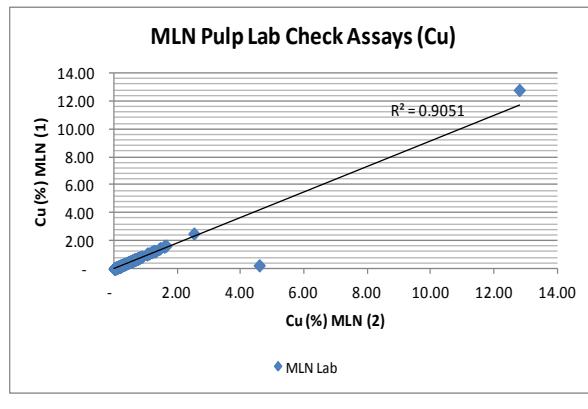
**Figure 12.1. Laboratory pulp check assay correlation: Silver (Ag)**



**Figure 12.2. Laboratory pulp check assay correlation: Lead (Pb)**



**Figure 12.3. Laboratory pulp check assay correlation: Zinc (Zn)**



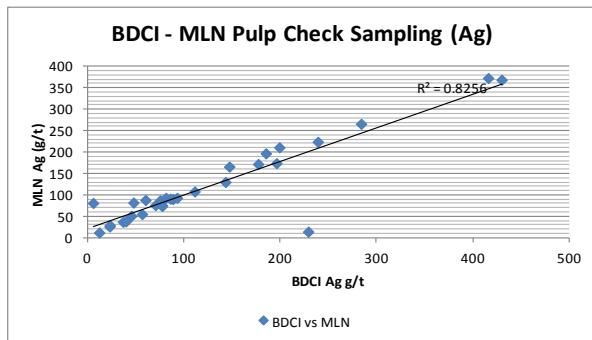
**Figure 12.4. Laboratory pulp check assay correlation: Copper (Cu)**

MLN LABORATORY PULP ASSAY CORRELATION					
Minera La Negra Pulps Internal Check Sampling.					
Correlation Coefficient "r"					
		MLN (1)			
MLN (2)	Au	N/A			
	Ag		0.9987		
	Pb			0.9852	
	Zn				0.9998
	Cu				0.9514

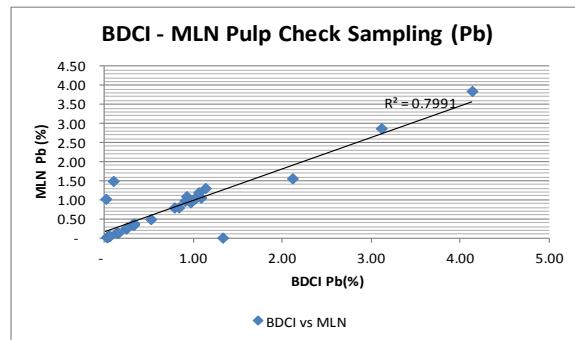
## 12.2.2 Laboratory Assay Verification of Pulps in ALS Chemex Labs

Thirty-one pulp production samples, analyzed by MLN between October 1, 2011 and October 18, 2011, were retrieved and sent for re-analysis to the ALS Chemex labs in Vancouver, Canada. MLN pulp check

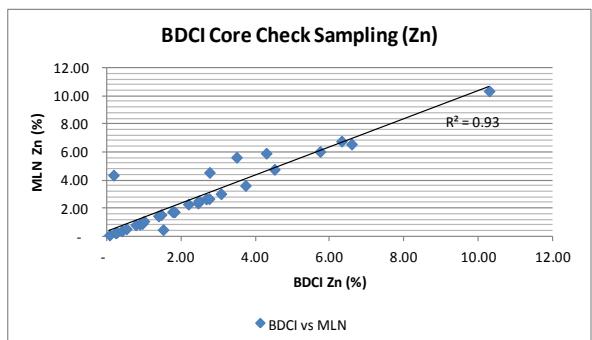
assay produced similar results for both sets of samples (MLN and ALS). The graphs of Figure 12.5 through Figure 12.8 and Table 12.4 show a very good correlation of core samples taken by the authors compared to MLN results.



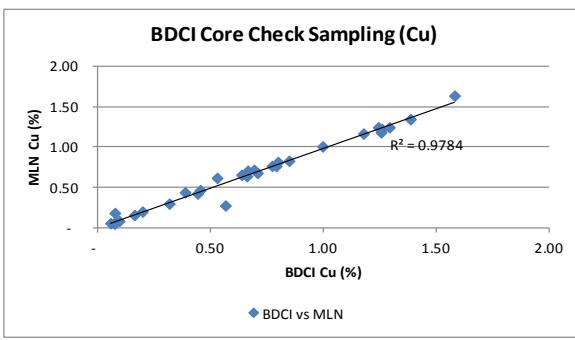
**Figure 12.5. Laboratory pulp check assay correlation: Ag**



**Figure 12.6. Laboratory pulp check assay correlation: Pb**



**Figure 12.7. Laboratory pulp check assay correlation: Zn**



**Figure 12.8. Laboratory pulp check assay correlation: Cu**

**TABLE 12.4**  
**LABORATORY PULP ASSAY CORRELATION**

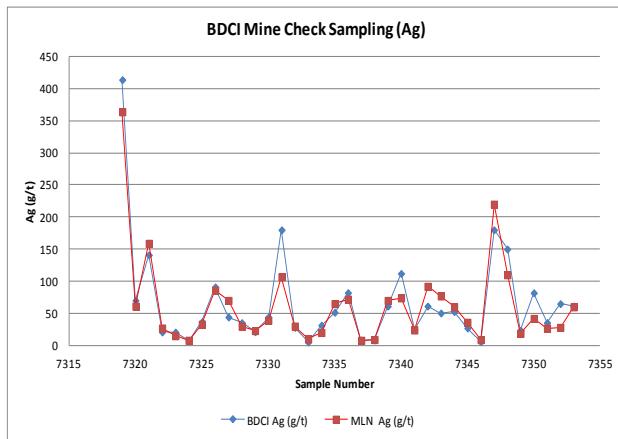
BDCI - MLN Pulp Check Sampling (Ag)					
Correlation Coefficient "r"					
		BDCI			
MLN	Au	N/A	Au	Ag	Pb
	Ag			0.9087	
	Pb				0.8939
	Zn				
	Cu				

### 12.2.3 Mine Sampling Verification – ALS Chemex Labs

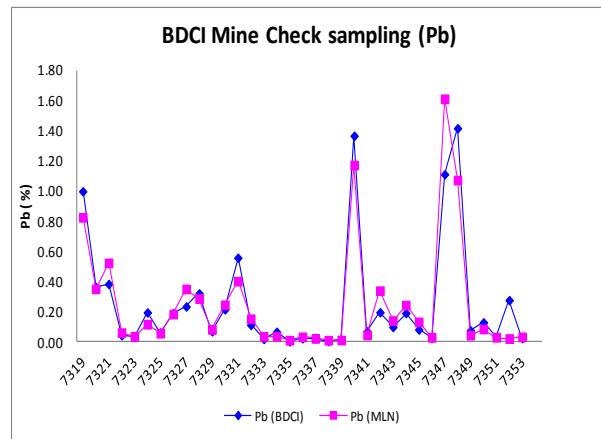
Thirty-five channel samples were taken from 13 different potential mining areas adjacent to where the old channel samples locations could be identified to confirm MNL's assay values. These samples were taken parallel to the old samples and are listed in Table 12.5.

TABLE 12.5 BEHRE DOLBEAR'S CHANNEL SAMPLE CHECK PROGRAM			
Sample Number		Mine Area	Mine Level
Original	Check Sample		
2293	7319	Maravillas Rampa III	Ramp III
2294	7320		
1963	7321		
1958	7322		
7743	7323	Monica	2200
9287	7324		
1170	7325		
1171	7326		
1172	7327	Desp Monica	2185
1173	7328		
9473	7329	Bicentenario	2115
9476	7330		
390	7331		
393	7332		
6680	7333	Cobrizo	2115
2728	7334		
2729	7335		
2732	7336		
10714	7337	Nuestra Señora	2100
10711	7338		
3346	7339		
3351	7340		
1914	7341	Brecha	1918
1160	7342		
8213	7343		
6911	7344		
7715	7345	Alacrán	2000
7718	7346		
1128	7347		
7725	7348		
9438	7349	La Negra	2045
3084	7350		
7701	7351		
7703	7352		
7704	7353	San Pedro	2315

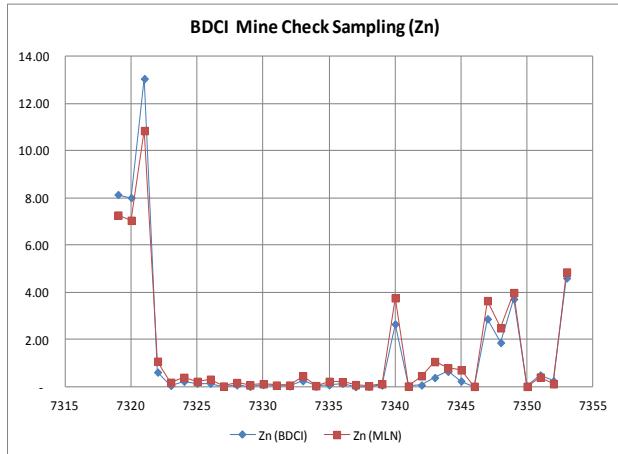
The correlation graphs of Figure 12.9 through Figure 12.12 and Table 12.6 show a very good correlation of core samples taken by the authors compared to MLN results.



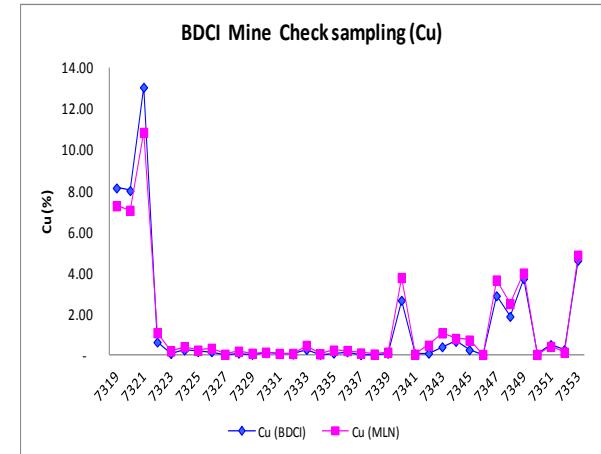
**Figure 12.9. Laboratory pulp check assay correlation: Ag**



**Figure 12.10. Laboratory pulp check assay correlation: Pb**



**Figure 12.11. Laboratory pulp check assay correlation: Zn**



**Figure 12.12. Laboratory pulp check assay correlation: Cu**

**TABLE 12.6**  
**MLN – BEHRE DOLBEAR’S MINE CHECK SAMPLING CORRELATION**

Behre Dolbear Mine Check Sampling.					
Correlation Coefficient "r"					
Minera La Negra	Behre Dolbear				
	Au	Au	Ag	Pb	Zn
	Au	N / A			
	Ag		0.954		
	Pb			0.938	
	Zn				0.988
	Cu				0.973

#### **12.2.4 Drill Hole Core Sampling Verification**

Considering the variation in diameters and limited availability of old drill holes core, it was decided (1) to retrieve existing pulp samples from old intersections; and (2) re-sample some available core (Table 12.7).

- 42 pulp samples were sent to the ALS Chemex lab for re-analysis.
- 38 quarter core samples were taken and sent to ALS Chemex lab for re-analysis.

Technical Report of the La Negra Mine, Querétaro, México  
 Dated: October 4, 2012, Amended: May 31, 2013

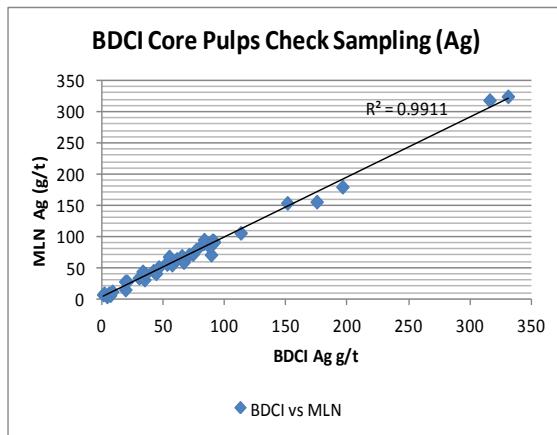
TABLE 12.7  
 CORE CHECK SAMPLE LOCATION

Behre Dolbear		Minera La Negra		Drill Hole	From	To	Int
Check Sample Number	Sample Number	Number		m	m	m	
BDM 1	17764	MLN	17764		196.35	197.85	1.50
BDM 2	17765	MLN	17765	LYA-03	197.85	199.95	2.10
BDM 3	9863	MLN	9863		1.45	3.20	1.75
BDM 4	9864	MLN	9864	IBX-03	3.20	4.00	0.80
BDM 5	7691	MLN	7691		5.80	7.10	1.30
BDM 6	7692	MLN	7692		7.10	8.40	1.30
BDM 7	7693	MLN	7693		8.40	10.30	1.90
BDM 8	7694	MLN	7694		10.30	12.30	2.00
BDM 9	7695	MLN	7695		12.30	14.30	2.00
BDM 10	7696	MLN	7696		14.30	16.30	2.00
BDM 11	7697	MLN	7697		16.30	17.50	1.20
BDM 12	7698	MLN	7698		17.50	19.30	1.80
BDM 13	7699	MLN	7699		19.30	21.30	2.00
BDM 14	7700	MLN	7700		21.30	23.30	2.00
BDM 15	7901	MLN	7901		23.30	23.90	0.60
BDM 16	7902	MLN	7902		23.90	25.75	1.85
BDM 17	7903	MLN	7903	IBX-08	25.75	27.75	2.00
BDM 18	7904	MLN	7904		27.75	29.75	2.00
BDM 19	7905	MLN	7905		29.75	31.55	1.80
BDM 20	7906	MLN	7906		31.55	33.05	1.50
BDM 21	7907	MLN	7907		33.05	34.00	0.95
BDM 22	7914	MLN	7914		45.00	46.35	1.35
BDM 23	7915	MLN	7915		46.35	47.70	1.35
BDM 24	7916	MLN	7916		47.70	49.00	1.30
BDM 25	7917	MLN	7917		49.00	50.30	1.30
BDM 26	7918	MLN	7918		50.30	50.65	0.35
BDM 27	7919	MLN	7919		50.65	52.05	1.40
BDM 28	7920	MLN	7920		52.05	53.75	1.70
BDM 29	7921	MLN	7921		53.75	55.45	1.70
BDM 30	18604	MLN	18604	DBX-157	33.15	33.45	0.30
BDM 31	18605	MLN	18605		33.45	34.60	1.15
BDM 32	18606	MLN	18606		34.60	35.15	0.55
BDM 33	89	MLN	89	PPAT-171	14.15	15.30	1.15
BDM 34	90	MLN	90		15.30	15.95	0.65
BDM 35	2646	MLN	2646	PPAT-173	7.25	8.65	1.40
BDM 36	2647	MLN	2647		8.65	10.00	1.35
BDM 37	42808	MLN	42808	CR-2-186	297.00	299.90	2.90
BDM 38	42809	MLN	42809		299.90	301.00	1.10
BDM 39	42810	MLN	42810		301.00	303.00	2.00

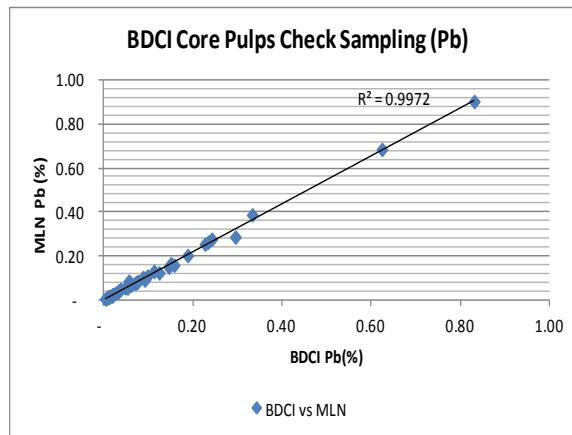
  

Behre Dolbear		Minera La Negra		Drill Hole	From	To	Int
Check Sample Number	Sample Number	Number		m	m	m	
BDM 40	18125	MLN	18125		33.80	34.40	0.60
BDM 41	18126	MLN	18126		34.40	35.00	0.60
BDM 42	18127	MLN	18127		35.00	35.60	0.60
BDM 43	18128	MLN	18128		35.60	36.20	0.60
BDM 44	18129	MLN	18129		36.20	36.80	0.60
BDM 45	18130	MLN	18130		36.80	37.40	0.60
BDM 46	18131	MLN	18131		37.40	38.00	0.60
BDM 47	6552	MLN	6552		29.35	30.30	0.95
BDM 48	6553	MLN	6553		30.30	31.80	1.50
BDM 49	6554	MLN	6554		31.80	33.80	2.00
BDM 50	6564	MLN	6564		49.05	49.90	0.85
BDM 51	6565	MLN	6565		49.90	50.80	9.00
BDM 52	6566	MLN	6566		50.80	52.15	1.35
BDM 53	6567	MLN	6567		52.15	53.20	1.05
BDM 54	6568	MLN	6568		53.20	54.05	0.85
BDM 55	7933	MLN	7933		1.70	2.80	1.10
BDM 56	7934	MLN	7934		2.80	4.10	1.30
BDM 57	7935	MLN	7935		4.10	5.30	1.20
BDM 58	7936	MLN	7936		5.30	6.50	1.20
BDM 59	7937	MLN	7937		6.50	8.50	2.00
BDM 60	7938	MLN	7938		8.50	10.50	2.00
BDM 61	7939	MLN	7939		10.50	11.50	1.00
BDM 62	7953	MLN	7953		33.20	34.80	1.60
BDM 63	7967	MLN	7967		51.65	52.90	1.25
BDM 64	7990	MLN	7990		22.90	24.40	1.50
BDM 65	7992	MLN	7992		25.90	27.70	1.80
BDM 66	8000	MLN	8000		36.75	38.25	1.50
BDM 67	9602	MLN	9602		4.10	5.20	1.10
BDM 68	9604	MLN	9604		6.60	7.90	1.30
BDM 69	9606	MLN	9606		9.20	10.80	1.60
BDM 70	9608	MLN	9608		12.05	13.60	1.55
BDM 71	9609	MLN	9609		2.80	4.30	1.50
BDM 72	9613	MLN	9613		7.50	7.80	0.30
BDM 73	9617	MLN	9617		10.00	11.50	1.50
BDM 74	9618	MLN	9618		11.50	12.50	1.00
BDM 75	9621	MLN	9621		16.50	17.10	0.60
BDM 76	9622	MLN	9622		17.10	18.15	1.05
BDM 77	9624	MLN	9624		19.65	20.85	1.20
BDM 78	9625	MLN	9625		20.85	22.05	1.20
BDM 79	9626	MLN	9626		22.05	23.35	1.30
BDM 80	9631	MLN	9631		30.35	31.80	1.45

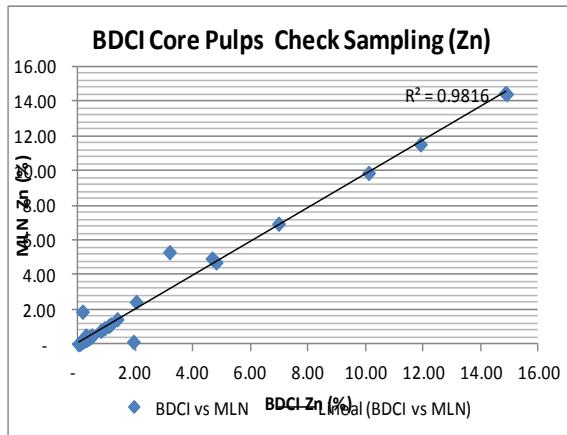
The correlation graphs of Figure 12.13 through Figure 12.16 and Figure 12.17 to Figure 12.20 and Table 12.8, Table 12.9, and Table 12.10 show a very good correlation between the MLN and ALS pulps assayed and good correlation in core sampling verification taken by the authors compared to the MLN results.



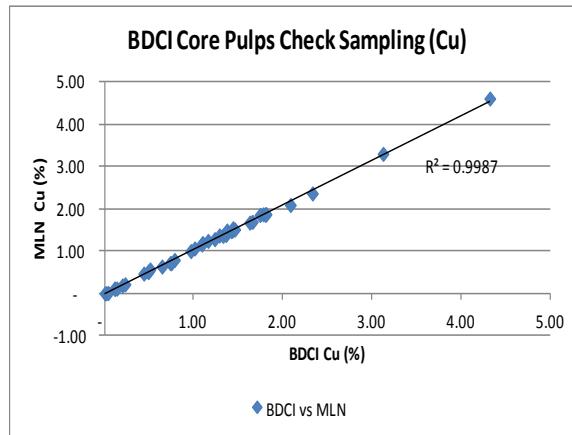
**Figure 12.13. Core pulp check assay correlation: Ag**



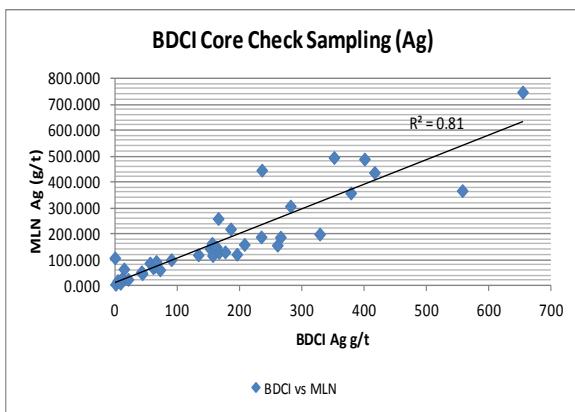
**Figure 12.14. Core pulp check assay correlation: Pb**



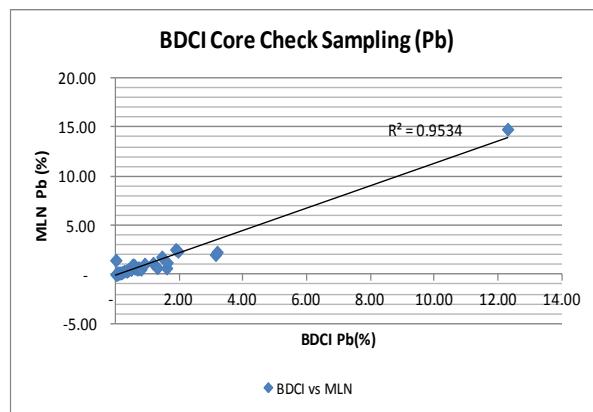
**Figure 12.15. Core pulp check assay correlation: Zn**



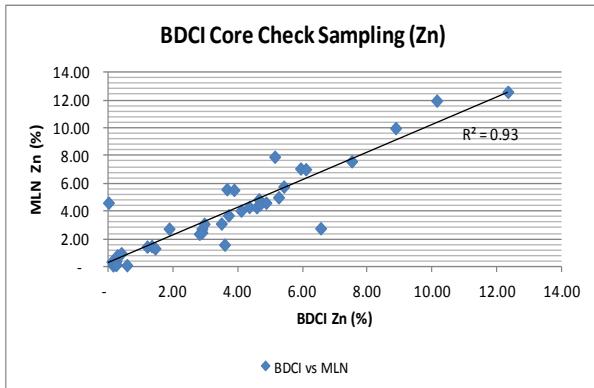
**Figure 12.16. Core pulp check assay correlation: Cu**



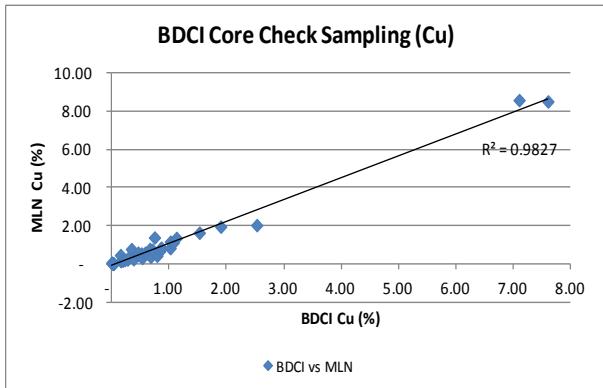
**Figure 12.17.** Drill core check assay correlation: Ag



**Figure 12.18.** Drill core check assay correlation: Pb



**Figure 12.19.** Drill core check assay correlation: Zn



**Figure 12.20.** Drill core check assay correlation: Cu

**TABLE 12.8**  
**MLN'S – BDCI'S CORE PULP SAMPLING CORRELATION**

Minera La Negra BDCI Core Pulps Check Sampling.					
Correlation Coefficient "r"					
		BDCI			
MLN	Au	N/A	-	-	-
	Ag	-	<b>0.996</b>	-	-
	Pb	-	-	<b>0.999</b>	-
	Zn	-	-	-	<b>0.991</b>
	Cu	-	-	-	<b>0.999</b>

**TABLE 12.9**  
**MLN'S – BDCI'S DRILL CORE RE-SAMPLING CORRELATION**

		Minera La Negra BDCI Core Check Sampling.				
		Correlation Coefficient "r"				
		MLN (1)				
		Au	Ag	Pb	Zn	Cu
MLN (2)	Au	N/A				
	Ag		0.9295			
	Pb			0.9782		
	Zn				0.9644	
	Cu					0.9923

**TABLE 12.10**  
**MLN'S – BDCI'S DRILL CORE RE-SAMPLING CORRELATION**

		Minera La Negra BDCI Core Check Sampling.				
		Correlation Coefficient "r"				
		BDCI				
		Au	Ag	Pb	Zn	Cu
MLN	Au	N/A				
	Ag		0.9000			
	Pb			0.9764		
	Zn				0.9158	
	Cu					0.9913

### 12.3 ASSAY VERIFICATION CONCLUSIONS

Several observations can be made from this check sampling.

- 1) The internal MLN verification of pulps resulted in good correlations for Ag, Pb, Zn, and Cu, with "r" values between 0.95 and 0.99.
- 2) Verification of production pulps remaining in the MLN versus ALS laboratories. Assay results had good "r" correlation values between 0.89 and 0.98.
- 3) Correlation values in all elements are also good in the verification made of underground channel sampling, although with a higher dispersion, particularly in Ag.
- 4) Check sampling of MLN core pulps against ALS labs is particularly good in all elements, in the order of 0.99.
- 5) Mine sampling, sample preparation, MLN assay verification, verification of mine channel samples, and MLN laboratory versus ALS Labs.

It is concluded that results reported are acceptable; therefore, mine sampling, core sampling, and sample preparation and assaying at MLN's laboratory are considered reliable.

### 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

MLN currently operates a conventional milling and flotation plant with a capacity of 2,200 tpd producing zinc, lead, and copper concentrates. MLN operates a laboratory with well-equipped assay and metallurgical research facilities.

Routine metallurgical lab testing is commonly carried out when mining new sections of the mine or new mineralized bodies are planned to be mined to establish their particular process parameters or sections of the mine where specific mineralogical, hardness, grain size, or contents of deleterious materials may be expected.

According to the monthly operation reports of MLN, from January to May 2012, approximately 244,000 tonnes were milled with the production of 1,525 tonnes of lead concentrate, 6,259 tonnes of zinc concentrate, and 3,316 tonnes of copper concentrate. Average recoveries for the 5-month period were 84.86% and 81.0% of silver and lead in lead concentrates, respectively; 74.62% of zinc in zinc concentrates; and 70.66% of copper in copper concentrates and are considered to be representative of mineralization produced from the different active stopes in different mineralization throughout the mine, during the said period.

Currently, the MLN lab is focusing its metallurgical research in their own facilities to improve recoveries, improve the quality of concentrates, milling, and reagent use controls, granulometry control, and blending and feeding, according to the material received from different mine stopes.

For such purposes, the metallurgical laboratory has carried out the following activities.

- Mineral characterization of concentrates
- Metallurgical lab testing for the optimization of lead, copper and zinc circuits
- Research in the use of different collectors in the copper circuit
- Research in the use of different promoters in the lead, copper and zinc circuits
- Standardization and plant automation with the installation of Outotec's Courier equipment

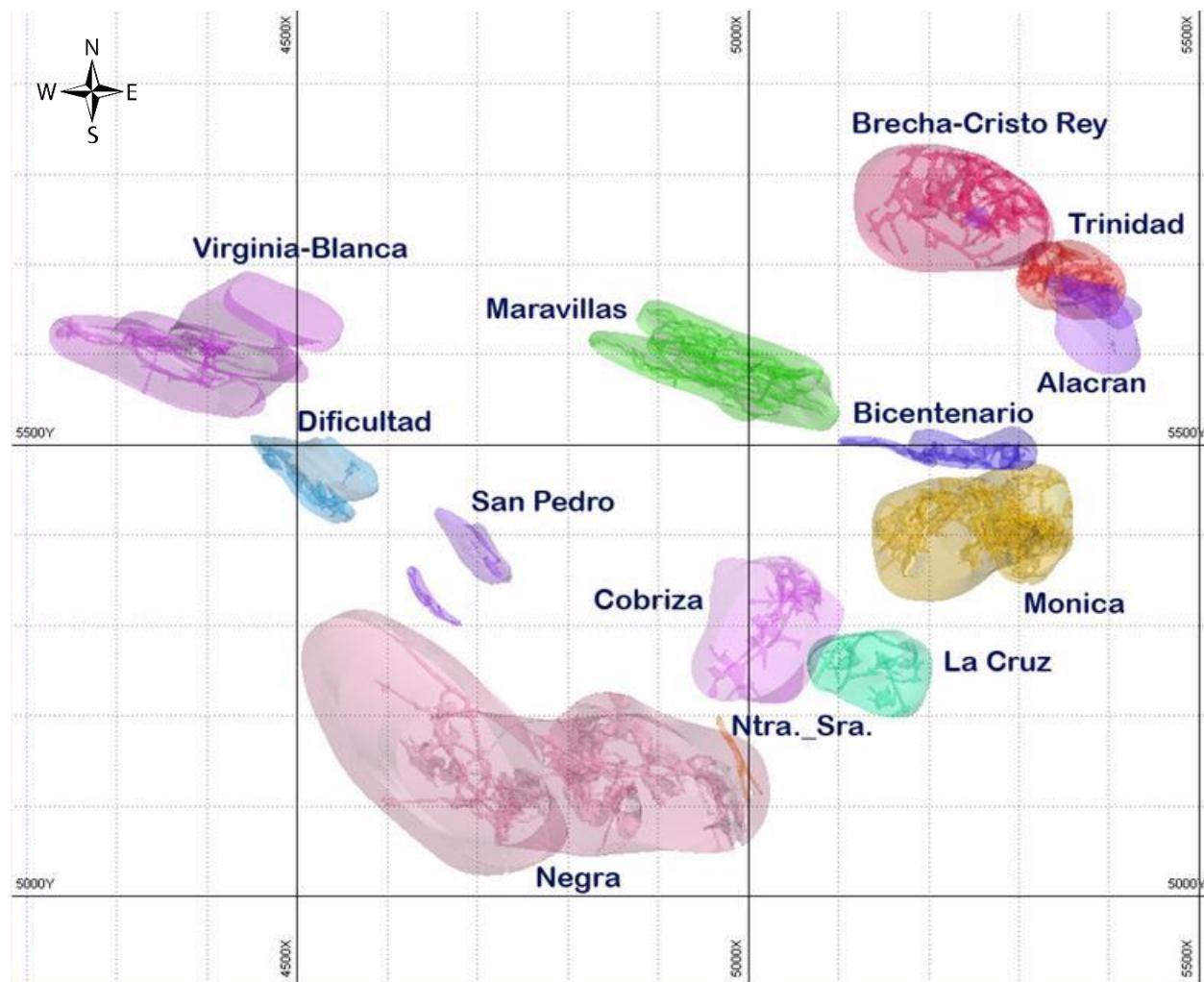
Excess bismuth, antimony, and arsenic in copper concentrates is penalized by smelters, as well as excess iron in zinc concentrates and excess bismuth, antimony, arsenic, and zinc and insolubles in lead concentrates. Therefore, most of the metallurgical testing focuses on the detection of mineralization with potential penalized elements and in the improvement of recoveries and operation parameters and costs.

Bismuth in lead concentrates (over 2% bismuth) is the element with the highest NSR penalties. Therefore, the analysis of the source of bismuth, tracing back to the stopes and further characterization of the mineralization, is recommended.

## 14.0 MINERAL RESOURCE ESTIMATES

### 14.1 SCOPE OF WORK

Resources for the La Negra property were estimated using several automated interpolation methods, including geostatistics. The Company divided the area into 13 separate “deposits.” Figure 14.1 shows the layout of the deposits and the mineralized envelopes defined by the Aurcana geologists.



**Figure 14.1. Plan view layout of the deposits and the mineralized envelopes**

Most of the deposits were analyzed and modeled separately, but several were combined and analyzed as a single unit because they are physically close or intersected. Cobriza and La Cruz intersected in a small volume so the solids were combined and modeled as a single unit. The drill holes and channel samples for Cobriza, La Cruz, and Ntra.\_Sra. were combined into a single database, checked to eliminate duplicate samples, and grades were estimated in a single model. Brecha-Cristo Rey and Trinidad did not intersect, but were combined into a single block model because they were separated by about 20 meters.

## 14.2 RESOURCE SUMMARY

The La Negra deposits contain four primary marketable metals. Silver is the key metal although the other metals contribute substantially. The mineral resource tonnage and grades were estimated by generating 3D block models for each deposit.

To consider the contained minerals as a single economic unit, a recovered block value is calculated based on the modeled grade estimates using the metal prices and recoveries shown in Table 14.1. The metal prices used are the trailing 12-quarter averages as of June 30, 2012 and the recoveries are the average of the monthly recoveries reported by the Company from January 2012 through May 2012.

TABLE 14.1 METAL PRICES AND RECOVERIES USED FOR RECOVERED BLOCK VALUE CALCULATION				
	Silver	Copper	Lead	Zinc
12Q Average Price <sup>1</sup>	\$28.29	\$3.33	\$0.88	\$0.84
Recovery <sup>2</sup>	84.87%	81.02%	74.62%	70.66%

<sup>1</sup>Prices are the averages of the trailing 12-quarter spot prices as of June 30, 2012.  
<sup>2</sup>Recoveries are the average of actual mill recoveries from January through May 2012.

The mineral resource estimates were made in accordance with CIM Definition Standards and a recovered block value of US\$40 per tonne was used as the economic cutoff for the Mineral resource summaries.

Table 14.2 through Table 14.7 summarize the mineral resources for all the Auricana La Negra deposits.

**TABLE 14.2**  
**MEASURED AND INDICATED RESOURCES FOR ALL DEPOSITS AND ALL BLOCKS WITH A MINIMUM RECOVERED  
 VALUE OF US\$40 PER TONNE  
 (AS OF JUNE 30, 2012)**

Classification	Tonnes (000)	Average				In Situ Metal Quantities (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc %	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	11,862	133.42	0.50	0.90	2.60	50,070	130,834	228,825	673,603
Indicated	15,159	130.12	0.41	0.92	2.19	65,026	138,695	310,673	745,060
Measured plus Indicated	<b>27,021</b>	<b>131.31</b>	<b>0.49</b>	<b>0.91</b>	<b>2.36</b>	<b>115,096</b>	<b>269,529</b>	<b>539,498</b>	<b>1,418,664</b>

**TABLE 14.3**  
**INFERRRED RESOURCES ALL BLOCKS WITH A MINIMUM RECOVERED VALUE OF US\$40 PER TONNE  
 (AS OF JUNE 30, 2012)**

Deposit	Tonnes (000)	Average				In Situ Metal Quantities (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Totals	<b>13,278</b>	<b>126.05</b>	<b>0.42</b>	<b>0.88</b>	<b>2.14</b>	<b>56,501</b>	<b>132,260</b>	<b>263,033</b>	<b>657,370</b>

**TABLE 14.4**  
**MEASURED RESOURCES SUMMARIZED BY DEPOSIT FOR ALL BLOCKS WITH A MINIMUM RECOVERED**  
**VALUE OF US \$40 PER TONNE**  
**(AS OF JUNE 30, 2012)**

Deposit	Tonnes (000)	Average				In Situ Metal Quantities (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Alacrán	188	56.36	0.71	0.11	1.45	289	2,730	366	5,482
Bicentenario	221	61.86	0.32	0.20	0.86	417	1,609	977	3,340
Brecha-Cristo Rey	983	106.70	0.67	0.64	1.96	3,191	14,248	13,059	44,539
Cobriza-LaCruz	430	61.68	0.51	0.19	0.22	860	5,395	1,655	2,021
Dificultad	107	67.82	0.79	0.17	5.45	220	1,526	441	10,786
Maravillas	2,435	135.36	0.72	0.79	3.92	11,256	40,014	43,893	215,319
Monica	684	99.70	0.38	0.64	0.98	2,022	5,341	9,304	15,272
Negra	5,381	162.87	0.40	1.19	2.52	27,432	46,554	135,939	291,414
Ntra._Sra.	15	106.62	0.23	0.54	0.43	50	77	181	157
San Pedro	—	—	—	—	—	—	—	—	—
Trinidad	256	76.60	0.70	0.54	2.16	640	3,639	3,632	12,827
Virginia-Blanca	1,162	106.95	0.40	0.79	3.01	3,693	9,702	19,377	72,446
<b>Totals</b>	<b>11,862</b>	<b>133.42</b>	<b>0.50</b>	<b>0.90</b>	<b>2.60</b>	<b>50,070</b>	<b>130,834</b>	<b>228,825</b>	<b>673,603</b>

**TABLE 14.5**  
**INDICATED RESOURCES SUMMARIZED BY DEPOSIT FOR ALL BLOCKS WITH A MINIMUM RECOVERED**  
**VALUE OF US\$40 PER TONNE**  
**(AS OF JUNE 30, 2012)**

Deposit	Tonnes (000)	Average				In Situ Metal Quantities (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Alacrán	250	41.84	0.49	0.12	1.31	295	2,349	567	6,358
Bicentenario	351	63.76	0.28	0.23	0.91	692	2,268	2,006	6,066
Brecha-Cristo Rey	1,375	99.10	0.54	0.54	2.03	4,336	16,426	14,191	59,092
Cobriza-LaCruz	733	64.44	0.45	0.27	0.36	1,323	7,689	2,878	4,220
Dificultad	335	62.69	0.56	0.22	3.92	652	3,982	1,643	28,641
Maravillas	790	150.75	0.76	0.96	3.52	4,208	13,899	19,031	60,272
Monica	2,605	92.13	0.36	0.70	0.92	7,463	19,615	38,220	56,896
Negra	6,759	174.15	0.35	1.29	2.62	40,122	55,864	202,568	411,369
Ntra._Sra.	18	104.42	0.23	0.66	0.48	58	95	241	205
San Pedro	209	99.39	0.56	0.84	3.15	665	2,390	4,241	14,223
Trinidad	284	79.22	0.63	0.45	2.23	640	3,684	2,618	13,095
Virginia-Blanca	1,449	106.03	0.33	0.81	2.74	4,571	10,435	22,468	84,624
<b>Totals</b>	<b>15,159</b>	<b>130.12</b>	<b>0.41</b>	<b>0.92</b>	<b>2.19</b>	<b>65,026</b>	<b>138,695</b>	<b>310,673</b>	<b>745,060</b>

**TABLE 14.6**  
**MEASURED PLUS INDICATED RESOURCES SUMMARIZED BY DEPOSIT FOR ALL BLOCKS WITH A MINIMUM RECOVERED VALUE OF US\$40 PER TONNE**  
**(AS OF JUNE 30, 2012)**

Deposit	Tonnes (000)	Average				In Situ Metal Quantities (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Alacrán	438	49.31	0.60	0.12	1.38	584	5,078	933	11,839
Bicentenario	572	62.92	0.30	0.21	0.89	1,109	3,877	2,983	9,407
Brecha-Cristo Rey	2,357	103.35	0.61	0.60	1.99	7,528	30,675	27,250	103,630
Cobriza-LaCruz	1,163	63.12	0.48	0.23	0.29	2,183	13,084	4,533	6,241
Dificultad	442	64.18	0.63	0.20	4.37	872	5,508	2,084	39,427
Maravillas	3,225	139.47	0.73	0.83	3.81	15,464	53,914	62,924	275,591
Monica	3,289	94.31	0.37	0.68	0.94	9,485	24,956	47,524	72,168
Negra	12,141	168.10	0.38	1.24	2.56	67,554	102,417	338,507	702,782
Ntra._Sra.	33	105.66	0.23	0.59	0.45	107	172	422	362
San Pedro	209	99.39	0.56	0.84	3.15	665	2,390	4,241	14,223
Trinidad	540	77.63	0.67	0.51	2.18	1,280	7,323	6,250	25,922
Virginia-Blanca	2,611	106.46	0.37	0.80	2.87	8,265	20,136	41,845	157,070
<b>Totals</b>	<b>27,021</b>	<b>131.31</b>	<b>0.49</b>	<b>0.91</b>	<b>2.36</b>	<b>115,096</b>	<b>269,529</b>	<b>539,498</b>	<b>1,418,664</b>

**TABLE 14.7**  
**INFERRRED RESOURCES SUMMARIZED BY DEPOSIT FOR ALL BLOCKS WITH A MINIMUM RECOVERED VALUE OF US\$40 PER TONNE**  
**(AS OF JUNE 30, 2012)**

Deposit	Tonnes (000)	Average				In Situ Metal Quantities (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Alacrán	50	39.09	0.47	0.12	1.68	73	572	152	2,062
Bicentenario	40	48.94	0.36	0.20	0.63	61	369	162	533
Brecha-Cristo Rey	1,443	90.04	0.49	0.35	1.90	4,376	16,563	11,514	60,245
Cobriza-LaCruz	2,060	51.53	0.56	0.16	0.38	3,071	26,493	5,595	16,255
Dificultad	165	76.59	0.45	0.39	2.61	406	1,720	1,471	9,780
Maravillas	678	144.54	0.71	1.03	3.64	3,392	10,666	17,267	54,744
Monica	758	92.54	0.34	0.72	1.09	2,247	6,082	11,918	19,566
Negra	4,436	186.99	0.36	1.35	2.77	30,171	37,582	146,598	294,875
Ntra._Sra.	22	97.70	0.18	0.63	0.29	71	95	312	148
San Pedro	7	102.01	0.44	1.38	2.59	21	65	149	329
Trinidad	549	34.28	0.41	0.10	1.27	606	5,479	1,055	15,629
Virginia-Blanca	3,069	130.87	0.35	1.13	2.63	12,006	26,573	66,840	183,201
<b>Totals</b>	<b>13,278</b>	<b>126.05</b>	<b>0.42</b>	<b>0.88</b>	<b>2.14</b>	<b>56,501</b>	<b>132,260</b>	<b>263,033</b>	<b>657,370</b>

- The resources for each deposit are contained within volumes derived from geological limits, as defined by the Company.
- Mineral resources are not mineral reserves and do not have demonstrated economic viability. The average economic values reported are only a guideline to economic potential.

## **14.3 MINERAL RESOURCE ESTIMATION PROCEDURES**

The following information summarizes the general methods used to analyze the deposits. Details of the analysis for each individual deposit are included after this procedure summary section.

### **14.3.1 Data Received**

The drill hole and underground channel sample data was provided in Microsoft Access® databases, with one database supplied for each “deposit.” Each database contained tables for collars, surveys, assays, and geology (lithology) for the drill holes. Geology for the underground channel samples was not included in the digital database.

The Company provided solid models of the mineralized areas generated using the Surpac® geologic and mine planning software package. Solid models of the underground workings were also provided in a Surpac format (.dtm) and the existing underground workings were subtracted from the final solid. The mineral resource quantities (grades and tonnes) were estimated only within the geological solid models with the workings extracted. The QP made a review of geological level maps with the Geology Staff of MLN, made a series of observations and found that the geological envelopes as interpreted by MLN are reasonable to be used in the resource estimate.

All dimensions and distances are metric.

The Company also provided technical reports including the following.

- “Technical Report on the Mineral Resources and Mineral Reserves of the el Alacrán Deposit of the La Negra Silver, Lead, Zinc, Copper Mine Queretaro, México”, Wardrop, 2008.
- “Mineral Resource Estimate Monica Deposit La Negra Mine, Queretaro State, México March 14, 2008”, GeoSim Services Inc., 2008

### **14.3.2 Data Analysis**

The Micromine® geologic and mine planning software was used for the data analysis and block modeling for this report.

Classical statistics were run for each deposit. Details are included in Appendix 2.0 and also with each deposit summary.

Compositing at the La Negra deposits was not done because many of the assays were already 2 meters in length. Test composites were calculated, but the compositing sometimes fragmented the data and created more intervals than the uncomposed data. Compositing fragments the data for these deposits. When the

drill hole assay samples are linked to a geological composite, the intervals are fragmented even more. The drill hole assays were not identified by geological zone.

All of the data in each supplied database was used to construct variograms and subsequently estimate grades in the block models. The data includes a combination of drill hole core assays and channel sample assays. Parts of the mine are heavily channel sampled, so the distribution of data in some areas is clustered along the drifts and workings while drill hole data is scattered in both mined and un-mined areas. In many of the deposits, the influence of the channels is much stronger than the drill hole influences.

Variograms were constructed on the natural log of the raw data using only channel samples, only drill holes, and all assays combined. The channel samples influence areas near the mine workings and the drill hole assays are apparent in the more distant areas. In some cases, the difference is distinctive and results in “nested” variograms.

Cross validation was used to determine the applicability of the variograms. Plots of the original grade versus the estimate obtained from the cross validation results were also used to determine the natural cut for silver. A top cut of the silver grade was applied for all the deposits.

#### **14.4 MODELING PROCEDURE**

A block size of 5 meters × 5 meters × 5 meters is used for all the models. Many of the assays are spaced less than 5 meters apart (especially the channel samples), so the assays are averaged by the modeling program when more than 1 assay appears in a block.

Block model limits are set at the limits of the data. The data limits extend well beyond the geological limits defined by the Company.

The silver block grade estimates were generated with Ordinary Kriging with limiting factors determined by the variograms. The copper, lead, and zinc estimates were determined using an inverse distance weighting method with a power of three. The same search radii and ellipsoids were used for both methods. Inverse distance weighting to a power of three was used as an alternative block model check and to estimate the copper, lead, and zinc. The overall average grades for silver from both estimation methods matched closely.

All samples provided for each of the deposit databases were used in the estimation even though many of the samples were outside the geological limits. In a few cases, outlying samples with distances greater than 200 meters from the other samples were excluded. A few duplicate samples were also deleted from the databases.

#### **14.5 VOLUME CALCULATIONS**

Resources (grades and tonnes) were estimated in block models encompassing the geological limits and the associated data. When the block model was completed, the model was intersected by the geological limits solids with the workings removed. The final deposit models included only blocks extracted from the full block model contained within each mineralized geologic limit solid.

Volumes inside the geological limits wireframes were calculated with the Micromine® software. To fit the block models to the geological limits, sub-blocking<sup>1</sup> was used and set so that a block could be divided into 4 segments in each direction. The smallest sub-blocks could be 1.25 meters on a side. All sub-blocks are assigned the same grade as the original parent block.

Block model volumes were compared to the volume of the geological limit solids and the volumes differed by no more than 0.5%. The sub-block size was accepted as being representative of the geological limit solid.

The bulk density was assumed to be 3.2 tonnes per cubic meters ( $t/m^3$ ). This is the factor used by Peñoles in previous resource estimates at La Negra and in other resource reports.

#### 14.6 CLASSIFICATION PROCEDURE

Resource classification can be done using several automated techniques applied to data calculated during block value estimation. Classification by Kriging variance is one option that was considered. Another classification option considered was to use average distance from the block to the data points used to estimate the block value. Resource classification is commonly based on several factors including data generated by the estimation methods and judgmental factors, such as geology and other physical limitations. The authors determined that classification by average distance to samples was most appropriate for the deposits.

Three runs were made for each deposit using increasing search distances. Data produced by the interpolation techniques include statistical variances, number of data points used in the estimation, and an average distance from the block to the sample data used to estimate the block value.

The classifications were based on the following.

- **Average Distance.** For the La Negra deposits, resources were initially classified based on average distance to a block from the data points used to estimate the block grades. The distance limits used for the first level classification reflect the ranges as determined by variography and search distances as used for grade estimates.
- **In Situ Metal Value.** An in situ metal value was calculated for each block (Table 14.1). A block with a value less than US\$40 per tonne was not included in the resource. The in situ metal value allows for all metals to be considered as contributing rather than setting cutoffs for one or more grades.
- **Existence of Mine Workings.** In addition to average distance and value, where large areas of a volume had no mine workings and only drill holes, those volumes were allowed a classification of indicated or inferred only and include no measured resources.

Distance classification is a commonly used technique and is based on the distance from the centroid of the interpolated block to the samples used for the estimate. Micromine® stores the average distance from the block centroid to the data used for the estimate. Thus, the lowest average distances become Measured resources and the further distances become Indicated and Inferred resources.

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<sup>1</sup>Sub-blocking is a process of dividing a block into smaller segments to more closely fit an outline.

Categorization conforms to the CIM Definition Standards for Mineral Resources.

A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions, might become economically extractable.

*Inferred Mineral Resource*

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

Due to the uncertainty which may attach to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.

*Indicated Mineral Resource*

An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

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

*Measured Mineral Resource*

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques

from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

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

## 14.7 RESOURCE RISK

Resource estimation is based on data interpretation and extrapolation of limited sample volumes to very large volumes. Several levels of risk are identified for the La Negra deposits.

- **Low to Moderate – Grade Interpretation Methods.** Automated grade estimates depend on many factors and interpolation methods assume continuity between samples. Variography is used to define relationships between data points that help to mitigate the smoothing effects of the interpolations. A risk always exists that a grade estimate at any 3D location in a deposit will not match actual mining. An automated interpolation cannot account for the vein without restricting the interpolation to those areas only inside a solid model representing the vein boundaries.
- **Moderate Risk – Geological and Mined Area Definition.** The geological limits supplied by the Company extend laterally beyond known mining areas and can be considered a mineral envelope rather than an interpretation of the limits of mineralized area. A risk is inherent in the extension of grade estimations into wall rock in the areas of previous mining. Many of the mined areas were presumably excavated some years ago under different economic conditions and the potential for metal values in the mined areas could still exist. Some of the areas appear to be more massive and some appear to be vein limited. The ore volume could be over-estimated, if the mined area outlines do not include material that was actually mined and never recorded.
- **Low to Moderate Risk – Lithology Definition.** A lithology model was not used because of limited data available and lack of definition of the boundaries of zones, such as skarns and limestones. Instead, the geological limits of the deposits, as provided by the Company, were used to limit geology.
- **Low Risk – Density.** A general density of  $3.2 \text{ t/m}^3$  has been traditionally used for tonnage estimates at the property. A better definition of the density by rock type combined with a lithology model could enhance the resource estimate and provide a higher level of confidence in the tonnages.

## 14.8 DEPOSIT MODELS

Resources for the La Negra property were estimated using several automated interpolation methods, including geostatistics. The deposit area is divided by the Company into 13 separate “deposits” or models. The individual deposits show some grade continuity similarities. However, the variograms of the deposits were different and resulted in different models. All the deposits exhibit a “nugget” effect.

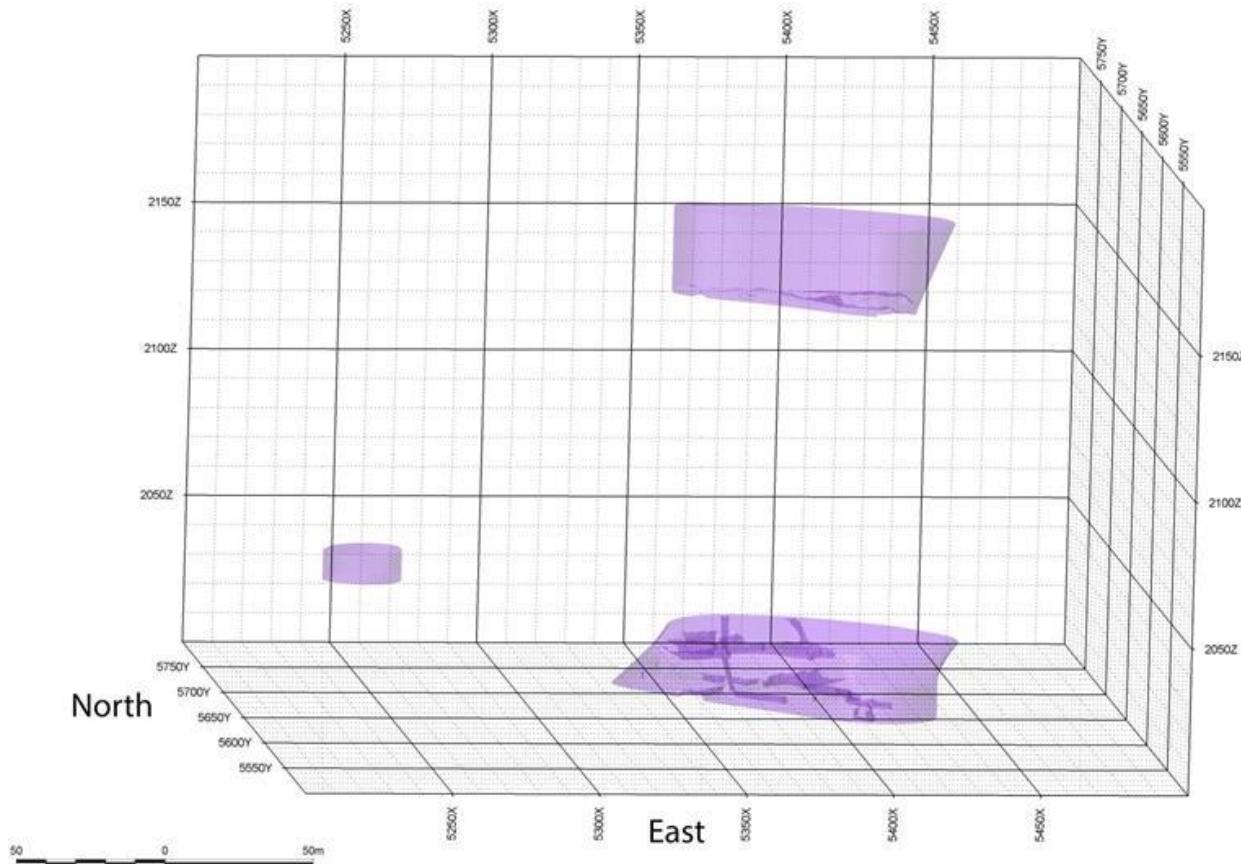
Some of the deposits, as outlined by the Company's geologists, appear to follow a vein structure, while some of the deposits are more massive. The amount of geological information in the databases was limited, so the solids as provided are the basis for limiting the models geologically.

The solid models provided by the geologists include the underground workings. The figures with each of the deposit summaries include a picture of the solid models with workings removed and pictures of the block models with the assay data points.

When the volume of the block model inside the geological limits is calculated, any blocks that intersect the mined areas are eliminated. The final block model includes only those blocks inside the geological limits that have not been mined.

#### 14.9 ALACRÁN

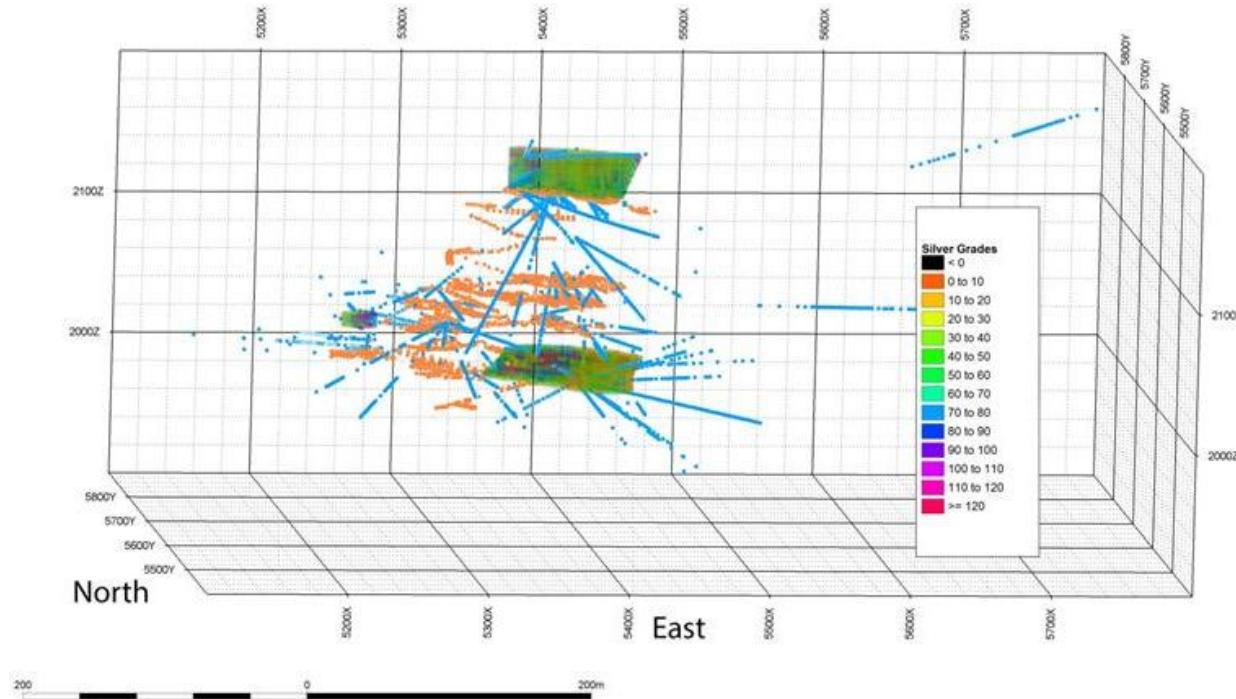
The Alacrán geological limits are shown in Figure 14.2. The limits are divided into three sections. A block model was designed to encompass the three areas and include all the assays in the Alacrán database.



**Figure 14.2. Alacrán geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.3 shows the block model restricted to the three geological limit volumes along with the assays used for estimation. Note that for Alacrán, very few of the channel sample assays are located inside the

geological limits, as defined by the Company. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.3. Alacrán block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

Note that most of the assays are outside the geological limits, as provided.

#### 14.9.1 Data Summary and Statistics

Table 14.8 summarizes the data provided for the Alacrán area. The averages include all assays the company provided for the area.

<b>TABLE 14.8</b> <b>ALACRÁN ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	879	2,350	46.06	7,075.34	84.12	1.83
	Channels	977	3,907	59.09	5,234.06	72.35	1.22
	All Assays	977	6,257	54.19	5,964.45	77.23	1.43
Copper (%)	Drill Holes	7.61	2,216	0.37	0.40	0.63	1.69
	Channels	9.73	3,851	0.60	0.65	0.81	1.35
	All Assays	9.73	6,067	0.52	0.57	0.75	1.46
Lead (%)	Drill Holes	22.00	2,048	0.32	1.33	1.15	3.56
	Channels	4.48	3,800	0.18	0.08	0.29	1.59
	All Assays	22.00	5,848	0.23	0.53	0.72	3.14
Zinc (%)	Drill Holes	15.83	2,324	1.03	2.97	1.72	1.68
	Channels	16.82	3,897	0.98	2.18	1.48	1.51
	All Assays	16.82	6,221	1.00	2.48	1.57	1.58

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

#### 14.9.1.1 Data Analysis and Variogram Parameter Development

Following is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades (Table 14.9, Table 14.10, and Table 14.11).

<b>TABLE 14.9</b> <b>ALACRÁN VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.31		
Component 1	0.3	5	Spherical
Component 2	0.2	40	Spherical

<b>TABLE 14.10</b> <b>ALACRÁN DIRECTIONS</b>	
Main Azimuth	90
Plunge of Main Azimuth	0
Plunge of 2 <sup>nd</sup> Axis	0

<b>TABLE 14.11</b> <b>ALACRÁN SEARCH PARAMETERS</b>	
Search Type	Spherical
Search Distances	5, 15, 40
Sectors	4 sectors
Maximum Points per Sector	5
Minimum Points	2

#### 14.9.1.2 Grade Cap

The level of grade to cut the assays was determined from cross validation of the data points using the variogram parameters. The grade was capped at 750 g/t for both drill hole and channel assays.

#### 14.9.2 Block Model Limits

TABLE 14.12 ALACRÁN BLOCK MODEL PARAMETERS			
	X	Y	Z
Minimum	5,130	5,430	1,960
Maximum	5,790	5,870	2,180
Number	133	89	45
Model Size (meters)	665	445	225

#### 14.9.3 Classification and Resources

Resource classification followed the method, as described in Section 14.6. In addition, adjustments were made to customize the classification to the deposit configuration.

- **Upper Area** – Only indicated and inferred classifications were assigned above elevation 2,155.
- **Lower Area to East** – No changes were made from the classification based on average distance and block value.
- **Lower Area to West** – All model blocks to the west of X = 5,270 were set to inferred because of limited data and only drilling penetrated the area.

Table 14.13 shows the summary of Measured and Indicated mineral resources for the Alacrán deposit. Table 14.14 shows the summary of Inferred mineral resources for the Alacrán deposit.

**TABLE 14.13**  
**SUMMARY OF ALACRÁN MEASURED AND INDICATED MINERAL RESOURCES**

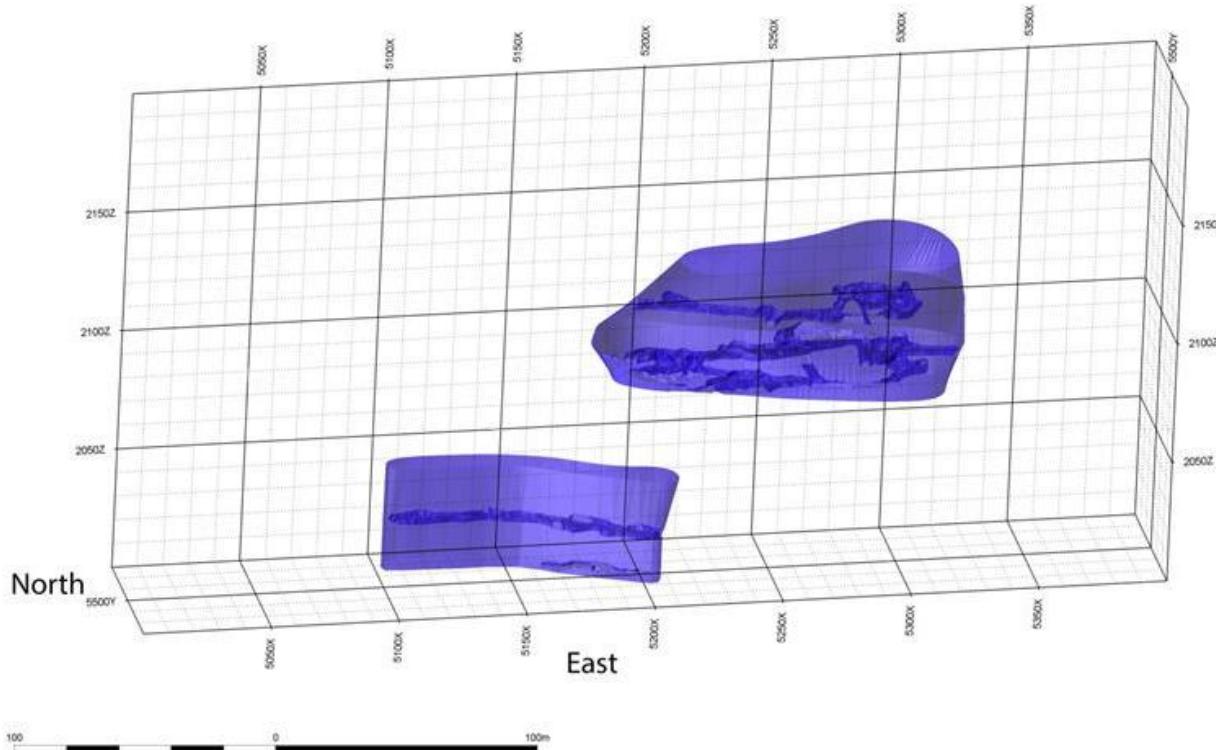
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	188	56.36	0.71	0.11	1.45	289	2,730	366	5,482
Indicated	250	41.84	0.49	0.12	1.31	295	2,349	567	6,358
Measured plus Indicated	438	49.31	0.6	0.12	1.38	584	5,078	933	11,839

**TABLE 14.14**  
**SUMMARY OF ALACRÁN INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	50	39.09	0.47	0.12	1.68	73	572	152	2,062

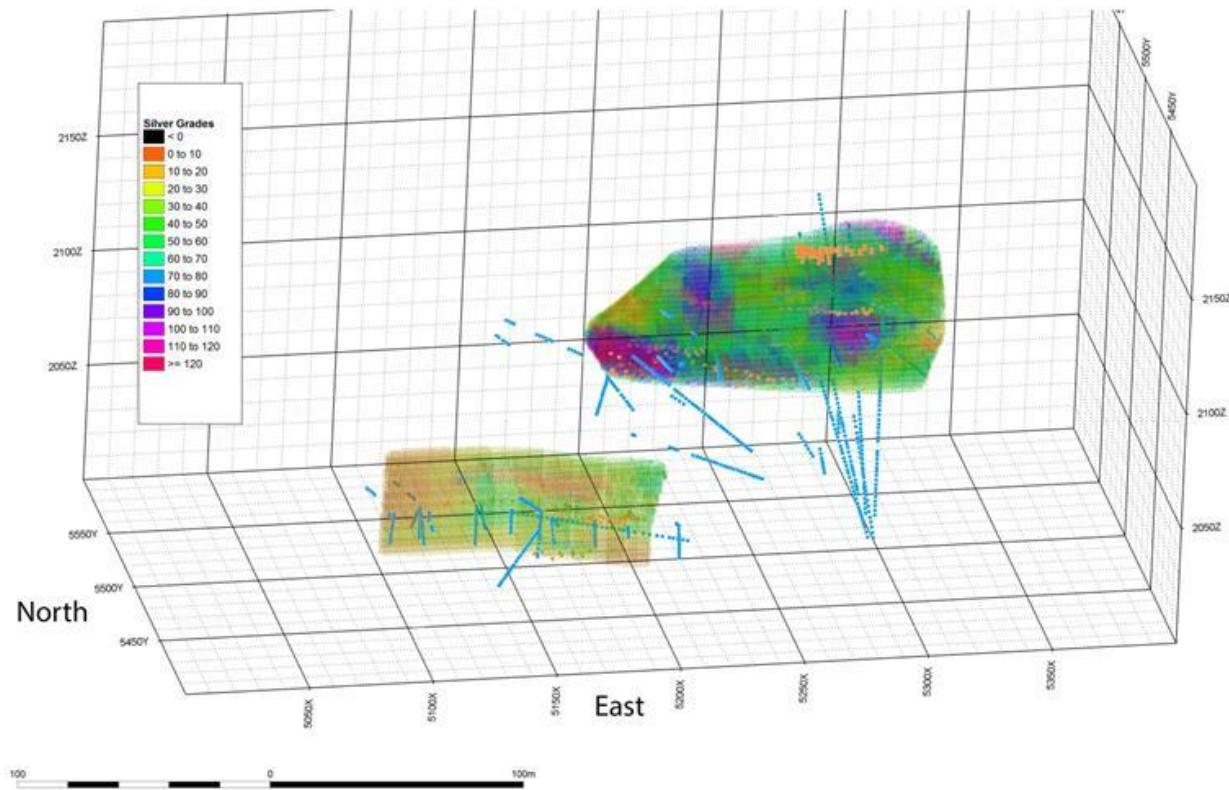
## 14.10 BICENTENARIO

The Bicentenario geological limits are shown in Figure 14.4. The limits are divided into two sections. A block model was designed to encompass the two areas and the assays in the Bicentenario database.



**Figure 14.4. Bicentenario geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.5 shows the block model restricted to the two geological limit volumes along with the assays used for estimation. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.5. Bicentenario block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

#### 14.10.1 Data Summary

Table 14.15 summarizes the data provided for the Bicentenario area. The averages include all assays the Company provided for the area.

<b>TABLE 14.15</b> <b>BICENTENARIO ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	870	1,005	43.34	4,940.08	70.29	1.62
	Channels	2,434	359	69.25	21,438.47	146.42	2.11
	All Assays	2,434	1,364	50.16	9,400.16	96.95	1.93
Copper (%)	Drill Holes	8.04	952	0.29	0.23	0.48	1.69
	Channels	7.09	344	0.48	0.47	0.69	1.44
	All Assays	8.04	1,296	0.34	0.30	0.55	1.63
Lead (%)	Drill Holes	7.58	934	0.21	0.22	0.47	2.30
	Channels	10.63	329	0.26	0.54	0.73	2.78
	All Assays	10.63	1,263	0.22	0.30	0.55	2.50
Zinc (%)	Drill Holes	9.53	987	0.63	1.15	1.07	1.69
	Channels	13.75	355	0.93	2.98	1.73	1.85
	All Assays	13.75	1,342	0.71	1.65	1.29	1.80

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

#### 14.10.2 Data Analysis and Variogram Parameter Development

Table 14.16, Table 14.17, and Table 14.18 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.16</b> <b>BICENTENARIO VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.51		
Component 1	0.46	34	Exponential

<b>TABLE 14.17</b> <b>BICENTENARIO DIRECTIONS</b>	
Main Azimuth	90
Plunge of Main Azimuth	0
Plunge of 2 <sup>nd</sup> Axis	0

<b>TABLE 14.18</b> <b>BICENTENARIO SEARCH PARAMETERS</b>	
Search Type	Elliptical, 3 <sup>rd</sup> Axis 1/3 of Distance
Search Distances	8, 24, 36
Sectors	4 sectors
Maximum Points per Sector	5
Minimum Points	2

#### **14.10.2.1 Grade Cap**

The level of grade to cut the assays was determined from cross validation of the data points using the variogram parameters. The grade was capped at 275 g/t for both drill hole and channel assays.

#### **14.10.3 Block Model Limits**

<b>TABLE 14.19</b> <b>BICENTENARIO BLOCK MODEL PARAMETERS</b>			
	<b>X</b>	<b>Y</b>	<b>Z</b>
Minimum	5,050	5,400	2,000
Maximum	5,350	5,570	2,150
Number	61	35	31
Model Size (meters)	305	175	155

#### **14.10.4 Classification and Resources**

Resource classification followed the method, as described in Section 14.6. No adjustments were made to customize the classification to the deposit configuration.

Table 14.20 shows the summary of Measured and Indicated mineral resources for the Bicentenario deposit. Table 14.21 shows the summary of Inferred mineral resources for the Bicentenario deposit.

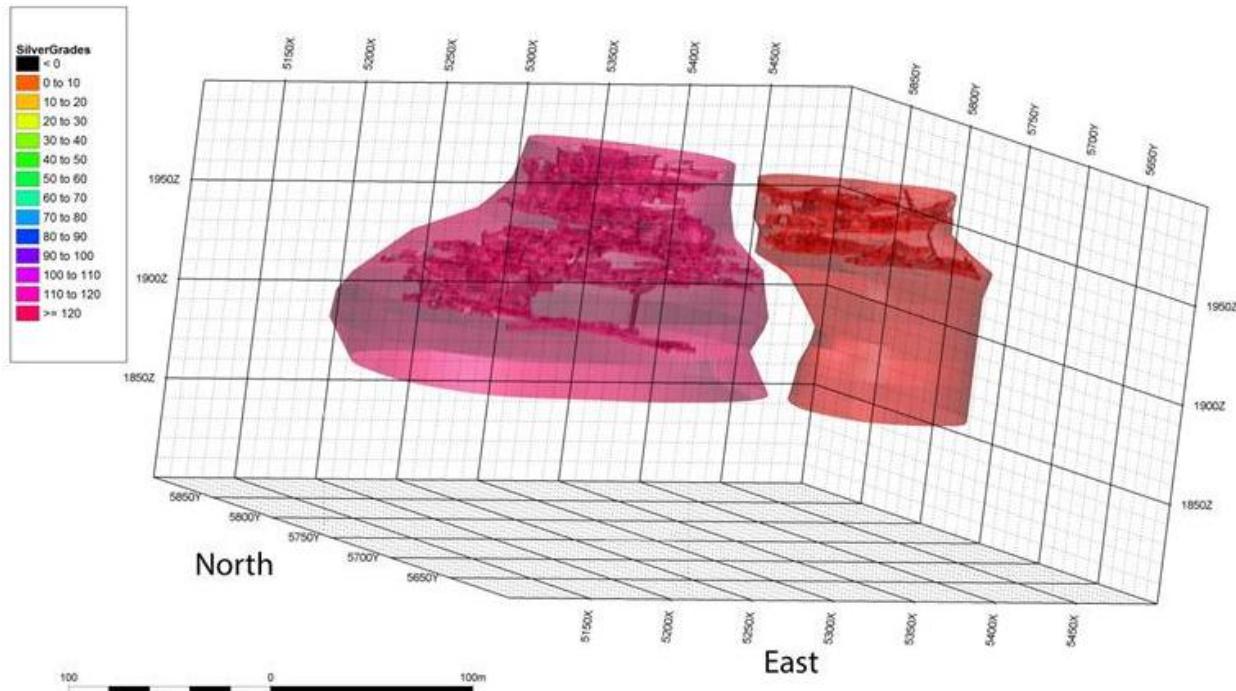
TABLE 14.20 SUMMARY OF BICENTENARIO MEASURED AND INDICATED MINERAL RESOURCES								
Class	Total Tonnes (000)	Average				Metal Quantity (000)		
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)
Measured	221	61.86	0.32	0.20	0.86	417	1,609	977
Indicated	351	63.76	0.28	0.23	0.91	692	2,268	2,006
Measured plus Indicated	572	62.92	0.30	0.21	0.89	1,109	3,877	2,983
								9,407

TABLE 14.21 SUMMARY OF BICENTENARIO INFERRED MINERAL RESOURCES								
Class	Total Tonnes (000)	Average				Metal Quantity (000)		
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)
Inferred	40	48.94	0.36	0.20	0.63	61	369	162
								533

#### 14.11 BRECHA-CRISTO REY AND TRINIDAD

The Brecha-Cristo Rey and Trinidad deposits did not intersect, but were combined into a single block model because they were separated by about 20 meters. The databases were combined and statistics were run on the deposits separately and together. Variogram analysis was done separately and combined. It was determined that a single model was suitable for the two areas.

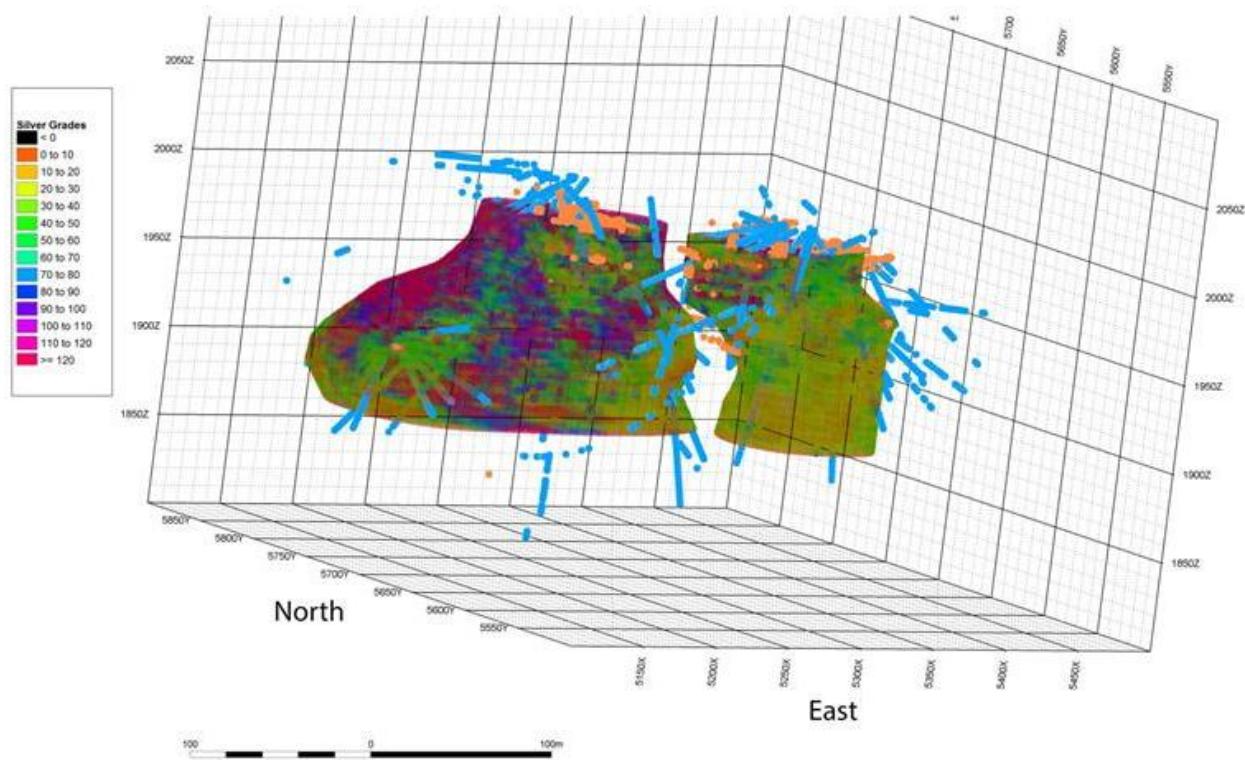
The Brecha\Trinidad geological limits are shown in Figure 14.6.



**Figure 14.6. Brecha (on left) and Trinidad (on right) geological limits showing internal workings (darker areas) – looking northeasterly**

The resources for the two deposits are reported separately.

Figure 14.7 shows the block model restricted to the Brecha and Trinidad geological limit volumes along with the assays used for estimation. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.7. Brecha\Trinidad block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

#### 14.11.1 Data Summary and Statistics

Table 14.22 summarizes the data provided for the Brecha area. The averages include all assays the Company provided for the Brecha area.

Table 14.23 summarizes the data provided for the Trinidad area. The averages include all assays the Company provided for the Trinidad area.

TABLE 14.22 BRECHA ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	977	2,661	68.96	13,229.73	115.02	1.67
	Channels	5,124	2,397	100.14	34,424.09	185.54	1.85
	All Assays	5,124	5,058	83.73	23,511.39	153.33	1.83
Copper (%)	Drill Holes	9.00	2,538	0.51	0.78	0.88	1.73
	Channels	11.03	2,437	0.78	0.90	0.95	1.22
	All Assays	11.03	4,975	0.64	0.86	0.92	1.44
Lead (%)	Drill Holes	17.50	2,536	0.48	1.76	1.33	2.76
	Channels	40.74	2,341	0.49	1.95	1.39	2.86
	All Assays	40.74	4,877	0.48	1.85	1.36	2.81
Zinc (%)	Drill Holes	40.73	2,648	1.49	6.70	2.59	1.74
	Channels	17.13	2,370	1.20	3.61	1.90	1.59
	All Assays	40.73	5,018	1.35	5.26	2.29	1.70
<b>Note:</b> All silver grades are grams/tonne. All other grades are %. The averages include all assays above 1 grams/tonne for silver and 0.1% for the copper, lead, and zinc. Zero assays are not included in the averages.							

TABLE 14.23 TRINIDAD ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	858	1,537	50.57	9,371.02	96.80	1.91
	Channels	960	1,324	90.00	13,312.69	115.38	1.28
	All Assays	960	2,861	68.82	11,577.79	107.60	1.56
Copper (%)	Drill Holes	6.92	1,496	0.44	0.58	0.76	1.75
	Channels	5.77	1,345	0.74	0.52	0.72	0.97
	All Assays	6.92	2,841	0.58	0.58	0.76	1.30
Lead (%)	Drill Holes	16.37	1,245	0.35	1.50	1.22	3.53
	Channels	28.77	1,163	0.36	1.07	1.04	2.91
	All Assays	28.77	2,408	0.35	1.29	1.14	3.24
Zinc (%)	Drill Holes	15.67	1,512	1.47	4.98	2.23	1.51
	Channels	18.14	1,345	1.90	4.85	2.20	1.16
	All Assays	18.14	2,857	1.67	4.96	2.23	1.33
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

#### 14.11.2 Data Analysis and Variogram Parameter Development

Table 14.24, Table 14.25, and Table 14.26 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

**TABLE 14.24**  
**BRECHA AND TRINIDAD VARIOGRAM PARAMETERS**

	Nugget/Sill	Range	Model Type
Nugget (Co)	0.55		
Component 1	0.89	6	Spherical

**TABLE 14.25**  
**BRECHA AND TRINIDAD DIRECTIONS**

Main Azimuth	90
Plunge of Main Azimuth	0
Plunge of 2 <sup>nd</sup> Axis	0

**TABLE 14.26**  
**BRECHA AND TRINIDAD SEARCH PARAMETERS**

Search Type	Spherical
Search Distances	6, 15, 45
Sectors	4 sectors
Maximum Points per Sector	5
Minimum Points	2

#### 14.11.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation of the data points using the variogram parameters. The grade was capped at 700 g/t for both drill hole and channel assays.

#### 14.11.3 Block Model Limits

A block model was designed to encompass the two areas and includes assays in the combined Brecha\Trinidad database (Table 14.27).

**TABLE 14.27**  
**BRECHA AND TRINIDAD BLOCK MODEL PARAMETERS**

	X	Y	Z
Minimum	5,100	5,400	1,800
Maximum	5,500	5,880	2,030
Number	81	97	47
Model Size (meters)	405	485	235

#### 14.11.4 Classification and Resources

Resource classification followed the method, as described in Section 14.5. In addition, adjustments were made to customize the classification to the deposit configuration.

- Everything below elevation 1,900 was classified as only indicated and inferred.

Table 14.28 shows the summary of Measured and Indicated mineral resources for the Brecha deposit. Table 14.29 shows the summary of Inferred mineral resources for the Brecha deposit.

Adjustments to the Trinidad classification were made to customize the classification to the deposit configuration.

- All resources below elevation 1,950 were classified as inferred.

Table 14.30 shows the summary of Measured and Indicated mineral resources for the Trinidad deposit. Table 14.31 shows the summary of Inferred mineral resources for the Trinidad deposit.

**TABLE 14.28**  
**BRECHA MEASURED AND INDICATED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	983	106.70	0.67	0.64	1.96	3,191	14,248	13,059	44,539
Indicated	1,375	99.10	0.54	0.54	2.03	4,336	16,426	14,191	59,092
Measured plus Indicated	2,357	103.35	0.61	0.60	1.99	7,528	30,675	27,250	103,630

**TABLE 14.29**  
**BRECHA INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	1,443	90.04	0.49	0.35	1.90	4,376	16,563	11,514	60,245

**TABLE 14.30**  
**TRINIDAD MEASURED AND INDICATED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	256	76.60	0.70	0.54	2.16	640	3,639	3,632	12,827
Indicated	284	79.22	0.63	0.45	2.23	640	3,684	2,618	13,095
Measured plus Indicated	540	77.63	0.67	0.51	2.18	1,280	7,323	6,250	25,922

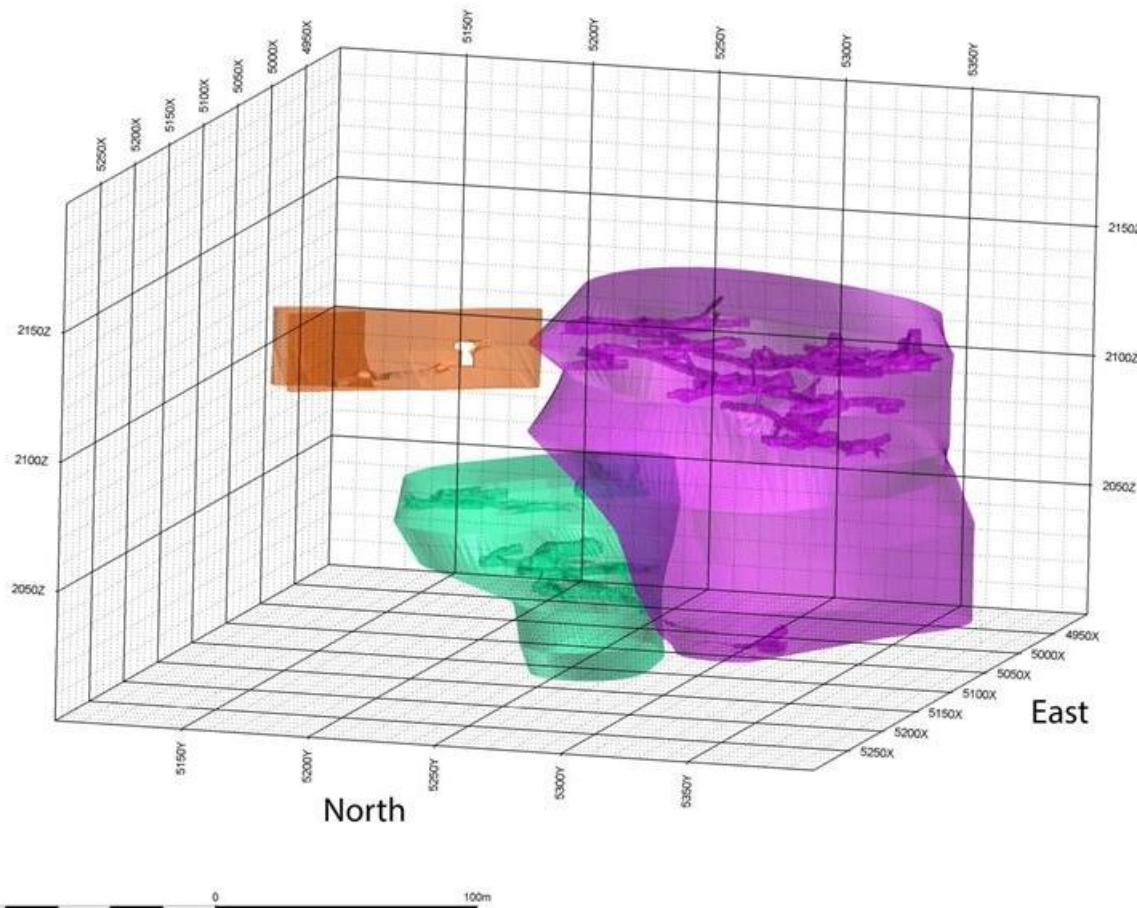
**TABLE 14.31**  
**TRINIDAD INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	549	34.28	0.41	0.10	1.27	606	5,479	1,055	15,629

The Trinidad geological limits used for determining the resources has a minor error. Two mining levels below the major mining workings in the upper portion of the limits were not subtracted from the solid. The volume of those levels is minor and only affects the total tonnage in the inferred resources. An estimate of the volume of the lower workings is not available.

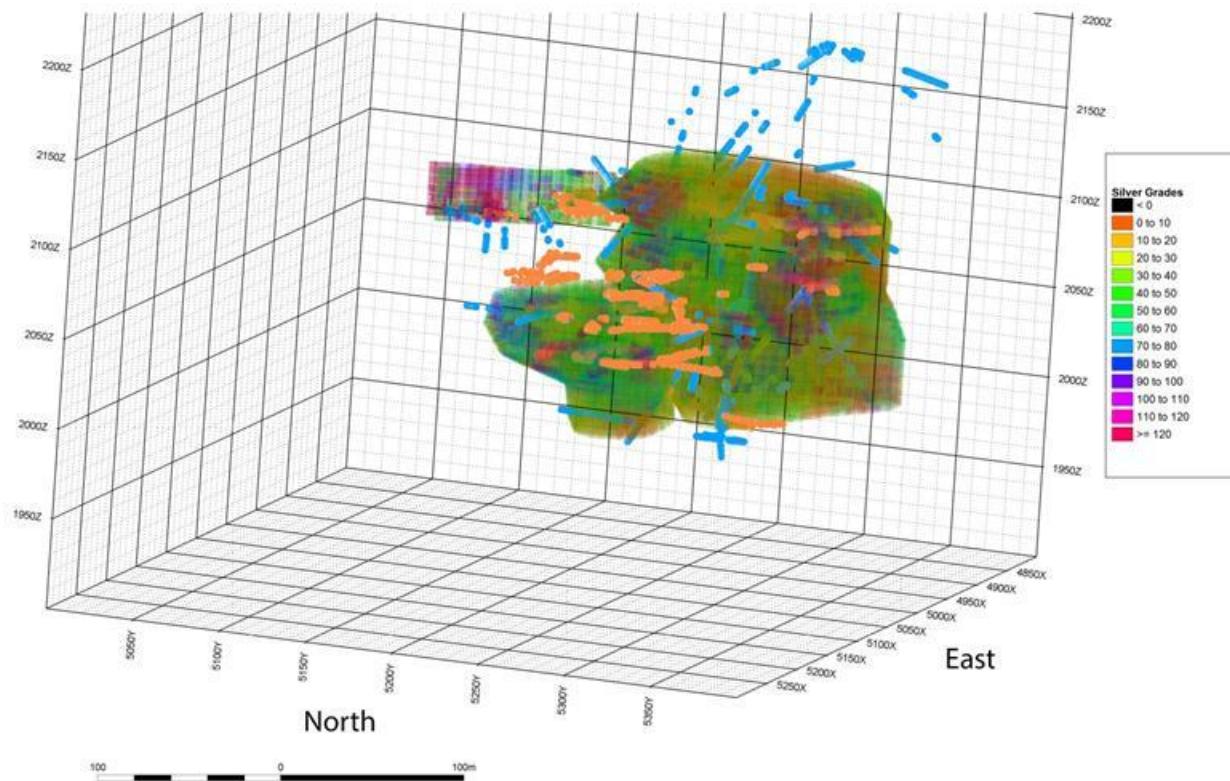
#### 14.12 COBRIZA/LACRUZ/NTRA.\_SRA.

The deposits for Cobriza, LaCruz, and Ntra.\_Sra. were analyzed with a single block model for several reasons. The geological limits provided by the company for Cobriza and La Cruz intersected (had shared volumes), and the Ntra.\_Sra. deposit is very close to the Cobriza area. Because these areas are located close together, the assay data was combined into a single block model. Statistics were run for the areas separately and combined (Figure 14.8).



**Figure 14.8. Cobriza, La Cruz and Ntra.\_Sra. geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.9 shows the block model restricted to the geological limit volumes along with the assays used for estimation. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.9. Cobriza/LaCruz and Ntra.\_Sra. block models inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

Data from all the areas were used to estimate grades in a single model.

#### 14.12.1 Data Summary and Statistics

Table 14.32 summarizes the data provided for the combined Cobriza/LaCruz area. Table 14.33 summarizes the data provided for the Ntra.\_Sra. area. The averages include all assays the company provided for the areas.

TABLE 14.32 COBRIZA\LA CRUZ COMBINED AREAS ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	680	1,767	31.91	3,089.71	55.59	1.74
	Channels	782	1,597	40.06	3,156.60	56.18	1.40
	All Assays	782	3,364	35.78	3,137.14	56.01	1.57
Copper (%)	Drill Holes	5.47	1,577	0.36	0.33	0.57	1.59
	Channels	15.82	1,518	0.39	0.45	0.67	1.72
	All Assays	15.82	3,095	0.37	0.39	0.62	1.66
Lead (%)	Drill Holes	13.17	1,107	0.16	0.25	0.50	3.10
	Channels	2.31	1,226	0.17	0.06	0.25	1.51
	All Assays	13.17	2,333	0.17	0.15	0.39	2.38
Zinc (%)	Drill Holes	11.33	1,623	0.30	0.86	0.93	3.09
	Channels	9.81	1,440	0.42	0.79	0.89	2.11
	All Assays	11.33	3,063	0.36	0.83	0.91	2.55
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

TABLE 14.33 NTRA. SRA. ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	640	140	64.59	11,457.99	107.04	1.66
	Channels	399	60	46.57	4,319.44	65.72	1.41
	All Assays	640	200	59.18	9,352.48	96.71	1.63
Copper (%)	Drill Holes	3.12	133	0.20	0.15	0.39	1.91
	Channels	1.10	56	0.24	0.06	0.25	1.02
	All Assays	3.12	189	0.21	0.12	0.35	1.64
Lead (%)	Drill Holes	4.81	140	0.41	0.51	0.72	1.73
	Channels	1.53	48	0.23	0.09	0.30	1.32
	All Assays	4.81	188	0.37	0.41	0.64	1.75
Zinc (%)	Drill Holes	12.08	139	0.40	1.30	1.14	2.86
	Channels	1.72	57	0.17	0.09	0.31	1.80
	All Assays	12.08	196	0.33	0.96	0.98	2.95
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

#### 14.12.2 Data Analysis and Variogram Parameter Development

Table 14.34, Table 14.35, and Table 14.36 are summaries of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

**TABLE 14.34**  
**COBRIZA/LACRUZ/NTRA. SRA. VARIOGRAM PARAMETERS**

	Nugget/Sill	Range	Model Type
Nugget (Co)	0.64		
Component 1	0.33	18	Spherical
Component 2	0.34	66	Spherical

**TABLE 14.35**  
**COBRIZA/LACRUZ/NTRA. SRA. DIRECTIONS**

Main Azimuth	90
Plunge of Main Azimuth	0
Plunge of 2 <sup>nd</sup> Axis	0

**TABLE 14.36**  
**COBRIZA/LACRUZ/NTRA. SRA. SEARCH PARAMETERS**

Search Type	Elliptical, 3 <sup>rd</sup> Axis 1/3 of Distance
Search Distances	8, 24, 36
Sectors	4 sectors
Maximum Points per Sector	5
Minimum Points	2

#### 14.12.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation. The grade was capped at 480 g/t for both drill hole and channel assays.

#### 14.12.3 Block Model Limits

The block model limits for the combined Cobrizo/LaCruz/Ntra.\_Sra. deposits are shown in Table 14.37.

**TABLE 14.37**  
**COBRIZA/LACRUZ/NTRA. SRA. BLOCK MODEL PARAMETERS**

	X	Y	Z
Minimum	4,850	5,100	1,980
Maximum	5,200	5,390	2,210
Number	71	59	47
Model Size (meters)	355	295	335

#### 14.12.4 Classification and Resources

Resource classification followed the method, as described in Section 14.6. In addition, adjustments were made to customize the classification to the deposit configuration.

- All blocks between elevation 2,020 and 2,070 in the Cobrizo area were classified as only indicated and inferred.

- All blocks west of X = 5,070 and between elevations 2,020 and 2,070 in the Cobriza area were classified only as inferred.
- No additional changes in classification were made for the either the LaCruz or Ntra.\_Sra. areas.

Table 14.38 shows the summary of Measured and Indicated mineral resources for the Cobriza/LaCruz deposit. Table 14.39 shows the summary of Inferred mineral resources for the Cobriza/LaCruz deposit. Table 14.40 shows the summary of Measured and Indicated mineral resources for the Ntra.\_Sra. deposit. Table 14.41 shows the summary of Inferred mineral resources for the Ntra.\_Sra. deposit.

**TABLE 14.38**  
**COBRIZA/LACRUZ MEASURED AND INDICATED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	430	61.68	0.51	0.19	0.22	860	5,395	1,655	2,021
Indicated	733	64.44	0.45	0.27	0.36	1,323	7,689	2,878	4,220
Measured plus Indicated	1,163	63.12	0.48	0.23	0.29	2,183	13,084	4,533	6,241

**TABLE 14.39**  
**COBRIZA/LACRUZ INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	2,060	51.53	0.56	0.16	0.38	3,071	26,493	5,595	16,255

**TABLE 14.40**  
**NTRA. SRA. MEASURED AND INDICATED MINERAL RESOURCES**

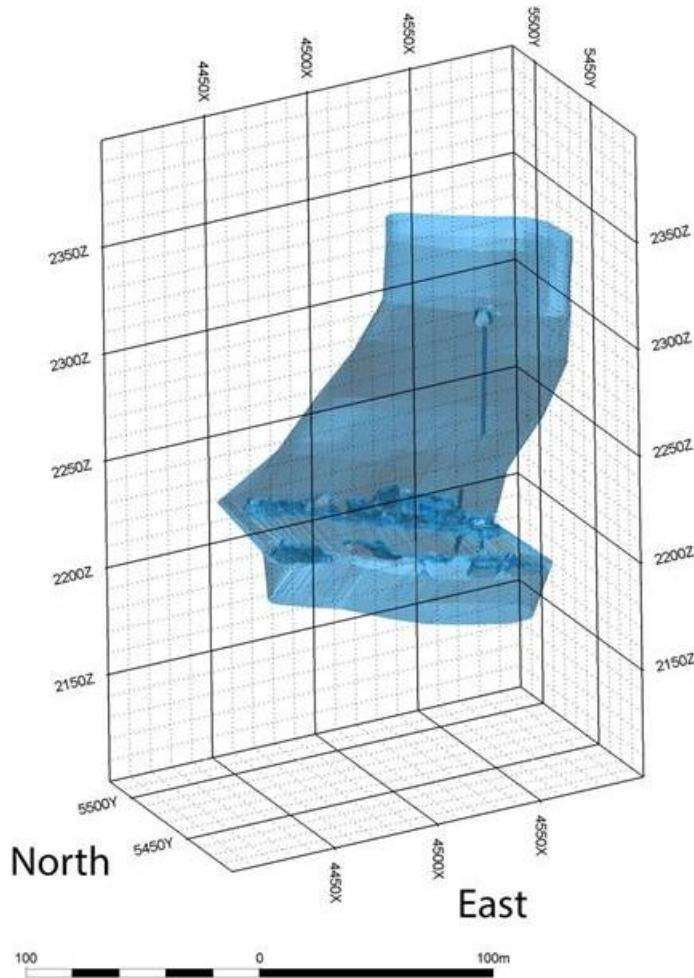
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	15	106.62	0.23	0.54	0.43	50	77	181	157
Indicated	18	104.42	0.23	0.66	0.48	58	95	241	205
Measured plus Indicated	33	105.66	0.23	0.59	0.45	107	172	422	362

**TABLE 14.41**  
**NTRA. SRA. INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	22	97.70	0.18	0.63	0.29	71	95	312	148

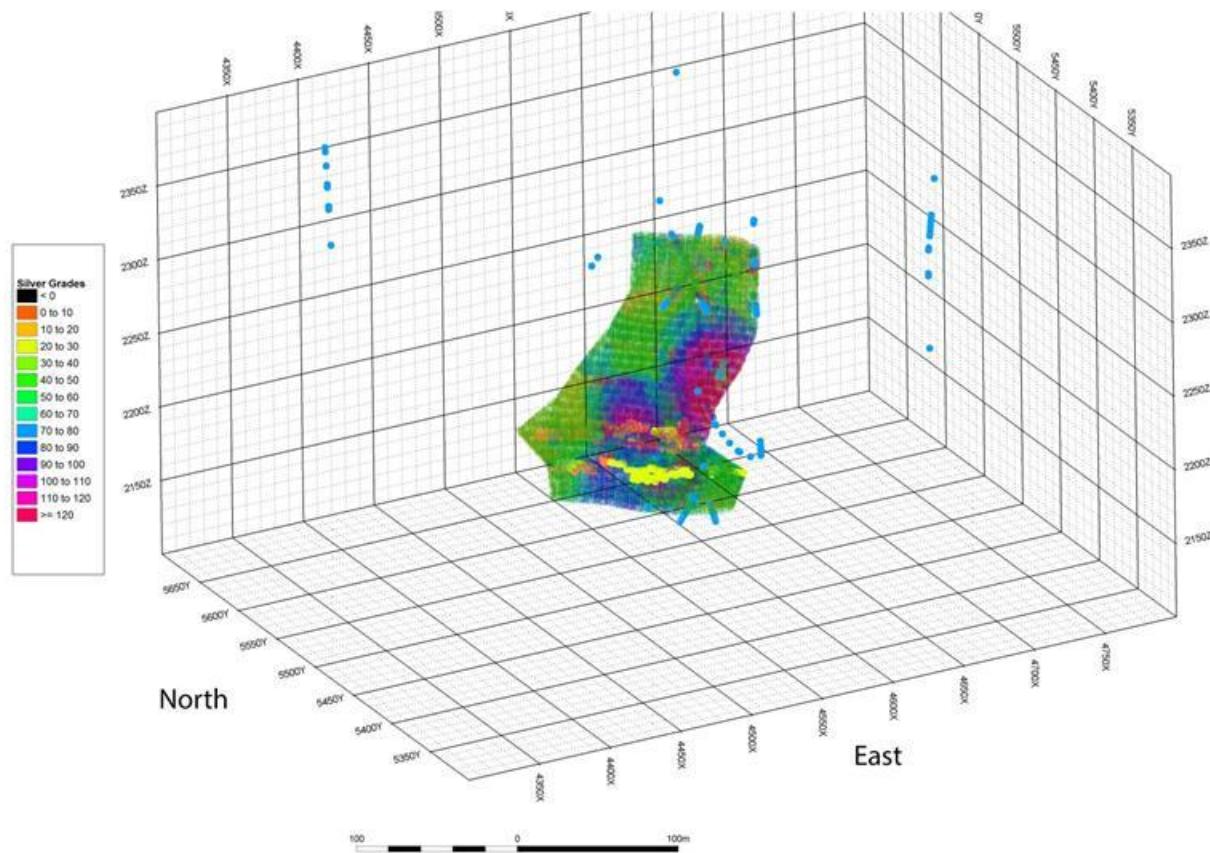
#### 14.13 DIFICULTAD

The Dificultad geological limits are shown in Figure 14.10.



**Figure 14.10. Dificultad geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.11 shows the block model restricted to the two geological limit volumes along with the assays used for estimation. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.11. Dificultad block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples, yellow dots are Peñoles channel samples, and the blue dots are drill hole assays.

#### 14.13.1 Data Summary and Statistics

Table 14.42 summarizes the data provided for the Dificultad area. The averages include all assays the Company provided for the area.

<b>TABLE 14.42</b> <b>DIFICULTAD ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	477	268	50.41	4,636.33	68.09	1.35
	Channels	606	293	49.93	3,189.62	56.48	1.13
	All Assays	367	181	79.88	4,272.14	65.36	0.82
Copper (%)	Drill Holes	606	742	57.41	4,128.38	64.25	1.12
	Channels	7.47	247	0.26	0.45	0.67	2.54
	All Assays	3.47	287	0.62	0.38	0.61	0.99
Lead (%)	Drill Holes	12.93	180	1.01	1.54	1.24	1.23
	Channels	12.93	714	0.60	0.78	0.88	1.48
	All Assays	3.43	266	0.26	0.14	0.38	1.45
Zinc (%)	Drill Holes	5.36	275	0.12	0.12	0.34	2.97
	Channels	2.98	181	0.20	0.10	0.31	1.57
	All Assays	5.36	722	0.19	0.13	0.35	1.87

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

#### 14.13.2 Data Analysis and Variogram Parameter Development

Table 14.43, Table 14.44, and Table 14.45 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.43</b> <b>DIFICULTAD VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.55		
Component 1	0.09	32	Spherical
Component 2	0.30	52	Exponential

<b>TABLE 14.44</b> <b>DIFICULTAD DIRECTIONS</b>	
Main Azimuth	150
Plunge of Main Azimuth	0
Plunge of 2 <sup>nd</sup> Axis	0

<b>TABLE 14.45</b> <b>DIFICULTAD SEARCH PARAMETERS</b>	
Search Type	Spherical
Search Distances	6, 32, 52
Sectors	4 sectors
Maximum Points per Sector	5
Minimum Points	2

#### 14.13.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation. The grade was capped at 240 g/t for both drill hole and channel assays.

#### 14.13.3 Block Model Limits

TABLE 14.46 DIFICULTAD BLOCK MODEL PARAMETERS			
	X	Y	Z
Minimum	4,400	5,380	2,140
Maximum	4,620	5,540	2,380
Number	45	33	49
Model Size (meters)	225	165	245

#### 14.13.4 Classification and Resources

Resource classification followed the method, as described in Section 14.6. In addition, adjustments were made to customize the classification to the deposit configuration.

- All blocks between elevations 2,250 and 2,285 were set to inferred. The volume is above the lower workings and 15 meters below the upper workings.
- The upper workings are not extensive, but are reasonably well covered by drilling.

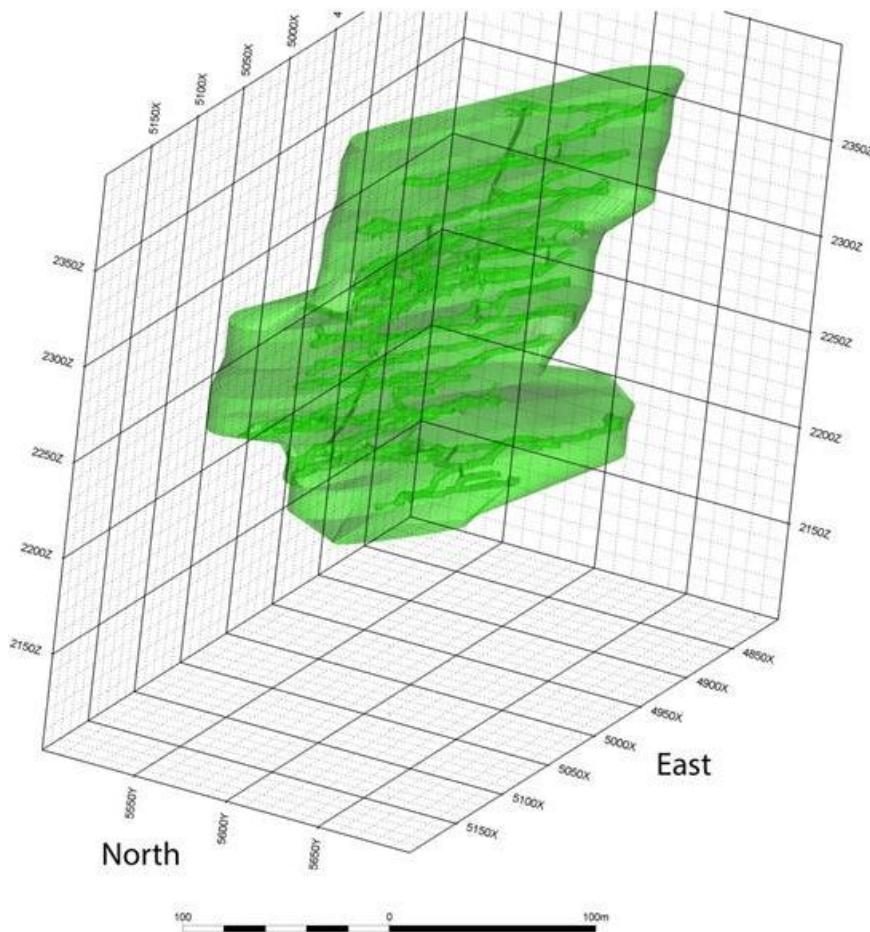
Table 14.47 shows the summary of Measured and Indicated mineral resources for the Difícultad deposit. Table 14.48 shows the summary of Inferred mineral resources for the Difícultad deposit.

TABLE 14.47 DIFICULTAD MEASURED AND INDICATED MINERAL RESOURCES									
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	107	67.82	0.79	0.17	5.45	220	1,526	441	10,786
Indicated	335	62.69	0.56	0.22	3.92	652	3,982	1,643	28,641
Measured plus Indicated	442	64.18	0.63	0.20	4.37	872	5,508	2,084	39,427

TABLE 14.48 DIFICULTAD INFERRED MINERAL RESOURCES									
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	165	76.59	0.45	0.39	2.61	406	1,720	1,471	9,780

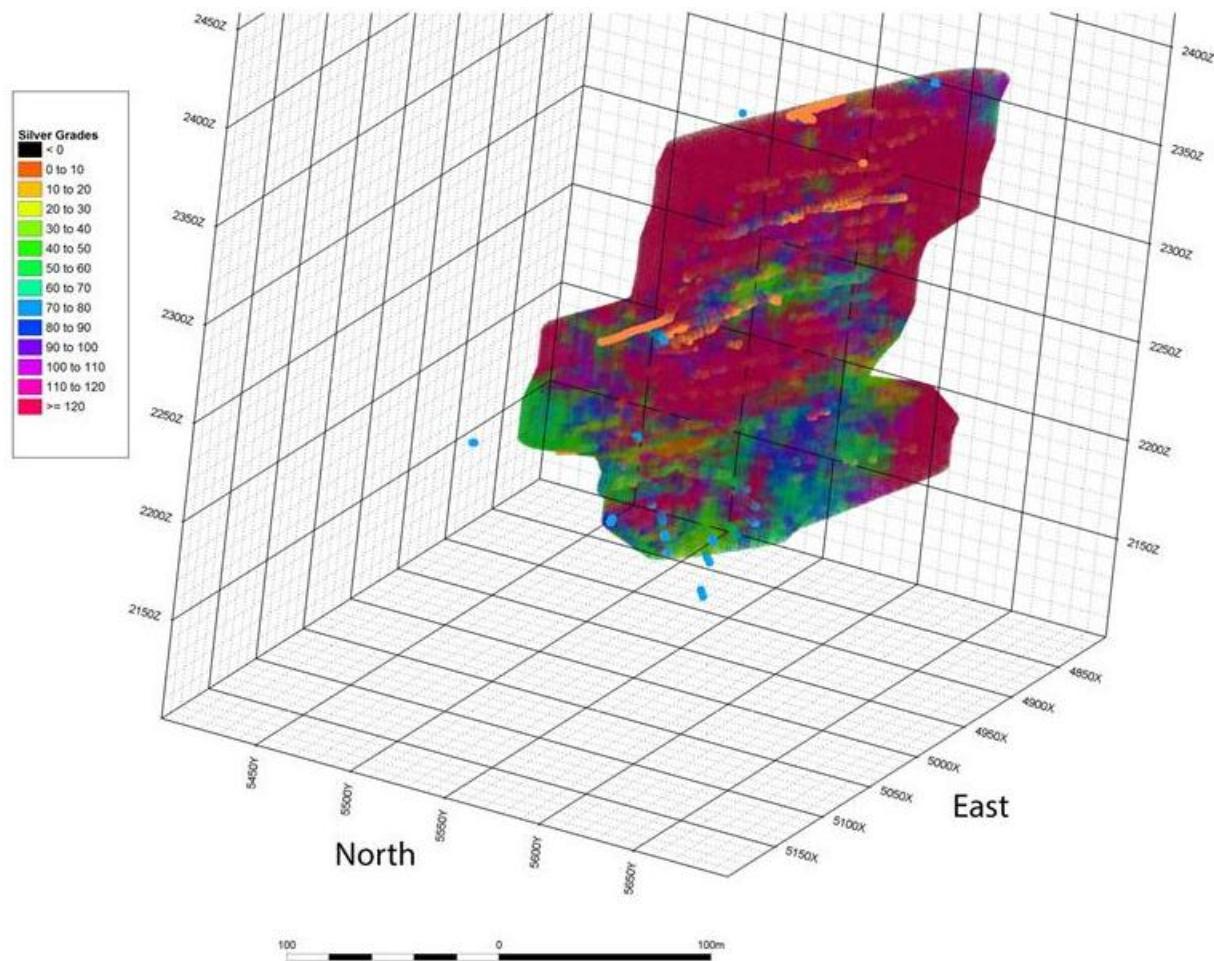
## 14.14 MARAVILLAS

The Maravillas geological limits are shown in Figure 14.12. The block model limits encompass the geological limits as well as the assays provided in the Maravillas database.



**Figure 14.12. Maravillas geological limits showing internal workings (darker areas) and the assay sample locations – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

Figure 14.13 shows the Maravillas block model restricted to the geological limit volume along with locations of the assays used for estimation. The channel samples combined with the drill hole assays are analyzed to define the modeling parameters.



**Figure 14.13. Maravillas block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

#### 14.14.1 Data Summary and Statistics

Table 14.49 summarizes the data provided for the Maravillas area. The averages include all assays the Company provided for the area.

<b>TABLE 14.49</b> <b>MARAVILLAS ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	738	186	144.96	32,469.46	180.19	1.24
	Channels	2,132	1,492	118.27	25,143.05	158.57	1.34
	All Assays	2,132	1,678	121.23	26,006.51	161.27	1.33
Copper (%)	Drill Holes	1.89	179	0.34	0.16	0.40	1.17
	Channels	13.04	1,454	0.71	0.89	0.94	1.33
	All Assays	13.04	1,633	0.67	0.82	0.91	1.36
Lead (%)	Drill Holes	13.22	185	1.20	4.89	2.21	1.85
	Channels	19.60	1,457	0.60	1.37	1.17	1.95
	All Assays	19.60	1,642	0.67	1.80	1.34	2.01
Zinc (%)	Drill Holes	19.81	186	3.11	14.32	3.78	1.22
	Channels	22.93	1,496	3.60	11.47	3.39	0.94
	All Assays	22.93	1,682	3.55	11.80	3.43	0.97
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

#### 14.14.2 Data Analysis and Variogram Parameter Development

Table 14.50, Table 14.51, and Table 14.52 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.50</b> <b>MARAVILLAS VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.76		
Component 1	0.28	18	Spherical
Component 2	0.51	45	Exponential

<b>TABLE 14.51</b> <b>MARAVILLAS DIRECTIONS</b>	
Main Azimuth	120
Plunge of Main Azimuth	15
Plunge of 2 <sup>nd</sup> Axis	0

TABLE 14.52 MARAVILLAS SEARCH PARAMETERS			
Search Type	Elliptical		
	Factor	Az	Plunge
	1.0	120	15
	1.0	210	0.0
Search Distances	6, 32, 52		
Sectors	4 sectors		
Maximum Points per Sector	5		
Minimum Points	2		

#### 14.14.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation. The grade was capped at 800 g/t for both drill hole and channel assays.

#### 14.14.3 Classification and Resources

Resource classification followed the method, as described in Section 14.6. No adjustments were made to customize the classification to the deposit configuration.

Table 14.53 shows the summary of Measured and Indicated mineral resources for the Maravillas deposit. Table 14.54 shows the summary of Inferred mineral resources for the Maravillas deposit.

**TABLE 14.53**  
**MARAVILLAS MEASURED AND INDICATED MINERAL RESOURCES**

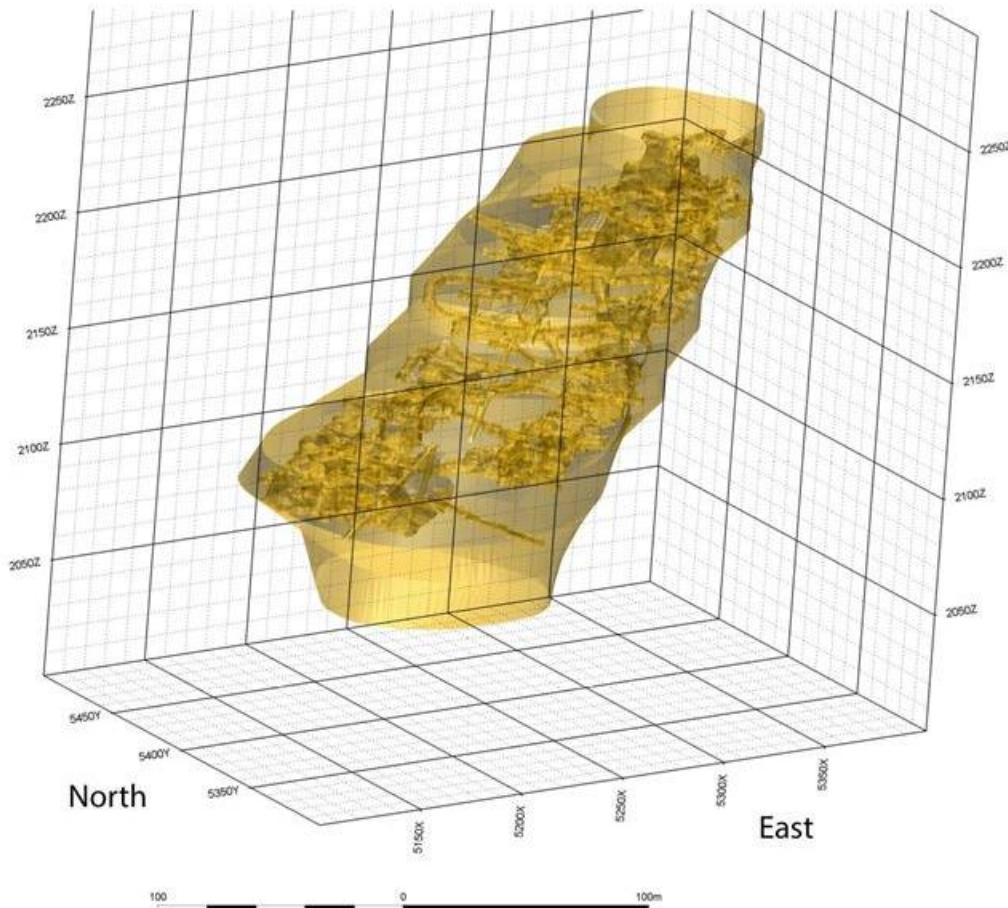
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	2,435	135.36	0.72	0.79	3.92	11,256	40,014	43,893	215,319
Indicated	790	150.75	0.76	0.96	3.52	4,208	13,899	19,031	60,272
Measured plus Indicated	3,225	139.47	0.73	0.83	3.81	15,464	53,914	62,924	275,591

**TABLE 14.54**  
**MARAVILLAS INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	678	144.54	0.71	1.03	3.64	3,392	10,666	17,267	54,744

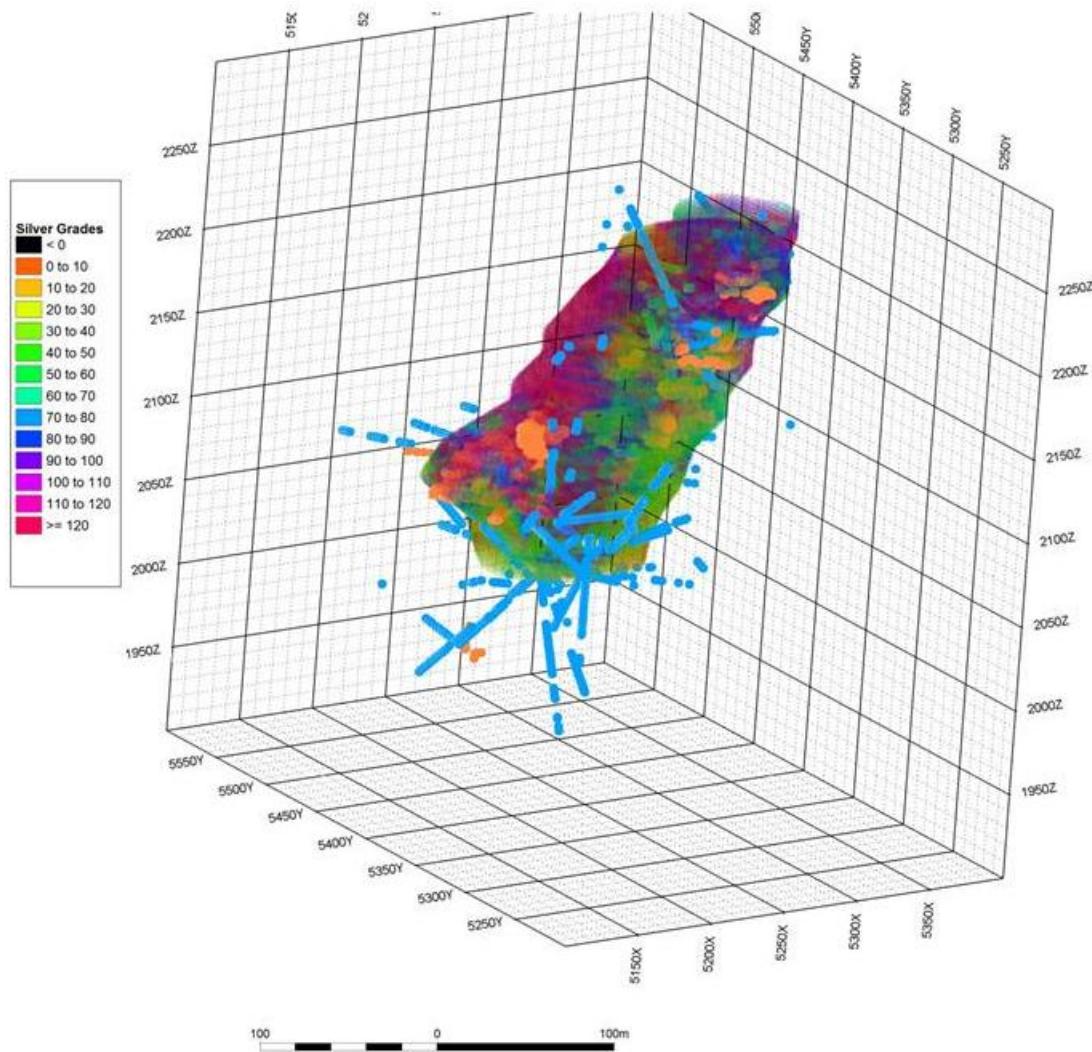
#### 14.15 MONICA

The Monica geological limits are shown in Figure 14.14. The block model limits encompass the geological limits as well as the assays provided in the Monica database.



**Figure 14.14. Monica geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.15 shows the Monica block model restricted to the geological limit volume along with locations of the assays used for estimation. The channel samples combined with the drill hole assays are analyzed to define the modeling parameters.



**Figure 14.15. Monica block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

#### 14.15.1 Data Summary and Statistics

Table 14.55 summarizes the data provided for the Monica area. The averages include all assays the Company provided for the area.

<b>TABLE 14.55</b> <b>MONICA ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	930	2,503	71.01	11,276.78	106.19	1.50
	Channels	3,347	4,391	113.88	19,120.67	138.28	1.21
	All Assays	3,347	6,894	98.31	16,695.67	129.21	1.31
Copper (%)	Drill Holes	8.62	2,358	0.28	0.25	0.50	1.77
	Channels	6.36	4,266	0.37	0.21	0.45	1.22
	All Assays	8.62	6,624	0.34	0.22	0.47	1.39
Lead (%)	Drill Holes	10.12	2,409	0.42	0.67	0.82	1.93
	Channels	8.41	4,359	0.67	0.72	0.85	1.26
	All Assays	10.12	6,768	0.58	0.71	0.85	1.45
Zinc (%)	Drill Holes	20.73	2,488	0.80	1.74	1.32	1.64
	Channels	21.79	4,347	1.05	3.04	1.74	1.66
	All Assays	21.79	6,835	0.96	2.58	1.61	1.68

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

#### 14.15.2 Data Analysis and Variogram Parameter Development

Table 14.56, Table 14.57, and Table 14.58 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.56</b> <b>MONICA VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.60		
Component 1	0.63	44	Exponential

<b>TABLE 14.57</b> <b>MONICA DIRECTIONS</b>	
Main Azimuth	120
Plunge of Main Azimuth	-15
Plunge of 2 <sup>nd</sup> Axis	0

<b>TABLE 14.58</b> <b>MONICA SEARCH PARAMETERS</b>	
Search Type	Spherical
Search Distances	16, 24, 50
Sectors	4 sectors
Maximum Points per Sector	5
Minimum Points	2

#### **14.15.2.1 Grade Cap**

The level of grade to cut the assays was determined from cross validation. The grade was capped at 400 g/t for both drill hole and channel assays.

#### **14.15.3 Block Model Limits**

The block model limits for the Monica deposit is shown in Table 14.59.

<b>TABLE 14.59</b> <b>MONICA BLOCK MODEL PARAMETERS</b>			
	<b>X</b>	<b>Y</b>	<b>Z</b>
Minimum	5,130	5,260	1,990
Maximum	5,400	5,550	2,250
Number	55	59	53
Model Size (meters)	275	295	265

#### **14.15.4 Classification and Resources**

Resource classification followed the method, as described in Section 14.6. No adjustments were made to customize the classification to the deposit configuration.

Table 14.60 shows the summary of Measured and Indicated mineral resources for the Monica deposit. Table 14.61 shows the summary of Inferred mineral resources for the Monica deposit.

**TABLE 14.60**  
**MONICA MEASURED AND INDICATED MINERAL RESOURCES**

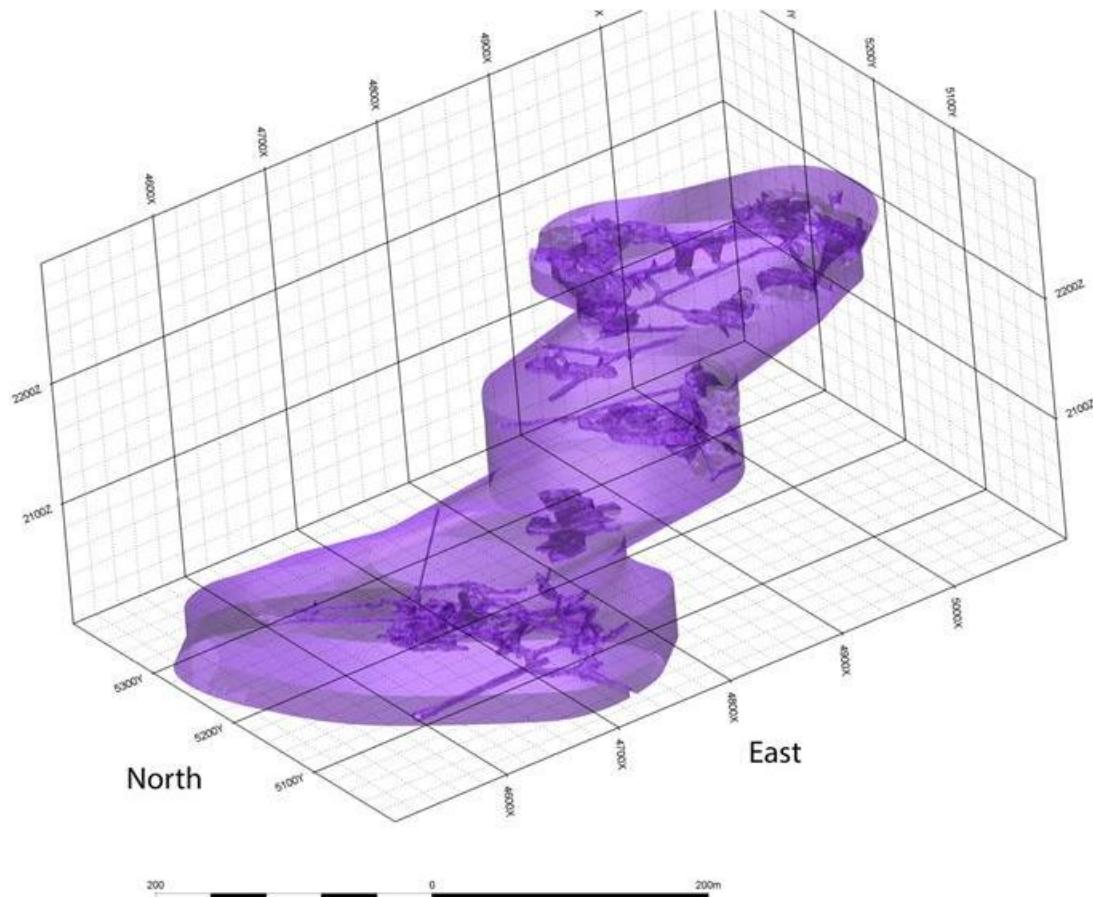
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	684	99.70	0.38	0.64	0.98	2,022	5,341	9,304	15,272
Indicated	2,605	92.13	0.36	0.70	0.92	7,463	19,615	38,220	56,896
Measured plus Indicated	3,289	94.31	0.37	0.68	0.94	9,485	24,956	47,524	72,168

**TABLE 14.61**  
**MONICA INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	758	92.54	0.34	0.72	1.09	2,247	6,082	11,918	19,566

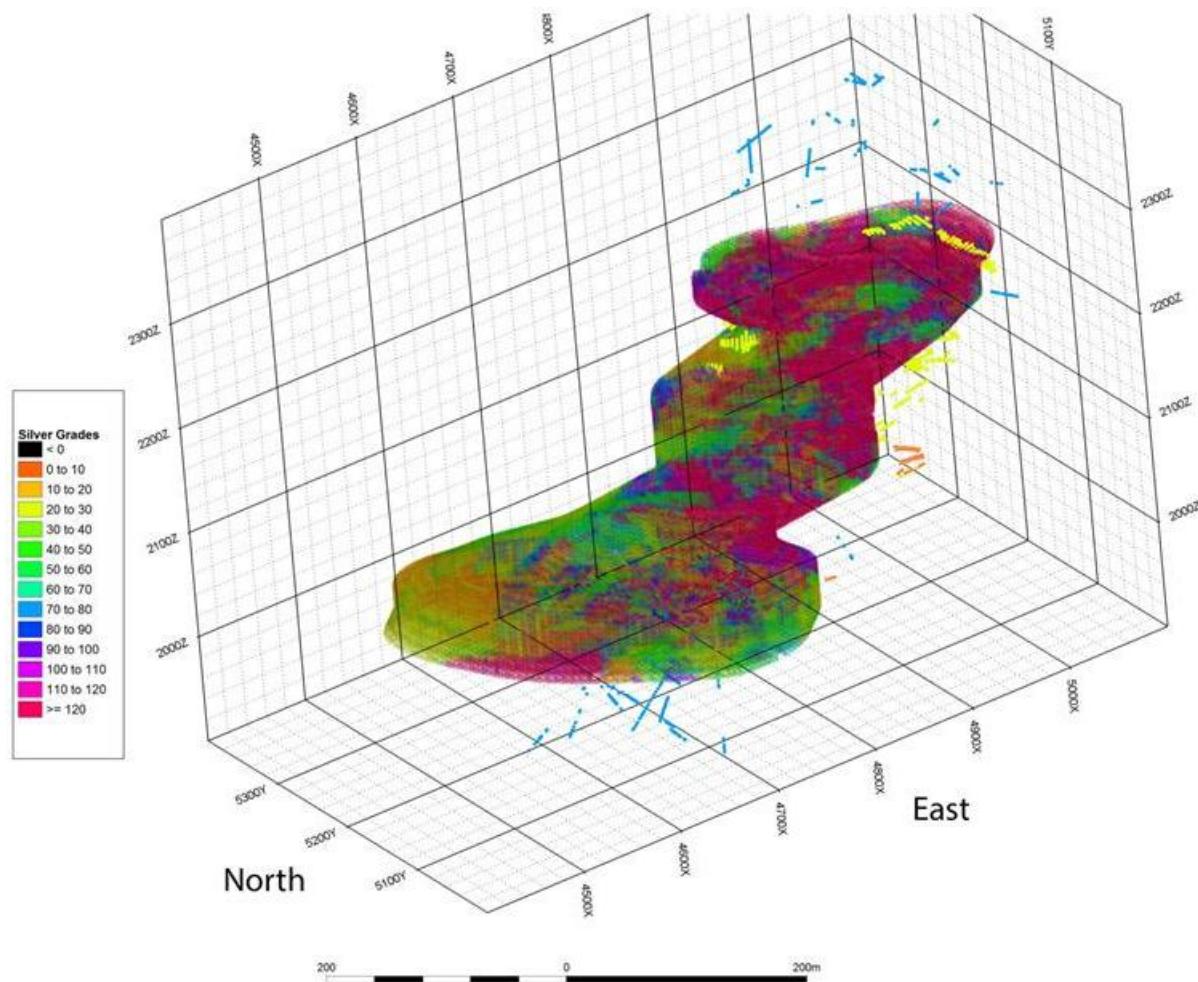
## 14.16 NEGRA

The Negra geological limits are shown in Figure 14.16. The block model limits encompass the geological limits as well as the assays provided in the Negra database.



**Figure 14.16. Negra geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.17 shows the block model restricted to the geological limit volume along with locations of the assays used for estimation. The channel samples combined with the drill hole assays are analyzed to define the modeling parameters.



**Figure 14.17. Negra block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples, the yellow dots are Peñoles channel samples, and the blue dots are drill hole assays.

#### 14.16.1 Data Summary and Statistics

Table 14.62 summarizes the data provided for the Negra area. The averages include all assays the Company provided for the area.

<b>TABLE 14.62</b> <b>NEGRA ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	1,528	1,589	79.20	20,755.50	144.07	1.82
	Channels	1,183	993	70.06	11,937.66	109.26	1.56
	All Assays	2,592	2,329	185.21	72,540.94	269.33	1.45
Copper (%)	Drill Holes	2,592	4,911	127.62	46,520.99	215.69	1.69
	Channels	68.00	1,555	0.38	6.44	2.54	6.65
	All Assays	4.68	1,009	0.43	0.29	0.53	1.24
Lead (%)	Drill Holes	28.00	2,332	0.43	1.15	1.07	2.50
	Channels	68.00	4,896	0.41	2.65	1.63	3.93
	All Assays	10.38	1,548	0.53	1.31	1.15	2.15
Zinc (%)	Drill Holes	8.97	975	0.30	0.47	0.69	2.27
	Channels	16.92	2334	1.36	4.60	2.15	1.58
	All Assays	16.92	4857	0.88	2.94	1.71	1.94

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

#### 14.16.2 Data Analysis and Variogram Parameter Development

Table 14.63, Table 14.64, and Table 14.65 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.63</b> <b>NEGRA VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.58		
Component 1	0.68	36	Exponential
Component 2	0.24	61	Exponential

<b>TABLE 14.64</b> <b>NEGRA DIRECTIONS</b>	
Main Azimuth	135
Plunge of Main Azimuth	-15
Plunge of 2 <sup>nd</sup> Axis	0

TABLE 14.65 NEGRA SEARCH PARAMETERS			
Search Type	Elliptical		
	Factor	Az	Plunge
	1.0	135	-15
	0.9	225	0.0
Search Distances	0.5	135	75.0
	20, 40, 80		
	Sectors		
	4 sectors		
Maximum Points per Sector		5	
Minimum Points		2	

#### 14.16.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation. The grade was capped at 240 g/t for both drill hole and channel assays.

#### 14.16.3 Block Model Limits

The block model limits for the Negra deposit are shown in Table 14.66.

TABLE 14.66 NEGRA BLOCK MODEL PARAMETERS			
	X	Y	Z
Minimum	4,500	5,000	1,900
Maximum	5,100	5,350	2,400
Number	121	71	101
Model Size (meters)	605	355	505

#### 14.16.4 Classification and Resources

Resource classification followed the method, as described in Section 14.6. No adjustments were made to customize the classification to the deposit configuration.

Table 14.67 shows the summary of Measured and Indicated mineral resources for the Negra deposit. Table 14.68 shows the summary of Inferred mineral resources for the Negra deposit.

**TABLE 14.67**  
**NEGRA MEASURED AND INDICATED MINERAL RESOURCES**

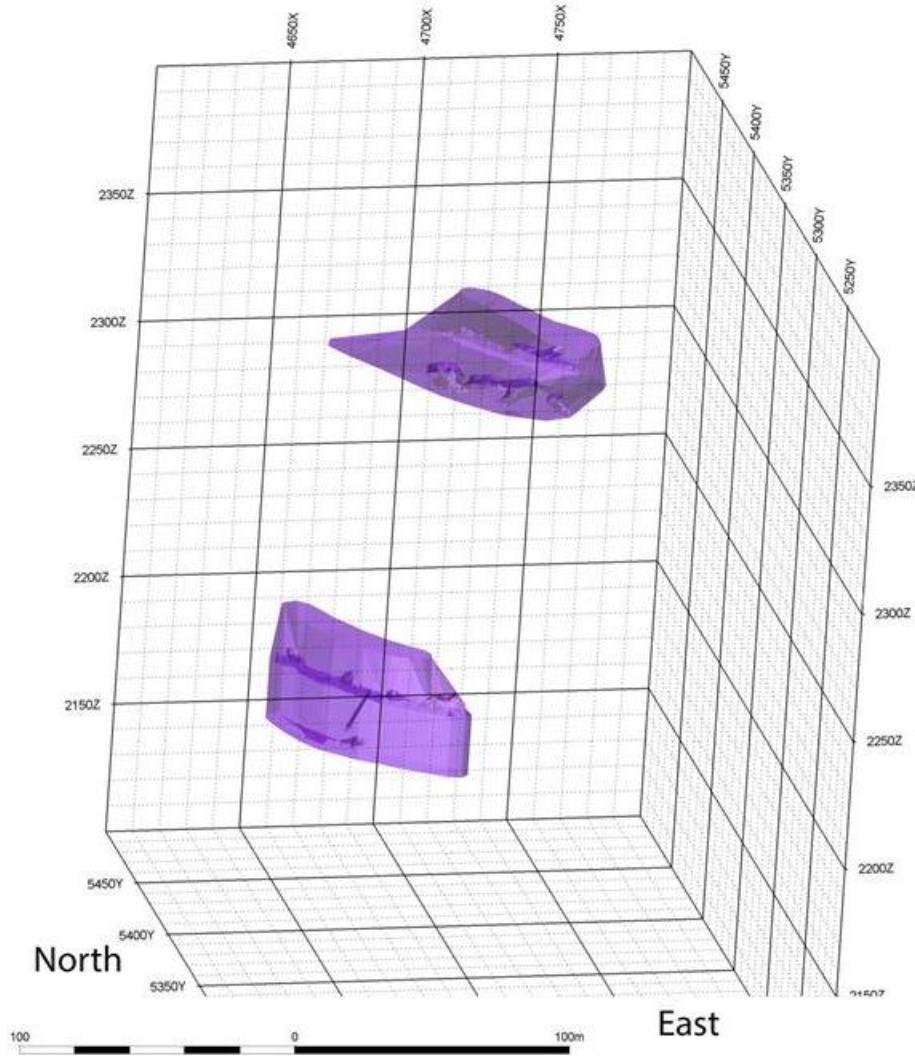
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	5,381	162.87	0.40	1.19	2.52	27,432	46,554	135,939	291,414
Indicated	6,759	174.15	0.35	1.29	2.62	40,122	55,864	202,568	411,369
Measured plus Indicated	12,141	168.10	0.38	1.24	2.56	67,554	102,417	338,507	702,782

**TABLE 14.68**  
**NEGRA INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	4,436	186.99	0.36	1.35	2.77	30,171	37,582	146,598	294,875

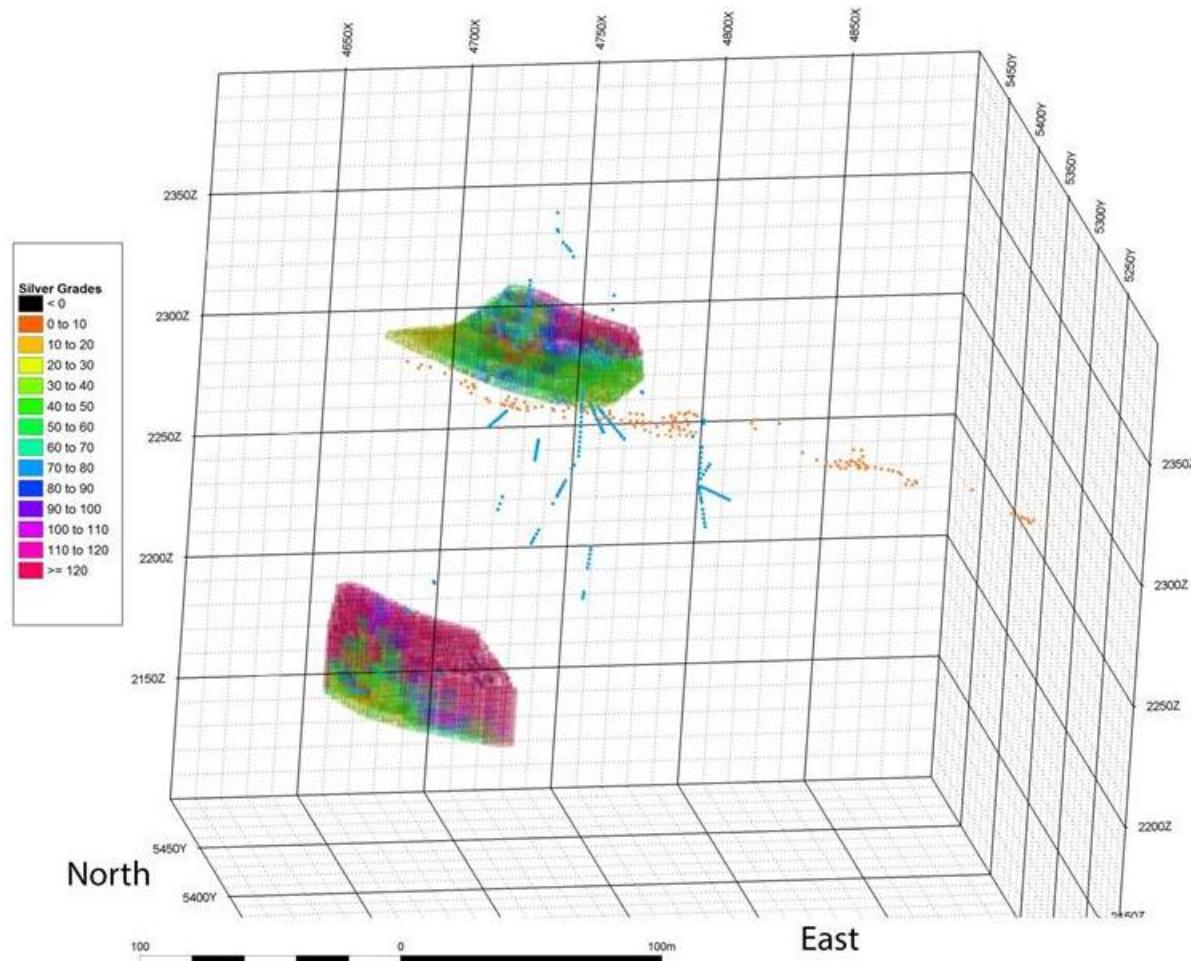
## 14.17 SAN PEDRO

The San Pedro geological limits are shown in Figure 14.18. The limits are divided into two sections. A block model was designed to encompass the two areas and the assays in the San Pedro database.



**Figure 14.18. San Pedro geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.19 shows the block model restricted to the two geological limit volumes along with the assays used for estimation. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.19. San Pedro block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

#### 14.17.1 Data Summary and Statistics

Table 14.69 summarizes the data provided for the San Pedro area. The averages include all assays the Company provided for the area.

<b>TABLE 14.69</b> <b>SAN PEDRO ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	1,526	295	74.07	23,688.12	153.91	2.08
	Channels	450	193	49.26	2,969.32	54.49	1.11
	All Assays	1,526	488	64.26	15,618.61	124.97	1.95
Copper (%)	Drill Holes	2.34	293	0.27	0.16	0.40	1.53
	Channels	2.21	185	0.51	0.20	0.45	0.88
	All Assays	2.34	478	0.36	0.19	0.44	1.22
Lead (%)	Drill Holes	10.35	300	0.46	1.32	1.15	2.48
	Channels	3.13	176	0.19	0.20	0.44	2.35
	All Assays	10.35	476	0.36	0.92	0.96	2.66
Zinc (%)	Drill Holes	12.37	300	1.63	5.19	2.28	1.40
	Channels	11.20	192	2.31	5.23	2.29	0.99
	All Assays	12.37	492	1.89	5.30	2.30	1.22
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

#### 14.17.2 Data Analysis and Variogram Parameter Development

Table 14.70, Table 14.71, and Table 14.72 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.70</b> <b>SAN PEDRO VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.36		
Main Axis Component 1	0.78	36	Spherical
2 <sup>nd</sup> Axis Component 1	0.78	15	Spherical
3 <sup>rd</sup> Axis Component 1	0.78	8	Spherical

<b>TABLE 14.71</b> <b>SAN PEDRO DIRECTIONS</b>	
Main Azimuth	120
Plunge of Main Azimuth	0
Plunge of 2 <sup>nd</sup> Axis	20

TABLE 14.72 SAN PEDRO SEARCH PARAMETERS			
Search Type	Elliptical		
	Factor	Az	Plunge
	0.75	120	0
	1.0	210	20
	0.75	30	70
Search Distances	10, 25, 45		
Sectors	4 sectors		
Maximum Points per Sector	5		
Minimum Points	2		

#### 14.17.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation. The grade was capped at 280 g/t for both drill hole and channel assays.

#### 14.17.3 Block Model Limits

The block model limits for the San Pedro deposit are shown in Table 14.73.

TABLE 14.73 SAN PEDRO BLOCK MODEL PARAMETERS			
	X	Y	Z
Minimum	4,620	5,220	2,200
Maximum	4,870	5,440	2,390
Number	51	45	39
Model Size (meters)	255	225	195

#### 14.17.4 Classification and Resources

Resource classification followed the method, as described in Section 14.6. In addition, adjustments were made to customize the classification to the deposit configuration.

- Both Sections – Classified as indicated and inferred only because no channel samples are in the area.

The areas are relatively small. The distance between mine workings on the upper part is only about 10 meters. The lower part ends just about 15 meters above the mine workings. It is appropriate to call it primarily indicated and the rest of the deposit is inferred. No Measured resource has been classified for this deposit.

Table 14.74 shows the summary of Measured and Indicated mineral resources for the San Pedro deposit. Table 14.75 shows the summary of Inferred mineral resources for the San Pedro deposit.

**TABLE 14.74**  
**SAN PEDRO MEASURED AND INDICATED MINERAL RESOURCES**

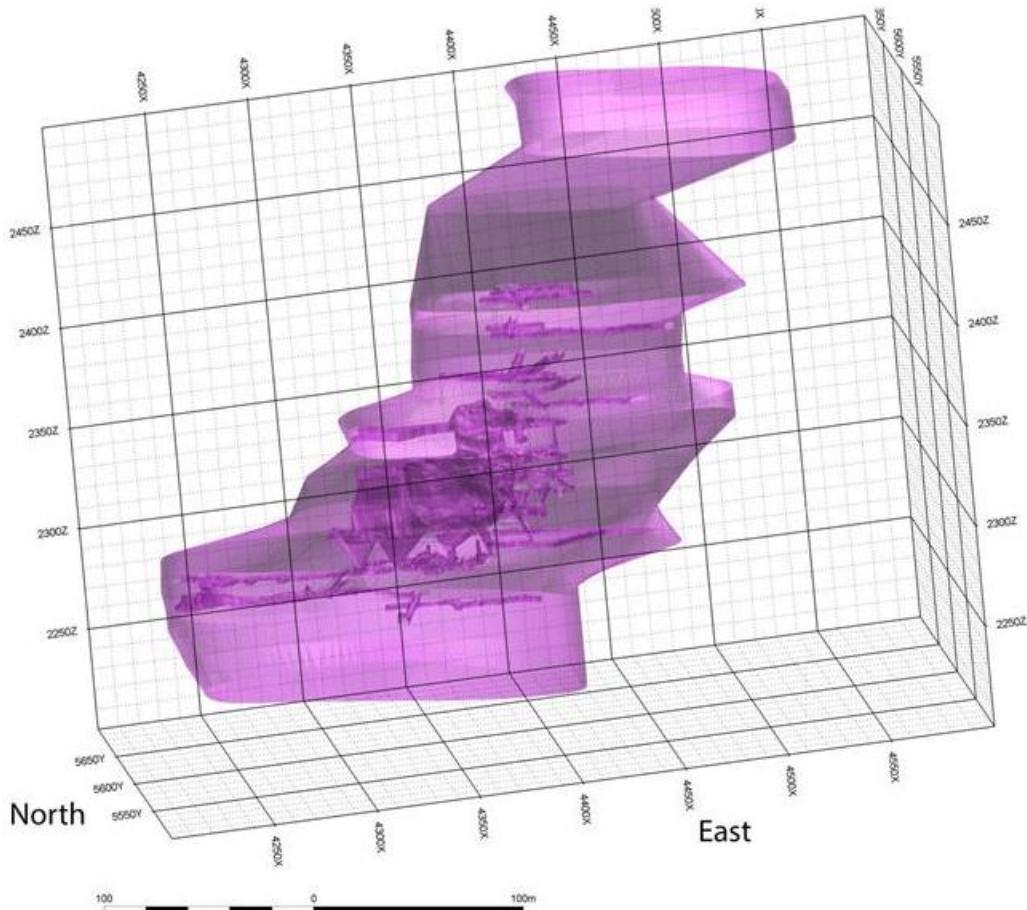
Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	—	—	—	—	—	—	—	—	—
Indicated	209	99.39	0.56	0.84	3.15	665	2,390	4,241	14,223
Measured plus Indicated	209	99.39	0.56	0.84	3.15	665	2,390	4,241	14,223

**TABLE 14.75**  
**SAN PEDRO INFERRED MINERAL RESOURCES**

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	7	102.01	0.44	1.38	2.59	21	65	149	329

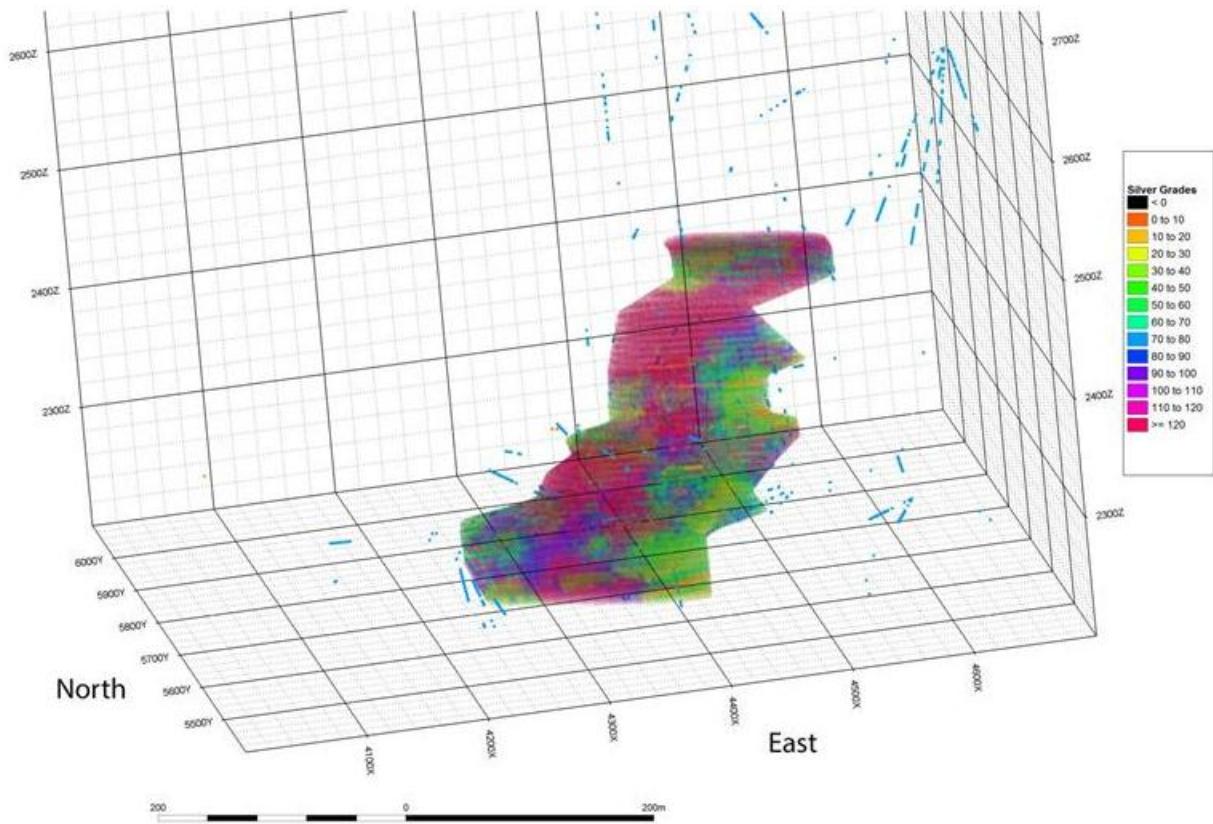
#### 14.18 VIRGINIA-BLANCA

The Virginia-Blanca geological limits are shown in Figure 14.20. The limits are divided into two sections. A block model was designed to encompass the two areas and the assays in the Virginia-Blanca database.



**Figure 14.20. Virginia-Blanca geological limits showing internal workings (darker areas) – looking northeasterly**

Figure 14.21 shows the block model restricted to the geological limit volumes along with the assays used for estimation. The channel samples combined with the drill hole assays define the modeling parameters.



**Figure 14.21. Virginia-Blanca block model inside geological limits with drill hole and channel assays – looking northeasterly**  
The orange dots are channel samples and the blue dots are drill hole assays.

#### 14.18.1 Data Summary and Statistics

Table 14.76 summarizes the data provided for the Virginia-Blanca area. The averages include all assays the Company provided for the area.

<b>TABLE 14.76</b> <b>VIRGINIA-BLANCA ASSAY STATISTICS</b>							
<b>Metal</b>	<b>Sample Type</b>	<b>Maximum</b>	<b>Number of Points</b>	<b>Mean</b>	<b>Variance</b>	<b>Std. Dev.</b>	<b>Coeff. of Variation</b>
Silver (g/t)	Drill Holes	960	1,597	81.84	16,489.10	128.41	1.57
	Channels	771	529	106.86	14,840.45	121.82	1.14
	All Assays	960	2,126	88.07	16,188.74	127.23	1.45
Copper (%)	Drill Holes	6.28	1,535	0.25	0.21	0.46	1.80
	Channels	6.11	496	0.49	0.24	0.49	0.99
	All Assays	6.28	2031	0.31	0.23	0.48	1.52
Lead (%)	Drill Holes	15.60	1597	0.76	2.33	1.53	2.00
	Channels	4.18	524	0.52	0.38	0.61	1.19
	All Assays	15.60	2121	0.70	1.86	1.36	1.94
Zinc (%)	Drill Holes	16.12	1604	1.88	5.63	2.37	1.26
	Channels	17.91	524	3.69	9.51	3.08	0.84
	All Assays	17.91	2128	2.33	7.19	2.68	1.15
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

#### 14.18.2 Data Analysis and Variogram Parameter Development

Table 14.77, Table 14.78, and Table 14.79 is a summary of the variogram parameters, the search constraints, and the grade cap used to estimate block model grades.

<b>TABLE 14.77</b> <b>VIRGINIA-BLANCA VARIOGRAM PARAMETERS</b>			
	<b>Nugget/Sill</b>	<b>Range</b>	<b>Model Type</b>
Nugget (Co)	0.52		
Main Axis Component 1	0.65	14	Spherical
2 <sup>nd</sup> Axis Component 1	0.65	14	Spherical
3 <sup>rd</sup> Axis Component 1	0.65	10.5	Spherical

<b>TABLE 14.78</b> <b>VIRGINIA-BLANCA DIRECTIONS</b>	
Main Azimuth	105
Plunge of Main Azimuth	-15
Plunge of 2 <sup>nd</sup> Axis	15

TABLE 14.79 VIRGINIA-BLANCA SEARCH PARAMETERS			
Search Type	Elliptical		
	Factor	Az	Plunge
	1.0	105	-15
	1.0	191	15
	0.75	58	68
	Search Distances	12, 22, 42	
	Sectors	4 sectors	
	Maximum Points per Sector	5	
	Minimum Points	2	

#### 14.18.2.1 Grade Cap

The level of grade to cut the assays was determined from cross validation. The grade was capped at 450 g/t for both drill hole and channel assays.

#### 14.18.3 Block Model Limits

The block model limits for the Virginia-Blanca deposit are shown in Table 14.80.

TABLE 14.80 VIRGINIA-BLANCA BLOCK MODEL PARAMETERS			
	X	Y	Z
Minimum	4,050	5,450	2,210
Maximum	4,690	6,050	2,760
Number	120	121	111
Model Size (meters)	600	605	555

#### 14.18.4 Classification and Resources

Resource classification followed the method, as described in Section 14.6. In addition, adjustments were made to customize the classification to the deposit configuration.

- Above elevation 2,420 is set to inferred only.
- Below elevation 2,270 is set to inferred only.

Table 14.81 shows the summary of Measured and Indicated mineral resources for the Virginia-Blanca deposit. Table 14.82 shows the summary of Inferred mineral resources for the Virginia-Blanca deposit.

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Measured	1,162	106.95	0.40	0.79	3.01	3,693	9,702	19,377	72,446
Indicated	1,449	106.03	0.33	0.81	2.74	4,571	10,435	22,468	84,624
Measured plus Indicated	2,611	106.46	0.37	0.80	2.87	8,265	20,136	41,845	157,070

Class	Total Tonnes (000)	Average				Metal Quantity (000)			
		Silver (g/t)	Copper (%)	Lead (%)	Zinc (%)	Silver (oz)	Copper (lb)	Lead (lb)	Zinc (lb)
Inferred	3,069	130.87	0.35	1.13	2.63	12,006	26,573	66,840	183,201

## 15.0 MINERAL RESERVE ESTIMATES

Currently, Aurcana is mining their mill feed primarily from the blocks identified as potentially economic within their Mineral Resource estimates. They determine profitability of a mining area based on internally derived economic parameters at the time of stope development. Wardrop published the last CIM Definitions Standards compatible ore reserve estimate for the La Negra Mine in February 2008 in a technical report titled “*Technical Report on the Mineral Resources and Mineral Reserves of the el Alacrán Deposit of the La Negra Silver, Lead, Zinc, Copper Mine Queretaro, México.*” This report involved estimates of reserves within only the Alacrán deposit. The authors reviewed the Wardrop resource and reserve work, believe it was completed in a manner appropriate for reserve estimation and disclosure pursuant to CIM Definitions Standards and re-estimated the remaining Mineral Reserves at the Alacrán deposit as of March 31, 2013 by deducting the mined out areas

### 15.1 PROCEDURES FOR WARDROP 2008 RESERVE ESTIMATE

Wardrop estimated the in situ resource using a traditional 3D block model. Grades were appropriately capped and grade interpolation was completed using standard Ordinary Kriging. Measured resource was those areas in the Alacrán deposit that were fully exposed and channel sampled on 2 mining levels, above and below with samples no more than 15 meters apart. Indicated resources were areas that were fully exposed and channel sampled on 1 mining level and projected, up or down dip, a maximum of 15 meters. Resources and reserves were reported using a US\$30/tonne Net Smelter Return (NSR) cutoff using the metal price and recoveries shown in Table 15.1.

TABLE 15.1 WARDROP 2008 NSR UNIT VALUE ASSUMPTIONS		
Metal	Price (US\$)	Recovery (%)
Ag	12.00/oz	83
Pb	0.70/lb	72
Zn	1.50/lb	81
Cu	2.80/lb	90

To estimate Mineral Reserves, Wardrop took 100% of their Measured Resource and 99% of their Indicated Resource. They then applied approximately 13% internal dilution at 35% of the average block grade and another 14% external dilution at 20% of the block grade. Tonnage was estimated using an average specific gravity of 3.2 t/m<sup>3</sup>. Table 15.2 shows the 2008 Reserves estimated by Wardrop (Wardrop, 2008).

TABLE 15.2 2008 MINERAL RESERVES FOR THE ALACRÁN DEPOSIT (WARDROP, 2008)					
Category	Tonnes	Ag (g/t)	Pb (%)	Zn (%)	Cu (%)
Proven	244,496	71.87	0.24	0.99	0.81
Probable	190,329	69.5	0.26	0.89	0.72
<b>Total</b>	<b>434,825</b>	<b>70.83</b>	<b>0.25</b>	<b>0.94</b>	<b>0.77</b>

The authors then took the mined out areas through March 31, 2013 and deducted them from the published 2008 Wardrop mineral reserve to estimate the remaining Mineral Reserves for the Alacrán deposit. Table 15.3 shows the remaining Measured and Indicated Mineral Resource at the Alacrán deposit.

<b>TABLE 15.3</b> <b>REMAINING 2008 WARDROP ALACRÁN MINERAL RESOURCES</b> <b>(AS OF MARCH 31, 2013)</b>					
<b>Category</b>	<b>Tonnes</b>	<b>Ag (g/t)</b>	<b>Pb (%)</b>	<b>Zn (%)</b>	<b>Cu (%)</b>
Measured	88,167	93	0.34	1.77	1.02
Indicated	33,371	72	0.26	1.40	0.70
<b>Total</b>	<b>121,538</b>	<b>88</b>	<b>0.31</b>	<b>1.67</b>	<b>0.93</b>

**Note:**  
 Remaining 2008 Wardrop Proven and Probable Reserves are included within the Mineral Resources  
 Mineral reserve estimates have not been estimated for the newly identified Measured and Indicated resources within the Alacrán deposit or for the other 12 mining areas at the Le Negra Project

The authors took the remaining resource blocks shown in Table 15.3 and added 13.5% internal dilution at 35% of the grade and then another 14% external dilution at 20% grade in a similar manner as Wardrop calculated the mineral reserves in 2008. Table 15.4 shows the remaining Proven and Probable 2008 Wardrop Reserves at the Alacrán deposit. The Proven and Probable Reserves listed in Table 15.4 are included within the updated Mineral Resources estimated by the authors.

<b>TABLE 15.4</b> <b>REMAINING 2008 WARDROP ALACRÁN MINERAL RESERVES</b> <b>(AS OF MARCH 31, 2013)</b>					
<b>Category</b>	<b>Tonnes</b>	<b>Ag (g/t)</b>	<b>Pb (%)</b>	<b>Zn (%)</b>	<b>Cu (%)</b>
Proven	114,079	78	0.28	1.47	0.85
Probable	42,747	61	0.21	1.17	0.58
<b>Total</b>	<b>156,826</b>	<b>73</b>	<b>0.26</b>	<b>1.39</b>	<b>0.77</b>

Mineral reserve estimates have not been completed for the newly identified Measured and Indicated resources at the Alacrán deposit or for the other 12 mining areas at the Le Negra Project.

## 16.0 MINING METHODS

The main mine infrastructure workings in operation at La Negra Mine are:

- Four main levels (2100; 2200; 2300; 2400)
- 2000 haulage level
- Two main service shafts (La Negra and El Alacrán)
- Two ramp systems, at surface and underground
- Two main draw shafts to the 2000 level
- Ventilation shafts

Other infrastructure includes:

- Pumping stations
- Draw points, ventilation, and service shafts
- Ore bins

Figure 16.1 and Figure 16.2 show a plan view and longitudinal section of main infrastructure and mineralization under exploration, development, and/or mining.

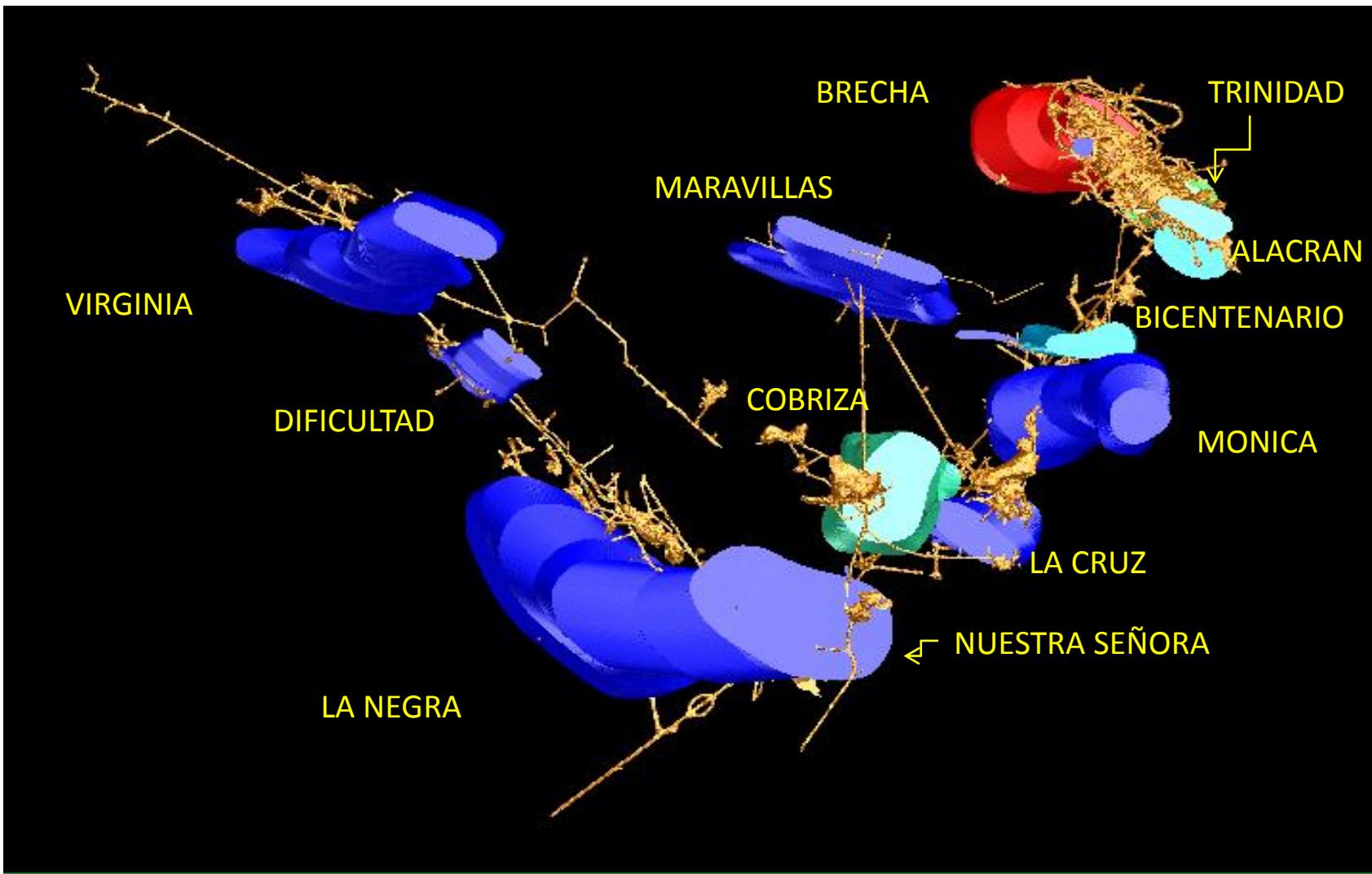
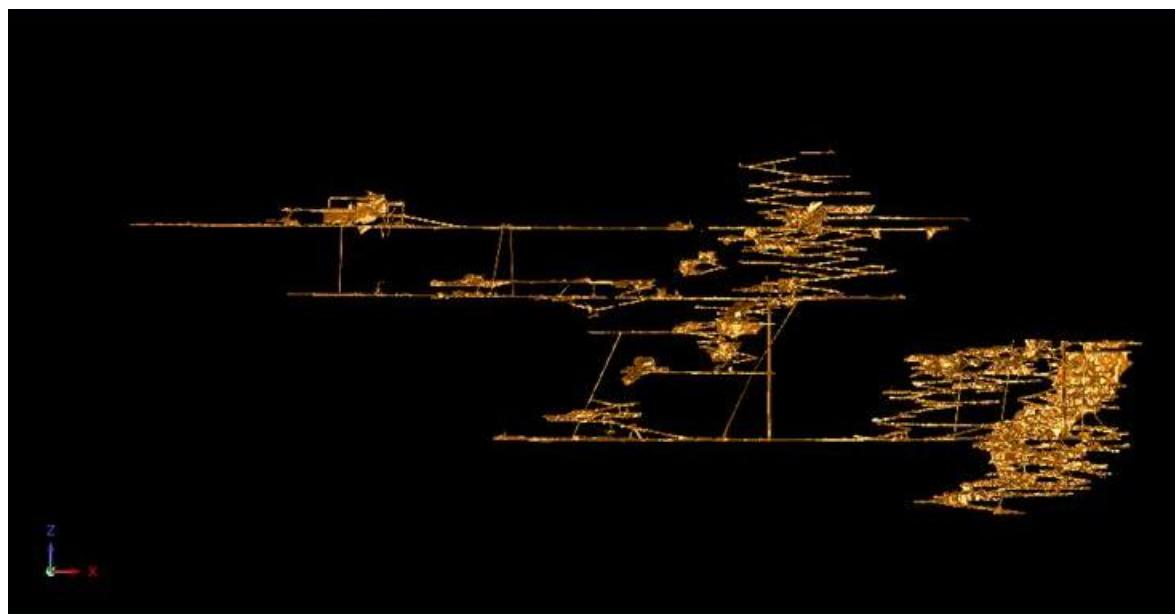


Figure 16.1. La Negra Mine plan map showing mineralization and mine workings  
(MLN, 2011)



**Figure 16.2. La Negra Mine longitudinal section looking northeast showing mine workings (MLN, 2011)**

Based on this infrastructure MLN is currently following two main low cost mining systems.

- 1) Long hole open stope mining
- 2) Room and pillar mining, depending on the morphology, width, and attitude of the mineralization

Current activities include the development of new mineralization, mainly along the northwest-trend, such as Maravillas, Virginia, San Pedro, Patriota, Silvia, and La Blanca multiple mining faces, enables MLN to meet the current production rate of 2,200 tpd.

Some of the main mining equipment used in the operation are:

- 1) Preparation
  - Electro hydraulic Atlas Copco Simba H-17 Jumbos
  - Pneumatic jack legs
- 2) Development and Mining
  - Electro hydraulic Atlas Copco Simba H-17 Jumbos
  - CMAC long hole drilling equipment
  - Scoop trams MTI Mod LT 650 3.5 Yd<sup>3</sup> and one 6 Yd<sup>3</sup>
  - Scoop tram John-Deere 724J 6 Yd<sup>3</sup>
- 3) Haulage
  - Low profile diesel trucks

Mining operations are supported by a series of rock mechanics studies and tests. SOP procedures for structural mapping, RQD (Rock Quality Data) logging, and RMR (Rock Mass Rating) are currently being developed.

This information will contribute to a better understanding of the type of support required in each area, such as the use of split set anchoring, rebar, cable bolting, mechanical support, shotcreting, etc.

Table 16.1 shows mine production from 2010 to 2011 at La Negra. It is noticed a 40% increase in the mine production between 2010 and 2011 with the improvements in mine infrastructure and acquisition of new equipment.

TABLE 16.1			
MINE PRODUCTION FROM 2010 TO 2011 AT LA NEGRA			
Item	Units	2010	2011
Mine Production	t	388,093	545,160
Ag Grade	g/t	80	80
Pb Grade	%	0.92	0.58
Zn Grade	%	1.26	1.41
Cu Grade	%	0.59	0.53
Development	m	4,434	7,690

## 17.0 RECOVERY METHODS

### 17.1 HISTORY OF OPERATIONS

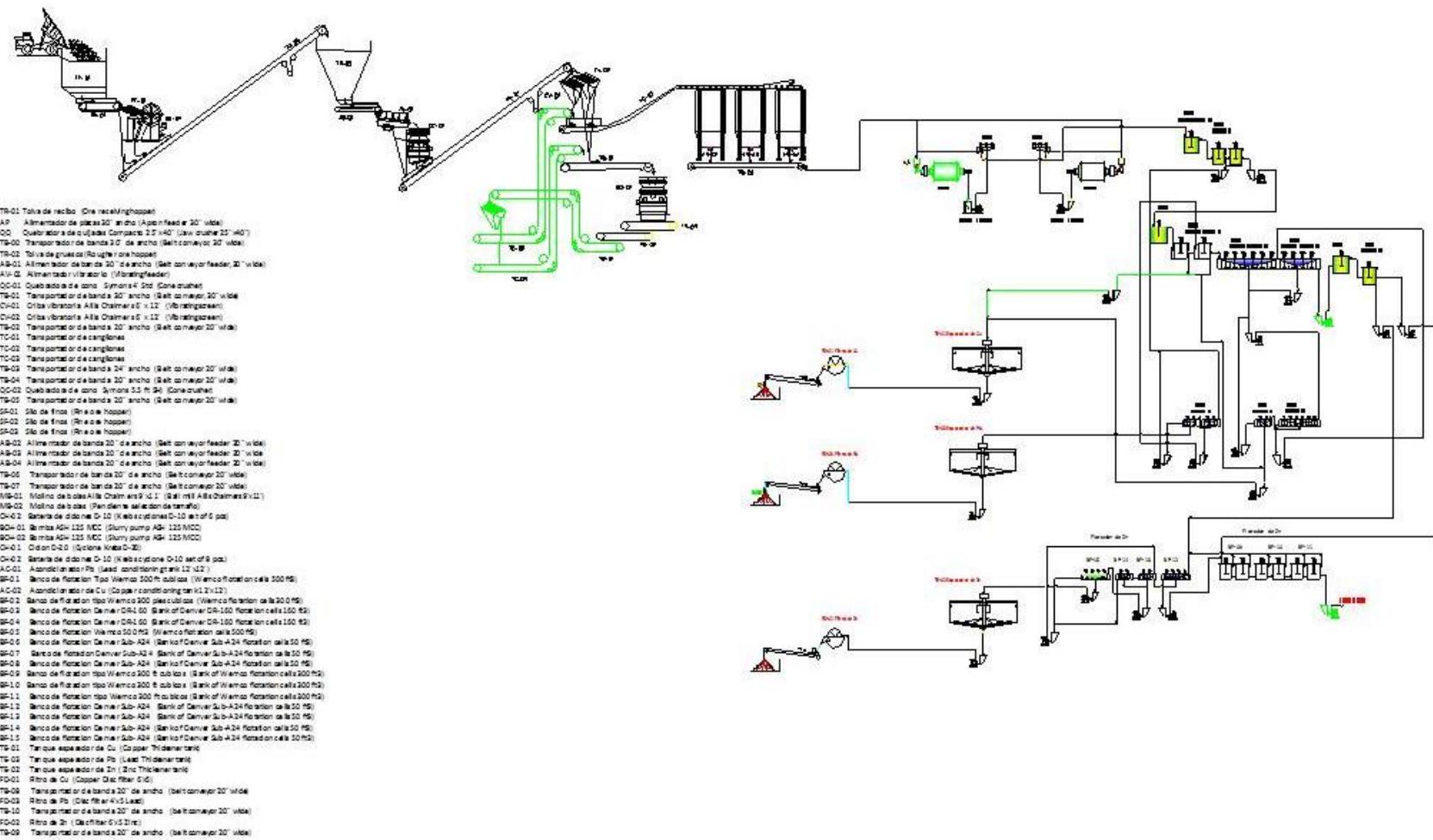
MLN currently operates a conventional milling and floatation plant with a capacity of 2,200 tpd producing zinc, lead, and copper concentrates. Original operations started with the 800 tpd plant, previously owned by Peñoles, and upgraded by Aurcana to 1,000 tpd in 2007. At that time, La Negra had all the required infrastructure for the operation of the plant, including power line, company owned housing, water availability, tailings ponds facilities, etc. The plant was formed by a 3-stage crushing plant and an 8 foot × 10 foot ball mill plus floatation and cleaning of lead, zinc, and copper cells, concentrate drying, and concentrate handling and shipping sections.

By June 2010, the expansion to 1,500 tpd had been completed by Aurcana and by April 2012, La Negra Mine completed its process plant expansion to 2,200 tpd.

### 17.2 SUMMARY OF CURRENT OPERATIONS AND FLOW SHEET

A summary of current metallurgical operations at La Negra, for information purposes, follows.

Figure 17.1 shows the flow sheet of the current process plant facilities and a generalized list of major equipment is included in Table 17.1.



**Figure 17.1. MLN process plant flow sheet diagram**  
(Reference: La Negra PowerPoint® presentation, February 7, 2012)

<b>TABLE 17.1</b> <b>LIST OF MAJOR EQUIPMENT IN THE PROCESS PLANT</b>	
Jaw Crusher – 25” × 40” (Compacto)	
Cone Crusher – 4 ft Standard (Symons)	
Cone Crusher – 5.5 ft Standard (Symons)	
Ball Mill – 9’ × 11’ (Allis Chalmers)	
Ball Mill – 10’ × 10’ (Marcy)	
D 10 Cyclone Battery – 6 pcs (Krebbs)	
Floatation Cell Bank – 500 ft <sup>3</sup> (Wemco)	
4 Floatation Cell Banks – 300 ft <sup>3</sup> (Wemco)	
4 Floatation Cell Banks – 160 ft <sup>3</sup> (Denver DR 160)	
6 Floatation Cell Banks – 50 ft <sup>3</sup> (Denver SubA-24)	
Copper Thickener Tank	
Lead Thickener Tank	
Zinc Thickener Tank	
Copper Disk Filter – 6’ × 5’	
Lead Disk Filter – 4’ × 5’	
Zinc Disk Filter – 6’ × 5’	
<b>Reference:</b> La Negra PowerPoint® presentation, February 7, 2011	

During the year 2011, approximately 512,000 tonnes of mineralized material were produced and milled with the following metallurgical parameters (Table 17.2).

<b>TABLE 17.2</b> <b>SUMMARY OF 2011 PRODUCTION IN THE PROCESS PLANT</b>		
<b>Milling</b>	<b>Tonnes</b>	<b>512,621</b>
Average Zn Grade	%	1.28
Average Cu Grade	%	0.41
Average Pb Grade	%	0.42
Average Ag Grade	g/t	74
Zn Recovery	%	63.10
Cu Recovery	%	75.60
Pb Recovery	%	81.80
Ag Recovery	%	81.10
Zn Concentrates	t	9,965
Cu Concentrates	t	8,551
Pb Concentrates	t	2,326
<b>Reference:</b> La Negra PowerPoint® presentation, February 7, 2012		

According to the monthly operation reports of MLN, from January to May 2012, approximately 244,000 tonnes were milled with the production of 1,525 tonnes of lead concentrate, 6,259 tonnes of zinc concentrate, and 3,316 tonnes of copper concentrate. Average recoveries for the 5-month period were 84.86% and 81.0% of silver and lead in lead concentrates, respectively, 74.62% of zinc in zinc concentrates, and 70.66% of copper in copper concentrates. These figures are considered to be representative of mineralization produced from the active stopes in different areas throughout the mine, during the said period.

The MLN operation has the required water, energy, and support facilities for the current operation of 2,200 tpd. MLN is served by a 34.5 kilo volt (kV) line connected to the National Power Grid through a 115 kV line to the Ezequiel Montes Substation.

### **17.3 METALLURGICAL RESEARCH**

Current metallurgical research at MLN is focused on improving recoveries, quality of concentrates, milling and reagent use controls, granulometry control, and blending and feeding according to the different mine stopes.

For such purposes, the metallurgical laboratory has carried out the following activities.

- Mineral characterization of concentrates
- Metallurgical lab testing for the optimization of lead, copper and zinc circuits
- Research in the use of different collectors in the copper circuit
- Research in the use of different promoters in the lead, copper and zinc circuits
- Standardization and plant automation with the installation of Outotec's Courier equipment

The presence of bismuth in lead concentrates (over 2% bismuth) is the element with the highest NSR penalties. Therefore, the analysis of the source of bismuth, tracing back to the stopes and further characterization of the mineralization is recommended.

## 18.0 PROJECT INFRASTRUCTURE

### 18.1 MINE INFRASTRUCTURE

The following industrial infrastructure is currently operational.

- The Company operates a floatation process plant at a rate of 2,200 tpd with the production of lead, zinc, and copper concentrates. These facilities include crushing, milling, floatation, concentrate drying, and concentrate shipping facilities.
- MLN operates 5 tailings dams, 3 of which have been closed and reforested (Numbers 1, 2, and 3); Site Number 4, is also abandoned and is currently used for temporary mill feed stockpiles or waste material before their final disposal. Tailings of current operations of the process plant are pumped to Site Number 5 to be deposited and excess water pumped back to the process plant.
- Water for industrial purposes is obtained from the mine underground sources and recycled from the tailings dam facilities.
- Water for domestic sources at the company's compounds comes from the Maconí River.
- Electrical power is obtained from CFE's national grid from the Vizarrón sub-station through a 34 kV line to the process plant and mine facilities. Occasionally, power is delivered directly from the larger Ezequiel Montes sub-station. Two major hydroelectric plants along the Moctezuma River and one combined cycle 340 megawatt (MW) power plant at Ezequiel Montes.

The Company operates a floatation process plant with the production of lead, zinc, and copper concentrates. The facilities include crushing, milling, floatation, concentrate drying, and concentrate shipping facilities.

Figure 18.1 shows access road and the location of the main haulage adit (2000 level), process plant, stockpile and waste dumps areas, and the currently active tailings dam Number 5.



**Figure 18.1. Mine infrastructure (Google® image, 2007)**

The mine has access from the state capital city of Querétaro through a paved road to the town of Maconí. The last stretch to the plant site is managed on a well maintained year-round 4 km long, gravel road. Although it narrows to one lane locally, it can handle the introduction of all heavy equipment, like the new mill and recent expansion parts.

The following industrial infrastructure is currently operational.

## **18.2 WATER INFRASTRUCTURE**

Water for industrial purposes is obtained from underground mine sources and recycled from the tailings dam facilities. Approximately 32,000 m<sup>3</sup> of fresh water and 129,000 m<sup>3</sup> of recovered water were used in the process during the month of July 2012. Approximately 80% of the water used in the process is recovered from tailings pond Number 5. Water usage has increased significantly from the first quarter 2012 having increased the production from approximately 1,500 tpd to 2,200 tpd.

Figure 18.2 shows the distribution of water lines from tailings pond Number 5 (to the right) and from the San Nicolás pumping station to the south. Water for domestic sources at the Company's compounds comes from the Maconí River.

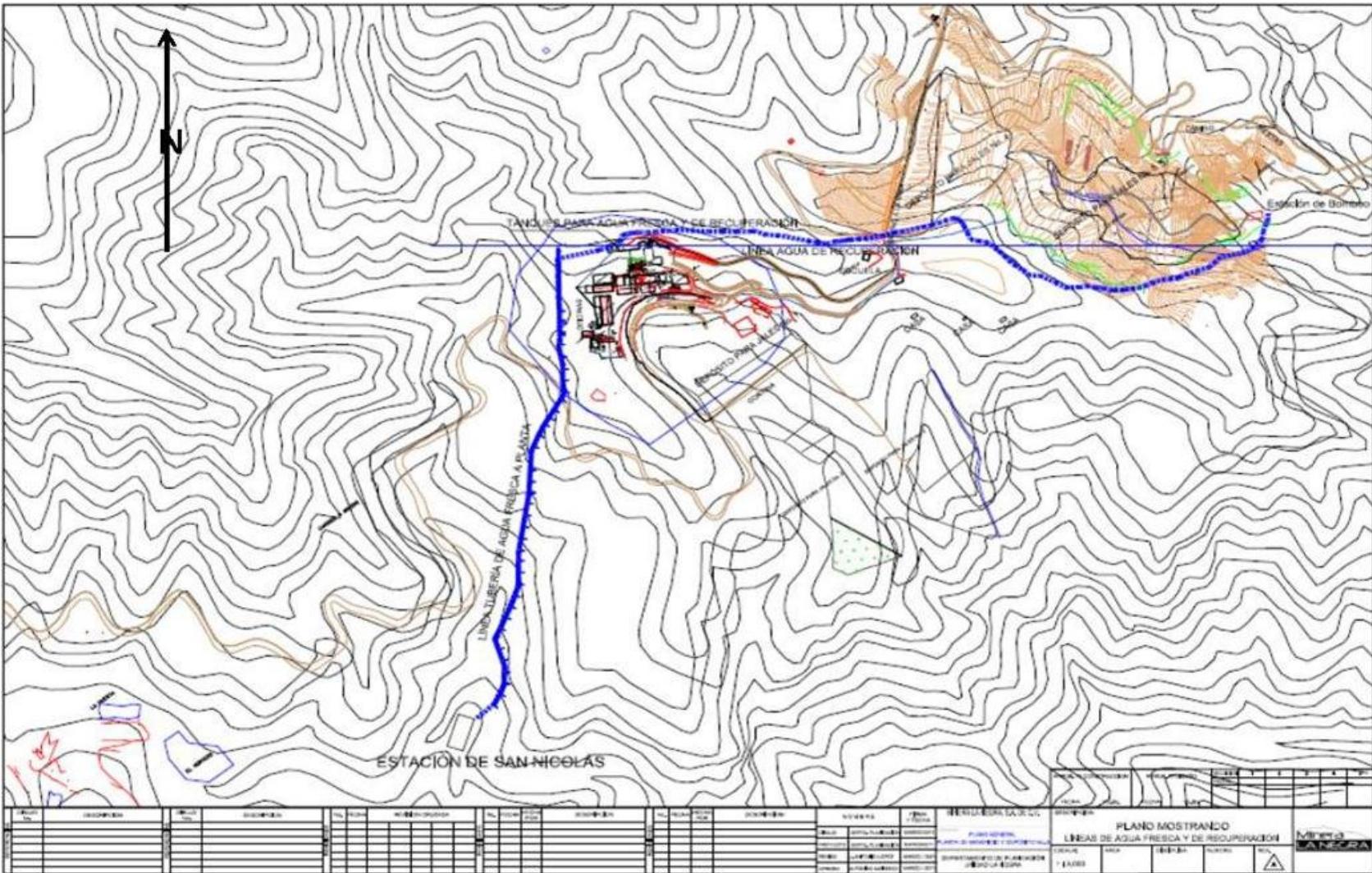


Figure 18.2. Local industrial water infrastructure (MLN, 2011)

### 18.3 TAILINGS STORAGE FACILITIES (TSF)

MLN operates 5 tailings dams, 3 of which have been closed and reforested (UNAM, 2011) (Numbers 1, 2, and 3).

- **Site No. 1** is currently used for the maintenance and scrap deposit, diesel tanks, core house, and temporary storage for hazardous wastes.
- **Site No. 3** is currently used as emergency pond for possible spills and is provided with a pumping system to recover any water leakages and re-pump to the process plant.
- **Site No. 4**, located above the process plant level, is also abandoned and is currently used for temporary mill feed stockpiles or waste material before their final disposal. Part of the area is being adapted to build a sports unit that will include a soccer football stadium that will be given to the community.
- Tailings of current operations of the process plant are pumped to **Site No. 5** to be deposited and excess water pumped back to the process plant.

TSF No. 5 is being constructed with the “upstream” method, as shown in Figure 18.3. In this method, cycloned coarse sand is deposited in the curtain of the dam and fine material is settled in the upper part where clarified water forms a pond and water is pumped back to the plant. The construction and operation of these facilities follows current regulations for the construction and operation of tailings dams (NOM-141-SEMARNAT-2003).

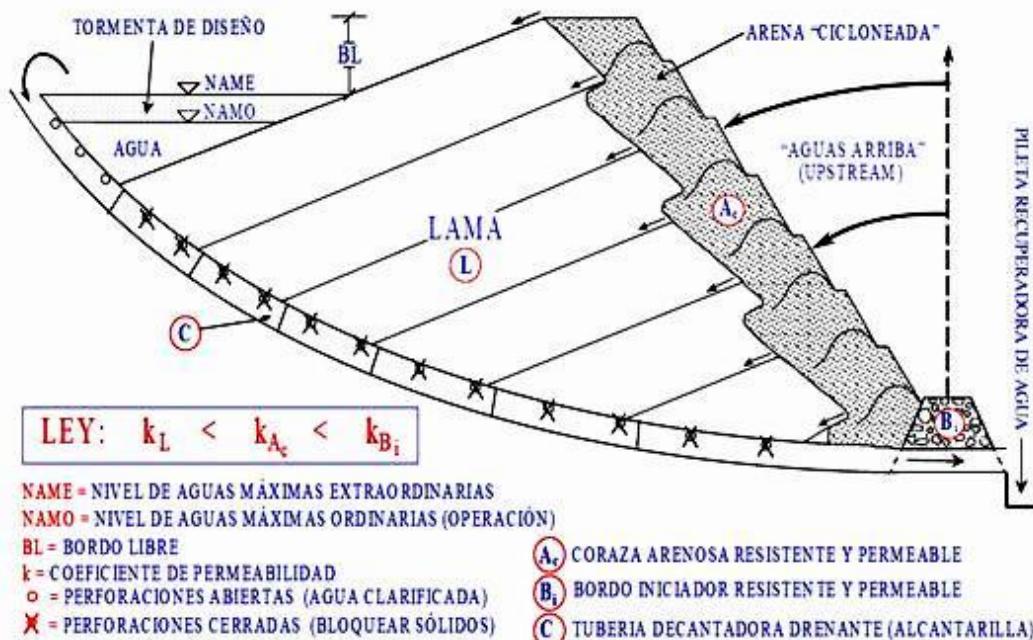


Figure 18.3. TSF construction method  
 (MLN, 2011)

MLN has carried out stability analyses of tailings dam Number 5 through the National University and specialized local consultants.

It is estimated that tailings pond Number 5 will have a final capacity in the order of 1.8 million m<sup>3</sup> through a 6-year life to the year 2018.

#### **18.4 POWER INFRASTRUCTURE**

The Maconí-San Joaquín Region is served by a 34.5 kV line departing from CFE's Vizarrón sub-station, which in turn is connected to the National Power Grid through a 115 kV line to the Ezequiel Montes sub-station to the 610 MW combined cycle power plant at El Sáuz and to the 292 MW Zimapán hydroelectric plant along the Moctezuma River. Electrical power is transformed at the Company's sub-station to 6.9 kV to be distributed to the process plant and mine facilities at 440 voltage.

#### **18.5 LOCAL AND PUBLIC INFRASTRUCTURE**

- San Joaquín is the largest town close to Maconí, at 21 km with better than elementary services. Local schooling is provided at Maconí through primary basic level while San Joaquín provides secondary and high school equivalent levels. For technical and higher level education, local people have to attend schools at Cadereyta, Ezequiel Montes, or Querétaro, State Capital.
- Health services are provided locally by a first-level health center (SSA/IMSS); for higher-level services, local people have to be transferred to a Regional Health center and hospital or a local center to Cadereyta.
- Other local municipal services include water and telephone.
- Public transportation is limited to private bus service from San Joaquín (21 km from Maconí) to Querétaro and other localities. Transportation to San Joaquín has to be privately arranged.
- With a long mining history including that of the neighboring San Joaquín, El Doctor, Vizarrón, and Zimapán Districts, the La Negra region is well endowed of mining workers and technicians, including miners, electricians, mechanics, computer skilled technicians, etc.
- Higher-level professionals are commonly hired in Querétaro, México City and other places in México.

## **19.0 MARKET STUDIES AND CONTRACTS**

La Negra produces 3 separate concentrates from their milling operations: a copper concentrate, a zinc concentrate, and a lead concentrate. La Negra has signed a purchase contract with Trafigura Beheer B.V. (Trafigura) whereby Trafigura agreed to purchase 100%, evenly spread from January to December, of copper and zinc concentrate to be produced during the years 2007, 2008, and 2009 and they have extended the contract until the end of 2013. On March 2011, La Negra signed a purchase contract with Glencore, whereby Glencore's Mexican subsidiary (Metagri), agreed to purchase 100% of lead concentrate to be produced until the end of 2013. Prices in the agreements are based on the published prices in the Metal Bulletin in London in U.S. dollars of the following month when shipment is made.

## 20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

### 20.1 ENVIRONMENTAL STATUS AND ACTIVITIES

Environmental activities and permitting are carried out at La Negra in order to comply with existing regulations with particular emphasis in the areas of TFS operations and management and handling of hazardous materials including mitigation of environmental impacts and risks and monitoring of sources of pollution (atmosphere, soil, sub-soil, and water) as well as training of local personnel in order to comply with existing regulations and requirements from the environmental authorities.

Current active programs are:

- Reforestation Program
  - MLN operates 5 tailings dams, 3 of which have been closed and reforested (Nos. 1, 2, and 3).
  - **Flora and Fauna Studies:** Among these activities, a study of endemic vegetation in the mine area was carried out in order to be used in the Reclamation Program of the Tailings Dam No. 5, as required by the authorities (UNAM, 2011).
  - Installation and operation of bio-enzyme septic tanks to treat sewage and dispose of treated waters conforming to NOM-003-SEMARNAT-2003.
- Tailings Dams (Figure 20.1)
  - MLN operates 5 tailings dams, 3 of which have been closed and reforested (Nos. 1, 2, and 3).
  - **Site No.1** is currently used for the maintenance and scrap deposit, diesel tanks, core house, and temporary storage for hazardous wastes.
  - **Site No. 3** is currently used as emergency pond for possible spills and is provided with a pumping system to recover any water leakages and re-pump to the process plant.
  - **Site No. 4**, located above the process plant level, is also abandoned and is currently used for temporary mill feed stockpiles or waste material before their final disposal. Part of the area is being adapted to build a sports unit that will include a soccer football stadium that will be given to the community.
  - Tailings of current operations of the process plant are pumped to **Site No. 5** to be deposited and excess water pumped back to the process plant.

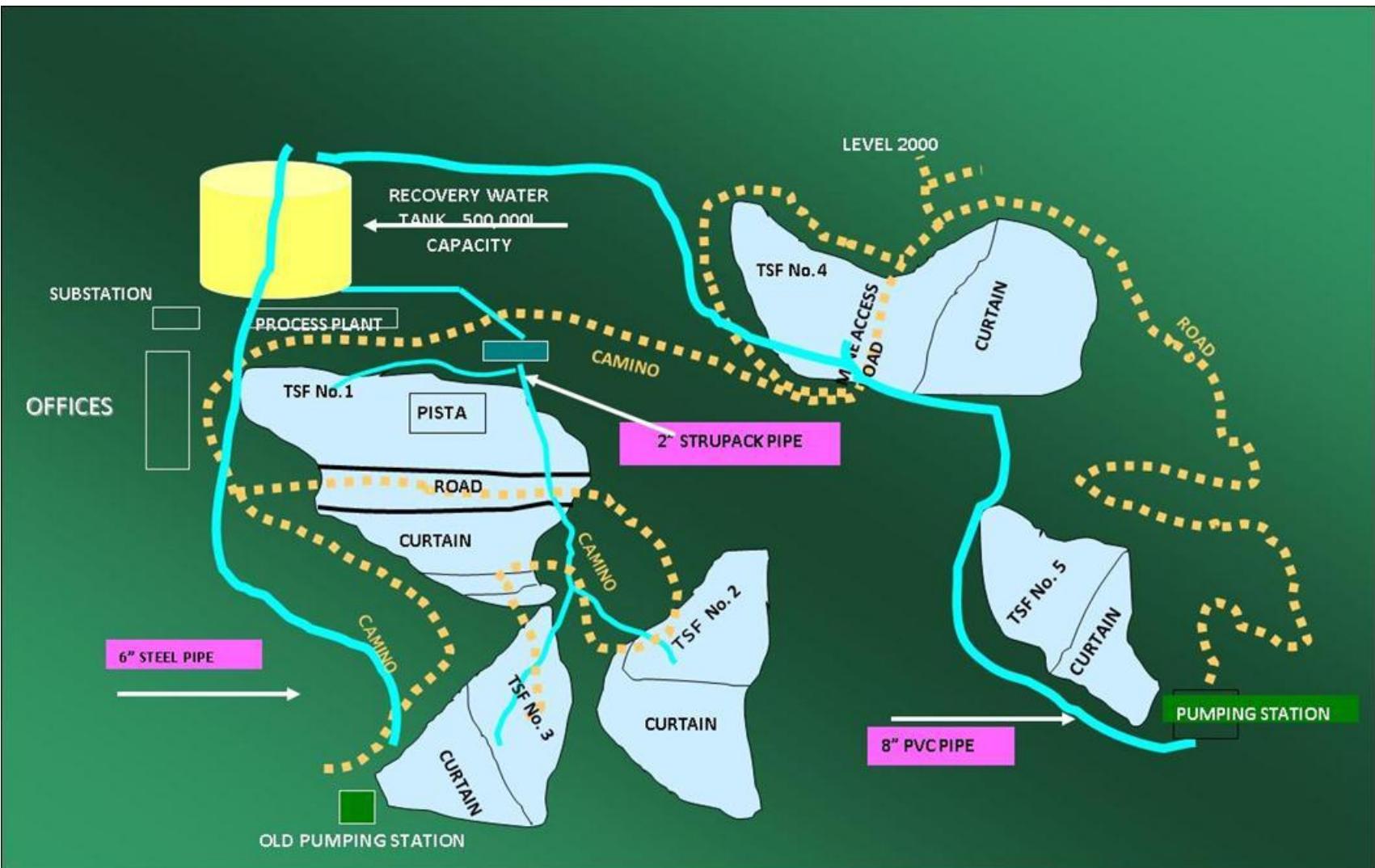


Figure 20.1. TSF infrastructure including re-forestation piping system  
(MLN, 2011)

- Hazardous wastes are separated, collected and stored in temporary storage facilities before final disposal, following specifications of Norma Oficial Mexicana NOM-052-SEMARNAT-2005.
- Municipal solid waste separation program
- Recycling of non-hazardous residual materials (paper, plastic cardboard, metal, glass, and other recyclables)
- Collection and handling of ink and toner cartridges
- Monitoring
  - Tailings
    - Acid drainage in solids of TFS No. 5 (Non PGA)
  - Water quality monitoring:
    - **Los Alamos Water Spring.** Water monitoring analyses every six months
    - Mine Waters
    - **Tailings Dam No. 5.** Water monitoring analyses of water recovered every six months according to NOM regulations
  - Air
    - Air emissions to the atmosphere are monitored from fixed and perimetral sources according to NORMA OFICIAL MÉXICANA NOM-034-SEMARNAT-1993

## 20.2 ENVIRONMENTAL PERMITTING

Minera La Negra, S.A. de C.V. is in compliance with required environmental and other related permits as shown in the summary table with the status of all relevant environmental permits (Table 20.1).

**TABLE 20.1**  
**SUMMARY TABLE SHOWING THE STATUS OF ALL RELEVANT ENVIRONMENTAL PERMITS**  
**(REFERENCE: MLN, 2012)**

License/Permit	Status	Government Agency
LF (Licencia de Funcionamiento)	<b>VALID</b> License Number 0168	Semarnat, Profepa
Environmental Register Number	NR; MNEMK2200411	Semarnat, Profepa
COA (Cédula de operación anual)	<b>VALID</b> Número de Bitácora de Registro;22/CO-0237/04/12 Fecha de recepción; 27 de abril de 2012.	Semarnat, Profepa
Environmental Impact Statement (Tailings Dam No. 5)	<b>VALID</b> Permit D.O.O.DGOEIA.-04853 dated Oct. 2, 1996. Permit to maintain and continue operation of Tailings Dam No. 5 as required by S.G.P.A./DGIRA.DDT.0606.06 of March 31, 2006	Semarnat, Profepa
Registration as Hazardous Waste Producer Company	<b>VALID</b> Oficio SMA/1241 Registro N. 2200423200014596 Hazardous Wastes Producer Registration. In compliance, obtained by Minera Capela, S.A. de C.V. (Unidad La Negra), September 29 1998	Semarnat, Profepa, Stps, SSC, Municipal Authorities, SDS
Land Rezoning (Cambio de Uso de Suelo)	<b>VALID</b> Oficio SRN./280/98 A CUS ( <i>Cambio de Uso de Suelo</i> ) permit was granted by SEMARNAP (June 8, 1998) to <i>Unidad Minera La Negra</i> for surface exploration activities in the properties of the Maconí Community, temporarily in the possession of MLN.	Semarnat, Profepa, SDS, STPS, SS Ayuntamiento
Water Concession Title	<b>VALID</b> Concesión Title Number; 09QRO100564/26FDDL11 Valid for 8 years as of July 26 2012 MLN received approval for the extension of its Surface Water Concession permit granted July 26, 2004 for 622,080 m <sup>3</sup> / year and valid until Jul 25, 2020.	Semarnat, Conagua
Discharge Waste Waters Permit	<b>VALID</b> Document No. BBOO.E.56.1.-No 02604 Dated Sep. 12, 2011	Semarnat, Conagua
Explosives Permits	<b>VALID</b> In compliance	Sedena

**TABLE 20.1**  
**SUMMARY TABLE SHOWING THE STATUS OF ALL RELEVANT ENVIRONMENTAL PERMITS**  
**(REFERENCE: MLN, 2012)**

License/Permit	Status	Government Agency
Residual Waters Sampling Analyses	<b>VALID</b> According to <b>NOM-001-SEMARNAT/96.</b>	Semarnat, Conagua
Drinking Water Analyses	<b>VALID</b> According to <b>NOM-127-SSAI-1994.</b>	Semarnat, Conagua SSA
Dry and Wet Tailings Analyses	<b>VALID</b> According to <b>NOM-052-SEMARNAT-2005,</b> <b>NOM-141-SEMARNAT-2003</b>	Semarnat, Profepa Conagua

According to current environmental legislation in México, closure and reclamation plans have to be filed in Semarnat before the projected closure of operations. These documents have to include a Closure Plan and Program, Reclamation Plan and Program, Post Closure Plan and Program with an estimate of costs. A Reclamation Bond may be requested by the authorities.

MLN has informed the authors that the La Negra operation are normal and comply with all required permits, and copies of corresponding documents are kept in the MLN files and available in case they are required.

Based on the information shown and provided by MLN to the authors, and considering that operations are continuous and normal, there is no reason to believe that major risks and/or possible disruptions on the production at La Negra, derived of permitting failures, may occur. A close follow-up of all permits and on-going environmental monitoring is required to prevent any negative impacts on the operation.

### **20.3 SOCIAL AND COMMUNITY IMPACT AND ACTIVITIES**

The resumption of mining activities by Aurcana in 2006 has resulted in a positive impact to the community with the reactivation of economic activities in Maconí and the region. This impact extends to Maconí's 22 municipal delegations with the creation of 360 direct jobs and more than 1,400 indirect jobs.

MLN's current approach is that of a "Sustainable Development" with the purpose of "satisfying the needs of current generations without compromising the possibilities of future generations to fulfill their needs."

MLN has contributed to the development of local infrastructure and activities of social benefit. Some of the most relevant programs carried out by MLN in the region are:

- Paving of the 14 km access road from the San Joaquín junction to Maconí.
- Installation of a new water pipe system to the La Blanca, El Huizache, and Cerro Colorado communities.
- Support to the electrical power services by CFE to the El Mortero and adjacent communities.
- Support to the community to obtain the services from State and Federal organizations, such as CFE, STPS, IMSS, and SEDESOL.
- Rehabilitation of IMSS Clinic No. 66 at Maconí.
- Maintenance and support of the local church.
- Maintenance of the local auditorium.
- Maintenance and support of the local primary school.
- Support to the paving of the access road to La Blanca.

Based on this information and the site visits made to the area by one of the authors, the author believes that major risks and/or possible disruptions on the production at La Negra because of social problems are not likely to occur.

## 21.0 OPERATING AND CAPITAL COSTS

### 21.1 OPERATING COSTS

The cash operating cost summary at the La Negra operation for the years 2011 and 2012 are detailed in Table 21.1. The unit costs are:

TABLE 21.1 LA NEGRA MINE OPERATING COST SUMMARY		
Item	Year	
	2011 (\$/t)	2012 (\$/t)
Mining Operating Expenses	34.76	25.45
Profit Sharing	1.31	0.96
Mine and Mill Supplies	15.26	11.17
Power	3.20	2.34
Salaries and Benefits	17.61	12.89
<b>Subtotal</b>	<b>36.08</b>	<b>26.41</b>
Royalties	3.29	2.41
Freight and Delivery	1.91	1.40
<b>Total</b>	<b>41.28</b>	<b>30.21</b>

### 21.2 SUSTAINING CAPITAL

MNL reports that they will be spending approximately \$8 million per year for sustaining capital at the La Negra Mine project.

## **22.0 ECONOMIC ANALYSIS**

An economic analysis has not been provided, as the La Negra mine is currently in production.

## **23.0 ADJACENT PROPERTIES**

Known precious and base metals mineralization occurrences, associated to manto, chimney, and irregular skarn deposits in the LMaconí-La Negra District are included within the La Negra Group of claims. Other occurrences in the region, with similar mineral and geological environment, are located at the Pinal de Amoles and Zimapán Districts, located at 35 km to the North and 9.0 km to the southeast. Considering the distance from La Negra, both districts were not considered adjacent properties for the purpose of this report.

## **24.0 OTHER RELEVANT DATA AND INFORMATION**

No other relevant data or information was considered.

## 25.0 INTERPRETATION AND CONCLUSIONS

La Negra is a mining operation that has been in production for most of the last 40 years. The mine has produced almost 9.0 Mt of silver, lead, copper, and zinc mineralized material from a series of skarn deposits in a number of manto, chimney vein, and breccia deposits.

More than 20 different deposits have been discovered at La Negra and some of them coalesce to form individual bodies. Mantoes and chimneys have comprised the bulk of silver, lead, zinc, and copper mineralization. The authors suggest that the exploration potential at MLN is good. Exploration at La Negra, as carried out by Peñoles and currently by Aurcana, has replaced and increased resources and reserves.

Resource estimates on 13 of the deposits are presented in this technical report that result in substantially higher resource than previously available. Previous resource estimates covered fewer of the deposits and were limited in depth. The current understanding of the extent of the deposits includes extensions of the areas to depths where drilling shows vertical continuity and mineralization.

La Negra shows important mineralization potential at depth and additional exploration is required for further development of resources and reserves. The expansion of resources and reserves in this type of deposit requires continuing direct exploration by underground core drilling and channel sampling in cross cuts, drifts, and development workings.

MLN follows Industry Standards for exploration, drilling, sampling, assaying, and QA/QC procedures that produce reliable information for the estimate of Mineral Resources.

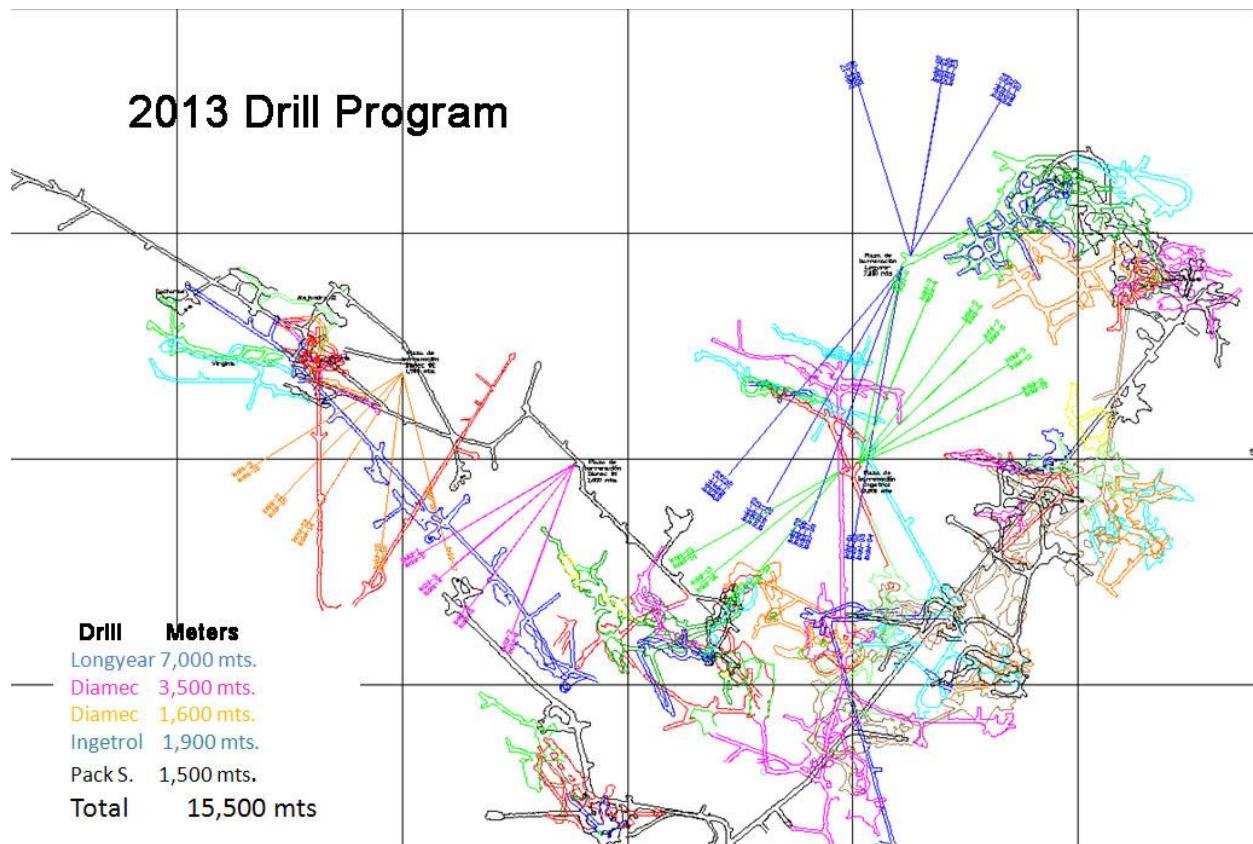
## 26.0 RECOMMENDATIONS

The following recommendations are made and are of minimal cost to the Company.

- Increase accuracy in the location and mapping of samples, sample collection, sample numbering and sample control format to eliminate duplicate sample numbers.
- When channel samples are collected, include geological information in the database.
- Take special care when drilling broken contacts and mineralized zones. Additional training for the drillers may be necessary to achieve higher core recoveries.
- Obtain blanks from specialized labs and in the meantime acquire high purity silica sand to use as a blank.
- Purchase standard samples from a specialized lab, and have the standards prepared with La Negra material at different head grades.
- Transfer analyses stored in the AA equipment directly to the assay database to avoid time-consuming digitizing and potential human errors.
- Continue current metallurgical research. The presence of bismuth in lead concentrates (over 2% bismuth) is the element with the highest NSR penalties. Therefore, the analysis of the source of bismuth, tracing back to the stopes and further characterization of the mineralization is recommended.
- Refine definition of the mineralized zones as needed when additional information is collected.
- Provide Surpac training to employees related to resource and reserve estimation, and mine planning and scheduling.
- Complete additional mine planning and Mineral Reserves estimates so that MLN has 2 years to 3 years of defined Mineral Reserves in advance of production.

### 26.1 2013 RECOMMENDED EXPLORATION PROGRAM

In addition to the recommendations in the proceeding section, the authors would recommend an aggressive underground exploration program to assist with mining planning and the expansion of the resources and reserves. The 2013 underground exploration program should consist of approximately 15,500 meters of drilling, as shown in Figure 26.1, and with an estimated budget shown in Table 26.1.



**Figure 26.1. 2013 drill program**

**TABLE 26.1  
2013 UNDERGROUND EXPLORATION BUDGET  
(15,500 METER DRILLING)**

Item	MX\$	US\$
Wages	7,438,000	611,678
Office Supplies and Materials	732,000	60,197
Drilling Supplies	5,295,000	435,444
Maintenance	2,104,000	173,026
Capital Expenditures	1,800,000	148,026
<b>Total</b>	<b>17,369,000</b>	<b>1,428,372</b>

Currency Conversion – US\$1 = MX\$12.16  
Expenses are primarily incurred in Mexican pesos and the US dollar equivalent value will be subject to the prevailing exchange rates.

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#### DATE AND SIGNATURE PAGE

The undersigned prepared this Technical Report, titled “Technical Report on the La Negra Mine Project, Querétaro, México,” dated October 4, 2012 and amended May 31, 2013.

The format and content of the Technical Report conform to Form 43-101F1 of National Instrument (NI) 43-101 of the Canadian Securities Administrators.

Dated this 31<sup>st</sup> day of May 2013.

“Signed and sealed”



Baltazar Solano-Rico, Geol. Eng., M.Sc., MMSA 01411QP

  
Betty Gibbs

Betty Gibbs, E.M., M.Sc., MMSA 01164QP



Robert E Cameron, Ph.D., MMSA 01357QP

## CERTIFICATE OF AUTHOR

I, Baltazar Solano-Rico, M.Sc., Geol. Eng., do hereby certify that:

- 1) I am currently a Senior Associate of Behre Dolbear and Company, Inc., with business office at: Paseo de los Robles 4092, Fracc. San Wenceslao Zapopan, Jalisco, C.P. 45110, México.
- 2) I am a Geological Engineer registered at the Professions Directorship of the Public Education Ministry in México, holder of a Registry Certificate number 181191.
- 3) I am a graduate of the National University of México with a degree of Geological Engineer (1970) and of the University of Arizona, with a Master of Science degree in Geological Engineering (Exploration of Mineral Deposits), 1975.
- 4) I am an active member of the MMSA Mining and Metallurgical Society of America with QP membership in Geology, Ore Reserves and Environmental Number MMSA 01411QP. I am an active member of the AIMMGM and CIMMGM (Mining, Metallurgical and Geological Professional Association and College of México).
- 5) I have read the definition of “qualified person” set out in National Instrument 43-101 and certify that by reason of my education, affiliation with a professional association as defined in N.I. 43-101 and past relevant work experience, I fulfill the requirements to be and am the “qualified person” for the purposes of NI 43-101 and this report in its entirety.
- 6) I have practiced my profession continuously since graduation and have acted in a responsible manner throughout my professional career. For a period of more than 42 years, I have performed predominantly field, supervision, management, and consulting assignments with respect to exploration, evaluation, development and economic analysis of mineral deposits in México, the United States of America, Canada, and Latin America.
- 7) My experience in the geology and mineralization of the ore deposits in the particular area of interest, and other mining Districts of the State of Querétaro, is of more than 20 years, while my experience in the area of precious and base metals deposits in México is of more than 40 years. I have made site several visits to the property and spent more than 10 days on site in October 2011, February 2012, March 2012, and April 2012.
- 8) I am co-responsible for the preparation of the technical report titled “Technical Report on the La Negra Mine Project, Querétaro, México,” dated October 4, 2012, amended May 31, 2013 (the “Technical Report”).
- 9) As of the date of this report: to the best of my knowledge, information, and belief, the Report contains all scientific and technical information that is required to be disclosed to make the report not misleading.
- 10) I have had no prior involvement with the properties that are the subject of the Technical Report.
- 11) I am independent of the Aurcana Corporation applying all the tests in Section 1.5 of National Instrument 43-101.
- 12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- 13) I consent to the filing of this Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites

accessible by the public. I consent to the use of this report in a Prospectus, A Statement of Material Facts, or any other filing required by Aurcana Corporation, various securities commissions, or any other similar institutions.

Dated this 31<sup>st</sup> day of May 2013.

“Signed and sealed”



Baltazar Solano-Rico, Geol. Eng., M.Sc., MMSA 01411QP

### CERTIFICATE OF AUTHOR

I, Betty L. Gibbs, of Boulder, Colorado do hereby certify that:

- 1) I am a Senior Associate with Behre Dolbear & Company (USA), Inc. at the address 91 Camino Bosque, Boulder, Colorado, USA 80302.
- 2) I am a graduate of Colorado School of Mines with an Engineer of Mines degree in 1969, and a Master of Science degree (Mining Engineering) in 1972.
- 3) I am registered as a Qualified Person with the Mining and Metallurgical Society of America (MMSA – #01164QP). I have been a member of the Society for Mining, Metallurgy, and Exploration for 50 years, and a member of MMSA for 19 years.
- 4) I have continuously worked as a mining engineer and ore reserves specialist.
- 5) I have read the definition of “Qualified Person” as set out in National Instrument 43-101 (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 in part for preparation of Section 14.0 of this Technical Report titled “Technical Report on the La Negra Mine Project, Querétaro, México,” dated October 4, 2012, amended May 31, 2013 (the “Technical Report”).
- 7) I have had no prior involvement with the property that is the subject of the Report. I have not visited the property.
- 8) I am independent of Aurcana, as set out in Section 1.4 of National Instrument 43-101.
- 9) I have read National Instrument 43-101, and Section 14.0 has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.
- 10) As of the date of this report: to the best of my knowledge, information, and belief, my contribution to the Report contains all scientific and technical information that is required to be disclosed to make the report not misleading.
- 11) I consent to the filing of this Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public. I consent to the use of this report in a Prospectus, A Statement of Material Facts, or any other filing required by Aurcana Corporation, various securities commissions, or any other similar institutions.

Dated this 31<sup>st</sup> day of May 2013.

“Signed and sealed”

  
Betty Gibbs, E.M., M.Sc., MMSA 01164QP

### CERTIFICATE OF AUTHOR

I, Robert E Cameron, Ph.D., MMSA QP, do hereby certify that:

- 1) I am a consulting Resource and Reserve Specialist doing business as Robert Cameron Consulting at the address of 200 Dubois St, Black Hawk, Colorado, USA 80422.
- 2) I am a Qualified Person - No. 01357QP of the Mining and Metallurgical Society of America.
- 3) I am a graduate of The University of Utah with a B.S., M.S. and Ph.D. degrees in Mining Engineering.
- 4) I have practiced my profession since 1977. My relevant experience for the purpose of the Technical Report is acting as a consulting resource and reserve specialist for 30 years specializing in the due diligence review, computerized mine design, mine optimization, geostatistical review and resource and reserve audits of a wide variety of minerals.
- 5) I have read the definition of "Qualified Person" as set out in Canadian National Instrument 43-101 *Standards of Disclosure for Minerals 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 co-responsible for preparation of this Technical Report and I am responsible for sections 15.0 and 21.0 of this Technical Report titled "Technical Report on the La Negra Mine Project, Queretaro, México" dated October 4, 2012, amended May 31, 2013.
- 7) I have not personally visited to the properties that are the subject of this report.
- 8) I have had no prior involvement with the properties that are the subject of the Technical Report.
- 9) I am independent of Aurcana Corporation, as set out in Section 1.5 of NI 43-101.
- 10) I have read National Instrument 43-101 and the technical report has been prepared in compliance with NI 43-101 and Form 43-101F1.
- 11) As of the date of the certificate, to the best of my knowledge, information, and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.
- 12) I consent to the filing of this Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public.

Dated this 31<sup>st</sup> day of May 2013



Robert E Cameron, Ph.D., MMSA 01357QP

**APPENDIX 1.0**  
**LETTER CERTIFICATE OF THE**  
**MINES PUBLIC REGISTRY**



SECRETARÍA  
DE ECONOMÍA

SE

Oficio No.: 421/ 4/132/2011

México D.F., a 3 de octubre de 2011

Asunto: Se informa

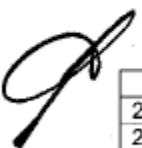
**MINERA LA NEGRA, S.A. DE C.V.**  
**A/C ING. ALFONSO CANSECO HERNANDEZ**  
**REPRESENTANTE LEGAL**  
Calle Revillagigedo 18 Fase II Torre Sur Area 5  
Col. Centro  
06050 México, D.F.

En respuesta a su solicitud para que le sea informado del estado legal de las concesiones mineras de las que es titular esa empresa, así como de las solicitudes en trámite de titulación a su nombre, me permito hacer de su conocimiento lo siguiente:

#### I. CONCESIONES MINERAS

##### I.1 Vigencia

Al 30 de septiembre de 2011, la empresa MINERA LA NEGRA, S.A. DE C.V., tiene nueve (9) concesiones mineras vigentes, mismas que se detallan a continuación:



TITULO	NOMBRE	SUPERFICIE (HAS)	TERMINO DE VIGENCIA
202546	La Negra	1,350.7856	19/12/2032
202592	La Yegua	203.3884	07/12/2045
203319	Mariana	0.6509	27/06/2046
213197	El Negro	1.1459	29/03/2051
218878	El Patriarca	110.3341	22/01/2053
227969	Diana	43.0150	19/09/2056
228598	Ligia	1.5284	11/12/2056
230352	Maconí	2,281.1233	16/08/2057
230686	Tichi	293.5316	02/10/2057
<b>TOTAL</b>		<b>4,285.5032</b>	



SECRETARÍA  
DE ECONOMÍA

### I.2 Pago de derechos

TÍTULO	NOMBRE	SUPERFICIE	AL MES DE DICIEMBRE DE 2011 (Pago adelantado)
202546	La Negra	1,350.7856	Al corriente
202592	La Yegua	203.3884	Al corriente
203319	Mariana	0.6509	Al corriente
213197	El Negro	1.1459	Al corriente
218878	El Patriarca	110.3341	Al corriente
227969	Diana	43.0150	Al corriente
228598	Ligia	1.5284	Al corriente
230352	Maconí	2,281.1233	Al corriente
230686	Tichi	293.5316	Al corriente
<b>TOTAL</b>		<b>4,285.5032</b>	

### I.3 Presentación de informes de comprobación de obras e inversiones

TÍTULO	NOMBRE	SUPERFICIE	INFORMES ANUALES HASTA 2010 (El de 2011 se presenta en mayo de 2012)
202546	La Negra	1,350.7856	Presentados
202592	La Yegua	203.3884	Presentados
203319	Mariana	0.6509	Presentados
213197	El Negro	1.1459	Presentados
218878	El Patriarca	110.3341	Presentados
227969	Diana	43.0150	Presentados
228598	Ligia	1.5284	Presentados
230352	Maconí	2,281.1233	Presentados
230686	Tichi	293.5316	Presentados
<b>TOTAL</b>		<b>4,285.5032</b>	



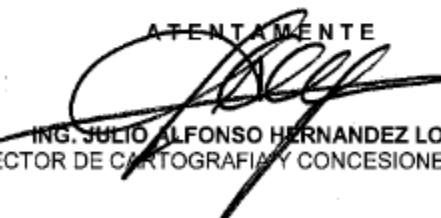
**1.4 Informe estadístico sobre la producción, beneficio y destino de minerales o sustancias concesibles.**

TITULO	NOMBRE	SUPERFICIE	INFORMES ANUALES
202546	La Negra	1,350.7856	Al corriente hasta 2010
202592	La Yegua	203.3884	Al corriente hasta 2010
203319	Mariana	0.6509	Al corriente hasta 2010
213197	El Negro	1.1459	Al corriente hasta 2010
218878	El Patriarca	110.3341	Al corriente hasta 2010
227969	Diana	43.0150	Al corriente hasta 2010
228598	Ligia	1.5284	Al corriente hasta 2010
230352	Maconí	2,281.1233	Al corriente hasta 2010
230686	Tichi	293.5316	Al corriente hasta 2010
<b>TOTAL</b>		<b>4,285.5032</b>	

**II. SOLICITUDES DE CONCESION MINERA EN TRAMITE**

EXPEDIENTE	NOMBRE	SUPERFICIE (HAS)	OBSERVACIONES
065/15723	Auricana I	14,938	Se titulará en noviembre 2011
065/15724	Auricana II	19,287	Se titulará en noviembre 2011
065/15710	El Sol	23	Se titulará en octubre de 2011
<b>TOTAL</b>		<b>34,248</b>	

Se hace de su conocimiento lo anterior para los fines legales a que haya lugar.

ATENTAMENTE  
  
ING. JULIO ALFONSO HERNANDEZ LOPEZ  
DIRECTOR DE CARTOGRAFIA Y CONCESIONES MINERAS

C.c.p.- Lic. Miguel Ángel Romero González.-Director General de Minas.-Presente.  
C.c.p.- Minutario.

**APPENDIX 2.0  
SUMMARY STATISTICS FOR THE  
DEPOSITS – ALL METALS**

TABLE A2.1 ALACRÁN ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	879	2,350	46.06	7,075.34	84.12	1.83
	Channels	977	3,907	59.09	5,234.06	72.35	1.22
	All Assays	977	6,257	54.19	5,964.45	77.23	1.43
Copper (%)	Drill Holes	7.61	2,216	0.37	0.40	0.63	1.69
	Channels	9.73	3,851	0.60	0.65	0.81	1.35
	All Assays	9.73	6,067	0.52	0.57	0.75	1.46
Lead (%)	Drill Holes	22.00	2,048	0.32	1.33	1.15	3.56
	Channels	4.48	3,800	0.18	0.08	0.29	1.59
	All Assays	22.00	5,848	0.23	0.53	0.72	3.14
Zinc (%)	Drill Holes	15.83	2,324	1.03	2.97	1.72	1.68
	Channels	16.82	3,897	0.98	2.18	1.48	1.51
	All Assays	16.82	6,221	1.00	2.48	1.57	1.58
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

TABLE A2.2 BICENTENARIO ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	870	1,005	43.34	4,940.08	70.29	1.62
	Channels	2,434	359	69.25	21,438.47	146.42	2.11
	All Assays	2,434	1,364	50.16	9,400.16	96.95	1.93
Copper (%)	Drill Holes	8.04	952	0.29	0.23	0.48	1.69
	Channels	7.09	344	0.48	0.47	0.69	1.44
	All Assays	8.04	1,296	0.34	0.30	0.55	1.63
Lead (%)	Drill Holes	7.58	934	0.21	0.22	0.47	2.30
	Channels	10.63	329	0.26	0.54	0.73	2.78
	All Assays	10.63	1,263	0.22	0.30	0.55	2.50
Zinc (%)	Drill Holes	9.53	987	0.63	1.15	1.07	1.69
	Channels	13.75	355	0.93	2.98	1.73	1.85
	All Assays	13.75	1,342	0.71	1.65	1.29	1.80
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

TABLE A2.3 BRECHA ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	977	2,661	68.96	13,229.73	115.02	1.67
	Channels	5,124	2,397	100.14	34,424.09	185.54	1.85
	All Assays	5,124	5,058	83.73	23,511.39	153.33	1.83
Copper (%)	Drill Holes	9.00	2,538	0.51	0.78	0.88	1.73
	Channels	11.03	2,437	0.78	0.90	0.95	1.22
	All Assays	11.03	4,975	0.64	0.86	0.92	1.44
Lead (%)	Drill Holes	17.50	2,536	0.48	1.76	1.33	2.76
	Channels	40.74	2,341	0.49	1.95	1.39	2.86
	All Assays	40.74	4,877	0.48	1.85	1.36	2.81
Zinc (%)	Drill Holes	40.73	2,648	1.49	6.70	2.59	1.74
	Channels	17.13	2,370	1.20	3.61	1.90	1.59
	All Assays	40.73	5,018	1.35	5.26	2.29	1.70
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

TABLE A2.4 COBRIZA\LA CRUZ COMBINED AREAS ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	680	1,767	31.91	3,089.71	55.59	1.74
	Channels	782	1,597	40.06	3,156.60	56.18	1.40
	All Assays	782	3,364	35.78	3,137.14	56.01	1.57
Copper (%)	Drill Holes	5.47	1,577	0.36	0.33	0.57	1.59
	Channels	15.82	1,518	0.39	0.45	0.67	1.72
	All Assays	15.82	3,095	0.37	0.39	0.62	1.66
Lead (%)	Drill Holes	13.17	1,107	0.16	0.25	0.50	3.10
	Channels	2.31	1,226	0.17	0.06	0.25	1.51
	All Assays	13.17	2,333	0.17	0.15	0.39	2.38
Zinc (%)	Drill Holes	11.33	1,623	0.30	0.86	0.93	3.09
	Channels	9.81	1,440	0.42	0.79	0.89	2.11
	All Assays	11.33	3,063	0.36	0.83	0.91	2.55
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

TABLE A2.5 DIFICULTAD ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	477	268	50.41	4,636.33	68.09	1.35
	Channels	606	293	49.93	3,189.62	56.48	1.13
	All Assays	367	181	79.88	4,272.14	65.36	0.82
Copper (%)	Drill Holes	606	742	57.41	4,128.38	64.25	1.12
	Channels	7.47	247	0.26	0.45	0.67	2.54
	All Assays	3.47	287	0.62	0.38	0.61	0.99
Lead (%)	Drill Holes	12.93	180	1.01	1.54	1.24	1.23
	Channels	12.93	714	0.60	0.78	0.88	1.48
	All Assays	3.43	266	0.26	0.14	0.38	1.45
Zinc (%)	Drill Holes	5.36	275	0.12	0.12	0.34	2.97
	Channels	2.98	181	0.20	0.10	0.31	1.57
	All Assays	5.36	722	0.19	0.13	0.35	1.87

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

TABLE A2.6 MARAVILLAS ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	738	186	144.96	32,469.46	180.19	1.24
	Channels	2,132	1,492	118.27	25,143.05	158.57	1.34
	All Assays	2,132	1,678	121.23	26,006.51	161.27	1.33
Copper (%)	Drill Holes	1.89	179	0.34	0.16	0.40	1.17
	Channels	13.04	1,454	0.71	0.89	0.94	1.33
	All Assays	13.04	1,633	0.67	0.82	0.91	1.36
Lead (%)	Drill Holes	13.22	185	1.20	4.89	2.21	1.85
	Channels	19.60	1,457	0.60	1.37	1.17	1.95
	All Assays	19.60	1,642	0.67	1.80	1.34	2.01
Zinc (%)	Drill Holes	19.81	186	3.11	14.32	3.78	1.22
	Channels	22.93	1,496	3.60	11.47	3.39	0.94
	All Assays	22.93	1,682	3.55	11.80	3.43	0.97

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

**TABLE A2.7**  
**MONICA ASSAY STATISTICS**

Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	930	2,503	71.01	11,276.78	106.19	1.50
	Channels	3,347	4,391	113.88	19,120.67	138.28	1.21
	All Assays	3,347	6,894	98.31	16,695.67	129.21	1.31
Copper (%)	Drill Holes	8.62	2,358	0.28	0.25	0.50	1.77
	Channels	6.36	4,266	0.37	0.21	0.45	1.22
	All Assays	8.62	6,624	0.34	0.22	0.47	1.39
Lead (%)	Drill Holes	10.12	2,409	0.42	0.67	0.82	1.93
	Channels	8.41	4,359	0.67	0.72	0.85	1.26
	All Assays	10.12	6,768	0.58	0.71	0.85	1.45
Zinc (%)	Drill Holes	20.73	2,488	0.80	1.74	1.32	1.64
	Channels	21.79	4,347	1.05	3.04	1.74	1.66
	All Assays	21.79	6,835	0.96	2.58	1.61	1.68

**Note:**

The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

**TABLE A2.8**  
**NEGRA ASSAY STATISTICS**

Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	1,528	1,589	79.20	20,755.50	144.07	1.82
	Channels	1,183	993	70.06	11,937.66	109.26	1.56
	All Assays	2,592	2,329	185.21	72,540.94	269.33	1.45
Copper (%)	Drill Holes	2,592	4,911	127.62	46,520.99	215.69	1.69
	Channels	68.00	1,555	0.38	6.44	2.54	6.65
	All Assays	4.68	1,009	0.43	0.29	0.53	1.24
Lead (%)	Drill Holes	28.00	2,332	0.43	1.15	1.07	2.50
	Channels	68.00	4,896	0.41	2.65	1.63	3.93
	All Assays	10.38	1,548	0.53	1.31	1.15	2.15
Zinc (%)	Drill Holes	8.97	975	0.30	0.47	0.69	2.27
	Channels	16.92	2334	1.36	4.60	2.15	1.58
	All Assays	16.92	4857	0.88	2.94	1.71	1.94

**Note:**

The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

TABLE A2.9 NTRA. SRA. ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	640	140	64.59	11,457.99	107.04	1.66
	Channels	399	60	46.57	4,319.44	65.72	1.41
	All Assays	640	200	59.18	9,352.48	96.71	1.63
Copper (%)	Drill Holes	3.12	133	0.20	0.15	0.39	1.91
	Channels	1.10	56	0.24	0.06	0.25	1.02
	All Assays	3.12	189	0.21	0.12	0.35	1.64
Lead (%)	Drill Holes	4.81	140	0.41	0.51	0.72	1.73
	Channels	1.53	48	0.23	0.09	0.30	1.32
	All Assays	4.81	188	0.37	0.41	0.64	1.75
Zinc (%)	Drill Holes	12.08	139	0.40	1.30	1.14	2.86
	Channels	1.72	57	0.17	0.09	0.31	1.80
	All Assays	12.08	196	0.33	0.96	0.98	2.95

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

TABLE A2.10 SAN PEDRO ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	1,526	295	74.07	23,688.12	153.91	2.08
	Channels	450	193	49.26	2,969.32	54.49	1.11
	All Assays	1,526	488	64.26	15,618.61	124.97	1.95
Copper (%)	Drill Holes	2.34	293	0.27	0.16	0.40	1.53
	Channels	2.21	185	0.51	0.20	0.45	0.88
	All Assays	2.34	478	0.36	0.19	0.44	1.22
Lead (%)	Drill Holes	10.35	300	0.46	1.32	1.15	2.48
	Channels	3.13	176	0.19	0.20	0.44	2.35
	All Assays	10.35	476	0.36	0.92	0.96	2.66
Zinc (%)	Drill Holes	12.37	300	1.63	5.19	2.28	1.40
	Channels	11.20	192	2.31	5.23	2.29	0.99
	All Assays	12.37	492	1.89	5.30	2.30	1.22

**Note:**  
 The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.

TABLE A2.11 TRINIDAD ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	858	1,537	50.57	9,371.02	96.80	1.91
	Channels	960	1,324	90.00	13,312.69	115.38	1.28
	All Assays	960	2,861	68.82	11,577.79	107.60	1.56
Copper (%)	Drill Holes	6.92	1,496	0.44	0.58	0.76	1.75
	Channels	5.77	1,345	0.74	0.52	0.72	0.97
	All Assays	6.92	2,841	0.58	0.58	0.76	1.30
Lead (%)	Drill Holes	16.37	1,245	0.35	1.50	1.22	3.53
	Channels	28.77	1,163	0.36	1.07	1.04	2.91
	All Assays	28.77	2,408	0.35	1.29	1.14	3.24
Zinc (%)	Drill Holes	15.67	1,512	1.47	4.98	2.23	1.51
	Channels	18.14	1,345	1.90	4.85	2.20	1.16
	All Assays	18.14	2,857	1.67	4.96	2.23	1.33
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

TABLE A2.12 VIRGINIA-BLANCA ASSAY STATISTICS							
Metal	Sample Type	Maximum	Number of Points	Mean	Variance	Std. Dev.	Coeff. of Variation
Silver (g/t)	Drill Holes	960	1,597	81.84	16,489.10	128.41	1.57
	Channels	771	529	106.86	14,840.45	121.82	1.14
	All Assays	960	2,126	88.07	16,188.74	127.23	1.45
Copper (%)	Drill Holes	6.28	1,535	0.25	0.21	0.46	1.80
	Channels	6.11	496	0.49	0.24	0.49	0.99
	All Assays	6.28	2031	0.31	0.23	0.48	1.52
Lead (%)	Drill Holes	15.60	1597	0.76	2.33	1.53	2.00
	Channels	4.18	524	0.52	0.38	0.61	1.19
	All Assays	15.60	2121	0.70	1.86	1.36	1.94
Zinc (%)	Drill Holes	16.12	1604	1.88	5.63	2.37	1.26
	Channels	17.91	524	3.69	9.51	3.08	0.84
	All Assays	17.91	2128	2.33	7.19	2.68	1.15
<b>Note:</b> The averages include all assays above 1 g/t for silver and 0.1% for the copper, lead, and zinc.							

**APPENDIX 3.0  
ASSAY CERTIFICATE  
(UNDER SEPARATE COVER)**