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# Technical Report and Preliminary Economic Assessment

## Nuestra Señora, San Rafael, and El Cajón Deposits

## Sinaloa, Mexico

*Prepared for*

**SCORPIO MINING CORPORATION**

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Thomas L. Dyer, P.E.
Steven Ristorcelli, C. P. G.
Paul Tietz, C. P. G.
Michael S. Lindholm, C. P. G.
Pierre Lacombe, Eng.
Jack McPartland, Q.P.M.

775-856-5700

210 South Rock Blvd.
Reno, Nevada 89502
FAX: 775-856-6053

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775-856-5700

210 South Rock Blvd.
Reno, Nevada 89502
FAX: 775-856-6053

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***Cover Photo: Entrance to the Nuestra Señora Plant Site***

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# 1.0 SUMMARY

## 1.1 Introduction

Mine Development Associates ("MDA") has prepared this Technical Report on the Nuestra Señora, San Rafael, and El Cajón silver-copper-gold-lead-zinc deposits in the Cosalá mining district, Sinaloa, Mexico at the request of Scorpio Mining Corporation ("Scorpio"). The purpose of this report is to provide a technical summary in support of updated mineral resource estimates for the San Rafael and El Cajón deposits, a new mineral reserve calculation for the Nuestra Señora deposit, and a Preliminary Economic Assessment ("PEA") for all three deposits. Note that a PEA is preliminary in nature and includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied that would enable them to be classified as mineral reserves; there is no certainty that the preliminary economic assessment will be realized. The resource estimate for Nuestra Señora was reported in a 2012 Technical Report by MDA and has not been updated for this report; MDA has reviewed the results of 66 holes drilled since completion of that resource estimate and has concluded that while this drilling did extend narrow, high-grade silver zones and substantially supported the 2012 resource estimate at Nuestra Señora, the new drilling did not expand the resource in any material way. This report and associated resource and reserve estimates have been prepared in compliance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's ("CIM") Mineral Resource and Reserves definition standards.

The effective date of the Nuestra Señora database on which the resource was previously estimated is February 20, 2012. The effective date of the previously reported Nuestra Señora resource estimate is June 22, 2012. The effective date of both the San Rafael and El Cajón databases on which the resources described in this Technical Report are estimated is July 20, 2012. The effective date of both the El Cajón and San Rafael resource estimates is September 7, 2012. The effective date of the new Nuestra Señora reserve and the PEA is December 31, 2012. The effective date of this report is December 31, 2012.

## 1.2 Location and Ownership

The Cosalá mining district is located in the east-central portion of the state of Sinaloa, Mexico. The town of Cosalá is about 240km by road from Mazatlán. The Nuestra Señora mine is about 10km east of the town of Cosalá and about 10km southeast of San Rafael. The San Rafael and El Cajón deposits are located about 12km north-northeast of the town of Cosalá. The district is accessible from the town of

775-856-5700

210 South Rock Blvd.
Reno, Nevada 89502
FAX: 775-856-6053

Cosalá via rural paved and dirt roads. All primary access roads can accommodate standard highway vehicles.

Scorpio's property in the Cosalá mining district, on which the Nuestra Señora, San Rafael, and El Cajón deposits are located, consist of 70 mineral concessions that cover approximately 26,819 hectares. The concessions occur in two non-contiguous blocks, and within both blocks are a number of areas of land that Scorpio does not control. One such concession not controlled by Scorpio lies immediately adjacent to the southwest boundary of the San Rafael deposit and also covers a portion of the El Cajón deposit.

Scorpio owns the concessions through its wholly owned subsidiaries, Minera Cosalá, S.A. de C.V. ("Minera Cosalá) and Minera Platte River Gold, S. de R.L. de C.V. Although five of the 70 concessions are subject to a 1.25% net smelter return royalty, the Nuestra Señora, San Rafael, and El Cajón resources do not extend onto any of these five concessions.

## 1.3 History and Exploration

The Cosalá mining district, where polymetallic mineralization occurs as primarily skarn-related deposits, was discovered and locally worked by the Spanish approximately 400 years ago. At the turn of the 19$^{th}$ century, French engineers reportedly developed and worked the Nuestra Señora mine with a 10-stamp mill that produced 800 to 1,000kg of silver per month. In 1949, Asarco Mexicana ("Asarco") purchased the Nuestra Señora mine and also mined material from La Estrella mine north of San Rafael. In addition, Asarco did some work at El Cajón, sending the material to the mill at La Estrella. In or about February 1965, Asarco ceased production and subsequently removed all of the mining equipment. Asarco let its concessions at Nuestra Señora lapse in 1980.

There was no exploration drilling or geologic activity in this area from 1965 until 1991, when the Consejo de Recursos Minerales, (Mexican government mineral division) drilled three core holes beneath Santo Domingo, intersecting narrow widths of mineralization. Some small-scale mining occurred sporadically from 1980 until 1992 in the Nuestra Señora area, but no records of these activities were filed.

Scorpio acquired the right to earn 100% interest in the Nuestra Señora property in 1998 and began an exploration program there in 1999. Since 1999, Scorpio's exploration at the Nuestra Señora property has included airborne magnetic, electromagnetic, and radiometric surveying; ground magnetic and electromagnetic surveying; geologic mapping; and sampling. Scorpio drilled a total of 1,503 core holes at Nuestra Señora from 2000 through 2011 that were used for the 2012 resource estimate. Additional drilling has been done, and MDA has reviewed the results of 66 holes totaling 12,192m. MDA concludes that this drilling did extend narrow, high-grade silver zones and substantially supported the 2012 resource estimate, but the drilling did not expand the resource in any material way. Scorpio began underground mine development at Candelaria in 2004 and in the Nuestra Señora Main Zone in 2005. The mill components were moved on-site from San Manuel, Arizona, starting in 2006, and the mill began producing concentrates in 2008.

Since 1965, several small Mexican mining operators have worked the mines in the vicinity of San Rafael and El Cajón. Modern exploration was started by Industrias Peñoles, S.A. de C.V. ("Peñoles") in the late 1970s into the 1980s and again in 1999. In 1995, Minas de Oro Hemlo, S.A. de C.V. ("Hemlo") conducted mapping, sampling, and road building, and drilled 15 reverse circulation ("RC") holes primarily within the San Rafael area exploring for precious metals. In early 2000, Noranda

Exploraciones Mexico, S.A. de C.V. ("Noranda") completed three IP-resistivity lines over the San Rafael zone in the area of the previous Hemlo drilling. Noranda drilled seven core holes at San Rafael totaling 1,347.5m in 2001.

Platte River Gold Inc. ("PRG") became interested in the San Rafael-El Cajón-La Verde property in early 2004. On June 1, 2004, PRG, through their Mexican subsidiary, signed a four-year option agreement for 100% of the exploration and mining concessions along with all of the infrastructure and mining equipment used at the La Verde mine and project area but excluding the mill in Cosalá. PRG made the final payment and acquired the property in July 2008. During their tenure, PRG conducted induced polarization ("IP"), resistivity, and ground magnetic surveying; geological mapping; chip-channel sampling of outcrops and road cuts; and the drilling of 371 holes. They tested 15 different targets, but the focus of their work was on San Rafael and El Cajón.

Scorpio acquired PRG in 2010, thereby acquiring the San Rafael and El Cajón projects. On March 16, 2011, Scorpio acquired five mineral concessions from Grupo Industrial Minera Mexico S.A. de C.V. in the Cosalá district immediately adjacent to its existing concessions. From 2010 through July 20, 2012, Scorpio's exploration in the San Rafael and El Cajón area has consisted of mapping and the drilling of 282 core holes totaling 35,296m. The focus of the work has been on the San Rafael and El Cajón resource areas and all of these drill data is included in the current resource estimates for these deposits. Scorpio also drilled four other targets including surface and underground drilling at the historic La Verde mine area. In 2010, Quantec Geoscience Ltd. completed a 48-line-kilometer Titan-24 DC/IP geophysical survey centered over the San Rafael area; results of subsequent drilling to test some of the anomalies were not encouraging.

## 1.4 Geology and Mineralization

The Cosalá mining district lies along the western edge of the Sierra Madre Occidental, an extensive Tertiary volcanic province covering approximately 800,000km$^2$. Mineralization within the Cosalá mining district is related to granodioritic or granitic intrusions emplaced between 140 and 45 million years ago into Cretaceous sedimentary rocks that overlie older basement terranes.

The Nuestra Señora property lies within a sub-circular inlier of Cretaceous limestone approximately 10km in diameter situated in the eastern part of the 139 to 45 Ma-old Sinaloa Batholith. Contact metamorphism of the limestones created re-crystallized limestone, marble, and skarn. Initial skarn development in the area was contemporaneous with emplacement of the batholith; however, there were several pulses of magmatic and hydrothermal activity. Carbonate replacement-style mantos, veins, chimneys, chimney breccias, and mineralized exoskarn and endoskarn occur within limestone and felsic and lesser mafic intrusions. Pyrite, sphalerite, chalcopyrite, galena, and lesser tetrahedrite are the principal minerals.

In the San Rafael-El Cajón area, Cretaceous limestone, commonly recrystallized and marbleized but only locally skarn-altered, is exposed within windows in Tertiary volcanic rocks. Massive sulfide mineralization at San Rafael occurs primarily along the contact of dacite tuff with Cretaceous limestone, with additional mineralization within the dacite in the Upper Zone and within skarn-altered limestone in the 120 Zone. The protolith at El Cajón is altered limestone, thought to be of Cretaceous age. San Rafael contains silver, lead, and zinc mineralization with minor gold and copper. The main minerals are pyrite, pyrrhotite, sphalerite, and galena with minor marcasite, chalcopyrite, and magnetite. The El Cajón-type of mineralization, also seen within the San Rafael deposit's 120 Zone, is related to skarn alteration of calcareous sediments and occurs as both mantos and chimneys. It consists of silver-copper-gold mineralization in the form of chalcopyrite and tetrahedrite with minor pyrite, galena, sphalerite, arsenopyrite, chalcocite, jalpaite, native silver, copper, and bismuth.

## 1.5 Metallurgical Testing

### 1.5.1 Nuestra Señora

Pre-production metallurgical studies for various mineralized zones of Nuestra Señora have included petrography, mineralogy, grindability determinations, and batch-scale flotation optimization test work leading through locked cycle tests. The most complete series of pre-production processing test work was performed by SGS Lakefield Research Ltd. in Canada between May 2006 and May 2007. Their test work included mineralogical analyses, Bond Work Index determinations, batch flotation testing, and confirmatory testing of fully sequential flowsheet through locked cycle tests.

Ore representative of Nuestra Señora assaying 1.48% Cu, 1.36% Pb, 3.24% Zn, and 151g Ag/t was tested through locked cycle test producing three concentrates. A lead concentrate assaying 45.1% Pb, 9.51% Cu, and 3,863g Ag/t recovered 91.7% of the lead and 58.6% of the silver, while recovering 15.5% of the copper. A copper concentrate grading 35.6% Cu and 1,408g Ag/t recovered 73.1% of the copper and a further 26.9% of the silver. The zinc concentrate graded 53.4% Zn, while recovering 87.9% of the zinc.

Ore representative of the Hoag Zone assaying 0.23% Cu, 2.53% Pb, 3.63% Zn and 71.1g Ag/t was tested through locked cycle test producing two concentrates. A combined lead + copper/lead concentrate assaying 57.8% Pb, 3.58% Cu, and 1,598g Ag/t recovered 97.4% of the lead, 55.9% of the copper, and 89.5% of the silver. The zinc concentrate assayed 54.3% Zn, while recovering 91.5% of the zinc.

While pre-production testing constituted a solid basis and reference for earlier resource/reserve reporting and design of the processing plant, the relevance of laboratory-based results for predicting the metallurgical outcome of processing the same ore types as those mined and processed to date has been largely superseded by the availability of actual production data from the Nuestra Señora process plant.

Metallurgical performance on a daily production scale is highly dependent upon the head grades, the ratios of each base metal head grade to the others, and the mineralogy of the ore zones being processed at that time. For 2012, with average ore head grades of 0.28% Cu, 0.87% Pb, 1.85% Zn, and 89. g Ag/t, the plant provided metal recoveries of 77.4% for Zn and 6.9% for Ag to the zinc concentrate, 65.6% for Pb and 47.5% for Ag to the lead concentrate, and 49.2% for Cu and 24.5% for Ag to the copper concentrate for a total silver recovery of 78.9%.

### 1.5.2 San Rafael and El Cajón

Metallurgical testing was conducted over a period of roughly four years (2005 – 2009) on a total of seven drill-cuttings or drill-core composites at McClelland Laboratories, Inc. ("McClelland") in Sparks, Nevada. The testing conducted was focused exclusively on processing by flotation treatment. Testing included samples of El Cajón, San Rafael (Main Zone) sulfide, San Rafael oxide, 120 Zone, and Main/120 overlap sulfide mineralization. Additional flotation testing was conducted by McClelland in 2011 and 2012 on the 120 Zone material.

Testing established that the El Cajón mineralization type was amenable to bulk sulfide flotation treatment, at a feed size of as coarse as 80%-106µm. Upgrading of a final concentrate product was possible through reagent-optimization testing. The most recent (2009) optimization testing included a locked-cycle flotation test series conducted on an El Cajón drill core composite, using optimized conditions. Results showed that it was possible to produce a flotation cleaner concentrate with copper, gold, and silver recoveries of 96.7%, 87.3%, and 97.8%, respectively. Ore-variability testing will be required to determine if this response can be expected throughout the El Cajón mineralization.

Testing conducted on the San Rafael (Main Zone) sulfide mineralization type has shown this ore type can be processed using a sequential flotation scheme to produce separate lead/silver concentrate and zinc concentrate products. Reagent optimization for this mineralization type has proven to be significantly more difficult than for the El Cajón mineralization type, and carry-over of gangue minerals into the concentrate products presents a significant challenge. The most recent batch sequential rougher/cleaner flotation testing (average of two tests) on the drill-core composite showed that it was possible to produce a lead cleaner concentrate with lead and silver recoveries of 68% and 27%, respectively. The zinc cleaner concentrate produced from the corresponding lead rougher flotation tailings had zinc and silver recoveries of 81% and 20%, respectively. Further reagent-optimization testing, locked-cycle flotation testing, and ore variability testing will be required for the San Rafael (Main Zone) sulfide mineralization type.

Early testing on the 120 Zone and 120 Main Overlap Zone mineralization types was less successful than the work summarized above for the El Cajón and San Rafael Main Zone sulfide mineralization types. Attempts at applying the flotation processing schemes optimized for the El Cajón and San Rafael mineralization types to the 120 Zone and Main/120 Overlap Zone mineralization types were not particularly successful. Significant progress was made in reagent optimization and improvement in the flotation response of the 120 Zone material during 2011-2012 testing of a 120 Zone composite. Locked cycle flotation testing showed that it was possible to produce a final cleaner concentrate that was 2.1% of the feed weight, assayed 21.39% Cu and 5,978g Ag/t, and represented copper and silver recoveries of 84.7% and 72.1%, respectively.

## 1.6 Mineral Resource Estimates

### 1.6.1 Nuestra Señora Resources

This report describes MDA's 2012 mineral resource estimate for Nuestra Señora, which was first reported in MDA's 2012 Technical Report. The effective date of the Nuestra Señora database on which the resource was estimated was February 20, 2012. The effective date of the Nuestra Señora resource estimate was June 22, 2012. Since completion of that estimate, 66 additional holes have been drilled at Nuestra Señora. MDA reviewed the results of new holes and concludes that this drilling did extend narrow, high-grade silver zones and substantially supported the 2012 resource estimate, however, drilling did not expand the resource in any material way. For this reason, the 2012 Nuestra Señora resource estimate described in this report is still current.

Nuestra Señora is a skarn deposit in which the lower grade mineralization generally occurs as fine-grained disseminated sulfides and the high-grade mineralization occurs as massive, clotty sulfides (Main and Hoag Zones) and carbonate replacements (at Candelaria). The deposit is extraordinarily complex, made up of many isolated bodies and pods of mineralization, and continuity of mineralization is often low. The ability to predict the presence of mineralization beyond 20m should be considered the exception rather than the rule. In particular, the spectacular grades to which Scorpio has become accustomed and which have proven economically important generally occur in small and highly irregular pods.

Upon completion of the database validation process, MDA constructed cross sections on 20m intervals looking northwest (in the local mine coordinate system), with individual sets of sections created for silver, zinc, copper, and lead. Based on natural distributions of the metals and knowledge of the geology, low-grade and mid- to high-grade mineral domains were defined for each metal separately. Geometries, continuity, and orientation of the mineral domains relied heavily on geologic cross sections interpreted by Scorpio geologists. Outside these domains, the rock is considered either unmineralized or discontinuously mineralized. The sectional mineral-domain polygons were used to code drill holes. Quantile plots along with global zone statistics were made to assess the validity of these domains and to determine capping levels. Compositing of capped grades was done to 3m down-hole lengths, honoring mineral domain boundaries. Using Scorpio's cross-sectional geologic interpretations, MDA modeled the major lithologies on 3m plans. Subsequently, four different plan models of the metal domains, guided by the lithology plans, were constructed and later combined into one block model for economic and engineering studies. The 3m by 3m by 3m blocks inside each mineral domain were estimated using only composites from inside its respective domain. MDA assigned density values, ranging from 2.76g/cm$^3$ to 3.09g/cm$^3$, to the blocks by major rock type.

The reported estimates were made using inverse distance to the fifth power; kriging and nearest neighbor estimates were used for comparison and validation. MDA classified the Nuestra Señora resources by a combination of distance to the nearest sample, number of samples, and number of holes used to estimate a particular block, while also taking into account reliability of underlying data and understanding and use of the geology. There is significant mineralization outside the defined domains, but because this mineralization does not have demonstrable continuity and cannot be modeled as a domain, it does not meet the requirement for defining resources for underground mining scenarios.

The stated resource is diluted to 3m by 3m by 3m blocks and is tabulated on a silver-equivalent ("AgEq") cutoff grade of 60g AgEq/t. The equation for calculating AgEq is given below:

$$\text{g AgEq/t} = \text{g Ag/t} + (\%\text{Zn}*24.2857) + (\%\text{Pb}*24.2857) + (\%\text{Cu}*77.1429)$$

The ratio of the metals was derived from prices for silver, zinc, lead, and copper of $24/oz Ag, $0.85/lb Zn, $0.85/lb Pb, and $2.70/lb Cu. While some gold is recovered at Nuestra Señora, it is a small part of the total value of the mineralization and was neither modeled, estimated, nor considered in the equivalency calculation. No metal recoveries are applied, as this is the *in situ* resource. Table 1.1 lists the mineral resources for Nuestra Señora.

**Table 1.1 Nuestra Señora Resources**

| Cutoff | | | | | | Measured | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| g AgEq/t | Tonnes | g AgEq/t | g Ag/t | %Zn | %Pb | %Cu | oz Ag | lbs Zn(x1000) | lbs Pb(x1000) | lbs Cu(x1000) |
| 60.0 | 332,000 | 184.12 | 92.76 | 2.01 | 0.98 | 0.24 | 990,000 | 14,712 | 7,173 | 1,757 |
| **Cutoff** | | | | | | **Indicated** | | | | |
| **g AgEq/t** | **Tonnes** | **g AgEq/t** | **g Ag/t** | **%Zn** | **%Pb** | **%Cu** | **oz Ag** | **lbs Zn(x1000)** | **lbs Pb(x1000)** | **lbs Cu(x1000)** |
| 60.0 | 2,088,000 | 178.62 | 95.26 | 1.70 | 0.89 | 0.27 | 6,395,000 | 78,255 | 40,969 | 12,429 |
| **Cutoff** | | | | | | **Measured and Indicated** | | | | |
| **g AgEq/t** | **Tonnes** | **g AgEq/t** | **g Ag/t** | **%Zn** | **%Pb** | **%Cu** | **oz Ag** | **lbs Zn(x1000)** | **lbs Pb(x1000)** | **lbs Cu(x1000)** |
| 60.0 | 2,420,000 | 179.37 | 94.92 | 1.74 | 0.90 | 0.27 | 7,385,000 | 92,967 | 48,142 | 14,186 |
| **Cutoff** | | | | | | **Inferred** | | | | |
| **g AgEq/t** | **Tonnes** | **g AgEq/t** | **g Ag/t** | **%Zn** | **%Pb** | **%Cu** | **oz Ag** | **lbs Zn(x1000)** | **lbs Pb(x1000)** | **lbs Cu(x1000)** |
| 60.0 | 2,025,000 | 160.98 | 88.98 | 1.44 | 0.71 | 0.26 | 5,793,000 | 64,287 | 31,697 | 11,607 |

### 1.6.2 El Cajón Resources

The El Cajón resources reported here are based on Scorpio's database as of July 20, 2012. The effective date of the El Cajón resource estimate is September 7, 2012.

Upon completion of the database validation process, MDA modified the 2009 geologic cross-sections which are evenly spaced on 25m intervals looking northwest at 330°. Individual sets of sections were created for silver, copper, gold, and percent sulfide. Low-, mid-, and high-grade domains were modeled for each of the three metals independently, and low- and high-grade domains were modeled for percent sulfide. The cross-sectional domains were sliced to long section on 3m intervals, to coincide with the center of each row of blocks in the model. After reinterpretation, the long section domains were used to code the block model to percent of block in each mineral domain.

The cross-sectional mineral domains for the three metals were used to code the samples. Quantile plots were made to assess validity of these domains and to determine capping levels; MDA capped 22 samples (six gold, eleven silver, and five copper). Compositing was done to 3m down-hole lengths, matching the model block size, honoring all material-type and mineral-domain boundaries. The sulfide domains were used by MDA to assign density values, ranging from 2.95g/cm$^3$ to 3.23g/cm$^3$, to the blocks.

The reported estimates were made using inverse distance to the second power; ordinary kriging and nearest neighbor estimates were used for comparison and validation. MDA classified the El Cajón resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology.

The stated resource is volume-diluted to the entire 3m by 3m by 3m blocks and is tabulated on a silver-equivalent ("AgEq") cutoff grade of 60g AgEq/t. Using the individual metal grades of each block, the AgEq grade is calculated using the following formula:

$$\text{g AgEq/t} = \text{g Ag/t} + (77.142857 * \%\text{Cu}) + (54.166667 * \text{g Au/t})$$

This formula is based on prices of US$24.00 per ounce silver, US$2.70 per pound copper, and US$1,300.00 per ounce gold. No metal recoveries are applied, as this is the *in situ* resource. The El Cajón resources controlled by Scorpio are tabulated in Table 1.2.

**Table 1.2 Summary Table of El Cajón Resources**

**Indicated Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 60.00 | 2,597,000 | 149.1 | 0.48 | 0.21 | 12,451,000 | 27,742,000 | 18,000 | 198.1 |

**Inferred Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 60.00 | 850,000 | 121.8 | 0.41 | 0.17 | 3,331,000 | 7,679,000 | 5,000 | 162.4 |

Various checks were made on the El Cajón resource model and it is believed that the resource estimate is reasonable, honors the geology, and is supported by the geologic model.

It is expected that additional drilling will increase the size of the estimated resource. There is potential for additional mineralization to the east down dip within the limestone and to the south and east along the diorite contact. Additional infill drilling and QA/QC work is recommended to bring greater confidence to the interpretation of the mineralization and increase the resource classification.

### 1.6.3 San Rafael Resources

The San Rafael resources reported here are based on Scorpio's database as of July 20, 2012. The effective date of the San Rafael resource estimate is September 7, 2012.

Upon completion of the database validation process, MDA modified the 2009 geologic cross-sections, which are evenly spaced on 25m intervals looking northwest at 330°. Individual sets of sections with unique mineral domains were created for zinc, lead, silver, copper, gold, and percent sulfide. The mineral domains represent distinct styles of mineralization with unique statistical characteristics. The cross-sectional domains were sliced to long section on 3m intervals to coincide with the center of each row of blocks in the model. After reinterpretation, the long-section domains were used to code the block model to percent of block in each mineral domain.

The cross-sectional mineral domains for the five metals were used to code the samples. Quantile plots were made to assess validity of these domains and to determine capping levels; MDA capped 26 samples (three zinc, six lead, eight silver, eight gold, and one copper). Compositing was done to 3m down-hole lengths, matching the model block size, honoring all material-type and mineral-domain boundaries. The sulfide domains were used by MDA to assign density values, ranging from 2.55g/cm$^3$ to 3.88g/cm$^3$, to the blocks.

The reported estimates were made using inverse distance to the second power; ordinary kriging and nearest neighbor estimates were used for comparison and validation. MDA classified the San Rafael resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology.

The stated resource is volume-diluted to 3m by 3m by 3m blocks and is tabulated on a zinc-equivalent ("ZnEq") cutoff grade of 1.5% ZnEq. Using the individual metal grades of each block, the ZnEq grade is calculated using the following formula:

%ZnEq = %Zn + (1.0 * %Pb) + (0.041176 * g Ag/t) + (3.176471 * %Cu) + (2.230392 * g Au/t)

This formula is based on prices of US$0.85 per pound zinc, US$0.85 per pound lead, US$24.00 per ounce silver, US$2.70 per pound copper, and US$1,300.00 per ounce gold. No metal recoveries are applied, as this is the *in situ* resource. The San Rafael resources, excluding a very small fraction of the deposit that lies within the northeast corner of the Silvia Maria concession, are tabulated in Table 1.3.

**Table 1.3 Summary Table of San Rafael Resources**

**Measured and Indicated Resources (1.5% ZnEq cut-off)**

| Class | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Measured | 5,124,000 | 2.10 | 0.93 | 72.9 | 0.06 | 0.14 | 237,277,000 | 104,906,000 | 12,013,000 | 7,187,000 | 23,000 | 6.55 |
| Indicated | 14,788,000 | 1.37 | 0.56 | 57.6 | 0.10 | 0.10 | 446,863,000 | 182,409,000 | 27,409,000 | 31,776,000 | 48,000 | 4.84 |
| M+I | 19,912,000 | 1.56 | 0.65 | 61.6 | 0.09 | 0.11 | 684,140,000 | 287,315,000 | 39,422,000 | 38,963,000 | 71,000 | 5.28 |

**Inferred Resource (1.5% ZnEq cut-off)**

| Class | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inferred | 3,331,000 | 0.18 | 0.58 | 56.1 | 0.08 | 0.16 | 13,170,000 | 42,619,000 | 6,006,000 | 5,584,000 | 17,000 | 3.67 |

The low zinc grade for the Inferred resource in Table 1.3 is a result of the Inferred resources occurring primarily within the silver-dominant Upper and 120 Zones. The use of a zinc equivalent cut-off has been done for convenience for combining resources from the different zones into a single table. Using a more appropriate silver equivalent cut-off for these resources would not change the total Inferred tonnes or metal content.

The San Rafael resource estimate is based on analytical measurements and geology from 288 drill holes and 14 surface trenches. For the Main Zone of the San Rafael deposit, the most important observation that can be presented to the reader is the relatively even distribution of metals, primarily zinc, lead, and silver, within tabular zones that for the most part occur along the volcanic/limestone contact. The recent infill drilling provided increased confidence in the continuity of the mineralization. Additional infill drilling is not expected to materially change the currently defined Main Zone resource.

The 120 Zone silver-copper-gold mineralization occurs within skarn-altered limestone as bedding horizons and irregular zones along intrusive contacts. The 120 Zone is more variable, both in geology and mineral grades, than the Main Zone mineralization. Additional drilling and more density measurements are recommended to bring greater confidence to the interpretation of this mineralization.

The Upper Zone is primarily silver-gold mineralization within a number of small tabular zones sub-parallel to and within the hanging wall of the Main Zone. The Upper Zone is more erratic than the Main Zone, though the recent drilling has provided greater confidence in the continuity of mineralization and the lithologic interpretation. Additional drilling is not expected to materially change the Upper Zone resource.

The depth of oxidation is generally shallow, though in the northeast portion of the deposit, oxidation can reach up to 200m down-dip. Zinc mineralization is strongly leached within the oxide zone, and there are uncertainties as to metallurgical recoveries and processing costs associated with the oxide mineralization. Further work is needed to better characterize the oxide material.

## 1.7 Mineral Reserves Estimate

While this Technical Report includes a PEA which evaluates mining at Nuestra Señora, El Cajón, and San Rafael, Proven and Probable reserves have been defined only for Nuestra Señora. The El Cajón and San Rafael deposits have not been studied to the level of detail necessary for reporting reserves at this time.

The Proven and Probable reserves for Nuestra Señora have been calculated based on underground development and stope designs created by MDA. Net smelter return ("NSR") values were determined for each block using only Measured and Indicated material. Inferred material was considered to be waste with no value or metal content. Designs were created based on an NSR cutoff of $60/t. Reserves calculations are based on the total tonnage of material inside of the final designs and include internal dilution. Ore loss and external dilution have also been considered for the reporting of reserves.

Resources estimated by MDA were depleted to account for subsequent production through the end-of-year 2012 mining. The effective date of the Nuestra Señora reserves is December 31, 2012.

Reserves are processed on site to create copper, lead, and zinc concentrates. Treatment and transportation costs were derived from existing contracts and used in the NSR calculation for design. By the end of the study, additional contracts had been completed, which were used in the final economic evaluation. Table 1.4 shows the smelter costs used for both design and the final smelter cost parameters.

**Table 1.4 Smelter Parameters ($/Dry Tonne of Concentrate)**

| | Treatment | Transport | Penalties | Marketing |
|---|---|---|---|---|
| | **Used for Design** | | | |
| Zinc | $ 160.00 | $ 57.31 | $ 12.00 | $ 11.00 |
| Lead | $ 284.91 | $ 47.44 | $ 12.00 | $ 11.00 |
| Copper | $ 290.00 | $ 57.31 | $ 91.00 | $ 11.00 |
| | **Used for Final Economics** | | | |
| Zinc | $ 160.00 | $ 67.62 | $ 12.00 | $ 11.00 |
| Lead | $ 337.20 | $ 52.59 | $ 12.00 | $ 11.00 |
| Copper | $ 290.00 | $ 62.97 | $ 91.00 | $ 11.00 |

Other economic parameters for reserve estimation include metal prices, mining costs, processing costs, and other general and administrative costs. Metal prices used are shown in Table 1.5, and operating cost assumptions are shown in Table 1.6.

**Table 1.5 Reserve Metal Prices**

| Metal Prices | | |
|---|---|---|
| Silver | $ 25.00 | $/oz Ag |
| Zinc | $ 0.85 | $/lb Zn |
| Copper | $ 3.40 | $/lb Cu |
| Lead | $ 0.90 | $/lb Pb |

**Table 1.6 Reserves Operating Cost Assumptions**

| NSR Cutoff for Design | | |
|---|---|---|
| Long Hole Mining Cost | 15.85 | $/t |
| Cut and Fill Mining Cost | 20.97 | $/t |
| Process Plant Costs | 10.97 | $/t |
| Process Maintenance | 5.41 | $/t |
| Technical Services | 2.47 | $/t |
| Safety and Environment | 1.79 | $/t |
| Administration | 8.07 | $/t |
| Total Long Hole Cost | 44.56 | $/t |
| Total Cut and Fill Cost | 49.68 | $/t |

Underground designs were completed based on the depleted resources. Both long-hole and cut-and-fill stopes were designed to exploit continuous blocks above a $60.00 per tonne NSR cutoff value. Underground development was designed to access each of the designed stopes, and resources too isolated from existing development to be economically accessed were excluded from reserves. Pillars for geomechanical stability were identified adjacent to current and historic stopes. Some of those pillars contain mineral resources that have been excluded from the reserve estimation.

Long-hole designs were kept to a maximum of 15m high and take into account the shape of the ore body to define their width and length. Cut-and-fill stopes were used as a more selective method to access resources that did not have continuity to be economically mined using long-hole stoping.

Block dilution, internal dilution, and external dilution have been included in the statement of reserves. Block dilution is the result of the resource estimate; internal dilution is the inclusion of sub-grade resources and non-resource material within the stope designs; and external dilution of 35% was included to represent additional unintended rock breakage.

Ore loss occurs where ore grade material cannot be physically mined from its designed stope due to unforeseen circumstances or misclassification of material during mining. Additionally, because of the complex nature of the ore body, it is inevitable that some ore will go unidentified, and thus unmined. Ore loss has been accounted for using a 35% reduction of mine design volumes, which offsets the external dilution and reduces the overall grade of reserves.

Proven and Probable reserves have been estimated using only Nuestra Señora Measured and Indicated resources. The estimates use the economic and dilution factors described above. Table 1.7 shows the fully diluted Proven and Probable reserves for Nuestra Señora.

**Table 1.7 Nuestra Señora Proven and Probable Reserves**

| | Proven | Probable | Proven & Probable | Internal Dilution | Ore Loss | External Dilution | Fully Diluted Proven & Probable |
|---|---|---|---|---|---|---|---|
| K Tonnes | 89 | 333 | 422 | 111 | 187 | 187 | 533 |
| g Ag/t | 164.5 | 186.6 | 181.9 | 34.0 | 151.0 | - | 98.2 |
| K Oz Ag | 470 | 1,997 | 2,467 | 122 | 906 | - | 1,683 |
| % Zn | 3.29 | 3.14 | 3.17 | 0.77 | 2.67 | - | 1.74 |
| K Lbs Zn | 6,448 | 23,052 | 29,500 | 1,901 | 10,990 | - | 20,411 |
| % Pb | 1.50 | 1.64 | 1.61 | 0.41 | 1.36 | - | 0.88 |
| K Lbs Pb | 2,932 | 12,026 | 14,958 | 1,008 | 5,588 | - | 10,378 |
| % Cu | 0.50 | 0.47 | 0.47 | 0.09 | 0.39 | - | 0.25 |
| K Lbs Cu | 976 | 3,416 | 4,393 | 218 | 1,614 | - | 2,997 |

***Proven and Probable reserves are based on designs using a $60 NSR cutoff grade***

***Dilution includes grades for Measured and Indicated material within designs***

***Dilution also includes internal and external waste tonnage at zero grades***

***A factor of 35% is added for ore loss and external dilution to reflect current reconciliation***

### 1.7.1 Comparison of Measured and Indicated Resources to Proven and Probable Reserves

The 2012 Nuestra Señora Measured and Indicated resources were estimated using data current as of February 2012 and with as-built solids current at the end of June 2012, with a reporting cutoff grade of 60 g AgEq/t.

There is a fairly low conversion rate of resources to reserves due to:

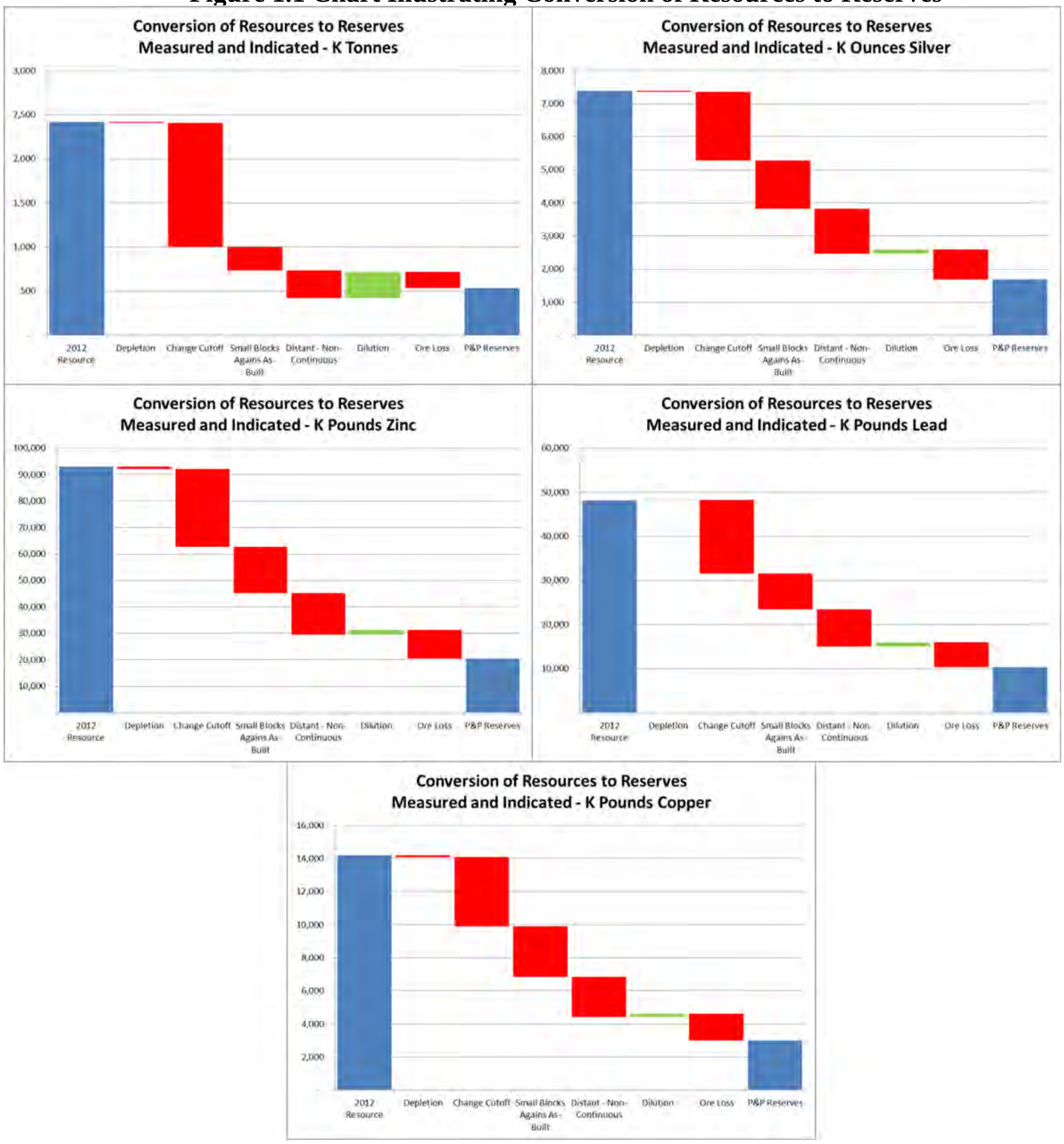
- Reduction due to depletion from July through December mining;
- Reduction due to the application of $60/t NSR value cutoff, which includes metallurgical and smelter recoveries (versus the 60g AgEq/t cutoff exclusive of recoveries applied for the reported resource);
- Reduction due to sterilization of blocks against or near mined out areas;
- Reduction of portions of the resource that were too distant and not continuous to be economic;
- Addition of both internal and external dilution; and
- Reduction due to ore loss.

The conversion of resources to reserves is shown in Table 1.8 and Figure 1.1.

## Table 1.8 Conversion of Resources to Reserves

| | Measured & Indicated / Proven and Probable | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Change Due to Depletion*** | **K Tonnes** | **g Ag /t** | **Zn%** | **Pb%** | **Cu%** | **K Ozs Ag** | **K Lbs Zn** | **K Lbs Pb** | **K Lbs Cu** |
| Reported Resource (60 g AgEq/t) | 2,420 | 94.92 | 1.74 | 0.90 | 0.27 | 7,385 | 92,967 | 48,142 | 14,186 |
| Depleted Resource (60 g AgEq/t) | 2,405 | 95.24 | 1.74 | 0.91 | 0.27 | 7,364 | 92,071 | 48,202 | 14,087 |
| **Change Due to Depletion** | **(15)** | **0.32** | **(0.01)** | **0.01** | **(0.00)** | **(21)** | **(896)** | **60** | **(99)** |
| ***Change Due to Cutoff Grade*** | | | | | | | | | |
| Depleted Resource ($60 NSR) | 999 | 164.27 | 2.85 | 1.43 | 0.45 | 5,275 | 62,643 | 31,568 | 9,903 |
| **Change Due to Cutoff** | **(1,421)** | **69.35** | **1.10** | **0.53** | **0.18** | **(2,110)** | **(30,324)** | **(16,574)** | **(4,283)** |
| ***Change Due to Design*** | | | | | | | | | |
| M&I Inside Designs | 422 | 181.9 | 0.00 | 0.00 | 0.00 | 2,467 | 29,500 | 14,958 | 4,393 |
| M&I Dilution Inside Designs | 111 | 34.0 | 0.77 | 0.41 | 0.09 | 122 | 1,901 | 1,008 | 218 |
| M&I Ore Loss Inside Designs | 187 | 151.0 | 2.67 | 1.36 | 0.39 | 906 | 10,990 | 5,588 | 1,614 |
| External Dilution (zero grade) | 187 | | | | | - | | | |
| Reported Reserve (Fully Diluted) | 533 | 98.2 | 0.00 | 0.00 | 0.00 | 1,683 | 20,411 | 10,378 | 2,997 |
| **Change Due to Design** | **(466)** | **(66.1)** | **(2.84)** | **(1.43)** | **(0.45)** | **(3,592)** | **(42,232)** | **(21,191)** | **(6,906)** |

**Figure 1.1 Chart Illustrating Conversion of Resources to Reserves**




There is a history of successfully delineating mineable material at Nuestra Señora with infill drilling, both in areas predicted by exploration drilling and in areas not encountered by exploration drilling. This reflects the poddy nature of the deposit. It is likely this history of success will continue with the upgrade and/or discovery of additional resources.

## 1.8 Reserve Case Mining and Economics

Two mining cases have been developed and are described in this Technical Report: the "Reserve Case" and the "PEA Case". The Reserve Case applies only to Nuestra Señora and is based on current mining methods and metallurgical processes used to develop Proven and Probable reserves from the Measured and Indicated resources. The Nuestra Señora Reserve Case mines the Proven and Probable reserves to completion and assumes that the plant would be shut down at the end of mine life with closure costs and salvage value applied in the cash-flow. This evaluation was done only to confirm that Proven and Probable reserves can be economically extracted. It is not intended to imply the coming closure of the Nuestra Señora mine or plant in the near future because mining of resources is anticipated to continue as additional ore is defined by short-term definition drilling.

The Reserve Case mining and economic highlights include:

- 533,000 tonnes mined through 2013;
- $42,956,000 in net revenue (after smelting treatment and transportation charges);
- Operating costs of $26,641,000;
- Capital costs of $4,870,000;
- Net after-tax cash-flow of $21,444,000; and
- Net present value (5%) of $20,470,000.

The cash-flow assumes a $10,000,000 salvage value and $1,908,000 closure costs attributed to the end of the year 2013. The cash-flow was developed solely to determine the economic viability of the Proven and Probable reserves. Due to the complex geological nature of the deposit, there may be zones that have not been included, and it is anticipated that Scorpio will continue to find and develop ore that is not included in the current Proven and Probable reserves.

## 1.9 PEA Case Mining and Economics

The PEA Case assumed continued mining at Nuestra Señora along with the development of El Cajón and San Rafael underground operations and San Rafael open pit mining. Unlike the Reserve Case, the PEA Case is based on Measured, Indicated, and Inferred resources.

Note that a PEA is preliminary in nature. It includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied that would enable them to be classified as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

Mining and operational highlights for the PEA include:

- Continued mining from Nuestra Señora of 1,461,000 tonnes adding approximately three and a half years of mining at Nuestra Señora at 750,000 tonnes per year;
- Expansion of the process plant from 1,500 tonnes per day to 2,750 tonnes per day upon commencement of El Cajón ore mining;
- Development of San Rafael underground to achieve production at the end of the El Cajón mining; and
- Mining of San Rafael open pit starting in year three.

Financial highlights include:

- A total of 10.2 million tonnes processed through an 11-year project life;
- 40,318,000 ounces of equivalent silver produced through the project life;
- Total life of project net revenue (after smelting and transportation charges) of $863,068,000;
- Total operating costs of $480,618,000 over the project life;
- Total capital cost of $85,267,000 with $49,999,000 in capital for the first two years;
- Payback of the first two years of capital occurs half-way through year three;
- Total life-of-project cash flow of $229,792,000; and
- Net present value (5%) of the project is $166,653,000.

The PEA for Nuestra Señora, El Cajón, and San Rafael shows a strong return on investment and cash-flow to strengthen Scorpio's operations in Mexico. The high rate of return on the project is due to strong resources providing strong revenues and existing infrastructure reducing capital requirements.

The resources considered in the PEA Case include Measured, Indicated, and Inferred resources. Material processed in the PEA include these resources along with allowances for dilution and ore loss. The total material processed in the PEA case are shown in Table 1.9.

**Table 1.9 PEA Material Processed**

| | Underground | | | Open Pit San Rafaell | |
|---|---|---|---|---|---|
| Units | Nuestra Senora | El Cajon | San Rafael | Main / Upper | 120 Zone |
| K Tonnes | 1,461 | 2,319 | 518 | 5,474 | 438 |
| g Ag/t | 99.5 | 144.3 | 151.5 | 94.1 | 149.8 |
| KOz Ag | 4,675 | 10,760 | 2,523 | 16,563 | 2,110 |
| % Zn | 1.63 | - | - | 3.61 | - |
| K Lbs Zn | 52,475 | - | - | 435,276 | - |
| % Pb | 0.78 | - | - | 1.49 | - |
| K Lbs Pb | 25,142 | - | - | 179,443 | - |
| % Cu | 0.28 | 0.47 | 0.41 | - | 0.41 |
| K Lbs Cu | 9,049 | 24,053 | 4,668 | - | 3,933 |
| g Au/t | - | 0.21 | 0.12 | 0.13 | 0.17 |
| K Oz Au | - | 15 | 2 | 23 | 2 |

***PEA Case designs are based on a $60 NSR cutoff grade***

***Dilution includes grades for Measured, Indicated, and Inferred material within designs***

***Dilution also includes internal and external waste tonnage at zero grades***

## 1.10 Recommendations

Recommendations for Nuestra Señora emphasize expanding the resource and reserve and evaluating the ongoing operations. Exploration drilling should include: 1) continued drilling in the area of the Inferred resources in order to upgrade those resources to at least Indicated; 2) expanding the resource up dip, along strike, and down dip as guided by geologic projections of favorable horizons or mineralized structures; and 3) drilling both underground and from the surface to search for, and develop additional deposits in the Nuestra Senora district. The total cost for these programs is approximately $1.25 million.

Nuestra Señora, as with any mine operation, should have production and operation audits to ensure that all available efficiencies and proper accounting are being employed, but also to gather all data and information that would ensure more efficient production. Ongoing operations should also include:

- Constant underground mine mapping, incorporating the interpretations on the geologic cross sections;
- Regular comparisons of production data to the block model to assess how the model has performed and how best to use it;
- Use of Scorpio's newly acquired X-ray fluorescence analyzer to determine sample grades, but first assessing the quality and reliability of these analyses;
- Implementing a QA/QC program for grade-control sampling and Scorpio's in-house laboratory; and
- Undertaking a complete review of the mining and processing operations and material balances.

The following recommendations are made for the optimization of processing operations at Nuestra Señora:

- Continuing metallurgical test work to confirm ore hardness and to optimize the flotation processing route for each ore type, and then applying those results to variability test work samples; and
- Appropriate performance monitoring of the new flash flotation cell to confirm the expected concentrate product improvements.

These operational recommendations would be paid for out of on-going operational budgets, with the possible exception of an estimated $50,000 for outside assistance in the mining and processing operations review and an estimated $50,000 for external consultants and laboratory work for the continuing metallurgical testing.

A feasibility level of study is recommended for San Rafael and El Cajón. This should include infill drilling, geotechnical work for pit slopes and facilities, and additional metallurgical studies as required. Feasibility study costs are estimated to be $750,000 with an additional $600,000 for more definition drilling. Infill drilling would primarily cover the open pit area; the feasibility study would combine El Cajón and San Rafael open pit and underground into a single integrated study. The study would also include hydrological and geotechnical issues.

Additional exploration drilling is recommended on the east side of El Cajón, following up on structural targets, and to the south and east along the diorite contact. A 6,000m drill program is recommended at a cost of about $900,000.

# 2.0 INTRODUCTION AND TERMS OF REFERENCE

## 2.1 Introduction

Mine Development Associates ("MDA") has prepared this Technical Report on the Nuestra Señora, San Rafael, and El Cajón deposits in Sinaloa, Mexico at the request of Scorpio Mining Corporation ("Scorpio"). Scorpio, a Canadian company listed on the Toronto Stock Exchange, owns these three deposits, which are located in the Cosalá mining district. Silver, lead, zinc, copper, and gold occur in a variety of deposit types within the district, including skarns, carbonate replacement deposits, breccia deposits, and massive sulfides.

Scorpio owns all three deposits as part of its larger holdings in the Cosalá mining district. Scorpio acquired its interest in San Rafael and El Cajón through acquisition of Platte River Gold Inc. and its wholly owned subsidiary Minera Platte River Gold, S. de R.L. de C.V. (collectively referred to as "PRG"); PRG is now a wholly owned subsidiary of Scorpio. Scorpio acquired the right to earn 100% interest in the Nuestra Señora property through its wholly owned subsidiary Minera Escorpión S.A. de C.V. Scorpio currently operates the Nuestra Señora polymetallic mine and an approximately 1,500tpd-capacity flotation plant east of the town of Cosalá and about 10km southeast of the San Rafael and El Cajón resources. Scorpio is currently mining approximately 1,500 to 2,000tpd of skarn-hosted silver-lead-zinc-copper mineralization from the Nuestra Señora mine. Mining is generally by long-hole stoping with smaller-tonnage jackleg drifting being used locally to extract narrow, high-grade mineralization.

The purpose of this report is to provide a technical summary of: (1) updated mineral resource estimates for the San Rafael and El Cajón deposits, (2) a new mineral reserve calculation for the Nuestra Señora deposit, and (3) a Preliminary Economic Assessment ("PEA") for Nuestra Señora, San Rafael, and El Cajón. Note that a PEA is preliminary in nature and includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied that would enable them to be classified as mineral reserves and there is no certainty that the preliminary economic assessment will be realized. The resource estimate for Nuestra Señora was reported in a 2012 Technical Report by MDA (Ristorcelli *et al.*, 2012) and has not been updated for this report; MDA has reviewed results of 66 holes drilled since completion of that resource estimate and has concluded that while this drilling did extend narrow, high-grade silver zones and substantially supported the 2012 resource estimate, the new drilling did not expand the resource in any material way. This report and the resource and reserve estimates have been prepared in compliance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's ("CIM") Mineral Resource and Reserve definition standards.

The scope of this study included a review of pertinent technical reports and data provided to MDA by Scorpio relative to the general setting, geology, project history, exploration activities and results, methodology, quality assurance, interpretations, drilling programs, and metallurgy. MDA has relied on the data and information provided by Scorpio for the completion of this report, including the supporting data for the estimation of the mineral resources. In compiling the background information for this report, MDA relied on information provided by Scorpio and on other references as cited in Section 27.0, including Technical Reports by MDA on the San Rafael and El Cajón resources (Ristorcelli *et al.*, 2009) and on the Nuestra Señora deposit (Ristorcelli *et al.*, 2012).

MDA has reviewed much of the available data, has made site visits, and has made judgments about the general reliability of the underlying data. Where deemed either inadequate or unreliable, the data were eliminated from use or procedures were modified to account for lack of confidence in that specific information.

This report has been prepared by Thomas L. Dyer, P.E., Senior Engineer for MDA; Steven Ristorcelli, C. P. G., Principal Geologist for MDA; Paul Tietz, C. P. G., Senior Geologist with MDA; Michael Lindholm, C. P. G., Project Geologist with MDA; Pierre Lacombe, Eng. and a director of Scorpio; and Jack McPartland, Q.P.M., Metallurgist/V.P. Operations of McClelland Laboratories, Inc. The Mineral Reserve was calculated under the supervision of Mr. Dyer, who also supervised preparation of reserves and the PEA. The Mineral Resources were estimated and classified under the supervision of Mr. Ristorcelli, Mr. Tietz, and Mr. Lindholm. Peter Ronning, P. Eng., associate of MDA and an independent geological engineer, audited the databases and performed the evaluation of the quality assurance/quality control ("QA/QC") data for the Nuestra Señora deposit; Mr. Ristorcelli and Mr. Lindholm are taking responsibility for this work. Mr. Lacombe supervised the preparation of Section 13.1 on Mineral Processing and Metallurgical Testing of the Nuestra Señora deposit. Mr. McPartland supervised the preparation of Section 13.2 on Mineral Processing and Metallurgical Testing of the San Rafael and El Cajón deposits.

Mr. Dyer, Mr. Ristorcelli, Mr. Tietz, Mr. Lindholm, Mr. Ronning, Mr. Lacombe, and Mr. McPartland are qualified persons under NI 43-101. There is no affiliation between Mr. Dyer, Mr. Ristorcelli, Mr. Tietz, Mr. Lindholm, Mr. Ronning, and Mr. McPartland and Scorpio except that of an independent consultant/client relationship. Mr. Lacombe is a director of Scorpio and is not independent of Scorpio by applying all of the tests in Section 1.5 of NI 43-101.

The authors' mandate requires that they review and comment on substantive public or private documents and technical information listed in Section 27.0. The mandate also required on-site inspections and the preparation of this independent Technical Report containing the authors' observations, conclusions, and recommendations. MDA has made such independent investigations as deemed necessary in the professional judgment of the authors to be able to reasonably present the conclusions discussed herein.

Mr. Dyer made a site visit to Nuestra Señora, El Cajón, and San Rafael from June 4 to June 5, 2012 to review current underground operations, process plant operations, mining and processing costs, and productivity. Mr. Tietz made a site visit to San Rafael-El Cajón in January 29 through February 3, 2007, and again September 19 through September 21, 2007. Mr. Tietz and Mr. Lindholm visited the Nuestra Señora and San Rafael projects on September 27 through October 1, 2011 to review current drill programs, drilling/logging/sampling procedures, pertinent geology, and data availability. Mr. Ristorcelli, Mr. Lindholm, and Mr. Ronning visited the Nuestra Señora project on March 12 through March 20, 2012 and conducted the following activities: review of current drill programs and associated drilling/logging/sampling procedures; determination and modeling of relevant geology; collection and auditing of collar, survey, assay, and geology data and compilation of these data into the accepted database; compilation and evaluation of QA/QC data; and plotting of drill-hole data and Scorpio's geologic interpretations for metal-domain modeling. MDA also visited Scorpio's in-house laboratory, which, until recently, was processing the Nuestra Señora drill core and underground mine samples. Mr. Ristorcelli visited Nuestra Señora on June 28, 2012.

The effective date of the Nuestra Señora database on which the resource was previously estimated is February 20, 2012. The effective date of the previously reported Nuestra Señora resource estimate, the estimate on which the reserve presented herein is based, is June 22, 2012. The effective date of both the San Rafael and El Cajón databases on which the resources described in this Technical Report are estimated is July 20, 2012. The effective date of both the El Cajón and San Rafael resource estimates is September 7, 2012. The effective date of the new Nuestra Señora reserve and the PEA is December 31, 2012. The effective date of this report is December 31, 2012.

## 2.2 Frequently Used Acronyms, Abbreviations, and Units of Measure

In this report, measurements are generally reported in metric units. Unless otherwise indicated, all references to dollars ($) in this report refer to currency of the United States.

The following lists frequently used acronyms and abbreviations:

| | |
|---|---|
| AA | atomic absorption spectrometry |
| Ag | silver |
| Au | gold |
| Cu | copper |
| DC/IP | high-resolution, direct-current, resistivity and induced polarization geophysical survey method |
| DTM | digital topographic model |
| FA | fire assay |
| FDH | face-discharge hammer |
| g/t | grams per tonne |
| ha | hectare |
| ICP | inductively coupled plasma analytical technique |
| ICP-AES | inductively coupled plasma-atomic emission spectroscopy analytical technique |
| in | inches |
| km | kilometer |
| kv | kilovolt |
| kw | kilowatt |
| lb | pound (2000 lbs to 1 ton, 2204.6 lbs to 1 tonne) |
| m | meters |
| Ma | million years old |
| MDA | Mine Development Associates, the authors of this technical report |
| mwh | megawatt hour |
| MX$ | Mexican pesos |
| NPV | net present value |
| NSR | net smelter return royalty |
| oz | troy ounce |
| Pb | lead |
| PEA | Preliminary Economic Assessment |
| PRG | Platte River Gold |
| RC | reverse circulation drilling method |
| SAP | systems, applications and products data processing software |
| ton | short ton |

| | |
|---|---|
| t or tonne | metric tonne |
| tpd | tonnes per day |
| XRF | X-ray fluorescence |
| Zn | zinc |

# 3.0 RELIANCE ON OTHER EXPERTS

Section 4.0 of this report contains information relating to mineral concessions, mineral permits and licenses, environmental liabilities and permitting, regulatory matters, and legal agreements. While the authors have some understanding of these issues in the context of the mineral industry, they are not legal or regulatory professionals. For Section 4.0, MDA has relied entirely upon information provided by Scorpio and on other experts as cited and contracted by Scorpio. The information in the report concerning these matters is provided as required by Form 43-101F1 but is not an opinion, professional or otherwise, of the authors.

MDA has relied entirely upon Scorpio to provide information on the land area, concessions, agreements, and surface rights described in Sections 4.2, 4.3, and 4.4.

MDA has relied entirely upon Scorpio to provide information on the permitting and environmental liability aspects of the project in Sections 4.5 and 4.6, respectively, and on environmental studies, permitting, and social or community impacts described in Section 20.0 . The authors did not conduct any investigations of the environmental or social-economic issues associated with the Nuestra Señora, San Rafael, and El Cajón deposits, and the authors are not experts with respect to these issues.

As discussed in Section 2.1, the authors have relied on Peter Ronning, who audited the databases and performed the evaluation of the quality assurance/quality control ("QA/QC") data for the Nuestra Señora deposit; Mr. Ristorcelli and Mr. Lindholm are taking responsibility for this work.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

## 4.1 Location

The Cosalá mining district is located in the east-central portion of the state of Sinaloa, Mexico, near 106º 40'W longitude and 24º 29'N latitude, UTM zone 13; some of the concessions that form the property extend into adjacent Durango state. The San Rafael and El Cajón deposits are about 240km by road from Mazatlán and 12km north-northeast of the town of Cosalá. The Nuestra Señora deposit is located about 10km east of Cosalá and about 10km southeast of San Rafael. Figure 4.1 shows the property location. Figure 4.2 shows the locations of the Nuestra Señora, San Rafael, and El Cajón deposits that are the focus of this report.

**Figure 4.1 Location Map for the Nuestra Señora, San Rafael, and El Cajón Deposits**

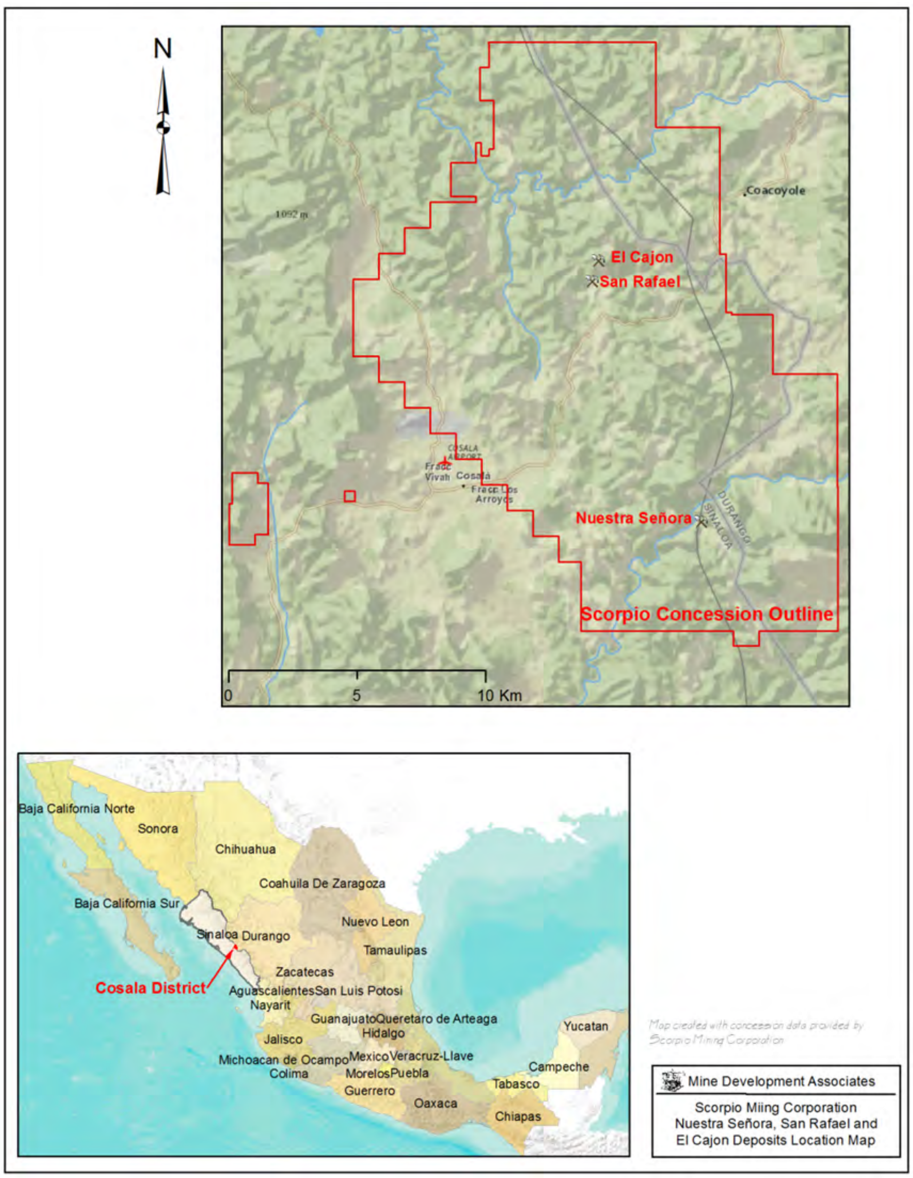
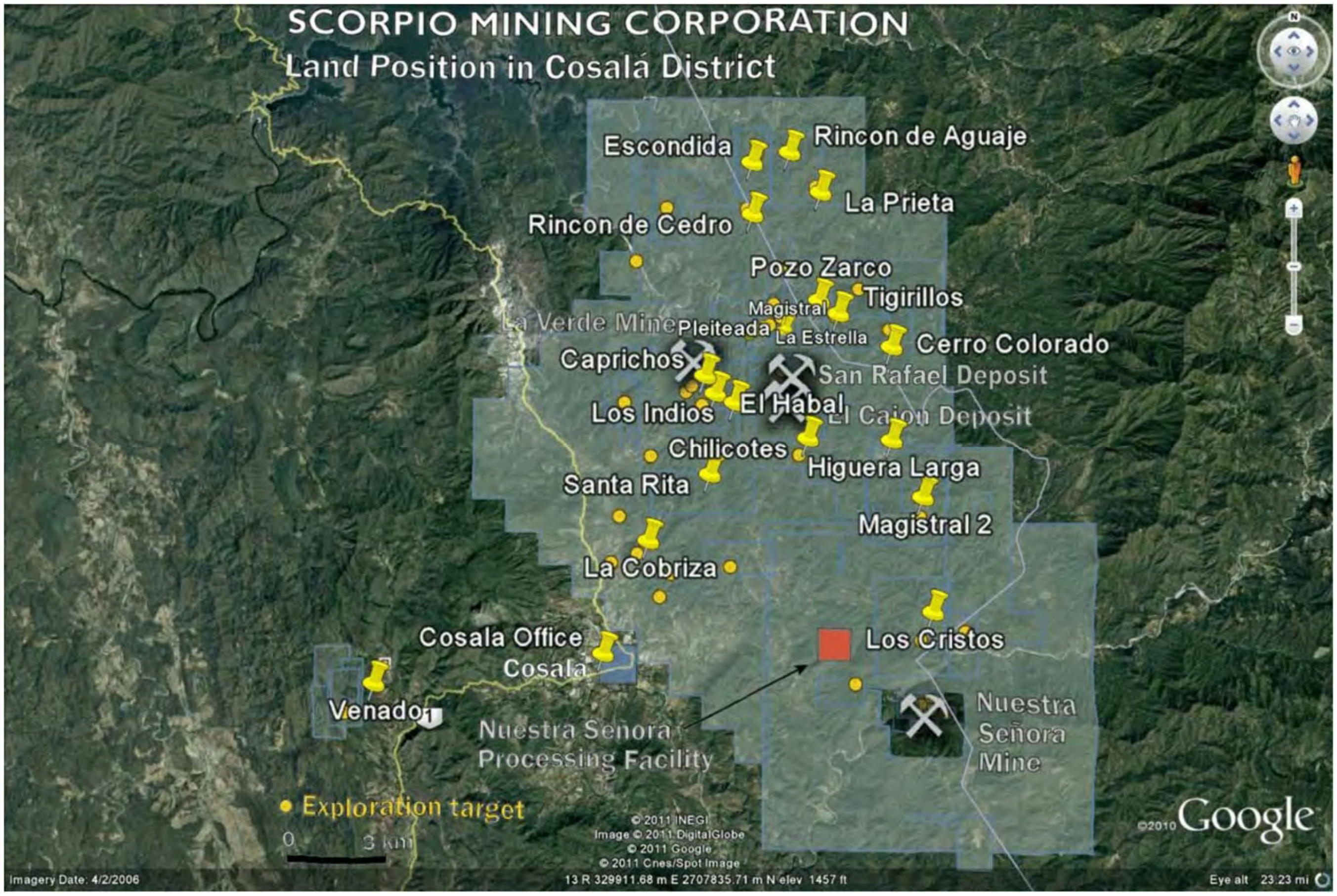


**Figure 4.2 Location of the Nuestra Señora, San Rafael, and El Cajón Deposits in the Cosalá District**




## 4.2 Land Area

MDA and the authors are not experts with respect to land and legal matters. The information presented in this section is based on information provided to MDA by Scorpio and from additional references as cited. MDA presents this land information to fulfill reporting requirements of NI 43-101. MDA is not qualified to present an opinion on the validity of the concessions or any leases or agreements and has relied on the descriptions in Sections 4.2, 4.3 and 4.4 as provided by Scorpio and other sources, which MDA has no reason to believe are not reliable.

Scorpio's property in the Cosalá mining district, including the Nuestra Señora, San Rafael, and El Cajón deposits, consists of 70 mineral concessions that cover approximately 26,819 hectares. The list of concessions is presented in Appendix A, and a concession map is given in Figure 4.3. Figure 4.4 shows detail of the concessions in the vicinity of the Nuestra Señora deposit, and Figure 4.5 shows detail in the vicinity of the San Rafael and El Cajón deposits. Scorpio has recently acquired a new concession of 1,000 hectares that is not yet registered, but this concession is not contiguous with the 70 mineral concessions just described and is not relevant to this PEA; it is not included on figures or the list of concessions in this report. Scorpio owns the concessions listed in Appendix A through its wholly owned subsidiaries, Minera Cosalá, S.A. de C.V. ("Minera Cosalá) and Minera Platte River Gold, S. de R.L. de C.V.

The concessions occur in two non-contiguous blocks as shown on Figure 4.3. Within both blocks are a number of areas of land that Scorpio does not control. One of the concession blocks not under Scorpio's control (Silvia Maria Title Number 147043; not the same concession also called Silvia Maria listed in Appendix A) lies immediately adjacent to the southwest boundary of the San Rafael deposit and also covers a significant portion of the El Cajón deposit. Approximately 7,000 tonnes of San Rafael reported resource (about 0.04% of the total resource) lies along the Silvia Maria concession boundary and could potentially lie within this ground not presently controlled by Scorpio. The El Cajón resource boundary abuts against the Silvia Maria concession boundary.

All concessions remain valid for 50 years from the date of title as long as the semiannual mining duties are paid and minimum annual work requirements are met. The mining duties are based on the number of years the concession has been held. Total, current, semiannual mining duties for the 70 concessions are approximately MX$1.90 million, payable to the Secretaría de Economía, Coordinación General de Minería, Dirección General de Minas. Scorpio reports that those payments are up to date. The current total minimum annual work commitment for all of Scorpio's Cosalá district concessions is approximately MX$31.90 million.

All of the mineral concessions have been legally surveyed by qualified and government-approved surveyors. The surveys have been registered with the titles at the Department of Mines in Mexico City and are in compliance with Mexican mining laws.

## 4.3 Agreements and Encumbrances

Five of the 70 concessions – El Cajón, El Cajón 2, El Magistral, La Escondida, and Simon – are subject to a 1.25% net smelter return ("NSR") royalty payable on future production to a subsidiary of Grupo Mexico. The Nuestra Señora, San Rafael, and El Cajón resources do not extend onto any of these five concessions.

## 4.4 Surface Rights

Scorpio's predecessor, PRG, purchased the surface rights to 253 hectares that overlie the main areas of mineralization at San Rafael and El Cajón. The cost of the surface rights was US$172,500 and was paid to the *ejido* Higuera Larga. *Ejidos* are registered communal organizations that own much of the surface rights to rural land in Mexico.

While the transfer of title for that land was being ratified, a Presidential decree changed the transfer process for all *ejido* lands in Mexico. The new process requires the approval of Secretaría de Medio Ambiente y Recursos Naturales ("SEMARNAT") prior to title transfer of *ejido* lands. As a consequence of that decree, during 2011 SEMARNAT rejected the title transfer to PRG of the 253 hectares at San Rafael and El Cajón. Although a legal challenge to this rejection is available, Scorpio chose to negotiate an alternative land access agreement with the *ejido* to grant temporary use of the land for a period of 30 years and includes the establishment of mining and processing operations. Negotiations successfully incorporated an additional 174.3 hectares from Higuera Larga and 49.4 hectares from the *ejido* Los Molinos immediately adjacent to the original area for an additional $250,000. These land access agreements have been registered with the national agrarian authority.

In late 2006, Minera Cosalá through its employee Cesar Lemas purchased 118 hectares of surface lands situated 3km northwest of the Nuestra Señora property, as a location for the processing plant facility and tailings pond, from the *ejido* of the Cosalá area. In 2007, the ejido's main assembly meeting granted Mr. Lemas full domain over the lands. Mr. Lemas then granted to Minera Cosalá an irrevocable power of attorney allowing Minera Cosalá to act as Mr. Lemas's designee to process the transfer of the land title. On January 26, 2009, the title to the surface lands was issued in the name of Cesar Lemas. The subsequent transfer of the title to these surface lands from Cesar Lemas to Triturados Noroeste S.A. de C.V. was completed in December 2009, and the lands were then immediately transferred to Minera Cosalá. These transactions were registered and confirmed with the government authorities on February 26, 2010.

Scorpio has a surface land agreement with the University of Sinaloa that covers the Nuestra Señora and Santo Domingo deposits. The deposits are covered by an ecological reserve owned and managed by the University. This agreement allows Scorpio to conduct exploration and mining activities on the concessions owned by Scorpio and covered by the agreement. Scorpio's access road used for haulage goes through the reserve and is the major issue addressed in the access agreement.

Figure 4.3 shows the access and surface rights controlled by Scorpio. Figure 4.4 and Figure 4.5 show detail around the Nuestra Señora and the San Rafael and El Cajón resource areas, respectively.

# Figure 4.3 Scorpio Property Concession Map

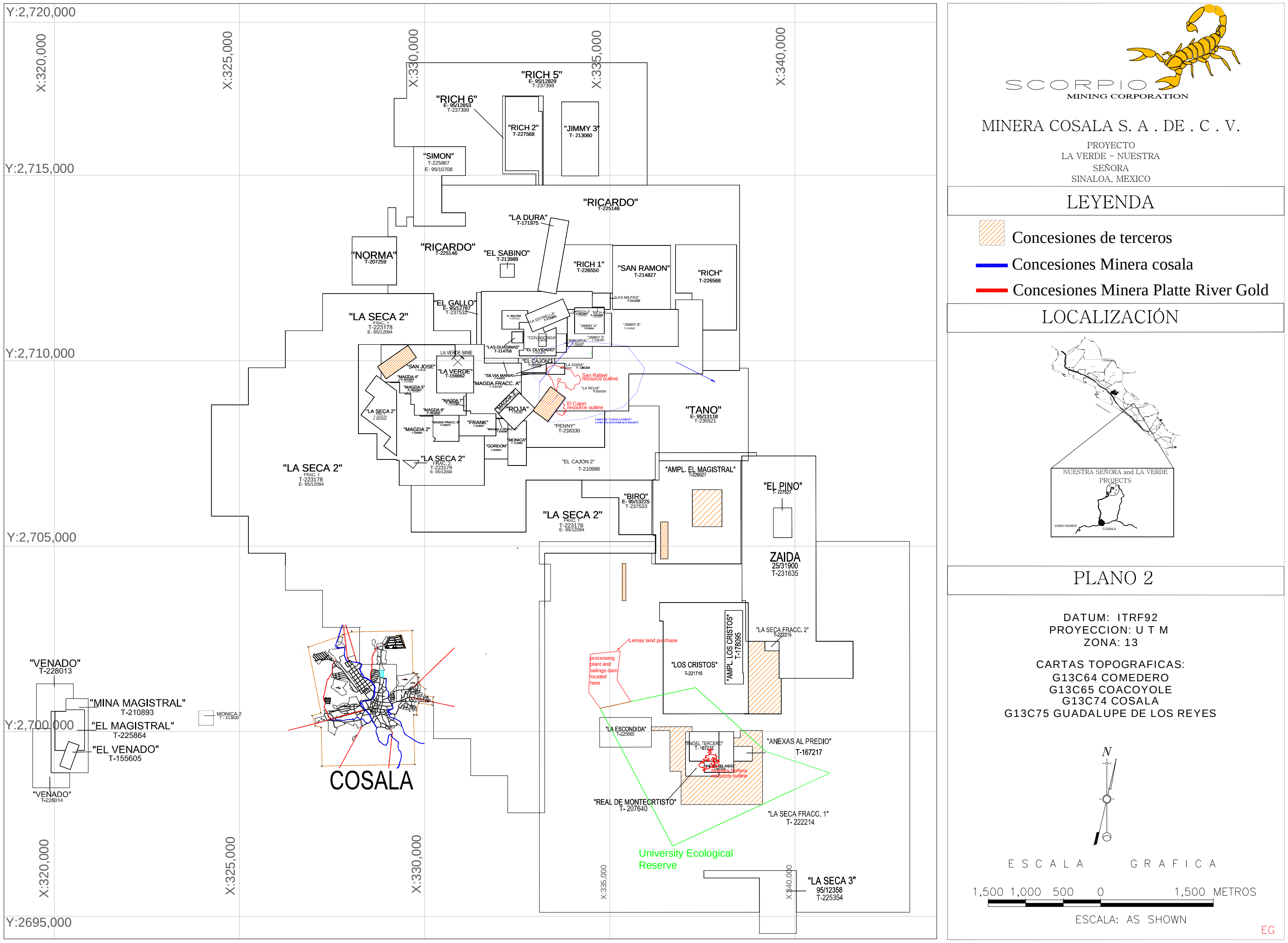


**Figure 4.4 Nuestra Señora Concession Map – Detail around Resource Area**

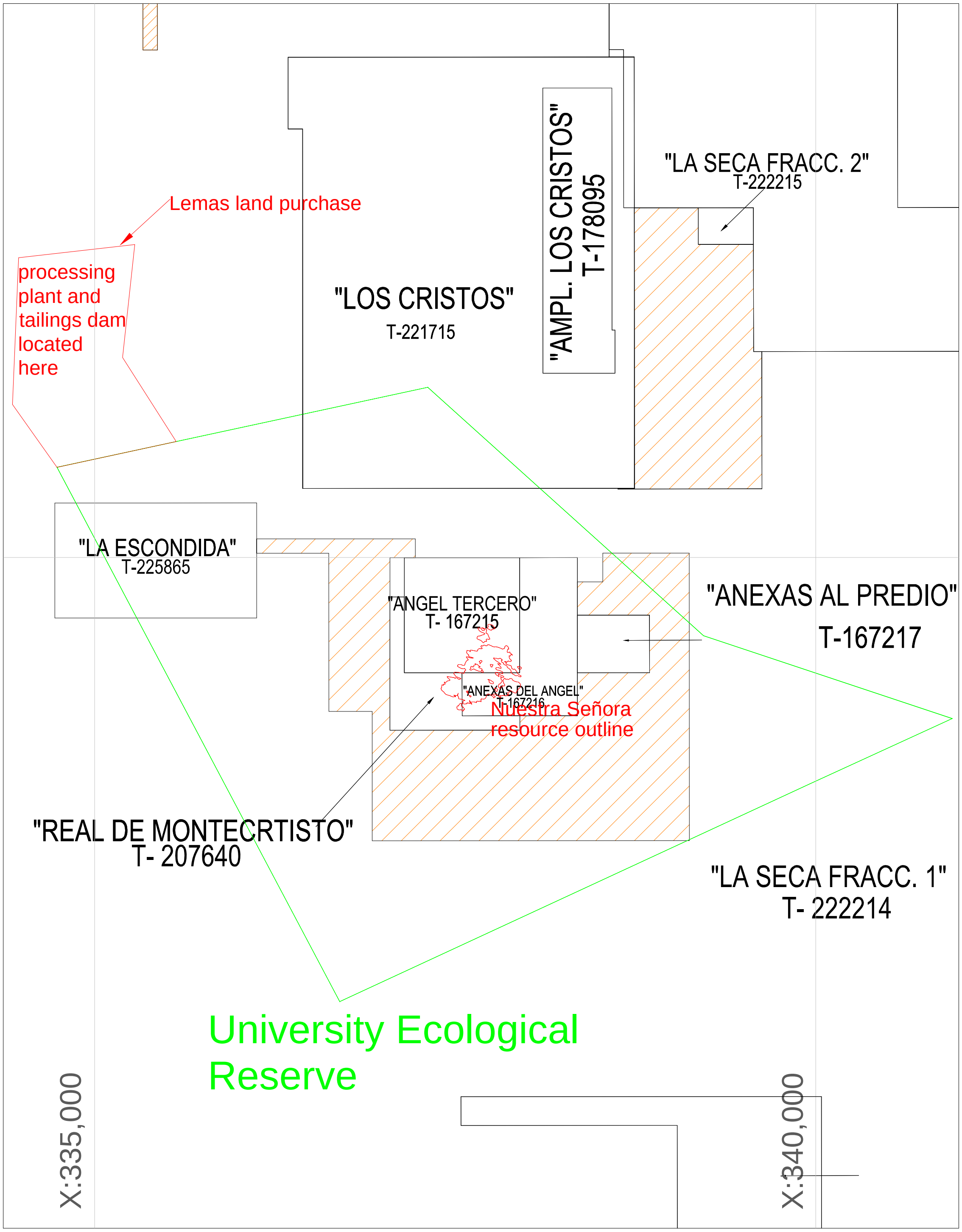
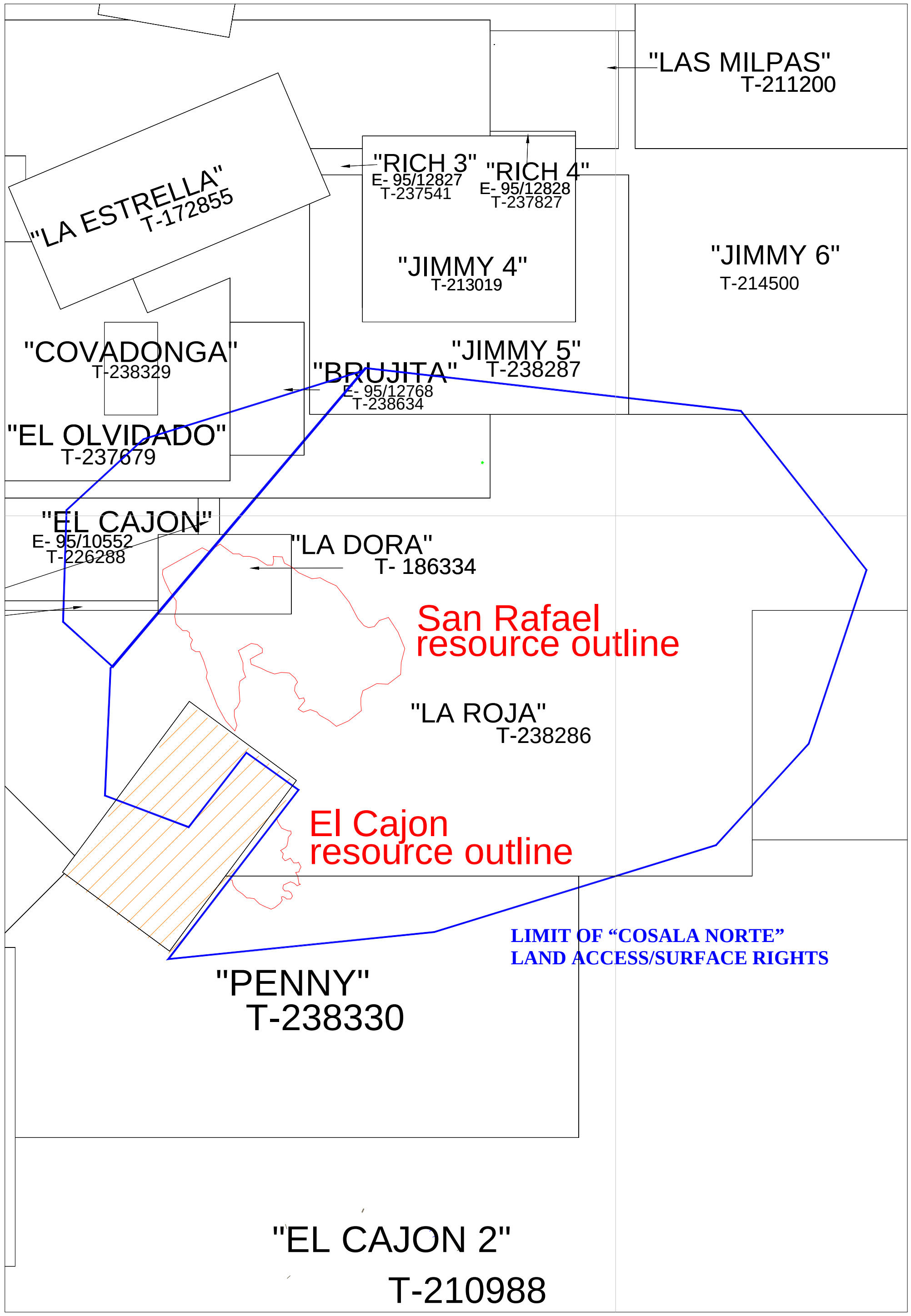


**Figure 4.5 San Rafael and El Cajón Area Concession Map – Detail around Resource Areas**




## 4.5 Environmental Permitting

MDA did not conduct any investigation of the environmental or social-economic issues associated with the Nuestra Señora, San Rafael, and El Cajón deposits, and the authors are not experts with respect to these issues. For Sections 4.5.1 and 4.5.2, MDA has relied upon information provided by Scorpio. The information in the report concerning these matters is provided as required by Form 43 101F1 but is not an opinion, professional or otherwise, of the authors.

### 4.5.1 Nuestra Señora

Scorpio's activities related to its Nuestra Señora-San Rafael-El Cajón deposits are subject to regulation by SEMARNAT, the environmental protection agency of Mexico. Regulations require that an environmental impact statement, known in Mexico as a Manifesto Impacto Ambiental ("MIA"), be prepared by a third-party contractor for submittal to SEMARNAT. Studies required to support the MIA include a detailed analysis of the following areas: soil, water, vegetation, wildlife, cultural resources and socio-economic impacts. Proof of local community support for a project must also be provided to gain final approval of the MIA.

Environmental legislation provides for restrictions and prohibitions on spills, releases, or emissions of various substances produced in association with certain mining industry operations, such as seepage from tailing disposal areas, which would result in environmental pollution. A breach of such legislation may result in the imposition of fines and penalties. In addition, certain types of operations require the submission and approval of environmental impact assessments. Environmental legislation is evolving in a manner which means stricter standards and enforcement. Fines and penalties for non-compliance are more stringent.

Although managed by different departments within SEMARNAT, and as a pre-requisite to the approval of the MIA, separate approvals are also required whenever the surface is modified from its existing state and when activities interfere with water flows. The approval for "change of soil use" is regulated by the Forestry Department, and water impacts are regulated by the Comision Nacional de Agua ("CONAGUA").

During the evaluation process of each MIA, SEMARNAT may request further information required for its assessment or may deliver notice that it requires more than the stipulated review time to complete its evaluation. At the conclusion of this process, SEMARNAT issues a resolution that either rejects or approves the proposed project. In the case of rejection, a list of deficiencies will be detailed that would require correction in future MIAs. In the case of approval, the resolution will detail the compliance criteria and restrictions under which operations may proceed.

The MIA for exploration and mining of the Nuestra Señora deposit was submitted to SEMARNAT and approved on July 18, 2005. The approval allows Scorpio's subsidiary, Minera Cosalá, to conduct exploration and mining activities on the El Angel Tercero, Anexas del Angel, and Anexas al Predio exploitation concessions for a period of 10 years. Under the terms of the MIA, Minera Cosalá could initially extract 27,000 tonnes of waste per month and 650 tonnes of ore per day during the developmental stages, but with no limit to ore capacity as production grew.

The MIA for the construction and operation of the Nuestra Señora processing plant was approved on February 1, 2007 with a 1,000 tonnes per day treatment rate. Prior to production commencing, a modification was sought and then approved on March 5, 2008 to raise the processing capacity to 2,000 tonnes per day. A further modification of the plant's capacity to 4,000 tonnes per day was approved on June 7, 2012, which paves the way for an expansion of the existing facility.

Since the granting of each MIA and modification, Scorpio has observed all compliance criteria and holds them in good standing. Other necessary permits held in good standing include:

- explosives permit;
- explosives transport permit; and,
- permit for transportation of specialized and dangerous materials.

### 4.5.2 San Rafael and El Cajón

In accordance with new environmental laws, on December 14, 2012, an MIA was submitted to SEMARNAT for ongoing exploration activities at El Cajón. A request for additional information was received from SEMARNAT on January 25, 2013, and this information was submitted on March 4, 2013.

An MIA for the underground exploitation at El Cajón and San Rafael was submitted to SEMARNAT on November 26, 2012. A request for additional technical information was received from SEMARNAT on February 18, 2013, and this information was submitted on April 5, 2013.

On December 14, 2012, the Justifying Technical Studies (*Estudio Técnico Justificativo*, "ETJ") for the change of land-use permits for exploration and exploitation at El Cajón and San Rafael were submitted to SEMARNAT. Requests for additional technical information and clarification were received on January 31, 2013; such information was submitted to SEMARNAT on February 22, 2013 and is currently under review by that authority.

## 4.6 Environmental Liability

For Sections 4.6.1 and 4.6.2, MDA has relied upon information provided by Scorpio. The information is provided as required by Form 43 101F1 but is not an opinion, professional or otherwise, of the authors.

### 4.6.1 Nuestra Señora

Scorpio assesses its provision for environmental rehabilitation on an annual basis or when new material information becomes available. Mining and exploration activities are subject to various laws and regulations governing the protection of the environment. In general, these laws and regulations are continually changing, and Scorpio has made, and intends to make in the future, expenditures to comply with such laws and regulations. Accounting for environmental rehabilitation requires management to make estimates of the future costs that will be incurred to complete the rehabilitation work required to comply with existing laws and regulations at each mining operation.

Although future changes to environmental laws and regulations could increase the extent of rehabilitation work required to be performed by Scorpio, the current provision of $2,931,500 represents management's best estimate of the undiscounted value for environmental rehabilitation. These asset retirement obligations are not expected to be paid until several years in the future and are intended to be funded from cash balances at the time of the mine closure.

Under its land access agreement with the University of Sinaloa ("UAS"), and by mining law, Scorpio is protected from any environmental liabilities pertaining to Asarco's infrastructure and tailings at Nuestra

Señora since they were present prior to Scorpio and Minera Cosalá becoming involved with the property in 1998.

### 4.6.2 San Rafael and El Cajón

The following information has been taken from MDA's 2009 Technical Report (Ristorcelli *et al.*, 2009), which is still current, according to Scorpio.

Scorpio has not completed, either internally or through a third-party consultant, a complete review of the environmental hazards at San Rafael or El Cajón. The project area is typical of many strongly mineralized areas in Mexico in which there are numerous prospects and small mines. These areas of historic disturbance often contain small dumps (many sulfide-bearing), small pits (generally less than 25,000 tons), and a number of adits. Such workings are present at most of the exploration targets in the vicinity, such as Magistral, La Bufa, Parian, El Cajón, San Rafael, Los Manueles, San Antonio, and also others that have been visited by Scorpio geologists.

Within the concessions controlled by Scorpio, one significant abandoned historic mine site is present. La Estrella mine, located northwest of the San Rafael mineralized area (Figure 4.2) was operated by Asarco into the 1950s and later by a Mexican owner. A small open pit and unknown amounts of underground workings are present at the site. Most of the dumps have since been removed and processed. Tailings remain from the mill that was present at the site when the mine was in operation. The mill has also been removed.

Scorpio reports (electronic communication, March 28, 2013) that there are no environmental liabilities at La Verde because it is an operation grandfathered from times prior to environmental regulation.

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

## 5.1 Access

The Nuestra Señora mine site is accessible from the town of Cosalá via a rural dirt road that can accommodate standard highway vehicles. Another dirt road connects that road with the plant and tailing sites. A bridge capable of supporting a load of 40,860kg has been constructed across the Habitas River to ensure there will be no disruption to the operation during times of flooding. The San Rafael and El Cajón resource areas are accessible from the town of Cosalá via a rural paved and then dirt road for a total of 15km. Both of these roads can accommodate standard highway vehicles.

The Pacific coast highway is located 55km to the west of the project, and 18km further west are the toll highway and the railroad. The toll road connects Mazatlán with Los Mochis and Nogales, situated at the Mexican/US border.

A small airport at the edge of Cosalá serves the mountain towns and large ranches of the Sierra Madre. Chartered flights are available to both Mazatlán and Culiacán. Daily buses run from Cosalá to the main coast highway, where connections can be made to reach all the major cities in Mexico.

## 5.2 Climate

The climate ranges from subtropical to high coastal arid, with rainfall averaging 18 inches per year. Rainfall occurs most commonly from mid-June to late October, usually as intense thunderstorms which last for several hours. Until the end of November, occasional tropical to hurricane-strength storms originating in the Pacific Ocean, or westerly over the Sierra Madre Mountains from the Caribbean, can cause severe flooding which may temporarily isolate the area.

The weather does not impact on Scorpio's exploration and development activities except that during severe thunderstorms operations may be suspended temporarily, usually less than a couple of hours, for safety reasons. The exception is for surface drill programs taking place within the canyon. The Habitas River is susceptible to flash flooding during the rainy season, and consequently for safety reasons, surface drilling within the canyon is suspended during times of heavy rain. The mining activities at Nuestra Señora and transporting of the ore to the plant site are not affected by the flooding, since the mine entrance and the bridge over the Habitas River connecting the mine portal to the access road are higher than the level of flooding.

## 5.3 Local Resources and Infrastructure

The town of Cosalá, with its population of over 17,000, supplies the project with a sufficient labor force to fulfill both its present needs and any requirements in the foreseeable future. Cosalá is the business, education, and governmental center for the region. Rural families subsist on small farms and ranches scattered throughout the area. Modern schools are present, teaching through Grade 12, and the University of Sinaloa campus in the town of Cosalá offers post-secondary education. The town has internet facilities, both as internet cafes and in private connections. Post offices and telephone services are available; cellular telephones are widely used. The Banamex Bank has a branch office providing banking and electronic services. A local hospital can treat minor trauma, although for more serious medical problems one must go to Mazatlán or Culiacán, both cities a two-hour drive from Cosalá.

The ports of Mazatlán, 160km to the southwest, and Los Mochis, 300km to the northwest, are both capable of handling bulk materials as well as containers. Scorpio currently transports zinc and copper concentrates from the Nuestra Señora mine by road to Manzanillo for transport by sea freight. Several metal-trading companies now have significant infrastructure in Manzanillo to handle, store, and ship concentrates (de Corta, 2011). Lead concentrate is currently sold to a Mexican smelter, operated by Peñoles, and is transported by road to Torreon (de Corta, 2011).

Comisión Federal de Electricidad is the supplier of electricity for Mexico. There is a hydroelectric power plant at the Comedero reservoir with a rated capacity of 100 megawatts, which supplies electricity to Cosalá. A 34.5kv power line provides electricity from the power plant to the processing plant at Nuestra Señora; this line was extended to the Nuestra Señora mine and was activated in January 2011.

The following information on water is taken from the 2011 Genivar Technical Report (de Corta, 2011). Water rights are controlled by the Comisión National del Agua. The Nuestra Señora/Cosalá area is considered to have excess water supplies and has been designated a "Zona de Libre Alumbramiento" – a free water exploitation zone. No permits are required to drill wells for the extraction of water. However, according to the current legislation, individuals or companies must pay for the use of the national waters regardless of how the rights were obtained. These rates are determined by its availability and the method of extraction.

The Habitas River, which runs all year, is located in a steep-sided canyon approximately 200m deep which traverses the Nuestra Señora area.

Dewatering of the Nuestra Señora workings was completed in November 2006. Waste water from the current mine operations is being re-cycled, with only minor amounts being discharged. This water is monitored to ensure it conforms to Canadian and Mexican environmental standards.

In 2004, Scorpio purchased the decommissioned San Manuel 1,500 tpd plant in Arizona from Phelps Dodge and in late 2006 began to move it to Cosalá. Scorpio also purchased additional plant components, including a 500 tpd ball mill. Commercial production of the plant at Cosalá began in January 2009.

## 5.4 Physiography

The three resource areas lie within the western foothills of the Sierra Madre Occidental, and the project area topography, especially at San Rafael, is rugged and steep. The project elevation ranges from 350 to 1,000m above mean sea level with about 350m of relief within the immediate San Rafael area. The Nuestra Señora portal is located at the bottom of the steep-sided Habitas River canyon at an elevation of about 360m above sea level. The nearby Santo Domingo and Santa Teresa mines are also in the canyon bottom, but the Candelaria mine is located above the canyon at an elevation of 485m above sea level. The town of Cosalá lies at an elevation of about 325m above sea level.

Incised perennial drainages cut through the property, and stream flows are highly variable depending on time of year. Drainage channels are often used for local access, although during the rainy season, many drainages become impassable due to high water flow. The slopes are brush and tree covered making cross-country travel difficult, particularly during the rainy season.

# 6.0 HISTORY

The Cosalá mining district's mining and exploration history is summarized from an internal company report (PRG, 2006a) with additional information from Henriksen (2004), Spring and Breede (2008), and de Corta (2011). (*Note, it is unclear if the "tpd" used by PRG (2006a) refers to metric tonnes or short tons per day*).

## 6.1 Exploration and Mining History

### 6.1.1 Nuestra Señora Area

The Cosalá district was discovered and locally worked by the Spanish approximately 400 years ago with production of enriched silver ore from the upper levels of the Nuestra Señora mine; however, no records of any kind remain from their activities. At the turn of the 19$^{th}$ century, French engineers through Negociación Minera La República reportedly developed and worked the Nuestra Señora mine with a 10-stamp mill that produced 800 to 1,000kg of silver per month. Activities in the area may have been halted after the 1910 Mexican Revolution.

In 1949, Asarco Mexicana ("Asarco") purchased the Nuestra Señora mine and property and carried out exploration and development, putting the property into production in 1954. Ore was mined from four deposits (Nuestra Señora, Santo Domingo, Candelaria, and Santa Teresa), all within 200m of each other, with most of the production coming from the Nuestra Señora mine down to the 8th level. The Ag-Zn-Pb-Cu-Au ore was processed in a 450tpd flotation plant. Asarco also mined some similar material from the La Estrella mine north of San Rafael. In addition, Asarco did some work at El Cajón, sending the material to the mill at La Estrella.

According to Henriksen (2004), "*The actual tonnage and grade of ore taken from the Nuestra Señora mine is estimated from mine level maps, the ASARCO database and conversations with the former mine manager, Mr. Andre Coumides. According to these sources, the ASARCO mill operated at 450 tonnes per day and achieved recoveries of 90% of the silver and lead and 65% of the zinc, with the total ore processed by ASARCO being approximately 1.5 million tonnes. The average mined-grade of the Nuestra Señora deposit is estimated at 350 g/t Ag, 8% Zn, 0.5% Cu, 3.5% Pb and 0.5 g/t Au based on ASARCO's historical documents.*"

Asarco mined approximately 150,000 tonnes of material at Candelaria from three stopes between the 0-level and the +50-level (Henriksen, 2004). Based on Asarco's data, the estimated mined grade of this material was about 750g Ag/t, 6.5% zinc, 2.8% copper, 3.5% lead, and 1 g Au/t (Henriksen, 2004).

Asarco mined no more than 50,000 tonnes from an underground stope at Santo Domingo, located at river level. The estimated average grade of this material was about 200g Ag/t, 8% zinc, 0.8% copper, 3% lead, and 1 g Au/t (Henriksen, 2004).

About 20,000 tonnes of material were mined from an open cut on the surface at Santa Teresa (Henriksen, 2004).

In or about February 1965, Asarco ceased production from Nuestra Señora, presumably because of anticipated Mexican government policies (Spring and Breede, 2008). Asarco subsequently removed all of the mining equipment. Asarco let their concessions lapse in 1980. The Genivar Technical Report (de

Corta, 2011) notes that Nuestra Señora mine records and exploration drilling by Asarco indicate that mineralization remains unexploited from the 8th to 10th levels and extends below the development. The stope definition drilling done on the 8th, 9th, and 10th levels of the Nuestra Señora is recorded on level plans and sections together with assay intervals and values. Asarco's drill core is gone, and Asarco's drill logs were said to be incomplete (Henriksen, 2004). No documentation in the form of assay certificates, drill logs, or drill core is available to Scorpio (de Corta, 2011).

Jorge Amador Solis acquired the El Angel Tercero, Anexas del Angel, and Anexas al Predio concessions in 1980 following Asarco's departure. There was no exploration drilling or geologic activity in the Nuestra Señora area from 1965 until 1991, when the Consejo de Recursos Minerales, (Mexican government mineral division) drilled three core holes beneath Santo Domingo, intersecting narrow widths of mineralization (de Corta, 2011). Some small-scale mining occurred sporadically from 1980 until 1992 in the Nuestra Señora area, but no records of these activities were filed.

In 1996, LMX Resources Ltd's wholly owned Mexican subsidiary Minera LMX S.A. de C.V. (collectively "LMX") optioned the Nuestra Señora property from the owners (the family of the late Jorge Amador Solis) and began an extensive program of sampling the accessible underground stopes and workings of the four mines (Nuestra Señora, Santo Domingo, Candelaria, and Santa Teresa). Under a contract with the Amador family, LMX committed to a program of exploration and eventual exploitation, if warranted. LMX, however, did not initiate an exploration drill program or geological mapping and geophysical surveying. In late 1997 and early 1998, the contract with LMX was transferred to Tower Consulting and then to Scorpio via its Mexican subsidiary, Minera Escorpion S.A. de C.V. Scorpio acquired the right to earn 100% interest in the Nuestra Señora property in 1998 and began an exploration program there in 1999 (de Corta, 2011). Scorpio's exploration at Nuestra Señora is described in Section 9.1. On December 15, 2003, Scorpio transferred the Nuestra Señora property to another of its wholly owned subsidiaries, Minera Cosalá S.A. de C.V. In 2004, Minera Cosalá S.A. de C.V. purchased the El Angel Tercero, Anexas del Angel, and Anexas al Predio concessions from the family of the late Jorge Amador Solis.

Scorpio began underground mine development at Candelaria in 2004 and in the Nuestra Señora Main Zone in 2005. The plant components were moved on-site from San Manuel, Arizona, starting in 2006, and the plant began producing concentrates in 2008.

### 6.1.2 San Rafael-El Cajón Area

As mentioned in Section 6.1.1, Asarco operated the La Estrella mine north of San Rafael and did some work at El Cajón (see Figure 4.2) during its tenure on the property from 1949 to 1965. In 1965, the Gaitán family worked the La Estrella mine and developed a small open-pit operation around the area previously mined by Asarco. About 50 men were employed to produce 150tpd, and the material was trucked to an 80 to100tpd plant owned by Minera Reyna del Cobre (the Gaitán family) and located 100km from Cosalá at La Minita. The silver-lead and zinc concentrates were trucked to the Industrias Peñoles, S.A. de C.V ("Peñoles") smelter in Torreon, Coahuila.

At about the same time, the small El Mamut and La Verde mines (both Ag-Cu-Au) were operated by Messrs. Vicente Cortez, Alonzo Cortez, and Jaime Garriaga, using some of the Asarco infrastructure. The El Mamut mine, located in what is now the El Cajón mineralized area, had also apparently been tested by Asarco with three diamond drill core holes ("core"). The data on these core holes are not available to Scorpio or MDA. The Cortez and Garriaga families produced approximately 10 to 15tpd from the mines and shipped the ore to the Gaitán mill at La Minita.

During the summer of 1973, fieldwork was completed by Duane Allen Cibula towards his Master of Science Degree in the Department of Geology at the University of Iowa. His thesis titled "*The Geology and Ore Deposits of the Cosalá Mining District, Cosalá Municipality, Sinaloa, Mexico*" was completed and published in 1975. The thesis emphasized the stratigraphy, structure, and mineralization in the district and was financed by Consejo de Recursos Minerales no Renovables.

In the late 1970s or early 1980s, a subsidiary of Peñoles explored the area around La Estrella mine and El Cajón area and reportedly completed some drilling around La Estrella. They subsequently abandoned their interest in the area. At the same time, Mr. Enrique Gaitán constructed a 100tpd plant near La Estrella mine to process material from that deposit, as well as from La Profesora, a small mine about 0.5km to the southeast. In the early 1980s, Mr. Gaitán moved the plant to the town of Cosalá, supposedly due to his relationship with the *ejido* that owned the surface in the area and also to procure a more consistent water source.

In 1985, Mr. Jaime Guinea Gonzalez acquired the rights to the La Verde mine concession, from which he processed 50 to 80tpd of dump material and also signed an option to purchase the Gaitán plant in Cosalá. Mr. Guinea developed two new cross cuts to intercept the La Verde zone and increased production to about 190tpd.

Minerales para la Industria, S.A. de C.V. signed an exploration agreement in 1987 with Mr. Guinea and Minera Humaya S.A. de C.V. ("Humaya"), a company controlled by him, and completed mapping and sampling in the area around the La Verde mine and the El Cajón and La Estrella areas. The results of their work were not sufficient to continue in the district. Mr. Guinea subsequently completed 12 reverse circulation ("RC") drill holes along the La Verde zone, and production over the ensuing years was increased to approximately 200tpd. He also acquired substantial additional concessions in the area at this time.

In the middle of 1995, Minas de Oro Hemlo, S.A de C.V. ("Hemlo"), subsidiary of Hemlo Gold Mines Inc., the first company to show interest in the San Rafael-Los Manueles areas located northwest of San Rafael, signed an exploration agreement with Mr. Guinea and Humaya. After six months of intense mapping and sampling in those zones, Hemlo decided to build a new road to explore a stockwork zone of Au-Ag mineralization hosted in the rhyolite that overlies the San Rafael base-metal mineralization. On the basis of encouraging rock-sample geochemistry, Hemlo drilled 15 RC holes in 1997 in the San Rafael area and encountered local Au-Ag mineralization in the rhyolite. Scorpio has copies of drill logs and assays, though none of the data is in digital form. Hemlo's data were not used for the current resource estimate due to QA/QC concerns and a general lack of documentation. Hemlo's drilling targeted the high-level gold and silver mineralization that overlies the massive-sulfide base-metal mineralization, though a number of holes were drilled deep enough to encounter the base-metal zone. Nine holes contained sample intervals assaying greater than 1% Pb and Zn, while three of these holes had 10m or greater drill intervals that assayed >40g Ag/t and over 1% Pb and Zn. The base-metal assay technique employed by Hemlo had an upper limit of 1%, and further analyses were not conducted on the samples whose results exceeded the upper limits. All of the Hemlo holes which encountered sulfide mineralization were later twinned by PRG. A few of the holes were drilled deep enough to discover the buried massive-sulfide base-metal mineralization that is the current focus of Scorpio's drilling.

However, since Hemlo was primarily interested in gold and silver and also had unrelated legal issues, they did not continue work in the area.

Early in 1997, Mr. Guinea and Humaya signed an option agreement for the property in the San Rafael-El Cajón-La Verde area with Golden Panther, a Canadian junior company. This agreement included all of the claims staked by Humaya (~11,000 hectares), as well as the plant and the offices and houses located in Cosalá. Golden Panther carried out an induced polarization ("IP")-resistivity geophysical program over the La Verde mineralization and completed three core holes, two of which attempted to intercept the mineralization beneath the deepest workings of the La Verde mine. A cross cut was developed to intercept another mineralized structure but was stopped short of the area of interest. Along with the exploration program, Golden Panther increased the capacity of the plant in Cosalá to 450tpd. Golden Panther abandoned the project the following year.

In 1999, Peñoles signed a letter of intent with Mr. Guinea for the San Rafael-El Cajón-La Verde area. Peñoles conducted fieldwork on the project but did not continue with additional work.

In early 2000, Grupo Industrial Minera Mexico S.A. de C.V. ("IMMSA") expressed interest in the San Rafael-El Cajón-La Verde property and made a verbal agreement with Minera Real de Cosalá S.A de C.V. ("MRC"), a new company controlled by Mr. Guinea's wife and daughters. During this time, IMMSA staked three claims within the main claim block that had been allowed to lapse by MRC. After several months, IMMSA declined to pursue its interest in the area, but they kept their concessions. One of IMMSA's concessions is located immediately northwest of the San Rafael mineralized area.

Noranda Exploraciones Mexico, S.A. de C.V. ("Noranda") started negotiations and later signed two option agreements at the end of 2000 with Mr. Guinea and MRC. One agreement was for the La Verde mine area, and the second was for the La Estrella-San Rafael-El Cajón area. Three IP-resistivity lines were completed over the San Rafael zone in the area of the previous Hemlo drilling. A significant IP anomaly was identified that coincided with the base-metal mineralization encountered in several of the Hemlo holes. Noranda subsequently drilled seven vertical core holes totaling 1,347.5m in 2001. Scorpio has digital assay, collar, and summary geology data but no hard-copy data. The Noranda drilling targeted the base-metal mineralization encountered in the deeper Hemlo drill holes. Two of the more significant Noranda drill intercepts are 36.8m assaying 43.8ppm Ag, 1.54% Pb, and 4.06% Zn (drill hole SR-01-01 from 48.7 to 85.4m) and 23.3m assaying 45.0ppm Ag, 1.24% Pb, and 3.23% Zn (drill hole SR-01-03 from 116.5 to 139.8m). The results of Noranda's drilling confirmed the presence of the massive-sulfide mineralization, but the size potential was believed to be small, and Noranda abandoned their interest in the property in 2001. Five of the seven Noranda holes were subsequently twinned by PRG. As with the Hemlo data, the Noranda drilling was not used in MDA's 2009 resource estimate for San Rafael and El Cajón because of QA/QC concerns and a general lack of documentation.

PRG became interested in the San Rafael-El Cajón-La Verde property in early 2004. On June 1, 2004, PRG, through its Mexican subsidiary, signed a four-year option agreement for 100% of the exploration and mining concessions owned by MRC along with all of the infrastructure and mining equipment used at the La Verde mine and project area but excluding the processing plant in Cosalá. PRG completed payments and acquired the property in 2008. PRG acquired an additional three concessions from MRC in 2006 and also filed an additional 19 concessions between 2005 and 2008. PRG's exploration is described in Section 9.2. The previous work by Noranda and Hemlo guided PRG's drill program, and any of the previously drilled mineralized holes were twinned by PRG.

On July 1, 2008, PRG, through its Mexican subsidiary, signed a three-year option agreement with MRC to purchase MRC's processing plant in Cosalá and associated infrastructure. That option was fully paid in May 2011.

On January 1, 2009, PRG signed a three-year option agreement with Contratista de Obras Mineras, S.A. de C.V. ("COMSA"), a Mexican contract-mining company, to sell the Cosalá processing plant. COMSA completed its option payments in June 2011. The registering of title transfers from MRC to PRG and then to COMSA is still in process.

As of 2006, the La Verde mine had produced about 1.5 million tonnes of ore, and for the 18 months through January 2006, the average grade had been 152g Ag/t and 0.53% Cu (Armbrust and Chlumsky, 2006). In January 2009, the operation of the La Verde mine was leased to COMSA. That lease agreement allowed COMSA to extract ore from the La Verde mine and process it at the processing plant in Cosalá. Concentrate sales had a royalty paid to PRG. The La Verde mine operating lease was terminated in February 2011, by which time COMSA had excavated and processed 281,000 tonnes with grades of approximately 114g Ag/t, 0.46% Cu, and 0.10g Au/t. The La Verde portion of Scorpio's property is not part of the resources described in Section 14.0.

Scorpio acquired all of the outstanding shares of PRG effective April 1, 2010, thereby acquiring the San Rafael-El Cajón-La Verde property. Scorpio's exploration in this area is described in Section 9.2, and their drilling is described in Section 10.2.

On March 16, 2011, Scorpio acquired five mineral concessions from IMMSA in the Cosalá district immediately adjacent to its existing concessions. These concessions covering 1,387 ha are subject to a 1.25% NSR royalty payable on future production to IMMSA (see Section 4.3).

## 6.2 Previous Resource Estimates

### 6.2.1 Nuestra Señora

An early mineral resource estimate on just the Candelaria deposit was reported by Henriksen (2004). The estimate was based on results from 10 surface and 20 underground core holes, five underground jackleg test holes, and underground sampling of accessible workings; only data from Scorpio's drilling and sampling were used. The estimate was based on the polygonal method. The 2004 estimate for Candelaria used a cutoff of 3oz Ag/ton and included a "total measured resource" of 64,463 tonnes grading 0.02oz Au/ton (0.82g Au/t), 12.56oz Ag/ton (430.76g Ag/t), 0.84% Cu, 1.66% Pb, and 3.86% Zn and a "total indicated resource" of 66,595 tonnes grading 0.03oz Au/ton (0.93g Au/t), 17.74oz Ag/ton (608.23g Ag/t), 0.84% Cu, 2.09% Pb, and 3.77% Zn. The "total inferred resource" was 49,468 tonnes grading 0.03oz Au/ton (0.99g Au/t), 19.22oz Ag/ton (658.98g Ag/t), 0.98% Cu, 2.52% Pb, and 6.50% Zn. MDA has not done sufficient work to classify these estimates for Candelaria as current mineral resources, and Scorpio is not treating them as current mineral resources. Current resources for the entire Nuestra Señora deposit are reported in Section 14.0.

The 2011 Genivar Technical Report on the Nuestra Señora property (de Corta, 2011) described previous mineral resource and mineral reserve estimates prepared by or for Scorpio in 2006 and 2007 and an audit of mineral resources as of February 2008. In the same report, Genivar estimated mineral resources and reserves for Nuestra Señora, which are summarized below as taken directly from Genivar's Technical Report (de Corta, 2011). The database on which Genivar's 2011 estimate was made contained 1,243 drill holes, of which about 80% were in the model area. At the time, there were analyses for silver (44,792 records), gold (44,779 records), copper (30,771 records), lead (39,766 records), zinc (43,771 records) and specific gravity (35,913 records).

The following summary and tabulations of the 2011 Genivar estimates of mineral resources and reserves for Nuestra Señora, based on geological data and a mine excavation survey as of October 31, 2010, are taken directly from de Corta (2011); the quoted mineral reserves are completely contained within the mineral resources:

> *The estimate was done using the GEMS software (version 6.2.4) and its block model building protocol. The database furnished by Scorpio consisted in spreadsheets describing the parameters of 1,243 drill holes of which, about 80% were located within the defined block to be estimated. The assay values were capped according to the previous resource estimate (GENIVAR 2007) to keep a consistency between the actual results and the previous ones. These capping values are as follows: Ag: 760 g/t, Au: 1.19 g/t, Cu: 2.03%, Pb: 5.7% and Zn: 16.9%.*
>
> *As this is a polymetallic deposit, for the purpose of classification of resources and reserves, a parameter called dollar value (S_VAL) was calculated and used for controlling the grade of the block model. This parameter is calculated with metal prices furnished by Scorpio as follows: Ag: 16 US$/oz, Au: 1,015 US$/oz, Cu: 2.30 US/lb, Pb: 0.80 US$/lb, Zn: 0.85 US$/lb.*
>
> *A cut-off value was used for separating ore from waste. The resources and reserves calculations were done for two cut-off values: 50 and 85 US$/t.*
>
> *The interpolation parameters are:*
>
> - *Composite length of 1.5 m;*
> - *No anisotropy;*
> - *Nearest Neighbor Interpolation (NNI) for attribution of rock types and specific gravity to cells;*
> - *Inverse Distance Squared (ID2) for attribution of grades and categories to cells;*
> - *Search ellipses of 10 m, 20 m and 30 m for measured, indicated and inferred categories respectively.*
>
> *The resources classification was divided in three categories, measured, indicated and inferred, in function of the spherical distance of 10 m, 20 m and 30 m with the silver value as controlling grade since this is the element that has the greatest number of analysis. The transformation of resources into reserves was applied only to the lower part of the deposit, below the 4750 level where development is advanced enough to warrant exploitation in the near term. A dilution factor of 12.5% and a recovery factor of 80%, including pillar loss, were applied to the measured and indicated resources to convert them as proven and probable reserves.*

*The results of the estimates for the part of the mineral deposit located below the 4750 level are as follows* [Table 6.1 and Table 6.2]*:*

**Table 6.1 Results of Genivar's Resources Estimate Below the 4750 Level (Actual Exploitation)**
(from de Corta, 2011)

| CATEGORY | $ VALUE | Tonnage | AG | AU | CU | PB | ZN | US$/t | AgEq |
|---|---|---|---|---|---|---|---|---|---|
| | | T x 1000 | g/t | g/t | % | % | % | $/t | g/t |
| MEASURED | >85 | 1,890 | 114 | 0.16 | 0.46 | 1.60 | 3.41 | 179 | 349 |
| MEASURED | 50-85 | 1,372 | 47 | 0.12 | 0.15 | 0.54 | 1.08 | 65 | 127 |
| total | >50 | 3,262 | 86 | 0.14 | 0.33 | 1.15 | 2.43 | 131 | 255 |
| INDICATED | >85 | 1,181 | 115 | 0.14 | 0.49 | 1.50 | 3.42 | 179 | 348 |
| INDICATED | 50-85 | 1,104 | 47 | 0.11 | 0.15 | 0.51 | 1.06 | 65 | 126 |
| total | >50 | 2,285 | 82 | 0.13 | 0.32 | 1.02 | 2.28 | 124 | 240 |
| total Meas+Ind >85 | | 3,071 | 115 | 0.15 | 0.47 | 1.56 | 3.41 | 179 | 348 |
| total Meas+Ind >50 | | 5,547 | 84 | 0.14 | 0.33 | 1.10 | 2.37 | 128 | 249 |
| INFERRED | >85 | 446 | 123 | 0.17 | 0.53 | 1.68 | 3.97 | 199 | 388 |
| INFERRED | 50-85 | 383 | 49 | 0.14 | 0.13 | 0.50 | 1.00 | 64 | 124 |
| total | >50 | 829 | 89 | 0.15 | 0.34 | 1.13 | 2.60 | 137 | 266 |

**Table 6.2 Results of Genivar's Reserves Estimate**
(from de Corta, 2011)

| CATEGORY | $ VALUE | Tonnage | AG | AU | CU | PB | ZN | US$/t | AgEq |
|---|---|---|---|---|---|---|---|---|---|
| | | T x 1000 | g/t | g/t | % | % | % | $/t | g/t |
| PROVEN | >85 | 1,701 | 94 | 0.13 | 0.38 | 1.32 | 2.81 | 148 | 288 |
| PROVEN | 50-85 | 1,235 | 38 | 0.10 | 0.12 | 0.45 | 0.89 | 54 | 105 |
| total | >50 | 2,936 | 71 | 0.12 | 0.27 | 0.95 | 2.00 | 108 | 211 |
| PROBABLE | >85 | 1,063 | 95 | 0.12 | 0.40 | 1.23 | 2.82 | 148 | 287 |
| PROBABLE | 50-85 | 994 | 39 | 0.09 | 0.13 | 0.42 | 0.88 | 53 | 104 |
| total | >50 | 2,057 | 68 | 0.11 | 0.27 | 0.84 | 1.88 | 102 | 198 |
| Total Prov+Prob >85 | | 2,764 | 95 | 0.12 | 0.39 | 1.28 | 2.81 | 148 | 287 |
| Total Prov+Prob >50 | | 4,992 | 70 | 0.11 | 0.27 | 0.91 | 1.95 | 106 | 206 |

The previous estimates of mineral resources and mineral reserves for Nuestra Señora reported by Genivar (de Corta, 2011) are no longer relevant or current and should not be relied upon. Scorpio is not treating these previous estimates as current mineral resources or reserves.

MDA estimated resources for Nuestra Señora in a 2012 Technical Report (Ristorcelli *et al.*, 2012), and those resources, which are unrelated to the mineral reserve reported by Genivar, are described in Section

14.2 of this report. New reserves based on MDA's 2012 resources at Nuestra Señora are described in Section 15.0 of this report.

### 6.2.2 San Rafael and El Cajón

Previous estimates of the mineral resources on the San Rafael-El Cajón property were made in-house by PRG and by independent consultants including MDA, whose work culminated in two draft technical reports in 2007 and 2008 (Ristorcelli and Tietz, 2007, 2008) that were never made public and a published technical report in 2009 (Ristorcelli *et al.*, 2009). Previous estimates by both PRG and MDA are presented here as historic estimates in the interest of complete disclosure. Scorpio is not treating these previous estimates as current mineral resources. These previous estimates should not be relied upon and are superseded by the current mineral resource estimates for San Rafael and El Cajón reported in Sections 14.3 and 14.4, respectively.

PRG completed a number of polygonal resource estimates both during and at the completion of their 2005/2006 drill program (Table 6.3). These preliminary resource estimates do not meet NI 43-101 reporting requirements but are included here for completeness and as historic information. The authors have not done sufficient work to classify these historic estimates as current mineral resources, and Scorpio is not treating these historic estimates as current mineral resources.

Preliminary polygonal resource estimates for the San Rafael and El Cajón mineralization were completed by PRG in December 2005 (Armbrust and Chlumsky, 2006) using cross sections created in Surpac Software's XplorPac program (Table 6.3). The El Cajón estimate was based on 13 drill holes, while the number of drill holes used in the San Rafael estimate was not stated in the Armbrust and Chlumsky report. For both estimates, mineral shells were created with material exceeding \$20/tonne. PRG used a density of 4.0g/cm$^3$ for San Rafael mineralization and a density of 3.1 g/cm$^3$ for El Cajón material.

Updated polygonal resource estimates were completed in May 2006 by PRG (Armbrust and Chlumsky, 2006) based on 41 San Rafael drill holes and 20 El Cajón drill holes (Table 6.3). The same specific gravities were used again, but the mineral shells were created with material exceeding \$50/tonne.

In August 2006, at the end of the 2006 drill program, PRG completed final polygonal, cross-section resource estimates for the San Rafael and El Cajón mineralization (Table 6.3). The estimates were based on 101 drill holes at San Rafael and 53 drill holes at El Cajón, with a final drill spacing of 15 to 60m at both deposits (PRG, 2006b). Shells created at \$50/tonne material (based on \$8.25/oz Ag, \$0.49/lb Pb, \$0.78/lb Zn, \$2.01/lb Cu and \$493/oz Au) were used at both deposits.

The San Rafael estimate used a 4.0g/cm$^3$ density and included only the significant sulfide-bearing drill intercepts. Oxidized mineralization was not included in the August 2006 estimate. The resource was said to be open immediately to the southeast.

PRG's August 2006 El Cajón resource estimate used a 3.1g/cm$^3$ density. About 70% of the total volume comes from one main mineralized body that is higher grade. The resource was said to be open immediately to the east.

In November 25, 2009, MDA completed a Technical Report for PRG and Scorpio that included the first publically reported mineral resource estimates for San Rafael and El Cajón (Ristorcelli *et al*., 2009)

(Table 6.4 and Table 6.5). Those estimates were based on PRG's drilling on both deposits through 2008. The interested reader is referred to that report for details, but those estimates are superseded by the estimates described in Sections 14.3 and 14.4 of this report.

**Table 6.3 Previous Resource Estimates for the San Rafael and El Cajón Deposits by Platte River Gold**

(As reported in Armbrust and Chlumsky, 2006 and PRG 2006b)

| Date | Area | Tonnes | g Ag/t | g Au/t | Zn % | Pb % | Cu % |
|---|---|---|---|---|---|---|---|
| December 2005 | San Rafael | 4,700,000 | 55 | | 3.0 | 1.6 | |
| | El Cajón | 1,900,000 | 165 | 0.33 | | | 0.59 |
| May 2006 | San Rafael | 3,500,000 | 72 | | 4.2 | 2.2 | |
| | El Cajón | 2,100,000 | 239 | 0.43 | | | 0.79 |
| August 2006 | San Rafael | 4,590,000 | 66.8 | | 4.57 | 2.02 | |
| | El Cajón | 1,630,000 | 246.1 | 0.45 | | | 0.82 |

**Table 6.4 2009 MDA Resource Estimate for San Rafael**

(Ristorcelli *et al*., 2009)

**Measured and Indicated**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.50 | 15,741,000 | 1.78 | 0.80 | 66.0 | 0.08 | 0.11 | 617,219,000 | 276,417,000 | 33,416,000 | 29,258,000 | 56,000 | 4.28 |

**Inferred Resource**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.50 | 545,000 | 0.38 | 0.23 | 72.7 | 0.15 | 0.11 | 4,578,000 | 2,773,000 | 1,274,000 | 1,757,000 | 2,000 | 2.69 |

**Table 6.5 2009 MDA Resource Estimate for El Cajón**

(Ristorcelli *et al*., 2009)

**Indicated Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 100.00 | 1,751,000 | 161.7 | 0.54 | 0.25 | 9,101,000 | 20,879,000 | 14,000 | 238.9 |

**Inferred Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 100.00 | 545,000 | 138.5 | 0.49 | 0.20 | 2,429,000 | 5,921,000 | 3,000 | 207.2 |

# 7.0 GEOLOGIC SETTING AND MINERALIZATION

## 7.1 Geologic Setting

### 7.1.1 Regional Geology

The Cosalá mining district lies along the western edge of the Sierra Madre Occidental, an extensive volcanic province covering approximately 800,000km$^2$. The basement rocks are composed of a variety of tectonic/stratigraphic terranes of Precambrian, Paleozoic, and Mesozoic rocks. In the mid-Cretaceous, a thick sequence of sedimentary units, primarily limestone and pelitic rocks, was deposited over the basement terranes. These marine sedimentary rocks host many of the carbonate replacement/skarn deposits in Mexico. The Cretaceous sedimentary rocks are unconformably overlain by a sequence of Tertiary volcanic rocks, subdivided into a lower andesitic unit (70 to 40 Ma) and an upper rhyolitic unit (40 to 20 Ma). Both volcanic sequences can range up to 1km in thickness. Within the Sierra Madre Occidental, mineral deposits are typically confined to the quartz-sericite-pyrite-altered volcanic units and underlying Mesozoic rocks, which have been altered to recrystallized limestone and skarn. Mineralization within the Cosalá mining district is related to granodioritic or granitic intrusions emplaced between 140 and 45 million years ago. Most of the intrusive rocks are part of the Sinaloa Batholith, a disrupted, massive gabbroic to granodioritic complex that induced strong contact metamorphism in the host rocks. Exposures of the underlying sedimentary rocks and associated mineralization are limited to eroded inliers surrounded by Tertiary volcanic rocks (Armbrust *et al.*, 2006).

An extensional phase of basin and range-type faulting followed the intrusive event. This mid- to late-Tertiary faulting produced an extensive northwest-trending graben and related parallel fault system along with late northeast-trending dextral faults.

### 7.1.2 Property Geology

#### 7.1.2.1 Nuestra Señora Area

The following description of the geology of the Nuestra Señora area is taken from Henriksen (2004), Spring and Breede (2008), and de Corta (2011).

The Nuestra Señora property lies within a sub-circular inlier of Cretaceous limestone approximately 10km in diameter situated in the eastern part of the Sinaloa Batholith. The batholith is a massive gabbroic to granodioritic complex that evolved through multiple intrusive stages between about 139 to 45 Ma. Contact metamorphism of the limestones created re-crystallized limestone, marble, and skarn. Initial skarn development in the area was contemporaneous with emplacement of the batholith; however, there were several pulses of magmatic and hydrothermal activity.

The Cretaceous sedimentary rocks vary from fine-grained massive to medium-bedded carbonates. These units strike northwest and dip between 35° and 50° northeast. Tilting of the sedimentary rocks probably occurred early in the late Cretaceous and early Tertiary Laramide orogeny, associated with northeast-directed compression (Starling, 2005). Low-angle, northeast-dipping thrusts or shear planes occur in both the Nuestra Señora and Candelaria areas. In some locations, these structures appear to have been active during mineralization as evidenced by mylonitic and cataclastic fabrics that cut the endoskarn and place it in contact with silicified granodiorite (Starling, 2005). Post-mineralization deformation resulted in brecciation, displacement, and dislocation of the sulfide mineralization at Candelaria.

In the Candelaria area and further east, iron-rich andesite dikes intrude the limestones. These dikes are relatively unaltered and are not mineralized, even though they are often in contact with mineralization and associated alteration. Quartz-feldspar porphyry has been intersected within the workings at Candelaria and in drill holes within that deposit. Sulfide deposition coincides with emplacement of the Sinaloa Batholith, particularly the late magmatic pulses.

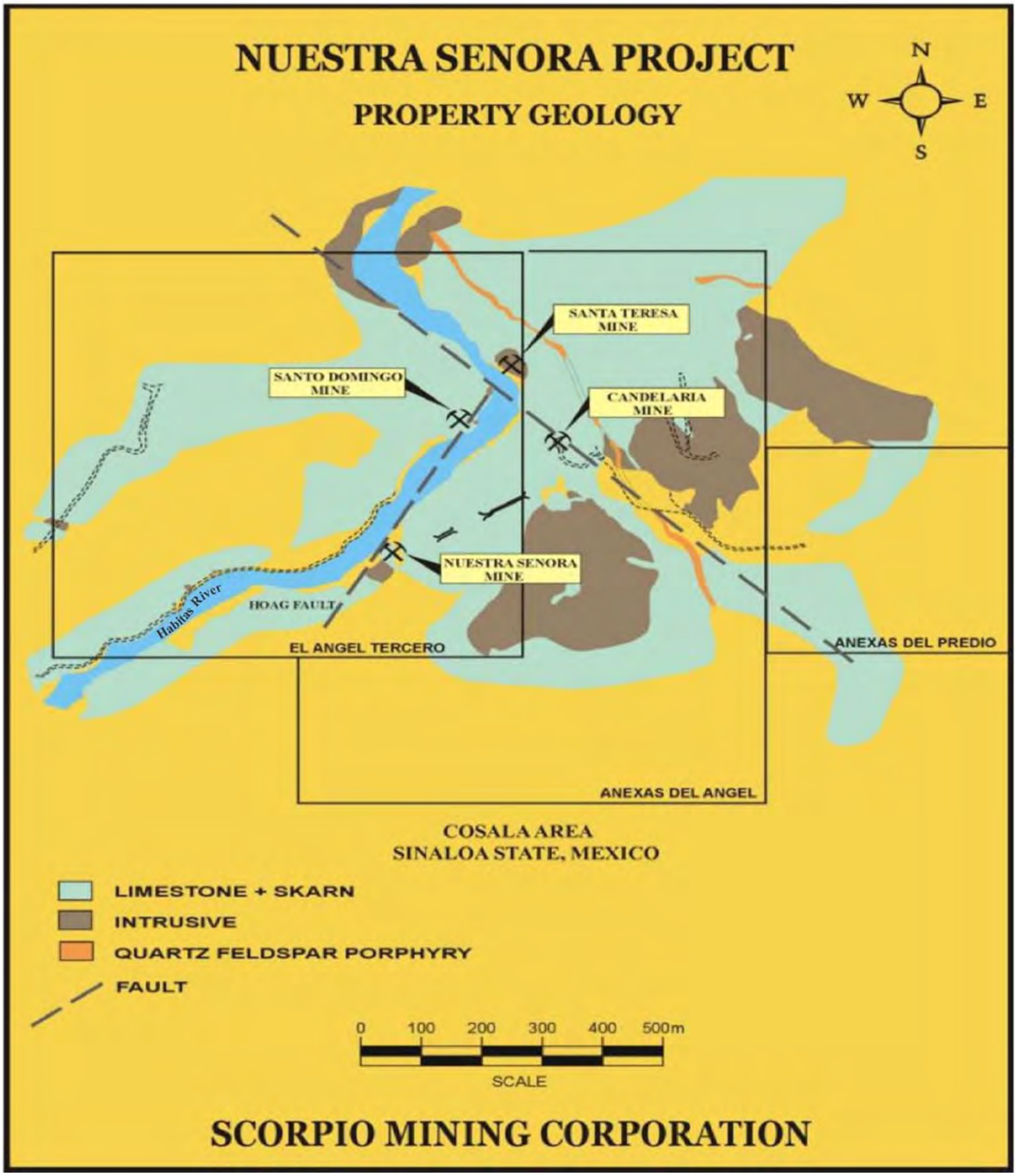
The northeast-trending, steeply southeast-dipping Hoag fault forms the northwestern limit of the mineralization at Nuestra Señora above the $8^{th}$ level. Although there is no evidence of major displacement, this structure was repeatedly reactivated over time.

The geology of the Nuestra Señora area as mapped by Armbrust *et al.* (2005) is shown in Figure 7.1.

Scorpio has further refined the understanding of the geology at Nuestra Señora. The bulk of the mineralization is contained in two distinct areas, the Main Zone and the Hoag Zone. The Main Zone extends down-dip from the historic Asarco workings, which reached the 8th level, to and beyond the 12th level. The Hoag Zone appears to be a structural sliver of the deposit, bounded by the Hoag fault in the footwall and separated from the Main Zone by fault(s) mapped on only two or three levels below level 8. The roughly 45°-northeast-dipping orientation of bedding and mineralization persists within the zone. Numerous sub-parallel faults are present within the Hoag Zone, which could be considered a shear zone. The structures appear to be predominantly syn- and post-mineral. The two zones are situated within a crude embayment in the mineralizing granodiorite intrusive, which is encountered in the northern portions of existing workings and down-dip from level 12 in drilling.

Within the carbonate sequence, the smaller Candelaria deposit is hosted in stratigraphically younger sediments than the Main Zone. Recent geologic interpretations indicate that there is not a major fault between the two areas. The mineralization at Santa Teresa may lie in the immediate footwall of an upward projection of the Hoag fault, although this interpretation is speculative at present.

**Figure 7.1 Geology of the Nuestra Señora Property**
(Modified from Armbrust *et al.*, 2005)



#### 7.1.2.2 San Rafael-El Cajón Area

Much of the following information is taken from PRG (2006b and 2006c).

The geology of the San Rafael-El Cajón area is dominated by Tertiary intrusive and extrusive rocks that make up much of the Sierra Madre Occidental (Figure 7.2). Cretaceous limestone, commonly recrystallized and marbleized but only locally skarn-altered, is exposed within windows in the Tertiary volcanic rocks and is the oldest rock identified to date in the San Rafael-El Cajón area. The basal Tertiary unit is a volcaniclastic arenite composed of heterolithic volcanic clasts that are variable in size, sub-angular to sub-rounded, and commonly porphyritic. Clast and grain size generally range from fine-grained sand to medium-sized boulders, and the unit commonly displays graded bedding. The arenite is an areally extensive rock type on the property and is also the primary host for skarn alteration/mineralization at the original La Verde mine. The protolith at El Cajón was originally believed to be a fine-grained limestone sub-unit within the Tertiary volcaniclastic arenite, although the current interpretation is that the altered limestone is of Cretaceous age. Overlying the basal arenite are andesitic flows/tuffs and dacitic tuffs. At San Rafael, the basal arenite section is missing, and massive sulfide mineralization occurs primarily along the dacite tuff/Cretaceous limestone contact with additional mineralization within the dacite, where the Upper Zone is located, and skarn-altered limestone, which is the main host rock for the 120 Zone. The youngest rock type is felsic rhyolite tuff. The rhyolite tuff contains quartz phenocrysts and small lithic fragments. Although there are silver-gold veinlets that crosscut the tuff, no strong silver-copper-gold or silver-lead-zinc mineralization has been identified in the rhyolite. Figure 7.3 shows more detailed geology of the San Rafael and El Cajón deposits.

**Figure 7.2 Geology of the San Rafael-El Cajón Area**
(Area shown in the dark outline is approximately that shown in Figure 7.3)

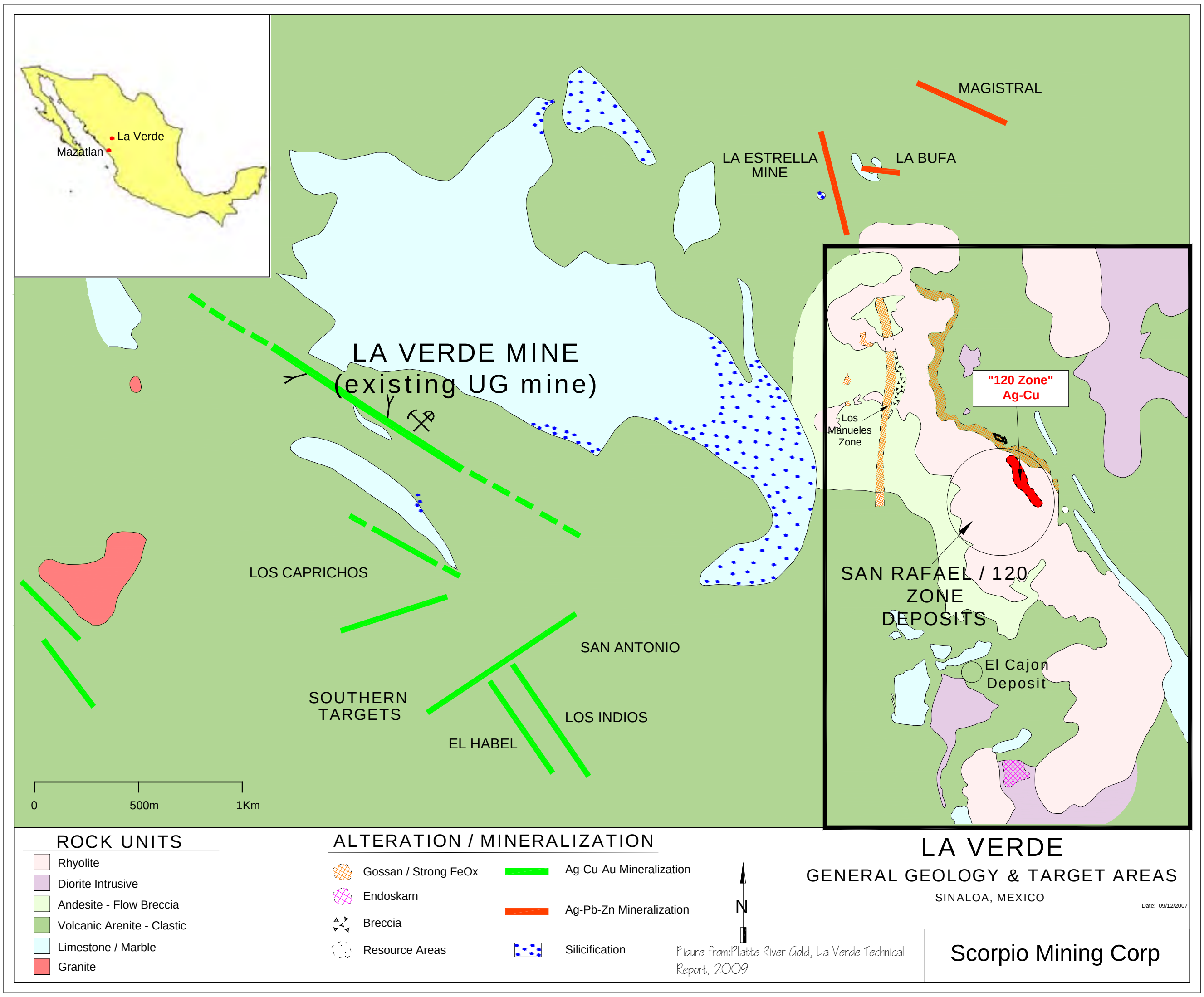
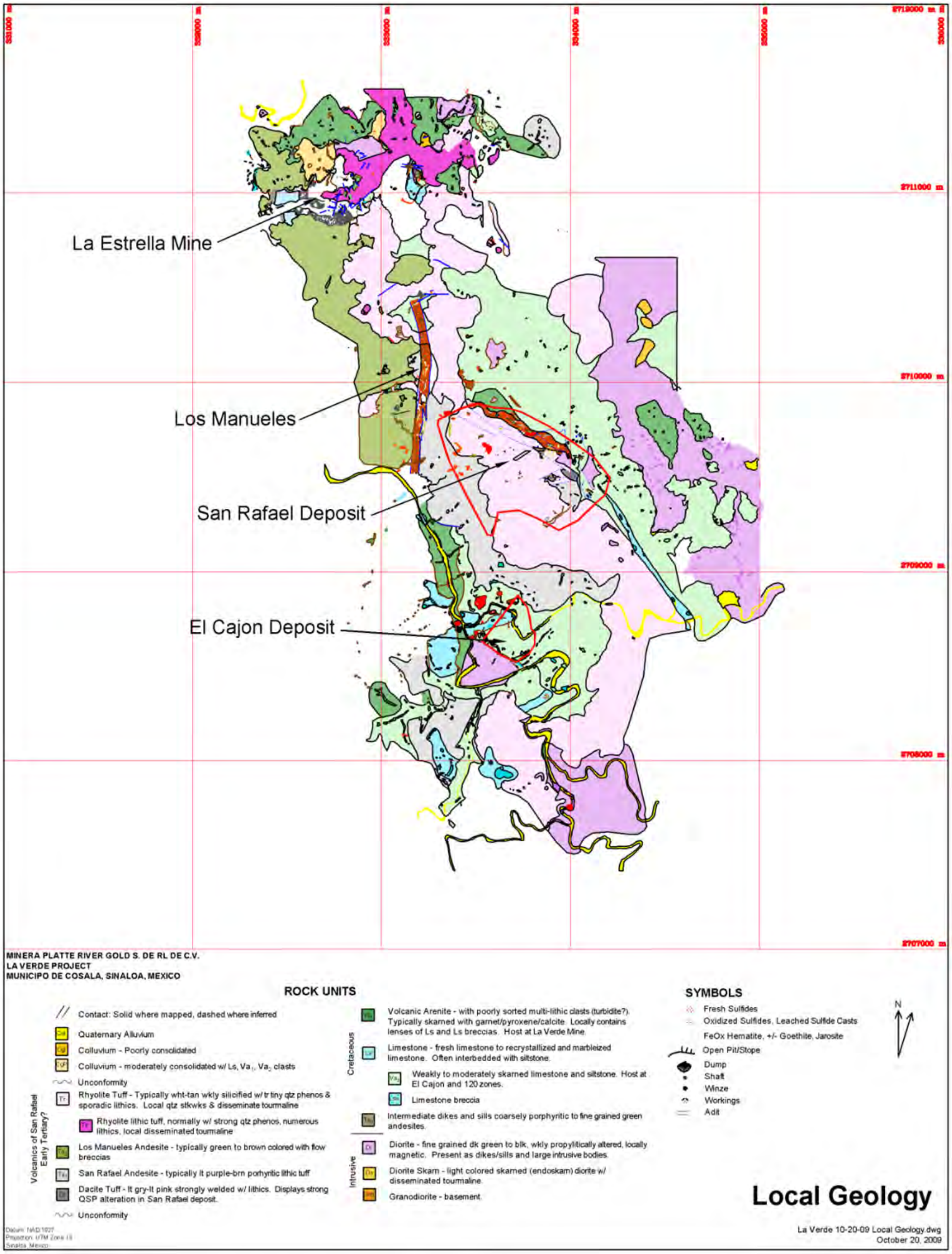


**Figure 7.3 Geology of the San Rafael and El Cajón Deposits**



Three types of Tertiary intrusions are present in the San Rafael-El Cajón area. Medium- to coarse-grained granodiorite, which is part of the district-wide batholith, crops out in the western part of the project area and is also intersected at the bottom of a number of PRG drill holes in the El Cajón area. There are also large local intrusions of diorite, often occurring as sills, that are interpreted to be related to the emplacement of the batholith. Andesitic dikes and sills, which are sometimes weakly magnetic, are also thought to be Tertiary in age.

The skarn alteration in the vicinity of San Rafael and El Cajón covers a broad area of at least 20km$^2$. Paragenetically, from earlier to later stage, typical skarn minerals are garnet (especially andradite and grossularite), pyroxene, wollastonite, potassium feldspar, calcite, chlorite, epidote, and quartz-sericite-pyrite. Calcite and chlorite increase near the mineralized zones. A garnet-pyroxene-calcite alteration assemblage tends to be more strongly associated with the mineralization at El Cajón. The quartz-sericite-pyrite assemblage is associated with the dominant massive-sulfide mineralization at San Rafael.

The property-wide dioritic intrusions are often weakly magnetic and generally only weakly altered, although the dioritic intrusion(s) spatially associated with the El Cajón mineralization exhibit a pervasive skarn alteration assemblage consisting of albite, tourmaline, scapolite, epidote, calcite, titanite/sphene, and minor quartz. Though pervasively altered, the diorite contains only trace amounts of pyrite and chalcopyrite. The skarn-altered diorite was often logged by earlier geologists as quartz monzonite.

## 7.2 Mineralization

Information on the Nuestra Señora mineralization was taken from Henriksen (2004), de Corta (2011), Spring and Breede (2008), and Armbrust *et al*. (2006), with additional information from Scorpio and MDA. Much of the following information on the San Rafael and El Cajón mineralization was taken from PRG (2006b), with the more detailed petrographic data from Larson (2005a, 2005b, 2006a, and 2006b).

### 7.2.1 Nuestra Señora Mineralization

Mineralization at the Nuestra Señora mine occurs in four known deposits located within a 500m by 250m area – Nuestra Señora, Candelaria, Santa Teresa, and Santo Domingo – that were originally developed and exploited from 1954 to 1965 by Asarco. Carbonate replacement-style mantos, veins, chimneys, chimney breccias, and mineralized exoskarn and endoskarn occur within limestone and granodiorite (see Figure 14.1). Pyrite, sphalerite, chalcopyrite, galena, and lesser tetrahedrite are the dominant sulfide minerals.

Pb-Zn-Cu-Ag mineralization at Nuestra Señora is primarily associated with variably retrograde-altered garnet-pyroxene exoskarn (bedded limestone protolith) with lesser mineralization within pyroxene-garnet endoskarn. In general, exoskarn mineralization occurs within preferential horizons in the general stratigraphy which strikes northwest and dips to the northeast 30-50$^o$. Thrust faulting sub-parallel to bedding has been proposed to create more favorable fluid pathways and localize mineralization.

Within the Nuestra Señora Main Zone, post-skarn brecciation and calcite emplacement appear to be contemporaneous with mineralization, with sulfides occurring as fracture-fill and large “clots” (up to 10cm across) within the calcite-filled breccia matrix. The breccia texture can be coarse with clasts greater than one meter in width. Though there are some weak disseminated sulfides within the clasts, the majority of sulfides occur within the highly irregular calcite-quartz-chlorite matrix.

In contrast to the skarn-hosted mineralization within the Nuestra Señora mine area, carbonate-replacement mineralization occurs at the Candelaria mine located about 200m to the northeast and 150m higher in elevation than the Nuestra Señora mineralization. Highly irregular, massive-sulfide base-metal bodies, that can be over one meter across, occur within a coarse crystalline, relatively unmineralized marble which formed by thermal metamorphism distal to the skarn alteration. The sulfide/marble contacts can be knife sharp. The sulfide mineralization is highly erratic, although there is evidence that the more significant mineralization is localized along southeast-dipping structures.

Deposition of sulfides occurred during several cycles, with the presence and relative abundance of chalcopyrite with sphalerite and galena indicating fluctuating temperatures during formation. The order of deposition of the sulfides appears to be pyrite, sphalerite, chalcopyrite, galena, and tetrahedrite. The distribution of silver may be related to deposition of copper and not lead. Deposition of silver, copper, and lead probably occurred independently to that of zinc.

The Nuestra Señora, Santo Domingo, and Santa Teresa deposits all have surface expressions. Scorpio found two additional large mineralized zones – Hoag and Sept 9 – adjacent to the main Nuestra Señora zone and between Nuestra Señora and Santo Domingo-Santa Teresa that do not crop out. Scorpio's initial interpretations postulated that a series of stacked thrust faults provided the main conduit for mineralizing fluids. Subsequent deformation along the thrust faults created dilational zones, which provided structural traps for the emplacement of mineralization. The Sept 9 Zone appears to be a mineralized feeder for emplacement of mineralization into the Hoag and Santa Teresa zones. Recent reinterpretation suggests that the Main, Hoag, and possibly the Santa Teresa deposits appear to have been part of the same, formerly contiguous mineralized zone that has subsequently been offset by a series of northeast-striking, normal and/or strike-slip faults (i.e. Hoag fault). This interpretation is new and requires more investigation and modification.

Mineralization in the Hoag Zone consists predominantly of zinc and lead with over 100g Ag/t and only minor amounts of copper. The zinc and lead sulfides in the Hoag Zone are generally finer grained, and zinc tends to be more enriched and silver slightly less enriched relative to the Nuestra Señora Main Zone. Mineralization in the Sept 9 Zone consists of coarser-grained sphalerite, galena, and chalcopyrite, similar to that at Nuestra Señora, with higher grades of silver and copper. The mineralization is located at the contact of a skarn and a granodiorite body.

Carbonate replacement mineralization occurs in re-crystallized limestones near or at the faulted contact between granodiorite and limestone at the Candelaria, Santo Domingo, and Santa Teresa deposits, with most of this mineralization occurring at Candelaria. At Candelaria, irregularly shaped massive sulfide pods vary considerably in size, shape, and orientation, which makes it difficult to define them with widely spaced core drilling. The pods are cut and displaced by steep north-northeast-trending faults. There is a spatial relationship between mineralization and a quartz-feldspar porphyry sill or dike that is from 2 to 10m thick and is predominantly sub-parallel to bedding. In addition to the massive sulfides, disseminated mineralization occurs along the interface between endoskarn and exoskarn developed at the contact between the limestones and intrusion. It is associated with retrograde skarn and mylonitic material within the faulted contact.

The Santo Domingo deposit is located on the north side of the Habitas River, 300m northeast of the Nuestra Señora mine portal. Santo Domingo is situated at the intersection of a regional N50°W-trending fault with the northeast-trending Hoag fault. Chimney and manto-type mineralization is locally disrupted and overprinted by intense silica flooding and discrete quartz veining that contains coarse sphalerite, chalcopyrite, minor pyrite, and locally enriched gold.

Santa Teresa is located about 150m northeast of Santo Domingo and about 200m northwest of Candelaria. The surface expression of skarn mineralization extends over a width of 100m along the river. Alteration consists of epidote, actinolite, tremolite, hornfels, grossular garnets, and silicification.

### 7.2.2 San Rafael and El Cajón Mineralization

Two types of sulfide mineralization have been identified within a broad area of skarn alteration in the vicinity of San Rafael and El Cajón. The San Rafael-type of mineralization consists of massive sulfides that occur at an unconformable contact between what is believed to be Tertiary volcanic tuff and Cretaceous limestone. Although it can be difficult to determine the host rock when total sulfide content is 90 to 100%, most of the massive sulfide mineralization appears to be hosted in the volcanic tuff. San Rafael contains silver, lead, and zinc mineralization with minor gold and copper. The main minerals are pyrite, pyrrhotite, sphalerite, and galena with minor marcasite, chalcopyrite, and magnetite. This mineralization, in the San Rafael Main Zone, is often associated with quartz, sericite, and pyrite alteration minerals and has been interpreted as more distal skarn alteration. It has also been suggested that San Rafael displays many similarities to volcanogenic massive sulfide deposits, such as those found in the Guerrero Terrane in central Mexico. At San Rafael, a dacite tuff is the primary host for the mineralization.

The El Cajón-type of mineralization, also seen within the San Rafael deposit’s 120 Zone, is related to skarn alteration of calcareous sediments and occurs as both mantos and chimneys. It consists of silver-copper-gold mineralization in the form of chalcopyrite and tetrahedrite with minor pyrite, galena, sphalerite, arsenopyrite, chalcocite, jalpaite, native silver, copper, and bismuth. This mineralization is accompanied by garnet-pyroxene-calcite proximal skarn alteration. A skarn-altered limestone is the host at El Cajón and is also believed to be the host at the 120 Zone. Both skarn alteration and sulfide mineralization are spatially associated with intermediate dikes, sills, and small stocks.

In addition to the El Cajón and Main Zone types of mineralization, there is primarily silver-gold mineralization within a number of small tabular zones sub-parallel to and within the hanging wall of the San Rafael Main Zone; this mineralization is called the Upper Zone. The Upper Zone is more erratic than the Main Zone but is also found in volcanic rocks.

Minor oxide mineralization occurs throughout the San Rafael-El Cajón area. Significant gossan horizons are exposed along road cuts located up dip from the San Rafael sulfide mineralization, while a strong gossan surface trend occurs within the Los Manueles area just north of San Rafael. The exposed San Rafael oxide mineralization has been explored by shallow drill holes and surface trenches and has been sampled for metallurgical test work, but it contributes only incrementally to the current San Rafael resource.

In addition to the mineralization at San Rafael and El Cajón, strong mineralization has been mined from the La Verde mine and has been drilled or identified at Magistral, La Bufa, San Antonio, and elsewhere in the neighboring area.

Mineralization within the Main Zone at San Rafael is primarily massive-sulfide material, which can contain greater than 90% sulfides, dominantly pyrite and pyrrhotite. The massive-sulfide body is discrete, tabular, and lies along the shallow-dipping volcanic/limestone contact (Figure 7.4). The zinc, lead, and silver mineralization, for the most part, lies within the body of massive sulfide and consists of sphalerite and galena. The contacts of all elemental zones generally overlap within the massive sulfide, but mineral-shell boundaries and their internal grade distribution are not necessarily coincident.

A silver-dominant mineralized zone ("Upper Zone") lies within the Tertiary volcanic rocks about 50 to 100m above the massive sulfide along the eastern portion of the San Rafael deposit. The Upper Zone is composed of irregular, sub-horizontal layers sub-parallel to the Main Zone. Mineralization is associated with sulfides, but sulfide content is much less than in the Main Zone massive sulfide. Gold and weak base-metal mineralization occurs with the silver.

The 120 Zone mineralization occurs not as a single horizon but as multiple bedding- and intrusive-contact-related mineralized horizons. The 120 Zone mineralization is interpreted to occur along near-vertical diorite/skarn-altered limestone contacts in the lower parts and in quartz-sericite-pyrite-altered volcanic rocks in the upper parts. The 120 Zone mineralization extends upwards to overlap the Main Zone mineralization (Figure 7.4). Mineralization is associated with generally 2 to 10% sulfides and, like the El Cajón mineralization, is more irregular in shape and more variable in mineral character than the San Rafael Main Zone.

Silver, copper, and gold mineralization at El Cajón is associated with disseminated sulfide mineralization in a proximal skarn setting along the east and north sides of a diorite intrusion (Figure 7.5). As currently defined, the deposit is roughly an oval extending 550m east-west and 400m north-south, with the mineralization aligned along the general 330° strike and 20°NE dip of the limestone country rock. Mineralization occurs primarily within the skarn-altered limestone with minor contact-related skarn mineralization within the diorite. Mineralized skarn often follows the diorite/limestone contact and can be very irregular as is typical of many proximal skarn deposits. Contacts within the mineralized skarn and the unmineralized diorite or limestone can be very sharp, with the transition from unmineralized rock to sulfide skarn occurring within less than one-half meter. Preferentially mineralized horizons do occur within the limestone, and skarn mineralization can be found up to 150m away from the diorite contact.

Metal deposition is associated with generally 2% to 5% disseminated sulfides with isolated high metal grades occurring with up to 50% sulfide content. The silver, copper, and gold zones generally overlie each other, but the internal grade distribution is not always coincident.

**Figure 7.4 San Rafael Schematic Geologic Cross-Section with Mineralized Zones**

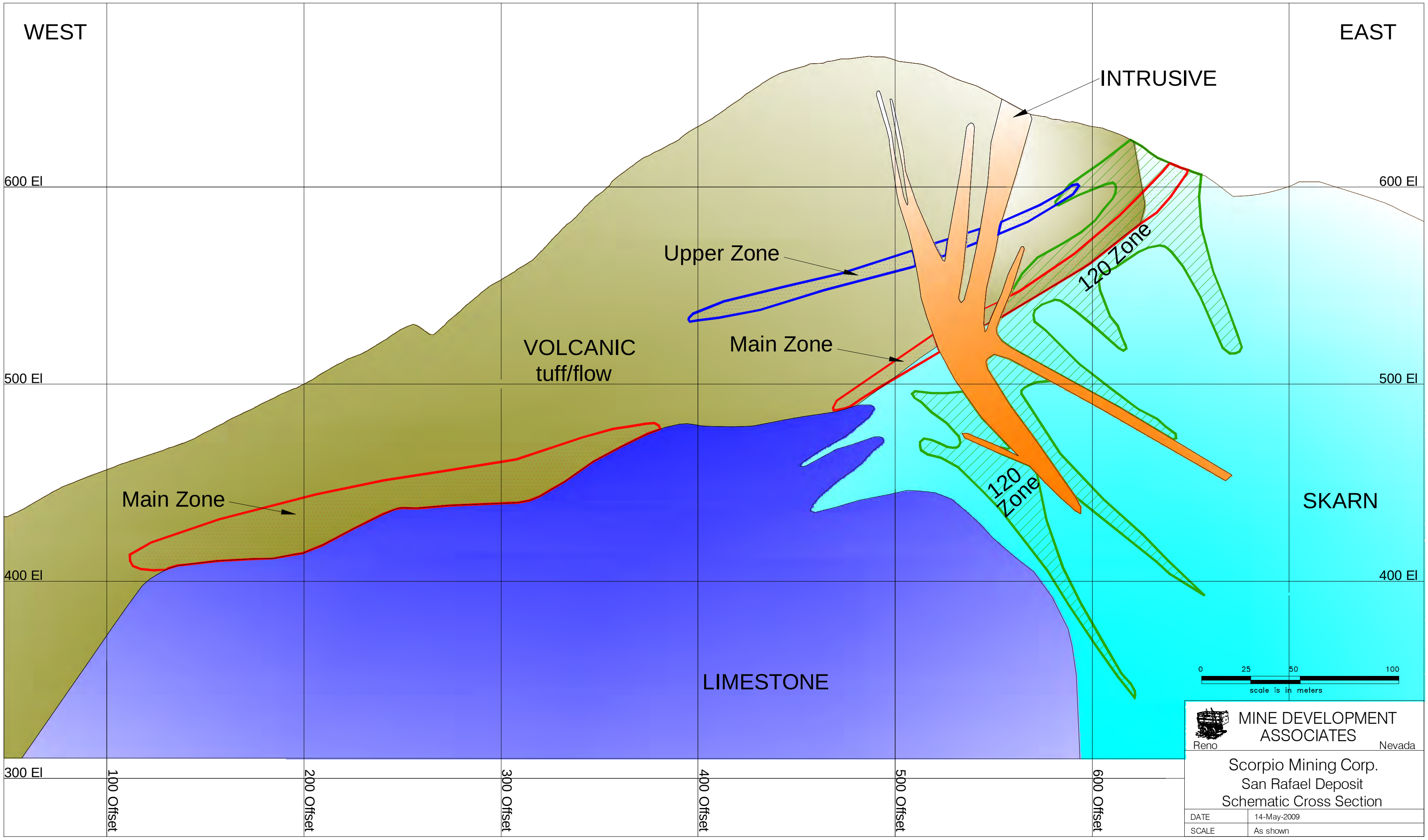
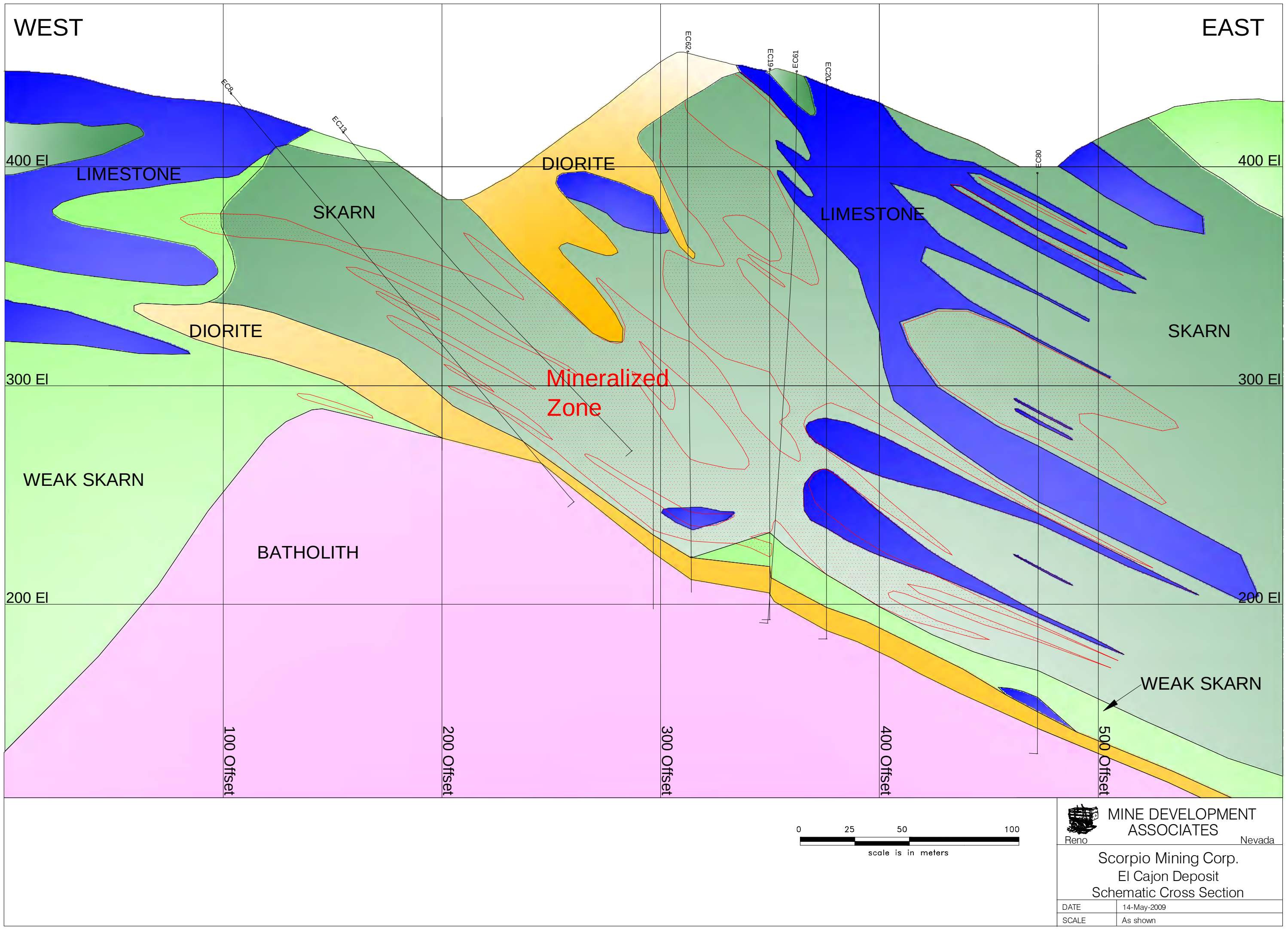


**Figure 7.5 El Cajón Geologic Cross Section with Mineralization**



## 8.0 DEPOSIT TYPES

Mineralization in the Nuestra Señora area includes mineralized calc-silicate skarns, carbonate replacement deposits, veins, and breccia-hosted deposits that occur within limestone and granodiorite. Pb-Zn-Cu-Ag mineralization is primarily associated with variably retrograde-altered garnet-pyroxene exoskarn with lesser mineralization within pyroxene-garnet endoskarn in the Nuestra Señora mine. Within the Nuestra Señora Main Zone, post-skarn brecciation and calcite emplacement appear to be contemporaneous with mineralization, with sulfides occurring as fracture-fill and large "clots" within the calcite-filled breccia matrix.

Carbonate-replacement mineralization occurs at the Candelaria mine, where massive-sulfide base-metal bodies occur within relatively unmineralized marble that formed by thermal metamorphism distal to the skarn alteration.

Chimney and manto-type mineralization, overprinted by sulfide-bearing and locally gold-enriched quartz veins, occur at the Santo Domingo deposit.

Precious and base-metal mineralization at the San Rafael-El Cajón area is associated with both fracture-controlled and massive-sulfide deposits within variably altered Tertiary andesitic flows, dacite tuffs, and volcaniclastic arenite as well as Cretaceous limestone. Silver-lead-zinc mineralization, associated with quartz-sericite-pyrite alteration, occurs within the Main Zone at San Rafael. This alteration type is believed to be a more distal phase of the skarn system.

Silver-copper-gold mineralization, occurring within garnet-pyroxene-calcite skarn, is typically seen at El Cajón and also in the 120 Zone along the east side of the San Rafael deposit. The strong metasomatic alteration and the close spatial relationship with a large dioritic intrusion suggest that the El Cajón-style of mineralization represents a proximal skarn deposit.

# 9.0 EXPLORATION

## 9.1 Nuestra Señora Area

Scorpio commenced exploration on the Nuestra Señora property in March 1999. The following information on their activities is taken from Henriksen (2004), Armbrust *et al*. (2005), and the Genivar Technical Report (de Corta, 2011), with updated information provided by Scorpio.

Scorpio's initial focus was on the Candelaria deposit, followed by exploration of other mineralized areas in the Nuestra Señora area.

### 9.1.1 Geophysical Surveys

#### 9.1.1.1 Airborne Magnetic, Electromagnetic, and Radiometric Survey

Scorpio's exploration program began with a helicopter airborne geophysical survey flown in May 1999 over an area of 5km by 5km with the Nuestra Señora deposits being centered in the middle of the survey area (Armbrust, *et al.*, 2005). High-Sense Geophysics Ltd. was the survey contractor. The survey included a total of 292.6 line kilometers with a line spacing of 100m. The airborne surveys flown were total field and vertical derivative magnetics, four channels of horizontal loop electromagnetics ("HLEM"), and radiometrics, comprised of gamma, potassium, thorium, and total-count spectrums.

The following equipment was used for this survey:

- Five-frequency Aerodat kestrel electromagnetic system
- Exploranium GR 820 digital gamma spectrometer
- High-sensitivity cesium vapor magnetometer
- Global Positioning System
- Radar altimeter.

As reported by Armbrust *et al*. (2005), John Irvine, a consulting geophysicist, reviewed the airborne data and determined that 13 electromagnetic conductive anomalies warranted further evaluation in addition to those in close proximity to known mineralization (Irvine, 1999a). As discussed in the next section, those in proximity to the Candelaria mineralized zones were followed up with ground geophysical surveys. The magnetic and radiometric responses from the airborne survey were also used in regional structural and geological interpretations (Irvine, 1999a, 2000a).

#### 9.1.1.2 Ground Magnetic and Electromagnetic Survey

Scorpio followed up the airborne survey anomalies in June 1999 in the area of the Candelaria mine with a ground geophysical survey comprised of total-field and first-derivative magnetics and very low frequency ("VLF") electromagnetics. The survey covered a 5km by 5km grid over and to the east of Candelaria in an area in which a weak airborne electromagnetic anomaly had been identified. The baseline was parallel to the known mineralization (320°), with traverses every 50m along the baseline. A Gem Systems GS-8 proton magnetometer and a Geonics EM-16 VLF unit were used for the survey.

As reported by de Corta (2011), the VLF identified a strong conductor closely associated with the Candelaria mineralized zones, which John Irvine (1999b, 2000b) postulated may be a major structure. According to de Corta (2011), mapping in the Candelaria ramp and regionally has confirmed that the conductor is a major regional thrust fault located immediately northeast of the mineralized zones. According to Irvine, the magnetic survey did not define the zones of mineralization or geological contacts.

### 9.1.2 Geologic Mapping and Sampling

The ground geophysical survey was followed by detailed surface and underground sampling of the Candelaria mine.

Scorpio employees and contractors conducted reconnaissance mapping and prospecting over an area of approximately 6.5 square kilometers surrounding Nuestra Señora from March until June 2005. The river valley was mapped in detail, and on both sides traverses at approximately 500m intervals were conducted following valleys cut into the canyon walls. The road cuts were also mapped. Outcrops, geological contacts, mineralized occurrences, and other features were located using a hand-held GPS (Garmin Etrex Vista).

After completion of the 2011 Technical Report, Scorpio conducted limited mapping, compiled geologic sections, and conducted grade-control sampling at Nuestra Señora.

### 9.1.3 Other Exploration

Eagle Mapping flew an aerial photo survey on April 13, 2004 and has produced selected digital topographical maps. Scorpio has used these maps for accurate geological mapping.

Since completion of the 2012 Technical Report (Ristorcelli *et al.,* 2012), Scorpio has only conducted drilling at Nuestra Señora, which is discussed in Section 10.1.

## 9.2 San Rafael-El Cajón Area

This section describes exploration of the San Rafael-El Cajón area by PRG prior to its acquisition by Scorpio and exploration performed by Scorpio since the acquisition.

### 9.2.1 Drilling by Platte River Gold

PRG initiated exploration in the vicinity of San Rafael and El Cajón in 2004 and conducted four phases of drilling through August 2008. Total PRG drill footage was 65,706m in 371 drill holes, which corresponds to the totals found in the database used by MDA to estimate the 2009 resource. Four additional drill holes (EC5a for 25.9m, EC11a for 15.2m, SR139 for 124.97m, and VE9 for 7.5m) were not entered into the database since they were abandoned or lost, not logged, and re-drilled with a new hole. No additional drilling was conducted by PRG prior to being acquired by Scorpio in August 2010.

The first phase drill program began November 20, 2004, and concluded in June 2005. The Phase I drilling, which consisted of 56 RC holes for a total of 8,423.2m, tested 12 different targets throughout the San Rafael-El Cajón area that had been identified by surface mapping and sampling. The most significant results of this drilling were indications of continuity of massive-sulfide (silver-lead-zinc) mineralization that had been tested by Hemlo and Noranda at San Rafael. The drilling also discovered significant silver-copper mineralization peripheral to the mineralization exposed in old mine workings at El Cajón.

The second drill phase began October 17, 2005, and ended July 6, 2006. Phase II, which consisted of 91 RC and 37 core holes totaling 18,609.9m, focused on defining the limits of the San Rafael mineralization and also expanding and defining the El Cajón mineralization. Due to the rugged topography and difficulty in locating drill pads, both vertical and angle holes were used to test the mineralized zones.

The third phase began January 2007, and ended August 2007. Phase III, which consisted of 80 RC and 51 core holes totaling 26,507.8m, focused on infilling and defining the limits of the El Cajón mineralization in preparation for a first-time publicly reported resource estimate and also infilling the San Rafael deposit for the purposes of resource classification upgrading. The 120 Zone was recognized while drilling hole SR120 at the San Rafael deposit during Phase III.

The fourth phase of drilling began March 2008, and ended August 2008. Phase IV, which consisted of 56 core holes totaling 12,165.1m, focused on upgrading and further expanding the 120 Zone, defining the limited extents of the oxide mineralization, as well as minor step-out drilling at El Cajón.

At the conclusion of all phases of PRG's exploration program through 2009, there were 194 drill holes and 14 surface trenches in the San Rafael deposit area, and 95 drill holes in the El Cajón deposit area. The El Cajón drilling total included 52 drill holes located within the Silvia Maria concession, ground which PRG did not control. PRG had been in negotiations with the Silvia Maria property owners but as of the acquisition by Scorpio, had not concluded an agreement. The Silvia Maria drill holes have been included within the project database and have been used by MDA in estimating and classifying the El Cajón resource, though the reported resource specifically excludes that portion of the resource that occurs within the Silvia Maria concession.

### 9.2.2 Geophysical Surveys by Platte River Gold

Geophysical work by PRG, which is summarized by Ellis (2007), was completed in 2005 and 2006 by Quantec Geoscience Inc. of Reno, Nevada (USA). IP, resistivity, and ground magnetics data were collected. The IP and resistivity data were collected to map the distribution of pyrite and chalcopyrite, while the ground magnetics data were collected as a test to determine whether the skarn mineralization and intrusive rocks could be identified by their magnetic properties.

A total of five IP lines were acquired, four lines at El Habal (located west-southwest of El Cajón; see Figure 7.2), and 12 lines covering the San Rafael/El Cajón target for a total of 27.4 line-km of IP and resistivity. IP anomalies correlated with mineralization in all areas. Low-amplitude IP anomalies (<5.0 msec.) seem to correspond to the El Habal mineralization, while high-amplitude IP anomalies (reaching 20msec. or higher) correlate well with mineralization at San Rafael and El Cajón. This amplitude can indicate disseminated sulfide in the range of 3% to 5%. However, the percentage of sulfide can be much higher if the habit of the mineralization is more massive or if it consists of a lower IP-responding sulfide such as chalcopyrite (Ellis, 2007).

Resistivity was not a good indicator of mineralization. Resistivity values varied between 100ohm-m and 500ohm-m. Lateral variations in resistivity probably reflect structure, lithology, or the overprint of alteration.

Ground magnetics data were acquired along two IP lines at El Cajón during the 2006 survey. A GEM system (GSM-19) proton precession magnetometer was used for the survey, and a total of 2.5 line-km of data were acquired and plotted in profile format. The results of the magnetic survey were inconclusive. No clear correlation of magnetic anomalies with mineralization was identified. However, the value of ground magnetics is often in its ability to map lithology, structure, and sometimes alteration and is difficult to assess with limited coverage (Ellis, 2007).

### 9.2.3 Other Exploration by Platte River Gold

In addition to drilling and geophysical surveys, PRG conducted geologic mapping and chip-channel sampling of outcrops and road cuts. Geochemical data from 14 trenches located on the eastern edge of the San Rafael deposit are in the database and were used in the current resource estimate.

Since August 2008, PRG has conducted regional mapping and sampling outside of the resource areas.

### 9.2.4 Exploration by Scorpio

Since acquiring the San Rafael and El Cajón properties in August 2010, Scorpio has conducted road building, limited mapping, and drilling. Their drilling program is described in Section 10.2.4.

In 2010, Quantec Geoscience Ltd. completed a 48-line-kilometer Titan-24 DC/IP geophysical survey centered over the San Rafael area (Izarra, 2010). The survey was initiated in June 2010 and covered a 3km x 3km area, using 100m dipole spacing with a 200m line spacing. Interpreted results of this survey led to seven exploration core holes being drilled at El Cajón between September and November 2010 to test some of the geophysical anomalies. A total of 2,555.1m was cored by Major Drilling, but the results were not encouraging and have not been followed up by additional drilling. These holes are not located within the San Rafael-El Cajón resource areas.

# 10.0 DRILLING

## 10.1 Nuestra Señora Area

As of February 2, 2012, the database used for the resource estimate contained a total of 1,503 core holes that Scorpio had drilled in the Nuestra Señora area, including the Nuestra Señora, Candelaria, Santo Domingo, and Santa Teresa deposits, since 2000 (Table 10.1). Of these, 150 were holes drilled from the surface for a total of 26,730.83m, and the remainder were underground holes. Figure 10.1 is a cross-sectional view showing the drill holes at Nuestra Señora, and Figure 10.2 is a surface map showing the location of the drill holes.

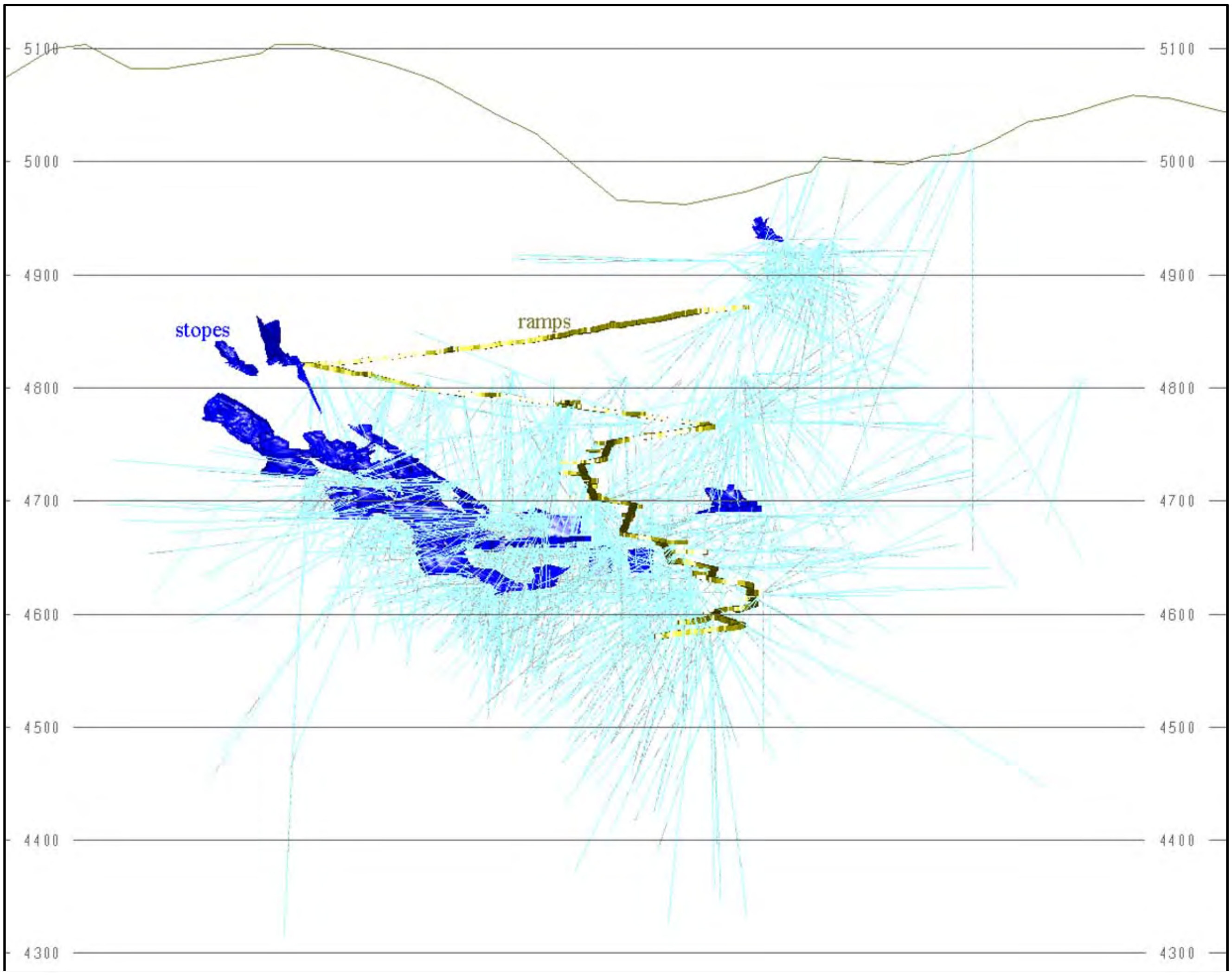
From February 2, 2012 to the end of January 2013, additional drilling, not included on Table 10.1, Figure 10.1, or Figure 10.2, was performed at Nuestra Señora. The underground diamond drilling was advanced with the objectives of upgrading Inferred mineral resources to higher categories and increasing the size of the resource. Results from that drilling were reviewed by MDA in early February 2013. Essentially, all the new post-model drill holes do intersect at least low-grade mineralization. All but one were drilled into areas where no high-grade resources were projected, but did encounter narrow zones of high-grade silver mineralization. The one drill hole that targeted an area where high-grade mineralization had been inferred in the block model did not encounter high-grade mineralization. MDA concludes that this drilling did extend narrow, high-grade silver zones and substantially supported the 2012 resource estimate, but the drilling did not expand the resource in any material way.

**Table 10.1 Drill Holes in the Nuestra Señora Database as of February 2, 2012**

| Year | Type | No. Holes | Meters Drilled |
|---|---|---|---|
| 2000 | Surface | 17 | 2,956 |
| 2001 | Underground | 16 | 762 |
| 2002 | Underground | 27 | 1,310 |
| 2004 | Surface | 72 | 6,292 |
| | Underground | 13 | 2,466 |
| 2005 | Surface | 36 | 7,184 |
| | Underground | 143 | 20,281 |
| 2006 | Surface | 17 | 3,819 |
| | Underground | 134 | 15,565 |
| 2007 | Surface | 55 | 7,689 |
| | Underground | 323 | 34,614 |
| 2008 | Surface | 12 | 2,617 |
| | Underground | 260 | 30,642 |
| 2009 | Underground | 56 | 2,954 |
| 2010 | Underground | 198 | 16,526 |
| 2011 | Underground | 124 | 13,690 |
| **Total** | | **1,503** | **169,366** |

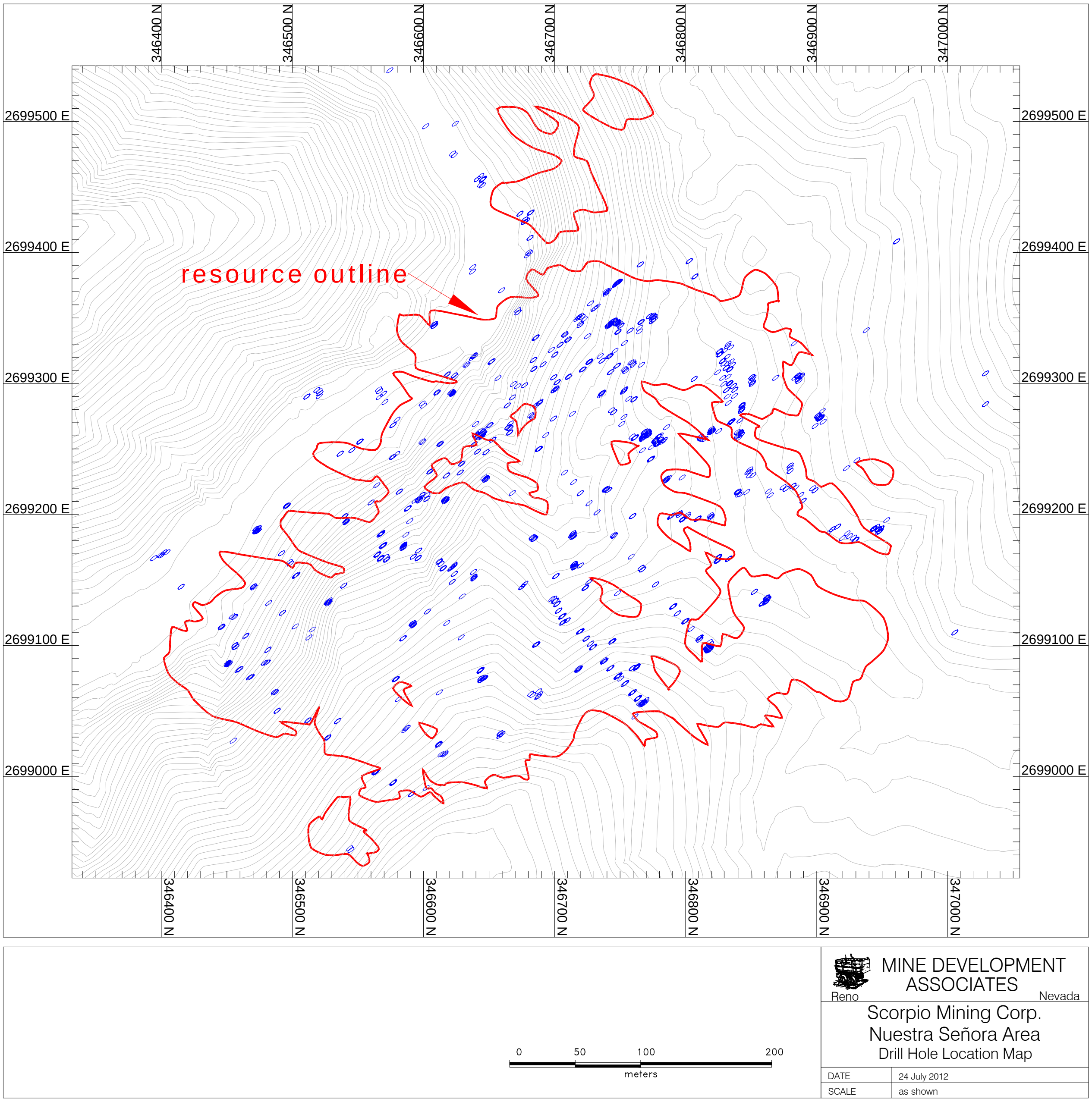
Apparent discrepancy in total is a function of rounding.

**Figure 10.1 Nuestra Señora Drill-Hole Map with Ramps and Stopes**




This figure does not include the holes drilled since February 2, 2012.

**Figure 10.2 Nuestra Señora Surface Drill-Hole Map**




This figure does not include the holes drilled since February 2, 2012.

The following information has been taken from reports by Henriksen (2004), de Corta (2011), and Spring and Breede (2008), with updated information from Scorpio and MDA. This information pertains to drilling as of February 2, 2012.

Scorpio began drilling in the vicinity of the Candelaria deposit in March 2000 and by January 2002 had completed 17 surface and 44 (43 are in the database) underground diamond drill holes in and near Candelaria. Of the 61 holes drilled, eight were abandoned due to bad ground conditions (Henriksen, 2004). The holes were angled at -45°, horizontal, and vertical on azimuths of 45° or 225°. The underground drilling was performed by Techno Drill de Mexico S.A. de C.V., and all core was BQ thinwall in size. The BQ thinwall size is about the same diameter as the NQ-size core drilled from the surface (Henriksen, 2004). MDA has no information on the drill contractor or rigs used for the 2000-2002 surface drilling. The drill core was routinely photographed, and each box of core was measured for core recovery; recoveries varied between 90 and 100% (Henriksen, 2004). Sample intervals were no shorter than 10cm and no longer than 1.5m. When possible, samples were broken into specific lithologic units or representative types of mineralization. Sulfide-bearing intervals were bracketed by barren intervals to define the limits of mineralization (Henriksen, 2004). Core was split on site using a manual hand splitter. Half of the split core was returned to the box and stored at site for future reference. At the end of the day, site geologists transported the samples to Scorpio's office in Cosalá. Once there were enough samples for shipment, the plastic sample bags were placed into large burlap sacks, which were then transported by a company vehicle to Mazatlán or Culiacán, where they were sent by DHL courier service to the assayer.

In February 2004, Scorpio began excavation of a 782m ramp to 50m below the "0" level of the Candelaria mine and made a series of cross-cuts totaling 593m to examine the continuity of the mineralized zone mined by Asarco. Between June 2004 and April 2005, Scorpio drilled 151 BQ-size core holes (CUG-04- and CUG-05- series on Table 10.1) totaling 17,195m underground at Candelaria. Two electric drills were used – a Longyear 38 and a Boyles B-10 hydraulic rig. Core was recovered by a wire-line recovery system, and the core was immediately transferred by the geologist and/or a technician into covered wooden boxes for transportation to and storage at Scorpio's core-logging facilities at Cosalá. The inclination of the holes was measured using the test-tube acid method. The azimuths were determined using a total station survey instrument (Leica TCR 405) and inclination using a Brunton compass. After completion of the hole, the azimuth and inclination were measured using the total station survey instrument.

For the Nuestra Señora drilling from 2004 to 2010, underground drilling was performed with Atlas Copco V-10 drill rigs, drilling BQ core. Surface drilling utilized Forage Valdor 38 rigs, drilling NQ core.

In October 2004, Scorpio initiated a surface drilling program directed at the area between the Nuestra Señora workings and the Hoag fault. As of the end of August 2006, 66 surface holes (NSS-04-, NSS-05-, and NSS-06- series) had been drilled at Nuestra Señora from the steep-sided banks of the Habitas River. Exploratory drilling of the down-dip extensions of the Nuestra Señora zone was restricted because of the existing drifts, stopes, raises, and other workings. Consequently, only the area between the Hoag fault, which lies beneath the river and the mine workings to the south, could be explored. Drilling was with a unitized hydraulic rig powered by a Longyear 38 diesel motor. Core was recovered by a wire-line recovery system, and the core was immediately transferred into covered wooden boxes for transportation to and storage at Scorpio's facilities at Cosalá. The core size in holes NSS-05-01 to NSS-05-39 was of NQ diameter, and their orientation and inclination were measured using a Tropari surveying instrument manufactured by Pajari Instruments Ltd. Due to the unavailability of N- sized rods, the hole size was reduced to BQ for holes NSS-05- 40 to NSS-05-49 and NSS-06-50 to NSS-06-66. As a consequence of the reduction in size, the Tropari delivery system could not be used, and only the inclination was measured in the 2005 BQ-size holes using the test-tube acid method. For the 2006 program, starting with NSS-06-50, the orientation and inclination of the holes were measured using a Reflex electromagnetic directional down-hole survey instrument rented from Reflex Instrument North America located in Timmins, Ontario. The hole collar was located with a compass and measuring chain.

Upon completion the drill casing's dip, orientation, location, and elevation were determined using a total station survey instrument (Leica TCR 405). The casing was left in the hole, and it was sealed using a cement mixture to prevent the ingress of river water into the existing and future development during flooding.

Underground exploration drilling at Nuestra Señora of the Main, Hoag and Sept 9 zones totaled 147 BQ-size holes (NSUG-05-01 to NSUG-05-62 and NSUG-06-63 to NSUG-06-130 and NSUG-07- 131 to NSUG-07-150) for a total of 24,141.8m as of 2011. Drilling was with a Boyles B-10 hydraulic rig. Core was recovered by a wire-line recovery system, and the core was immediately transferred into covered wooden boxes for transportation to and storage at the company's core-logging facilities at Cosalá. Orientation and inclination of the holes were measured with a Reflex electromagnetic directional down-hole survey instrument.

Spring and Breede (2008) reported that as of early 2008 most of the drilling had been BQ core, but about 25% of the total drilling consisted of ATW ("A" Thin Wall) core, which has a smaller radius than BQ core (1.185in diameter compared to 1.432in).

For core sampling through 2008, core was collected and transported in covered core boxes to the logging facilities located in Cosalá. Individual pieces of core were aligned to ensure that the core had the same orientation throughout the hole and that all halves sent for assaying were contiguous. RQD measurements were taken, and geological, mineralogical, and structural descriptions were made. Digital photos of the core were taken with the hole name and core interval present on the photo. Sample intervals were marked for splitting, and a continuous line was drawn along the entire length of the sample interval to ensure that alignment of the core was maintained during movement of the core box and handling of the core.

For their underground drilling in 2010, Scorpio reports that they used proprietary machines developed by the contractor, DR Drilling Mexico.

When MDA visited Nuestra Señora in September 2011, two core rigs were drilling underground with AQTK-size core (Tietz and Lindholm, 2011). Recovery was generally averaging over 90%. Scorpio personnel deliver the core twice per day to the core processing facility at the mine offices adjacent to the Nuestra Señora mill, where it is logged, photographed and sampled. At the time of MDA's most recent site visit in March 2012, exploration drilling from underground at Nuestra Señora was on-going with one core rig. This was a Versadrill KM300 core rig, provided by DR Drilling from Mazatlán, Sinaloa, Mexico, and was drilling AQTK-size core. MDA has noted that the AQ-size core may not accurately reflect local mineral grades due to the combination of high variability inherent in this small sample size and the high local variability of mineralization apparent throughout much of the deposit.

Two CUBEX D6200 grade-control and blasting rigs and one Boart-Longyear Stope Mate S36 development rig were being used underground for grade-control drilling. The CUBEX and Boart-Longyear rigs drill 4.5in and 2.5in holes, respectively. Underground grade-control samples are taken at 1.2m intervals and consist of 2 to 3kg of sand-size material. Assaying is performed at the Nuestra Señora mine lab. These drilling and sampling data are not used in resource estimation but were used as general guides for mineral domain modeling on section. Contradictions between exploration and grade-control sample data defaulted to exploration data.

## 10.2 San Rafael-El Cajón Area

As of March 2013, 653 drill holes for 101,001.9m have been completed in the San Rafael-El Cajón area. This total includes 371 drill holes completed by PRG between 2004 and 2008 and 282 drill holes completed by Scorpio in 2011 and 2012.

The great majority of both the PRG and Scorpio drilling has focused on the immediate San Rafael and El Cajón resource areas. Along with the two resource areas, 14 other properties have been targeted. The PRG and Scorpio drilling is summarized in Table 10.2. Figure 10.3 shows the drill-hole locations at San Rafael and the current resource outline. Figure 10.4 shows the El Cajón drill-hole locations along with the current resource plan outline and the Silvia Maria concession boundary.

**Table 10.2 Drilling in the San Rafael-El Cajón Area**

| Property | # of RC Drill Holes | Length (meters) | # of Core Drill Holes | Length (meters) | # RC-Core Drill Holes | Length (meters) |
|---|---|---|---|---|---|---|
| **Platte River Gold (2004 thru 2008)** | | | | | | |
| El Cajón | 24[1] | 3,712.4 | 38 | 9,021.4 | 26 | 6,204.0 |
| San Rafael | 124[2] | 18,881.8 | 43 | 7,554.1 | 27 | 6,018.4 |
| El Magistral | 11 | 1,280.2 | | | | |
| La Verde | 7 | 1,516.4 | | | | |
| Los Manueles | 10 | 2,217.4 | | | | |
| El Venado | 8 | 1,315.2 | 9[3] | 1,897.0 | | |
| Caprichos Norte | 4 | 745.2 | | | | |
| El Mamut | 7[4] | 826.3 | | | | |
| La Estrella | 20 | 2459 | | | 1 | 452.5 |
| La Profesora | 4 | 396.2 | | | | |
| El Habal | 3 | 525.8 | | | | |
| La Buffa | 2 | 189.0 | | | | |
| Caprichos Sur | 1 | 128.0 | | | | |
| Los Indios | 1 | 170.7 | | | | |
| San Antonio | 1 | 195.1 | | | | |
| **PRG Totals** | **227** | **34,558.7** | **90** | **18,472.5** | **54** | **12,674.9** |
| **Scorpio (2010 thru March 2013)[5]** | | | | | | |
| El Cajón | | | 35 | 6923.5 | | |
| San Rafael | | | 141 | 13578 | | |
| El Cajón NW | | | 4 | 1555.9 | | |
| La Humaya | | | 3 | 999.3 | | |
| La Verde (surface) | | | 20 | 2428.7 | | |
| La Verde (UG) | | | 64 | 7991.4 | | |
| Rincon del Aguaje | | | 15 | 1819 | | |
| **Scorpio Totals** | | | **282** | **35,295.8** | | |

[1] Does not include two RC holes (EC5A and EC11A totaling 41.1 meters) which were abandoned and re-drilled by later holes. [2] Does not include one RC hole (SR139 totaling 125 meters) which was abandoned and is not in the current database. [3] Does not include one El Venado core hole (VE9 totaling 7.5 meters) which was abandoned and is not in the current database. [4] The El Mamut RC drilling is included in the El Cajón resource database. [5] Scorpio drill totals are as of July 1, 2012.

### 10.2.1 Historic Drilling

As discussed in Section 6.1, Asarco, Peñoles, Mr. Jaime Guinea Gonzalez, Hemlo, Golden Panther, and Noranda are known to have drilled in the vicinity of San Rafael and El Cajón during their tenure. None of these holes are included in the database, and none were used for the resource estimates of this report. MDA has no details about any of this drilling, contractors or type of rigs used, or down-hole surveying, although PRG has some hard-copy records of some of the historic drilling.

At some time prior to 1965, Asarco drilled three core holes at El Mamut, in what is now the El Cajón mineralized area. In the late 1970s or early 1980s, Peñoles did some drilling around La Estrella mine, but MDA has no further details. At some time after 1987, Mr. Guinea drilled 12 RC holes along the La Verde zone. In 1997, Hemlo drilled 15 RC holes in the San Rafael area, and in the same year Golden Panther drilled three core holes over the mineralization at La Verde mine. In 2001, Noranda drilled seven vertical core holes in the San Rafael area; PRG subsequently drilled twins of five of Noranda's holes. PRG has an electronic archive with Noranda's assay data for six of their drill holes.

### 10.2.2 Drilling by Platte River Gold

As of August 2008 at the end of all of PRG's drilling, PRG had drilled a total of 371 holes (227 RC only, 90 core only, and 54 RC pre-collar to core/core combination) for 65,706m in the San Rafael-El Cajón area. An additional three RC holes and one core hole (EC5a for 25.9m, EC11a for 15.2m, SR139 for 124.97m, and VE9 for 7.5m) are not included in the total of 371 holes because these four holes were abandoned at shallow depths and re-drilled. The current database has 371 drill holes and 14 surface trenches. Of the 65,706m drill total in the database, 34,559m were RC, 3,830m were RC pre-collar to core, and 27,317m were core.

PRG's Phase I drill program in late 2004 to mid-2005 tested prospects throughout the San Rafael-El Cajón area with the drilling of 56 RC holes for a total of 8,423.2m. Phase II, drilled in late 2005 through mid-2006, focused on the San Rafael and El Cajón targets with the drilling of 91 RC holes and 37 core holes for a total of 18,609.9m. Seventeen of the core holes were started using RC and changed to core drilling when water was encountered or as the mineralized horizons were approached. Phase III, drilled in early to mid-July 2007, further delineated the San Rafael and El Cajón targets and also tested other exploration targets on the property. Phase III drilling consisted of 80 RC holes and 51 core holes for a total of 26,507.8m. Thirty of the Phase III core holes were started using RC, and changed to core drilling when water was encountered or as the mineralized horizons were approached. Phase IV drilling consisted of 56 core holes totaling 12,165.1m. Phase IV drilling focused on upgrading and further expanding the 120 Zone and defining the limited extents of the oxide mineralization, as well as minor step-out drilling at El Cajón. Seven of the Phase IV core holes were started using RC, and changed to core drilling when water was encountered or as the mineralized horizons were approached.

There were no abandonment procedures upon completion of the Phase I and II drill holes. The holes were left open, and the collar location marked by a large painted rock so as to be identified by the surveyor. The Phase III drill-hole collars have the drill-hole name and number marked on a metal plate attached to a buried rebar post. Phase IV utilized a short piece of PVC tubing with rebar placed in the top to hold the tubing near the top of the hole. The drill-hole locations soon become obscured due to both traffic and slope failures, and then the resulting road reconstruction, especially after the late summer rainy season.

**Figure 10.3 2012 San Rafael Drill-Hole Location Map**

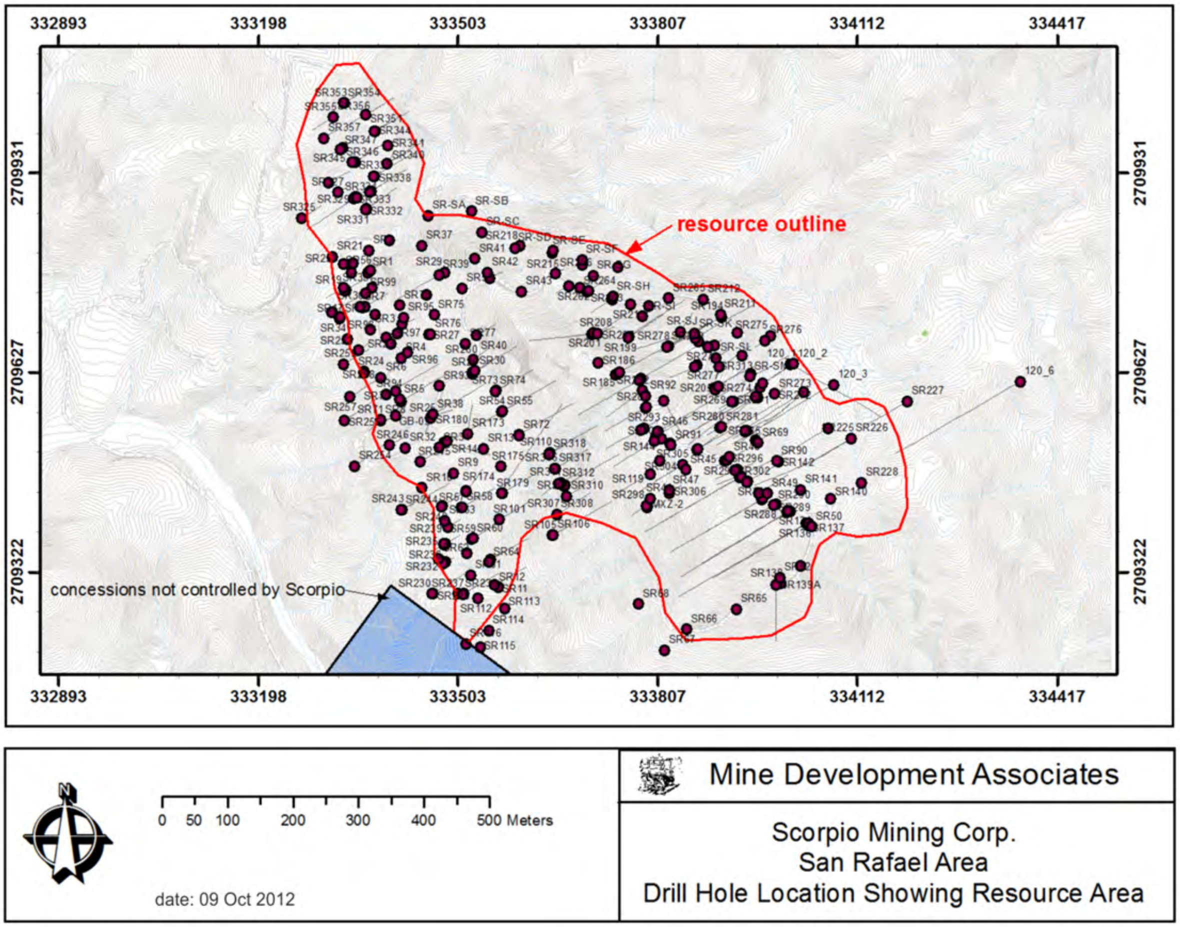
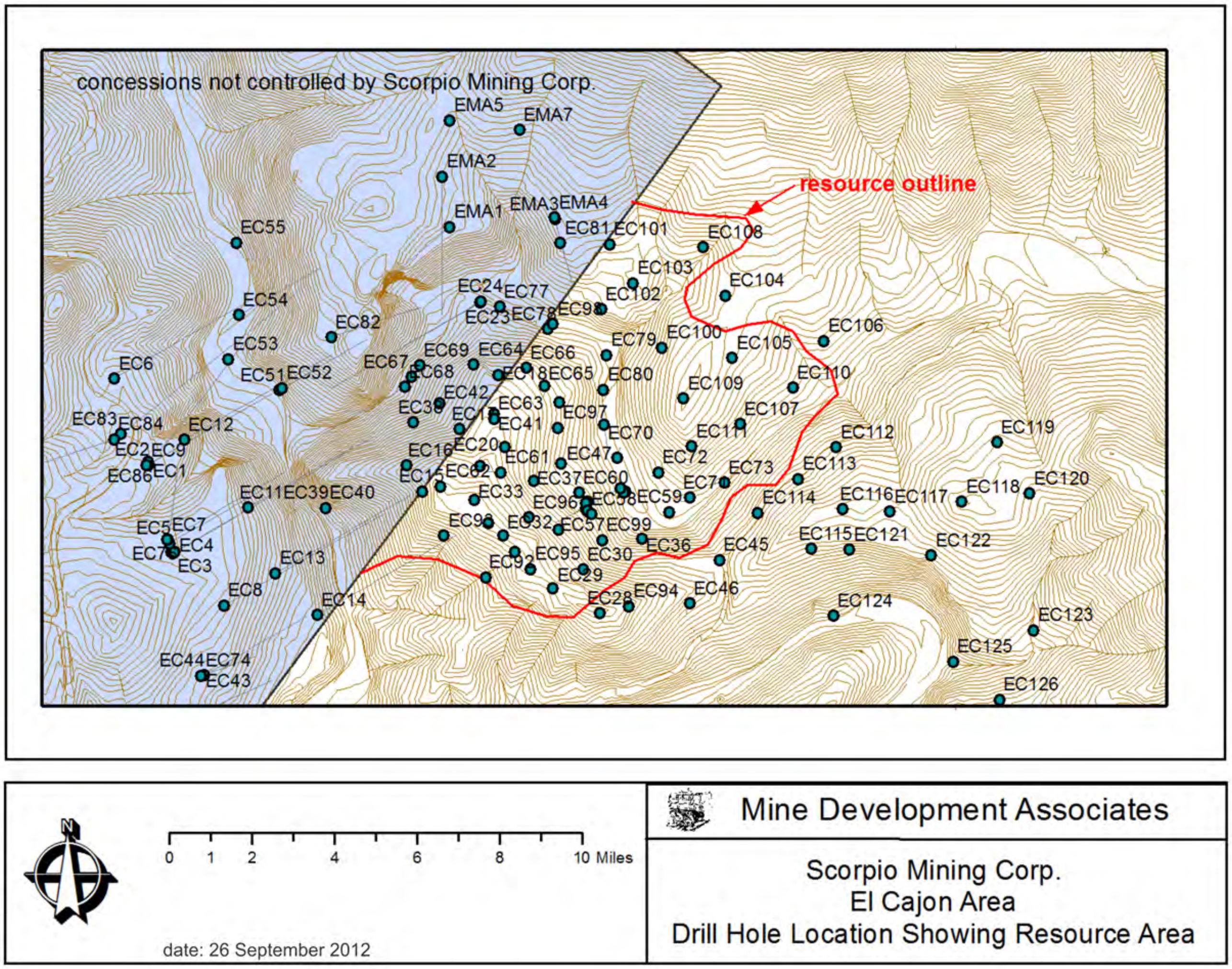


**Figure 10.4 2012 El Cajón Drill-Hole Location Map**




### 10.2.2.1 Reverse Circulation Drilling by Platte River Gold

PRG's Phase I RC drilling was done by Layne de Mexico, S.A. de C.V. ("Layne"), which is based out of Hermosillo, Sonora, Mexico. The drilling was completed using a truck-mounted Ingersol Rand TH-100 RC rig with a 900cfm and 350psi compressor. Due to the large volumes of water encountered in the drill holes, a secondary booster compressor was used in the spring of 2005 to aid in the penetration rate and the ability to complete the holes to desired depth. A total of 56 RC holes for 8,423.2m was completed in the Phase I drilling.

The Phase II, III, and IV RC drilling was done by Layne and Major Drilling de Mexico, S.A. de C.V. ("Major"). Layne completed 11,273m of Phase II drilling in 95 holes using a Drill Systems MDP 1500 track-mounted drill with a 900cfm and 350psi compressor. In Phase III, Layne completed 14,355m of drilling in 72 holes using a Foremost Prospector buggy rig with 750cfm air. No booster compressor was used in either the Phase II or III programs.

Major completed 4,498m of Phase II, III, and IV RC drilling using a track-mounted UDR-650 drill with RC- and core-drilling capabilities. Of the Phase II, III, and IV RC drilling completed by Major, six holes were RC only (five in Phase II, and one in Phase III), while 54 were started with RC and then completed with core.

During the Phase I drilling, the general practice was to drill all holes using a 5.25in.-diameter face-discharge hammer ("FDH") bit to minimize sample loss. However, the high volumes of water encountered in many drill holes exceeded the capacity of the FDH, and the bit was changed to a standard Mission hammer, which has the interchange sub 1.5m above the bit. Even using the Mission hammer, the high water volumes stopped completion of several holes above the desired depth. A tricone bit was attempted in a few holes, but the penetration rate was very slow, and the holes were terminated before the desired depth was reached. When the booster compressor arrived in early 2005, it allowed completion of most of the remaining Phase I holes to desired depth using a hammer bit, although high water flows continued to be a problem.

The Phase II, III, and IV RC drilling was completed using only FDH bits. The Layne RC drill rig was used primarily at San Rafael, where most drill holes were completed at shallow depths, and lower volumes of water were present. The majority of Major's RC holes were at El Cajón, where it was necessary to drill to greater depth, and high water flows were encountered.

In all phases of drilling, the RC holes were drilled using a 5 1/8in to 5 ½in drill bit. Samples were collected every 5ft or 1.5m depending on the drill rig. The sample bags were pre-numbered at the drill site, and chip trays were made as drilling progressed. A geologist logged the hole at the drill site as the hole progressed. A review of the drill logs by MDA indicates that most of the Phase I RC logs contain comments concerning drilling problems, groundwater depths and flows, and approximate sample recovery. Very few of the Phase II, III, or IV RC drill logs comment on these same drilling issues. However, a separate field notebook was kept with similar comments.

#### 10.2.2.2 Core Drilling by Platte River Gold

Major completed a total 25,420m of HQ- or NQ-diameter (very few meters were drilled with NQ core, only when necessary due to depths over 400m or extremely bad ground conditions) core drilling in the Phase II, III, and IV drill programs: 6,624.1m during Phase II, 8,915.75m in Phase III, and 9,880.1m during Phase IV. A total of 135 core holes were completed using a track-mounted UDR-650 drill, though 54 were started using RC and then changed to core when water was encountered or as the mineralized horizons were approached. Core recoveries were generally greater than 95%, although lower recoveries were obtained when drilling in strongly fractured and void-rich recrystallized limestone. The drill runs are the standard 10ft (3.05m) length, and continuous 1m or greater sticks of core are common.

Landdrill International Mexico S. A. de C. V. ("Landdrill") completed nine core holes for a total of 1,897m of HQ- or NQ-diameter core drilling in Phase IV. Landdrill utilized a skid-mounted core rig (Longyear 38) and only tested the El Venado anomaly during Phase IV.

Core was put into wooden core boxes (3m/box) with wood blocks marking drill depth (in meters) between each run. The core was picked up twice per day by PRG personnel and transported to a secure, gated facility in Cosalá, where it was logged, photographed, and split for samples. The geologic logs are fairly comprehensive, with columns for rock quality data (RQD and core recovery) and various geologic characteristics, including lithology, alteration, comments, and most significantly for the project, both total sulfide percentage and individual sulfide-mineral percentages. The geologist marked the intervals to be sampled, and a technician photographed and then split the core. Only the core to be sampled was photographed. After being logged and sampled, the core was stored outside, with no overhead cover to protect the core from the weather, at the secure Cosalá facility. In 2009, the core was moved to a covered storage area at the same Cosalá facility.

### 10.2.3 Drill-Hole Surveying by Platte River Gold

Drill-hole collars were surveyed with a Trimble total station survey instrument by Servicio Topographic (now Terra Group) of Hermosillo. The surveyor was on-site every two to three months and surveyed the new drill holes and any other significant surface disturbance. Collar surveys are available on 331 of the total 371 project drill holes and all 14 of the surface trenches used in the San Rafael resource estimate. The majority of drill holes without collar surveys are located away from the San Rafael and El Cajón resource areas. Within the current resource models, collar surveys are not available for one San Rafael and five El Cajón drill holes.

The majority of RC holes in Phase II and Phase III were surveyed down-hole with a Reflex EZ-Shot survey tool that has a single-shot, in-pipe camera giving digital readings. The RC survey readings were taken inside the drill rods due to a concern over losing the survey instrument in the open hole. This procedure provides accurate dips but meaningless azimuth readings due to the magnetic effects of the drill rods. As a result of the unusable azimuth readings, all vertical RC holes remain as undeviating vertical holes in the database. For angle holes, the azimuth reading in the database is the estimated collar reading determined by the geologist using a Brunton compass. In Phase I and Phase II, the drill site was flagged with a predetermined azimuth, and after the rig was set up, there was usually no further reading on orientation. During Phase III and Phase IV, the rig orientation was routinely checked by the responsible geologist using a Brunton compass. Corrections to actual rig orientation were noted and changed on the drill log before being entered into the database. While in the field, MDA did not observe the down-hole survey procedures at the either the RC drill rig or the core rig.

None of the Phase II core holes were surveyed down-the-hole. The Phase III, and IV core down-hole surveys were taken below the drill rods, and the azimuth and dip readings were used in the database. The magnetic nature of some of the project lithologies, especially the dioritic intrusions both on the east side of San Rafael and also within the center of the El Cajón deposit, resulted in a number of azimuth readings which had significant deviations from either the collar set-up orientation or from adjacent down-hole readings. To aid in determining the “accepted” survey values, the magnetic field data, as recorded by the driller for each survey reading, were analyzed with particular attention to spurious magnetic field values significantly different from the general magnetic field. This information was recorded and compared to the coincident azimuth values. The result showed a high correlation between spurious magnetic field readings and erratic azimuth values. As a result of this analysis, 13 individual survey readings out of a total of over 1,000 were removed from the database.

### 10.2.4 Drilling by Scorpio Mining Corp.

As of March 2013, Scorpio has completed a total of 282 core holes for 35,295.8m in the San Rafael-El Cajón area. Scorpio began core drilling within the San Rafael mineralized area in the fall 2011 and at El Cajón in the spring 2012. Scorpio also drilled four other areas in the vicinity, including surface and underground targets at the historic La Verde mine area. Seven exploration core holes were drilled in the San Rafael-El Cajón general area from September to November 2010 to test geophysical anomalies. A total of 2555.1m was cored by Major Drilling, but the results were not encouraging and have not been followed up by additional drilling. These holes are not located within the San Rafael-El Cajón resource areas and are not included in the updated resource estimates described in Section 14.0.

Scorpio has completed 141 core holes, including 10 geotechnical core holes, in the San Rafael resource area. Drilling in the San Rafael deposit area by both Scorpio and PRG now totals 184 core holes, 124 RC holes, and 27 drill holes pre-collared with RC and completed with core. The geology from the geotechnical holes was used to guide the geologic model, but assay data were not available in time to be used in the resource estimate. Scorpio's drilling was primarily shallow (95m average depth) vertical and angle holes targeting extensions of mineralization to the northwest and along the east edges of the San Rafael deposit. Infill holes were also drilled to test and upgrade the existing resource classification.

As of March 2013, Scorpio has completed thirty-five core holes in the El Cajón resource area. Drilling has primarily targeted eastern extensions of the existing resource, while a few infill holes were drilled targeting gaps in the previous drilling. Positive results on the east side of the deposit indicate potential growth in the resource. The infill holes confirm the existing mineralization and also provide greater geologic control on the current geologic model.

At the time of MDA's visit in September-October 2011, two core rigs were operating at San Rafael, performing infill and pit-expansion drilling along the west and north sides of the Main and Upper zones (Tietz and Lindholm, 2011). MAZA Drilling out of Mazatlán was the operator, and the rigs were drilling HQ-size core. Core was collected from the rig once or twice per day and transported to Scorpio's camp outside of Cosalá. The wooden core boxes were not covered during transport. Geotechnical and geologic logging and photography of the core were completed there. Overall core recovery appeared to be consistently over 90%.

Scorpio reported that in the summer of 2012 at San Rafael and El Cajón, they were using Forage Val d'Or 38 rigs, drilling HQ core and reducing to NQ when necessary. Collars are located by total-station surveying provided by Hector Martinez, licensed surveyor. Down-hole survey information is collected using Reflex survey tools.

# 11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

## 11.1 Sampling Methods

### 11.1.1 Nuestra Señora

The following information is taken from Spring and Breede (2008) and de Corta (2011) with updated information from MDA. It does not include details on sampling of the additional drilling performed since February 2012 that were not used for the 2012 resource estimate.

For exploration drilling, Scorpio determines core sample intervals based on the percentage of sulfides. With a few exceptions, sample lengths vary from a minimum of 10cm to a maximum of 2m with mean and median at 1.2m. Where there are sections in excess of two meters, they are sampled every two meters. At least two meters of host rock are sampled on either side of the mineralized zone. The complete mineralized zone is sampled even where a visible estimation indicates an amount of sulfide less than 1 percent. Samples are also constrained by geological boundaries, and consequently no sample interval extends across a geological contact.

For development and production, chip samples are taken from multidirectional and blast drilling on the faces with 12m holes. The cuttings of the drilling are sampled in 2.4m-long intervals (5 samples per hole). After the blast, the pile is sampled with five grabs of about 5kg each, one in the middle of the pile and one at each corner of the pile. Each sample is individually bagged, tagged, and sent to the laboratory.

Prior to June 2009, exploration core samples were split in half, and one portion was placed in a plastic bag to be sent to ALS Minerals ("ALS"; formerly called "ALS Chemex") for assaying and the other returned to the core box to be stored at Scorpio's secured enclosures in Cosalá. Core sizes were of BQ to NQ size, and the samples' weight varied between 0.6 and 5kg. Core recoveries within the mineralized zones varied between 90 and 100 percent.

From June 2009 until July 2010, the entire core (AQ size) was sent to Scorpio's in-house laboratory for analysis. From July 2010 to March 2012, Scorpio was sending exploration samples to ALS as well as to their in-house laboratory. If a drill hole encountered a strongly mineralized zone, all samples for that hole were sent to ALS; otherwise, the core was sent to Scorpio's in-house laboratory. At about the time of MDA's March 2012 site visit, Scorpio began sending all exploration samples to ALS.

Only apparently mineralized core were being sampled (Tietz and Lindholm, 2011); much calc-silicate-altered rock was left unsampled. Sample lengths varied from 15cm to 6.5m with a mean of 1.81m and a median of 1.75m. The core was photographed. Core was generally split using a hydraulic splitter, although some select pieces were cut using a diamond saw to provide a smooth surface for viewing sulfide mineralization. Half core was sampled and bagged in poly cloth bags with sample numbers written on the bags.

### 11.1.2 San Rafael-El Cajón

The following information refers only to the work of PRG and Scorpio. MDA has no information on sample preparation, analyses, or security used by prior operators, but none of their samples are used in the resource estimate.

### 11.1.2.1 RC Sampling by Platte River Gold

Samples were collected every 5ft or 1.5m depending on the drill rig. The samples were split at the drill rig with a mechanical splitter for the dry samples and a rotating splitter for the wet samples. A Gilson splitter was used at the UDR drill rig, while a Jones three-tiered splitter was used by the Layne rig. PRG states that for Phase I and Phase II, a 12.5% split was generally collected for the dry samples, while the wet samples were usually a 16.6% split. During Phase III, PRG changed to larger sample bags that allowed for a 41.7% dry split and a 20.8% wet sample split. The sample splits were varied at times when sample return was very low to assure sufficient sample size (PRG, 2006d). The change in sample split occurred between samples and never within an individual sample. In areas of bad ground and resulting poor sample recovery, such as observed by MDA during their site visit, it was at times necessary to collect all of the sample returned to have a sufficient sample size for assaying. PRG noted the drilling conditions and significant changes in sample procedures for each hole.

The split dry samples were collected in 11x17in cloth sample bags in Phases I and II. During Phase III, PRG changed to 20x24in cloth bags that fit inside a 5-gallon bucket. The wet samples were collected in 5-gallon buckets, with the excess water allowed to overflow the bucket. There was some loss of sample due to the overflow, which could have been substantial when drilling in high-water zones. At the end of the sample interval, the bucket was removed and replaced with a clean bucket for the next sample. In Phases I and II, the complete sample was collected by decanting the water and filling an 11x17in cloth sample bag with the remaining solids. During MDA’s site visit, it was observed that there was a minor amount of spillage and sample loss when filling the sample bag. MDA suggested PRG use larger sample bags to both avoid any sample spillage and simplify the sample collection. During Phase III, PRG changed to 20x24in cloth sample bags. Sample collection was greatly improved using the larger sample bag and bucket combination for both wet and dry samples, and larger sample splits were collected for RC samples.

Duplicate samples were collected every 20$^{th}$ sample for submission to a second laboratory. At the geologist’s discretion, duplicate samples were also collected within the mineralized zones and sent to the primary lab for analysis. The mineralized duplicate samples were taken every time from the same side of the splitter and were given unique sample numbers to assure anonymity.

When the RC hole was completed, the samples to be submitted for analysis were selected, and appropriate blanks and standards were inserted blind into the sample sequence. In general, one blank and one standard were inserted for every 40 samples. The samples for analysis were placed into large rice sacks, sealed, and moved to PRG’s secure facility in Cosalá, where they were stored until they were shipped to the laboratory.

### 11.1.2.2 Core Sampling by Platte River Gold

PRG’s core samples were split in half using a hydraulic splitter, a traditional splitter, or a simple hammer; the hardness of the rock made splitting very difficult. No core was sawed. Half the sample intercept was put into 11x17in sample bags, while the remaining half was left in the core box. Once the core hole was completely logged, split, and sampled, appropriate standards and blanks were added to the sample stream, and the samples then shipped to ALS in Hermosillo, Sonora, Mexico. The remaining split core was stored in Cosalá at a secure site, but until 2009 was only covered with waterproof tar paper. In 2009, the core was moved to a covered storage area at the same Cosalá facility.

#### 11.1.2.3 Core Recovery / Sample Recovery Determinations by Platte River Gold

PRG collected and recorded core-recovery data for all but three of the 70 San Rafael core drill holes and, except for the occasional drill interval, for all of the El Cajón core holes. The recovery data were based on the drill-run lengths, which in optimal drilling conditions were usually a standard 3.05m length. The recovery data, both the measured total core pieces and the calculated recovery in percent, were recorded on the drill log and then entered into a spreadsheet for analysis.

The average core recovery for the San Rafael holes, based on 3,762 drill runs with calculated recovery data, is 94.9%. Removed from this data set are the initial collar intervals (starting at 0m), which often have low recoveries due to surficial soil and/or highly broken ground. Only 71 of the San Rafael drill runs (1.9% of the drill data) had calculated recoveries less than 50%. The average core recovery for the El Cajón holes, based on 3,874 calculated recovery values, is 93.3%, with only 37 individual drill runs (1.0% of the total drill data) having less than 50% recovery. Core recovery from San Rafael and El Cajón is good and can be used to support the resource estimate.

RC sample recovery data have not been compiled.

#### 11.1.2.4 Core Sampling by Scorpio Mining Corp.

The following information is based on a site visit by MDA in fall 2011 (Tietz and Lindholm, 2011) and information provided by Scorpio.

After geotechnical and geologic logging at a secure core processing facility near Cosalá, the core is marked for sampling. The geologist determines sample intervals using geology as a guide, but only mineralized core (where sulfides are noted) was sampled as of September 2011. Core is split using a hydraulic splitter, although at the time of MDA's 2011 site visit, some select pieces were cut using a diamond saw to provide a smooth surface for viewing sulfide mineralization. The mineralized zones are not generally highly fractured, and the split core appears to provide an adequate sample split. Half core is sampled and bagged in poly cloth bags with sample numbers written on bags; no sample tag is inserted into the bag. Sample numbers are based on a pre-determined scheme that allows for insertion of standards, blanks, and duplicates. Blanks and standards are added to the sample stream in a random fashion, with an approximate average of one standard, one blank, and one duplicate in every 20 samples. Samples are bagged in rice bags and stored for shipment by truck, using an independent contractor, to the ALS lab in Hermosillo.

## 11.2 Sample Preparation and Analysis

### 11.2.1 Nuestra Señora

The following information is taken from Henriksen (2004), Spring and Breede (2008), and de Corta (2011) with updated information from MDA and Scorpio. It does not include details on sampling of the 66 additional holes drilled since February 2012 that were not used for the 2012 resource estimate.

For Scorpio's 2000-2002 drilling, samples were prepped at Bondar Clegg de Mexico S.A. de C.V. ("Bondar Clegg") in Hermosillo. Fifty-gram pulps were sent to Bondar Clegg's laboratories in Vancouver, Canada for assaying, and the remaining rock pulps were held in storage at Bondar Clegg's Hermosillo lab. Analyses for gold and silver were by fire assay ("FA") with a gravimetric finish.

Copper, lead, and zinc were analyzed by inductively coupled plasma ("ICP"). Re-checks were performed on all high-grade values, and at the request of Scorpio on particular samples, to determine the repeatability of the reported values (Henriksen, 2004).

Subsequent to that and prior to June 2009, all technical information for the Nuestra Señora project was obtained and reported under a formal QA/QC program. The procedure for sample collection, processing, and assaying was as follows:

Underground chip channel samples were collected in plastic bags and assigned two sample tickets with a designated number. One sample ticket was placed into the bag, and the other retained for reference. The samples were transported to the surface, sealed, and placed into a sugar sack. They were either stored in a secure location at the mine site or transported to the office in Cosalá.

In the case of drill-core samples, the core was logged, and selected sample intervals were marked and assigned two sample tickets with a designated number. The core was then split, with one half placed in a plastic bag with one of the tickets and the other half returned to the core box with the other ticket for future reference. The plastic bag was sealed and placed into a sugar sack. They were either stored in a secure location at the mine site or transported to the office in Cosalá. Both locations had 24-hour security surveillance. Up to that point, all sample handling was done by Scorpio's employees.

Usually every three to four days, the collected channel and core samples were delivered to Paqueteria, Mensajeria y Movimiento, a courier service located in La Cruz, which shipped them to ALS's preparation laboratory in Hermosillo for drying, crushing, and pulverizing. ALS then sent the pulps by air-freight to ALS in Vancouver for assaying. The rejects were retained by ALS, Hermosillo, for shipment back to Cosalá.

The ALS Vancouver laboratory is certified to ISO 9001:2008 standards and has ISO/IEC 17025:2005 accreditation for its assaying methods (ALS website, May 18, 2012).

All of Scorpio's core samples were assayed for Au, Ag, Cu, Pb, and Zn utilizing ALS's ME-GRA21 30-gm fire assay with gravimetric finish and AA62 (HF-HNO3-HCLO4) acid digestion and AA for Cu, Pb' and Zn. Periodically they were also assayed for 27 other elements by (HF-HNO3-HCLO4) acid digestion, HCl leach, and ICP-AES, package ME-ICP61m. Details of the various assaying techniques may be obtained from the ALS website at http://www.alsglobal.com/minerals.aspx .

In addition to the blank standards, reference standards, and duplicate analyses performed by ALS, Scorpio conducted its own data verification by inserting standard and blank samples with the pulps (pulverized samples) that were shipped to ALS, Vancouver. Scorpio obtained its low-grade and high-grade Au-Ag-Cu-Pb-Zn sample standards and sample blanks from WCM Sales Ltd. of Burnaby BC.

At regular intervals, two pulps were produced from the sample; one was analyzed by ALS, Vancouver, while the other was sent to SGS Lakefield Research Ltd. ("SGS Lakefield") in Lakefield, Ontario. The assay results of the duplicate samples were then compared in order to monitor lab precision.

In March 2005, the assaying procedure was changed to reduce costs without jeopardizing the analytical accuracy. The mineralized chip and core samples were assayed for gold using 30-gram FA AA (AA23). Twenty-seven elements including silver, copper, lead, and zinc are also analyzed using the ME-ICP61 package. Any samples with silver over the detection limit of 200 ppm were re-assayed utilizing the

AA62 method. This also applied to copper, lead, and zinc that exceeded the detection limit of 10,000 ppm. If the silver exceeded the limit of the AA62 method of 1,000 ppm, then the sample was fire assayed with a gravimetric finish (GRA21).

Beginning in June 2009, an in-house laboratory was handling both exploration and production sample analysis. The procedures were similar to the previous external handling, except for the lack of splitting of exploration core. Geological samples from long-hole drilling are received with a size less than 3/8in. They are then dried and sieved to minus 200 mesh and homogenized before the chemical tests. Core samples are crushed and pulverized to pass the 200 mesh sieve. They are sent for analysis after homogenization and splitting.

Standards for calibration of the equipment are prepared from a 1,000 ppm stock solution and applied every 10 samples. For quality control, pulp duplicate samples are sent to SGS Lakefield for comparison. Internal control is performed by duplication of all the concentrate samples and 5% of the exploration samples.

In September 2011, Scorpio was sending exploration samples to ALS as well as to their in-house laboratory. If a drill hole encountered a strongly mineralized zone, all samples for that hole were sent to ALS; otherwise, the core was sent to Scorpio's in-house laboratory.

In 2012, for sample preparation, samples were sent to ALS's sample prep labs in either Hermosillo or Chihuahua, whichever had the more rapid service.

### 11.2.2 San Rafael-El Cajón

All of PRG's primary RC and core samples were sent to ALS for sample preparation and analysis. Silver, copper, lead, and zinc were analyzed by four-acid (HF-$HNO_3$-$HClO_4$-HCl) leach digestion. Gold was analyzed by 30g FA-AA. Sample preparation took place in ALS's Hermosillo labs, and coarse rejects were stored in Hermosillo in a PRG warehouse. Pulps were sent to Vancouver, B.C., Canada for analysis.

RC rig duplicates were regularly checked by a second lab during drilling Phases I through III. PRG used SGS de México S.A. de C.V. ("SGS") for the Phase I and II (years 2005 and 2006) second-lab check assaying of the ALS results. SGS has a sample preparation facility in Durango City, Durango, Mexico, and the pulps were sent to Toronto, Canada for analysis. SGS used a similar multi-acid digestion for the base-metal and silver analysis and a FA-AA process for the gold. PRG used International Plasma Labs Limited ("IPL") for the Phase III (year 2007) second-lab check assaying of the ALS results. IPL has a sample preparation facility in Hermosillo, Sonora, Mexico, and the pulps were sent to Richmond, British Columbia, Canada for analysis. IPL used a similar multi-acid digestion for the base-metal and silver analysis and a FA-AA process for the gold. No second-lab check samples were submitted in PRG's Phase IV.

For Scorpio's drilling, samples are delivered to ALS's preparation laboratory in either Hermosillo or Chihuahua for drying, crushing, and pulverizing. ALS then sends the pulps by air-freight to ALS in Vancouver for assaying. Gold is analyzed by FA AA on a 30g sample (ALS code Au-AA23). Silver, lead, zinc, and copper are analyzed by HF-$HNO_3$-$HClO_4$ digestion with HCl leach and ICP-AES or AA finish (ALS code OG62). The QA/QC program used by Scorpio includes standards, blanks, and duplicate pulps sent to a second lab. Upon receipt of results, variances are noted and each exception is re-run at the laboratory. The new value with the control material falling within limits is used in the final reporting.

## 11.3 Security

For Scorpio's drilling, samples are kept within a guarded compound until shipping. Samples are delivered by a company driver and vehicle to a contract shipper, who ships the samples to the laboratory. A signature is acquired from the representative of the contract shipper. On rare occasions, Scorpio's driver will deliver samples directly to the laboratory.

As of MDA's visit in September 2011, Scorpio had three core storage facilities. The pre-2011 San Rafael-El Cajón core drilled by PRG was stored at the Cosalá geology/mine office compound on the west side of Cosalá. The 2011 San Rafael drill core and the 2004 through 2011 underground and surface core from the Nuestra Señora mine were stored at the Camp 3 facility just outside of Cosalá. Core drilled at the Candelaria mine was stored at a small, fenced-in area south of the Candelaria mine portal. All the storage areas are in fenced areas behind locked gates.

# 12.0 DATA VERIFICATION

## 12.1 Project Databases

### 12.1.1 Nuestra Señora Project Database

The following discussion of the Nuestra Señora database is taken from the 2012 Technical Report (Ristorcelli *et al.*, 2012) and does not include the drilling performed since February 2, 2012, that is not included in the mineral resource estimate.

Mr. Tietz and Mr. Lindholm visited the Nuestra Señora project during the September 27 through October 1, 2011 site visit. Following an initial review, Scorpio transformed the entire database, which had been in both local mine and UTM coordinate space, to local mine space only. The relationship between local mine and UTM coordinate space is as follows:

AZ_MINE = AZ_UTM + 38.19°
Z_MINE = Z_UTM – 4462.76

Base point of rotation:

X_MINE of 10000 is equivalent to X-UTM of 337387.717 and,
Y_MINE of 10000 is equivalent to Y-UTM of 2699075.494

The normalized database, as well as all available raw data, was received by MDA on February 20, 2012, at which time auditing of the data began and continued through Mr. Ristorcelli's, Mr. Lindholm's, and Mr. Ronning's March 12 through March 20, 2012 site visit. Collar, survey, assay, specific gravity, and geology data were audited, then compiled into an accepted database. These files, which were mutually agreed upon by MDA and Scorpio personnel, were ultimately used in metal-domain modeling and resource estimation.

During the course of the audit, MDA discovered a number of errors and inconsistencies, primarily in the down-hole survey data. All were documented, and all verifiable errors were corrected. However, MDA and Scorpio were not able to resolve a significant number of the discrepancies, the majority of which were systematic by year and do not necessarily represent incorrect data. Rather, they could simply not be reconciled with available documentation. Data that appeared reasonable but could not be fully explained were retained, although this imparts a degree of uncertainty to the overall database. A smaller subset of errors and inconsistencies was ultimately determined to be irreconcilable and was removed from use in the resource estimate.

As a general comment, based on experience with many databases MDA can state that there were fewer actual errors in the assay table than is typically the case, although there was some loss of precision due to rounding of assays and inconsistencies in treatment of assays below laboratory detection limits. MDA restored original precision and entered values of half the detection limits where original data were available. The drill-hole locations entered into the collar table contained a typical percentage of errors. A small number of drill holes were excluded from resource estimation based on unresolved collar coordinate errors; no omissions were incurred based on the assay table audit. The number of errors revealed by the specific gravity audit was typical for projects of this size. Original assays that had been capped below 2.5g/cm$^3$ and above 4.5g/cm$^3$ were restored to the database.

#### 12.1.1.1 Collar Locations

Scorpio provided MDA with a set of topographic contour models for the region where Nuestra Señora is situated. MDA extracted part of the contour model in the immediate vicinity of Nuestra Señora, transformed it to local mine coordinate space, and built a digital topographic model ("DTM") for use in modeling software. Locations of drill-hole collars were checked against the DTM.

Several issues were found during initial comparison of the collar locations to the DTM. Individual occurrences are not listed, but the list that follows indicates the types of issues that were identified:

- Collar elevations that appear high or low relative to the topography are present locally.
- Some holes that were presumably drilled from underground do not originate from known underground workings.
- Some horizontal holes, also likely drilled from underground, do not originate from known workings, breach the surface and pass through "air."

Scanned copies of the mine surveyors' notebooks were obtained from Scorpio, and the raw collar coordinate data were entered into an Excel spreadsheet. The drill-hole identifiers in the notebooks were matched to records in Scorpio's collar table by locations. The compilation derived from the surveyors' notes contains records of 1,809 collar coordinates. The collar table for Nuestra Señora, received from Scorpio on February 20, 2012, contains 1,504 records. Eventually MDA was able to make 940 matches between the collar locations in the database and the surveyors' notes, with a reasonable level of confidence. Collar coordinates obtained from the surveyors' notes were compared to those in the Nuestra Señora project database, which resulted in an error rate that is typical in MDA's experience and acceptable. The comparison is summarized below:

| | |
|---|---|
| Records in database collar table | 1,504 |
| Records copied from surveyor's notebooks | 1,809 |
| Matches | 940 |
| Count of differences, Northing | 14 |
| **Count of significant differences, Northing** | **6** |
| Count of differences, Easting | 15 |
| **Count of significant differences, Easting** | **6** |
| Count of differences, Elevation | 11 |
| **Count of significant differences, Elevation** | **1** |

All of the differences that MDA considers significant occur in instances where the surveyors' notes give coordinates in UTM, whereas the database gives collar locations in local grid. There are 119 instances in which the notes use UTM coordinates. In 113 instances, once converted to local grid, the locations match the database reasonably well, leaving only six instances of significant differences. These six holes were drilled at the surface, and five plot well below the DTM topography noted above. Scorpio could not rectify these differences, so the six drill holes were removed from use in the resource estimate. All other data were verified and retained.

#### 12.1.1.2 Audit of the Down-Hole Survey Table

MDA audited Scorpio's down-hole survey table against Reflex instrument data text files, which were confirmed by Scorpio to contain the most original survey data available. As previously noted, Scorpio's database contains 1,504 drill-hole records in the collar table; the accepted survey table after the audit contains data for 1,503 drill holes. Of these, 695 holes (46%) consisted of a single survey record. No original data were available for the single-record azimuths and dips and were therefore not checked.

The total number of records in the survey table, excluding the single records, is 5,998. The total number of records compiled from original Reflex instrument data files is 5,519 (92%). Numerous discrepancies of various types were found when comparing original Reflex data to Scorpio's survey table. These discrepancies, and treatment jointly determined by Scorpio and MDA, are summarized below:

- A large number of unexplained discrepancies were encountered in the 2005 underground drill-hole data that are often unique to that data set. As a result, Scorpio and MDA agreed to remove all of these drill holes from the resource estimate.
- Four additional drill holes were also removed for reasons similar to the 2005 underground drilling.
- There are 226 Reflex records that were not present in Scorpio's survey table. The vast majority appear to have been rejected as bad data by previous data compilers, so changes were not made to Scorpio's database except for a handful of unused records that were restored.
- Three major groups of systematic differences in azimuth readings were encountered. Azimuths for 5,161 total records in 788 drill holes differed by 43.39° (2005), 42.39° (2005 to 2007) or 5.2° (2007 to 2009). Although there is no documentation to support or explain the systematic azimuth differences, Scorpio personnel recalled that averaged correction factors were applied to the older survey data, so MDA chose not to change the data in the database. The result is a lowering of the level of confidence in location of the affected samples, which in turn may result in a lowered classification of the resource.
- There are 143 individual azimuth differences in down-hole survey depths that do not belong to the systematic or unused data categories. All cases were examined jointly by Scorpio and MDA to determine the likely reason the azimuths differed, and records were maintained or restored accordingly.
- There are 658 differences in down-hole survey depths. All cases were examined jointly by Scorpio and MDA to determine the likely reason the records differed. The vast majority (about 440), MDA speculates, were changed by database software that assigned surveyed depths to assay intervals. MDA and Scorpio jointly agreed to restore these, and other original Reflex depths, whereas others were not changed.
- There are 58 discrepancies in down-hole dip angles. The 15 non-2005 records were examined jointly by Scorpio and MDA and restored or retained accordingly.

#### 12.1.1.3 Audit of the Assay Table

Scorpio provided MDA with original assay source data, as batch files, from ALS and Scorpio's in-house lab. No signed certificates for any of the assays in the Nuestra Señora project database were received. Using the batch files, MDA built its own assay tables and used software tools to compare the MDA assay tables to the assay table in the project database. At the time of the audit, the Nuestra Señora assay table contained 49,835 records. The overall audit process required several iterations of corrections to

Scorpio's database and MDA's audit tables using newly-acquired original source files, which were also provided to MDA by Scorpio. The end result was that about 90% of the records in the assay table for each of gold, silver, copper, lead, and zinc were verified.

The quantity of actual errors that MDA found in the assay table was relatively small, compared to typical exploration assay data sets undergoing a first audit. Additionally, there was some loss of precision in large portions of the database due to rounding of assays. Where possible, MDA has restored assays to their original precision, using the laboratory batch files. Some inconsistencies were also noted in recording of assays below laboratory detection limits. In most cases the detection limit was entered, but in others zeros were entered. Where original information was available, MDA entered half of the reported detection limit.

#### 12.1.1.4 Audit of the Density Table

Scorpio routinely collected density measurements during the core-logging process in past drilling programs. One small (typically 400g or less) specimen of core was tested for every sample interval and assigned to logged geology or assay intervals. This resulting density table contains 36,013 records.

Initial evaluation of the density data revealed that values in the database had been capped, such that all densities below 2.5g/cm$^3$ were assigned a value of 2.5g/cm$^3$, and densities above 4.5g/cm$^3$ were assigned values of 4.5g/cm$^3$. Scorpio provided a table containing the uncapped data, which was the subject of MDA's audit, as well as original hard-copy source data.

MDA first checked the formulas for calculating densities from weight and volume measurements in the density table; no errors were found. MDA then entered the raw weight and volume data from the hard-copy notebooks for 1,781 records (5% of the total data), calculated densities, and compared them to Scorpio's density table. A total of 22 density records in MDA's audit table differed from Scorpio's database. Of these, 18 differed by more than 0.1g/cm$^3$ and were considered significant. All differences were the result of data entry errors for weights or volumes, and the significant error rate is 1%. All errors discovered during the audit were corrected in the database, which contained the uncapped data and was used for assignment of density values for major lithologies and metal domains.

### 12.1.2 San Rafael-El Cajón Project Database

The San Rafael-El Cajón project database contains geochemical and geologic data on 645 drill holes and 14 surface trenches, of which 335 drill holes and all the trenches are from San Rafael and 130 holes are from El Cajón. Included in the El Cajón database are the seven El Mamut RC holes which are located immediately to the northeast of the El Cajón drilling. The data verification for the 2009 Technical Report (Ristorcelli *et al*., 2009) addressed all of the holes drilled by PRG; holes drilled by Scorpio were verified in 2012.

The database contains geochemical data for 14,427 drill-hole sample intervals, of which 10,432 sample intervals are within the San Rafael deposit and 3,995 are within the El Cajón deposit. Where there are no geochemical data, the geochemical database lists the sample-interval footage, though with no geochemical data entered into the columns. However, at the bottom of some of the drill holes, the last drill interval entered corresponds to the last sample interval containing geochemical data and not the last drill interval at the actual bottom of the hole. This situation is common in the San Rafael deposit, where the bottom of many holes ends in unmineralized limestone/marble that was not sampled and assayed.

Less-than-detection-limit geochemical results are entered as a value equal to one half the detection limit (i.e., 0.005% Zn for a <0.01% Zn analytical result).

The drill-hole geologic data are in digital form, and the database contains lithologic and alteration mineralogy, along with detailed sulfide percentages, both total sulfide and individual sulfide species, for each sample interval.

#### 12.1.2.1 Geochemical Database Audit

***2006-2008***

MDA audited the San Rafael Phase I and II data in November 2006 in preparation for the initial San Rafael resource estimate. Another audit was completed in September 2007 on the San Rafael and El Cajón drill data, while PRG's Phase IV drill-hole geochemical data were audited in September 2008.

For the November 2006 audit, a total of 481 intervals containing 1,635 individual assays (18% of the San Rafael data) were checked for errors against the hard copy assay certificates received from the lab. Thirty errors were noted, though only two were deemed significant. Two Ag assays in drill hole SR22 are duplicate samples that were listed in the database as unique assays; they have been removed from the database. The remaining errors all were less-than-detection Ag and Pb values that were listed in the database as the detection level, i.e., a <1 ppm Ag lab assay was in the database as 1 ppm. None of these minor errors would have any effect on the resource estimate.

The September 2007 audit consisted of electronically comparing the total database against a compilation of all assay data provided in digital form by the analytical laboratories. This analysis specifically checked both for numeric errors in the assay data and for sample data currently in the database though not supported by laboratory results. This work did not check for analytical results missing from the database. To augment this wholesale audit, an additional 430 sample intervals from the San Rafael and El Cajón deposits were individually checked for errors against laboratory assay certificates. Seventeen errors arose from these audits, while 36 additional gold assays were added to the database. Nine of the errors are considered significant, though all nine were from the same drill hole (EC19) and resulted from a shift in the sample sequence. The 36 added values all were from one early San Rafael drill hole (SR7).

The September 2008 audit of the Phase IV geochemical data consisted of electronically comparing the total database against a compilation of all assay data provided in digital form by the analytical laboratories. This analysis specifically checked both for numeric errors in the assay data and for sample data currently in the database though not supported by laboratory results. This work did not check for analytical results missing from the database. No additional errors arose from this latest audit.

***2012***

The 2011 and 2012 drill samples from San Rafael and El Cajón were sent to ALS Minerals ("ALS") in Chihuahua and Hermosillo for geochemical analyses. As in the 2008 and 2009 work completed by PRG, Scorpio has entered the less-than-detection-limit geochemical results as a value equal to one half the detection limit (i.e., 0.005% Zn for a <0.01% Zn analytical result).

For the samples from San Rafael, MDA first manually audited the database sample-interval data against the geologic log sample data for 22 drill holes (about 21 percent of the drill data). Six errors were noted and corrected in the database. MDA's assay audit consisted of electronically comparing the 2012 database against a compilation of all assay data provided in digital form by ALS. The audit specifically checked for numeric errors in the existing assay data along with proper correlation between sample ID and database "from-to" sample intervals. This work did not check for analytical results missing from the database. The audit of the complete assay database resulted in corrections to the data within 183 sample intervals. The high number of corrections primarily reflects swapped lead and zinc values for nine drill holes (119 sample intervals). There were also 15 incorrect assay values likely due to isolated entry errors. All of the above errors were considered significant, and all have been corrected. MDA noted and corrected errors in the conversion of less-than-detection silver and copper values; none of these errors are considered significant.

The Scorpio database used in the resource estimate includes all corrections noted above and is considered adequate for use in future modeling and resource work.

For the samples from El Cajón, MDA's assay audit consisted of electronically comparing the 2012 database against a compilation of all assay data provided in digital form by ALS. The audit specifically checked for numeric errors in the existing assay data along with proper correlation between sample ID and database "from-to" sample intervals. This work did not check for analytical results missing from the database. In addition to the electronic audit, MDA manually audited the database sample-interval data using the sample data within the geologic logs for six drill holes. Thirteen errors arose from these audits. Eight sample intervals had the incorrect sample ID noted in the database, although the assay data were correct for that interval. Three sample intervals had incorrect from-to values, while two intervals had errors in the conversion of less-than-detection silver values. These were all corrected prior to using the database, and none of these errors are considered significant.

#### 12.1.2.2 Drill Collar Database Audit

***2009***

The collar coordinates for all of PRG's San Rafael and El Cajón drill holes were checked against digital files supplied to PRG by the contracted surveyor (Servicio Topographic of Hermosillo). MDA found no errors in the existing database coordinates, but five El Cajón holes and one San Rafael hole were missing survey data and were likely not surveyed.

MDA checked the drill-hole final depths listed in the database with the depths noted on the drill logs. Errors were noted in five holes, and these data points were corrected. In four of the cases, the final depth was in error by 1.5m, while the fifth was off by 3m. These changes had minimal effect on the geologic model and subsequent resource estimate.

***2012***

The collar coordinates for all of Scorpio's San Rafael drill holes were checked against digital files supplied to Scorpio by the contracted surveyor (Terra Group of Hermosillo). MDA audited all of the database collar coordinates against the original spreadsheet data and found no errors in the drill-hole location data.

The drill-hole locations were also viewed on-screen and checked against the current topography. One collar location (SR275) did not coincide with the topographic surface. Scorpio re-surveyed the collar location for this drill hole and the new, corrected coordinates were entered into the database.

MDA checked the total-depth data and found a number of minor discrepancies with the drill logs and/or drill reports for holes in the sequence between SR294 through SR320. MDA corrected the total-depth data; none of these changes are considered significant.

The collar coordinates for all El Cajón drill holes were checked against digital files supplied to Scorpio by the contracted surveyor (Terra Group of Hermosillo). MDA audited all of the database collar coordinates against the original spreadsheet data and found no errors in the drill-hole location data.

#### 12.1.2.3 Down-Hole Survey Database Audit

***2006-2008***

As discussed in Section 10.2.3, the database contains down-hole survey data for the majority of the PRG RC holes and the Phase III and IV core holes. MDA audited the down-hole data for just the San Rafael and the El Cajón drill holes.

MDA’s November 2006 audit of the Phase I and II down-hole survey data indicated that of the 114 total RC holes, PRG had down-hole survey data for 83 RC holes. The survey readings were taken at approximate 30m down-hole intervals, with the bottom reading usually taken at a depth 5 to 10m above the drill-hole’s final drill depth. MDA found no significant discrepancies between the survey field notes, the geologic logs, and the database for the 83 holes.

MDA’s September 2007 audit of the Phase III San Rafael and El Cajón surveys found no significant discrepancies between the survey field notes, the geologic logs, and the database for the 33 RC and 52 core holes.

MDA’s September 2008 audit of the Phase IV San Rafael and El Cajón surveys found no significant discrepancies between the survey field notes and the database for the 41 core holes surveyed, though depth readings within the survey notes for two El Cajón holes were in error and were therefore removed from the database. Six additional core holes, for a total of 47 San Rafael and El Cajón drill holes, were not surveyed down-hole; the database contains the collar set-up orientation for these six holes.

All of the Phase I, II, and III RC survey readings were taken inside the drill rods, due to a concern over losing the survey instrument in the open hole, and the azimuth readings were considered meaningless due to the magnetic effects of the drill rods. As a result of the unusable azimuth readings, all vertical holes remain as undeviating vertical holes in the database. The one exception within the PRG database was drill hole SR10, where the actual down-hole dip readings were used. This database input error makes the hole trend to the north (using the standard $0^o$ azimuth reading) at a steep dip that ends with a -$86^o$ dip reading at the drill hole’s 121m final depth. The database has been changed by removing the actual dip readings and using the standard $0^o$ azimuth and -$90^o$ dip values. For RC angle holes, the azimuth data are based on a Brunton compass reading taken by the field geologist. For the majority of drill holes, this reading is taken on a flagged orientation at the drill site, which is then used by the drill crew to set up and orient the drill rig.

The Phase III and IV core survey data contained a number of erratic azimuth readings which were attributed to the magnetic nature of some of the project lithologies, especially the dioritic intrusions both on the east side of San Rafael and also within the center of the El Cajón deposit. To aid in determining the "accepted" survey values, the magnetic field data, as recorded by the driller for each survey reading, were analyzed with particular attention to spurious magnetic field values significantly different from the general magnetic field. This information was recorded and compared to the coincident azimuth values. The result showed a high correlation between spurious magnetic field readings and erratic azimuth values. As a result of this analysis, 18 individual survey readings, out of a total of over 1,150, were removed from the database.

***2012***

There are down-hole survey readings for 126 of the 141 Scorpio holes drilled at San Rafael. The drill holes were surveyed down hole using a Reflex EZ-shot survey instrument providing digital readings. The majority of holes had multiple readings taken at approximately 25m down-hole intervals. For holes with just one survey reading, the down-hole reading was usually collected near the bottom of the hole. MDA audited all of the survey data against the original survey measurements provided by Scorpio. As a result, MDA added survey data to seven drill holes and made minor corrections to the data in two drill holes. Besides the azimuth and dip data, the survey readings included magnetic field data, and one survey reading was removed from the database due to anomalous magnetic readings. None of these changes are considered significant since the corrected data did not vary in a material amount from the original survey readings or drill-collar set-up orientation.

The drill holes at El Cajón were surveyed down hole using a Reflex EZ-shot survey instrument providing digital readings. At least one down-hole reading, usually near the bottom of the hole, was taken in each of the Scorpio drill holes, while a number of holes had multiple readings taken at approximately 50m down-hole intervals. All of the Scorpio drill holes are vertical in orientation, and the down-hole data indicate the common 1° to 2° drift from vertical. Besides the azimuth and dip data, the survey readings included magnetic field data, and two survey readings were removed from the database due to anomalous magnetic readings. One other error in an azimuth reading was also corrected; none of these changes are considered significant.

## 12.2 MDA Site Visits

### 12.2.1 Nuestra Señora

Mr. Tietz and Mr. Lindholm visited both the Nuestra Señora and San Rafael projects from September 27 through October 1, 2011. They reviewed the current drill programs, drilling/logging/sampling procedures, pertinent geology, and data availability.

Mr. Ristorcelli, Mr. Lindholm, and Mr. Ronning visited the Nuestra Señora project from March 12 through March 20, 2012. Their visit included review of current drill programs and associated drilling/logging/sampling procedures, as well as determination and modeling of relevant geology. Collar, survey, assay and geology data were collected and audited, then compiled into the accepted database on which geologic and mineral domain modeling are based. QA/QC data were obtained, compiled, and evaluated. Sections with drill-hole data and Scorpio's geologic interpretations were plotted for metal-domain modeling.

Mr. Ristorcelli reviewed MDA's preliminary Nuestra Señora block model and resource estimate with Scorpio personnel at Scorpio's Cosalá geology/engineering office on June 28, 2012. Scorpio's grade control and related mining procedures were also discussed.

#### 12.2.1.1 MDA Collar Locations

An effort was made by MDA to verify the locations of exploration holes drilled from surface locations. Drill collars were found at four locations, which were recorded using a hand-held GPS. GPS accuracy was poor, only on the order of ±20 meters, attributable to the location deep in an arroyo without a broad view of the sky. MDA compared the GPS locations' UTM locations obtained from the surveyors' notes. Only one of the collars had an identifier in the field and the coordinates were within about 18m from each other. GPS coordinates for the other holes could not be confidently correlated to any of the collar locations in the database.

### 12.2.2 San Rafael-El Cajón

Mr. Tietz visited the San Rafael-El Cajón project site from January 29 through February 3, 2007 and again from September 19 through September 21, 2007. The purpose of MDA's visits were to a) collect drill hole and surface verification samples, b) validate existing data, and c) develop greater insight into the El Cajón and 120 Zone geology.

As described in Section 12.2.1, Mr. Tietz and Mr. Lindholm also visited San Rafael from September 27 through October 1, 2011. During that visit, they reviewed the active drill program, including an evaluation of drilling/logging/sampling procedures, core storage, and deposit geology. MDA reviewed the current drill program with Scorpio and surveyed five Scorpio drill-hole collars using a hand-held GPS.

The core handling and sampling procedures at San Rafael were considered to be of good quality, and no significant issues were apparent that would negatively impact the resource models.

For the current 2012 estimation update, no additional site visits or sampling were conducted by MDA at El Cajón because the 2012 drill program was fairly limited and did not target new geographic areas or encounter unique geologic features.

#### 12.2.2.1 MDA Core Sampling

During the January 2007 site visit, MDA collected a total of 12 core samples from strongly mineralized intervals in four San Rafael holes and four El Cajón holes. The core samples consisted of the remaining half core from an existing sample interval (usually around 1.5m in length). The samples were shipped to ALS for analysis on February 3, 2007. The samples were analyzed for Au, Ag, Cu, Pb, and Zn using the same analytical techniques used by PRG for their San Rafael-El Cajón samples. Besides serving as independent verification of the San Rafael and El Cajón mineralization, the MDA samples are also a quality-control check on the initial assay results. The results of the core sampling analysis are shown in Table 12.1.

## Table 12.1 MDA Core Sample Comparison of MDA versus PRG Results – San Rafael-El Cajón Project

| MDA ID | Hole ID | Intercept (m) | MDA Ag ppm | PRG Ag ppm | Diff % | MDA Pb % | PRG Pb % | Diff % | MDA Zn % | PRG Zn % | Diff % | MDA Cu % | PRG Cu % | Diff % | MDA Au ppm | PRG Au ppm | Diff % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LVPT-1 | SR70 | 116.5-117.8 | 75 | 76 | 1% | 2.38 | 2.4 | 1% | 6.6 | 5.1 | -23% | 0.02 | NA | | 0.329 | NA* | |
| LVPT-2 | SR70 | 126-127 | 100 | 89 | -11% | 4.08 | 3.4 | -17% | 8.97 | 9.3 | 4% | 0.03 | NA | | 0.086 | NA | |
| LVPT-3 | SR73 | 121.6-123.1 | 238 | 255 | 7% | 6.22 | 7.5 | 21% | 9.16 | 10.2 | 11% | 0.82 | NA | | 0.529 | NA | |
| LVPT-4 | SR75 | 75.3-76.8 | 57 | 73 | 28% | 0.78 | 0.7 | -10% | 2.51 | 1.7 | -32% | 0.07 | NA | | 0.114 | NA | |
| LVPT-5 | SR78 | 70.5-72.0 | 113 | 120 | 6% | 4.35 | 5.1 | 17% | 7.4 | 6.3 | -15% | 0.02 | NA | | 0.047 | NA | |
| LVPT-6 | SR78 | 76.6-78.1 | 236 | 40 | -83% | 2.5 | 2.2 | -12% | 3.41 | 6.3 | 85% | 0.01 | NA | | 0.041 | NA | |
| LVPT-7 | EC42 | 143.9-145.5 | 1250 | 1750 | 40% | 4.48 | 5.3 | 18% | 2.51 | 2.4 | -4% | 1.74 | 2.2 | 26% | 0.557 | 0.86 | 54% |
| LVPT-8 | EC42 | 153-154 | 836 | 716 | -14% | 6.41 | 6.7 | 5% | 0.3 | 0.2 | -33% | 1.89 | 1.2 | -37% | 0.073 | 0.08 | 10% |
| LVPT-9 | EC15 | 190.8-192.3 | 260 | 263 | 1% | 0.29 | NA | | 0.09 | NA | | 0.49 | 0.6 | 22% | 0.292 | 0.29 | -1% |
| LVPT-10 | EC22 | 224.7-225.9 | 81 | 112 | 38% | 0.04 | NA | | 0.04 | NA | | 0.3 | 0.4 | 33% | 0.1 | 0.19 | 90% |
| LVPT-11 | EC22 | 230.3-231.8 | 709 | 615 | -13% | 0.01 | NA | | 0.23 | NA | | 2.51 | 2.3 | -8% | 0.62 | 0.7 | 13% |
| LVPT-12 | EC26 | 191.5-192.8 | 250 | 313 | 25% | 0.02 | NA | | 0.05 | NA | | 0.64 | 0.8 | 25% | 0.423 | 0.47 | 11% |
| | | Average | 350.42 | 368.50 | 2% | 3.90 | 4.16 | 3% | 5.11 | 5.19 | -1% | 1.26 | 1.25 | 10% | 0.34 | 0.43 | 30% |

#### 12.2.2.2 MDA Surface Sampling

MDA collected six surface samples from the San Rafael-El Cajón project area during the January 2007 site visit. Four San Rafael surface samples were collected from strongly oxidized "gossan" outcrops which are exposed within road cuts along the northeast side of the San Rafael deposit. These exposures are believed to be the up-dip portion of the main massive-sulfide zone. The two El Cajón samples were collected from the historic El Cajón mine, a small mine located within the main drainage on the northwest side of the deposit. The samples were shipped with the MDA core samples to ALS for analysis on February 3, 2007. The results of the surface sample analysis are shown in Table 12.2.

**Table 12.2 MDA Surface Sampling Results – San Rafael-El Cajón Project**

| MDA Sample ID | Easting | Northing | Area | Ag ppm | Pb % | Zn % | Cu % | Au ppm |
|---|---|---|---|---|---|---|---|---|
| LVPT-13 | 333395 | 2708720 | El Cajon | 320 | 0.05 | 0.17 | 1.16 | 0.479 |
| LVPT-14 | 333380 | 2708720 | El Cajon | 186 | 0.74 | 0.06 | 1.69 | 0.096 |
| LVPT-15 | 333689 | 2709783 | San Rafael | 76 | 1.3 | 0.03 | 0.15 | 0.233 |
| LVPT-16 | 333715 | 2709793 | San Rafael | 9 | 0.22 | 0.25 | 0.25 | 0.086 |
| LVPT-17 | 333760 | 2709726 | San Rafael | 60 | 0.17 | 0.43 | 0.45 | 0.119 |
| LVPT-18 | 333792 | 2709729 | San Rafael | 76 | 1.76 | 0.5 | 0.04 | 0.22 |

#### 12.2.2.3 San Rafael Hole Locations

MDA used a handheld GPS unit, which had a station accuracy ranging from 3 to 6m, to locate six Phase I and II drill holes during the January 2007 site visit. In comparing the GPS coordinates to the database, there was a difference in hole locations of between 2 and 7m, with the greatest difference coinciding with those hole locations which also had the least precision in GPS accuracy. During the September 2007 field visit, MDA confirmed the locations of a number of Phase III drill holes relative to the detail of the drill map (about 5m). MDA feels that this adequately verified drill-hole locations.

During the initial January 2007 site visit, MDA noted that many of the Phase I and II drill-hole collar locations were no longer visibly evident on the ground. Road traffic and road reconstruction, along with the significant amount of slope failures and washouts during the rainy season, soon obscured or covered many of the hole locations. Even along those access spur roads with no further road traffic or slope failures, there are still a few hole locations that cannot be located accurately without resurveying the hole location. The Phase III drill collars observed during the September visit have the drill ID marked on a metal plate attached to a buried rebar post. Most Phase III collars are still well marked, though a few in the middle of the road are subject to vehicle traffic and can easily be obscured. All drill sites, and especially the more historic drilling, are subject to road-cut slumping and collapse due to the very steep ground and high run-off during the summer rainy season.

#### 12.2.2.4 Core Recovery / Sample Recovery Determinations Audits

Only limited verification of the core-recovery data was completed by MDA in 2007. The core was viewed by MDA, both while drilling was in progress and while collecting the core samples for verification purposes (see Section 12.2.2.1). Excellent recoveries were noted in all cases, with only minor intervals of significantly fractured zones.

## 12.3 Quality Assurance/Quality Control

### 12.3.1 Nuestra Señora

The following analysis is taken from MDA's 2012 Technical Report (Ristorcelli *et al*., 2012). It does not include information for the additional holes drilled since February 2012 that were not used for the 2012 resource estimate.

Genivar (2007) reported that prior to May 2004, there were no formal documented QA/QC procedures in place. As of the time of Genivar's 2007 report, Scorpio was obtaining standard reference samples from WCM Sales, Vancouver. These were being inserted after every 40$^{th}$ pulp for samples shipped to ALS. Until August 2005, three standards (one medium grade, one low grade, and one blank) were inserted; in August 2005, two more were added, one of which replaced the original medium-grade standard. In addition, two pulps were produced from every 20$^{th}$ sample; one was sent to ALS for analysis, and the other was sent to SGS for comparative analysis. Samples of each standard and blank were also sent to SGS for analysis.

Based on its review of Scorpio's pre-2011 QA/QC data (Lindholm *et al*., 2012), MDA concluded that the data reveal QA/QC failures in a quantity that is, in MDA's experience, typical of exploration data sets. The main issues with the pre-2011 QA/QC data were:

- MDA found no evidence that any follow-up of QA/QC failures was done, and
- MDA did not find QA/QC data for almost half of the pre-2011 assay batches.

At the time of MDA's site visit in September 2011, Scorpio was sending samples to ALS or to the in-house mine lab for analysis (Tietz and Lindholm, 2011). The QA/QC program for core samples sent to ALS was the same as for samples from the San Rafael-El Cajón program; standards and blanks were included with the samples sent to ALS. At regular intervals, a duplicate pulp was created by ALS and sent to Inspectorate in Hermosillo, Mexico, for re-assay and verification of the ALS values. However, core samples sent to the in-house mine lab had no independent QA/QC samples included in the sample stream. By the time of MDA's March 2012 site visit, there was a QA/QC program for samples sent both to ALS and to the in-house mine lab. Scorpio was using quarter-core field duplicates in addition to standards and blanks.

Based on its review of Scorpio's 2011-2012 QA/QC data (Lindholm *et al.*, 2012), MDA noted that issues were identified by MDA and Scorpio in the analyses of blanks and standards that were sufficient to render the analyses of samples in the respective batches suspect. Field duplicates are primarily useful as a check on small-scale natural variability of grades, but too few were available for a comprehensive evaluation.

#### 12.3.1.1 QA/QC of Pre-2011 Assay Data

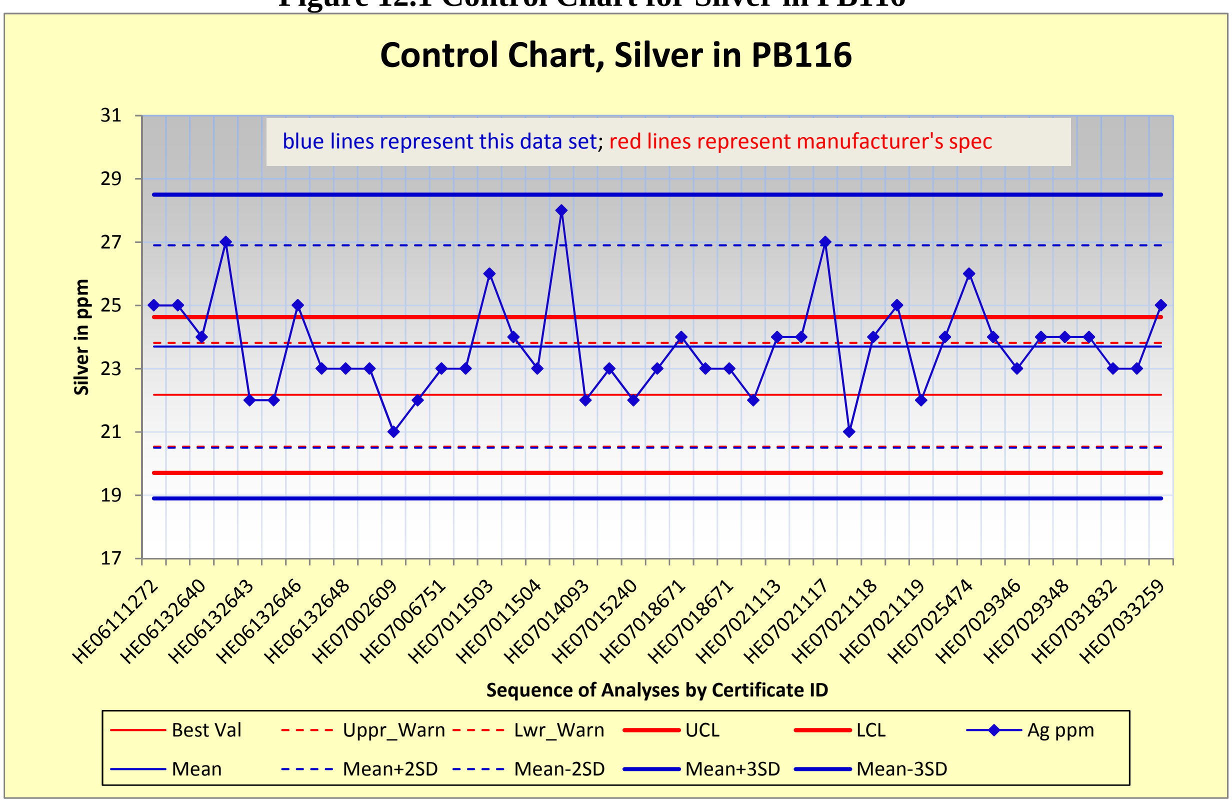
***<u>Standards</u>***

Twelve standards were used over a space of several years prior to 2011. Eleven of the standards were identified as having been prepared by WCM Minerals of Burnaby, B.C., Canada. Certificates with specifications were available for these eleven. One standard was simply referred to as "Standard D", for which MDA had no specifications. The accepted values of the WCM standards used by Scorpio are typically based on fewer labs and fewer analyses than are usual with other suppliers of commercial standards. This could result in a higher number of apparent failures due to a narrower range of standard deviations.

There are 786 analyses of standards available, from 326 assay certificates. MDA has identified 532 of the ALS certificates corresponding to assays in the Nuestra Señora assay table, and has been able to match 282 of those to certificates that contained analyses of standards. This implies that 250 of the identified ALS sample assay batches may not have contained standards, although there is uncertainty about this number. MDA evaluated all of the available analyses of standards, without trying to separate those which may or may not have related to Nuestra Señora. MDA did its evaluation using the common control charts derived from Shewhart charts, producing 48 such charts (four elements x 12 standards). For those 11 standards whose specifications are available, MDA set the failure limits as ±3 standard deviations, using the standard deviation provided by the manufacturer of the standards. One example of the control charts appears in Figure 12.1 below. It is impractical to present all 48 such charts, but the results of the analyses of standards are summarized in Table 12.3.

On balance, MDA has a reasonable level of global confidence in the pre-2011 assay batches that contained standards. The biases listed in Table 12.3 are typical of biases that MDA sees in similar data sets, although some of the biases for silver are rather large. For most of the metals in most of the standards, the number of failures is not unusual. However, MDA has not been able to determine whether Scorpio investigated any of the failures listed in Table 12.3, which reduces the overall confidence in the respective parts of the assay data. Similarly, confidence is reduced for the 250 assay batches for which corresponding analyses of standards were not found.

**Figure 12.1 Control Chart for Silver in PB116**



Note: On average, silver analyses of PB116 are biased about 6% high relative the manufacturer's specification.

## Table 12.3 Summarized Results of Analyses of pre-2011 Standards

| Standard ID | Accepted Value | Insertions | High Failures | Low Failures | Bias |
|---|---|---|---|---|---|
| | Grade | Counts | | | Percent |
| **Silver, ppm** | | | | | |
| PB107 | 170.58 | 43 | 9 | 10 | -2 |
| PB106 | 58.56 | 72 | 18 | 12 | +2.1 |
| Std D | 83 (avg of data) | 21 | nil | 1 | unknown |
| PB105 | 273.84 | 20 | nil | nil | +0.4 |
| PB109 | 29.59 | 94 | 3 | nil | +1.4 |
| PB110 | 278.14 | 40 | nil | nil | -5.8 |
| PB112 | 222.38 | 46 | nil | 16 | -2.6 |
| PB116 | 22.17 | 43 | 10 | nil | +6.9 |
| PB115 | 17.08 | 66 | nil | nil | +3.6 |
| PB120 | 19.44 | 70 | 2 | 1 | +2.4 |
| PB122 | 118.15 | 69 | nil | nil | 0 |
| PB1115 | 560.889 | 66 | nil | 1 | 1.5 |
| **Copper, pct** | | | | | |
| PB107 | 1.611 | 43 | nil | 5 | -1.3 |
| PB106 | 0.616 | 72 | 1 | 2 | -1 |
| Std D | 0.934 (avg of data) | 21 | nil | 1 | unknown |
| PB105 | 0.633 | 20 | nil | nil | +0.8 |
| PB109 | 0.496 | 94 | nil | 5 | -1.8 |
| PB110 | 0.465 | 40 | 1 | 1 | -1.7 |
| PB112 | 0.846 | 46 | nil | 35 | -3.5 |
| PB116 | 0.429 | 43 | 1 | nil | -0.9 |
| PB115 | 0.531 | 66 | nil | nil | -0.6 |
| PB120 | 0.48 | 70 | nil | 1 | -0.2 |
| PB122 | 0.779 | 69 | nil | 6 | -2.1 |
| PB1115 | 0.926 (avg of data) | 66 | nil | 1 | unknown |
| **Lead, pct** | | | | | |
| PB107 | 1.816 | 43 | 1 | 3 | -0.3 |
| PB106 | 0.518 | 72 | nil | nil | -1.5 |
| Std D | 0.943 (avg of data) | 21 | nil | 1 | unknown |
| PB105 | 3.673 | 20 | nil | nil | -0.6 |
| PB109 | 1.468 | 94 | nil | 1 | -2.6 |
| PB110 | 3.515 | 40 | 2 | 1 | -0.7 |
| PB112 | 0.921 | 46 | 1 | nil | +0.8 |
| PB116 | 1.39 | 43 | nil | nil | +1.4 |
| PB115 | 2.605 | 66 | 1 | nil | +1 |
| PB120 | 1.429 | 70 | 2 | 1 | -2.7 |
| PB122 | 1.993 | 69 | nil | nil | -2.2 |
| PB1115 | 0.065 (avg of data) | 66 | 1 | 1 | unknown |

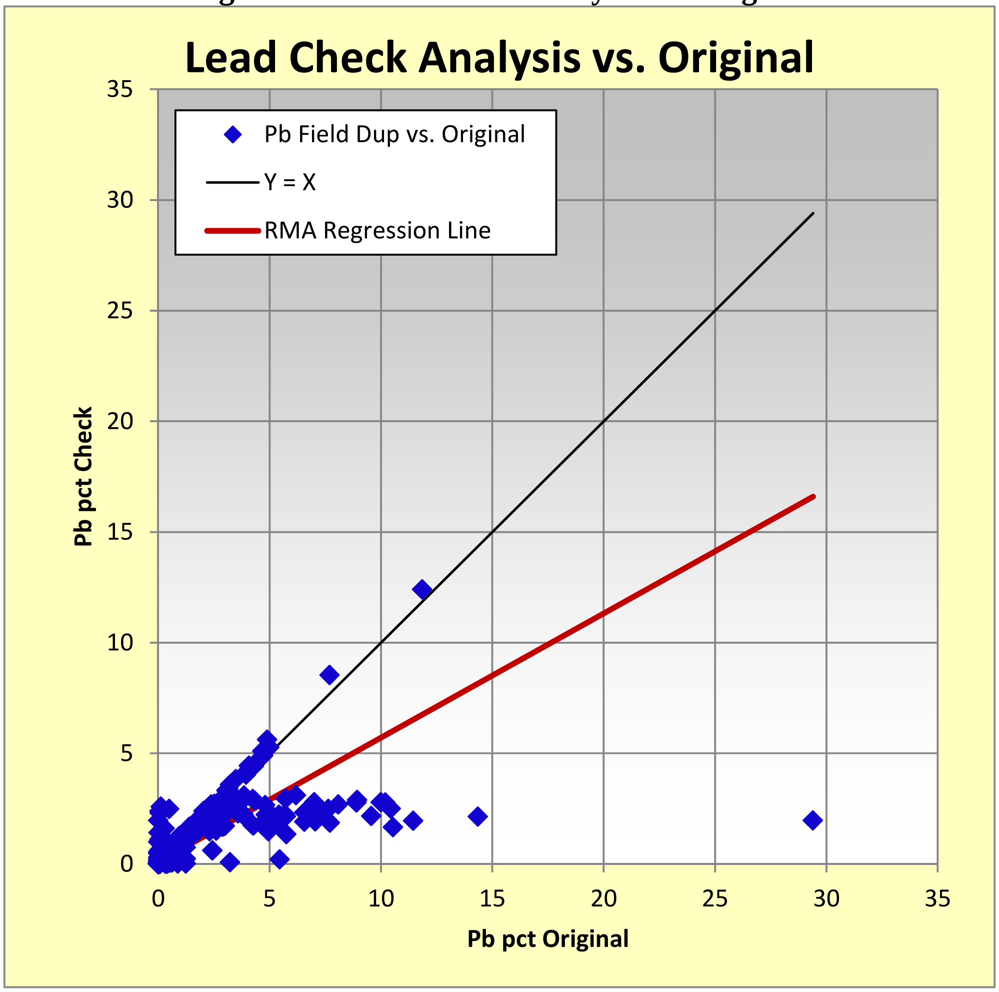
| Standard ID | Accepted Value | Insertions | High Failures | Low Failures | Bias |
|---|---|---|---|---|---|
| | Grade | Counts | | | Percent |
| | | Zinc, pct | | | |
| PB107 | 2.797 | 43 | 3 | 13 | -1 |
| PB106 | 0.84 | 72 | 2 | 1 | +1.2 |
| Std D | 1.49 (avg of data) | 21 | nil | 1 | unknown |
| PB105 | 5.648 | 20 | nil | nil | 0.9 |
| PB109 | 4.16 | 94 | 24 | 7 | 1 |
| PB110 | 0.999 | 40 | 2 | 1 | -0.4 |
| PB112 | 1.266 | 46 | nil | nil | 0.6 |
| PB116 | 0.848 | 43 | nil | 5 | -1.7 |
| PB115 | 1.65 | 66 | nil | nil | -1.2 |
| PB120 | 2.865 | 70 | nil | 1 | +0.5 |
| PB122 | 2.416 | 69 | nil | nil | 1 |
| PB1115 | 0.073 (avg of data) | 66 | 1 | 1 | unknown |

### *Check Analyses at External Lab*

The pre-2011 QA/QC data include 1,715 pairs of analyses in which the original analysis was done at ALS and a check analysis of the pulp prepared at ALS was done at SGS. MDA reviewed these check analyses for gold, silver, copper, lead and zinc. For all but lead, a comparison of the SGS results to the ALS results gives more-or-less expected results. There are some individual pulps whose two analyses did not correspond well, but the number of such discrepancies is, in MDA's experience, typical.

The check analyses for lead are an exception, as can be readily seen in Figure 12.2. Whereas, barring a few outliers, the pairs of analyses would be expected to cluster around the y = x line, Figure 12.2 shows a separate, almost horizontal trend in which the check analysis falls in the range of 2 to 3% lead, no matter how high the original analysis. There are approximately 48 such "suspect" pairs of lead analyses, corresponding to 15 SGS assay certificates and 40 ALS assay certificates, with dates ranging from October 2004 to March 2008. This observation casts doubt on a large proportion of the pre-2011 lead assays in the exploration data set.

**Figure 12.2 Lead Check Analysis vs. Original**

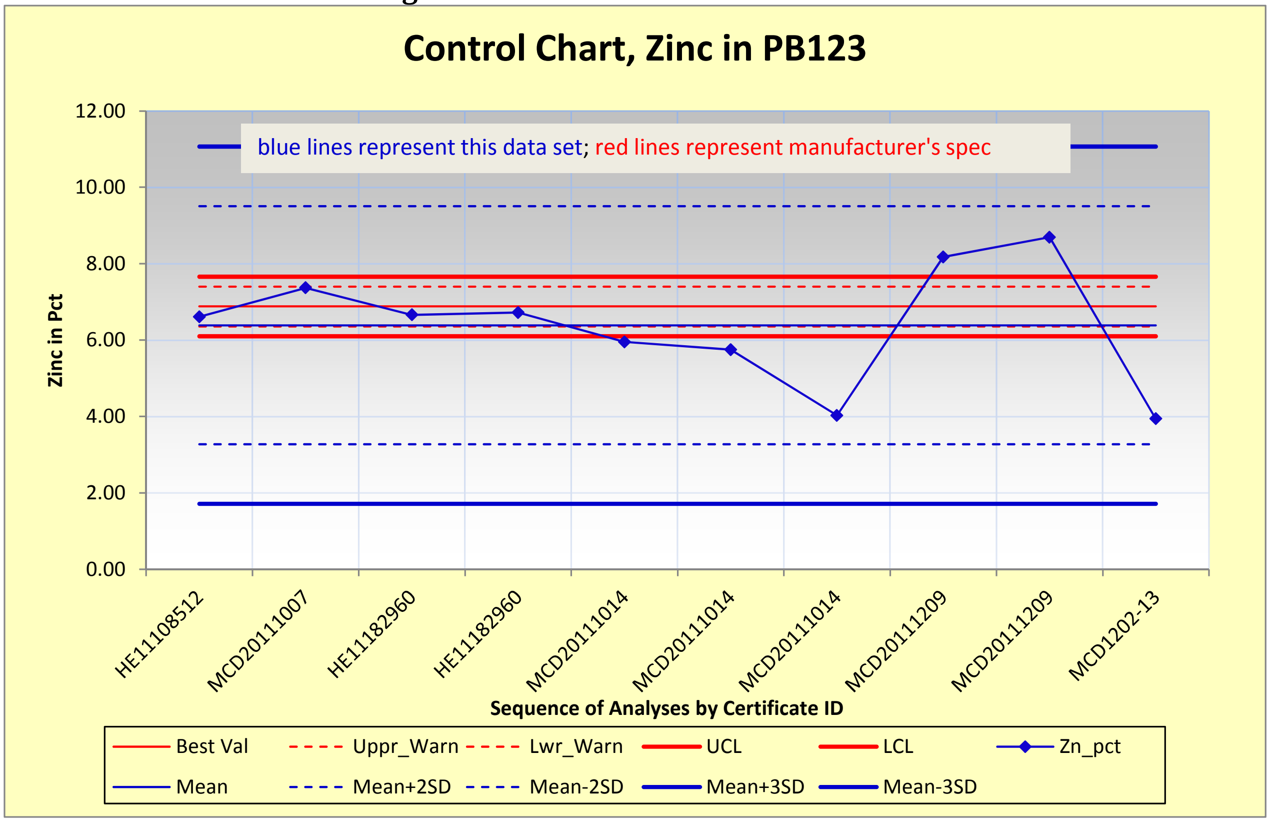



### 12.3.1.2 QA/QC of 2011-12 Assay Data

***Standards***

During the drilling program of 2011-2012, Scorpio used two WCM standards, inserting them 10 times each. Two labs were used during the 2011-2012 program, ALS and Scorpio's mine lab at the mine site. Of the 20 insertions of standards, seven were in batches analyzed at ALS and the remainder were in batches analyzed at the Scorpio lab. The results, illustrated in the example control chart shown in Figure 12.3, indicate there are substantive differences in standard analyses between the two labs. The relatively erratic pattern on the right-hand side of the chart is produced by analyses at the Scorpio lab. While the shape of each chart differs, the erratic character of analyses at the Scorpio lab is evident on each chart.

**Figure 12.3 Control Chart for Zinc in PB123**




Note: Batches (Certificate IDs) starting with "MC…" were analyzed at Scorpio's lab. All others were analyzed at ALS.

In Table 12.4 the results obtained for the standards in 2011 and 2012 are summarized. In the table, the results obtained from ALS and the Scorpio lab are not distinguished, but all of the failures occurred at the Scorpio lab. As of the June 2012 effective date of the Nuestra Senora technical report, Scorpio had not yet followed up on any of the failed analyses of standards. Since that date, Scorpio has reported that the standard failures were rerun by ALS, although MDA has not confirmed this nor evaluated any results.

**Table 12.4 Summarized Results of Analyses of 2011-12 Standards**

| Standard ID | Accepted Value | Insertions | High Failures | Low Failures | Bias |
|---|---|---|---|---|---|
| | Grade | Counts | | | Percent |
| | | Silver, ppm | | | |
| PB130 | 82 ppm | 10 | 2 | 1 | -2.2 |
| PB123 | 70 ppm | 10 | 3 | 1 | +6.4 |
| | | Copper, pct | | | |
| PB130 | 0.252 % | 10 | nil | 5 | -19.4 |
| PB123 | 0.676 % | 10 | nil | 7 | -18.8 |
| | | Lead, pct | | | |
| PB130 | 0.73 % | 10 | 3 | 2 | +0.1 |
| PB123 | 6.06 % | 10 | 1 | 6 | -30.5 |
| | | Zinc, pct | | | |
| PB130 | 1.45 % | 10 | 1 | 5 | -16.1 |
| PB123 | 6.88 % | 10 | 2 | 4 | -7.1 |

***Blanks***

At the time of MDA's March, 2012 site visit, Scorpio's staff had identified a problem with the blanks analyzed as part of the 2011-12 QA/QC program. The test samples are field blanks using core that had been previously determined to carry no significant grades. However, the assays of the material submitted as blanks had returned some significant grades. Scorpio has followed up on this issue and is seeking better material for use as blanks. MDA will not use the blank material analyzed to date in its QA/QC evaluation.

***Field Duplicates***

Silver, copper, lead, and zinc analyses are available for 12 field duplicates from the 2011-12 drilling. MDA has prepared charts to evaluate the data but has found that for QA/QC purposes the small number of sample sets, the low grade ranges of much of the data, and the inherent variability of the mineralization at Nuestra Señora preclude a comprehensive evaluation.

***Check Assays***

Data are available for check analyses of four pulps from Nuestra Señora, at Inspectorate. The original analyses were done at ALS, which also prepared the pulps sent to Inspectorate. MDA inspected the tabulated results and found that they compare reasonably well, although the small number of check assays is insufficient for a comprehensive evaluation.

### 12.3.2 San Rafael-El Cajón

MDA has no evidence that any QA/QC work was performed on the historic RC drilling samples collected by Hemlo. Noranda used both blanks and standards for their core drilling program, although there is no evidence of any check analysis on the core samples as either random assay checks or specific check assays on mineralized intervals.

#### 12.3.2.1 QA/QC by Platte River Gold

PRG undertook a QA/QC program on their exploration sampling. MDA analyzed the results post-drilling. The QA/QC data evaluated here comprise results from standards, rig duplicates, and blanks.

Taylor (2006a, b) conducted two statistical analyses of the assay data from the El Cajón and San Rafael areas. The results for the San Rafael and El Cajón deposits are superseded by but included in the analysis in the present report.

PRG used "blind" duplicates, standards, and blanks for QA/QC since the start of the drilling in Phase I. For the Phase I and II RC drilling, one duplicate sample was taken at the RC drill rig every 20 samples and was sent to SGS as a check on ALS's results. For the Phase III drilling, one duplicate sample was taken at the RC drill rig every 10 samples and was sent to IPL as a check on ALS's results. A variable number of additional duplicate samples, collected at the RC rig at the geologists' discretion, were taken in strongly mineralized zones and sent to ALS; the mineralized duplicates were moved to the end of the sample sequence and were treated as additional samples. Except for a limited test of 20 duplicate pulps from one San Rafael RC hole and 27 duplicate pulps from two El Cajón RC holes, there was no systematic re-analysis of high-grade assays using coarse rejects or pulps. No duplicate check analyses were completed on any of the core samples.

One blank was inserted into the sample sequence every 40 samples, with the original sample being moved to the end of the sequence and re-numbered. Blanks were inserted in mineralized intervals to check for contamination in sample preparation. Unmineralized rock was collected on site and was lightly crushed to resemble RC chips to be used for blanks.

One standard pulp was inserted into the sequence every 40 samples, with the original sample being moved to the end of the sequence and re-numbered. One low-grade standard and one high-grade standard were used. They were prepared by McClelland Laboratories, Inc. ("McClelland") from material collected from the La Verde mine. Each standard was analyzed five times by five different laboratories.

PRG conducted RC overflow tests on three San Rafael holes and one El Cajón hole. The testing was done to ascertain whether allowing the excess water and a significant portion of the fine suspended solids to overflow the sample bucket compromised the validity of the sample submitted for assay. In concert with the overflow tests, head-screen analysis was conducted on four mineralized samples (high-grade and low-grade samples from both San Rafael and El Cajón) to determine the distribution of the various metals by size fraction. A large percentage of the metal content within the smaller-size fractions would indicate potential problems with excess water overflow.

Two PRG RC holes were twinned by core holes to provide an additional check on the RC assay results. Both RC/core twins are in the San Rafael deposit. There have been no RC/core twin holes in the El Cajón deposit as the majority of the drilling is core.

***RC Drill Rig Duplicate***

Two sets of duplicate samples were taken, both at the RC drill rig. These rig-duplicate sample analyses test the reproducibility and bias for the entire sampling system thereby showing total sampling variance. MDA believes rig-duplicate samples are the best type of QA/QC samples.

One set of duplicate checks, collected at variable intervals at the geologist's discretion, was analyzed at the same laboratory as the primary sample (ALS). PRG collected a total of 179 same-lab duplicate samples. This total included 30 duplicate trench samples taken from two trenches along the up-dip exposure of the San Rafael deposit. The data from these trenches are included within the current MDA resource estimate. Of the 149 rig-duplicate samples, 11 are from RC holes in the El Cajón deposit, and the rest are from San Rafael. The limited QA/QC program at El Cajón is a reflection of the reliance on primarily core holes at El Cajón. From the rig-duplicate comparative statistics in Table 12.5, it is evident that differences in same-lab duplicate grades are not high, especially in light of the fact that these are drill-rig duplicates, which incorporate all error in the sampling procedures (except down-hole error, which is never evaluated). There is not much difference between well-mineralized and weakly mineralized sample material reproducibility. Overall, variability between samples remains the same at between 10 and 20% at all grades, except for some outliers which are scattered throughout the grade ranges. Increased variability is seen in the gold data, though this could be a reflection of the small sample size and generally low values. No significant biases are apparent in the data. Examples of the lack of bias and relatively low variability are seen in the relative difference and absolute relative difference graphs, respectively, of zinc in Figure 12.4 and Figure 12.5.

**Table 12.5 Descriptive Statistics of Platte River Same-Lab RC Rig Duplicates: Zn, Ag, and Pb**

**All zinc values (%)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 138 | 138 | | 138 | 138 | 138 |
| Median | 1.67 | 1.67 | 2% | 1.71 | 0% | 8% |
| Mean | 2.36 | 2.37 | -1% | 2.36 | 2% | 16% |
| Std. Dev. | 2.64 | 2.61 | | 2.71 | | |
| CV | 1.12 | 1.10 | | 1.15 | | |
| Minimum | 0.01 | 0.01 | | 0.01 | -93% | 0% |
| Maximum | 14.65 | 13.10 | | 16.20 | 150% | 150% |

**Greater than 0.3 % Zn (mean value)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 100 | 100 | | 100 | 100 | 100 |
| Median | 2.63 | 2.63 | 3% | 2.72 | 0% | 7% |
| Mean | 3.21 | 3.22 | -1% | 3.20 | 0% | 14% |
| Std. Dev. | 2.65 | 2.60 | | 2.74 | | |
| CV | 0.82 | 0.81 | | 0.86 | | |
| Minimum | 0.32 | 0.27 | | 0.31 | -93% | 0% |
| Maximum | 14.65 | 13.10 | | 16.20 | 74% | 93% |

CV = Standard Deviation / Mean

**All lead values (%)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 137 | 137 | | 137 | 137 | 137 |
| Median | 0.49 | 0.46 | 9% | 0.50 | 0% | 8% |
| Mean | 0.86 | 0.87 | -1% | 0.85 | 4% | 22% |
| Std. Dev. | 1.04 | 1.05 | | 1.03 | | |
| CV | 1.21 | 1.21 | | 1.21 | | |
| Minimum | 0.01 | 0.01 | | 0.01 | -305% | 0% |
| Maximum | 6.90 | 6.60 | | 7.19 | 300% | 305% |

**Greater than 0.3 % Pb (mean value)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 81 | 81 | | 81 | 81 | 81 |
| Median | 1.18 | 1.19 | -5% | 1.13 | -1% | 9% |
| Mean | 1.38 | 1.39 | -2% | 1.36 | -5% | 18% |
| Std. Dev. | 1.08 | 1.10 | | 1.08 | | |
| CV | 0.79 | 0.79 | | 0.79 | | |
| Minimum | 0.30 | 0.28 | | 0.21 | -305% | 0% |
| Maximum | 6.90 | 6.60 | | 7.19 | 42% | 305% |

**All silver values (ppm)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 144 | 144 | | 144 | 144 | 144 |
| Median | 27.00 | 27.00 | -2% | 26.50 | 0% | 10% |
| Mean | 50.97 | 50.95 | 0% | 51.00 | -4% | 21% |
| Std. Dev. | 83.19 | 82.31 | | 85.46 | | |
| CV | 1.63 | 1.62 | | 1.68 | | |
| Minimum | 0.75 | 0.50 | | 1.00 | -200% | 0% |
| Maximum | 654.00 | 651.00 | | 657.00 | 150% | 200% |

**Greater than 6 ppm Ag (mean value)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 123 | 123 | | 123 | 123 | 123 |
| Median | 34.50 | 32.00 | 9% | 35.00 | 0% | 9% |
| Mean | 59.09 | 59.02 | 0% | 59.16 | -1% | 17% |
| Std. Dev. | 87.50 | 86.55 | | 90.00 | | |
| CV | 1.48 | 1.47 | | 1.52 | | |
| Minimum | 6.00 | 5.00 | | 6.00 | -182% | 0% |
| Maximum | 654.00 | 651.00 | | 657.00 | 116% | 182% |

## Table 12.5 Descriptive Statistics of Platte River Same-Lab RC Rig Duplicates (continued): Cu and Au

**All copper values (%)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 39 | 39 | | 39 | 39 | 39 |
| Median | 0.05 | 0.04 | 25% | 0.05 | 0% | 12% |
| Mean | 0.24 | 0.24 | 0% | 0.24 | 10% | 32% |
| Std. Dev. | 0.42 | 0.43 | | 0.41 | | |
| CV | 1.75 | 1.82 | | 1.73 | | |
| Minimum | 0.00 | 0.00 | | 0.00 | -105% | 0% |
| Maximum | 1.80 | 1.86 | | 1.73 | 200% | 200% |

**Greater than 0.05% Cu (mean value)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 19 | 19 | | 19 | 19 | 19 |
| Median | 0.22 | 0.22 | 0% | 0.22 | 0% | 10% |
| Mean | 0.46 | 0.46 | 0% | 0.46 | 5% | 23% |
| Std. Dev. | 0.51 | 0.54 | | 0.50 | | |
| CV | 1.10 | 1.16 | | 1.08 | | |
| Minimum | 0.06 | 0.06 | | 0.05 | -82% | 0% |
| Maximum | 1.80 | 1.86 | | 1.73 | 158% | 158% |

CV = Standard Deviation / Mean

**All gold values (ppm)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 30 | 30 | | 30 | 30 | 30 |
| Median | 0.12 | 0.12 | 15% | 0.13 | -2% | 15% |
| Mean | 0.29 | 0.30 | -3% | 0.29 | 14% | 37% |
| Std. Dev. | 0.35 | 0.38 | | 0.34 | | |
| CV | 1.18 | 1.27 | | 1.18 | | |
| Minimum | 0.01 | 0.01 | | 0.01 | -87% | 0% |
| Maximum | 1.21 | 1.58 | | 1.12 | 200% | 200% |

**Greater than 0.1 ppm Au (mean value)**

| | Mean | Original | Difference | Duplicate | Rel Diff.(%) | Abs. Diff.(%) |
|---|---|---|---|---|---|---|
| Count | 17 | 17 | | 17 | 17 | 17 |
| Median | 0.28 | 0.29 | -3% | 0.28 | -5% | 20% |
| Mean | 0.49 | 0.50 | -4% | 0.48 | 2% | 31% |
| Std. Dev. | 0.36 | 0.40 | | 0.36 | | |
| CV | 0.74 | 0.81 | | 0.75 | | |
| Minimum | 0.11 | 0.08 | | 0.11 | -87% | 0% |
| Maximum | 1.21 | 1.58 | | 1.12 | 133% | 133% |

**Figure 12.4 Relative Difference Graph for Same Lab Rig Duplicates – Zinc**

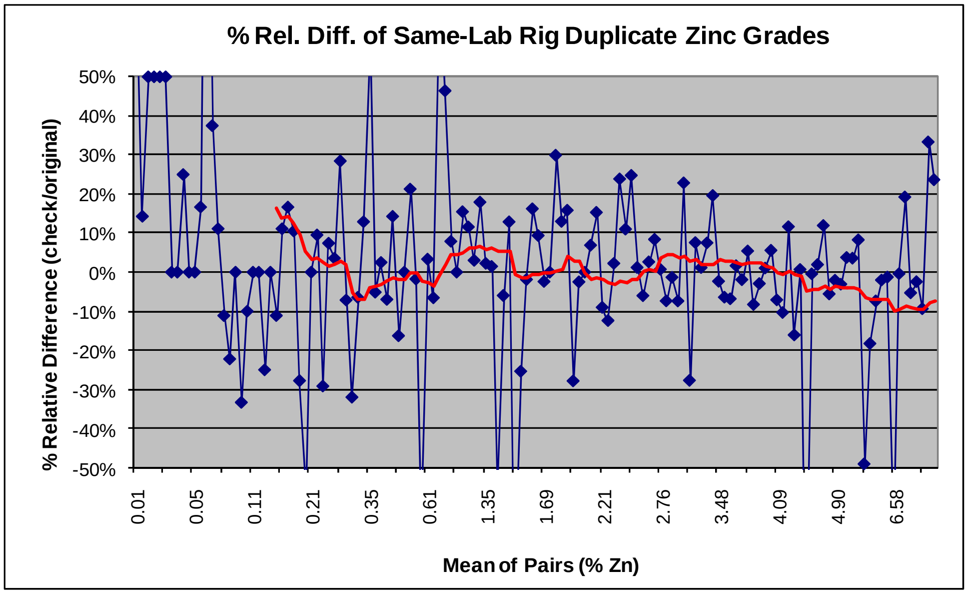
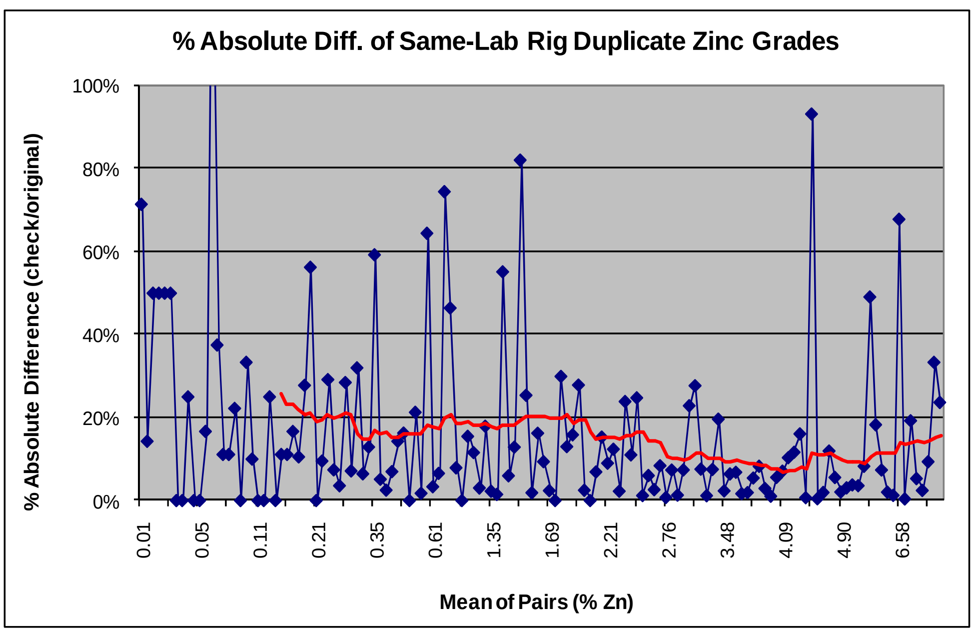



**Figure 12.5 Absolute Relative Difference Graph for Same Lab Rig Duplicates - Zinc**



Different-lab rig duplicate samples were sent to SGS (95 samples) and IPL (114 samples). Similar comparative statistics and relative difference graphs as shown above were evaluated for the different-lab rig duplicate samples.. The variability is slightly higher, and there are minor negative biases (<10%) for the zinc, lead, and silver pairs for both the SGS and IPL analyses. Both labs also show increased variability and higher negative biases for the copper and gold pairs, but the small sample populations above economic cutoff for these elements does not allow for any meaningful determinations as to the quality of the copper and gold duplicate data.

In conclusion, MDA believes that the sampling on PRG's RC rigs was reliable even with the occasional sampling variability noted in the field. Duplicate sampling should continue during project development.

***Blank Sample Results***

PRG made five different blank samples – four to be used for the RC drilling and a fifth for the core drilling. The four RC blanks (Blank PR1, Blank PR2, Blank PR3, and Blank PR4) were used separately for each of PRG's four drill phases, though Blank PR4 was only used once due to the limited amount of Phase IV RC drilling. For the RC sample blanks, PRG collected about 400kg of rock (volcanic arenite for PR1 and weathered diorite for PR2, PR3, and PR4) and ran it through a crusher to ¼in., giving it an appearance similar to RC cuttings. These blank RC samples were placed in RC bags and then into the sample sequence that was sent to the lab. For the core blank sample (Blank Di) used in all four drill phases, blank diorite that had been drilled in previous campaigns was split in a core splitter and placed into a bag as if it was a normal core sample.

Descriptive statistics of the round-robin analyses of PRG's five blanks are given in Table 12.6. Sample analytical precision and varying detection limits between the round-robin analyses and the blanks analyzed during the course of drilling create uncertainty in the determination of blank "failures," especially for the Blank PR1 and PR2 programs.

## Table 12.6 Descriptive Statistics of Platte River Blanks

**Blank PR1**

| | Au (ppm) | Ag (ppm) | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| **Count** | 8 | 8 | 8 | 5 | 5 |
| **Mean** | 0.006 | 2.375 | 0.005 | 0.002 | 0.005 |
| **Std. Dev.** | 0.003 | 1.482 | 0.004 | 0.001 | 0.001 |
| **CV** | 0.587 | 0.624 | 0.769 | 0.498 | 0.101 |
| **Minimum** | 0.003 | 0.500 | 0.001 | 0.001 | 0.005 |
| **Maximum** | 0.012 | 4.000 | 0.010 | 0.004 | 0.006 |

**Blank PR2**

| | Au (ppm) | Ag (ppm) | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| **Count** | 9 | 9 | 9 | 9 | 9 |
| **Mean** | 0.003 | 2.000 | 0.0005 | 0.002 | 0.010 |
| **Std. Dev.** | 0.001 | 1.323 | 0.0000 | 0.002 | 0.001 |
| **CV** | 0.300 | 0.661 | 0.0000 | 0.772 | 0.076 |
| **Minimum** | 0.003 | 1.000 | 0.0005 | 0.001 | 0.009 |
| **Maximum** | 0.005 | 5.000 | 0.0005 | 0.006 | 0.011 |

**Blank PR3**

| | Au (ppm) | Ag (ppm) | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| **Count** | 12 | 13 | 13 | 13 | 13 |
| **Mean** | 0.007 | 0.577 | 0.005 | 0.005 | 0.010 |
| **Std. Dev.** | 0.005 | 0.313 | 0.000 | 0.000 | 0.000 |
| **CV** | 0.709 | 0.542 | 0.000 | 0.000 | 0.000 |
| **Minimum** | 0.003 | 0.250 | 0.005 | 0.005 | 0.010 |
| **Maximum** | 0.013 | 1.000 | 0.005 | 0.005 | 0.010 |

**Blank PR4**

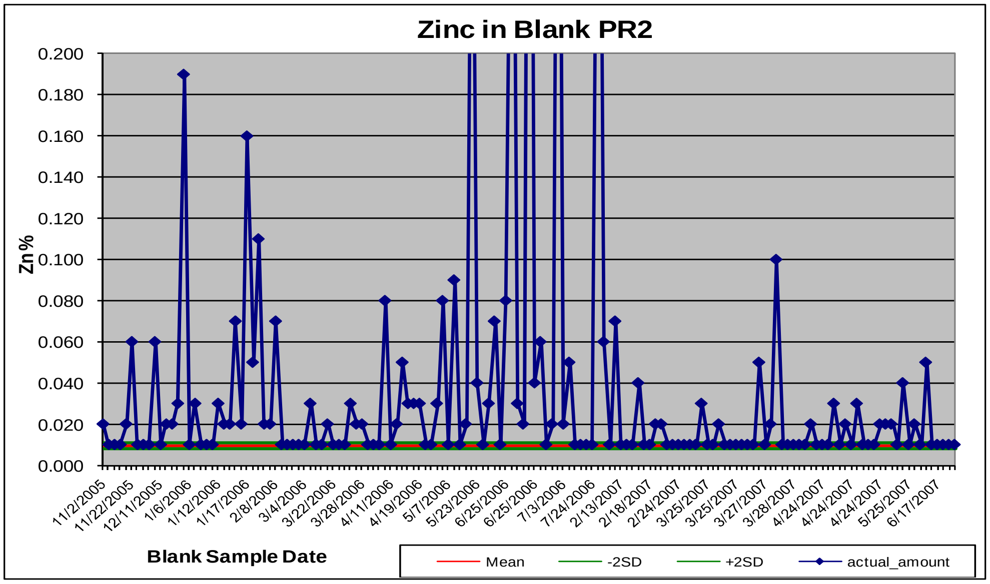
| | Au (ppm) | Ag (ppm) | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| **Count** | 8 | 8 | 8 | 8 | 8 |
| **Mean** | 0.003 | 0.438 | 0.004 | 0.008 | 0.011 |
| **Std. Dev.** | 0.000 | 0.259 | 0.003 | 0.003 | 0.001 |
| **CV** | 0.000 | 0.591 | 0.929 | 0.356 | 0.134 |
| **Minimum** | 0.003 | 0.250 | 0.001 | 0.005 | 0.010 |
| **Maximum** | 0.003 | 1.000 | 0.010 | 0.010 | 0.014 |

**Blank Di**

| | Au (ppm) | Ag (ppm) | Cu % | Pb % | Zn % |
|---|---|---|---|---|---|
| **Count** | 15 | 15 | 20 | 20 | 20 |
| **Mean** | 0.004 | 0.500 | 0.005 | 0.005 | 0.010 |
| **Std. Dev.** | 0.002 | 0.000 | 0.001 | 0.000 | 0.003 |
| **CV** | 0.436 | 0.000 | 0.301 | 0.000 | 0.281 |
| **Minimum** | 0.003 | 0.500 | 0.002 | 0.005 | 0.008 |
| **Maximum** | 0.008 | 0.500 | 0.010 | 0.005 | 0.020 |

The blank test results all show some possible sample contamination, mostly in isolated failures, though there are significant and consistent levels of elevated zinc and lead in the Blank PR2 samples analyzed in the first half of 2006 MDA questions whether this was a result of sample preparation contamination, analytical contamination, or if the blanks are, in fact, not blank (barren of metal). Figure 12.6 shows the Blank PR2 zinc analyses. Similar graphs were created for all metals for all five blank samples.

**Figure 12.6 PR2 Blank Sample Analyses – Zinc**




To aid in determining the probable cause of the systemic failures, the PR2 results for zinc and lead were evaluated in relation to the grade of the previous primary sample in the sample stream (Figure 12.7 and Figure 12.8). It is clear that all of the blank failures correlate with high-grade previous-sample values, indicating lab contamination. The presence of bad blanks would be indicated if there were blank failures across the range of previous-sample values, but this is not the case. A 1% contamination limit (noted in yellow) is noted on both figures. This limit marks the % Zn or % Pb value equal to 1% of the previous-sample value (noted in red). MDA has limited the contamination boundary to a value of 0.01% for the previous-sample grades below 1% Zn, since this is the detection limit used in the blank test analyses. It is clear that above 0.5% Zn, the blanks are consistently above the 1% contamination boundary as noted by the moving averages for the blank samples (noted as light blue line). For zinc, there are no blank test results at the "accepted" 0.01% value; all tests show some contamination. Statistics on the blank/previous-sample ratio indicate that above 1% Zn, the blanks show an average contamination of 4% with a median value of 2%.

This pattern of Blank PR2 failures correlating with high previous-sample values occurs in all metals, though the level and number of failures are not as high as for the Zn results. Similar analyses on the three other blanks (PR1, PR3 and Di) show the pattern of increased failures with high previous grades is still present though there are many less failures.

**Figure 12.7 Blank PR2 Zn versus Previous Sample Zn Grade**

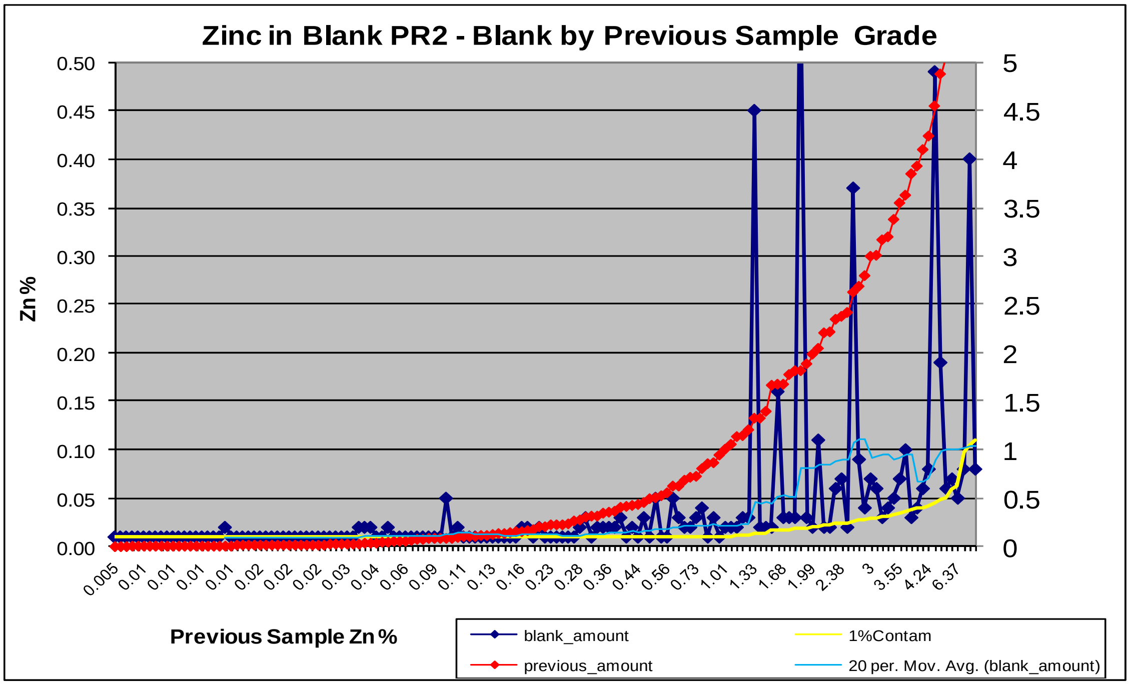
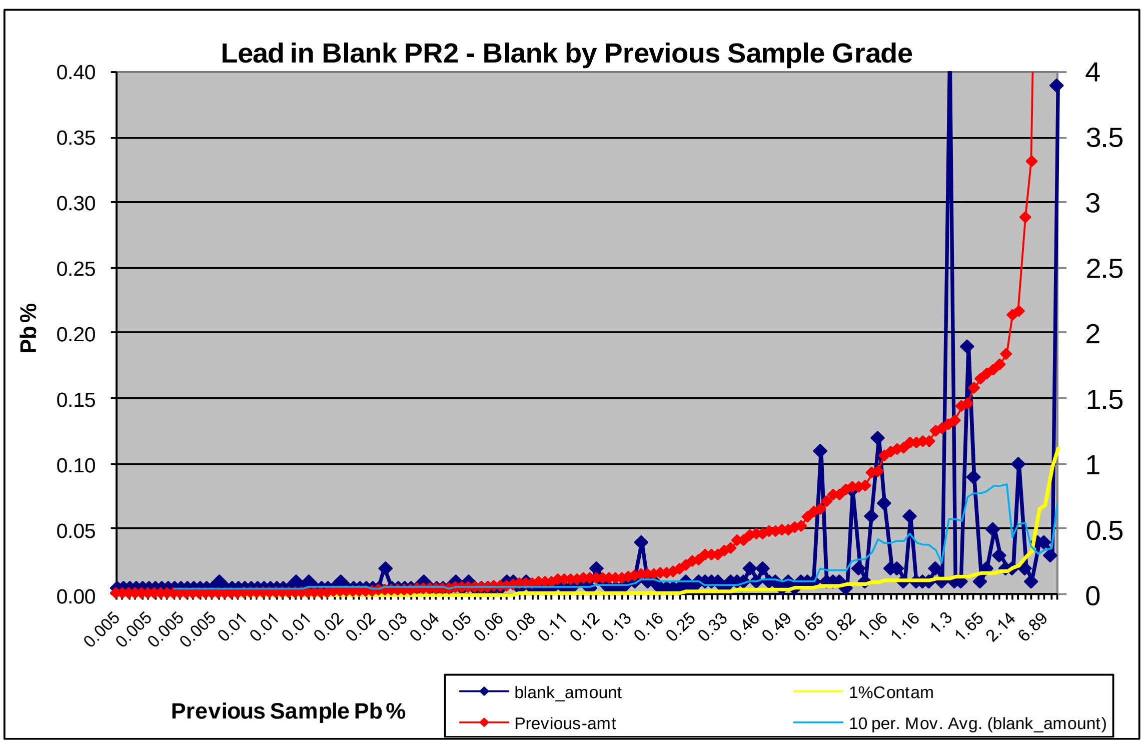



**Figure 12.8 Blank PR2 Pb versus Previous Sample Pb Grade**



***Standard Sample Results***

PRG made their standard material from San Rafael-El Cajón project site rock. Four standards were created: standards 688 and 689 were used in all four drill phases, while standards 690 and 691 were used only in the Phase IV drill program. The procedures for making standards are described below (PRG, 2007 and 2008, personal communication):

- Mineralized rock from mine dumps on the property was collected and separated, based on visual inspection, into two groups. Group 1 was low-grade (Standards 688 and 691), and Group 2 was high-grade (Standards 689 and 690).
- The two bulk samples, each weighing approximately 50kg, were shipped to McClelland in Sparks, Nevada.
- McClelland crushed and then pulverized the samples (McClelland, 2006, written communication via PRG):

*PHASE 1 Preparation Procedure*

*1) stage crush 50kg samples to -10 mesh*
*2) blend and split each sample (50kg) in entirety 3 times to obtain three 1kg splits for triplicate head assay to confirm desired grade range*
*3) save -10M rejects (~50kg) for phase 2 prep*
*4) blend and split 1kg splits from 2 above to obtain 250g for pulverizing*
*5) save -10M rejects from 4 above (~750g) for recombining with rejects from 3 above for phase 2 prep*
*6) ring & puck pulverize each 250g split from 4 above to just passing 200M (100% -200M)*
*7) roll blend each 250g split of -200M feed to obtain 100g for head assay (3, 100g assay splits for each sample)*
*8) save -200M rejects from 7 above (3 splits at 150g each, or 450g of each assay standard) for recombine with initial 50kg assay standard sample for phase 2 prep*
*9) place all 100g initial triplicate assay pulps into pulp bags and label with sample # and assay split (A, B, C)*
*10) submit initial assay splits to Chemex* [ALS] *for triplicate Au, Ag, Cu assay---Au and Ag assays, fire assay fusion with gravimetric finish*

*Wait for above assay results before proceeding with phase 2 prep to ensure that desired grade ranges and reproducibility are met*

*PHASE 2 Preparation Procedure*

*1) recombine all rejects from phase 1 prep with the initial 50kg assay standard sample (at -10 and -200M)*
*2) pulverize (ring & puck) the entire quantity of each assay standard sample (50kg each) to 100% -200M as in phase 1*
*3) after each 50kg assay standard sample is at -200M, do the following:*
*A) roll blend each 50kg standard, flatten, and quarter (or use rotary splitter)*
*B) separate each quarter (~12.5kg)*
*C) roll blend each quarter of each standard and quarter again (~3.1kg/quarter)*

*D) roll blend each 3.1kg quarter and weigh out 31, 100g assay samples from each of the 3.1kg quarters and place into pulp bags*
*E) when A-D above is complete, there should be 500 assay pulp bags each containing 100g assay splits for each assay standard sample---each assay pulp bag should be labeled with the assay standard sample designation only*
*F) randomly select 15 assay pulps from each standard and submit 10 to Chemex [ALS] for Au, Ag, Cu assay, and save 5 assay pulps for the client---Chemex [ALS] used fire assay fusion/AA finish for Au assays, and 4 acid digestion and AA or ICP analyses for Ag and Cu analyses*

- Pulps from the two now-pulverized samples were sent out to seven laboratories for round-robin analyses.

MDA reviewed the round-robin data and found the results to be unconvincing. Some problems of variable grade results were caused by varying detection limits for the different laboratories. Some differences in grade were caused by one laboratory using different digestion methods; others might be due to one lab using a different analytical procedure. The assays that resulted from these different procedures were excluded from the round-robin grade assigned to the standard by MDA. The round-robin results selected by MDA to be representative are given in Table 12.7. MDA believes that additional round-robin testing should be done to verify these grades and develop a higher confidence in the standards. The precision is not what it should be, and only gross errors might be determined from these standards' data.

## Table 12.7 Descriptive Statistics of Platte River Standards

**Std 688**

| | Au (ppm) | Ag (ppm) | Cu (%) | Pb (%) | Zn (%) |
|---|---|---|---|---|---|
| **Count** | 10 | 30 | 35 | 15 | 15 |
| **Mean** | 0.025 | 37 | 0.218 | 0.030 | 0.051 |
| **Std. Dev.** | 0.002 | 5 | 0.014 | 0.001 | 0.007 |
| **CV** | 0.080 | 0.128 | 0.064 | 0.019 | 0.141 |
| **Minimum** | 0.023 | 29 | 0.190 | 0.028 | 0.040 |
| **Maximum** | 0.031 | 46 | 0.248 | 0.030 | 0.063 |

**Std 689**

| | Au (ppm) | Ag (ppm) | Cu (%) | Pb (%) | Zn (%) |
|---|---|---|---|---|---|
| **Count** | 27 | 35 | 35 | 8 | 14 |
| **Mean** | 0.383 | 473 | 1.834 | 0.091 | 2.259 |
| **Std. Dev.** | 0.115 | 41 | 0.204 | 0.006 | 0.062 |
| **CV** | 0.300 | 0.088 | 0.111 | 0.062 | 0.028 |
| **Minimum** | 0.227 | 360 | 1.540 | 0.080 | 2.124 |
| **Maximum** | 0.647 | 523 | 2.340 | 0.100 | 2.370 |

**Std 690**

| | Au (ppm) | Ag (ppm) | Cu (%) | Pb (%) | Zn (%) |
|---|---|---|---|---|---|
| **Count** | 36 | 24 | 30 | 31 | 31 |
| **Mean** | 1.238 | 819 | 2.667 | 0.019 | 0.343 |
| **Std. Dev.** | 0.332 | 27 | 0.068 | 0.004 | 0.030 |
| **CV** | 0.268 | 0.033 | 0.026 | 0.218 | 0.088 |
| **Minimum** | 0.704 | 774 | 2.580 | 0.011 | 0.290 |
| **Maximum** | 2.120 | 880 | 2.869 | 0.026 | 0.390 |

**Std 691**

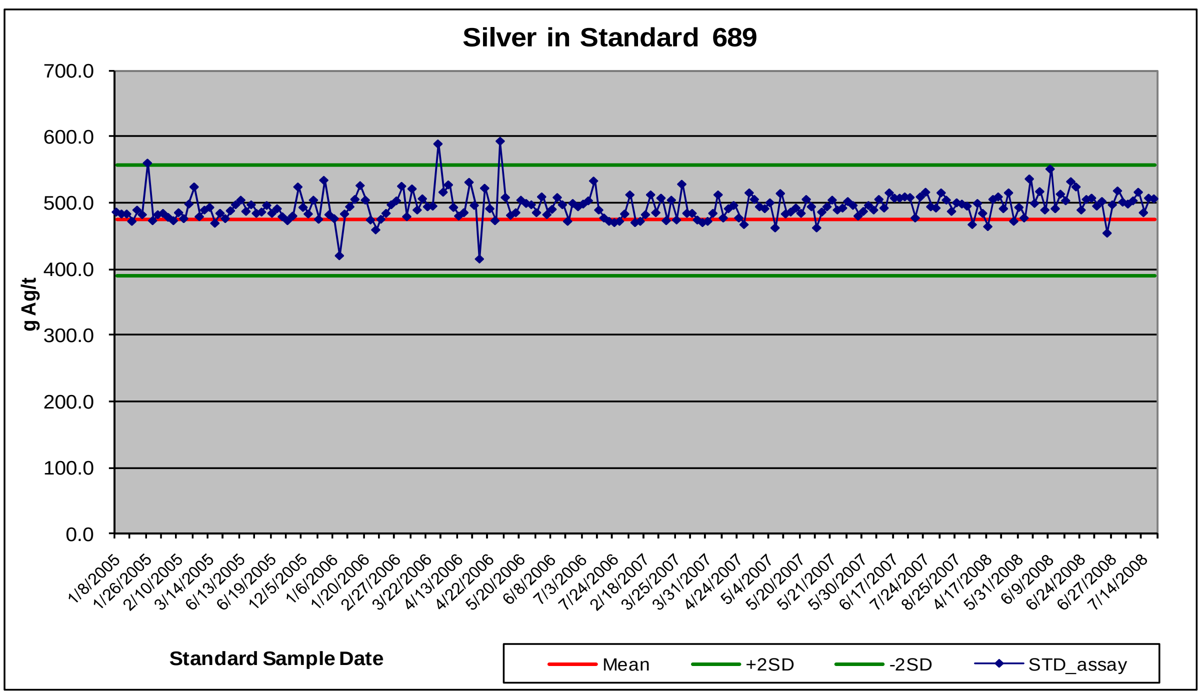
| | Au (ppm) | Ag (ppm) | Cu (%) | Pb (%) | Zn (%) |
|---|---|---|---|---|---|
| **Count** | 30 | 36 | 36 | 31 | 31 |
| **Mean** | 0.110 | 82 | 0.330 | 0.017 | 0.068 |
| **Std. Dev.** | 0.051 | 9 | 0.032 | 0.004 | 0.007 |
| **CV** | 0.466 | 0.112 | 0.097 | 0.226 | 0.102 |
| **Minimum** | 0.034 | 67 | 0.270 | 0.011 | 0.057 |
| **Maximum** | 0.221 | 104 | 0.400 | 0.021 | 0.088 |

The standard results, illustrated in the example control chart shown in Figure 12.9, are described briefly below:

- **Standard 688:** Zinc and lead values have a mean grade that reproduces the accepted round-robin values though there are a number of minor high failures that possibly reflect the lab precision at these low grades. Both metals show two significant failures within the 2008 Phase IV results which could be a result of lab clerical error since these same two samples show failures in silver, copper and gold. Silver grades show a consistently high bias, and there is some doubt as to the round-robin silver standard grades. Minor high failures, most reflective of the high bias, occur in the first three drill phase while the two significant high failures, mentioned above, occur within the 2008 Phase IV drilling. Copper results are reasonable with just one minor high failure outside of the two 2008 failures. The standard 688 gold grades show a number of high failures in the late 2006 – early 2007 drilling, these are not critical at these low grades.

- **Standard 689:** Zinc has an apparent low bias in the 2006-2007 analyses with no bias in the 2008 values. There are a number of failures, almost all below the accepted range, which is reflective of the low bias. There is one significant low failure in 2008 which is also observed in copper value for this same sample. Lead grades show good results, with just three minor failures. Silver had reasonable results with a minor high bias and just two minor failures. The copper results show a small negative bias, but that might be because the Inspectorate samples in the round robin are biased high relative to the other labs' values. Gold grades give highly variable though reasonable results; all samples are within the accepted range with just a few minor failures.
- **Standard 690:** Only twelve standard 690 samples were submitted for analyses. One sample shows significant failures in all five metals which could be the result of a lab clerical error. For the other eleven standard samples, the zinc, lead and silver grades are reasonable while the copper appears biased high, and the gold, though highly variable, appears biased low. There is one minor high failure in gold.
- **Standard 691:** Only seven samples were submitted for analyses. The results for all five metals are reasonable though there is one high failure in gold.

**Figure 12.9 Standard Analyses – Silver in Standard 689**




Overall, MDA deems these standards and the results from these standards to be adequate, but some improvement can be made.

***Overflow and Head-Screen Analysis Results***

The overflow *vs.* non-overflow sampling tests and head-screen results were provided to MDA in summary form. MDA has not evaluated the sample procedures or validated the original laboratory assay results that form the basis for the following conclusions.

The overflow *vs.* non-overflow assay results for 18 mineralized sample intervals within two holes in the San Rafael deposit (SR13 and SR14) indicate that the non-overflow samples, on average, showed a 10% increase in Ag grade and an 18% increase in both Pb and Zn grades. Of the 54 total analyses, only three "non-overflow" assays showed a lower grade than the typical overflow sample. These results for San Rafael massive-sulfide mineralization strongly suggest that though the loss is not great, there is a systematic loss of mineralization that occurs when excess drill water is allowed to overflow the sample bucket.

An additional two sample intervals within one San Rafael drill hole (SR9) were also tested. One sample was from a strongly mineralized interval, while the second was only weakly mineralized. Due to the overall low assay values in the latter sample, the observed difference between the overflow and non-overflow sample resulted in significant, but unrealistic percentage differences, and this sample was not used in MDA's analysis. The assay results for the mineralized sample interval showed little difference in the Ag and Pb values, but the non-overflow sample was slightly higher (6%) in Zn than the overflow sample.

PRG conducted overflow *vs.* non-overflow tests on four sample intervals from one drill hole at El Cajón. The results indicate an average 13% increase in mineralization from letting the water overflow the bucket. This is the opposite effect to that seen at San Rafael, where grades increased in the non-overflow samples. The more disseminated, and less massive, nature of the sulfide mineralization at El Cajón, along with the association of significant sulfides and quartz could account for the different result. It is possible that the sulfide-bearing quartz would resist being finely crushed at the drill hammer. The larger quartz chips would then be more easily captured in the overflow sample, while the more barren, softer country rock would be selectively washed away. Since nearly all of the mineralized intercepts at El Cajón were, and still are being drilled with core, the sampling errors in the limited RC drilling are not considered significant in any future evaluation of the El Cajón deposit.

Four drill standard samples, high-grade and low-grade samples from both San Rafael and El Cajón, were submitted to McClelland in Reno for head-screen analysis. For each sample, sample weight and metal distribution percentages were determined for seven size fractions ranging from +1.7mm to -75µm. The results for the low-grade San Rafael sample (about 1% Zn equivalent) indicated that the metal distribution is fairly uniform, though the smallest size fraction does contain the single highest percentage of Ag, Pb, and Zn mineralization, at 22.5, 30.0 and 23.3%, respectively. Conversely, the high-grade San Rafael sample (about 5% Zn equivalent) has over 60% of the Ag, Pb, and Zn mineralization in the three largest size fractions (+420µm), with the smallest size fraction containing between 15 and 20% of the total mineralization. These preliminary results suggest that metal loss due to the overflow of water and fines would be most significant in the lower-grade mineralization.

The head-screen results for the El Cajón samples indicate that for the low-grade sample (112g Ag/t and 0.6% Cu), there is a pronounced bimodal distribution of the Ag and Cu mineralization, with the largest- and smallest-size fractions both containing approximately 30% of the total metal content. Analysis of the high-grade sample (440g Ag/t and 1.5 % Cu) indicates that over 50% of the Ag and Cu mineralization occurs within the smallest-size fraction. Both El Cajón samples suggest that metal loss due to sample overflow could be significant, especially in the high-grade material. These results, though, contradict the overflow *vs.* non-overflow tests as discussed above, indicating additional testing is needed to reach a satisfactory conclusion.

***RC vs. Core Twin Results***

PRG drilled two core holes as twins for two RC holes drilled previously by PRG. Table 12.8 shows the metal content for the comparable mineral intervals within each drill pair. For the first pair (SR27 and SR76), the core hole has a higher grade in all metals, while in the second pair (SR22 and SR78), the RC hole is of a higher grade. The individual assays within these mineral intervals do show some differences, which are attributed to the internal, natural variability within the mineralized zone. These initial results do not show an obvious bias, though additional testing would be warranted.

**Table 12.8 San Rafael Core/RC Twin Comparison**

| **San Rafael Core/RC Twin Comparison** | | | | | |
|---|---|---|---|---|---|
| Hole ID | Mineral Interval (meters) | Thickness (meters) | Ag ppm | Pb % | Zn % |
| SR27 - RC<br>SR76 - core | 74 - 100<br>76 - 105 | 26<br>29 | 31.3<br>37.5 | 0.93<br>1.21 | 3.24<br>4.38 |
| | | | 20% | 30% | 35% |
| SR22 - RC<br>SR78 - core | 55 - 76<br>56 - 78 | 21<br>22 | 60.2<br>45.7 | 1.93<br>1.62 | 5.09<br>4.2 |
| | | | -24% | -16% | -17% |

There have been no core/RC twins within the El Cajón deposit.

### 12.3.2.2 QA/QC by Scorpio Mining Corp.

For Scorpio's drilling at San Rafael, Scorpio inserted one blank and one standard into every batch of approximately 40 samples sent to ALS. The blank material and standards are the same material used by PRG in 2007 and 2008. The blank consists of drill core from unmineralized diorite intrusive intervals, while the two standards (standard 690 and standard 691) are pulp samples derived from material collected from project site mine dumps and processed at a commercial lab.

The duplicate sampling program consisted of re-analyses at ALS of the initial sample pulp, a replicate pulp made from the coarse reject, and a half-core sample form select sample intervals. Original sample pulps were also sent to a second lab (Inspectorate) as a check on ALS.

For their drilling at El Cajón, Scorpio inserted one blank and one standard into every batch of approximately 40 samples sent to ALS. MDA reviewed the lab results compiled by Scorpio; there were no blank "failures," and the standards results all were within acceptable limits.

Eighteen half-core split duplicate samples were collected and sent to ALS for analyses. No significant differences were noted between the original and duplicate values for this limited data set. The majority of samples were from weakly mineralized intervals, and relative-difference evaluations are not practical at these low analytical levels. Of the few samples that approached economic grades, no evidence of a systematic bias was noted for any of the three metals (silver, copper, and gold), with the absolute difference between the two sample pairs averaging between 20 and 35 percent. These differences are acceptable for split-core duplicates.

***Blanks***

MDA's review of the results for 116 blank samples at San Rafael indicates one failure (a value five times the detection limit) in both the gold and silver values with no errors noted in the copper data. The failures noted were both at low levels and not considered significant. The lead and zinc data show a number of low-grade failures (all failures are <0.1% Zn or <0.05% Pb) in the blank samples inserted into the sample stream for holes SR231 through SR279. A preliminary evaluation comparing the blanks with the preceding samples in the sample stream indicates probable low-level contamination in the lead and zinc blanks that follow strongly mineralized (>3%Pb or Zn) sample intervals. A similar issue was noted in the 2009 technical report. The observed contamination is not considered to have a significant effect on the resource estimate.

MDA's review of the 62 blank samples at El Cajón indicates one low-level failure in the gold that is not considered significant. No errors were noted in the silver or copper values.

***Standards***

MDA has reviewed the round-robin analyses of the standards and believes that due to rounding issues, there are concerns about the precision of the control values. This concern over precision, combined with the low grades for both lead and zinc in the two standards, reduces the usefulness of the standards results in evaluating the lead and zinc results. Notwithstanding these concerns, MDA did evaluate the 41 analyses of standard 690 and 72 analyses of standard 691 for San Rafael. Both standards show large errors for one or two samples that appear to be clerical errors. Removing these large errors result in just one minor over-limit failure in lead for standard 690 and no failures for standard 691. The gold values for standard 690 do show a 17 percent low bias versus the standard control grade (1.04 g Au/t versus 1.26g Au/t). These standards were assayed at ALS in February through May, 2012 and indicate a possible low bias in the gold data for this time period. No other significant issues were noted in the standard results.

The evaluation of the 27 analyses of standard 690 and 18 analyses of standard 691 for El Cajón indicated no significant concerns with all values considered acceptable.

***Duplicate Samples – San Rafael***

A total of 84 sample pulps, 84 coarse rejects, and 118 split-core samples from San Rafael were sent to ALS for duplicate analysis. The initial 32 core duplicate samples, with blind sample numbers, were included in the original sample stream. The remaining samples were sent in batches to ALS after the receipt of the original assay results.

No significant differences were noted between the original and duplicate values. Disregarding the weakly mineralized samples at sub-economic grades, where relative-difference evaluations are not practical, no evidence of a systematic bias was noted in the pulp and coarse reject for any of the five metals (silver, copper, gold, lead, and zinc). The average relative difference values for all five metals were all under ±5 percent for both types of duplicate analyses. The core analyses did show a small negative bias with the duplicate samples averaging 5 percent lower than the original assays. The total variability between duplicate pairs, as measured by the absolute relative difference values, averaged less than 10 percent for the pulp duplicates, 5 percent to 15 percent for the coarse reject pairs, and 20 percent to 30 percent for the split-core duplicate samples. These differences are acceptable for the various duplicate analyses.

As a check on ALS, Scorpio sent 64 original pulps to a second lab (Inspectorate) for analyses. The results show extreme differences between labs within the very low-grades, but no significant differences or bias within sample pairs just below or at economic grade ranges. Average relative difference values for the limited number of mineralized sample pairs range from -9 percent for zinc to +3 percent for silver and lead. Average total variability ranges from 5 percent to 20 percent.

***Duplicate Samples – El Cajón***

Eighteen half-core split duplicate samples from El Cajón were collected and sent to ALS for analyses. No significant differences were noted between the original and duplicate values for this limited data set. The majority of samples were from weakly mineralized intervals, and relative-difference evaluations are not practical at these low analytical levels. Of the few samples that approached economic grades, no evidence of a systematic bias was noted for any of the three metals (silver, copper, and gold), with the absolute difference between the two sample pairs averaging between 20 and 35 percent. These differences are acceptable for split-core duplicates.

### 12.3.3 QA/QC Conclusions and Recommendations

During the course of the Nuestra Señora audit, MDA documented all errors that were discovered and corrected those that were verifiable. A significant number of systematic discrepancies in the down-hole survey data that could not be verified, but do not necessarily represent incorrect data, were retained in the database. During its review of all available Nuestra Señora QA/QC data, MDA concluded that the frequency of failures was typical for most projects. However, there was no evidence that any follow-up of QA/QC failures was done, nor were any QA/QC data for almost half of the pre-2011 assay batches found. The unverifiable down-hole survey discrepancies and QA/QC issues impart a degree of uncertainty to the overall database. This uncertainty is accounted for by applying stricter criteria for classification, and thereby reducing the quantity of Measured and Indicated resources.

Overall PRG did a commendable job of demonstrating sample and analytical reliability for their San Rafael and El Cajón drill programs. Although the QA/QC program could have been incrementally improved with the analysis of coarse reject and pulp duplicates, MDA concludes that the database is suitable for use in the resource estimate.

Scorpio's QA/QC program included blanks, standards, and pulp, coarse reject, and split-core duplicate samples. Some low-level contamination in the San Rafael lead and zinc values were noted, and there are minor concerns over the precision of the standard control values. Neither of these issues is considered significant, and MDA believes the Scorpio drill data for San Rafael amd El Cajón are suitable for use in the resource estimate.

# 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

*Note that the term "ore" appears in this metallurgical section. When used in this context, the word has no economic significance but is used to describe well-mineralized rock being used as plant feed source.*

## 13.1 Nuestra Señora

The following information in Section 13.1 on the metallurgical testing and mineral processing at Nuestra Señora has been prepared under the supervision of Pierre Lacombe, Eng, QP for this section of this report.

### 13.1.1 Historical Test Work

Pre-production metallurgical studies for various mineralized zones of Nuestra Señora have included petrography, mineralogy, grindability determinations, and batch-scale flotation optimization test work leading through locked cycle tests.

Although various consultants were engaged for specific investigations, the most complete series of processing test work was performed by SGS Lakefield Research Ltd. ("SGS Lakefield") in Canada between May 2006 and May 2007. Their test work included mineralogical analyses, Bond Work Index determinations, batch flotation testing, and confirmatory testing of fully sequential flowsheet through locked cycle tests. Reports of these tests were delivered in December 2006 (Imeson and Fleming, 2006; 11301-001 – Report No. 1), March 2007 (Bond Cromes, 2007; 11301-002 – Final Report), and August 2007 (Imeson and Bridge, 2007; 11301-003/-004).

The following information is taken from the Executive Summary of the report by Imeson and Bridge (2007):

> *"Ore representative of the Nuestra Señora and the Hoag Zone deposit was received for a metallurgical test program. The Nuestra Señora sample assayed 1.48% Cu, 1.36% Pb, 3.24% Zn and 151 g/t Ag and the Hoag Zone sample assayed 0.23% Cu, 2.53% Pb, 3.63% Zn and 71.1 g/t Ag. Previous testwork (SGS Lakefield project# 11301-001/-002) indicated that the sulphide minerals were coarse grained with good liberation characteristics at a primary grind in upwards of 100 µm.*
>
> *Flowsheet development of the Nuestra Señora ore confirmed that a fully sequential Pb-Cu-Zn rougher/cleaner flowsheet using a ZnO/NaCN complex to promote selectivity between the Pb and the Cu achieved the best results. Locked cycle testing on the fully sequential flowsheet achieved the following in the best test:*

| Product | Wt | Grade, %, g/t | | | | Distribution, % | | | |
|---|---|---|---|---|---|---|---|---|---|
| | % | Cu | Pb | Zn | Ag | Cu | Pb | Zn | Ag |
| **Pb Conc** | 2.34 | **9.51** | **45.1** | 5.42 | **3863** | **15.5** | **91.7** | 4.00 | **58.6** |
| **Cu Conc** | 2.95 | **35.6** | 1.18 | 2.74 | **1408** | **73.1** | 3.02 | 2.55 | **26.9** |
| **Zn Conc** | 5.20 | 1.92 | 0.31 | **53.4** | 143 | 6.93 | 1.39 | **87.9** | 4.81 |
| **Pb Cl Scav Tail** | 0.64 | 4.65 | 1.53 | 3.56 | 954 | 2.07 | 0.85 | 0.72 | 3.96 |
| **Zn Cl Scav Tail** | 1.48 | 0.29 | 0.18 | 0.95 | 53.1 | 0.30 | 0.23 | 0.44 | 0.51 |
| **Zn Rghr Tail** | 87.3 | 0.04 | 0.04 | 0.16 | 9.27 | 2.16 | 2.86 | 4.42 | 5.25 |
| **Head** | 100 | 1.42 | 1.19 | 3.17 | 154 | 100 | 100 | 100 | 100 |

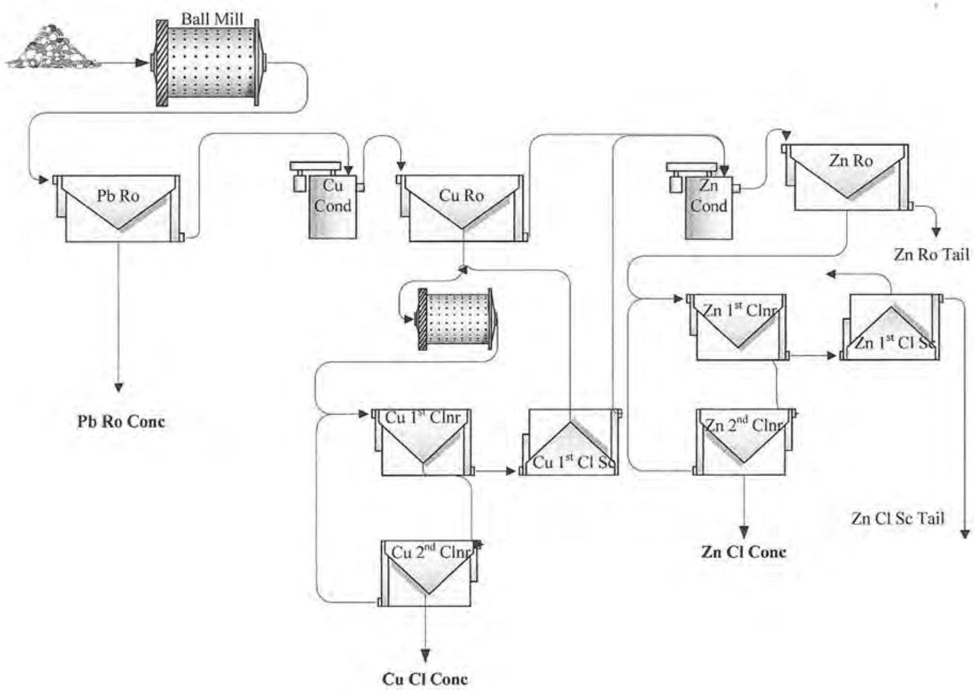
*A lead concentrate assaying 45.1% Pb, 9.51% Cu and 3,863 g/t Ag recovered 91.7% of the lead and 58.6% of the silver, while recovering 15.5% of the copper. A copper concentrate grading 35.6% Cu and 1,408 g/t Ag recovered 73.1% of the copper and a further 26.9% of the silver. The zinc concentrate graded 53.4% Zn, while recovering 87.9% of the zinc.*

*Flowsheet development of the Hoag Zone ore confirmed the amenability of a fully sequential Pb-Cu/Pb-Zn rougher/cleaner flowsheet. Locked cycle testing on the fully sequential flowsheet was pursued through confirmatory locked cycle testing. The following results were achieved:*

| Product | Wt | Assays, %, g/t | | | | Distribution, % | | | |
|---|---|---|---|---|---|---|---|---|---|
| | % | Cu | Pb | Zn | Ag | Cu | Pb | Zn | Ag |
| **Comb Pb + Cu/Pb Concentrate** | **3.67** | **3.58** | **57.8** | 5.24 | **1598** | **55.9** | **97.4** | 5.66 | **89.5** |
| **Pb Cleaner Concentrate** | **2.95** | 0.95 | **65.1** | 3.59 | 1708 | 11.9 | **88.2** | 3.12 | **76.9** |
| **Cu/Pb Cleaner Concentrate** | **0.72** | **14.3** | 27.8 | 12.0 | 1147 | **44.0** | 9.23 | 2.55 | **12.6** |
| **Zn Cleaner Concentrate** | **5.72** | 1.59 | 0.24 | **54.3** | 70.7 | 38.7 | 0.64 | **91.5** | 6.18 |
| Zn Cleaner Tailings | 2.63 | 0.10 | 0.19 | 0.49 | 19.8 | 1.17 | 0.23 | 0.38 | 0.80 |
| Zn Rougher Tailings | 87.7 | 0.01 | 0.04 | 0.09 | 2.60 | 4.29 | 1.71 | 2.42 | 3.48 |
| **Combined Zn Tailings** | 90.3 | 0.01 | 0.05 | 0.11 | 3.10 | 5.46 | 1.95 | 2.80 | 4.28 |
| Head (calculated) | 100 | 0.24 | 2.12 | 3.39 | 63.9 | 100 | 100 | 100 | 100 |

*A combined lead + copper/lead concentrate assaying 57.8% Pb, 3.58% Cu and 1,598 g/t Ag recovered 97.4% of the lead, 55.9% of the copper and 89.5% of the silver. The zinc concentrate assayed 54.3% Zn, while recovering 91.5% of the zinc. The zinc concentrate contained about 38.7% of the Cu and the Pb + Cu/Pb concentrate contained 5.7% of the Zn.*

*The flowsheet amenable to both ore types is shown in the figure below. The Nuestra Señora ore requires one additional stage of Pb cleaning."*




### 13.1.2 Production Metallurgical Performance

While pre-production testing constituted a solid basis and reference for earlier resource/reserve reporting and design of the processing plant, the relevance of laboratory-based results for predicting the metallurgical outcome of processing the same ore types as those mined and processed to date has been largely superseded by the availability of actual production data from the Nuestra Señora process plant.

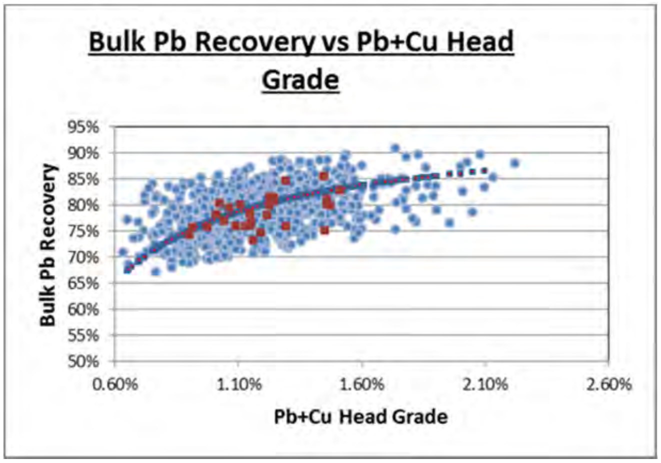
The use of ZnO/NaCN as evaluated by SGS Lakefield in pre-production test work was not implemented in the existing plant due to environmental and permitting concerns. This limitation to the reagent regime implemented led to a modification of the industrial circuit, with a bulk flotation of the copper and lead followed by separation of the two metals in distinct concentrates, instead of the sequential lead and copper flotation approach used with cyanide added as a depressant. Notwithstanding these modifications, some metallurgical performance metrics of the existing plant without cyanide are better than the pre-production test work implied.

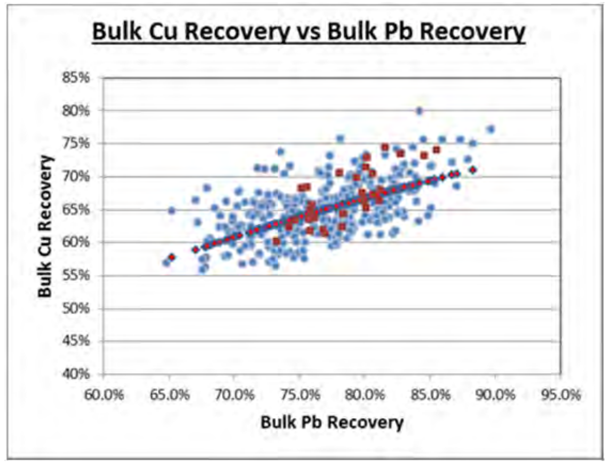
Plant production performance, in terms of recoveries and concentrate qualities is shown in the following graphs. These graphs depict the predictive relationships derived using daily balanced metal production (blue data points) for the most recent production months and are available as the basis for metallurgical results projection and ore block value determination. The monthly results for 2012 and Q1 2013 are shown as red data points.

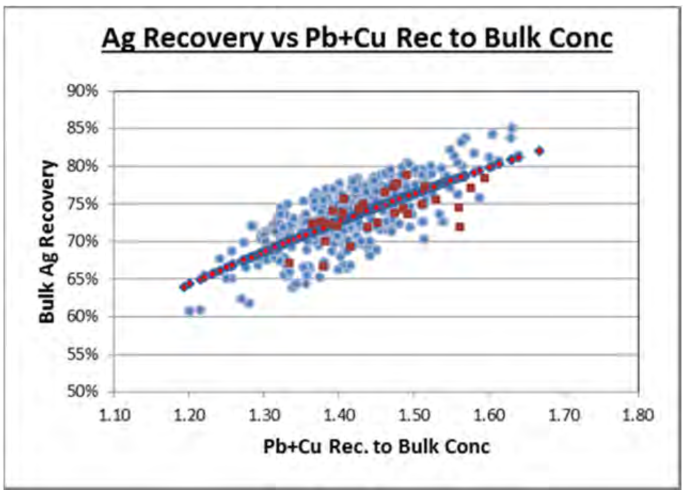
#### 13.1.2.1 Bulk Concentrate Performance

On a daily production scale, the best predictive relationship of lead recovery to the bulk concentrate is determined by the combined head grades of lead and copper. Copper recovery to the bulk concentrate, in turn, is broadly related to the lead recovery thus achieved, and its silver recovery to the combined lead and copper reovery to bulk concentrate. Figure 13.1 illustrates these relationships.

**Figure 13.1 Relationships of Lead, Copper, and Silver Recovery to Bulk Concentrate**



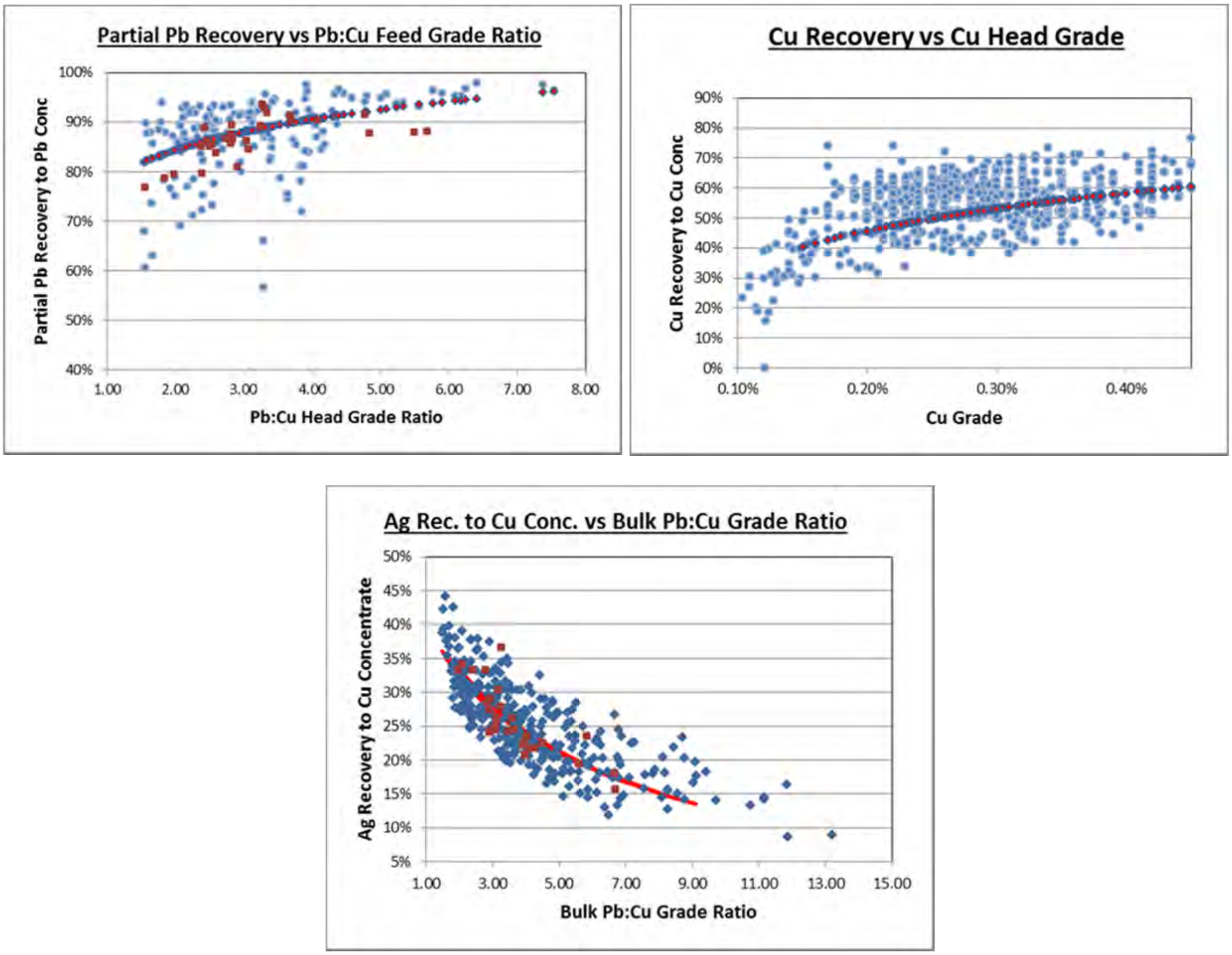




### 13.1.2.2 Lead and Copper Concentrates Performance

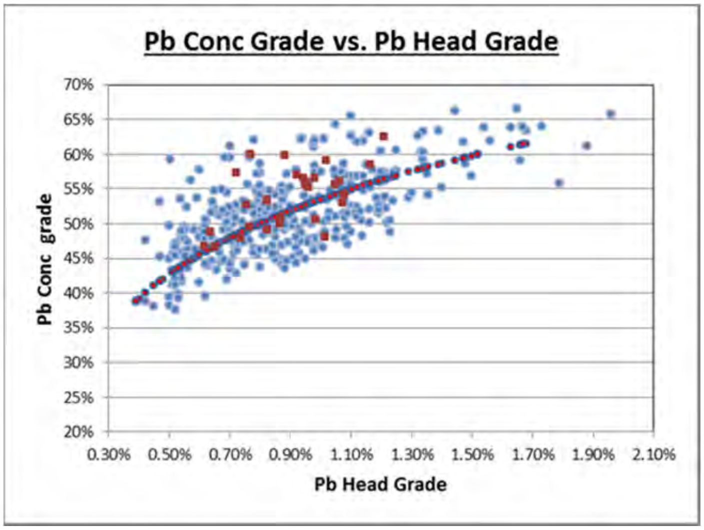
On a daily production scale, recoveries of lead to lead concentrate and silver to copper concentrate are best related to the bulk concentrate Pb:Cu grade ratio, while copper recovery expectation to copper concentrate depends on the copper head grade (Figure 13.2).

**Figure 13.2 Relationships of Lead, Copper, and Silver Recoveries to Lead and Copper Concentrates from Bulk Concentrate**



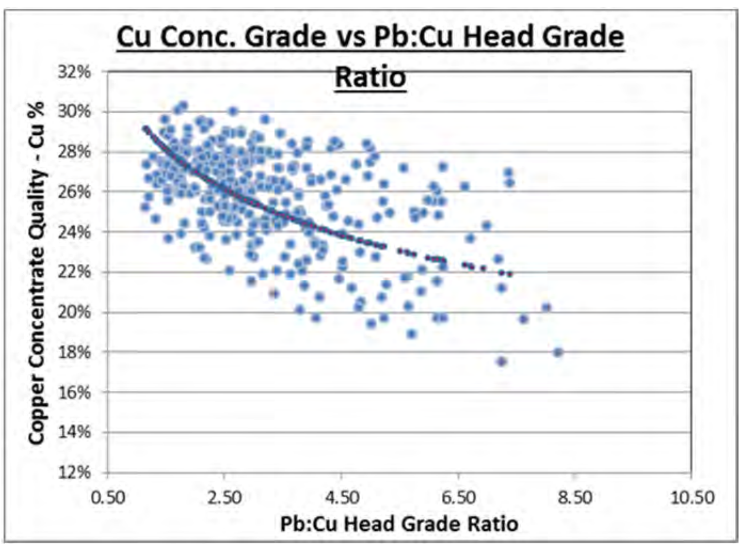

The expected concentrate quality of the lead concentrate is provided by the relationship shown in Figure 13.3.

**Figure 13.3 Lead Grade of Lead Concentrate**




The copper grade of the copper concentrate is then determined by the metallurgical relationships shown in Figure 13.4.

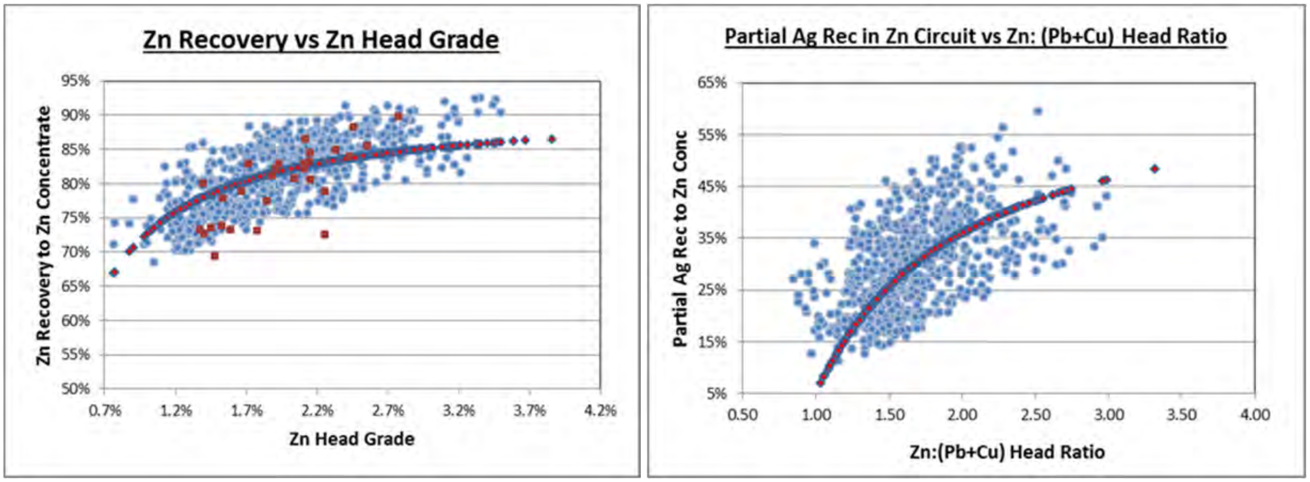
**Figure 13.4 Copper Grade of Copper Concentrate**




### 13.1.2.3 Zinc Concentrate Performance

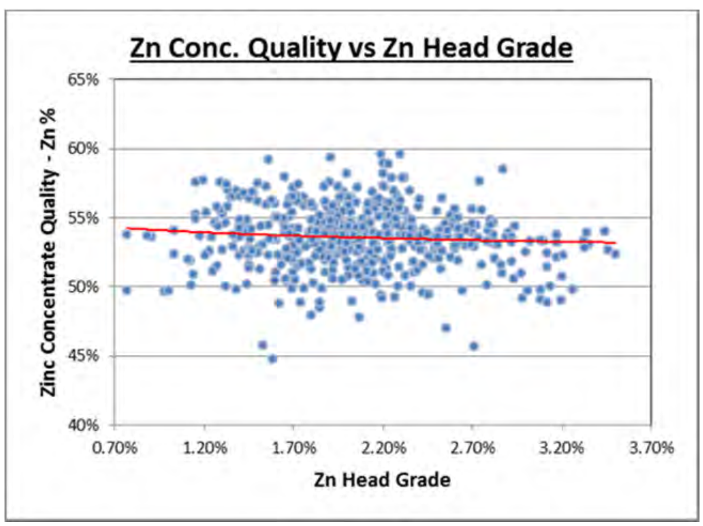
On a daily production scale, zinc recovery is best determined by the zinc head grade, while silver is determined by the ratio of zinc head grade to the combined head grades of lead and copper (Figure 13.5).

**Figure 13.5 Relationships for Zinc and Silver Recoveries to Zinc Concentrate**




The zinc concentrate grade does not display a close relationship to any input parameters. Although presented here as graphed against zinc head grade (Figure 13.6), the zinc concentrate grade is generally maintained within a relatively tight band around an average of 53.7 % Zn. This fixed value is used along with the regressed parameters to determine the zinc concentrate production expectations.

**Figure 13.6 Relationship of Zinc Grade of Zinc Concentrate**




## 13.2 San Rafael-El Cajón

The following information on metallurgical testing of the San Rafael and El Cajón mineralization is taken from MDA's 2012 Technical Report (Ristorcelli *et al.*, 2012), with updated information provided by Jack McPartland, Q.P.M.

McClelland Laboratories, Inc. ("McClelland") in Sparks, Nevada, completed all of PRG's metallurgical testing. All samples were derived from either RC cuttings or from core samples, and all testing assumed processing of mineralization by flotation. As of late 2009, detailed flotation testing had been completed on the San Rafael Main Zone sulfide mineralization, using drill-hole composites located within the western portion of the San Rafael deposit, and El Cajón sulfide mineralization. Only preliminary testing has been completed on three additional San Rafael metallurgical types, all located within the eastern portion of the deposit: oxide mineralization, 120 Zone sulfide mineralization (at depth beneath the Main Zone), and Main/120 Zone overlap sulfide mineralization. The Main/120 Zone overlap sulfide material type occurs where the near-surface, up-dip extension of the Main Zone massive sulfide is overprinted by the 120 Zone low-sulfide mineralization. In the following referenced McClelland metallurgical reports, this material type has been labeled the "120 Zone mixed sulfides," but for ease of understanding, this report will use the more descriptive term "Main/120 overlap sulfides" for this metallurgical type. Also, where the McClelland reports note the testing of "San Rafael sulfide" composites, the material tested is from the Main Zone massive sulfide only. There has been no metallurgical testing on the San Rafael Upper Zone as of April 2013.

### 13.2.1 2005 Metallurgical Testing

In late 2005, McClelland tested flotation responses on composite mineralized samples from the San Rafael and El Cajón deposits. According to Armbrust and Chlumsky (2006), the flotation test on San Rafael indicated "*that recoveries of about 85 percent for the lead and zinc are possible and that the silver recovery when combining the lead and zinc concentrates could be around 90 percent*."

### 13.2.2 January 2007 Metallurgical Testing

McClelland completed metallurgical test work on three drill-sample composites in early 2007 (McClelland, 2007). The following is a summary of this initial work.

A series of scoping base metal flotation tests were conducted on three composites of RC drill coarse rejects from San Rafael and El Cajón. The main purpose for the tests was to develop a technique for selective flotation of lead/silver and zinc concentrates from the San Rafael sulfide ore type. The three RC drill composites evaluated were designated El Cajón, San Rafael oxide, and San Rafael sulfide. Head assay results for the three composites are shown in Table 13.1.

**Table 13.1 Head Grades, San Rafael and El Cajón Ore Composites**

| Head Assays | | | | | | |
|---|---|---|---|---|---|---|
| **Ore Composite** | **Au, g/t** | **Ag, g/t** | **Cu, %** | **Pb, %** | **Zn, %** | **Fe, %** |
| El Cajón | 0.342 | 186 | 0.71 | 0.05 | 0.10 | 5.4 |
| San Rafael Oxide | 0.275 | 122 | 0.23 | 0.54 | 0.38 | 15.8 |
| San Rafael Sulfide | 0.164 | 83 | 0.03 | 2.09 | 3.09 | 28.4 |

An initial bulk sulfide flotation test was conducted on all three composites to obtain preliminary information concerning amenability to flotation processing. Subsequent testing focused on development of a sequential flotation scheme for the San Rafael sulfide composite.

Primary metals of interest for the El Cajón composite were gold, silver, and copper. That composite did not contain much lead or zinc. An initial flotation test showed that the El Cajón composite responded quite well to conventional bulk sulfide flotation treatment at an 80%-106µm feed size. Gold, silver, and copper recoveries of 89% or greater were obtained in a rougher concentrate equivalent to 5.2% of the feed weight. No further testing has been conducted on this composite.

An initial bulk sulfide flotation test conducted on the San Rafael oxide composite indicated that the oxide ore did not respond particularly well to conventional flotation treatment at an 80%-106μm feed size. In general, metal recoveries and concentrate grades were low. These results were not altogether unexpected for an oxide ore. No further testing has been conducted on this composite. Additional testing will be required to determine if the oxide ore can be processed using flotation methods. Flotation processing of the oxidized ore is considered to be unlikely.

An initial bulk sulfide flotation test conducted on the San Rafael sulfide composite showed that the composite did not respond well to bulk sulfide flotation treatment. Although metal recoveries to the flotation concentrate were high, selectivity was very poor. Activation of contained gangue minerals (primarily iron sulfides) during flotation appears to have been a problem. Subsequent testing has been focused on development of a sequential flotation procedure/reagent scheme to allow for selective flotation of a precious metal/lead concentrate and a zinc concentrate. This testing includes over 20 sequential flotation tests.

Overall, detailed testing on the San Rafael sulfide composite has shown that it is possible to selectively float a precious metal/lead concentrate that was less than 8% of the feed weight and contained over 75% of the total lead. Zinc flotation of the lead flotation rougher tailings showed that it was possible to generate a zinc concentrate that was less than 8% of the feed weight and contained over 75% of the total zinc. Silver values reporting to the lead and zinc rougher concentrates were equivalent to over 70% of the contained silver.

Lead concentrate grades of as high as 52% Pb and 3,500 g Ag/ t were achieved during cleaner flotation testing. Zinc concentrate grades of as high as 52% Zn were achieved.

Results under optimum conditions showed that approximately 15% of the zinc, 25% of the lead, 30% of the silver, and 50% of the gold contained in the whole ore reported to the final tailings. Final (cleaner) concentrates containing 52% lead and 52% zinc were obtained. The cleaner lead concentrate under optimized conditions was approximately 3% of the feed weight, while the cleaner zinc concentrate was approximately 5% of the feed weight.

Follow-up flotation testing included further optimization of reagent additions and optimization of grind size. Finally, locked-cycle flotation testing was planned under the optimized conditions to confirm recoveries and to determine the effects of middlings (cleaner tailings) recycle.

### 13.2.3 Additional 2007-2008 Metallurgical Testing

McClelland completed additional metallurgical test work on four drill-core composites during late 2007. Drill-core composites representing San Rafael Main Zone sulfide and El Cajón mineralization types were initially prepared for testing. The San Rafael sulfide composite contained 1.8% Pb, 4.2% Zn, and 50g Ag/t, while the El Cajón composite contained 0.33g Au/t, 179g Ag/t, and 0.71% Cu. Two additional composites representing 120 Zone sulfide and Main/120 overlap sulfide mineralization were prepared later from drill core and drill-cuttings rejects for preliminary (confirmatory) flotation testing. The 120 Zone sulfide composite contained 0.51g Au/t, 180g Ag/t, 0.61% Cu, 0.09% Pb, and 0.31% Zn, while the Main/120 overlap sulfide composite contained 0.29g Au/t, 108g Ag/t, 0.54% Cu, 0.26% Pb, and 6.07% Zn.

#### 13.2.3.1 San Rafael Main Zone Sulfide Composite

The following is taken from a preliminary report on the metallurgical testing by McClelland dated January 18, 2008.

Sequential lead/zinc rougher cleaner flotation testing was conducted on the San Rafael Main Zone sulfide composite using conditions optimized during earlier testing on a San Rafael Main Zone sulfide cuttings composite. The tests were conducted to confirm response of the drill-core composite to flotation under the optimized conditions and to optimize grind size for flotation. Summary results from those tests are presented in Table 13.2.

**Table 13.2 Summary Flotation Test Result-San Rafael Main Zone Sulfide Composite**

| | Weight Distribution | | | | | Assays | | | | | | Recovery to Rougher Conc. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lead Concentrate | | Zinc Concentrate | | | % Pb | | g Ag/t | | % Zn | | % of Total | | |
| Test | Cleaner | Rougher | Cleaner | Rougher | Ro. Tail | Cl. Conc | Ro. Tail | Cl. Conc | Ro. Tail | Cl Conc | Ro. Tail | Pb | Ag | Zn |
| F6 | 2.4 | 6.6 | 5.0 | 7.0 | 86.4 | 55.88 | 0.38 | 689 | 32 | 44.42 | 1.85 | 80.3 | 35.4 | 56.3 |
| F7 | 2.6 | 6.2 | 5.2 | 7.2 | 86.6 | 50.91 | 0.31 | 614 | 30 | 43.70 | 1.81 | 83.0 | 35.7 | 56.0 |
| F13 | 2.7 | 5.9 | 6.8 | 8.3 | 85.8 | 50.84 | 0.27 | 550 | 25 | 43.65 | 1.16 | 85.2 | 31.8 | 71.2 |
| F4 | 3.2 | 12.4 | 7.2 | 9.0 | 78.6 | 46.64 | 0.28 | 561 | 25 | 39.6* | 0.78 | 87.3 | 45.2 | 71.7 |
| F23 | 3.6 | 8.6 | 6.7 | 9.2 | 82.2 | NA | 0.20 | 509 | 25 | NA | 1.12 | NA | 42.8 | NA |
| F5 | 3.3 | 12.0 | 5.9 | 9.1 | 78.9 | 40.45 | 0.26 | 511 | 27 | 46.5* | 0.88 | 87.2 | 43.2 | 70.5 |

Results from batch flotation tests conducted on the San Rafael Main Zone sulfide composite confirmed amenability of the ore to flotation under the optimized conditions. Lead recoveries to the lead rougher concentrates of greater than 80% were achieved at grind sizes ranging from 80%-150µm to 80%-45µm. The ore was not particularly sensitive to grind size with respect to lead recovery. The lead cleaner concentrate grade tended to decrease with decreasing feed size and ranged from 56% Pb at the 150µm feed size to 40% Pb at the 53µm feed size, indicating some benefit to a coarser primary grind. The use of a coarser primary grind may require a regrinding stage ahead of the cleaning circuit.

Silver recoveries to the same lead concentrates ranged from 35% at the 150µm feed size to 45% at the 53µm grind size. Silver grade of the lead concentrate ranged from 689 g Ag/t to 509 g Ag/t and also tended to decrease with decreasing feed size. Zinc recoveries to the zinc rougher concentrate ranged from 56% at the 150µm feed size to 71% at the 75µm and finer feed sizes. Grinding finer than 75µm in size did not significantly improve zinc recovery. Zinc cleaner concentrate grade ranged from 40% to 47% (calculated) and did not vary much with feed size.

#### 13.2.3.2 San Rafael Main Zone Sulfide Composite Locked-Cycle Test

A locked-cycle flotation test series was conducted on the San Rafael Main Zone sulfide drill core composite, at an 80%-53µm feed size, to determine the effects of flotation cleaner tailings recycling. Conditions employed were the same as optimized during earlier batch flotation testing. The 53µm grind size was selected to maximize silver recovery, and to a lesser degree zinc recovery. It should be noted that there was no apparent benefit to zinc recovery obtained by grinding finer than 75µm during earlier batch flotation testing.

The locked-cycle flotation test procedure consisted of a series of sequential batch flotation tests, where the flotation cleaner tailings (lead and zinc) from the preceding batch test were fed to the corresponding rougher flotation stage during the subsequent batch flotation test. Reclaim solution from the flotation rougher tailings was also recycled and used for grinding and lead rougher flotation during each subsequent batch flotation test.

Results from the locked-cycle flotation test showed that overall, lead and silver recoveries to the lead cleaner concentrate were slightly lower than the corresponding recoveries obtained in the rougher concentrates during batch flotation testing. The overall zinc recovery (63%) was significantly lower than that obtained during batch rougher flotation testing (71%). Zinc recovery to the zinc cleaner concentrates from the individual cycles during locked-cycle testing varied significantly, ranging from 52% to 72%. The cause for the large variations in zinc recovery from cycle to cycle is not understood at this time. Additional testing (discussed later in this section) was conducted to further optimize flotation of the San Rafael Main Zone sulfide ore type. At the time, it was expected that it should be possible to consistently obtain a zinc recovery of approximately 71% to the zinc cleaner concentrate. Follow-up batch flotation testing (discussed later in this section) showed that it was possible to significantly improve zinc flotation from this ore type. Follow-up locked-cycle testing will be required to confirm those improvements.

### 13.2.3.3 El Cajón Composite Batch Flotation Test

Multiple batch rougher/cleaner bulk sulfide flotation tests were conducted on the El Cajón drill core composite using conditions optimized during earlier testing on an El Cajón drill cuttings composite. The tests were conducted to confirm response of the drill core composite to flotation under the optimized conditions and to optimize grind size for flotation. Summary results from those tests are presented in Table 13.3.

**Table 13.3 Summary Flotation Test Result-El Cajón Composite**

| Feed | | | | | | | | Distribution - % of Total | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | | Weight Distribution % | | | Cleaner Concentrate Assays | | | Cleaner Concentrate | | | Rougher Concentrate | | |
| P80 (µm) | Test | Cl. Conc | Cl. Tail | Ro Tail | gAu/t | gAg/t | % Cu | % Au | % Ag | % Cu | % Au | % Ag | % Cu |
| 212 | F24 | 2.5 | 1.3 | 96.2 | 9 | 6830 | 22.8 | 54.3 | 86.2 | 84.0 | 57.1 | 89.2 | 89.2 |
| 150 | F25 | 2.5 | 1.8 | 95.7 | 11 | 6860 | 23.1 | 74.8 | 87.5 | 84.9 | 79.7 | 91.6 | 92.1 |
| 106 | F12 | 2.4 | 2.6 | 95.0 | 11 | 6140 | 22.1 | 82.2 | 87.5 | 87.3 | 88.5 | 93.8 | 93.7 |
| 106 | F22 | 2.7 | 3.1 | 94.2 | 14 | 6410 | 22.2 | 83.4 | 89.8 | 89.6 | 89.6 | 96.1 | 95.8 |
| 45 | F26 | 2.6 | 3.3 | 94.1 | 14 | 6880 | 23.3 | 79.4 | 88.7 | 85.8 | 86.7 | 93.0 | 93.5 |

Batch flotation test results confirmed amenability of the El Cajón drill core composite to bulk sulfide flotation treatment at the feed sizes evaluated. At 80%-106µm grind sizes and finer, values reporting to the flotation cleaner concentrate represented recoveries of greater than 82% Au, 87% Ag, and 87% Cu. The cleaner concentrate weight was equivalent to approximately 2.5% of the feed weight. Gold, silver, and copper grades for the 106µm cleaner concentrate averaged 13 g Au/t, 6,275 g Ag/t, and 22.1% Cu. Further testing (discussed later in this section) showed that it was possible to produce a cleaner concentrate that was 7,413 g Ag/t and 26% Cu.

### 13.2.3.4 120 Zone and 120 Main Overlap Zone Composite Batch Flotation Test

A single batch flotation test was conducted on each of the 120 Zone composite and 120 Zone mixed sulfide (Main/120 overlap) composite. Procedures employed were the same as optimized during earlier testing on the El Cajón and San Rafael composites. The 120 Zone composite was expected to exhibit similar mineralogy to the El Cajón composite, so the same (optimized) bulk sulfide flotation procedures were employed. The 120 Zone mixed (Main/120 overlap) sulfide composite was expected to exhibit similar mineralogy to the San Rafael composite, so the same (optimized) sequential lead/zinc flotation procedures were employed. Results from the two batch flotation tests showed that the 120 Zone composite did not respond as well to bulk sulfide flotation treatment as did the El Cajón composite. The weight pull to the cleaner concentrate (11.8%) and rougher concentrate (23.4%) was substantially higher than for the El Cajón composite. The resulting concentrate grades were substantially lower. The cleaner concentrate produced from the 120 Zone composite was 11.8% of the feed weight, assayed 1.53 g Au/t, 1,400 g Ag/t and 4.45% Cu, and represented gold, silver and copper recoveries of 70%, 81% and 86%, respectively.

Batch flotation test results showed that the 120 Zone mixed (Main/120 overlap) sulfide composite did not respond particularly well to the sequential lead/zinc flotation procedure optimized earlier for the San Rafael composite. The 120 Zone mixed (Main/120 overlap) sulfide composite contained only 0.26% Pb, probably making production of a high-grade lead concentrate difficult. A substantial portion of the contained zinc (32% of total Zn) reported to the lead concentrates, limiting the zinc recovery to the zinc concentrate.

Further flotation-optimization testing was conducted at McClelland in 2008 on the same two composites and did not lead to a significant improvement in flotation response. Additional testing is required to prove metals from 120 Zone can be recovered in a saleable concentrate. Additional testing of Main/120 overlap sulfide material containing a more representative lead content is also warranted.

### 13.2.4 2009 Metallurgical Work

McClelland completed additional flotation-optimization test work in early 2009 for the San Rafael Main Zone sulfide mineralization. The following report on results was issued by McClelland (McClelland Laboratories, Inc., 2009).

#### 13.2.4.1 San Rafael Composite Flotation

Through continued optimization testing on the San Rafael Main Zone sulfide composite, McClelland determined that increasing copper sulfate addition (to 1.0 kg/t ore) during activation before zinc rougher flotation was effective in significantly increasing zinc recovery during flotation.

Earlier testing on the San Rafael Main Zone sulfide cuttings composite had indicated the potential for generating a flotation cleaner concentrate with approximately 75% of the contained zinc. This earlier testing included optimization of the copper sulfate addition made for sphalerite activation before zinc rougher flotation. Results from those tests indicated no significant benefit to a copper sulfate addition of greater than 0.5kg/t ore.

Subsequent testing conducted on the San Rafael Main Zone sulfide drill-core composite indicated that it was not possible to achieve a zinc recovery to a flotation rougher concentrate of greater than 70% when a 0.5 kg/t ore copper sulfate addition was employed. This work did not include re-optimization of the copper sulfate addition used before zinc rougher flotation to activate sphalerite.

More recent follow-up testing focused on improving zinc recovery from the core composite during flotation showed that by increasing the copper sulfate addition used for zinc rougher flotation to 2.0 lb/ton ore, it is possible to generate a zinc cleaner concentrate with 81% of the total contained zinc, or a zinc rougher concentrate with 84% of the total contained zinc. These results indicate that, for the fresh drill-core composite, the higher copper sulfate addition was effective in significantly improving zinc recovery.

Results from two typical tests (distinguished here as test A and Test B) conducted during the optimization testing using 0.5 kg/t ore copper sulfate for activation are shown in Table 13.4 and Table 13.5.

**Table 13.4 Main Zone Sulfide Flotation Test Data, Sequential Lead/Zinc Rougher Flotation Test A San Rafael Master Composite, $P_{80}$75µm Feed**

| | Weight | Assay | | | | | | Metal Distribution, % of Total | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Product** | **%** | **%Cu** | **%Pb** | **%Zn** | **%Fe** | **g Au/t** | **g Ag/t** | **Pb** | **Zn** | **Ag** |
| Pb Cl.Conc. | 2.1 | 0.02 | 58.02 | 3.74 | 11.00 | 1 | 571 | 67.5 | 1.8 | 25.4 |
| Pb Cl.Tail #2 | 0.4 | 0.02 | 5.21 | 5.17 | 30.10 | <1 | 73 | 1.2 | 0.5 | 0.6 |
| Pb Cl.Tail #1 | 3.6 | 0.02 | 5.21 | 5.17 | 30.10 | <1 | 73 | 10.4 | 4.4 | 5.6 |
| Zn Cl. Conc. | 8.1 | 0.15 | 0.93 | 42.57 | 15.05 | <1 | 99 | 4.2 | 81.2 | 17.0 |
| Zn Cl.Tail #2 | 0.4 | 0.13 | 1.29 | 5.77 | 30.20 | <1 | 105 | 0.3 | 0.5 | 0.9 |
| Zn Cl.Tail #1 | 2.0 | 0.13 | 1.29 | 5.77 | 30.20 | <1 | 105 | 1.4 | 2.7 | 4.5 |
| Ro. Tail | 83.4 | 0.02 | 0.33 | 0.45 | 37.13 | <1 | 26 | 15.1 | 8.8 | 46.0 |
| Composite | 100.0 | 0.04 | 1.81 | 4.25 | 34.35 | <1 | 47 | 100.0 | 100.0 | 100.0 |

**Table 13.5 Main Zone Sulfide Flotation Test Data, Sequential Lead/Zinc Rougher Flotation Test B San Rafael Master Composite, $P_{80}$75µm Feed**

| | Weight | Assay | | | | | | Metal Distribution, % of Total | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Product** | **%** | **%Cu** | **%Pb** | **%Zn** | **%Fe** | **g Au/t** | **g Ag/t** | **Pb** | **Zn** | **Ag** |
| Pb Cl.Conc. | 2.1 | 0.03 | 53.64 | 4.35 | 12.10 | 6 | 732 | 67.9 | 2.1 | 29.1 |
| Pb Cl.Tail #2 | 0.2 | 0.02 | 3.21 | 5.56 | 32.20 | <1 | 91 | 0.4 | 0.3 | 0.3 |
| Pb Cl.Tail #1 | 5.4 | 0.02 | 3.21 | 5.56 | 32.20 | <1 | 91 | 10.5 | 7.0 | 9.3 |
| Zn Cl. Conc. | 9.0 | 0.13 | 0.65 | 38.50 | 16.50 | <1 | 117 | 3.5 | 81.1 | 19.9 |
| Zn Cl.Tail #2 | 0.7 | 0.11 | 1.46 | 6.47 | 30.90 | <1 | 61 | 0.6 | 1.1 | 0.8 |
| Zn Cl.Tail #1 | 2.1 | 0.11 | 1.46 | 6.47 | 30.90 | <1 | 61 | 1.8 | 3.2 | 2.4 |
| Ro. Tail | 80.5 | 0.03 | 0.31 | 0.28 | 36.43 | <1 | 25 | 15.2 | 5.3 | 38.1 |
| Composite | 100.0 | 0.04 | 1.66 | 4.27 | 33.74 | <1 | 53 | 100.0 | 100.0 | 100.0 |

These results indicate that a zinc cleaner concentrate could be produced which would be approximately 9% of the feed weight, would assay approximately 40% Zn, and would contain approximately 81% of the total zinc values. It is expected that through further cleaning of the zinc concentrate, higher concentrate grades (approaching 45% Zn) could be achieved. Locked-cycle testing (planned as of 2009) will be required to confirm this observation.

### 13.2.4.2 El Cajón Locked-Cycle Testing

Locked-cycle test results from El Cajón became available from McClelland in mid-2009, who noted that copper and silver recoveries to the rougher concentrates were as high as 96%, indicating that recoveries approaching those levels may be possible in a commercial circuit.

A follow-up locked-cycle flotation test was conducted on the El Cajón drill-core composite at an 80%-106µm feed size to determine the effects of cleaner tailings recycle on flotation response. Testing conditions were based on results from batch rougher/cleaner flotation optimization testing conducted earlier. Testing was conducted as a series of six batch rougher/cleaner flotation tests (cycles). The flotation rougher concentrate from each cycle was cleaned, and the resulting cleaner concentrate was recleaned without regrinding. The final (recleaner) flotation concentrate and rougher tailings from each cycle were dried, weighed, and assayed to determine gold, silver, and copper content. Rougher tailings samples were assayed in triplicate. The first and second flotation cleaner tailings from each cycle were added to the rougher flotation feed (after grinding) for the subsequent cycle.

Flotation was conducted at 33% solids. Hydrated lime was added during rougher flotation to maintain pH 10.0. Rougher flotation was conducted in five stages. AERO 343, equivalent to 0.005 kg/t ore, and AERO 3477 and AEROPHINE 3418A, each equivalent to 0.010 kg/t ore were added before the first stage. Respective reagent additions equivalent to 0.002, 0.004 and 0.004 kg/t ore were added before each of the subsequent four stages of rougher flotation. Total additions of AERO 343, AERO 3477 and AEROPHINE 3418A were 0.013, 0.026 and 0.026 kg/t ore, respectively. Cleaner and recleaner flotation were conducted at pH 11, using hydrated lime. No additional collectors or promoters were added during cleaner or recleaner flotation. AEROFROTH 65 was added drop-wise as required, during rougher and cleaner flotation.

Results from the locked-cycle flotation test (average of the final three cycles) showed that the flotation recleaner concentrate produced was 2.2% of the feed weight, assayed 26.30% Cu, 15.3 g Au/t, and 7,413 g Ag/t, and represented copper, gold, and silver recoveries of 96.7%, 87.3%, and 97.8%, respectively.

### 13.2.5 Mineralogy

During the 2008 metallurgical testing program at McClelland, select ore and flotation product samples were submitted to Amtel Ltd. in London, Ontario, Canada, for mineralogical characterization. Included were representative subsamples from the San Rafael Main Zone sulfide drill-core composite, the Main/120 Zone sulfide composite, and the Main/120 overlap sulfides composite. Select flotation middlings and concentrate products from the same samples were also submitted to aid in interpretation of flotation testing that was ongoing at the time. The samples submitted were subjected to general mineralogical analysis, zinc and copper deportment analysis, and in the case of concentrate products, for concentrate diluent analysis.

Zinc deportment in the San Rafael Main Zone sulfide mineralization-type composite was described as being principally sphalerite with lesser amounts of andradite. The sphalerite was described as being mostly liberated at a grind size of ~100µm. Estimated zinc recoveries by flotation at a nominal 75µm grind size were 88%-94%, with a weight pull of 5%-7%. These mineralogical observations indicate some upside potential for further optimization of zinc flotation conditions for the San Rafael Main Zone sulfide mineralization type.

Zinc deportment in the Main/120 overlap sulfides (120 Zone mixed sulfides) composite was described as also being mainly sphalerite, with a finer (~40µm) liberation size. Zinc recoveries by flotation predicted at that grind size (based on mineralogy) were 86%-95%. Flotation testing on this composite to date has not been yielding encouraging results.

Principal diluents adversely affecting zinc concentrate grades were noted as liberated iron sulfides, unliberated gangue, and liberated gangue. Lead activation (probably by contained galena) of iron sulfides was suggested as a possible cause for iron sulfide carry-over into the zinc concentrate products.

The Main/120 Zone sulfide composite was primarily a copper and silver ore sample, so the focus of analysis on that composite was copper deportment. Principal copper minerals were reported to be chalcopyrite and tetrahedrite, with trace amounts of bornite, covellite, and chalcocite noted. A copper recovery of ~86% with a mass pull of 3%-4% was predicted for this ore type. That observation suggests the potential for a substantial improvement in flotation response for this ore type. Copper flotation testing on this composite to date has shown significant challenges with respect to concentrate dilution by gangue minerals. Further testing would be required to determine if the response predicted by mineralogical analysis could be achieved.

### 13.2.6 2011-2012 Metallurgical Testing

Additional testing was conducted by McClelland on another copper- and silver-bearing 120 Zone drill core composite in 2011 and 2012 (Olson, 2013). McClelland notes significant progress in reagent optimization and improvement in the flotation response of the 120 Zone material.

A total of 48 drill-core intervals from drill holes SR-197 and SR-202 were combined to make a 120 Zone master composite for flotation testing. Average head grades were 0.190g Au/t, 186g Ag/t, 0.58% Cu, 6.75% Fe, 0.09% Pb, and 0.17% Zn. Eighteen batch flotation tests were conducted to optimize conditions and reagents for producing a copper and silver concentrate. A locked cycle flotation test series was also conducted, using the optimized conditions, to determine the effects of flotation product recycle.

McClelland drew the following conclusions (Olson, 2013):

- The 120 Zone master composite responded well to flotation treatment using two different reagent schemes.
- Dominant copper and silver minerals present were chalcopyrite ($CuFeS_2$) and miargyrite ($AgSbS_2$).
- Indicated optimum primary grind size was 80%-150µm.
- Rougher concentrate regrinding to 80%-45µm significantly improved cleaner concentrate grade.
- Locked cycle flotation testing showed that it was possible to produce a final cleaner concentrate that was 2.1% of the feed weight, assayed 21.39% Cu and 5,978g Ag/t, and represented copper and silver recoveries of 84.7% and 72.1%, respectively.

### 13.2.7 Metallurgy Summary

Metallurgical testing was conducted over a period of roughly seven years (2005 – 2012) on a total of eight drill cuttings or drill-core composites at McClelland Laboratories, Inc., in Sparks, NV. The testing conducted was focused exclusively on processing by flotation treatment. The testing can be considered as having been conducted in five main phases from 2005 to 2012:

2005 - 2007 testing on El Cajón, San Rafael oxide, and San Rafael sulfide drill-cuttings composites.

2007 – 2008 testing on El Cajón and San Rafael Main Zone sulfide mineralization drill-core composites.

2008 testing on 120 Zone and Main/120 overlap sulfide drill core mineralization drill-core composites.

2008 – 2009 testing on El Cajón and San Rafael Main Zone sulfide mineralization drill-core composites.

2011 – 2012 testing on a 120 Zone drill core composite.

Testing conducted during the first three phases established that the El Cajón mineralization type was amenable to bulk sulfide flotation treatment, at a feed size of as coarse as 80%-106µm. Upgrading of a final concentrate product was possible through reagent-optimization testing. The 2009 optimization testing included a locked-cycle flotation test series conducted on an El Cajón drill core composite, using optimized conditions. Results from that test series showed that it was possible to produce a flotation cleaner concentrate that was 2.2% of the feed weight, assayed 26.3% Cu, 15.3g Au/t, and 7,413 g Ag/t, and represented copper, gold and silver recoveries of 96.7%, 87.3%, and 97.8%, respectively. Ore-variability testing will be required to determine if this response can be expected throughout the El Cajón mineralization.

Testing conducted on the San Rafael Main Zone sulfide mineralization type has shown this ore type can be processed using a sequential flotation scheme to produce separate lead/silver and zinc concentrate products. Reagent optimization for this mineralization type has proven to be significantly more difficult than for the El Cajón mineralization type, and carry-over of gangue minerals into the concentrate products presents a significant challenge. Reagent optimization done during early testing (2005 – 2007) on a drill-cuttings composite was of some benefit during later (2007 – current) testing on a drill-core composite. Enough variation between responses of the two composites was observed to require additional optimization testing. The only locked-cycle sequential flotation test series on the San Rafael Main Zone drill-core composite was conducted in 2008, while reagent-optimization testing was still in progress. Because that test was performed before subsequent improvements in reagent schemes determined during ongoing testing, those results are of questionable value. The most recent batch sequential rougher/cleaner flotation testing (average of two tests) on the drill-core composite showed that it was possible to produce a lead cleaner concentrate that was 2.1% of the feed weight, assayed 56% lead and 571 g Ag/t and represented lead and silver recoveries of 68% and 27%, respectively. The zinc cleaner concentrate produced from the corresponding lead rougher flotation tailings was 8.6% of the (ore) feed weight, assayed 41% zinc and 108 g Ag/t, and represented zinc and silver recoveries of 81% and 20%, respectively. Further reagent-optimization testing is required for this ore type. Once reagent optimization is complete, locked-cycle flotation testing will be required to determine the effects of middlings product recycle. Finally, once a satisfactory processing/reagent scheme is developed, ore variability testing will be required for the San Rafael Main Zone sulfide mineralization type.

Testing on the 120 Zone and 120 Main Overlap Zone mineralization types was less successful than the work summarized above for the El Cajón and San Rafael Main Zone sulfide mineralization types. Early attempts at applying the flotation processing schemes optimized for the El Cajón and San Rafael mineralization types to the 120 Zone and Main/120 Overlap Zone mineralization types were not particularly successful. Significant progress was made in reagent optimization and improvement in the flotation response of the 120 Zone material during 2011-2012 testing of a 120 Zone composite. Locked cycle flotation testing showed that it was possible to produce a final cleaner concentrate that was 2.1% of the feed weight, assayed 21.39% Cu and 5,978g Ag/t, and represented copper and silver recoveries of 84.7% and 72.1%, respectively.

# 14.0 MINERAL RESOURCE ESTIMATES

Section 14.2 describes MDA's 2012 mineral resource estimate for the Nuestra Señora deposit. As described in Section 10.1, since completion of this estimate (Ristorcelli *et al*., 2012) and to the end of January 2013, additional holes have been drilled at Nuestra Señora. MDA reviewed 66 of these holes and concludes that this drilling did extend narrow, high-grade silver zones and substantially supported the 2012 resource estimate, the drilling did not expand the resource in any material way. For this reason, the Nuestra Señora resource estimate described in Section 14.2 is still current.

Sections 14.3 and 14.4 describe the current resource estimates for the San Rafael and El Cajón deposits, respectively, which are updated from those originally reported by Ristorcelli *et al.* (2009).

## 14.1 Resource Classification

MDA classifies mineral resources in order of increasing geological and quantitative confidence into Inferred, Indicated, and Measured categories defined by the "CIM Definition Standards - For Mineral Resources and Mineral Reserves" (2010) so as to be in compliance with Canadian National Instrument 43-101. CIM mineral resource definitions are given below, with CIM's explanatory material shown in italics:

### Mineral Resource

> *Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories. An Inferred Mineral Resource has a lower level of confidence than that applied to an Indicated Mineral Resource. An Indicated Mineral Resource has a higher level of confidence than an Inferred Mineral Resource but has a lower level of confidence than a Measured Mineral Resource.*
>
> A Mineral Resource is a concentration or occurrence of diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.
>
> *The term Mineral Resource covers mineralization and natural material of intrinsic economic interest which has been identified and estimated through exploration and sampling and within which Mineral Reserves may subsequently be defined by the consideration and application of technical, economic, legal, environmental, socio-economic and governmental factors. The phrase 'reasonable prospects for economic extraction' implies a judgement by the Qualified Person in respect of the technical and economic factors likely to influence the prospect of economic extraction. A Mineral Resource is an inventory of mineralization that under realistically assumed and justifiable technical and economic conditions might become economically extractable. These assumptions must be presented explicitly in both public and technical reports.*

### 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 that may be attached 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, and 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.*

## 14.2 Nuestra Señora Resource Estimate

### 14.2.1 Resource Model Database

After auditing, the database had around 48,000 analyses, with slightly varying numbers for the individual metals. After 3,983 samples were eliminated from the estimate because of uncertain sample locations, the total number of analyses was reduced to around 44,000, varying by the metal. Table 14.1describes the statistics of the Nuestra Señora database. These samples are in 1,509 drill holes.

**Table 14.1 Descriptive Statistics of the Resource Model Database**

| | | | | Total Database | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Ag | 48,175 | 7.00 | 46.10 | 188.03 | 4.08 | 0.00 | 13670.50 | g/t |
| Au | 46,150 | 0.03 | 0.09 | 0.74 | 8.44 | 0.00 | 124.00 | g/t |
| Cu | 48,149 | 0.01 | 0.13 | 0.53 | 3.97 | 0.00 | 15.05 | % |
| Pb | 48,164 | 0.05 | 0.48 | 1.45 | 3.00 | 0.00 | 30.00 | % |
| Zn | 48,166 | 0.09 | 0.87 | 2.56 | 2.93 | 0.00 | 46.42 | % |
| Density | 35,783 | 2.93 | 2.93 | 0.36 | 0.12 | 1.52 | 7.97 | $g/cm^3$ |
| **USE** | **1** | | | **Samples used in estimate** | | | | |
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Ag | 44,192 | 6.00 | 45.51 | 191.89 | 4.22 | 0.00 | 13670.50 | g/t |
| Au | 42,167 | 0.03 | 0.09 | 0.78 | 8.56 | 0.00 | 124.00 | g/t |
| Cu | 44,166 | 0.01 | 0.13 | 0.52 | 4.06 | 0.00 | 15.05 | % |
| Pb | 44,181 | 0.05 | 0.50 | 1.48 | 2.99 | 0.00 | 30.00 | % |
| Zn | 44,183 | 0.09 | 0.87 | 2.55 | 2.93 | 0.00 | 46.42 | % |
| Density | 35,631 | 2.93 | 2.93 | 0.36 | 0.12 | 1.52 | 7.97 | $g/cm^3$ |

### 14.2.2 Geologic Background and Implications to Modeling

Nuestra Señora is a skarn deposit controlled by bedding and pre- and post-mineralization structures. The mineralization occurs as disseminations, which are usually low grade; replacements, which are usually high grade; and massive sulfides, which are the very high grades.

While working on the sections, it was clear that continuity along strike was poor to non-existent between the sections spaced at 20m apart. While larger bodies of mineralization can be projected between sections in a broad sense, individual pods or bodies of mineralization can appear, disappear, or change completely in geometry within that 20m span. The deposit is extraordinarily complex, and any presumption of continuity beyond 20m should be considered the exception rather than the rule. In particular, those spectacular grades to which Scorpio has become accustomed and which have proven so economically important, generally occur in small and highly irregular pods. They are real and substantially affect the economics of the deposit, but they are highly irregular and unpredictable. Scorpio believes that these pods seem to be more densely distributed in the vertical zone associated with levels 8, 9, and 10 in the Main Zone and seem to become less densely distributed deeper in the system and away from the Main Zone structure.

There are several deposits at Nuestra Señora separated by faults mapped by Scorpio. The Main and Hoag zones are the most important and account for nearly all of the exploited mineralization. The Hoag Zone appears to be a piece of Main Zone mineralization within a shear zone and is bounded by relatively major faults, including the Hoag fault. Candelaria is a smaller body, which is interpreted to be a carbonate-replacement deposit rather than a true skarn, and which is located closer to the surface north of the main mine. Santa Teresa, in the footwall of the Hoag fault, also hosts a small amount of mineralization. These areas were modeled separately, but the orientation and composition of mineralization within each zone are nearly identical. Therefore, the resource for each area is not reported separately.

### 14.2.3 Underground Workings Model

MDA received solids from Scorpio that represent existing underground workings up to June 6, 2012. MDA used these to code voids into the block model. Due to the complexity of the underground workings, and the solids that represent them, coding was adequate but not perfect. Particularly, coding errors occurred where the borders of solids overlap or where intersecting solids indicate material is present in void spaces. While the coding is not precise, it is reasonable and accurate, and therefore sufficient for this study.

### 14.2.4 Geologic Model

As part of the geologic and metal-domain modeling process for Nuestra Señora, MDA worked on site with Scorpio personnel and has relied heavily on their sectional geological interpretations. These provided extraordinarily good insight into the deposit and formed the basis of this estimate.

MDA received Scorpio's cross-sectional geologic interpretations digitally. These cross sections were loaded in MineSight, checked for reasonableness, corrected to the extent practical for mechanical errors, and sliced to plan. MDA then reinterpreted the lithologic model on 3m plans that coincide with mid-benches of the block model.

The lithologies modeled by Scorpio were simplified and grouped into five broad categories: exoskarn, endoskarn, limestone, intrusive, and breccia. Exoskarn and endoskarn are by far the most important rock types that contain the mineralization. Limestone and intrusive contain little mineralization, and together, host a very small part of the total resource. The breccia bodies are irregular and volumetrically not important.

Table 14.2 presents a list of mineral domains and materials defined for the Nuestra Señora model. While all metals are globally spatially related, they are not necessarily locally spatially related, thereby requiring separate domains for each metal. The four mineral domains were constructed by Scorpio with continual review by MDA, but the final edits and changes were made by MDA. These MDA changes were small, and the zones remained substantially the same as those originally made by Scorpio.

**Table 14.2 Coding and Description of the Nuestra Señora Geologic Model**

| Domain Code | Description |
|---|---|
| **11, 21, 31, and 41** | Primarily low-grade for silver, zinc, lead, and copper, respectively; content of fine-grained sulfides is low; each element modeled independently. Disseminated low-grade domain. |
| **12, 22, 32, and 42** | Mid- to high-grade silver, zinc, lead, and copper, respectively; each unique; content of coarse-grained sulfides is high. Characterized by moderate to strong skarn alteration. Sulfide minerals commonly occur as localized massive clots and with massive calcite in filled voids. Coarse-sulfide mid- to high-grade domain. |
| **99** | Unmineralized or discontinuously mineralized country rock outside of the above mineral domains |

### 14.2.5 Procedures

Upon completion of the database validation process, MDA constructed evenly spaced cross sections in local mine coordinate space on 20m intervals looking northwest at 333°. Since the local model in which Scorpio is operating is rotated from UTM coordinates by 38.19$^{o}$ to the east, the grid relative to true north is looking to 294.81$^{o}$. One set of sections was generated and plotted on vellum for silver and zinc domain modeling. Topography, existing underground workings, drill data with the respective metal color-coded to represent mineral domain grades, and Scorpio's geologic interpretations were plotted on these sections. Two of the four mineral domains, silver and zinc, were modeled on cross sections by MDA while on-site at the Cosalá company offices. Scorpio geologists continually reviewed and commented on the modeling, and by the time of MDA's departure, MDA and Scorpio agreed that the model fairly represented the deposit.

The interpretations of silver and zinc domains drawn on paper sections were digitized in Reno, loaded into MineSight, modified for grade-control samples, and verified and edited on-screen with respect to the final, post-audit drill-hole database loaded after the modeling. Lead and copper sectional domains, as well as final edits and changes to all domains, were then completed by MDA. Changes by MDA were small, and the zones remained substantially the same as those originally reviewed by Scorpio.

Two distinct populations of each of the four modeled metals were determined from quantile plots and supported by knowledge of the geology at Nuestra Señora. Each population is associated with a unique geologic setting and mineralization style as described in Section 14.2.2. The mineral domains as modeled and drawn on cross sections are not strict contours of metal grades. Rather, they are created using geologic information to define orientation, geometry, continuity, and contacts in conjunction with the grades.

All four metals generally occur together, but locally, one or more may be absent. Therefore, modeling all four metals together would not correctly represent the deposit. Consequently, four different models of the metal domains and one model of the guiding lithology were constructed and later combined into one block model for economic and engineering studies. A schematic cross section showing the Nuestra Señora geology and mineralized zones is given in Figure 14.1. The quantile plots of zinc, lead, and copper in percent and silver in grams per tonne that were made to help define the natural populations of metal grades to be modeled on cross sections are shown in Figure 14.2. The vertical lines on the plots help to display the relationships between the four metals. The grade boundaries used for mineral domain modeling are given in Table 14.3.

**Figure 14.1 Nuestra Señora Schematic Geologic Cross-Section with Mineralized Zones**

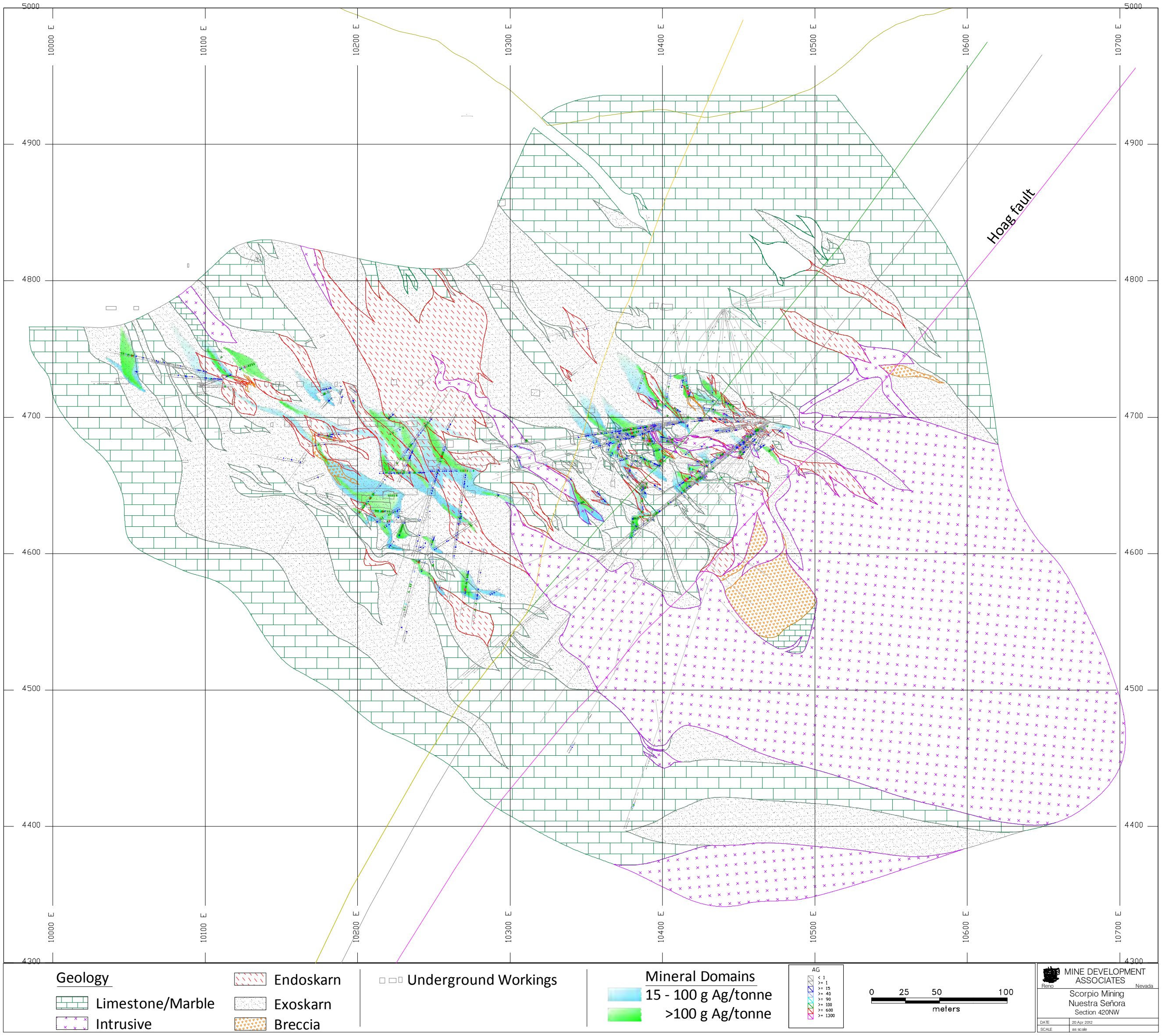


**Figure 14.2 Quantile-Quantile Plot with Distributions of Silver, Zinc, Lead, and Copper Grades for Nuestra Señora**

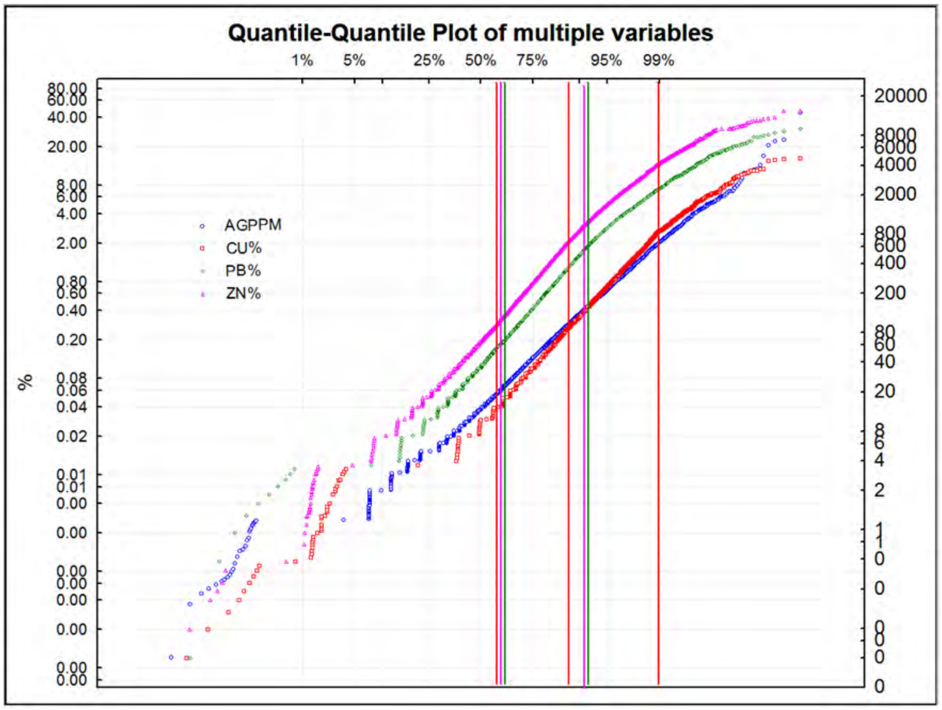



**Table 14.3 Summary of Metal Domain Ranges at Nuestra Señora**
(February 20, 2012 data)

| Metal | Low Grade | High Grade |
|---|---|---|
| Silver (ppm) | ~15 to ~100 | >~100 |
| Copper (%) | ~0.04 to ~0.25-0.50 | >~0.25-0.50 |
| Zinc (%) | ~0.3 to ~3.0 | >~3.0 |
| Lead (%) | ~0.2 to ~2.0 | >~2.0 |

Sectional interpretations for metal domains were modeled on mid-bench plans, using geology as a guide. Silver was modeled first, followed by zinc, lead, and copper, in order of decreasing abundance and importance. As each successive metal was modeled on plan, plan interpretations for previous metals were modified where appropriate. Ultimately, all four metals were modified together to provide a completed, unified metal domain model.

### 14.2.6 Composites and Variography

The sectional mineral-domain polygons were used to code drill holes. Quantile plots along with global zone statistics were made to assess the validity of these domains and to determine capping levels. Descriptive statistics of capped and uncapped sample grades by domain are given in Appendix B.

Compositing was done to 3m down-hole lengths, honoring mineral domain boundaries. The 3m by 3m by 3m blocks inside each mineral domain were estimated using only composites from inside its respective domain. Composite descriptive statistics are presented in Table 14.4.

Correlograms were made in numerous orientations and at lag lengths of 5m. Very good structures were modeled for each metal. In all cases, the nugget values were high ranging from 70% to 80% of the sill. All correlograms are nested with the majority of the sill between 15m and 40m. Anisotropy ranges from 30 to 60m, but generally the correlograms show minimal anisotropy of less than 1.5:1 with the dip and strike directions being the longer. Global correlograms for silver, zinc, lead, and copper are given in Figure 14.3 through Figure 14.6, respectively.

**Table 14.4 Nuestra Señora Mineral Domain Composite Descriptive Statistics**

| **Silver Domain** | **multiple** | | | | | | |
|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 24,070 | 0.00 | 2.34 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Ag | 24,070 | 7.09 | 39.57 | 135.52 | 3.42 | 0.00 | 7290.00 | g/t |
| AgC | 24,070 | 7.09 | 38.85 | 125.64 | 3.23 | 0.00 | 5000.00 | g/t |

| **Silver Domain** | **11** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 5,575 | 3.00 | 2.31 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Ag | 5,575 | 30.70 | 41.82 | 48.49 | 1.16 | 0.00 | 882.00 | g/t |
| AgC | 5,575 | 30.70 | 41.64 | 46.65 | 1.12 | 0.00 | 882.00 | g/t |

| **Silver Domain** | **12** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 2,258 | 2.70 | 2.18 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Ag | 2,258 | 152.67 | 252.90 | 359.60 | 1.42 | 0.50 | 7290.00 | g/t |
| AgC | 2,258 | 152.67 | 250.29 | 328.69 | 1.31 | 0.50 | 5000.00 | g/t |

| **Silver Domain** | **99** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 16,237 | 3.00 | 2.37 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Ag | 16,237 | 3.43 | 9.14 | 34.41 | 3.77 | 0.00 | 1356.60 | g/t |
| AgC | 16,237 | 3.43 | 8.49 | 22.21 | 2.62 | 0.00 | 500.00 | g/t |

| **Zinc Domain** | **multiple** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 24,077 | 0.00 | 2.34 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Zn | 24,077 | 0.10 | 0.77 | 2.15 | 2.79 | 0.00 | 38.52 | % |
| ZnC | 24,077 | 0.10 | 0.76 | 2.09 | 2.75 | 0.00 | 30.00 | % |

| **Zinc Domain** | **21** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 4,939 | 3.00 | 2.26 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Zn | 4,939 | 0.72 | 0.99 | 1.06 | 1.08 | 0.00 | 24.48 | % |
| ZnC | 4,939 | 0.72 | 0.98 | 0.99 | 1.02 | 0.00 | 15.00 | % |

| **Zinc Domain** | **22** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 1,816 | 2.30 | 2.07 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Zn | 1,816 | 4.47 | 6.03 | 4.83 | 0.80 | 0.01 | 38.52 | % |
| ZnC | 1,816 | 4.47 | 6.01 | 4.73 | 0.79 | 0.01 | 30.00 | % |

**Table 14.4 Nuestra Señora Mineral Domain Composite Descriptive Statistics** (continued)

**Zinc Domain** **99**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 17,322 | 3.00 | 2.39 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Zn | 17,322 | 0.05 | 0.16 | 0.63 | 3.93 | 0.00 | 30.00 | % |
| ZnC | 17,322 | 0.05 | 0.14 | 0.37 | 2.59 | 0.00 | 6.00 | % |

**Lead Domain** **multiple**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 24,027 | 0.00 | 2.34 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Pb | 24,027 | 0.06 | 0.45 | 1.27 | 2.83 | 0.00 | 25.00 | % |
| PbC | 4,027 | 0.06 | 0.44 | 1.24 | 2.80 | 0.00 | 20.00 | % |

**Lead Domain** **31**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 5,212 | 3.00 | 2.30 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Pb | 5,212 | 0.45 | 0.62 | 0.62 | 1.01 | 0.00 | 13.10 | % |
| PbC | 5,212 | 0.45 | 0.61 | 0.59 | 0.96 | 0.00 | 9.00 | % |

**Lead Domain** **32**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 1,475 | 2.00 | 1.94 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Pb | 1,475 | 3.32 | 4.14 | 2.94 | 0.71 | 0.00 | 25.00 | % |
| PbC | 1,475 | 3.32 | 4.12 | 2.86 | 0.69 | 0.00 | 20.00 | % |

**Lead Domain** **99**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 17,340 | 3.00 | 2.39 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Pb | 17,340 | 0.03 | 0.09 | 0.29 | 3.43 | 0.00 | 15.80 | % |
| PbC | 17,340 | 0.03 | 0.08 | 0.21 | 2.66 | 0.00 | 4.00 | % |

**Copper Domain** **multiple**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 23,890 | 0.00 | 2.35 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Cu | 23,890 | 0.01 | 0.12 | 0.42 | 3.62 | 0.00 | 12.93 | % |
| CuC | 23,890 | 0.01 | 0.11 | 0.39 | 3.49 | 0.00 | 9.00 | % |

**Copper Domain** **41**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 4,006 | 2.70 | 2.18 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Cu | 4,006 | 0.10 | 0.14 | 0.23 | 1.57 | 0.00 | 8.59 | % |
| CuC | 4,006 | 0.10 | 0.14 | 0.18 | 1.26 | 0.00 | 3.00 | % |

**Copper Domain** **42**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 1,807 | 2.30 | 2.07 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Cu | 1,807 | 0.58 | 0.97 | 1.14 | 1.17 | 0.00 | 12.93 | % |
| CuC | 1,807 | 0.58 | 0.96 | 1.07 | 1.11 | 0.00 | 9.00 | % |

**Copper Domain** **99**

| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
|---|---|---|---|---|---|---|---|---|
| Length | 18,077 | 3.00 | 2.42 | 0.00 | 0.00 | 0.10 | 3.00 | m |
| Cu | 18,077 | 0.01 | 0.02 | 0.11 | 4.33 | 0.00 | 4.12 | % |
| CuC | 18,077 | 0.01 | 0.02 | 0.07 | 3.19 | 0.00 | 1.50 | % |

**Figure 14.3 Global Correlogram for Silver**

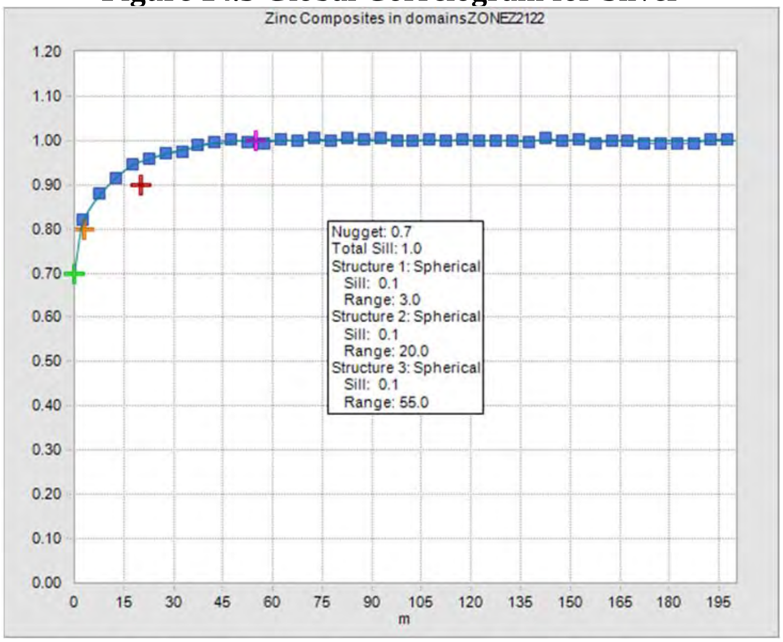



**Figure 14.4 Global Correlogram for Zinc**

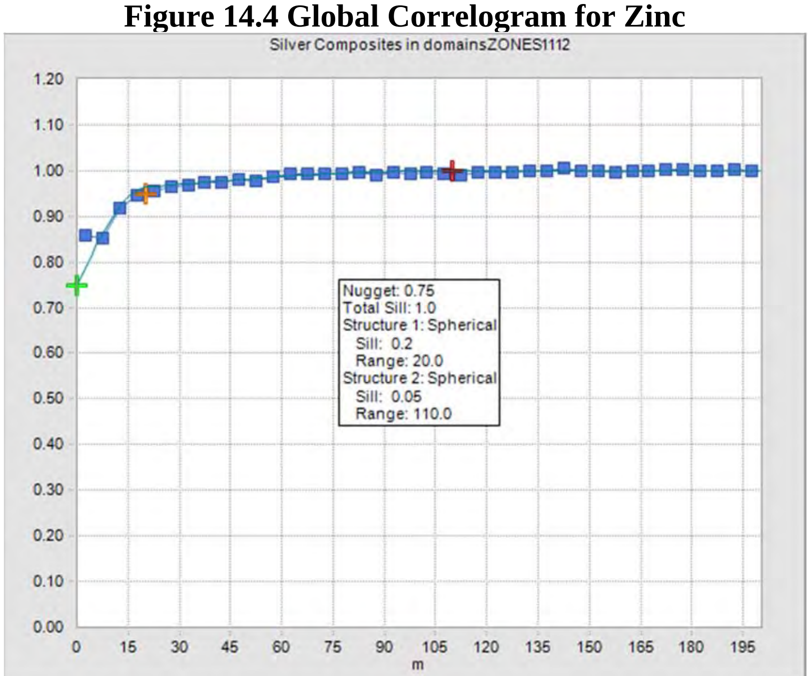


**Figure 14.5 Global Correlogram for Lead**

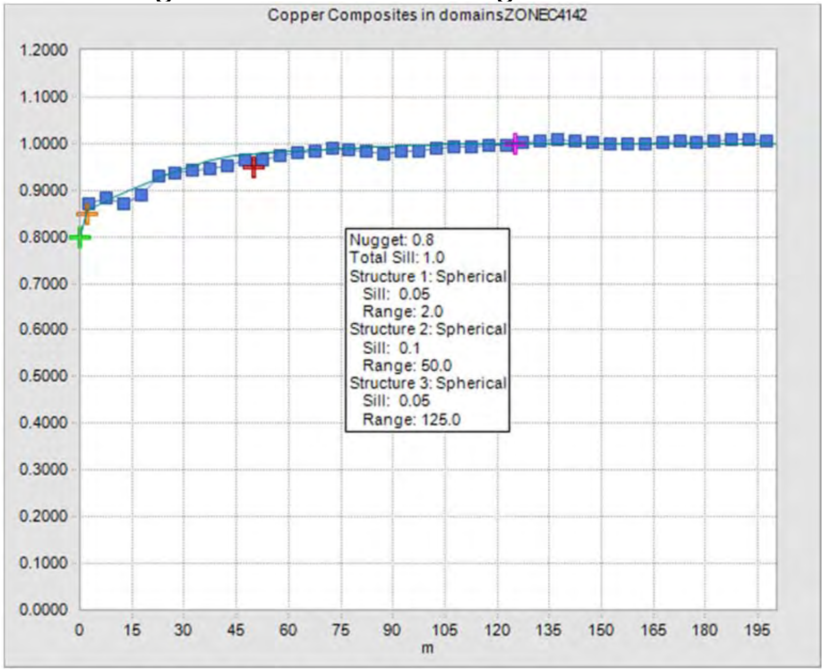
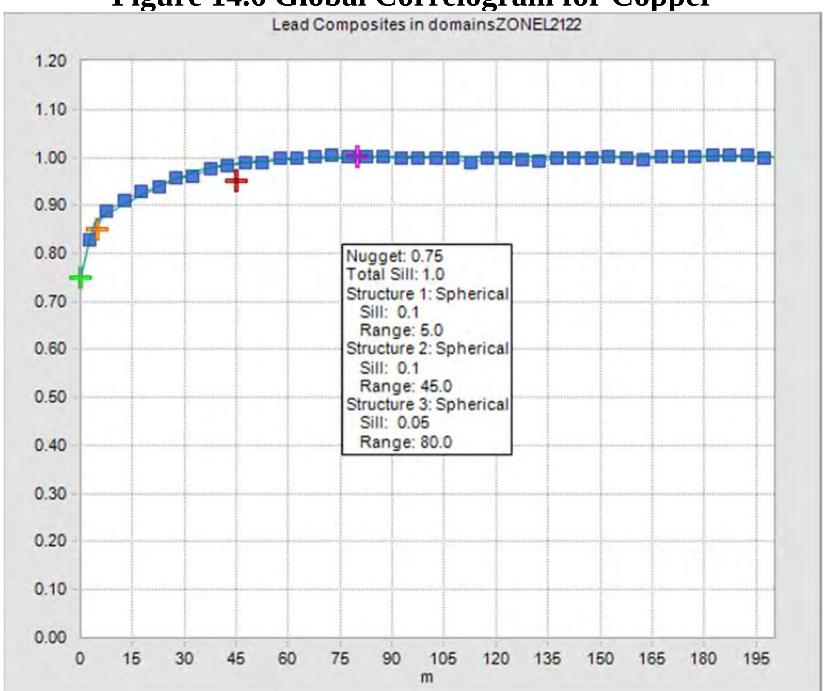



**Figure 14.6 Global Correlogram for Copper**




### 14.2.7 Density

There were 35,627 density measurements used in this analysis. These were evaluated by rock type, grade, and mineral domain. There are minor differences in density of the rock types. Densities are higher in the disseminated low-grade domain and increase in the coarse-sulfide high-grade domains.

There is a strong and positive relationship between density and grade, which is reflected in the differences by domain. Further, there are some spectacular densities equaling the specific gravity of galena (7.6g/cm$^3$). These were not removed from the database, because they are likely real and are used for the determination of mean density to assign to the block model inside mineral domains. The core sample size was not large (93% of the density samples were 300g or less), and it is conceivable that massive sulfides or even individual crystals may have been measured. All samples with density values over 8g/cm$^3$ and below 1.5g/cm$^3$ (total of 52 records) were eliminated from the final dataset before loading into MineSight because they were thought to be unrealistic. Samples over 4.5g/cm$^3$ comprise only 0.2% of the database and likely represent localized clots and pods of massive sulfides. These values were considered in calculating the averages. The final values used in the block model are given in Table 14.5.

**Table 14.5 List of Density Values Used in Model**

| Rock Name or Domain | Mean g/cm$^3$ |
|---|---|
| Limestone | 2.87 |
| Intrusive | 2.76 |
| Endoskarn | 2.90 |
| Exoskarn | 2.92 |
| Breccia | 2.68 |
| Disseminated domain* | 2.98 |
| Coarse sulfide domain* | 3.09 |

* Excluding silver domains

### 14.2.8 Mineral Resources

The Nuestra Señora resource estimates have been prepared in compliance with the disclosure and reporting requirements set forth in the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), Companion Policy 43-101CP, and Form 43-101F1, as well as with the Canadian Institute of Mining, Metallurgy and Petroleum's "CIM Definition Standards - For Mineral Resources and Reserves, Definitions and Guidelines" ("CIM Standards") adopted by the CIM Council on November 27, 2010.

The Nuestra Señora resource block model has blocks of 3m by 3m by 3m in size. Estimates were made using inverse distance, kriging, and nearest neighbor. The inverse distance estimate is reported, but the other two methods are used for comparison and validation. Estimation parameters are given in Appendix C.

MDA classified the Nuestra Señora resources by a combination of distance to the nearest sample, number of samples, and number of holes used to estimate a particular block. At the same time, reliability of underlying data, and understanding and use of the geology are taken into account. The criteria for resource classification are given in Table 14.6. MDA also considered each metal individually, then combined them into an overall model classification. In all cases, a block has to be in at least one mineral domain to be considered Measured, Indicated, or Inferred. There is significant mineralization outside the defined domains. However, because this mineralization does not have demonstrable continuity and cannot be modeled as a domain, it does not meet the requirement for defining resources for underground mining scenarios. A presently indeterminable amount of this mineralization will be mined after infill drilling is completed.

The overall classification of the Nuestra Señora resource is based on a number of factors. The largest impact on the classification is the continuity of the mineralization. But also the survey data audit and QA/QC evaluation revealed some issues that detract from the confidence in the database. This was partially mitigated by removing those drill holes that "appeared" illogical and had conflicting supporting information. But there were also numerous holes for which supporting documentation could not be found. In addition, although the number of standard, blank, and other QA/QC failures, in MDA's experience, is typical for most QA/QC programs, there is a general lack of investigation of these failures that render the assays locally suspect. MDA has also noted that the AQ-size core may not accurately reflect local mineral grades due to the combination of high variability inherent in this small sample size and the high local variability of mineralization apparent throughout much of the deposit. On the other hand, Scorpio has greatly enhanced the level of geologic understanding and geologic information that counters some of the lost confidence just discussed. In the end, the relatively low amount of Measured and Indicated resources compared to the total resource reflects the overall confidence levels.

**Table 14.6 Criteria for Nuestra Señora Resource Classification**

| Main Zone | |
|---|---|
| **Measured** | |
| Minimum no. of holes with samples | 3 |
| Maximum average distance (m) | 10m |
| **Indicated** | |
| Minimum no. of holes with samples | 3 |
| Maximum average distance (m) | 20m |
| Maximum closest distance (m) | 10m |
| **All material not classified above but lying within the modeled mineral domains is Inferred** | |

The discontinuity of the mineralization at Nuestra Señora is a very important consideration. Not only does this discontinuity require stricter criteria for resource classification, it also has presented opportunities during mining. Mining, as evidenced by the ore-control drilling, has exploited additional mineralization that was not encountered in the exploration drilling. This may primarily reflect the poddy nature of the deposit but could also be related to uncertainty in some exploration sample locations. Economic mineralization can, and has been found by exploring with more closely spaced ore-control drilling in areas not sufficiently tested by wider-spaced exploration drilling.

Because of the requirement that the resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction," MDA is reporting the resources at approximate economic cutoff grades based on existing operating costs. As such, some economic considerations were used to determine cutoff grades at which the resource is presented. MDA considered reasonable metal prices, extraction costs, and recoveries, albeit in a general sense, with slight reductions of these parameters to account for material that would become economic using internal cutoffs. Because multiple metals exist, but do not on a local scale necessarily co-exist, the AgEq grade is used for tabulation; silver is the most important contributor to economic value of the resource. The total Nuestra Señora resources are tabulated in Table 14.7. The stated resource is fully diluted to 3m by 3m by 3m blocks and is tabulated on a silver-equivalent ("AgEq") cutoff grade of 60g AgEq/t. All material, regardless of the presence or absence of individual metals, is tabulated. The equation for calculating AgEq is given below:

$$\text{g AgEq/t} = \text{g Ag/t} + (\%\text{Zn}*24.2857) + (\%\text{Pb}*24.2857) + (\text{Cu}*77.1429)$$

The ratio of the metals is the most important part of this equivalency equation, and it was derived from prices for silver, zinc, lead, and copper of $24/oz Ag, $0.85/lb Zn, $0.85/lb Pb, and $2.70/lb Cu. While some gold is recovered at Nuestra Señora, it is a small part of the total value of the mineralization and was neither modeled, estimated, nor considered in the equivalency calculation.

A typical cross section showing silver equivalent block grades of the block model is given in Figure 14.7.

**Table 14.7 Nuestra Señora Total Resource AgEq Tabulation**

| Cutoff | | | | | Measured | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| g AgEq/t | Tonnes | g AgEq/t | g Ag/t | %Zn | %Pb | %Cu | oz Ag | lbs Zn (x1000) | lbs Pb (x1000) | lbs Cu (x1000) |
| 30.0 | 481,000 | 140.53 | 70.81 | 1.53 | 0.76 | 0.18 | 1,095,000 | 16,224 | 8,059 | 1,909 |
| 40.0 | 423,000 | 155.13 | 78.19 | 1.69 | 0.84 | 0.20 | 1,063,000 | 15,760 | 7,833 | 1,865 |
| 50.0 | 373,000 | 169.88 | 85.58 | 1.85 | 0.91 | 0.22 | 1,026,000 | 15,213 | 7,483 | 1,809 |
| **60.0** | **332,000** | **184.12** | **92.76** | **2.01** | **0.98** | **0.24** | **990,000** | **14,712** | **7,173** | **1,757** |
| 70.0 | 292,000 | 200.11 | 100.99 | 2.18 | 1.06 | 0.27 | 948,000 | 14,034 | 6,824 | 1,738 |
| 80.0 | 262,000 | 214.45 | 108.37 | 2.33 | 1.12 | 0.29 | 913,000 | 13,458 | 6,469 | 1,675 |
| 90.0 | 236,000 | 228.61 | 115.62 | 2.48 | 1.19 | 0.31 | 877,000 | 12,903 | 6,191 | 1,613 |
| 100.0 | 214,000 | 242.80 | 123.09 | 2.63 | 1.24 | 0.33 | 847,000 | 12,408 | 5,850 | 1,557 |
| 120.0 | 178,000 | 269.80 | 136.89 | 2.90 | 1.37 | 0.38 | 783,000 | 11,380 | 5,376 | 1,491 |
| 140.0 | 150,000 | 295.97 | 150.63 | 3.15 | 1.49 | 0.42 | 726,000 | 10,417 | 4,927 | 1,389 |
| 150.0 | 138,000 | 308.60 | 157.26 | 3.26 | 1.55 | 0.45 | 698,000 | 9,918 | 4,716 | 1,369 |

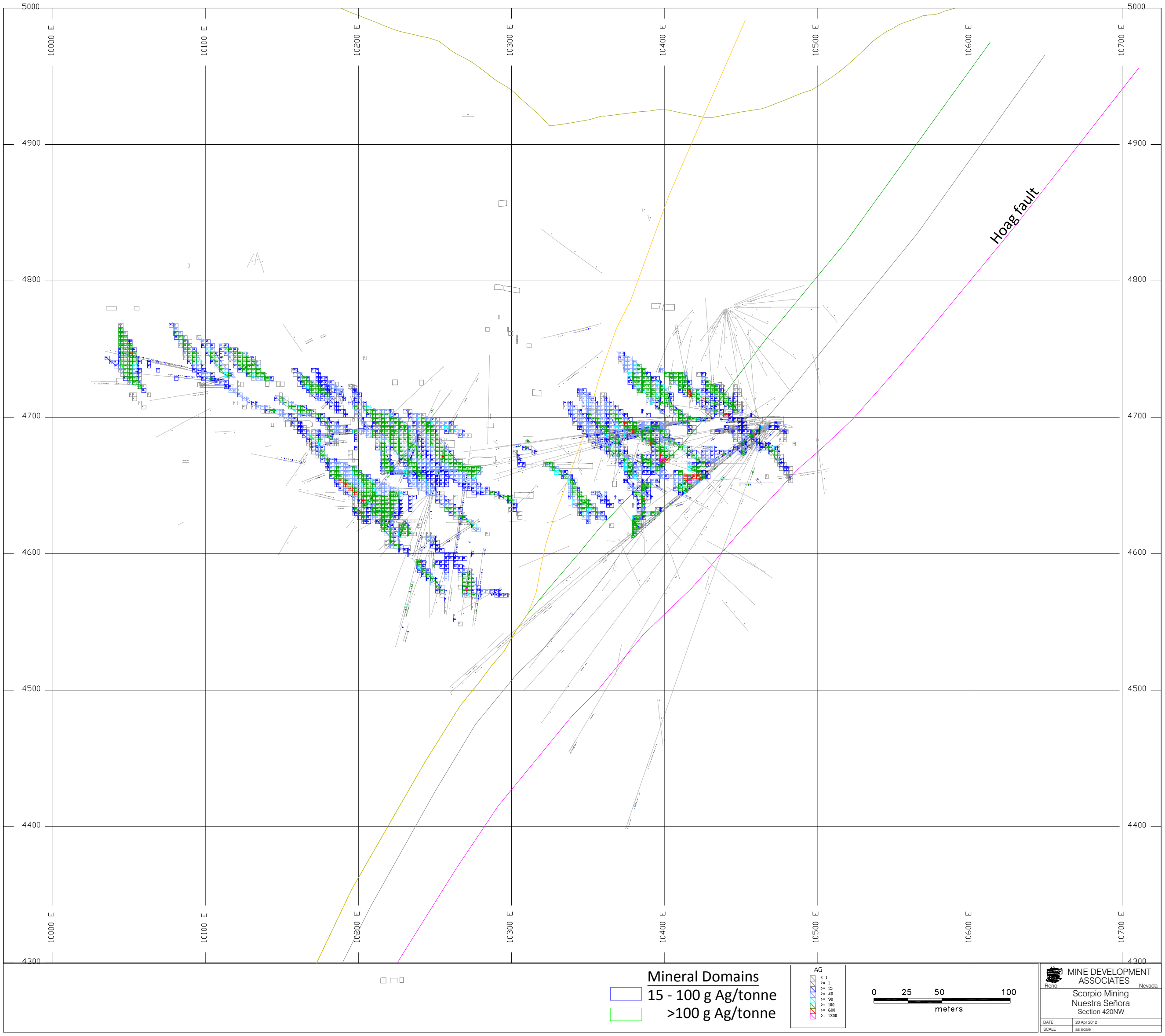
| Cutoff | | | | | Indicated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| g AgEq/t | Tonnes | g AgEq/t | g Ag/t | %Zn | %Pb | %Cu | oz Ag | lbs Zn (x1000) | lbs Pb (x1000) | lbs Cu (x1000) |
| 30.0 | 3,227,000 | 130.96 | 69.80 | 1.24 | 0.66 | 0.19 | 7,242,000 | 88,218 | 46,955 | 13,517 |
| 40.0 | 2,771,000 | 146.79 | 78.26 | 1.39 | 0.74 | 0.22 | 6,972,000 | 84,915 | 45,207 | 13,440 |
| 50.0 | 2,398,000 | 162.62 | 86.71 | 1.54 | 0.82 | 0.24 | 6,685,000 | 81,415 | 43,351 | 12,688 |
| **60.0** | **2,088,000** | **178.62** | **95.26** | **1.70** | **0.89** | **0.27** | **6,395,000** | **78,255** | **40,969** | **12,429** |
| 70.0 | 1,840,000 | 194.00 | 103.48 | 1.84 | 0.97 | 0.29 | 6,122,000 | 74,640 | 39,348 | 11,764 |
| 80.0 | 1,627,000 | 209.58 | 111.88 | 1.99 | 1.04 | 0.31 | 5,852,000 | 71,380 | 37,304 | 11,119 |
| 90.0 | 1,446,000 | 225.17 | 120.41 | 2.14 | 1.11 | 0.34 | 5,598,000 | 68,221 | 35,386 | 10,839 |
| 100.0 | 1,289,000 | 241.00 | 128.98 | 2.28 | 1.18 | 0.36 | 5,345,000 | 64,792 | 33,533 | 10,230 |
| 120.0 | 1,046,000 | 271.64 | 145.77 | 2.57 | 1.31 | 0.41 | 4,902,000 | 59,265 | 30,209 | 9,455 |
| 140.0 | 870,000 | 300.39 | 161.61 | 2.83 | 1.44 | 0.46 | 4,520,000 | 54,280 | 27,620 | 8,823 |
| 150.0 | 796,000 | 314.77 | 169.63 | 2.96 | 1.50 | 0.48 | 4,341,000 | 51,944 | 26,323 | 8,423 |

## Table 14.7 Nuestra Señora Total Resource AgEq Tabulation (continued)

| Cutoff | | | | | Measured and Indicated | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| g AgEq/t | Tonnes | g AgEq/t | g Ag/t | %Zn | %Pb | %Cu | oz Ag | lbs Zn (x1000) | lbs Pb (x1000) | lbs Cu (x1000) |
| 30.0 | 3,708,000 | 132.20 | 69.93 | 1.28 | 0.67 | 0.19 | 8,337,000 | 104,442 | 55,014 | 15,426 |
| 40.0 | 3,194,000 | 147.89 | 78.25 | 1.43 | 0.75 | 0.22 | 8,035,000 | 100,675 | 53,040 | 15,305 |
| 50.0 | 2,771,000 | 163.60 | 86.55 | 1.58 | 0.83 | 0.24 | 7,711,000 | 96,628 | 50,834 | 14,497 |
| **60.0** | **2,420,000** | **179.37** | **94.92** | **1.74** | **0.90** | **0.27** | **7,385,000** | **92,967** | **48,142** | **14,186** |
| 70.0 | 2,132,000 | 194.84 | 103.14 | 1.89 | 0.98 | 0.29 | 7,070,000 | 88,674 | 46,172 | 13,502 |
| 80.0 | 1,889,000 | 210.26 | 111.39 | 2.04 | 1.05 | 0.31 | 6,765,000 | 84,838 | 43,773 | 12,794 |
| 90.0 | 1,682,000 | 225.65 | 119.74 | 2.19 | 1.12 | 0.34 | 6,475,000 | 81,124 | 41,577 | 12,452 |
| 100.0 | 1,503,000 | 241.26 | 128.14 | 2.33 | 1.19 | 0.36 | 6,192,000 | 77,200 | 39,383 | 11,787 |
| 120.0 | 1,224,000 | 271.37 | 144.46 | 2.62 | 1.32 | 0.41 | 5,685,000 | 70,645 | 35,585 | 10,946 |
| 140.0 | 1,020,000 | 299.74 | 159.97 | 2.88 | 1.45 | 0.45 | 5,246,000 | 64,697 | 32,547 | 10,212 |
| 150.0 | 934,000 | 313.86 | 167.81 | 3.00 | 1.51 | 0.48 | 5,039,000 | 61,862 | 31,039 | 9,792 |

| Cutoff | | | | | | Inferred | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| g AgEq/t | Tonnes | g AgEq/t | g Ag/t | %Zn | %Pb | %Cu | oz Ag | lbs Zn (x1000) | lbs Pb (x1000) | lbs Cu (x1000) |
| 30.0 | 3,413,000 | 113.09 | 63.20 | 0.99 | 0.50 | 0.18 | 6,935,000 | 74,491 | 37,622 | 13,544 |
| 40.0 | 2,828,000 | 129.28 | 71.97 | 1.14 | 0.57 | 0.20 | 6,544,000 | 71,075 | 35,538 | 12,469 |
| 50.0 | 2,392,000 | 144.71 | 80.22 | 1.28 | 0.64 | 0.23 | 6,169,000 | 67,500 | 33,750 | 12,129 |
| **60.0** | **2,025,000** | **160.98** | **88.98** | **1.44** | **0.71** | **0.26** | **5,793,000** | **64,287** | **31,697** | **11,607** |
| 70.0 | 1,722,000 | 177.88 | 98.20 | 1.59 | 0.78 | 0.29 | 5,437,000 | 60,362 | 29,612 | 11,009 |
| 80.0 | 1,478,000 | 194.89 | 107.58 | 1.75 | 0.85 | 0.32 | 5,112,000 | 57,023 | 27,697 | 10,427 |
| 90.0 | 1,280,000 | 211.89 | 117.07 | 1.90 | 0.91 | 0.34 | 4,818,000 | 53,616 | 25,679 | 9,595 |
| 100.0 | 1,124,000 | 228.19 | 126.14 | 2.05 | 0.97 | 0.37 | 4,558,000 | 50,799 | 24,037 | 9,169 |
| 120.0 | 891,000 | 259.35 | 143.57 | 2.33 | 1.09 | 0.43 | 4,113,000 | 45,769 | 21,411 | 8,447 |
| 140.0 | 728,000 | 288.24 | 160.22 | 2.57 | 1.19 | 0.47 | 3,750,000 | 41,248 | 19,099 | 7,543 |
| 150.0 | 667,000 | 301.39 | 167.68 | 2.69 | 1.24 | 0.50 | 3,596,000 | 39,556 | 18,234 | 7,352 |

**Figure 14.7 Section 420 Nuestra Señora Block Model: AgEq Block Grades**




## 14.2.9 Discussion, Qualifications, Risk, and Recommendations

Nuestra Señora is a skarn deposit with extraordinary complexity in structure, geometry, continuity, and grade. While skarn deposits are generally known to be complex, the mineralization at Nuestra Señora has shown even more extreme spatial variability than is typical. Geometries change radically between sections 20m apart. High-grade pods may disappear with no evidence of their existence in less than a meter. However, the grades are often extraordinarily high, compensating somewhat for the complexity.

Checks were made on the Nuestra Señora resource model in the following manner:

1. Cross sections with mineral domains, drill-hole assays, and geology, topography, sample coding, and block grades with classification were plotted and reviewed for reasonableness.

2. Block-model information, such as coding, number of samples, and classification were checked visually on the computer by domain and lithology on sections and plans.
3. Cross-section mineral domain volumes and level-plan mineral domain volumes were compared.
4. Nearest-neighbor and inverse-distance models were made for comparison.
5. Quantile-quantile plots of assays, composites, and block-model grades were made to evaluate differences in distributions of metals by modeled domain.
6. Composites were calculated by bench elevations and compared to block grades.

After some, albeit minor, modifications were made to the model as a result of the extensive checking, it was concluded that the model presents a reasonable reflection of the deposit based on exploration data and considering its complexity.

The user of this estimate and the operator of the mine must realize and accept the complexities of this deposit as inherent complexities that will never be overcome without detailed infill drilling. In spite of extensive exploration drilling, variations in location and grade are still expected between what has been modeled using exploration data and what will ultimately be found to exist. The model presents a good estimate of global metal content and general locations of mineralization but cannot be used to predict precise locations of mineable material for final mine design. This is not a negative reflection on the current data but is an acknowledgement of wide drill spacing for this deposit, the small diameter of the core, and remaining uncertainty in some sample locations.

Consequently, this model, as with any good model based on exploration data alone, will require grade-control infill drilling before final stope designs can be made. The model should prove sufficiently reliable to plan and schedule on a quarterly or at least yearly basis, but not for shorter time frames.

There is risk in the definition of this resource, in part from the uncertainties in the exploration data and also in part from the complicated and highly variable geometry of the mineralization. Much of the risk has been minimized by using Scorpio's particularly valuable geologic cross-sectional interpretations, by removing drill holes with the most-suspect down-hole survey and collar coordinate data from the database, by working closely with Scorpio personnel to insure proper use of and obtaining original data, and by controlling the estimate with hard mineral boundaries. If the mine geologic staff begins to map the underground, that data could be used in future updates.

On the upside, geologic support and the number of drill holes impart relatively high confidence that the Inferred tonnes will, with additional infill drilling, be upgraded to Measured or Indicated. The determination of grade with sufficient confidence is the factor that keeps this material from becoming a higher classification. The mineralization is there; the certainty in grade is not.

The relative amounts of Measured (7%), Indicated (47%), and Inferred (46%) resources, based on tonnes, and the rather strict criteria for increased classification reflect the level of confidence in the estimate. These are consequences of uncertainty in predicting the continuity of mineralization beyond short distances from known sample locations.

Compared to the previous estimate prepared by Genivar in early 2011 and using the same cutoff criteria, the current resource estimate represents a reduction of around 60%, exclusive of that material mined since the last estimate. The previous estimate used a rather simple, although expedient, nearest-neighbor assignment method for lithology, which in turn controlled the grade estimate and the assignment of specific gravity. The current estimate applied more stringent geologic controls to define two separate domains for each metal, and this process resulted in a reduction of the resource. The use of more stringent criteria for resource classification further impacted the reduction in relative amounts of Measured and Indicated resources. A stringent resource classification at Nuestra Señora is required by the extreme spatial variability and lack of continuity, as described above.

## 14.3 San Rafael Resource Estimate

The San Rafael drill-hole assay database, including data within the Silvia Maria concession, contains 10,372 zinc assays, 10,432 silver assays, 10,372 lead assays, 7,051 copper assays, and 7,493 gold assays (listed in order of each metal's economic importance). All of the San Rafael sample data were used in developing the San Rafael models, estimating the resource, and determining resource classification. However, the reported resource estimate for San Rafael specifically excludes the small fraction of the total deposit volume that lies within the Silvia Maria (title number 147043) concession, which Scorpio does not presently control.

For the previous 2008 and 2009 resource estimates, MDA had audited the drill data, analyzed QA/QC data, made two site visits, and collected samples of drill core from the deposit. For the current 2012 estimation update, MDA audited the Scorpio drill data, including an analysis of the QA/QC data, and a site visit was made in October 2011 to review Scorpio's drilling and analytical procedures. No additional sampling was conducted by MDA because the 2012 drill program did not target new geographic areas or encounter unique geologic features.

The work done by MDA for the 2012 resource estimate includes modifying the 2009 San Rafael geologic model and subsequent mineral-domain models. The zinc, lead, silver, copper, and gold mineral-domain models were largely defined by the geology in conjunction with assay grades and formed the basis of the resource models described and reported in this document.

The San Rafael resources reported here are based on Scorpio's database as of July 20, 2012. The effective date of the San Rafael resource estimate is September 7, 2012.

### 14.3.1 Procedures

Upon completion of the database validation process, MDA modified the 2009 geologic cross-sections, which are evenly spaced on 25m intervals looking northwest at 330°. Individual sets of sections with unique mineral domains were created for zinc, lead, silver, copper, gold, and percent sulfide. The mineral domains represent distinct styles of mineralization with unique statistical characteristics. The cross-sectional domains were sliced to long section on 3m intervals to coincide with the center of each row of blocks in the model. After reinterpretation, the long-section domains were used to code the block model to percent of block in each mineral domain.

The cross-sectional mineral domains for the five metals were used to code the samples. Quantile plots were made to assess validity of these domains and to determine capping levels; MDA capped 26 samples (3 zinc, 6 lead, 8 silver, 8 gold, and 1 copper). Compositing was done to 3m down-hole lengths, matching the model block size, honoring all material-type and mineral-domain boundaries. The sulfide domains were used by MDA to assign density values, ranging from $2.55 g/cm^3$ to $3.88 g/cm^3$, to the blocks.

The reported estimates were made using inverse distance to the second power; ordinary kriging and nearest neighbor estimates were used for comparison and validation. MDA classified the San Rafael resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology.

### 14.3.2 Geologic Background

The San Rafael deposit contains both distal and proximal skarn mineralization. The distal mineralization is represented by the Main Zone, a discrete, tabular, massive-sulfide body that is zinc, lead, and silver dominant. The Main Zone lies along the shallowly dipping volcanic/limestone contact, and though it does extend up-dip and outcrops along the eastern edge of the deposit, it is most continuous and of highest grade at depth within the west half of the deposit. The proximal skarn mineralization is represented by the 120 Zone (named after the PRG discovery hole), where silver, copper, and gold mineralization is more common. The 120 Zone lies within the eastern portion of the San Rafael deposit and occurs primarily as irregular bedding and intrusive-contact-related bodies within skarn-altered limestone and the overlying volcanic units. The geologic and spatial relationships between the Main Zone and the 120 Zone indicate that Main Zone pre-dates the 120 Zone mineralization and is likely related to a different intrusive event.

The Main Zone as currently defined has a 1,000m strike length, is 15 to 20m thick, and extends down dip continuously for 300m and discontinuously for up to 600m. The Main Zone deposit strikes 320$^{o}$ and dips variably between 10° and 30° towards the southwest. The massive-sulfide mineralization extends to the surface along the northeast edge of the deposit, where it has been oxidized to a variable depth, usually less than 30m, though in the northeast portion of the deposit, oxidation can extend down dip for up to 200m. Where oxidized, zinc grades are appreciably lower due to supergene leaching.

The great majority of the Main Zone zinc and lead mineralization occurs within sphalerite and galena in the massive sulfide, and the external contacts are usually coincident. Only occasionally do the limits of zinc and lead mineralization diverge from the massive sulfide. Besides zinc and lead, the Main Zone also contains appreciable silver but has apparently weak copper and gold mineralization. The actual extent and tenor of the copper and gold mineralization within the Main Zone are not well-defined, since many of the historic drill holes were not assayed for these elements. The silver, copper, and gold all occur primarily within the massive sulfide, but all three metals also extend in many instances outside the massive-sulfide limits.

The 120 Zone mineralization occurs not as a single horizon but as multiple bedding- and intrusive-contact-related mineralized horizons. As currently defined, the 120 Zone mineralization occurs within a rock volume that is about 500m long, 250m wide, and extends to a depth of about 350m below the surface. The 120 Zone geologic setting and mineralogy are similar to the nearby El Cajón deposit in that the silver-copper-gold mineralization occurs primarily within low- (<6% by volume) sulfide-bearing pyroxene skarn, spatially, and possibly genetically, related to diorite intrusive sills and dikes.

The 120 Zone occurs primarily below the up-dip extension of the Main Zone zinc- and lead-rich massive sulfide, though both styles of mineralization do overlap in the near-surface. Below the massive sulfide, the 120 Zone mineralization occurs within moderately to strongly skarn-altered limestone. Near the surface, within and above the Main Zone, the 120 Zone mineralization occurs within weakly to moderately skarn-altered volcanic rocks. The 120 Zone skarn mineralization generally strikes 330°, and below the massive sulfide, the bedding-related mineralization dips steeply to the northeast at about 50°, reflecting the orientation of the host limestone formation and also the numerous sill-like dioritic intrusive bodies.

The Upper Zone mineralization occurs within the volcanic rocks about 50m to 100m stratigraphically above, and sub-parallel to, the up-dip extension of the Main Zone massive sulfide. The primary mineralized horizon within the Upper Zone is localized along bedding or possibly a sub-horizontal, bedding-parallel structure. The mineralized horizon can be up to 15m thick but often is about 5m thick. Within localized areas, multiple "stacked" mineralized horizons do occur, often spatially related to intrusive dikes, which cut through all rock types and extend to the topographic surface. Upper Zone mineralization is dominantly silver and gold, with decreased sulfide and base metals. The Upper Zone silver values are similar to those within the 120 Zone, but the gold values are significantly higher than within the 120 or Main Zones. For assay coding and cross-sectional modeling, the Upper Zone has been included with the 120 Zone mineralization; both within the eastern portion of the deposit. There is a question on the Upper Zone's genetic relationship to either the Main or 120 Zones, but its metal content and spatial association with intrusive dikes suggest that the Upper Zone mineralization is an upper-level, distal expression of the 120 Zone mineralization.

### 14.3.3 Geologic Model

Upon completion of the database validation process, MDA modified the 2009 geology cross sections, which are evenly spaced on 25m intervals looking northwest at 330°. The drill-hole information, including lithology, oxidation, metal grades, and percent sulfide, and the topographic surface were plotted on the cross sections. Individual sets of sections were either modified or re-created for each of the five metals (zinc, lead, silver, copper, and gold) and percent sulfide.

#### 14.3.3.1 Oxidation Model

The increased drill density within the eastern portion of the deposit has allowed for the modeling of an oxide surface that marks the transition between oxide- and sulfide-dominant mineralization. The oxide material is less dense than sulfide material, and there is more uncertainty as to the metallurgical characteristics and potential processing costs associated with the oxide mineralization. In general, the oxide surface is 20m-30m below topography, but in the central and northeast portions of the deposit, oxidation can occur up to 150-200m down-dip within the dominant southwest-dipping structures. Zinc is leached from the oxide material, so deep oxidation has a pronounced effect on zinc grades; there is a much less of an effect on the other four metals.

MDA modeled the oxide surface on the cross-sections then created an oxide solid used to code the block model on a block-in, block-out basis. The oxide coding is used to assign density to the model, and blocks coded as oxide are restricted to an Inferred-only resource classification.

#### 14.3.3.2 Mineral Domain Models

Quantile plots of the five metals and percent sulfide were made to help define the natural populations of metal grades. The analytical population breaks indicated on the quantile plots were used to guide the creation of distinct mineral domains which controlled grade estimation and density.

The distribution plots of all five metals were first created using all deposit-wide assay data. Additional plots were then made after subdividing the assay data into west and east portions of the deposit, which correlate to the Main Zone mineralization in the west and to the 120 Zone and Upper Zone mineralization in the east. A review of the quantile plots, along with a consideration for the spatial location of the individual metal assays, resulted in the use of the deposit-wide populations of zinc and lead assays for further statistical analyses and sectional modeling. For silver, there was a statistical difference between the west and east assays, and two unique population sets were used in creating the silver mineral domains. Copper and gold mineralization occurs primarily within the eastern portion of the deposit, with limited data in the west, so the analytical breaks in the east assay populations were used in creating the deposit-wide copper and gold mineral domains. Table 14.8 shows the assay population grade ranges associated with each mineral domain while Table 14.9 provides general geologic descriptions for the mineral domains coded into the geologic model.

**Table 14.8 San Rafael Assay Populations**

| Metal | Low-Grade | Mid-Grade | High-Grade | Very High-Grade |
|---|---|---|---|---|
| Zn (%) | 0.4 - 2.6 | 2.6 - 9.0 | >9.0 | - |
| Pb (%) | 0.18 - 1.0 | 1.0 - 4.0 | 4.0 - 10.0 | >10.0 |
| Ag West (g/t) | 6 - 30 | 30 - 125 | 125 - 350 | > 350 |
| Ag East (g/t) | 15 - 60 | 60 - 145 | 145 - 500 | > 500 |
| Cu (%) | 0.035 - 0.135 | 0.135 - 0.37 | 0.37 - 1.40 | > 1.40 |
| Au (g/t) | 0.09 - 0.8 | 0.8 - 2.2 | > 2.2 | - |
| sulfide (%) | 6 - 50 | > 50 | - | - |

**Table 14.9 Coding and Description of the San Rafael Geologic Model**

| Mineral Domain Code | Description |
|---|---|
| **100** | Primarily low-grade zinc, lead, silver, gold, and copper and low sulfide; each element modeled independently. Associated with weak mineralization and alteration peripheral to the Main Zone massive sulfide and/or the 120 Zone intrusive-contact-related skarn. |
| **200** | Primarily high-sulfide and mid-grade, zinc, lead, silver, gold, and copper; each unique. Characterized by the more sulfide-rich Main Zone and moderate to strong skarn alteration within the 120 Zone. |
| **300** | High-grade zinc, lead, silver, gold, and copper; each unique. Characterized by favorable horizons of increased base-metal sulfides within the Main Zone massive sulfide (sulfide domain 200) and strong intrusive- and bedding-related skarn alteration within the 120 Zone. |
| **400** | Very high-grade lead and silver; each unique. Occurs as isolated zones primarily within the western area. |

MDA used a combination of geology and logged sulfide percentages to model the percent sulfide domains. Zinc, lead, silver, copper, and gold, using the geology and percent sulfide as a guide, were each modeled separately. The mineral domains as modeled and drawn on the cross sections are not strict grade shells but are created using geologic information such as orientation, geometry, lithologic contacts, and continuity. Each of these domains represents a distinct style of mineralization with unique statistical characteristics. While all metals are globally spatially related, they are not necessarily locally spatially related, thereby requiring separate domains for each metal.

The cross sections were sliced to long section on 3m intervals to coincide with the center of each row of blocks in the model. The sliced sections were reinterpreted on those 3m intervals, and these interpretations were used to code the block model to percent of block in each mineral domain.

Typical cross sections of the San Rafael geologic model with the zinc mineral domains are given in Figure 14.8 and Figure 14.9.

**Figure 14.8 Section 300 San Rafael Geologic Model with Zinc Domains**

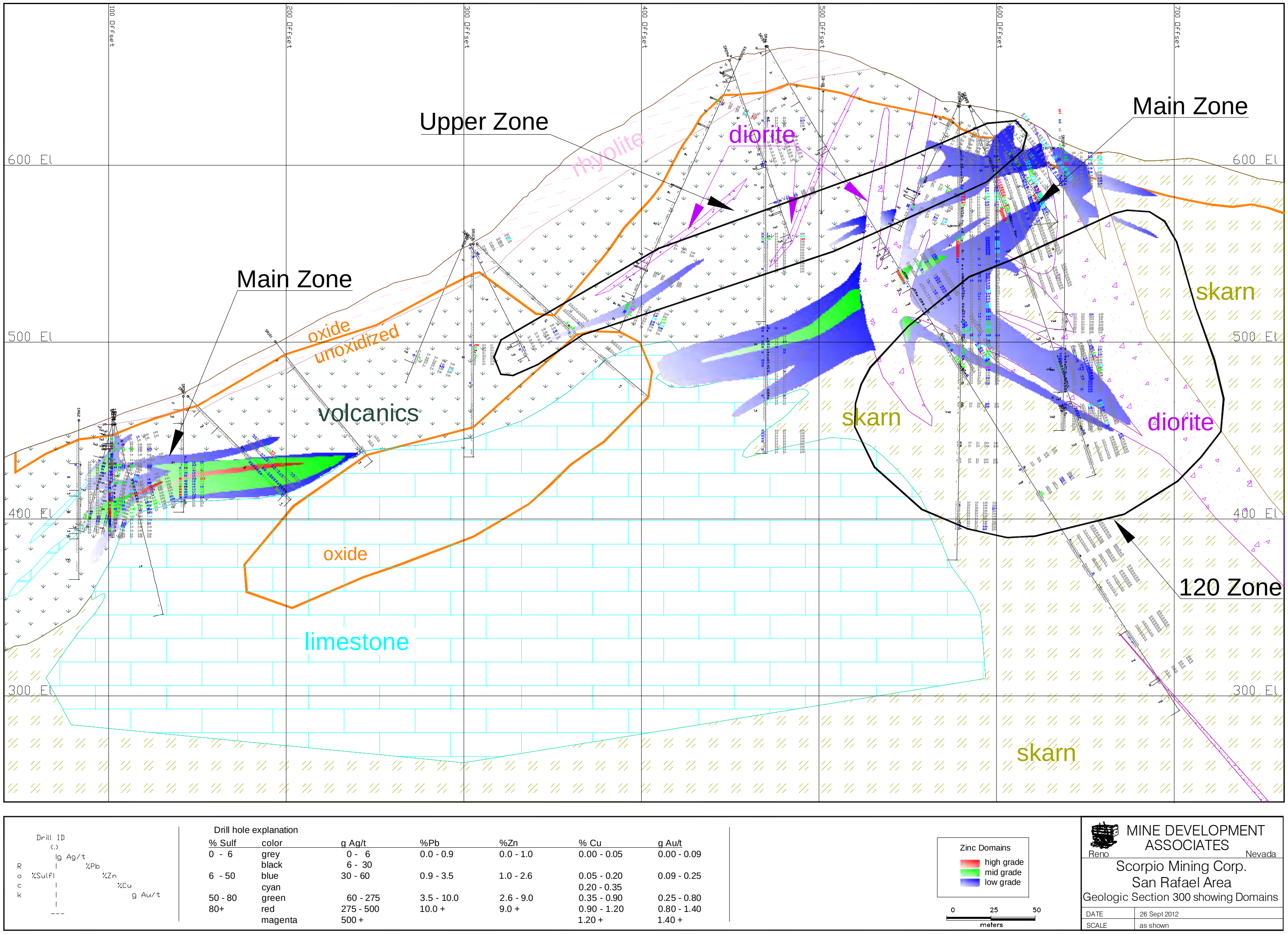
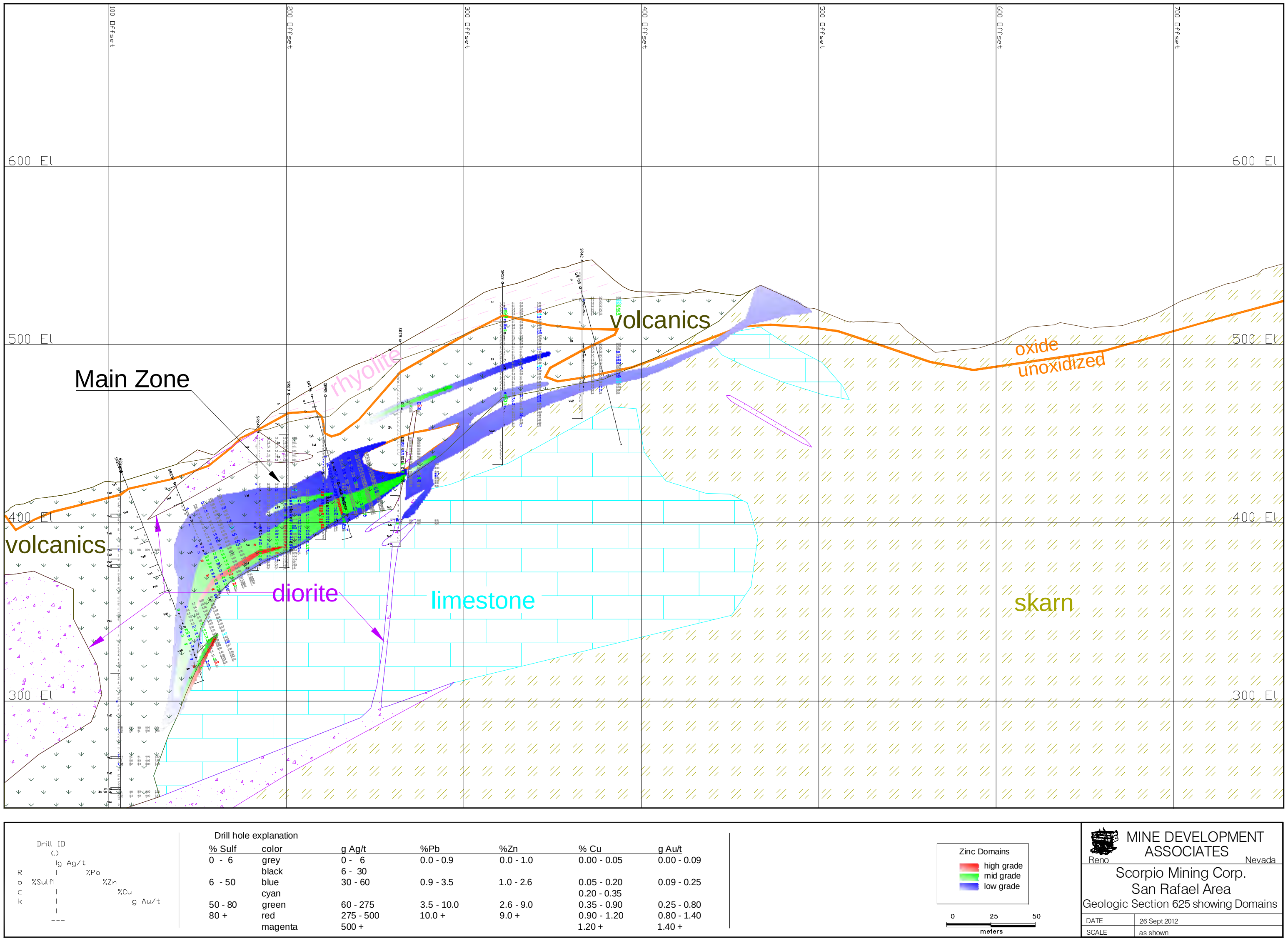


**Figure 14.9 Section 625 San Rafael Geologic Model with Zinc Domains**



### 14.3.4 Sample Coding and Compositing

The metal mineral-domain polygons were used to code drill and surface-trench samples. Quantile plots, along with domain statistics and spatial location of higher-grade samples, were made to assess validity of these domains and to determine capping levels for the individual mineral domain populations. After these analyses, MDA chose to cap 26 high-grade samples (3 zinc, 6 lead, 8 silver, 8 gold, and 1 copper) which MDA believe are not representative of their domain populations and which have a high probability of over-estimating grade locally. The capped assays represent less than 0.2 percent of the assays used in the resource estimation. Assay descriptive statistics, including the capping levels and effects of capping on the assay statistics, are presented in Table 14.10 and Table 14.11.

**Table 14.10 San Rafael Mineral Domain Assay Descriptive Statistics – Silver and Gold**

**Ag West Assays - San Rafael**

| Silver Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV* | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|---|
| **100** | Ag | 1105 | 14.7 | 12.0 | 10.0 | 0.68 | 0.5 | 70.0 |
| | Ag Cap | 1105 | 14.7 | 12.0 | 10.0 | 0.68 | 0.5 | 70.0 |
| **200** | Ag | 741 | 55.3 | 48.0 | 27.3 | 0.49 | 1.0 | 206.0 |
| | Ag Cap | 741 | 55.3 | 48.0 | 27.3 | 0.49 | 1.0 | 206.0 |
| **300** | Ag | 96 | 202.7 | 170.0 | 90.2 | 0.45 | 92.0 | 597.0 |
| | Ag Cap | 96 | 202.7 | 170.0 | 90.2 | 0.45 | 92.0 | 597.0 |
| **400** | Ag | 20 | 542.0 | 447.0 | 225.3 | 0.42 | 306.0 | 1060.0 |
| | Ag Cap | 20 | 542.0 | 447.0 | 225.3 | 0.42 | 306.0 | 1060.0 |
| ***All*** | *Ag* | *1962* | *43.4* | *24.0* | *72.5* | *1.67* | *0.5* | *1060.0* |
| | *Ag Cap* | *1962* | *43.4* | *24.0* | *72.5* | *1.67* | *0.5* | *1060.0* |

**Ag East Assays - San Rafael**

| Gold Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV* | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|---|
| **100** | Ag | 1760 | 27.4 | 22.0 | 21.6 | 0.79 | 0.50 | 345.0 |
| | Ag Cap | 1760 | 27.3 | 22.0 | 20.8 | 0.76 | 0.50 | 225.0 |
| **200** | Ag | 513 | 91.6 | 87.0 | 45.2 | 0.49 | 1.00 | 399.0 |
| | Ag Cap | 513 | 90.9 | 87.0 | 41.6 | 0.46 | 1.00 | 250.0 |
| **300** | Ag | 340 | 277.4 | 237.0 | 143.7 | 0.52 | 8.00 | 923.0 |
| | Ag Cap | 340 | 277.4 | 237.0 | 143.7 | 0.52 | 8.00 | 923.0 |
| **400** | Ag | 48 | 1271.0 | 851.0 | 1288.0 | 1.01 | 134.00 | 8130.0 |
| | Ag Cap | 48 | 1148.2 | 851.0 | 821.4 | 0.72 | 134.00 | 3200.0 |
| ***All*** | *Ag* | *2661* | *92.8* | *34.0* | *249.7* | *2.69* | *0.50* | *8130.0* |
| | *Ag Cap* | *2661* | *90.5* | *34.0* | *202.3* | *2.24* | *0.50* | *3200.0* |

**Au Assays - San Rafael**

| Gold Domain | Assays | Count | Mean (g Au/t) | Median (g | Std. Dev. | CV* | Min. (g Au/t) | Max. (g Au/t) |
|---|---|---|---|---|---|---|---|---|
| **100** | Au | 1730 | 0.229 | 0.163 | 0.201 | 0.880 | 0.003 | 2.250 |
| | Au Cap | 1730 | 0.227 | 0.163 | 0.186 | 0.820 | 0.003 | 1.200 |
| **200** | Au | 120 | 1.301 | 1.135 | 0.633 | 0.486 | 0.107 | 5.300 |
| | Au Cap | 120 | 1.278 | 1.135 | 0.514 | 0.402 | 0.107 | 3.000 |
| **300** | Au | 25 | 3.973 | 3.050 | 2.246 | 0.565 | 0.801 | 10.350 |
| | Au Cap | 25 | 3.973 | 3.050 | 2.246 | 0.565 | 0.801 | 10.350 |
| ***All*** | *Au* | *1875* | *0.342* | *0.180* | *0.587* | *1.719* | *0.003* | *10.350* |
| | *Au Cap* | *1875* | *0.338* | *0.180* | *0.573* | *1.695* | *0.003* | *10.350* |

* Coefficient of Variation (Std.Dev. / Mean)

## Table 14.11 San Rafael Mineral Domain Assay Descriptive Statistics – Copper, Lead and Zinc

**Cu Assays - San Rafael**

| Copper Domain | Assays | Count | Mean (%Cu) | Median (%Cu) | Std. Dev. | CV* | Min. (%Cu) | Max. (%Cu) |
|---|---|---|---|---|---|---|---|---|
| **100** | Cu | 1545 | 0.071 | 0.058 | 0.048 | 0.674 | 0.001 | 0.447 |
| | Cu Cap | 1545 | 0.071 | 0.058 | 0.048 | 0.674 | 0.001 | 0.447 |
| **200** | Cu | 388 | 0.229 | 0.21 | 0.108 | 0.471 | 0.015 | 0.733 |
| | Cu Cap | 388 | 0.229 | 0.21 | 0.108 | 0.471 | 0.015 | 0.733 |
| **300** | Cu | 309 | 0.891 | 0.61 | 1.150 | 1.291 | 0.029 | 12.750 |
| | Cu Cap | 309 | 0.87 | 0.61 | 0.962 | 1.105 | 0.029 | 8.000 |
| ***All*** | *Cu* | *2242* | *0.204* | *0.083* | *0.498* | *2.435* | *0.001* | *12.750* |
| | *Cu Cap* | *2242* | *0.202* | *0.083* | *0.439* | *2.177* | *0.001* | *8.000* |

**Pb Assays - San Rafael**

| Lead Domain | Assays | Count | Mean (%Pb) | Median (%Pb) | Std. Dev. | CV* | Min. (%Pb) | Max. (%Pb) |
|---|---|---|---|---|---|---|---|---|
| **100** | Pb | 2453 | 0.382 | 0.290 | 0.316 | 0.827 | 0.001 | 3.600 |
| | Pb Cap | 2453 | 0.382 | 0.290 | 0.316 | 0.827 | 0.001 | 3.600 |
| **200** | Pb | 786 | 1.808 | 1.540 | 1.059 | 0.585 | 0.020 | 11.750 |
| | Pb Cap | 786 | 1.802 | 1.540 | 1.013 | 0.562 | 0.020 | 7.500 |
| **300** | Pb | 79 | 6.872 | 6.240 | 2.787 | 0.406 | 2.420 | 17.250 |
| | Pb Cap | 79 | 6.824 | 6.240 | 2.659 | 0.390 | 2.420 | 12.500 |
| **400** | Pb | 11 | 16.021 | 13.750 | 6.158 | 0.384 | 10.200 | 30.000 |
| | Pb Cap | 11 | 16.021 | 13.750 | 6.158 | 0.384 | 10.200 | 30.000 |
| ***All*** | *Pb* | *3329* | *0.898* | *0.410* | *1.567* | *1.746* | *0.001* | *30.000* |
| | *Pb Cap* | *3329* | *0.895* | *0.410* | *1.550* | *1.732* | *0.001* | *30.000* |

**Zn Assays - San Rafael**

| Zinc Domain | Assays | Count | Mean (%Zn) | Median (%Zn) | Std. Dev. | CV* | Min. (%Zn) | Max. (%Zn) |
|---|---|---|---|---|---|---|---|---|
| **100** | Zn | 2742 | 0.779 | 0.560 | 0.672 | 0.863 | 0.008 | 7.090 |
| | Zn Cap | 2742 | 0.779 | 0.560 | 0.672 | 0.863 | 0.008 | 7.090 |
| **200** | Zn | 798 | 4.264 | 3.860 | 1.909 | 0.448 | 0.060 | 17.400 |
| | Zn Cap | 798 | 4.249 | 3.860 | 1.828 | 0.430 | 0.060 | 12.000 |
| **300** | Zn | 71 | 13.322 | 12.500 | 5.131 | 0.385 | 5.050 | 31.820 |
| | Zn Cap | 71 | 13.322 | 12.500 | 5.131 | 0.385 | 5.050 | 31.820 |
| ***All*** | *Zn* | *3611* | *1.748* | *0.810* | *2.477* | *1.417* | *0.008* | *31.820* |
| | *Zn Cap* | *3611* | *1.745* | *0.810* | *2.460* | *1.410* | *0.008* | *31.820* |

* Coefficient of Variation (Std.Dev. / Mean)

Compositing was done to 3m down-hole lengths (the model block size), honoring all material-type and mineral-domain boundaries. The volume inside each mineral domain was estimated using only composites from inside that domain. Composite descriptive statistics are presented in Table 14.12.

# Table 14.12 San Rafael Mineral Domain Composite Descriptive Statistics

**Ag West Composites - San Rafael**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV* | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 671 | 14.5 | 13.0 | 8.10 | 0.557 | 1.0 | 60.0 |
| 200 | 435 | 55.5 | 50.0 | 22.20 | 0.393 | 6.0 | 158.7 |
| 300 | 77 | 211.3 | 180.0 | 95.50 | 0.424 | 92.0 | 597.0 |
| 400 | 17 | 528.1 | 441.0 | 214.70 | 0.396 | 352.0 | 1060.0 |
| All | 1200 | 49.3 | 24.2 | 83.90 | 1.638 | 1.0 | 1060.0 |

**Ag East Composites - San Rafael**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV* | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 1073 | 27.5 | 24.0 | 16.40 | 0.598 | 2.0 | 154.7 |
| 200 | 353 | 91.6 | 87.0 | 33.50 | 0.359 | 8.0 | 250.0 |
| 300 | 246 | 281.7 | 242.6 | 129.90 | 0.423 | 34.0 | 923.0 |
| 400 | 33 | 1229.9 | 945.5 | 739.40 | 0.626 | 360.8 | 3188.0 |
| All | 1705 | 100.7 | 37.0 | 214.30 | 2.129 | 2.0 | 3188.0 |

**Au Composites - San Rafael**

| Gold Domain | Count | Mean (g Au/t) | Median (g Au/t) | Std. Dev. | CV* | Min. (g Au/t) | Max. (g Au/t) |
|---|---|---|---|---|---|---|---|
| 100 | 1078 | 0.226 | 0.176 | 0.162 | 0.707 | 0.003 | 1.200 |
| 200 | 97 | 1.276 | 1.109 | 0.482 | 0.367 | 0.307 | 2.790 |
| 300 | 21 | 4.176 | 3.210 | 2.379 | 0.539 | 2.230 | 10.350 |
| All | 1196 | 0.381 | 0.193 | 0.690 | 1.655 | 0.003 | 10.350 |

**Cu Composites - San Rafael**

| Copper Domain | Count | Mean (%Cu) | Median (%Cu) | Std. Dev. | CV* | Min. (%Cu) | Max. (%Cu) |
|---|---|---|---|---|---|---|---|
| 100 | 918 | 0.070 | 0.060 | 0.040 | 0.512 | 0.010 | 0.250 |
| 200 | 265 | 0.230 | 0.220 | 0.080 | 0.351 | 0.040 | 0.580 |
| 300 | 201 | 0.850 | 0.630 | 0.820 | 0.997 | 0.150 | 7.840 |
| All | 1384 | 0.210 | 0.090 | 0.410 | 2.037 | 0.010 | 7.840 |

**Pb Composites - San Rafael**

| Lead Domain | Count | Mean (%Pb) | Median (%Pb) | Std. Dev. | CV* | Min. (%Pb) | Max. (%Pb) |
|---|---|---|---|---|---|---|---|
| 100 | 1459 | 0.380 | 0.310 | 0.260 | 0.676 | 0.020 | 3.080 |
| 200 | 485 | 1.820 | 1.580 | 0.910 | 0.486 | 0.200 | 7.500 |
| 300 | 58 | 7.120 | 6.720 | 2.640 | 0.351 | 2.420 | 12.500 |
| 400 | 7 | 17.290 | 14.280 | 7.210 | 0.375 | 11.800 | 30.000 |
| All | 2009 | 0.980 | 0.430 | 1.750 | 1.690 | 0.020 | 30.000 |

**Zn Composites - San Rafael**

| Zinc Domain | Count | Mean (%Zn) | Median (%Zn) | Std. Dev. | CV* | Min. (%Zn) | Max. (%Zn) |
|---|---|---|---|---|---|---|---|
| 100 | 1590 | 0.790 | 0.640 | 0.540 | 0.679 | 0.010 | 3.240 |
| 200 | 473 | 4.220 | 3.870 | 1.520 | 0.348 | 0.710 | 12.000 |
| 300 | 51 | 13.200 | 12.890 | 4.580 | 0.357 | 5.050 | 30.070 |
| All | 2114 | 1.860 | 0.900 | 2.540 | 1.359 | 0.010 | 30.070 |

* Coefficient of Variation (Std.Dev. / Mean)

### 14.3.5 Density

The density values used in the updated resource estimate are based on 715 density measurements collected by PRG and Scorpio from diamond drill core in the San Rafael resource area. Approximately half (342 samples) of the density data was collected by Scorpio in 2011 and 2012.

The majority of the San Rafael density measurements were taken on samples from drill holes located in the massive-sulfide Main Zone. Most of the PRG samples were from the down-dip portion of the Main Zone, while Scorpio's samples were from the down-dip and eastern up-dip portion where the Main Zone and 120 Zone over-lap. Scorpio also collected samples from the up-dip portion of the Upper Zone and a limited number of samples (12) from the oxidized portion of the deposit. Scorpio's drilling did not target the deeper portions of the 120 Zone, so the database contains only the 42 samples collected by PRG. Additional density measurements for the oxide material and 120-Zone mineralization are recommended before an increase in resource classification should be considered.

MDA grouped the density data into high sulfide, low sulfide, outside sulfide, and oxide categories using the percent sulfide domains and the oxidation model. As in 2009, there is a separate "Outside Sulfide (<6%) group for the 120 Zone due to the observed difference in density values between the 120 Zone and the Main/Upper Zone for this sulfide category. MDA reviewed all of the density data, and after eliminating 12 of these samples as being outliers or improbable, there were 703 samples used for this analysis. Due to potential sample collection bias (the use of whole solid core versus fractured, possibly less-dense core), MDA lowered the mean values of each group by about 1% for use in the current resource estimate. The density values used in the estimate are shown in the "Model SG" column in Table 14.13.

**Table 14.13 List of Density Values Used in San Rafael Model**

| Sulfide Zone | Valid N | Median | Mean | Std. Dev. | Minimum | Maximum | Model SG |
|---|---|---|---|---|---|---|---|
| Oxide only | 12 | 2.64 | 2.52 | 0.55 | 1.44 | 3.26 | **2.55** |
| Outside Sulfide (<6%) | 129 | 2.77 | 2.82 | 0.23 | 2.21 | 3.51 | **2.77** |
| Outside Sulfide (<6%) 120 Zone | 24 | 3.03 | 2.99 | 0.25 | 2.48 | 3.38 | **2.98** |
| Low Sulfide (6% - 50%) | 179 | 2.99 | 3.09 | 0.41 | 2.59 | 4.70 | **3.01** |
| High Sulfide (>50%) | 359 | 3.96 | 3.88 | 0.51 | 2.54 | 5.12 | **3.88** |
| All Groups | 703 | 3.29 | 3.43 | 0.65 | 1.44 | 5.12 | |

### 14.3.6 Resource Model and Estimation

The San Rafael resource block model replicates the relatively evenly distributed metal grades that are zoned within the generally tabular Main Zone and Upper Zone mineral domains. The block model also reflects the more variable metal grades and mineral-domain morphology within the 120 Zone.

The resource has been estimated using the assay data from 182 core holes, 106 RC holes, and 14 trenches. As described in Section 14.3.3.2, the silver assays and composites have been subdivided into west and east populations. Silver grade estimation in the west area uses only silver west composites, while the east area uses only east composites. The other four metal assay and composite files have not been subdivided.

Mineral domains aid in controlling the grade distribution, and the estimation used inverse distance to the second power ("ID²") to interpolate grades into the domains, as this technique was judged to provide results superior to those obtained by ordinary kriging. Ordinary kriging and nearest neighbor estimates were also made as checks on the ID² estimate. To aid in determining search distances, variograms for each metal were made in numerous orientations and at various lag lengths. MDA attempted to develop variogram profiles for each domain but found that the data were too limited in number and spatially erratic to construct useable variogram models. When the mineral domains were combined, variograms could be sufficiently modeled to aid in determining search distances for each of the estimation passes.

The 120 Zone mineral domains have a significantly different orientation than the sub-parallel Main Zone and Upper Zone mineralization, and as a result, two separate estimations were completed at San Rafael; one for the Main and Upper Zones and a second for the 120 Zone. Both estimations used three search passes. Within the Main Zone, the initial 20m pass incorporated the surface trench data, while the latter two estimation passes excluded the trench samples. The estimation parameters for the Main Zone and Upper Zone are shown in Table 14.14 and for the 120 Zone in Table 14.15.

**Table 14.14 San Rafael Main and Upper Zone: Estimation Parameters**

| Description | Parameter |
|---|---|
| **SEARCH ELLIPSOID PARAMETERS: All Metals** | |
| Search Bearing/Plunge/Tilt (all searches) | 330° / 0° / 20° |
| First Pass Search (m): major/semimajor/minor (includes trench samples) | 20/ 20 /20 |
| First Pass Samples: minimum/maximum/maximum per hole | 2/ 9 / 3 |
| Second Pass Search (m): major/semimajor/minor | 120/ 120/ 30 |
| First Pass Samples: minimum/maximum/maximum per hole | 2/ 9 / 3 |
| Third Pass Search (m): major/semimajor/minor | 250/ 250 / 63 |
| Third Pass Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |

**Table 14.15 San Rafael 120 Zone: Estimation Parameters**

| Description | Parameter |
|---|---|
| **SEARCH ELLIPSOID PARAMETERS: All Metals** | |
| Search Bearing/Plunge/Tilt (all searches) | 330° / 0° / -50° |
| First Pass Search (m): major/semimajor/minor (includes trench samples) | 12/ 12 /12 |
| First Pass Samples: minimum/maximum/maximum per hole | 2/ 9 / 3 |
| Second Pass Search (m): major/semimajor/minor | 120/ 120/ 30 |
| First Pass Samples: minimum/maximum/maximum per hole | 2/ 9 / 3 |
| Third Pass Search (m): major/semimajor/minor | 250/ 250 / 63 |
| Third Pass Samples: minimum/maximum/maximum per hole | 1 / 9 / 3 |

### 14.3.7 Mineral Resources

MDA classified the San Rafael resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology. All of the San Rafael sample data, including the limited data within the Silvia Maria concession not controlled by Scorpio, were used in resource classification, although the stated resource discussed below specifically excludes the small fraction of total deposit mineralization that lies within the Silvia Maria concession. The samples used for the classification criteria stated above are independent of the modeled domains. The criteria for resource classification are given in Table 14.16.

**Table 14.16 Criteria for San Rafael Resource Classification**

| | |
|---|---|
| **Main and Upper Zone** | |
| **Measured** | |
| Minimum no. of samples /minimum no. of holes / maximum distance (m) | 2 / 1 / 12 |
| **Indicated** | |
| Minimum no. of samples /minimum no. of holes / maximum distance (m) | 2 / 1 / 30 or 2 / 2 / 50 |
| | |
| **120 Zone** | |
| **No Measured Resource** | |
| **Indicated** | |
| Minimum no. of samples /minimum no. of holes / maximum distance (m) | 2 / 1 / 25 or 2 / 2 / 40 |
| | |
| **All material not classified above but lying within the modeled mineralized domains is Inferred** | |
| | |
| **Oxide Resource – All Inferred** | |

There are no Measured resources within the 120 Zone at this time, primarily due to limited density data and some spatial uncertainty in the mineral domain morphology and extents. The maximum distance criteria for Indicated resources within the 120 Zone are less than for the Main and Upper Zones due to the greater variability in domain morphology and metal grades. There are no Measured or Indicated resources in the oxidized portion of the deposit due to limited density data and uncertain metallurgy and processing economics. None of these issues detracts from the overall confidence in the global project resource estimate, but they do detract from confidence in some of the accuracy which MDA believes is required for Measured and Indicated in these specific areas. The resource classifications will likely rise when those issues listed above are resolved.

Because of the requirement that the resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction," MDA is reporting the resources at approximate economic cutoff grades that are reasonable for deposits of this nature that will likely be mined by some combination of open-pit and underground methods. As such, some economic considerations were used to determine cutoff grades at which the resource is presented. MDA considered reasonable metal prices and extractions costs and recoveries and then factored those down to account for that material that would become economic using internal cutoffs.

The San Rafael reported resource is shown in Table 14.17 while the total San Rafael resources are tabulated in Table 14.18.

The stated resource is fully diluted to 3m by 3m by 3m blocks and is tabulated on a zinc-equivalent ("ZnEq") cutoff grade of 1.5% ZnEq. All material, regardless of which metal is present and which is absent, is tabulated. Because multiple metals exist, but do not on a local scale necessarily co-exist, the ZnEq grade is used for tabulation. Using the individual metal grades of each block, the ZnEq grade is calculated using the following formula:

$$\%ZnEq = \%Zn + (1.0 * \%Pb) + (0.041176 * g\ Ag/t) + (3.176471 * \%Cu) + (2.230392 * g\ Au/t)$$

This formula is based on prices of US$0.85 per pound zinc, US$0.85 per pound lead, US$24.00 per ounce silver, US$2.70 per pound copper, and US$1,300.00 per ounce gold. No metal recoveries are applied, as this is the *in situ* resource. Typical cross sections through the San Rafael block model showing ZnEq block grades are given in Figure 14.10 and Figure 14.11.

The decision as to the appropriate mining method for the San Rafael deposit awaits further evaluation, and there is the potential that a combination of open-pit and underground methods would be optimal. The 3m by 3m by 3m block size likely understates the dilution expected from standard open-pit mining methods, but this block size was used to provide the operator the option for evaluating the deposit, either in total or within specific areas, using underground mining methods. For evaluating open-pit methods, re-blocking to a more appropriate larger block size and dilution should be used. If underground mining methods are chosen for all or a portion of the deposit, the resource estimate used in the economic evaluation could potentially require a higher cutoff grade.

Table 14.18 provides the resource numbers at various ZnEq cutoff grades to be used in further optimization studies.

## Table 14.17 San Rafael Reported Resource

**Measured and Indicated Resources (1.5% ZnEq cut-off)**

| Class | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Measured | 5,124,000 | 2.10 | 0.93 | 72.9 | 0.06 | 0.14 | 237,277,000 | 104,906,000 | 12,013,000 | 7,187,000 | 23,000 | 6.55 |
| Indicated | 14,788,000 | 1.37 | 0.56 | 57.6 | 0.10 | 0.10 | 446,863,000 | 182,409,000 | 27,409,000 | 31,776,000 | 48,000 | 4.84 |
| M+I | 19,912,000 | 1.56 | 0.65 | 61.6 | 0.09 | 0.11 | 684,140,000 | 287,315,000 | 39,422,000 | 38,963,000 | 71,000 | 5.28 |

**Inferred Resource (1.5% ZnEq cut-off)**

| Class | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inferred | 3,331,000 | 0.18 | 0.58 | 56.1 | 0.08 | 0.16 | 13,170,000 | 42,619,000 | 6,006,000 | 5,584,000 | 17,000 | 3.67 |

Due to the 120 Zone's unique geologic setting and mineralization style, Scorpio requested that MDA sub-divide the total San Rafael resources and report the 120 Zone and Main Zone resources separately. The Main Zone resources, which include the Upper Zone mineralization, are tabulated in Table 14.19 by ZnEq cutoffs. The 120 Zone resources are tabulated in Table 14.20 and Table 14.21 by ZnEq and silver-equivalent ("AgEq") cutoffs, respectively.

The Main Zone resources (Table 14.19) and the 120 Zone resources tabulated by ZnEq cut-offs (Table 14.20) use the same fully diluted blocks (3m by 3m by 3m) and the same metal prices and %ZnEq formula as for the total San Rafael resource. While the Main Zone's reported resource estimate uses the same 1.5% ZnEq cutoff grade as for the total deposit, the 120 Zone's stated resources are shown at a 2.5% ZnEq cutoff grade, since it is likely that an economic evaluation using underground mining methods could require a higher cutoff grade in part or entirely for the 120 Zone. Table 14.19 and Table 14.20 provide the resource estimates at various ZnEq cutoff grades to better assess grade-tonnage curves. The 120 Zone resources are also tabulated using AgEq cutoff grades (Table 14.21), due to the dominance of silver grades over zinc grades within the 120 Zone proximal skarn. The same metal prices were used for this tabulation as for the total San Rafael deposit. Using the individual metal grades of each block, the AgEq grade is calculated using the following formula:

$$\text{g AgEq/t} = \text{g Ag/t} + (24.285714 * \%\text{Zn}) + (24.285714 * \%\text{Pb}) + (77.142857 * \%\text{Cu}) + (54.166667 * \text{g Au/t})$$

The stated 120 Zone resource in Table 14.21 is tabulated using a 60g AgEq/t cutoff grade (comparable to a 2.5% ZnEq cutoff grade at reported prices), though it is possible that an economic evaluation using underground mining methods could require a higher cutoff grade. Table 14.21 provides the resource numbers at various AgEq cutoff grades to better assess grade-tonnage curves.

# Table 14.18 San Rafael Total Resource ZnEq Tabulation

**Measured Resource:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 6,073,000 | 1.84 | 0.81 | 63.4 | 0.05 | 0.126 | 246,676,000 | 108,532,000 | 12,374,000 | 7,323,000 | 25,000 | 5.72 |
| 1.20 | 5,685,000 | 1.94 | 0.86 | 67.0 | 0.06 | 0.132 | 243,192,000 | 107,271,000 | 12,244,000 | 7,281,000 | 24,000 | 6.03 |
| 1.40 | 5,305,000 | 2.05 | 0.90 | 70.9 | 0.06 | 0.137 | 239,405,000 | 105,758,000 | 12,091,000 | 7,219,000 | 23,000 | 6.37 |
| **1.50** | **5,124,000** | **2.10** | **0.93** | **72.9** | **0.06** | **0.140** | **237,277,000** | **104,906,000** | **12,013,000** | **7,187,000** | **23,000** | **6.55** |
| 1.60 | 4,944,000 | 2.16 | 0.95 | 75.1 | 0.07 | 0.143 | 235,055,000 | 103,989,000 | 11,930,000 | 7,148,000 | 23,000 | 6.73 |
| 1.80 | 4,603,000 | 2.27 | 1.01 | 79.5 | 0.07 | 0.149 | 230,348,000 | 102,096,000 | 11,757,000 | 7,078,000 | 22,000 | 7.10 |
| 2.00 | 4,324,000 | 2.37 | 1.05 | 83.4 | 0.07 | 0.154 | 226,174,000 | 100,425,000 | 11,593,000 | 7,003,000 | 21,000 | 7.44 |
| 2.50 | 3,749,000 | 2.62 | 1.17 | 92.8 | 0.08 | 0.167 | 216,128,000 | 96,307,000 | 11,181,000 | 6,811,000 | 20,000 | 8.24 |
| 3.00 | 3,330,000 | 2.83 | 1.26 | 100.9 | 0.09 | 0.178 | 207,449,000 | 92,520,000 | 10,807,000 | 6,632,000 | 19,000 | 8.93 |
| 3.50 | 3,008,000 | 3.01 | 1.35 | 108.3 | 0.10 | 0.186 | 199,460,000 | 89,237,000 | 10,472,000 | 6,467,000 | 18,000 | 9.54 |
| 4.00 | 2,740,000 | 3.18 | 1.43 | 115.1 | 0.10 | 0.192 | 191,956,000 | 86,148,000 | 10,142,000 | 6,304,000 | 17,000 | 10.10 |
| 4.50 | 2,523,000 | 3.32 | 1.50 | 121.3 | 0.11 | 0.197 | 184,886,000 | 83,381,000 | 9,838,000 | 6,163,000 | 16,000 | 10.61 |
| 5.00 | 2,326,000 | 3.46 | 1.57 | 127.5 | 0.12 | 0.203 | 177,397,000 | 80,554,000 | 9,534,000 | 6,018,000 | 15,000 | 11.11 |
| 6.00 | 1,999,000 | 3.68 | 1.69 | 139.7 | 0.13 | 0.216 | 162,370,000 | 74,525,000 | 8,981,000 | 5,769,000 | 14,000 | 12.03 |
| 7.00 | 1,652,000 | 3.89 | 1.82 | 157.1 | 0.15 | 0.237 | 141,787,000 | 66,264,000 | 8,346,000 | 5,498,000 | 13,000 | 13.19 |
| 8.00 | 1,294,000 | 4.06 | 1.96 | 183.5 | 0.18 | 0.273 | 115,925,000 | 55,847,000 | 7,635,000 | 5,189,000 | 11,000 | 14.76 |
| 9.00 | 991,000 | 4.22 | 2.12 | 217.0 | 0.22 | 0.317 | 92,246,000 | 46,239,000 | 6,918,000 | 4,843,000 | 10,000 | 16.68 |
| 10.00 | 790,000 | 4.32 | 2.24 | 250.9 | 0.26 | 0.362 | 75,203,000 | 39,085,000 | 6,376,000 | 4,534,000 | 9,000 | 18.52 |

**Indicated Resource:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 19,201,000 | 1.12 | 0.45 | 48.2 | 0.08 | 0.084 | 473,891,000 | 191,842,000 | 29,775,000 | 35,303,000 | 52,000 | 4.01 |
| 1.20 | 17,366,000 | 1.21 | 0.49 | 51.8 | 0.09 | 0.091 | 463,186,000 | 188,208,000 | 28,935,000 | 34,016,000 | 51,000 | 4.32 |
| 1.40 | 15,612,000 | 1.31 | 0.54 | 55.7 | 0.09 | 0.098 | 452,276,000 | 184,401,000 | 27,940,000 | 32,547,000 | 49,000 | 4.66 |
| **1.50** | **14,788,000** | **1.37** | **0.56** | **57.6** | **0.10** | **0.101** | **446,863,000** | **182,409,000** | **27,409,000** | **31,776,000** | **48,000** | **4.84** |
| 1.60 | 14,044,000 | 1.43 | 0.58 | 59.6 | 0.10 | 0.105 | 441,282,000 | 180,252,000 | 26,912,000 | 31,095,000 | 47,000 | 5.01 |
| 1.80 | 12,642,000 | 1.54 | 0.63 | 63.8 | 0.11 | 0.111 | 428,311,000 | 175,398,000 | 25,938,000 | 29,817,000 | 45,000 | 5.38 |
| 2.00 | 11,395,000 | 1.65 | 0.68 | 68.3 | 0.11 | 0.118 | 414,582,000 | 170,180,000 | 25,013,000 | 28,532,000 | 43,000 | 5.76 |
| 2.50 | 9,034,000 | 1.91 | 0.79 | 79.5 | 0.13 | 0.134 | 381,204,000 | 156,805,000 | 23,099,000 | 25,928,000 | 39,000 | 6.69 |
| 3.00 | 7,541,000 | 2.13 | 0.87 | 89.4 | 0.14 | 0.145 | 354,930,000 | 145,388,000 | 21,665,000 | 24,081,000 | 35,000 | 7.47 |
| 3.50 | 6,551,000 | 2.32 | 0.95 | 97.3 | 0.16 | 0.152 | 335,693,000 | 136,765,000 | 20,488,000 | 22,605,000 | 32,000 | 8.11 |
| 4.00 | 5,787,000 | 2.50 | 1.02 | 104.4 | 0.17 | 0.157 | 318,727,000 | 129,634,000 | 19,419,000 | 21,278,000 | 29,000 | 8.69 |
| 4.50 | 5,165,000 | 2.66 | 1.08 | 110.8 | 0.18 | 0.161 | 303,155,000 | 123,386,000 | 18,397,000 | 20,048,000 | 27,000 | 9.23 |
| 5.00 | 4,609,000 | 2.84 | 1.15 | 117.0 | 0.18 | 0.167 | 288,453,000 | 117,296,000 | 17,337,000 | 18,696,000 | 25,000 | 9.77 |
| 6.00 | 3,723,000 | 3.14 | 1.28 | 129.5 | 0.20 | 0.178 | 257,696,000 | 105,093,000 | 15,500,000 | 16,569,000 | 21,000 | 10.79 |
| 7.00 | 3,061,000 | 3.33 | 1.37 | 143.0 | 0.22 | 0.192 | 224,785,000 | 92,453,000 | 14,070,000 | 15,020,000 | 19,000 | 11.72 |
| 8.00 | 2,274,000 | 3.38 | 1.41 | 170.1 | 0.28 | 0.227 | 169,574,000 | 70,841,000 | 12,435,000 | 13,827,000 | 17,000 | 13.18 |
| 9.00 | 1,600,000 | 3.31 | 1.41 | 210.8 | 0.36 | 0.276 | 116,918,000 | 49,784,000 | 10,843,000 | 12,781,000 | 14,000 | 15.17 |
| 10.00 | 1,272,000 | 3.37 | 1.44 | 238.7 | 0.42 | 0.307 | 94,472,000 | 40,413,000 | 9,764,000 | 11,721,000 | 13,000 | 16.65 |

# Table 14.18 San Rafael Total Resource ZnEq Tabulation (continued)

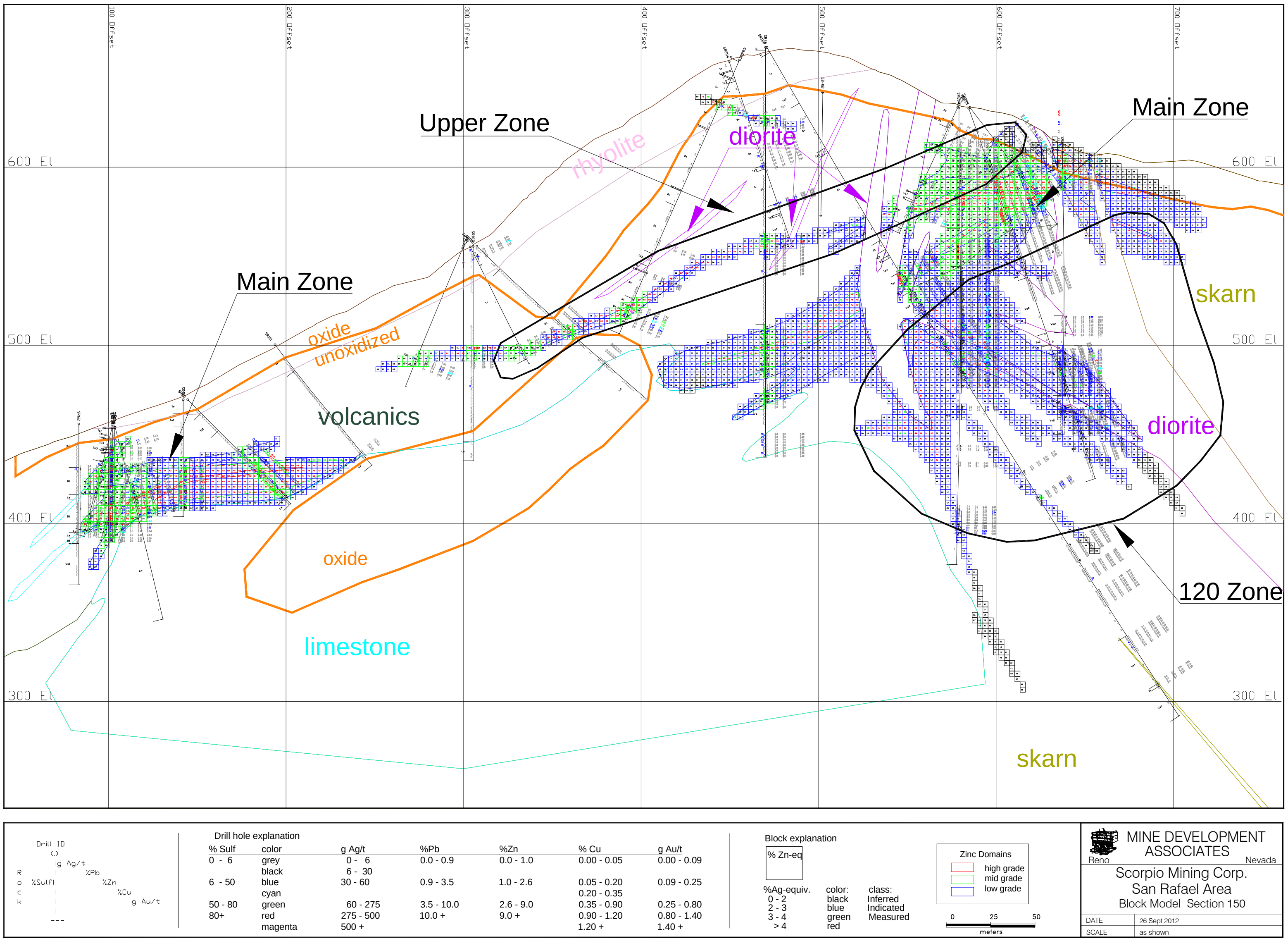
**Measured and Indicated**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 25,275,000 | 1.29 | 0.54 | 51.9 | 0.08 | 0.094 | 720,567,000 | 300,373,000 | 42,149,000 | 42,626,000 | 77,000 | 4.42 |
| 1.20 | 23,051,000 | 1.39 | 0.58 | 55.6 | 0.08 | 0.101 | 706,378,000 | 295,479,000 | 41,179,000 | 41,297,000 | 75,000 | 4.74 |
| 1.40 | 20,917,000 | 1.50 | 0.63 | 59.5 | 0.09 | 0.108 | 691,681,000 | 290,159,000 | 40,031,000 | 39,766,000 | 72,000 | 5.09 |
| **1.50** | **19,912,000** | **1.56** | **0.65** | **61.6** | **0.09** | **0.111** | **684,140,000** | **287,315,000** | **39,422,000** | **38,963,000** | **71,000** | **5.28** |
| 1.60 | 18,987,000 | 1.62 | 0.68 | 63.6 | 0.09 | 0.115 | 676,337,000 | 284,242,000 | 38,842,000 | 38,243,000 | 70,000 | 5.46 |
| 1.80 | 17,244,000 | 1.73 | 0.73 | 68.0 | 0.10 | 0.121 | 658,659,000 | 277,494,000 | 37,695,000 | 36,895,000 | 67,000 | 5.84 |
| 2.00 | 15,719,000 | 1.85 | 0.78 | 72.4 | 0.10 | 0.128 | 640,756,000 | 270,606,000 | 36,607,000 | 35,535,000 | 65,000 | 6.22 |
| 2.50 | 12,783,000 | 2.12 | 0.90 | 83.4 | 0.12 | 0.144 | 597,331,000 | 253,112,000 | 34,281,000 | 32,739,000 | 59,000 | 7.14 |
| 3.00 | 10,871,000 | 2.35 | 0.99 | 92.9 | 0.13 | 0.155 | 562,379,000 | 237,908,000 | 32,472,000 | 30,713,000 | 54,000 | 7.92 |
| 3.50 | 9,559,000 | 2.54 | 1.07 | 100.7 | 0.14 | 0.163 | 535,153,000 | 226,003,000 | 30,961,000 | 29,072,000 | 50,000 | 8.56 |
| 4.00 | 8,528,000 | 2.72 | 1.15 | 107.8 | 0.15 | 0.168 | 510,682,000 | 215,782,000 | 29,561,000 | 27,583,000 | 46,000 | 9.14 |
| 4.50 | 7,688,000 | 2.88 | 1.22 | 114.2 | 0.15 | 0.173 | 488,040,000 | 206,766,000 | 28,235,000 | 26,211,000 | 43,000 | 9.68 |
| 5.00 | 6,934,000 | 3.05 | 1.29 | 120.5 | 0.16 | 0.179 | 465,850,000 | 197,850,000 | 26,871,000 | 24,714,000 | 40,000 | 10.22 |
| 6.00 | 5,722,000 | 3.33 | 1.42 | 133.1 | 0.18 | 0.192 | 420,067,000 | 179,618,000 | 24,480,000 | 22,338,000 | 35,000 | 11.22 |
| 7.00 | 4,713,000 | 3.53 | 1.53 | 147.9 | 0.20 | 0.208 | 366,572,000 | 158,717,000 | 22,416,000 | 20,517,000 | 31,000 | 12.24 |
| 8.00 | 3,568,000 | 3.63 | 1.61 | 175.0 | 0.24 | 0.243 | 285,498,000 | 126,688,000 | 20,071,000 | 19,016,000 | 28,000 | 13.75 |
| 9.00 | 2,591,000 | 3.66 | 1.68 | 213.2 | 0.31 | 0.292 | 209,165,000 | 96,023,000 | 17,760,000 | 17,624,000 | 24,000 | 15.75 |
| 10.00 | 2,063,000 | 3.73 | 1.75 | 243.4 | 0.36 | 0.328 | 169,675,000 | 79,498,000 | 16,139,000 | 16,255,000 | 22,000 | 17.37 |

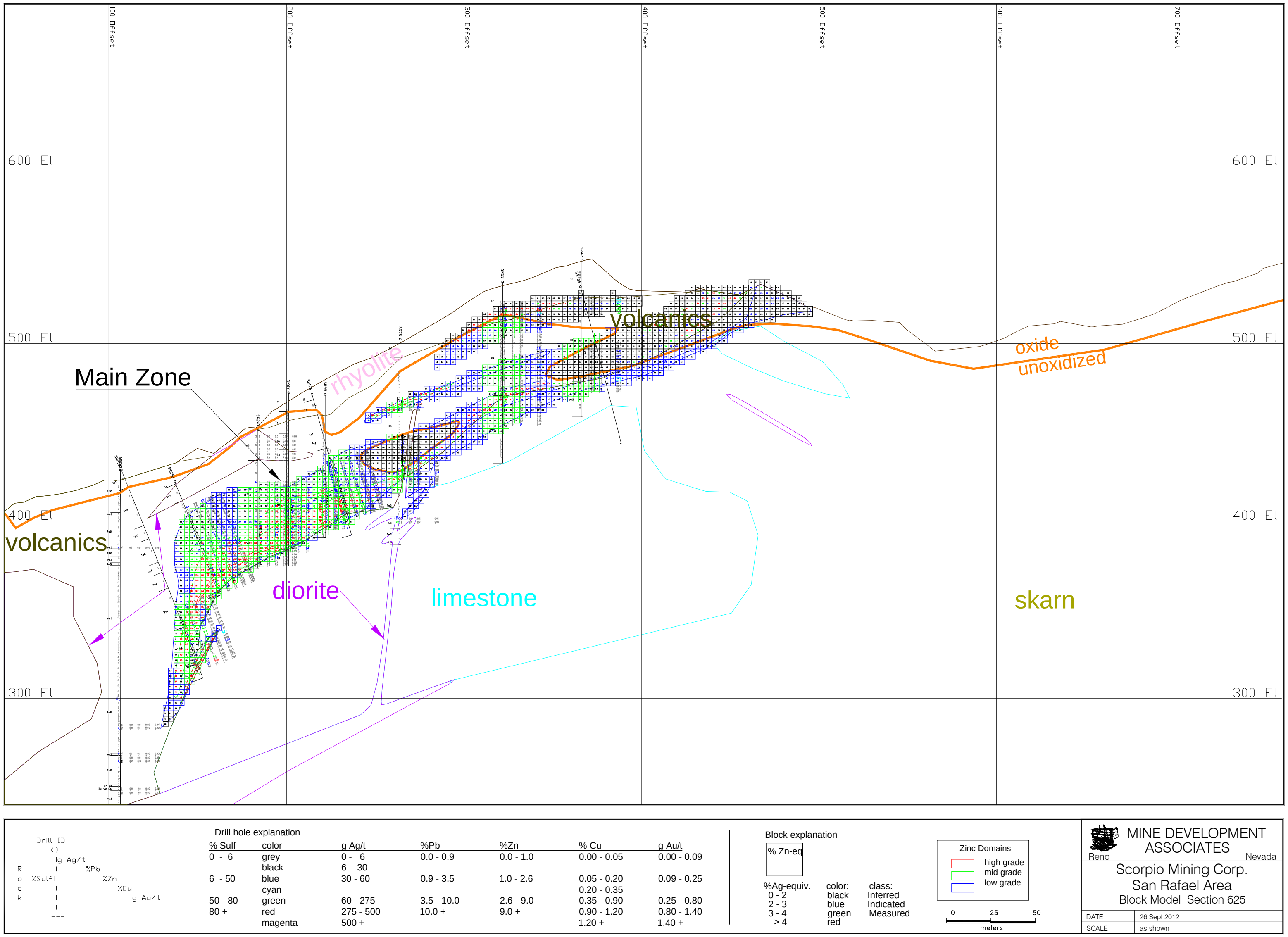
**Inferred Resource:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 4,894,000 | 0.13 | 0.42 | 45.1 | 0.06 | 0.13 | 14,447,000 | 45,723,000 | 7,089,000 | 6,913,000 | 20,000 | 2.89 |
| 1.20 | 4,335,000 | 0.15 | 0.47 | 48.4 | 0.07 | 0.14 | 13,997,000 | 44,716,000 | 6,750,000 | 6,524,000 | 19,000 | 3.13 |
| 1.40 | 3,608,000 | 0.17 | 0.55 | 53.6 | 0.07 | 0.15 | 13,467,000 | 43,366,000 | 6,220,000 | 5,863,000 | 18,000 | 3.50 |
| **1.50** | **3,331,000** | **0.18** | **0.58** | **56.1** | **0.08** | **0.16** | **13,170,000** | **42,619,000** | **6,006,000** | **5,584,000** | **17,000** | **3.67** |
| 1.60 | 3,101,000 | 0.19 | 0.61 | 58.4 | 0.08 | 0.17 | 12,843,000 | 41,760,000 | 5,828,000 | 5,353,000 | 16,000 | 3.82 |
| 1.80 | 2,706,000 | 0.20 | 0.67 | 63.2 | 0.08 | 0.18 | 12,131,000 | 39,945,000 | 5,498,000 | 4,955,000 | 15,000 | 4.13 |
| 2.00 | 2,338,000 | 0.22 | 0.74 | 68.8 | 0.09 | 0.19 | 11,194,000 | 37,882,000 | 5,167,000 | 4,564,000 | 14,000 | 4.49 |
| 2.50 | 1,638,000 | 0.23 | 0.90 | 85.0 | 0.10 | 0.22 | 8,430,000 | 32,512,000 | 4,477,000 | 3,781,000 | 12,000 | 5.46 |
| 3.00 | 1,260,000 | 0.24 | 1.00 | 99.8 | 0.12 | 0.25 | 6,549,000 | 27,826,000 | 4,045,000 | 3,340,000 | 10,000 | 6.28 |
| 3.50 | 1,008,000 | 0.25 | 1.11 | 113.3 | 0.13 | 0.27 | 5,485,000 | 24,713,000 | 3,671,000 | 2,973,000 | 9,000 | 7.04 |
| 4.00 | 803,000 | 0.27 | 1.25 | 127.5 | 0.15 | 0.29 | 4,710,000 | 22,200,000 | 3,294,000 | 2,584,000 | 8,000 | 7.88 |
| 4.50 | 625,000 | 0.30 | 1.43 | 145.5 | 0.16 | 0.31 | 4,148,000 | 19,702,000 | 2,923,000 | 2,213,000 | 6,000 | 8.93 |
| 5.00 | 509,000 | 0.33 | 1.58 | 162.7 | 0.18 | 0.31 | 3,731,000 | 17,730,000 | 2,660,000 | 2,013,000 | 5,000 | 9.88 |
| 6.00 | 365,000 | 0.37 | 1.83 | 194.7 | 0.22 | 0.32 | 2,997,000 | 14,718,000 | 2,285,000 | 1,770,000 | 4,000 | 11.63 |
| 7.00 | 283,000 | 0.40 | 2.06 | 221.8 | 0.25 | 0.33 | 2,474,000 | 12,857,000 | 2,020,000 | 1,576,000 | 3,000 | 13.13 |
| 8.00 | 236,000 | 0.38 | 2.25 | 243.5 | 0.27 | 0.33 | 1,994,000 | 11,714,000 | 1,851,000 | 1,417,000 | 3,000 | 14.26 |
| 9.00 | 205,000 | 0.39 | 2.40 | 259.8 | 0.29 | 0.33 | 1,741,000 | 10,857,000 | 1,711,000 | 1,313,000 | 2,000 | 15.16 |
| 10.00 | 175,000 | 0.39 | 2.59 | 277.6 | 0.31 | 0.34 | 1,485,000 | 9,985,000 | 1,560,000 | 1,178,000 | 2,000 | 16.13 |

## Figure 14.10 Section 300 San Rafael Block Model: ZnEq Block Grades



## Figure 14.11 Section 625 San Rafael Block Model: ZnEq Block Grades



# Table 14.19 San Rafael Main and Upper Zones ZnEq Resource Tabulation

**Measured Resource:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 6,073,000 | 1.84 | 0.81 | 63.4 | 0.05 | 0.126 | 246,676,000 | 108,532,000 | 12,374,000 | 7,323,000 | 25,000 | 5.72 |
| 1.20 | 5,685,000 | 1.94 | 0.86 | 67.0 | 0.06 | 0.132 | 243,192,000 | 107,271,000 | 12,244,000 | 7,281,000 | 24,000 | 6.03 |
| 1.40 | 5,305,000 | 2.05 | 0.90 | 70.9 | 0.06 | 0.137 | 239,405,000 | 105,758,000 | 12,091,000 | 7,219,000 | 23,000 | 6.37 |
| **1.50** | **5,124,000** | **2.10** | **0.93** | **72.9** | **0.06** | **0.140** | **237,277,000** | **104,906,000** | **12,013,000** | **7,187,000** | **23,000** | **6.55** |
| 1.60 | 4,944,000 | 2.16 | 0.95 | 75.1 | 0.07 | 0.143 | 235,055,000 | 103,989,000 | 11,930,000 | 7,148,000 | 23,000 | 6.73 |
| 1.80 | 4,603,000 | 2.27 | 1.01 | 79.5 | 0.07 | 0.149 | 230,348,000 | 102,096,000 | 11,757,000 | 7,078,000 | 22,000 | 7.10 |
| 2.00 | 4,324,000 | 2.37 | 1.05 | 83.4 | 0.07 | 0.154 | 226,174,000 | 100,425,000 | 11,593,000 | 7,003,000 | 21,000 | 7.44 |
| 2.50 | 3,749,000 | 2.62 | 1.17 | 92.8 | 0.08 | 0.167 | 216,128,000 | 96,307,000 | 11,181,000 | 6,811,000 | 20,000 | 8.24 |
| 3.00 | 3,330,000 | 2.83 | 1.26 | 100.9 | 0.09 | 0.178 | 207,449,000 | 92,520,000 | 10,807,000 | 6,632,000 | 19,000 | 8.93 |
| 3.50 | 3,008,000 | 3.01 | 1.35 | 108.3 | 0.10 | 0.186 | 199,460,000 | 89,237,000 | 10,472,000 | 6,467,000 | 18,000 | 9.54 |
| 4.00 | 2,740,000 | 3.18 | 1.43 | 115.1 | 0.10 | 0.192 | 191,956,000 | 86,148,000 | 10,142,000 | 6,304,000 | 17,000 | 10.10 |
| 4.50 | 2,523,000 | 3.32 | 1.50 | 121.3 | 0.11 | 0.197 | 184,886,000 | 83,381,000 | 9,838,000 | 6,163,000 | 16,000 | 10.61 |
| 5.00 | 2,326,000 | 3.46 | 1.57 | 127.5 | 0.12 | 0.203 | 177,397,000 | 80,554,000 | 9,534,000 | 6,018,000 | 15,000 | 11.11 |
| 6.00 | 1,999,000 | 3.68 | 1.69 | 139.7 | 0.13 | 0.216 | 162,370,000 | 74,525,000 | 8,981,000 | 5,769,000 | 14,000 | 12.03 |
| 7.00 | 1,652,000 | 3.89 | 1.82 | 157.1 | 0.15 | 0.237 | 141,787,000 | 66,264,000 | 8,346,000 | 5,498,000 | 13,000 | 13.19 |
| 8.00 | 1,294,000 | 4.06 | 1.96 | 183.5 | 0.18 | 0.273 | 115,925,000 | 55,847,000 | 7,635,000 | 5,189,000 | 11,000 | 14.76 |
| 9.00 | 991,000 | 4.22 | 2.12 | 217.0 | 0.22 | 0.317 | 92,246,000 | 46,239,000 | 6,918,000 | 4,843,000 | 10,000 | 16.68 |
| 10.00 | 790,000 | 4.32 | 2.24 | 250.9 | 0.26 | 0.362 | 75,203,000 | 39,085,000 | 6,376,000 | 4,534,000 | 9,000 | 18.52 |

**Indicated Resource:**

| Cutoff ZnEq% | Tonnes 0 | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 11,486,000 | 1.70 | 0.71 | 46.3 | 0.04 | 0.091 | 431,484,000 | 178,818,000 | 17,107,000 | 10,867,000 | 34,000 | 4.66 |
| 1.20 | 10,672,000 | 1.80 | 0.75 | 49.1 | 0.05 | 0.096 | 423,441,000 | 175,770,000 | 16,861,000 | 10,777,000 | 33,000 | 4.93 |
| 1.40 | 9,937,000 | 1.89 | 0.79 | 51.9 | 0.05 | 0.100 | 414,978,000 | 172,589,000 | 16,592,000 | 10,674,000 | 32,000 | 5.20 |
| **1.50** | **9,591,000** | **1.94** | **0.81** | **53.3** | **0.05** | **0.102** | **410,756,000** | **170,860,000** | **16,445,000** | **10,614,000** | **31,000** | **5.33** |
| 1.60 | 9,252,000 | 1.99 | 0.83 | 54.8 | 0.05 | 0.104 | 406,338,000 | 168,993,000 | 16,294,000 | 10,554,000 | 31,000 | 5.47 |
| 1.80 | 8,544,000 | 2.10 | 0.87 | 58.1 | 0.06 | 0.108 | 396,060,000 | 164,757,000 | 15,947,000 | 10,410,000 | 30,000 | 5.78 |
| 2.00 | 7,885,000 | 2.22 | 0.92 | 61.5 | 0.06 | 0.113 | 385,413,000 | 160,266,000 | 15,580,000 | 10,250,000 | 29,000 | 6.11 |
| 2.50 | 6,425,000 | 2.53 | 1.05 | 70.6 | 0.07 | 0.127 | 358,798,000 | 148,813,000 | 14,576,000 | 9,719,000 | 26,000 | 6.99 |
| 3.00 | 5,426,000 | 2.82 | 1.16 | 78.7 | 0.08 | 0.137 | 337,377,000 | 139,200,000 | 13,734,000 | 9,205,000 | 24,000 | 7.78 |
| 3.50 | 4,755,000 | 3.06 | 1.26 | 85.4 | 0.08 | 0.143 | 321,021,000 | 131,660,000 | 13,050,000 | 8,762,000 | 22,000 | 8.42 |
| 4.00 | 4,249,000 | 3.27 | 1.34 | 91.1 | 0.09 | 0.146 | 306,676,000 | 125,261,000 | 12,450,000 | 8,410,000 | 20,000 | 8.97 |
| 4.50 | 3,863,000 | 3.45 | 1.40 | 96.1 | 0.10 | 0.149 | 293,711,000 | 119,646,000 | 11,932,000 | 8,168,000 | 19,000 | 9.45 |
| 5.00 | 3,530,000 | 3.61 | 1.47 | 100.8 | 0.10 | 0.154 | 280,818,000 | 114,088,000 | 11,438,000 | 7,942,000 | 17,000 | 9.89 |
| 6.00 | 2,941,000 | 3.89 | 1.58 | 111.0 | 0.12 | 0.163 | 252,238,000 | 102,760,000 | 10,496,000 | 7,486,000 | 15,000 | 10.77 |
| 7.00 | 2,436,000 | 4.10 | 1.69 | 122.8 | 0.13 | 0.176 | 220,448,000 | 90,648,000 | 9,617,000 | 7,104,000 | 14,000 | 11.66 |
| 8.00 | 1,750,000 | 4.30 | 1.80 | 149.3 | 0.17 | 0.215 | 165,981,000 | 69,434,000 | 8,398,000 | 6,741,000 | 12,000 | 13.29 |
| 9.00 | 1,151,000 | 4.49 | 1.92 | 193.8 | 0.25 | 0.280 | 113,821,000 | 48,651,000 | 7,171,000 | 6,375,000 | 10,000 | 15.80 |
| 10.00 | 894,000 | 4.66 | 2.00 | 225.6 | 0.31 | 0.322 | 91,764,000 | 39,443,000 | 6,485,000 | 6,026,000 | 9,000 | 17.64 |

# Table 14.19 San Rafael Main and Upper Zone ZnEq Resource Tabulation (cont.)

**Measured and Indicated**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 17,560,000 | 1.75 | 0.74 | 52.2 | 0.05 | 0.103 | 678,160,000 | 287,349,000 | 29,481,000 | 18,190,000 | 58,000 | 5.02 |
| 1.20 | 16,357,000 | 1.85 | 0.79 | 55.3 | 0.05 | 0.108 | 666,633,000 | 283,042,000 | 29,105,000 | 18,058,000 | 57,000 | 5.31 |
| 1.40 | 15,243,000 | 1.95 | 0.83 | 58.5 | 0.05 | 0.113 | 654,383,000 | 278,347,000 | 28,683,000 | 17,893,000 | 55,000 | 5.61 |
| **1.50** | **14,715,000** | **2.00** | **0.85** | **60.2** | **0.05** | **0.115** | **648,033,000** | **275,767,000** | **28,458,000** | **17,801,000** | **54,000** | **5.76** |
| 1.60 | 14,196,000 | 2.05 | 0.87 | 61.8 | 0.06 | 0.117 | 641,393,000 | 272,982,000 | 28,224,000 | 17,703,000 | 54,000 | 5.91 |
| 1.80 | 13,147,000 | 2.16 | 0.92 | 65.5 | 0.06 | 0.123 | 626,409,000 | 266,853,000 | 27,704,000 | 17,488,000 | 52,000 | 6.25 |
| 2.00 | 12,210,000 | 2.27 | 0.97 | 69.2 | 0.06 | 0.128 | 611,587,000 | 260,691,000 | 27,174,000 | 17,253,000 | 50,000 | 6.58 |
| 2.50 | 10,173,000 | 2.56 | 1.09 | 78.7 | 0.07 | 0.142 | 574,926,000 | 245,120,000 | 25,757,000 | 16,530,000 | 46,000 | 7.45 |
| 3.00 | 8,756,000 | 2.82 | 1.20 | 87.2 | 0.08 | 0.153 | 544,826,000 | 231,719,000 | 24,540,000 | 15,837,000 | 43,000 | 8.21 |
| 3.50 | 7,764,000 | 3.04 | 1.29 | 94.2 | 0.09 | 0.159 | 520,481,000 | 220,897,000 | 23,522,000 | 15,229,000 | 40,000 | 8.85 |
| 4.00 | 6,989,000 | 3.24 | 1.37 | 100.5 | 0.10 | 0.164 | 498,632,000 | 211,409,000 | 22,593,000 | 14,714,000 | 37,000 | 9.42 |
| 4.50 | 6,386,000 | 3.40 | 1.44 | 106.0 | 0.10 | 0.168 | 478,596,000 | 203,027,000 | 21,770,000 | 14,332,000 | 35,000 | 9.91 |
| 5.00 | 5,856,000 | 3.55 | 1.51 | 111.4 | 0.11 | 0.173 | 458,216,000 | 194,641,000 | 20,972,000 | 13,959,000 | 33,000 | 10.37 |
| 6.00 | 4,940,000 | 3.81 | 1.63 | 122.6 | 0.12 | 0.184 | 414,609,000 | 177,285,000 | 19,477,000 | 13,256,000 | 29,000 | 11.28 |
| 7.00 | 4,088,000 | 4.02 | 1.74 | 136.7 | 0.14 | 0.201 | 362,235,000 | 156,912,000 | 17,963,000 | 12,601,000 | 26,000 | 12.28 |
| 8.00 | 3,044,000 | 4.20 | 1.87 | 163.9 | 0.18 | 0.239 | 281,906,000 | 125,281,000 | 16,034,000 | 11,931,000 | 23,000 | 13.92 |
| 9.00 | 2,142,000 | 4.36 | 2.01 | 204.5 | 0.24 | 0.297 | 206,067,000 | 94,890,000 | 14,088,000 | 11,219,000 | 20,000 | 16.21 |
| 10.00 | 1,684,000 | 4.50 | 2.12 | 237.5 | 0.28 | 0.341 | 166,967,000 | 78,528,000 | 12,861,000 | 10,561,000 | 18,000 | 18.05 |

**Inferred Resource:**

| Cutoff ZnEq% | Tonnes 0 | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 2,507,000 | 0.22 | 0.81 | 50.5 | 0.04 | 0.202 | 12,422,000 | 45,001,000 | 4,067,000 | 2,179,000 | 16,000 | 3.69 |
| 1.20 | 2,320,000 | 0.24 | 0.86 | 53.6 | 0.04 | 0.210 | 12,053,000 | 44,008,000 | 3,995,000 | 2,148,000 | 16,000 | 3.90 |
| 1.40 | 2,138,000 | 0.25 | 0.91 | 57.0 | 0.04 | 0.217 | 11,636,000 | 42,679,000 | 3,917,000 | 2,113,000 | 15,000 | 4.12 |
| **1.50** | **2,048,000** | **0.25** | **0.93** | **58.8** | **0.05** | **0.220** | **11,425,000** | **41,938,000** | **3,875,000** | **2,096,000** | **14,000** | **4.24** |
| 1.60 | 1,955,000 | 0.26 | 0.95 | 60.9 | 0.05 | 0.223 | 11,181,000 | 41,087,000 | 3,826,000 | 2,081,000 | 14,000 | 4.37 |
| 1.80 | 1,781,000 | 0.27 | 1.00 | 65.1 | 0.05 | 0.231 | 10,639,000 | 39,286,000 | 3,729,000 | 2,044,000 | 13,000 | 4.63 |
| 2.00 | 1,597,000 | 0.28 | 1.06 | 70.4 | 0.06 | 0.238 | 9,870,000 | 37,242,000 | 3,614,000 | 1,994,000 | 12,000 | 4.95 |
| 2.50 | 1,193,000 | 0.29 | 1.22 | 86.4 | 0.07 | 0.261 | 7,582,000 | 32,026,000 | 3,314,000 | 1,835,000 | 10,000 | 5.86 |
| 3.00 | 930,000 | 0.29 | 1.34 | 102.3 | 0.08 | 0.289 | 5,970,000 | 27,560,000 | 3,060,000 | 1,693,000 | 9,000 | 6.75 |
| 3.50 | 763,000 | 0.30 | 1.46 | 116.3 | 0.09 | 0.305 | 4,988,000 | 24,501,000 | 2,853,000 | 1,594,000 | 7,000 | 7.53 |
| 4.00 | 633,000 | 0.31 | 1.58 | 130.0 | 0.11 | 0.322 | 4,322,000 | 22,032,000 | 2,646,000 | 1,511,000 | 7,000 | 8.31 |
| 4.50 | 521,000 | 0.34 | 1.70 | 145.5 | 0.13 | 0.335 | 3,861,000 | 19,567,000 | 2,437,000 | 1,441,000 | 6,000 | 9.18 |
| 5.00 | 432,000 | 0.37 | 1.85 | 161.9 | 0.14 | 0.336 | 3,525,000 | 17,622,000 | 2,248,000 | 1,374,000 | 5,000 | 10.10 |
| 6.00 | 314,000 | 0.42 | 2.12 | 193.6 | 0.18 | 0.342 | 2,914,000 | 14,676,000 | 1,952,000 | 1,247,000 | 3,000 | 11.85 |
| 7.00 | 242,000 | 0.46 | 2.41 | 222.1 | 0.21 | 0.355 | 2,452,000 | 12,836,000 | 1,726,000 | 1,101,000 | 3,000 | 13.46 |
| 8.00 | 199,000 | 0.45 | 2.67 | 246.1 | 0.22 | 0.359 | 1,984,000 | 11,702,000 | 1,575,000 | 971,000 | 2,000 | 14.75 |
| 9.00 | 171,000 | 0.46 | 2.88 | 264.5 | 0.24 | 0.360 | 1,735,000 | 10,849,000 | 1,453,000 | 896,000 | 2,000 | 15.79 |
| 10.00 | 146,000 | 0.46 | 3.11 | 284.2 | 0.25 | 0.362 | 1,481,000 | 9,979,000 | 1,330,000 | 807,000 | 2,000 | 16.88 |

# Table 14.20 San Rafael 120 Zone ZnEq Resource Tabulation

**Indicated Resource:**

| Cutoff ZnEq% | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 7,715,000 | 0.25 | 0.08 | 51.1 | 0.14 | 0.075 | 42,407,000 | 13,024,000 | 12,668,000 | 24,436,000 | 18,000 | 3.05 |
| 1.20 | 6,694,000 | 0.27 | 0.08 | 56.1 | 0.16 | 0.083 | 39,745,000 | 12,438,000 | 12,074,000 | 23,239,000 | 18,000 | 3.35 |
| 1.40 | 5,675,000 | 0.30 | 0.09 | 62.2 | 0.17 | 0.094 | 37,297,000 | 11,812,000 | 11,348,000 | 21,873,000 | 17,000 | 3.72 |
| 1.50 | 5,197,000 | 0.32 | 0.10 | 65.6 | 0.18 | 0.100 | 36,107,000 | 11,548,000 | 10,964,000 | 21,162,000 | 17,000 | 3.93 |
| 1.60 | 4,792,000 | 0.33 | 0.11 | 68.9 | 0.19 | 0.106 | 34,944,000 | 11,260,000 | 10,618,000 | 20,541,000 | 16,000 | 4.13 |
| 1.80 | 4,097,000 | 0.36 | 0.12 | 75.8 | 0.21 | 0.118 | 32,251,000 | 10,641,000 | 9,991,000 | 19,407,000 | 16,000 | 4.54 |
| 2.00 | 3,510,000 | 0.38 | 0.13 | 83.6 | 0.24 | 0.129 | 29,169,000 | 9,914,000 | 9,433,000 | 18,282,000 | 15,000 | 4.99 |
| **2.50** | **2,609,000** | **0.39** | **0.14** | **101.6** | **0.28** | **0.151** | **22,406,000** | **7,992,000** | **8,524,000** | **16,208,000** | **13,000** | **5.94** |
| 3.00 | 2,116,000 | 0.38 | 0.13 | 116.6 | 0.32 | 0.166 | 17,553,000 | 6,189,000 | 7,931,000 | 14,876,000 | 11,000 | 6.69 |
| 3.50 | 1,796,000 | 0.37 | 0.13 | 128.8 | 0.35 | 0.177 | 14,672,000 | 5,106,000 | 7,439,000 | 13,843,000 | 10,000 | 7.31 |
| 4.00 | 1,538,000 | 0.36 | 0.13 | 140.9 | 0.38 | 0.187 | 12,051,000 | 4,372,000 | 6,968,000 | 12,868,000 | 9,000 | 7.91 |
| 4.50 | 1,301,000 | 0.33 | 0.13 | 154.5 | 0.41 | 0.196 | 9,444,000 | 3,739,000 | 6,465,000 | 11,880,000 | 8,000 | 8.58 |
| 5.00 | 1,078,000 | 0.32 | 0.13 | 170.2 | 0.45 | 0.211 | 7,634,000 | 3,208,000 | 5,899,000 | 10,755,000 | 7,000 | 9.37 |
| 6.00 | 781,000 | 0.32 | 0.14 | 199.3 | 0.53 | 0.237 | 5,458,000 | 2,333,000 | 5,004,000 | 9,082,000 | 6,000 | 10.86 |
| 7.00 | 625,000 | 0.31 | 0.13 | 221.6 | 0.57 | 0.254 | 4,337,000 | 1,805,000 | 4,453,000 | 7,916,000 | 5,000 | 11.97 |
| 8.00 | 525,000 | 0.31 | 0.12 | 239.3 | 0.61 | 0.265 | 3,592,000 | 1,407,000 | 4,037,000 | 7,086,000 | 4,000 | 12.82 |
| 9.00 | 449,000 | 0.31 | 0.11 | 254.4 | 0.65 | 0.268 | 3,097,000 | 1,132,000 | 3,672,000 | 6,406,000 | 4,000 | 13.56 |
| 10.00 | 378,000 | 0.32 | 0.12 | 269.6 | 0.68 | 0.271 | 2,707,000 | 969,000 | 3,279,000 | 5,695,000 | 3,000 | 14.31 |

**Inferred Resource:**

| Cutoff ZnEq% | Tonnes 0 | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | ZnEq (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 2,387,000 | 0.04 | 0.01 | 39.4 | 0.09 | 0.043 | 2,026,000 | 722,000 | 3,022,000 | 4,734,000 | 3,000 | 2.06 |
| 1.20 | 2,015,000 | 0.04 | 0.02 | 42.5 | 0.10 | 0.048 | 1,944,000 | 708,000 | 2,755,000 | 4,376,000 | 3,000 | 2.23 |
| 1.40 | 1,470,000 | 0.06 | 0.02 | 48.7 | 0.12 | 0.057 | 1,831,000 | 687,000 | 2,303,000 | 3,750,000 | 3,000 | 2.58 |
| 1.50 | 1,283,000 | 0.06 | 0.02 | 51.7 | 0.12 | 0.062 | 1,745,000 | 682,000 | 2,132,000 | 3,487,000 | 3,000 | 2.75 |
| 1.60 | 1,146,000 | 0.07 | 0.03 | 54.3 | 0.13 | 0.066 | 1,662,000 | 673,000 | 2,002,000 | 3,272,000 | 2,000 | 2.89 |
| 1.80 | 924,000 | 0.07 | 0.03 | 59.5 | 0.14 | 0.075 | 1,492,000 | 659,000 | 1,769,000 | 2,912,000 | 2,000 | 3.18 |
| 2.00 | 740,000 | 0.08 | 0.04 | 65.2 | 0.16 | 0.084 | 1,324,000 | 639,000 | 1,553,000 | 2,570,000 | 2,000 | 3.49 |
| **2.50** | **445,000** | **0.09** | **0.05** | **81.3** | **0.20** | **0.113** | **848,000** | **486,000** | **1,163,000** | **1,947,000** | **2,000** | **4.37** |
| 3.00 | 330,000 | 0.08 | 0.04 | 92.8 | 0.23 | 0.128 | 579,000 | 266,000 | 985,000 | 1,647,000 | 1,000 | 4.94 |
| 3.50 | 245,000 | 0.09 | 0.04 | 103.7 | 0.25 | 0.147 | 497,000 | 212,000 | 819,000 | 1,378,000 | 1,000 | 5.54 |
| 4.00 | 170,000 | 0.10 | 0.04 | 118.3 | 0.29 | 0.176 | 388,000 | 169,000 | 649,000 | 1,073,000 | 1,000 | 6.32 |
| 4.50 | 104,000 | 0.13 | 0.06 | 145.5 | 0.34 | 0.183 | 287,000 | 135,000 | 486,000 | 772,000 | 1,000 | 7.65 |
| 5.00 | 77,000 | 0.12 | 0.06 | 167.0 | 0.38 | 0.185 | 207,000 | 108,000 | 412,000 | 639,000 | - | 8.68 |
| 6.00 | 51,000 | 0.07 | 0.04 | 201.1 | 0.46 | 0.194 | 83,000 | 42,000 | 333,000 | 523,000 | - | 10.29 |
| 7.00 | 41,000 | 0.02 | 0.02 | 220.6 | 0.52 | 0.206 | 23,000 | 20,000 | 294,000 | 475,000 | - | 11.24 |
| 8.00 | 37,000 | 0.01 | 0.01 | 229.5 | 0.54 | 0.205 | 10,000 | 12,000 | 276,000 | 446,000 | - | 11.65 |
| 9.00 | 34,000 | 0.01 | 0.01 | 236.4 | 0.56 | 0.207 | 6,000 | 9,000 | 258,000 | 416,000 | - | 11.98 |
| 10.00 | 29,000 | 0.01 | 0.01 | 244.9 | 0.58 | 0.208 | 4,000 | 5,000 | 230,000 | 371,000 | - | 12.39 |

# Table 14.21 San Rafael 120 Zone AgEq Resource Tabulation

**Indicated Resource:**

| Cutoff g AgEq/t | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq (g/t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.00 | 3,359,000 | 0.38 | 0.13 | 86.0 | 0.24 | 0.133 | 28,270,000 | 9,696,000 | 9,287,000 | 17,955,000 | 14,000 | 124.3 |
| 54.00 | 3,022,000 | 0.39 | 0.14 | 92.2 | 0.26 | 0.140 | 25,958,000 | 9,064,000 | 8,956,000 | 17,180,000 | 14,000 | 132.4 |
| 58.00 | 2,759,000 | 0.39 | 0.14 | 97.9 | 0.27 | 0.147 | 23,779,000 | 8,413,000 | 8,685,000 | 16,562,000 | 13,000 | 139.7 |
| **60.00** | **2,644,000** | **0.39** | **0.14** | **100.7** | **0.28** | **0.150** | **22,753,000** | **8,100,000** | **8,562,000** | **16,291,000** | **13,000** | **143.2** |
| 62.00 | 2,540,000 | 0.39 | 0.14 | 103.4 | 0.29 | 0.153 | 21,725,000 | 7,765,000 | 8,448,000 | 16,035,000 | 12,000 | 146.6 |
| 66.00 | 2,362,000 | 0.38 | 0.14 | 108.5 | 0.30 | 0.158 | 20,029,000 | 7,139,000 | 8,241,000 | 15,573,000 | 12,000 | 152.8 |
| 70.00 | 2,209,000 | 0.38 | 0.13 | 113.4 | 0.31 | 0.163 | 18,480,000 | 6,544,000 | 8,054,000 | 15,160,000 | 12,000 | 158.7 |
| 80.00 | 1,911,000 | 0.37 | 0.13 | 124.1 | 0.34 | 0.173 | 15,784,000 | 5,487,000 | 7,625,000 | 14,240,000 | 11,000 | 171.8 |
| 90.00 | 1,688,000 | 0.36 | 0.13 | 133.7 | 0.36 | 0.181 | 13,522,000 | 4,767,000 | 7,253,000 | 13,458,000 | 10,000 | 183.3 |
| 100.00 | 1,482,000 | 0.35 | 0.13 | 143.9 | 0.39 | 0.189 | 11,392,000 | 4,226,000 | 6,857,000 | 12,648,000 | 9,000 | 195.6 |
| 110.00 | 1,286,000 | 0.33 | 0.13 | 155.5 | 0.42 | 0.197 | 9,287,000 | 3,699,000 | 6,430,000 | 11,812,000 | 8,000 | 209.4 |
| 120.00 | 1,099,000 | 0.32 | 0.13 | 168.5 | 0.45 | 0.209 | 7,825,000 | 3,258,000 | 5,954,000 | 10,864,000 | 7,000 | 225.5 |
| 130.00 | 953,000 | 0.32 | 0.14 | 180.9 | 0.48 | 0.220 | 6,697,000 | 2,855,000 | 5,545,000 | 10,087,000 | 7,000 | 240.9 |
| 134.00 | 902,000 | 0.32 | 0.14 | 185.9 | 0.49 | 0.225 | 6,282,000 | 2,723,000 | 5,389,000 | 9,804,000 | 7,000 | 247.2 |
| 138.00 | 856,000 | 0.31 | 0.14 | 190.7 | 0.51 | 0.230 | 5,945,000 | 2,551,000 | 5,250,000 | 9,546,000 | 6,000 | 253 |
| 142.00 | 815,000 | 0.32 | 0.14 | 195.3 | 0.52 | 0.234 | 5,674,000 | 2,427,000 | 5,115,000 | 9,291,000 | 6,000 | 258.8 |
| 146.00 | 778,000 | 0.32 | 0.14 | 199.6 | 0.53 | 0.237 | 5,435,000 | 2,326,000 | 4,994,000 | 9,066,000 | 6,000 | 264.2 |
| 150.00 | 746,000 | 0.32 | 0.13 | 203.7 | 0.54 | 0.240 | 5,197,000 | 2,201,000 | 4,882,000 | 8,879,000 | 6,000 | 269.3 |

**Inferred Resource:**

| Cutoff g AgEq/t | Tonnes | Zinc (%) | Lead (%) | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Zinc (lbs) | Lead (lbs) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq (g/t) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.00 | 639,000 | 0.09 | 0.04 | 69.3 | 0.17 | 0.094 | 1,263,000 | 629,000 | 1,424,000 | 2,350,000 | 2,000 | 90.6 |
| 54.00 | 559,000 | 0.09 | 0.05 | 73.6 | 0.18 | 0.100 | 1,122,000 | 591,000 | 1,323,000 | 2,191,000 | 2,000 | 96.1 |
| 58.00 | 490,000 | 0.09 | 0.05 | 77.9 | 0.19 | 0.107 | 965,000 | 544,000 | 1,228,000 | 2,045,000 | 2,000 | 101.7 |
| **60.00** | **454,000** | **0.09** | **0.05** | **80.6** | **0.20** | **0.112** | **874,000** | **507,000** | **1,175,000** | **1,967,000** | **2,000** | **105.2** |
| 62.00 | 425,000 | 0.09 | 0.05 | 83.0 | 0.20 | 0.115 | 811,000 | 437,000 | 1,135,000 | 1,903,000 | 2,000 | 108.1 |
| 66.00 | 382,000 | 0.08 | 0.04 | 87.3 | 0.21 | 0.120 | 650,000 | 340,000 | 1,073,000 | 1,796,000 | 1,000 | 113.1 |
| 70.00 | 350,000 | 0.08 | 0.04 | 90.7 | 0.22 | 0.125 | 601,000 | 293,000 | 1,021,000 | 1,706,000 | 1,000 | 117.3 |
| 80.00 | 274,000 | 0.09 | 0.04 | 99.6 | 0.24 | 0.140 | 536,000 | 228,000 | 878,000 | 1,473,000 | 1,000 | 129 |
| 90.00 | 218,000 | 0.10 | 0.04 | 108.3 | 0.27 | 0.155 | 462,000 | 195,000 | 758,000 | 1,273,000 | 1,000 | 140.5 |
| 100.00 | 155,000 | 0.11 | 0.05 | 122.8 | 0.29 | 0.179 | 373,000 | 162,000 | 611,000 | 1,007,000 | 1,000 | 159 |
| 110.00 | 102,000 | 0.12 | 0.06 | 146.6 | 0.34 | 0.184 | 279,000 | 132,000 | 481,000 | 766,000 | 1,000 | 187.2 |
| 120.00 | 81,000 | 0.12 | 0.06 | 163.2 | 0.37 | 0.185 | 212,000 | 111,000 | 424,000 | 661,000 | - | 206.3 |
| 130.00 | 64,000 | 0.11 | 0.06 | 182.2 | 0.41 | 0.185 | 158,000 | 88,000 | 375,000 | 574,000 | - | 227.9 |
| 134.00 | 61,000 | 0.11 | 0.06 | 185.7 | 0.42 | 0.188 | 146,000 | 78,000 | 367,000 | 564,000 | - | 232 |
| 138.00 | 58,000 | 0.09 | 0.05 | 190.3 | 0.43 | 0.189 | 120,000 | 63,000 | 357,000 | 553,000 | - | 237.1 |
| 142.00 | 54,000 | 0.08 | 0.04 | 196.3 | 0.45 | 0.192 | 99,000 | 49,000 | 344,000 | 535,000 | - | 244 |
| 146.00 | 51,000 | 0.07 | 0.04 | 201.5 | 0.46 | 0.194 | 82,000 | 41,000 | 332,000 | 521,000 | - | 250.3 |
| 150.00 | 47,000 | 0.06 | 0.03 | 207.9 | 0.49 | 0.198 | 66,000 | 33,000 | 317,000 | 509,000 | - | 258.4 |

Checks were made on the San Rafael resource model in the following manner:

- Block-model information, such as metal grade and geology coding, number of samples, and classification, was checked visually on the computer by domain and lithology on sections and long-sections;
- Cross-section mineral domain volumes to long-section mineral domain volumes were checked;
- Nearest-neighbor and ordinary-kriged models were made for comparison;
- A simple polygonal model was made with the original modeled section domains; and
- Normal-quantile distribution plots of assays, composites, and block-model grades were made to evaluate differences in distributions of metals.

The resource estimate is reasonable, honors the geology, and is supported by the geologic model.

#### 14.3.8 Discussion, Qualifications, Risk, and Recommendations

For the Main Zone of the San Rafael deposit, the most important observation that can be presented to the reader is the relatively even distribution of metals, primarily zinc, lead, and silver, within tabular zones that for the most part occur along the volcanic/limestone contact. The recent infill drilling provided increased confidence in the continuity of the mineralization. Additional infill drilling is not expected to materially change the currently defined Main Zone resource. The step-out drilling completed by Scorpio has extended mineralization approximately 250m to the northeast, though the mineral system appears to be weakening.

The 120 Zone silver-copper-gold mineralization occurs within skarn-altered limestone as bedding horizons and irregular zones along intrusive contacts. The 120 Zone is more variable, both in geology and mineral grades, than the Main Zone mineralization. Further definition of the 120 Zone will require more closely spaced drilling. This additional drilling combined with more density measurements is recommended to bring greater confidence to the interpretation of this mineralization. The 120 Zone is open at depth to the east and northeast. Mining of the deeper portions of the 120 Zone will likely require underground mining methods, due to the orientation and depth of mineralization.

The Upper Zone is primarily silver-gold mineralization within a number of small tabular zones sub-parallel to and within the hanging wall of the Main Zone. The Upper Zone is more erratic than the Main Zone, though the recent drilling has provided greater confidence in the continuity of mineralization and the lithologic interpretation. Additional drilling is not expected to materially change the Upper Zone resource.

The depth of oxidation is generally shallow, though in the northeast portion of the deposit, oxidation can reach up to 200m downdip. Zinc mineralization is strongly leached within the oxide and there are uncertainties as to metallurgical recoveries and processing costs associated with the oxide mineralization. Further work is needed to better characterize the oxide material.

### 14.4 El Cajón Resource Estimate

The El Cajón drill-hole assay database, including data within the Silvia Maria concession, contains 3,995 silver assays, 3,976 copper assays, 3,707 gold assays, 2,658 zinc assays, and 2,597 lead assays (listed in order of each metal's economic importance). The zinc and lead metal component was not considered to be economically significant and was therefore not estimated.

All of the El Cajón sample data, including all data within the Silvia Maria concession, were used in developing the El Cajón models, estimating the resource, and determining resource classification. However, the reported resource estimate for El Cajón specifically excludes all mineralization within the Silvia Maria concession.

For the previous 2008 and 2009 resource estimates, MDA had audited the drill data, analyzed QA/QC data, made two site visits, and collected samples of drill core from the deposit. For the current 2012 estimation update, no additional site visits or sampling were conducted by MDA because the 2012 drill program was fairly limited and did not target new geographic areas or encounter unique geologic features.

The work done by MDA for the 2012 resource estimate includes modifying the 2009 El Cajón geologic model and subsequent mineral-domain models. The silver, copper, and gold mineral-domain models were largely defined by the geology in conjunction with assay grades and formed the basis of the resource models described and reported in this document.

The El Cajón resources reported here are based on Scorpio's database as of July 20, 2012. The effective date of the El Cajón resource estimate is September 7, 2012.

### 14.4.1 Procedures

Upon completion of the database validation process, MDA modified the 2009 geologic cross-sections which are evenly spaced on 25m intervals looking northwest at 330°. Individual sets of sections were created for silver, copper, gold, and percent sulfide. Low-, mid-, and high-grade domains were modeled for each of the three metals independently, and low- and high-grade domains were modeled for percent sulfide. The cross-sectional domains were sliced to long section on 3m intervals, to coincide with the center of each row of blocks in the model. After reinterpretation, the long section domains were used to code the block model to percent of block in each mineral domain.

The cross-sectional mineral domains for the three metals were used to code the samples. Quantile plots were made to assess validity of these domains and to determine capping levels; MDA capped 22 samples (6 gold, 11 silver, and 5 copper). Compositing was done to 3m down-hole lengths, matching the model block size, honoring all material-type and mineral-domain boundaries. The sulfide domains were used by MDA to assign density values, ranging from 2.95g/cm$^3$ to 3.23g/cm$^3$, to the blocks.

The reported estimates were made using inverse distance to the second power; ordinary kriging and nearest neighbor estimates were used for comparison and validation. MDA classified the El Cajón resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding and use of the geology.

### 14.4.2 Geologic Background

Silver, copper, and gold mineralization at El Cajón is associated with disseminated sulfide mineralization in a proximal skarn setting along the east and north sides of a diorite intrusion. The deposit lies primarily within the garnet-pyroxene skarn-altered limestone country rock, with minor contact-related endoskarn alteration and mineralization within the diorite. The "minor" mineralization in the diorite occurs within a rind of endoskrn diorite at the diorite contact that can reach up to 10m thick; the rind is locally absent, and the diorite contact is sharp in those places. The diorite/limestone contact and associated skarn alteration/mineralization can be very irregular as is typical of many proximal skarn deposits. The skarn contacts with the unmineralized diorite or limestone can be very sharp, with the transition from unmineralized rock to sulfide skarn occurring within less than one-half meter.

Preferentially-mineralized horizons do occur within the limestone, and more tabular zones of skarn mineralization can be found up to 250m away from the diorite contact. As an example of this deposit type, the new La Emma zone mineralization, encountered by Scorpio 200m east of the diorite, is interpreted as mineralization along a favorable skarn horizon that is possibly localized within a north-west structural trend.

Mineralization does not extend down into the medium- to coarse-grained granodiorite intrusion that underlies much of the El Cajón deposit. The granodiorite is interpreted to be part of the regional Sinaloa Batholith that is the basement rock for much of the district.

Overall, the El Cajón deposit as currently defined is roughly oval in plan view, extending 550m east-west and 400m north-south. Internally the mineralization is aligned along the general 330° strike and 20°NE dip of the limestone country rock. The deposit has an elevation range of over 200m along the intrusive contact. Metal deposition is associated with generally 2% to 5% disseminated sulfides.

The eastern boundary of the Silvia Maria concession, which Scorpio does not control, cuts the deposit, resulting in only the southeast portion of the deposit being included within the current Scorpio mineral resource.

### 14.4.3 Geologic Model

Upon completion of the database validation process, MDA modified the 2009 geology cross sections, which are evenly spaced on 25m intervals looking northwest at 330°. The drill-hole information, including lithology and silver, copper, and gold grades, along with the topographic surface, were plotted on the cross sections. Individual sets of sections were either modified or re-created for each of silver, copper, gold, and percent sulfide.

Quantile plots of silver, copper, gold, and percent sulfide were made to help define the natural populations of metal grades to be modeled on the sections. The analytical population breaks indicated on the quantile plots were used to guide the creation of distinct low-, mid-, and high-grade mineral domains, which controlled grade estimation and density. Table 14.22 shows the assay population grade ranges associated with each mineral domain.

**Table 14.22 El Cajón Assay Populations**

| Metal | Low-Grade | Mid-Grade | High-Grade |
|---|---|---|---|
| Ag (g/t) | ~ 15 -75 | ~ 75 - 250 | > 250 |
| Cu (%) | ~ 0.05 - 0.28 | ~ 0.28 - 1.30 | > 1.3 |
| Au (g/t) | ~ 0.15 - 0.3 | ~ 0.3 - 1.0 | > 1.0 |
| sulfide (%) | ~ 2 - 6 | > 6 | |

MDA used a combination of geology and logged sulfide percentages to model the percent sulfide domains. Silver, copper, and gold, using the geology and percent sulfide as a guide, were each modeled separately. The mineral domains as modeled and drawn on the cross-sections are not strict grade shells but are created using geologic information such as orientation, geometry, lithologic contacts, and continuity. Each of these domains represents a distinct style of mineralization with unique statistical characteristics. While all metals are globally spatially related, they are not necessarily locally spatially related, thereby requiring separate domains for each metal. Table 14.23 presents a list of mineral domains and materials defined for this model.

**Table 14.23 Coding and Description of the El Cajón Geologic Model**

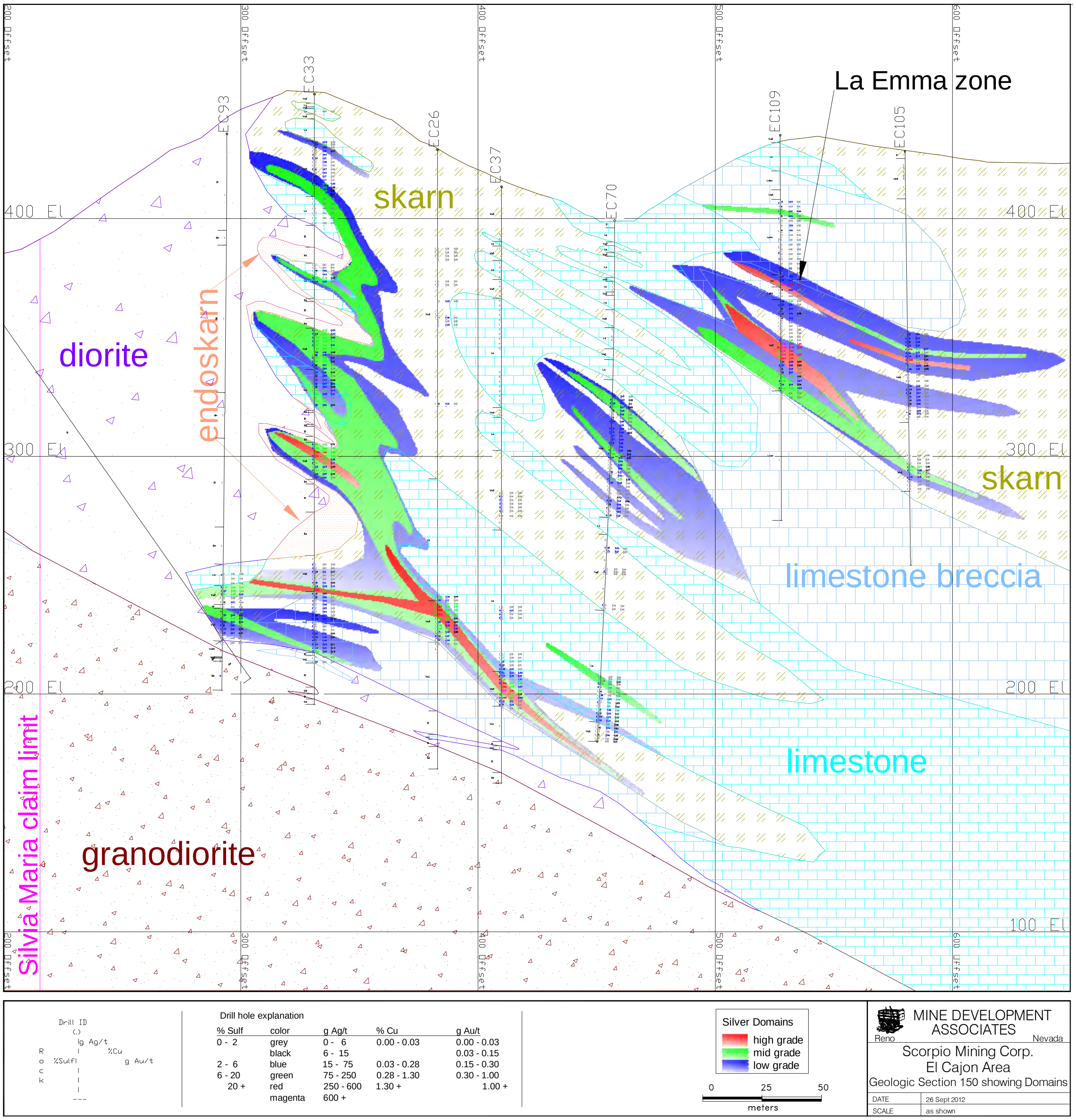
| Domain Code | Description |
|---|---|
| **100** | Primarily low-grade silver, copper, and gold and low sulfide; each element modeled independently. Characterized by weak to moderate skarn alteration within bedding horizons and peripheral to intrusive contacts. |
| **200** | High-grade sulfide, and mid-grade silver, copper, and gold; each modeled independently. Characterized by moderate to strong skarn alteration within favorable horizons and along the intrusive contact. |
| **300** | High-grade silver, copper, and gold; each modeled independently. Localized strong skarn alteration/mineralization dominantly proximal to the intrusive contact though isolated zones occur within favorable horizons. |

PRG, in 2008 and 2009, and Scorpio did not sample or assay material that was not visibly mineralized, and in most cases, the discontinuous sampling indicates sharp geologic transitions from mineralized to generally unaltered, unmineralized country rock. In these instances, the grade-domain boundaries are accurately located at these transitions. There are places within the deposit, though, where the low-grade boundary is at an “artificial” location created solely by an absence of sample data and not based on an obvious geologic transition. Additional sampling might represent an opportunity to increase the size of the low-grade mineral domains, leading to a potential increase in the resource.

The cross-sectional models were sliced to long section on 3m intervals to coincide with the block-model block size in that direction. The sliced sections were reinterpreted on those 3m intervals, and these were used to code the block model to percent of block in each mineral domain.

A typical cross section of the El Cajón geologic model with the silver mineral domains is given in Figure 14.12.

**Figure 14.12 Section 150 El Cajón Geologic Model with Silver Domains**



### 14.4.4 Sample Coding and Compositing

The three (silver, copper, and gold) digitized sets of mineral domains were used to code the samples. Quantile plots were made to assess validity of these domains and to determine capping levels for the mineral domain populations. MDA also used global zone statistics and spatial location of higher grades to determine capping levels. After these analyses, MDA chose to cap 22 high-grade samples (6 gold, 11 silver, and 5 copper) which MDA believe are not representative of their domain populations and which could have an undesirable effect on grade estimation. Assay descriptive statistics, including the capping levels and the effects of capping on the assay statistics, are presented in Table 14.24.

**Table 14.24 El Cajón Mineral Domain Assay Descriptive Statistics**

**Silver Assays - El Cajon**

| Gold Domain | Assays | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV* | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|---|
| **100** | Ag | 1148 | 30.0 | 23.0 | 24.8 | 0.83 | 0.50 | 385.0 |
| | Ag Cap | 1148 | 29.8 | 23.0 | 22.9 | 0.77 | 0.50 | 200.0 |
| **200** | Ag | 681 | 131.7 | 113.0 | 94.3 | 0.72 | 1.00 | 1030.0 |
| | Ag Cap | 681 | 130.1 | 113.0 | 83.0 | 0.64 | 1.00 | 600.0 |
| **300** | Ag | 218 | 484.8 | 380.0 | 373.5 | 0.77 | 3.00 | 2510.0 |
| | Ag Cap | 218 | 475.7 | 380.0 | 330.4 | 0.70 | 3.00 | 1800.0 |
| ***All*** | *Ag* | *2047* | *110.8* | *48.0* | *190.0* | *1.72* | *0.50* | *2510.0* |
| | *Ag Cap* | *2047* | *109.2* | *48.0* | *177.6* | *1.63* | *0.50* | *1800.0* |

**Gold Assays - El Cajon**

| Gold Domain | Assays | Count | Mean (g Au/t) | Median (g | Std. Dev. | CV* | Min. (g Au/t) | Max. (g Au/t) |
|---|---|---|---|---|---|---|---|---|
| **100** | Au | 537 | 0.178 | 0.169 | 0.090 | 0.502 | 0.003 | 0.779 |
| | Au Cap | 537 | 0.178 | 0.169 | 0.086 | 0.482 | 0.003 | 0.500 |
| **200** | Au | 324 | 0.508 | 0.464 | 0.239 | 0.471 | 0.007 | 1.485 |
| | Au Cap | 324 | 0.508 | 0.464 | 0.236 | 0.465 | 0.007 | 1.300 |
| **300** | Au | 32 | 1.637 | 1.335 | 1.080 | 0.660 | 0.065 | 6.050 |
| | Au Cap | 32 | 1.507 | 1.335 | 0.643 | 0.426 | 0.065 | 3.000 |
| ***All*** | *Au* | *893* | *0.349* | *0.236* | *0.389* | *1.116* | *0.003* | *6.050* |
| | *Au Cap* | *893* | *0.344* | *0.236* | *0.337* | *0.980* | *0.003* | *3.000* |

**Copper Assays - El Cajon**

| Copper Domain | Assays | Count | Mean (%Cu) | Median (%Cu) | Std. Dev. | CV* | Min. (%Cu) | Max. (%Cu) |
|---|---|---|---|---|---|---|---|---|
| **100** | Cu | 1183 | 0.126 | 0.110 | 0.086 | 0.678 | 0.002 | 0.600 |
| | Cu Cap | 1183 | 0.126 | 0.110 | 0.086 | 0.678 | 0.002 | 0.600 |
| **200** | Cu | 669 | 0.539 | 0.47 | 0.3306 | 0.613 | 0.005 | 3.54 |
| | Cu Cap | 669 | 0.536 | 0.47 | 0.3119 | 0.581 | 0.005 | 2 |
| **300** | Cu | 95 | 2.208 | 1.75 | 1.544 | 0.699 | 0.45 | 10.400 |
| | Cu Cap | 95 | 2.074 | 1.75 | 0.953 | 0.46 | 0.45 | 5.000 |
| ***All*** | Cu | 1947 | 0.365 | 0.182 | 0.600 | 1.644 | 0.002 | 10.400 |
| | Cu Cap | 1947 | 0.357 | 0.182 | 0.513 | 1.435 | 0.002 | 5.000 |

* Coefficient of Variation (Std.Dev. / Mean)

The capped assays were composited to 3m down-hole lengths (the model block height), honoring all material-type and mineral-domain boundaries. The volume inside each mineral domain was estimated using only composites from inside that domain. Composite descriptive statistics are presented in Table 14.25.

**Table 14.25 El Cajón Mineral Domain Composite Descriptive Statistics**

**Ag Composites - El Cajon**

| Silver Domain | Count | Mean (g Ag/t) | Median (g Ag/t) | Std. Dev. | CV* | Min. (g Ag/t) | Max. (g Ag/t) |
|---|---|---|---|---|---|---|---|
| 100 | 699 | 29.6 | 25.9 | 18.20 | 0.606 | 3.0 | 130.6 |
| 200 | 416 | 133.1 | 117.8 | 67.80 | 0.492 | 4.0 | 600.0 |
| 300 | 136 | 490.5 | 402.2 | 292.70 | 0.569 | 98.5 | 1800.0 |
| All | 1251 | 114.1 | 51.0 | 174.60 | 1.496 | 3.0 | 1800.0 |

**Au Composites - El Cajon**

| Gold Domain | Count | Mean (g Au/t) | Median (g Au/t) | Std. Dev. | CV* | Min. (g Au/t) | Max. (g Au/t) |
|---|---|---|---|---|---|---|---|
| 100 | 341 | 0.179 | 0.176 | 0.065 | 0.360 | 0.035 | 0.386 |
| 200 | 208 | 0.514 | 0.482 | 0.195 | 0.367 | 0.032 | 1.254 |
| 300 | 24 | 1.497 | 1.327 | 0.562 | 0.368 | 0.969 | 3.000 |
| All | 573 | 0.356 | 0.237 | 0.334 | 0.923 | 0.032 | 3.000 |

**Cu Composites - El Cajon**

| Copper Domain | Count | Mean (%Cu) | Median (%Cu) | Std. Dev. | CV* | Min. (%Cu) | Max. (%Cu) |
|---|---|---|---|---|---|---|---|
| 100 | 713 | 0.130 | 0.110 | 0.070 | 0.554 | 0.010 | 0.450 |
| 200 | 411 | 0.540 | 0.480 | 0.240 | 0.443 | 0.040 | 1.770 |
| 300 | 65 | 2.110 | 1.790 | 0.890 | 0.411 | 0.890 | 5.000 |
| All | 1189 | 0.380 | 0.200 | 0.530 | 1.370 | 0.010 | 5.000 |

* Coefficient of Variation (Std.Dev. / Mean)

### 14.4.5 Density

There are a total of 535 density measurements in the El Cajón resource area. All of the density data are from PRG's 2007 and 2008 drill program; no additional density measurements were collected by Scorpio. The following discussion is taken from the 2009 technical report.

MDA reviewed all of the density data, and after eliminating five of these samples as being outliers or improbable, there were 530 samples used for this analysis. These data were then coded by the percent sulfide mineral domains and statistical values were determined for each grouping. Table 14.26 shows the results of the analysis. Due to potential sample collection bias (the use of whole solid core versus fractured, possibly less-dense core), MDA lowered the mean values of each group by approximately 1% for use in the current resource estimate. The density values used in the estimate are shown in the "Model Density" column in Table 14.26.

**Table 14.26 List of Density Values Used in El Cajón Model**

| Sulfide Zone | Valid N | Median | Mean | Std. Dev. | Minimum | Maximum | Model SG |
|---|---|---|---|---|---|---|---|
| Outside Sulfide (<2%) | 141 | 2.94 | 3.00 | 0.28 | 2.42 | 3.65 | **2.95** |
| Low Sulfide (2% - 6%) | 241 | 3.24 | 3.19 | 0.26 | 2.57 | 3.67 | **3.16** |
| High Sulfide (>6%) | 147 | 3.27 | 3.26 | 0.27 | 2.57 | 3.86 | **3.23** |
| All Groups | 530 | 3.20 | 3.16 | 0.28 | 2.42 | 3.86 | |

The El Cajón density measurements are all from core drill holes located within the center of the skarn deposit. Various rock types were sampled, though the lack of spatial variability raises the possibility that the current density values do not accurately represent the weakly skarned and/or mineralized material along the outer portions of the deposit. A more comprehensive density model is warranted.

### 14.4.6 Resource Model and Estimation

The resource block model reflects the distribution of metal grades occurring as irregular bodies within the immediate contact-related proximal skarn and also as more regular, tabular horizons within the limestone country rock. The resource has been estimated using the assay data from 80 core holes and 17 RC holes. The estimation used three search passes. All of the search passes were oriented similar to the general bedding orientation of the country rock, and in all cases the minor search distance was one third the major and semi-major distance. Mineral domains aid in controlling the grade distribution, and the estimation used inverse distance to the second power ("$ID^2$") to interpolate grades into the domains. Ordinary kriging and nearest neighbor estimates were also made as checks on the $ID^2$ estimate. To aid in determining search distances, variograms for each metal were made in numerous orientations and at various lag lengths. MDA attempted to develop variogram profiles for each domain but found that the data were inadequate to construct usable variogram models. The variograms for the combined domains could be sufficiently modeled to aid in determining search distances for each of the estimation passes. The estimation parameters are listed in Table 14.27.

**Table 14.27 El Cajón: Estimation Parameters**

| Description | Parameter |
|---|---|
| **SEARCH ELLIPSOID PARAMETERS: All Metals** | |
| Samples: minimum/maximum/maximum per hole (all searches) | 1 / 9 / 3 |
| Search Bearing/Plunge/Tilt (all searches) | $330^{o}$ / $10^{o}$ / $-25^{o}$ |
| First Pass Search (m): major/semimajor/minor | 40/ 40 /13 |
| Second Pass Search (m): major/semimajor/minor | 100/ 100/ 33 |
| Third Pass Search (m): major/semimajor/minor | 200/ 200 / 67 |

### 14.4.7 Mineral Resources

MDA classified the El Cajón resources by a combination of distance to the nearest sample and the number of samples, while at the same time taking into account reliability of underlying data and understanding of the geology. The samples used for the classification criteria stated below are from compositing across any of the modeled metal domains. The criteria for resource classification are given in Table 14.28. All of the El Cajón sample data, including all data within the Silvia Maria concession not controlled by Scorpio, were used in resource classification, although the stated resource discussed below specifically excludes all mineralization within the Silvia Maria concession. There are no Measured resources at El Cajón at this time because a) the QA/QC data are predominantly blanks and standards, with limited duplicate check samples, b) there is apparent contamination in some of the pre-2012 blanks, and c) there are some geologic uncertainties as to spatial location of the lithologic units and corresponding mineralization. None of these deter from the overall confidence in the global project resource estimate, but they do detract from confidence in some of the accuracy which MDA requires for a Measured resource. The resource classification would likely rise if those issues listed above are resolved.

**Table 14.28 Criteria for El Cajón Resource Classification**

| | |
|---|---|
| **No Measured resource** | |
| **Indicated** | |
| Minimum no. of samples /minimum no. of holes / maximum distance m) | 2 / 1 / 15 or 4 / 2 / 30 |
| **All material not classified above but lying within the modeled mineralized domains is Inferred** | |

Because of the requirement that the resource exists "in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction," MDA is reporting the resources at cutoff grades that are reasonable for deposits of this nature that will be mined by underground methods. As such, some economic considerations were used to determine cutoff grades at which the resource is presented. MDA considered reasonable metal prices and extraction costs and recoveries, in a general sense, and then factoring those down to account for that material which would become ore using internal cutoffs.

The El Cajón reported resources, excluding the Silvia Maria concession, are shown in Table 14.29 while the total El Cajón resources are tabulated in Table 14.30. The stated resource is fully diluted to 3m by 3m by 3m blocks and is tabulated on a AgEq cutoff grade of 60g AgEq/t. All material, regardless of which metal is present and which is absent, is tabulated. Because multiple metals exist, but do not necessarily co-exist on a local scale, the AgEq grade is used for tabulation. Using the individual metal grades of each block, the AgEq grade is calculated using the following formula:

g AgEq/t = g Ag/t + (77.142857* %Cu) + (54.166667* g Au/t)

This formula is based on prices of US$24.00 per ounce silver, US$2.70 per pound copper, and US$1,300.00 per ounce gold. No metal recoveries are applied, as this is the *in situ* resource. A typical cross section of the El Cajón block model with the AgEq block grades are given in Figure 14.13.

**Table 14.29 El Cajón Reported Resources**

**Indicated Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 60.00 | 2,597,000 | 149.1 | 0.48 | 0.21 | 12,451,000 | 27,742,000 | 18,000 | 198.1 |

**Inferred Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 60.00 | 850,000 | 121.8 | 0.41 | 0.17 | 3,331,000 | 7,679,000 | 5,000 | 162.4 |

## Table 14.30 El Cajón Total Resource Excluding Silvia Maria Concession - AgEq Tabulation

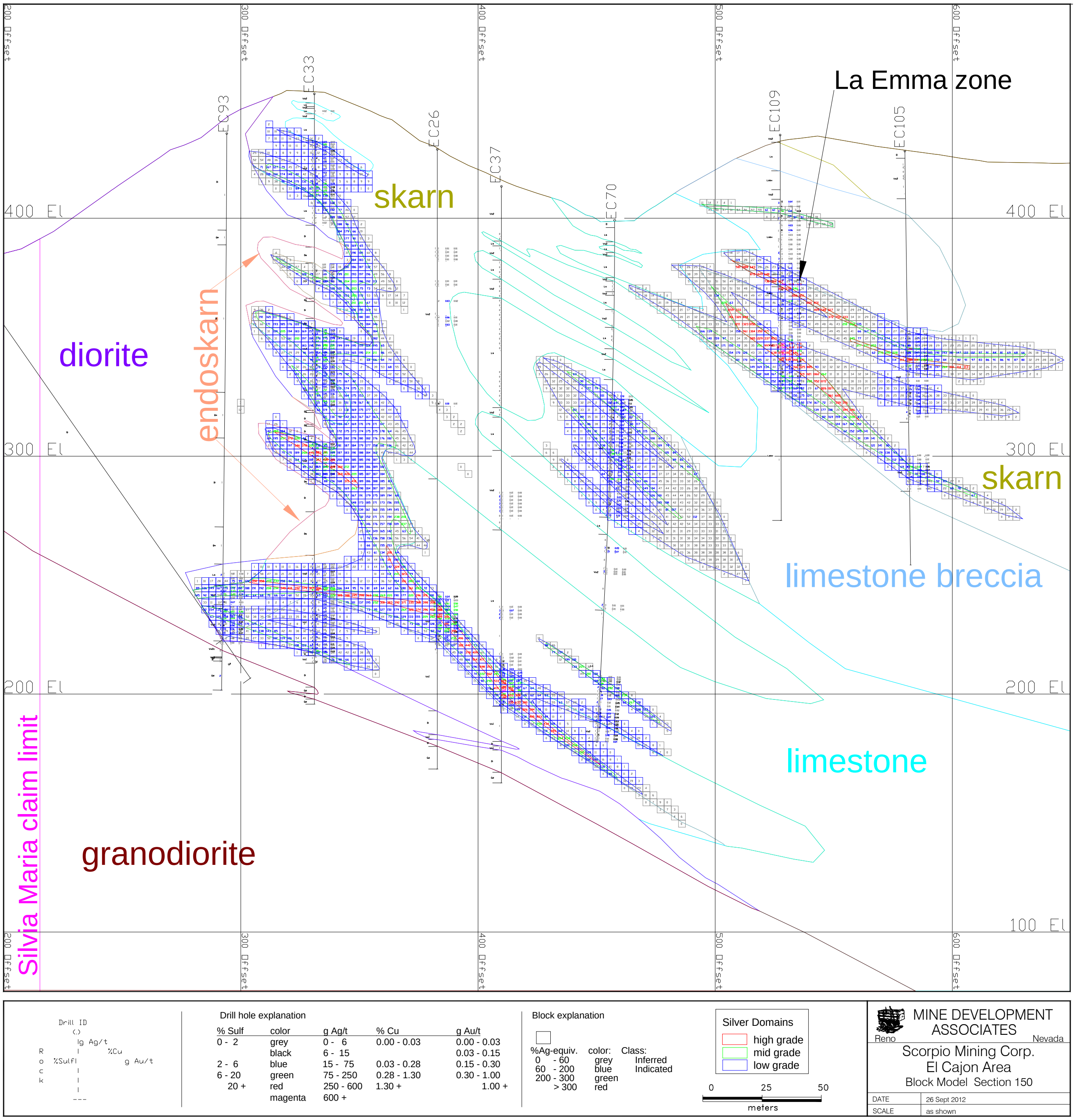
**Indicated Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 50.00 | 2,877,000 | 138.5 | 0.45 | 0.20 | 12,810,000 | 28,708,000 | 18,000 | 184.1 |
| 54.00 | 2,748,000 | 143.2 | 0.47 | 0.21 | 12,653,000 | 28,282,000 | 18,000 | 190.3 |
| 58.00 | 2,644,000 | 147.2 | 0.48 | 0.21 | 12,516,000 | 27,911,000 | 18,000 | 195.6 |
| **60.00** | **2,597,000** | **149.1** | **0.48** | **0.21** | **12,451,000** | **27,742,000** | **18,000** | **198.1** |
| 62.00 | 2,552,000 | 150.9 | 0.49 | 0.22 | 12,386,000 | 27,573,000 | 18,000 | 200.5 |
| 66.00 | 2,472,000 | 154.3 | 0.50 | 0.22 | 12,265,000 | 27,254,000 | 18,000 | 204.9 |
| 70.00 | 2,391,000 | 157.9 | 0.51 | 0.23 | 12,135,000 | 26,917,000 | 17,000 | 209.6 |
| 80.00 | 2,225,000 | 165.6 | 0.53 | 0.24 | 11,840,000 | 26,170,000 | 17,000 | 219.7 |
| 90.00 | 2,087,000 | 172.4 | 0.55 | 0.25 | 11,563,000 | 25,456,000 | 17,000 | 228.6 |
| 100.00 | 1,957,000 | 179.1 | 0.57 | 0.26 | 11,270,000 | 24,711,000 | 16,000 | 237.4 |
| 110.00 | 1,834,000 | 186.00 | 0.59 | 0.27 | 10,965,000 | 23,932,000 | 16,000 | 246.30 |
| 120.00 | 1,713,000 | 193.10 | 0.61 | 0.28 | 10,638,000 | 23,118,000 | 15,000 | 255.50 |
| 130.00 | 1,595,000 | 200.50 | 0.63 | 0.29 | 10,285,000 | 22,263,000 | 15,000 | 265.20 |
| 140.00 | 1,471,000 | 209.10 | 0.66 | 0.31 | 9,886,000 | 21,272,000 | 14,000 | 276.30 |
| 150.00 | 1,353,000 | 218.10 | 0.68 | 0.32 | 9,483,000 | 20,257,000 | 14,000 | 287.70 |
| 160.00 | 1,224,000 | 229.10 | 0.71 | 0.34 | 9,017,000 | 19,037,000 | 13,000 | 301.60 |
| 200.00 | 765,000 | 289.80 | 0.83 | 0.41 | 7,127,000 | 14,026,000 | 10,000 | 375.90 |

**Inferred Resource:**

| Cutoff g AgEq/t | Tonnes | Silver (g Ag/t) | Copper (%) | Gold (g Au/t) | Silver (oz) | Copper (lbs) | Gold (oz) | AgEq g/t |
|---|---|---|---|---|---|---|---|---|
| 50.00 | 1,053,000 | 106.2 | 0.36 | 0.14 | 3,594,000 | 8,362,000 | 5,000 | 141.7 |
| 54.00 | 956,000 | 113.0 | 0.38 | 0.15 | 3,473,000 | 8,054,000 | 5,000 | 150.9 |
| 58.00 | 891,000 | 118.2 | 0.40 | 0.16 | 3,389,000 | 7,832,000 | 5,000 | 157.7 |
| **60.00** | **850,000** | **121.8** | **0.41** | **0.17** | **3,331,000** | **7,679,000** | **5,000** | **162.4** |
| 62.00 | 824,000 | 124.3 | 0.42 | 0.17 | 3,294,000 | 7,577,000 | 4,000 | 165.7 |
| 66.00 | 777,000 | 129.1 | 0.43 | 0.18 | 3,224,000 | 7,389,000 | 4,000 | 171.9 |
| 70.00 | 733,000 | 133.9 | 0.45 | 0.18 | 3,157,000 | 7,201,000 | 4,000 | 178.0 |
| 80.00 | 652,000 | 143.7 | 0.48 | 0.19 | 3,013,000 | 6,847,000 | 4,000 | 190.9 |
| 90.00 | 584,000 | 153.1 | 0.50 | 0.21 | 2,877,000 | 6,502,000 | 4,000 | 203.2 |
| 100.00 | 526,000 | 162.2 | 0.53 | 0.22 | 2,746,000 | 6,181,000 | 4,000 | 215.1 |
| 110.00 | 474,000 | 171.6 | 0.56 | 0.23 | 2,615,000 | 5,861,000 | 4,000 | 227.3 |
| 120.00 | 427,000 | 181.0 | 0.59 | 0.24 | 2,486,000 | 5,544,000 | 3,000 | 239.7 |
| 130.00 | 387,000 | 190.20 | 0.62 | 0.26 | 2,364,000 | 5,259,000 | 3,000 | 251.70 |
| 140.00 | 351,000 | 199.20 | 0.64 | 0.27 | 2,249,000 | 4,988,000 | 3,000 | 263.50 |
| 150.00 | 317,000 | 209.00 | 0.67 | 0.28 | 2,132,000 | 4,706,000 | 3,000 | 276.20 |
| 160.00 | 284,000 | 219.80 | 0.71 | 0.30 | 2,007,000 | 4,425,000 | 3,000 | 290.30 |
| 200.00 | 169,000 | 278.20 | 0.90 | 0.36 | 1,512,000 | 3,340,000 | 2,000 | 366.80 |

**Figure 14.13 Section 150 El Cajón Block Model: AgEq Block Grades**



Checks were made on the El Cajón resource model in the following manner:

- Block-model information, such as metal grade and geology coding, number of samples, and classification, was checked visually on the computer by domain and lithology on sections and long-sections;
- Cross-section volumes to long-section volumes to block-model volumes were checked;
- Nearest-neighbor and ordinary kriging models were made for comparison;
- A simple polygonal model was made with the original modeled section domains; and
- Normal-quantile distribution plots of assays, composites, and block-model grades were made to evaluate differences in distributions of metals.

The resource estimate is reasonable, honors the geology, and is supported by the geologic model.

### 14.4.8 Discussion, Qualifications, Risk, Upside, and Recommendations

For the El Cajón deposit, the most important observation that can be presented to the reader is the spatial and mineral grade variability within the proximal skarn along the immediate diorite/limestone contact, a situation typical of many skarn deposits. Moving away from the intrusive contact, mineralization is more evenly distributed within tabular, bedding-related bodies. This latter style of mineralization is similar in morphology and metal content to the 120-Zone mineralization within the near-by San Rafael deposit. Though the El Cajón bedding-related mineralization is generally of lesser grade than in the proximal skarn, the new La Emma drill intercepts indicate that high-grade mineralization can be encountered away from the immediate intrusive contact.

It is expected that additional drilling will increase the size of the estimated resource. There is potential for additional mineralization to the east down dip within the limestone, following up on the La Emma zone mineralization, and to the south and east along the diorite contact. Additional infill drilling and QA/QC work is recommended to bring greater confidence to the interpretation of the mineralization and increase the resource classification.

# 15.0 MINERAL RESERVE ESTIMATES

While this Technical Report includes a PEA which includes mining at Nuestra Señora, El Cajón, and San Rafael, Proven and Probable reserves have been defined for Nuestra Señora only. The El Cajón and San Rafael deposits have not been studied to the level of detail necessary for reporting reserves at this time. The effective date of the Nuestra Señora reserves is December 31, 2012.

The Proven and Probable reserves for Nuestra Señora have been calculated based on underground development and stope designs created by MDA. Net smelter return ("NSR") values were determined for each block using only Measured and Indicated material. All Inferred material was considered to be waste with no value or metal content. Designs were created based on a NSR cutoff of $60/t. Reserves calculations are based on the total tonnage of material inside of the final designs and include internal dilution. Ore loss and external dilution have also been considered for the reporting of reserves.

The following sections provide details on the assumptions and design criteria used for reporting of Proven and Probable reserves.

## 15.1 Mining Model Depletion

The effective date of the reserves is December 31, 2012. MDA resources have been depleted based on the end-of-October 2012 solids and adjusted for the end of the year 2012. End-of-year adjustments assume that a major portion of mining in November and December 2012 was done outside of the current resources in upper areas of the mine. Much of the December 2012 feed to the plant was from stockpile rehandle.

## 15.2 Economic Parameters and NSR Calculation

The Nuestra Señora process plant produces three different concentrates: 1) zinc; 2) copper; and 3) lead. Each concentrate is transported to separate buyers, and the cost / revenue parameters for each concentrate is set out in contracts between the buyers and Scorpio. Revenue is generated from the contained zinc, copper, and lead as well as silver, which reports to all three concentrates.

The following parameters were used to calculate an NSR value for each individual concentrate type; the three results were then combined into a single NSR value. The NSR value considers revenues from sellable metals less the costs for treatment, penalties, marketing, and refining.

Metal prices used are shown in Table 15.1. The prices provided by Scorio were the prices currently being used for budget purposes. MDA finds these prices to be reasonable with respect to current market conditions and Scorpio's operating experience. It should be noted that the copper prices do fluctuate a fair amount, and the $3.40/lb Cu price may be considered on the high side for some projects. However, at this time the current Nuestra Señora reserves have a relatively short mine life (approximately one year), which makes the use of prices near current copper pricing reasonable.

**Table 15.1 Metal Prices**

| Metal Prices | | |
|---|---|---|
| Silver | $ 25.00 | $/oz Ag |
| Zinc | $ 0.85 | $/lb Zn |
| Copper | $ 3.40 | $/lb Cu |
| Lead | $ 0.90 | $/lb Pb |

The smelter parameters shown in Table 15.2 were used in the NSR calculations along with the metal prices. Smelter parameters were provided by Scorpio, based on their smelting and transportation contracts. After mine designs had been completed, the smelting contracts were revised. The revised parameters were used for the final economics. The revised parameters used for the final economic analysis are also shown in Table 15.2. MDA reviewed designs in light of the changes made in the parameters to ensure the statement of reserves remained valid.

**Table 15.2 Smelter Parameters ($/Dry Tonne of Concentrate)**

| | Treatment | Transport | Penalties | Marketing |
|---|---|---|---|---|
| | Used for Design | | | |
| Zinc | $ 160.00 | $ 57.31 | $ 12.00 | $ 11.00 |
| Lead | $ 284.91 | $ 47.44 | $ 12.00 | $ 11.00 |
| Copper | $ 290.00 | $ 57.31 | $ 91.00 | $ 11.00 |
| | Used for Final Economics | | | |
| Zinc | $ 160.00 | $ 67.62 | $ 12.00 | $ 11.00 |
| Lead | $ 337.20 | $ 52.59 | $ 12.00 | $ 11.00 |
| Copper | $ 290.00 | $ 62.97 | $ 91.00 | $ 11.00 |

Reserves anticipate mining by either long-hole stoping or cut-and-fill stoping. These methods are defined in subsequent sections. The estimated cost of long-hole stoping is $15.85/t, and cut-and-fill stoping costs are estimated to be $20.97/t. These costs are based on current costs at Nuestra Señora.

Other operating costs include processing through the Nuestra Señora process plant, technical services, safety and environmental, administration, and ore haulage from the underground mine to the plant. These costs are shown in Table 15.3 and are based on 2012 operating costs experienced at Nuestra Señora.

**Table 15.3 Nuestra Señora Operating Costs**

| NSR Cutoff for Design | | |
|---|---|---|
| Long Hole Mining Cost | 15.85 | $/t |
| Cut and Fill Mining Cost | 20.97 | $/t |
| Process Plant Costs | 10.97 | $/t |
| Process Maintenance | 5.41 | $/t |
| Technical Services | 2.47 | $/t |
| Safety and Environment | 1.79 | $/t |
| Administration | 8.07 | $/t |
| Total Long Hole Cost | 44.56 | $/t |
| Total Cut and Fill Cost | 49.68 | $/t |

A $60/t NSR cutoff grade was used for design of stopes.

## 15.3 Underground Mine Design

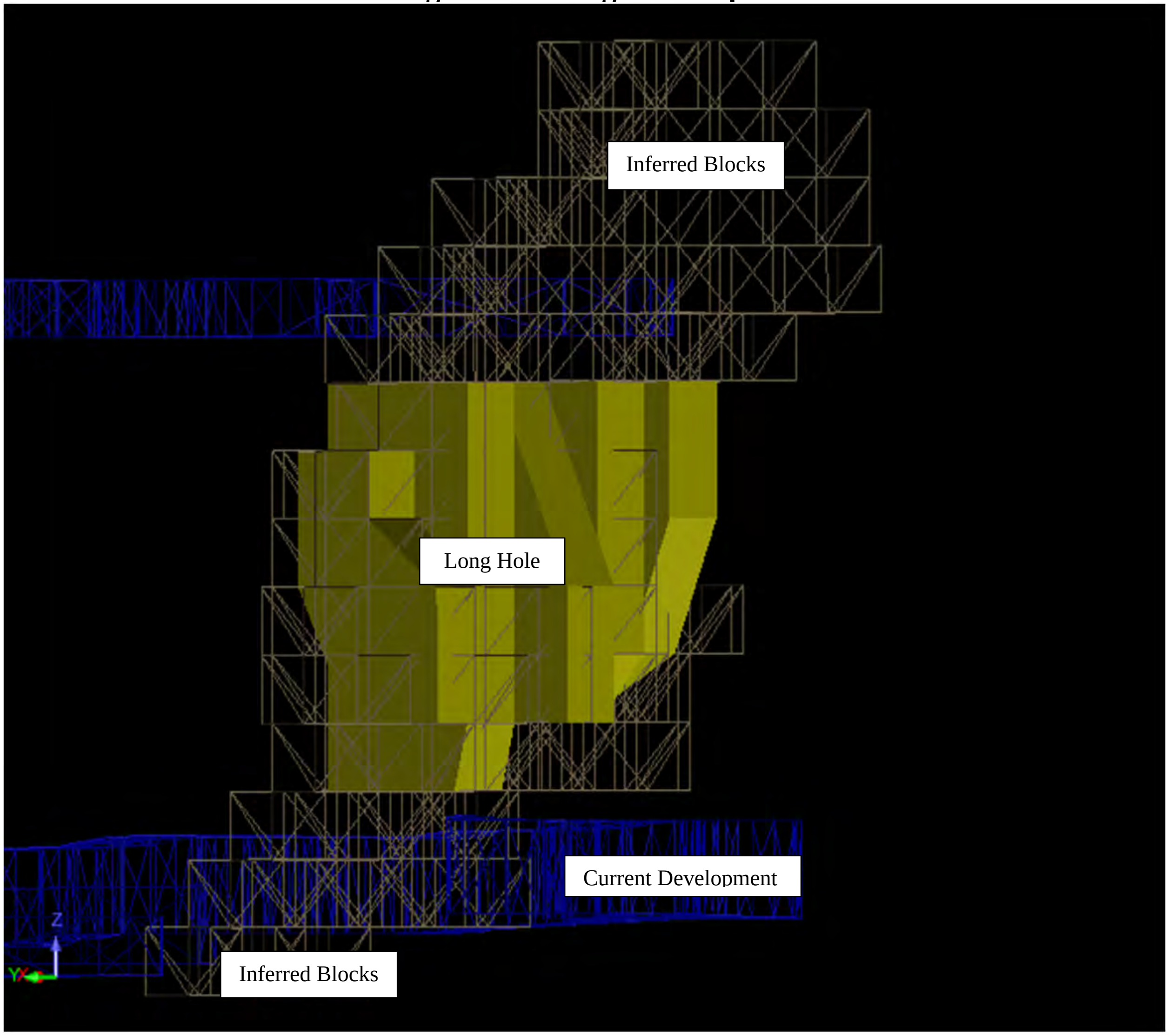
Underground mine design was completed based on the depleted resources. Both long-hole and cut-and-fill stopes were designed to exploit continuous blocks above a $60/t NSR value. Underground development was designed to access each of the designed stopes. Resources too isolated from existing development to be economically accessed were excluded from reserves.

Pillars for geomechanical stability were identified adjacent to current and historic stopes. Some of those pillars contain mineral resources that have been excluded from the reserve estimation.

### 15.3.1 Long-hole stope Design

Stope outlines were digitized based on 5-meter N63E cross-sections and then extruded to form solids. Top sills and bottom sills are included in the designs, and stope heights are kept to a maximum of 15 meters as per current operating practices. Long-hole drilling in larger stope heights might introduce higher internal dilution, especially in areas where low vertical continuity occurs. In this manner, the long-hole stope designs take into account continuity, size, and shape of the ore body. Figure 15.1 shows long-hole stopes at Level 8 (approximate elev. 4730m).

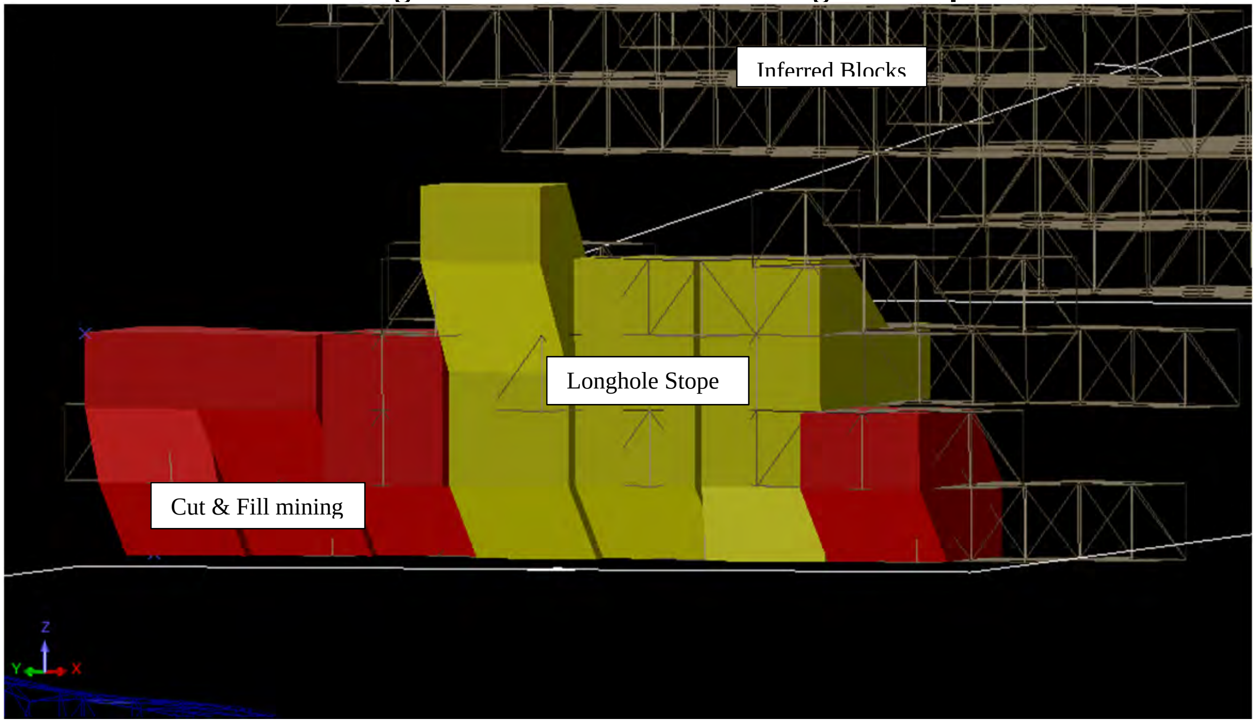
**Figure 15.1 Long-hole Stopes**




### 15.3.2 Cut-and-fill Design

Cut-and-fill is used in mining locations with less-continuous blocks and is also based on 5-meter N63E cross-sections. These locations are either at the end of the long-hole stopes, or they are areas that will be connected to the sills of the long-hole stopes. Cut-and-fill mining areas will require a higher degree of grade control and stoping flexibility due to poor continuity and/or variable width and height of the ore body. Figure 15.2 shows cut-and-fill stopes in red.

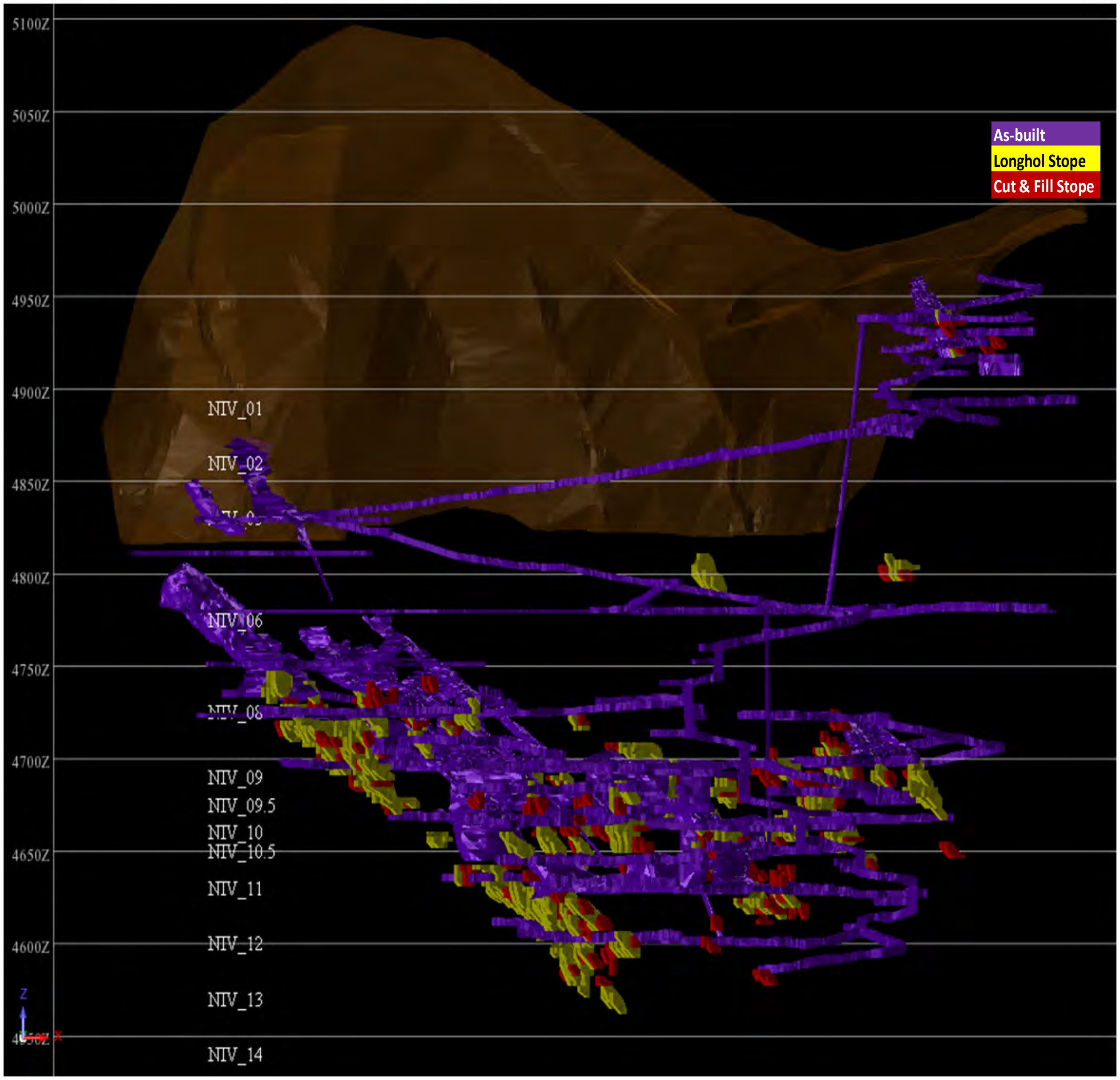
**Figure 15.2 Cut-and-fill and Long-hole Stopes**




### 15.3.3 Underground Development

Additional access will be required to reach the newly designed stopes. In most cases, access will be gained from current development. Main ramps are designed at a maximum gradient of 15%. Main ramps and haulage drifts have a cross-section of 4.5m x 4.5m, which is necessary to accommodate existing equipment.

**Figure 15.3 Long-hole and Cut-and-fill Stopes with Mined Out Areas and Development**



## 15.4 Ore Loss and Dilution

Dilution has been included in the statement of reserves through block dilution, internal dilution, and external dilution.

Block dilution was included through the estimation of the resource model. The resource block model was developed using 3m by 3m by 3m blocks. Estimation was done using grade domains based on digitized polygons. These domains were estimated separately for each metal and then combined into a single value for each metal weighted based on the proportion of the volume for each domain within each block. Thus, the model grades are block diluted to a single grade, which was used for the calculation of reserves.

Internal dilution was included based on the underground designs. The reserves were calculated based on the proportion of blocks contained within each designed stope. The stope designs were made to capture value from continuous blocks above cutoff grade, but some volumes of either waste or material below the NSR cutoff have been included within the stope design in order to capture the greater value of continuous volumes above cutoff grade. MDA has assumed that all of the material from a mined stope will be sent to the process facility, and the waste and sub-grade material constitute internal dilution. Internal dilution by Inferred or undefined material has been added at a zero NSR value and metal content. Internal dilution by Measured and Indicated material includes the NSR value and metal content for definition of reserves.

External dilution is realized through over-break of material beyond stope designs. This has been included using a factor of 35% of the designed volume. This dilution is added using a zero grade for NSR and metal content.

Ore loss occurs where ore grade material cannot be physically mined from its designed stope due to unforeseen curcumstances or misclassification of material during mining. Additionally, because of the complex nature of the ore body, it is inevitable that some ore will go unidentified, and thus unmined. Ore loss has been accounted for using a 35% reduction of mine design volumes.

Of note, the 35% adjustment has been made for external dilution and ore loss to preserve the mine design volumes while reducing metal grades. The 35% factor for dilution and ore loss results in the grades from scheduled production of Proven and Probable reserves better reflecting the grades from recent reconciliation. Thus, MDA considers the 35% adjustment to be reasonable for the definition of reserves.

Depletion has been accounted for by removing blocks within or touching areas that have been mined out. This was done using end of October 2012 solids provided by Scorpio engineers on site and adjustments to the resource for the end of the year 2012. Thus, the Proven and Probable reserves are considered to be effective as of December 31, 2012.

## 15.5 Mineral Reserves

Mineral reserves for the project were developed by applying relevant economic criteria in order to define the economically extractable portions of the resource. MDA developed the reserves to meet NI 43-101 standards. The NI 43-101 standards rely on the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by the CIM council. CIM standards define Proven and Probable Mineral Reserves as:

**Mineral Reserve**

Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

A 'Mineral Reserve' is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

Mineral Reserves are those parts of Mineral Resources which, after the application of all mining factors, result in an estimated tonnage and grade which, in the opinion of the Qualified Person(s) making the estimates, is the basis of an economically viable project after taking account of all relevant processing, metallurgical, economic, marketing, legal, environment, socio-economic and government factors. Mineral Reserves are inclusive of diluting material that will be mined in conjunction with the Mineral Reserves and delivered to the treatment plant or equivalent facility. The term 'Mineral Reserve' need not necessarily signify that extraction facilities are in place or operative or that all governmental approvals have been received. It does signify that there are reasonable expectations of such approvals.

**Probable Mineral Reserve**

A 'Probable Mineral Reserve' is the economically mineable part of an Indicated, and in some circumstances a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

**Proven Mineral Reserve**

A 'Proven Mineral Reserve' is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect potential economic viability.

Proven and Probable reserves have been estimated using only Nuestra Señora Measured and Indicated resources. The estimates use the economic and dilution factors described in the previous sections. Table 15.4 shows the fully diluted Proven and Probable reserves.

**Table 15.4 Nuestra Señora Proven and Probable Reserves**

| | Proven | Probable | Proven & Probable | Internal Dilution | Ore Loss | External Dilution | Fully Diluted Proven & Probable |
|---|---|---|---|---|---|---|---|
| K Tonnes | 89 | 333 | 422 | 111 | 187 | 187 | 533 |
| g Ag/t | 164.5 | 186.6 | 181.9 | 34.0 | 151.0 | - | 98.2 |
| K Oz Ag | 470 | 1,997 | 2,467 | 122 | 906 | - | 1,683 |
| % Zn | 3.29 | 3.14 | 3.17 | 0.77 | 2.67 | - | 1.74 |
| K Lbs Zn | 6,448 | 23,052 | 29,500 | 1,901 | 10,990 | - | 20,411 |
| % Pb | 1.50 | 1.64 | 1.61 | 0.41 | 1.36 | - | 0.88 |
| K Lbs Pb | 2,932 | 12,026 | 14,958 | 1,008 | 5,588 | - | 10,378 |
| % Cu | 0.50 | 0.47 | 0.47 | 0.09 | 0.39 | - | 0.25 |
| K Lbs Cu | 976 | 3,416 | 4,393 | 218 | 1,614 | - | 2,997 |

***Proven and Probable reserves are based on designs using a $60 NSR cutoff grade***

***Dilution includes grades for Measured and Indicated material within designs***

***Dilution also includes internal and external waste tonnage at zero grades***

***A factor of 35% is subtracted for ore loss and added for external dilution to reflect current reconciliation***

## 15.6 Discussion of Reserves

Geology at Nuestra Señora is very complex, and additional economic mineralization not identified in the resource model is expected to be found during delineation drilling. Mining of these areas of additional economic mineralization must be sequenced properly, leaving proper pillars in place, in order to ensure no material impact to the reserves is experienced due to geotechnical or access issues.

As Nuestra Señora ore is currently being processed through the Nuestra Señora plant, it is reasonable to assume that there will be no material impact to the reserves based on the current processing method.

### 15.6.1 Comparison of Measured and Indicated Resources to Proven and Probable Reserves

The 2012 Nuestra Señora Measured and Indicated resources were estimated using data current as of February 2012 and with as-built solids current at the end of June 2012. The reporting cutoff grade was 60 g Ag/t.

Several steps were undertaken to calculate the Nuestra Señora Proven and Probable reserves:

- The starting point was the 2012 Measured and Indicated resources as reported in 2012;
- The resources were depleted to the end of 2012, based on solids received from site;
- Pillars required for geomechanical stability were identified by Scorpio engineers and removed from consideration for mining;
- An NSR value was calculated for all blocks in the model to determine the value of all blocks;
- A $60 NSR cutoff grade was selected as the basis for stope design and applied for reserve calculations (The resource model used a 60g AgEq/t cutoff);
- Underground stope designs were created in sections spaced at 5m intervals using Measured and Indicated blocks above cutoff;
- Partial blocks touching the October 2012 end-of-month solid were removed due to lack of confidence in the amount of material that remained within those blocks;
- Proven and Probable reserves were calculated based on the material inside of the designed stopes.

The process described above created a low conversion rate of resources to reserves. The largest difference is due to the change in cutoff grade from resource to reserve reporting. The following reasons account for some of the resources being removed from consideration as reserves in a sequential manner:

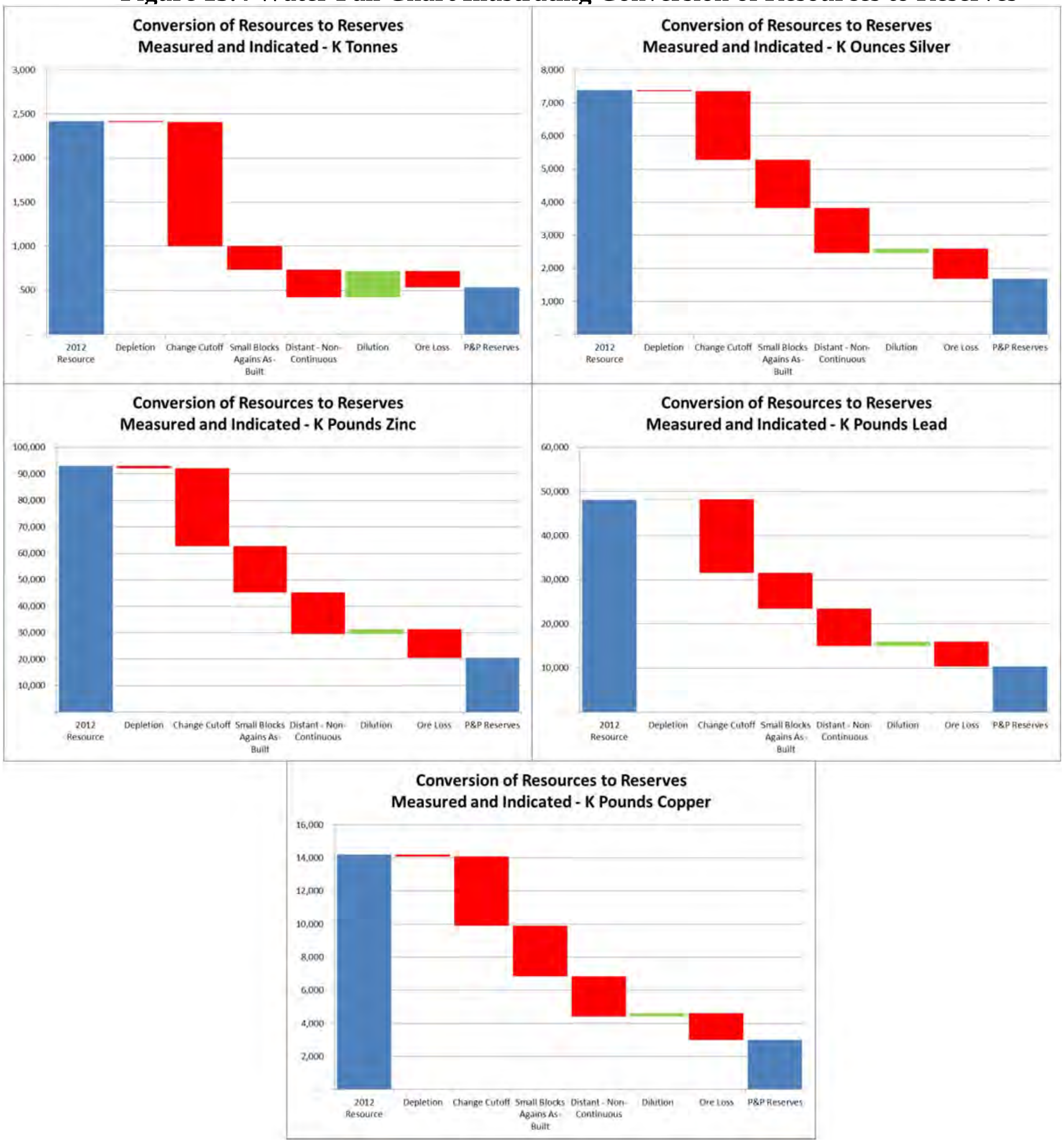
- Reduction due to depletion from July through December 2012 mining;
    - This was a reduction of 15,000 tonnes containing 21,000 ounces of silver, 896,000 lbs of zinc, a minimal amount of lead, and about 99,000 lbs of copper. This is considerably less than the reported mine production. The discrepancy between production and the amount depleted is primarily due to mining of different locations which were not part of the resource model.
- Reduction due to the application of $60/t NSR value cutoff (versus the 60g AgEq/t for the reported resource);
    - This was a reduction of 1,421,000 tonnes containing 2,110,000 ounces of silver, 30,324,000 lbs of zinc, 16,574,000 lbs of lead, and 4,283,000 lbs of copper.
- Reduction of partial blocks located against mined out solids;
    - This was a reduction of 266,000 tonnes containing 1,461,000 ounces of silver, 17,513,000 lbs of zinc, 8,163,000 lbs of lead, and 3,066,000 lbs of copper.
- Reduction of portions of the resource that were too distant and not continuous, therefore not economic;
    - This was a reduction of 311,000 tonnes containing 1,346,000 ounces of silver, 15,629,000 lbs of zinc, 8,447,000 lbs of lead, and 2,444,000 lbs of copper.
- Addition of both internal and external dilution; and
    - Internal dilution was added based on the amount of Measured and Indicated resources inside of the stope designs, but below cutoff grade;
        - This is the addition of 111,000 tonnes containing 122,000 ounces of silver, 1,901,000 lbs of zinc, 1,008,000 lbs of lead, and 218,000 lbs of copper.
    - External dilution was calculated using a factor of 35% adding 187,000 tonnes of material at zero grade.
- Reduction due to ore loss as described in Section 15.4.
    - This was a reduction of 187,000 tonnes containing 906,000 ounces of silver, 10,990,000 lbs of zinc, 5,588,000 lbs of lead, and 1,614,000 lbs of copper.

The conversion of resources to reserves is shown in Table 15.5 and Figure 15.4.

**Table 15.5 Conversion of Resources to Reserves**

| | Measured & Indicated / Proven and Probable | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Change Due to Depletion*** | **K Tonnes** | **g Ag /t** | **Zn%** | **Pb%** | **Cu%** | **K Ozs Ag** | **K Lbs Zn** | **K Lbs Pb** | **K Lbs Cu** |
| Reported Resource (60 g AgEq/t) | 2,420 | 94.92 | 1.74 | 0.90 | 0.27 | 7,385 | 92,967 | 48,142 | 14,186 |
| Depleted Resource (60 g AgEq/t) | 2,405 | 95.24 | 1.74 | 0.91 | 0.27 | 7,364 | 92,071 | 48,202 | 14,087 |
| **Change Due to Depletion** | **(15)** | **0.32** | **(0.01)** | **0.01** | **(0.00)** | **(21)** | **(896)** | **60** | **(99)** |
| ***Change Due to Cutoff Grade*** | | | | | | | | | |
| Depleted Resource ($60 NSR) | 999 | 164.27 | 2.85 | 1.43 | 0.45 | 5,275 | 62,643 | 31,568 | 9,903 |
| **Change Due to Cutoff** | **(1,421)** | **69.35** | **1.10** | **0.53** | **0.18** | **-2,110** | **-30,324** | **-16,574** | **-4,283** |
| ***Change Due to Design*** | | | | | | | | | |
| M&I Inside Designs | 422 | 181.9 | 0.00 | 0.00 | 0.00 | 2,467 | 29,500 | 14,958 | 4,393 |
| M&I Dilution Inside Designs | 111 | 34.0 | 0.77 | 0.41 | 0.09 | 122 | 1,901 | 1,008 | 218 |
| M&I Ore Loss Inside Designs | 187 | 151.0 | 2.67 | 1.36 | 0.39 | 906 | 10,990 | 5,588 | 1,614 |
| External Dilution (zero grade) | 187 | | | | | 0 | | | |
| Reported Reserve (Fully Diluted) | 533 | 98.2 | 0.00 | 0.00 | 0.00 | 1,683 | 20,411 | 10,378 | 2,997 |
| **Change Due to Design** | **(466)** | **(66.1)** | **(2.84)** | **(1.43)** | **(0.45)** | **(3,592)** | **(42,232)** | **(21,191)** | **(6,906)** |

**Figure 15.4 Water Fall Chart Illustrating Conversion of Resources to Reserves**




There is a history of successfully delineating mineable material at Nuestra Señora with infill drilling, both in areas predicted by exploration drilling and in areas not encountered by exploration drilling. This reflects the poddy nature of the deposit. It is likely this history of success will continue with the upgrade and/or discovery of additional resources.

# 16.0 MINING METHODS

Two mining cases have been developed and are described in this Technical Report: the Reserve Case and the PEA Case. The Reserve Case applies only to the mining of Nuestra Señora and is based on current mining methods for the mining of Nuestra Señora's Proven and Probable reserves. The PEA Case applies to the mining of the Nuestra Señora, El Cajón, and San Rafael deposits. The PEA case assumes that the same underground methods would be used for mining the Nuestra Señora, El Cajón, and portions of the San Rafael deposit and that, in addition, part of the San Rafael deposit would be mined by open pit mining methods. Unlike the Reserve Case, the PEA Case is based on Measured, Indicated, and Inferred resources.

## 16.1 Reserve Case

Nuestra Señora underground mine development commenced in 2005, and prior to the commissioning of the process plant in May 2008, approximately 87,000 tonnes of ore had been stockpiled on surface. Since attaining commercial production of the process plant in January 2009, the Nuestra Señora mine has been the sole source of ore feed for the plant. Mining at Nuestra Señora uses mechanized mobile mining equipment, principally twin-boom jumbos, 6yd$^3$ scoop trams, production drill rigs, and rigid-body highway trucks.

Complex geometries of the mineralized bodies make it imperative to employ high-density definition drilling techniques to determine the extents of the mineralization. During development, ore-control definition is performed by drilling 12m long holes on approximately 4m centers. Samples are taken from the cuttings of each 1.5m of drill steel and are assayed in the operation's laboratory. This detailed sampling control allows for more appropriate development, improving mining recovery and minimizing dilution.

As successive levels are developed, each mineralized body is tested for continuity and size. The mining method employed for each mineralized body is determined by its geometry. Predominantly long-hole or cut-and-fill stoping is designed for production; however, shrinkage stoping via hand-held air-leg drill mining is available for implementation where warranted.

Mine ore production for the most recent 12 months has been between 38,000t and 50,000t per month depending upon the requirements of the process plant. The actual tonnage produced is determined by stope availablity and short-term mine plans. Maximum utilization of the mining equipment fleet is not always required; therefore, in tandem with the management of surface-ore stockpiles, the mine has some production flexibility while still satisfying the process plant's needs.

Waste rock from access development is used as fill material in successive cut-and-fill lifts and exhausted long-hole stopes. Tailings are recovered from the Nuestra Señora process plant and delivered by truck to exhausted long-hole stopes for use as fill along with development waste rock.

### 16.1.1 Production Schedule

The Reserve Case mine production schedule was developed using MineSched. This program schedules both underground development and production into a single integrated schedule. Long-hole stopes and cut-and-fill stopes were used for production scheduling. The monthly schedule is shown in Table 16.1 and Table 16.2 for production and development schedules, respectively.

**Table 16.1 Reserve Case Mine Production Schedule**

| | Units | Jan-13 | Feb-13 | Mar-13 | Apr-13 | May-13 | Jun-13 | Jul-13 | Aug-13 | Sep-13 | Oct-13 | Nov-13 | Dec-13 | Jan-14 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Longhole Stopes | Tonnes | 31 | 28 | 31 | 30 | 31 | 30 | 31 | 31 | 30 | 43 | 45 | 32 | - | 394 |
| | g Ag/t | 91.2 | 119.4 | 130.0 | 95.2 | 89.2 | 78.1 | 106.8 | 98.9 | 79.7 | 111.9 | 94.6 | 133.0 | - | 102.5 |
| | Oz Ag | 91 | 107 | 130 | 92 | 89 | 75 | 106 | 99 | 77 | 156 | 137 | 138 | - | 1,297 |
| | % Zn | 2.16 | 1.92 | 1.78 | 1.92 | 1.49 | 1.30 | 2.58 | 1.94 | 2.31 | 1.75 | 1.70 | 1.44 | - | 1.85 |
| | K Lbs Zn | 1,478 | 1,185 | 1,219 | 1,267 | 1,020 | 862 | 1,766 | 1,324 | 1,525 | 1,670 | 1,688 | 1,019 | - | 16,023 |
| | % Pb | 0.50 | 0.54 | 0.86 | 1.23 | 0.85 | 1.09 | 1.46 | 1.12 | 1.00 | 0.96 | 0.74 | 0.66 | - | 0.91 |
| | K Lbs Pb | 345 | 332 | 588 | 816 | 584 | 723 | 998 | 766 | 662 | 916 | 736 | 466 | - | 7,931 |
| | % Cu | 0.04 | 0.03 | 0.04 | 0.17 | 0.20 | 0.12 | 0.40 | 0.37 | 0.34 | 0.60 | 0.30 | 0.38 | - | 0.27 |
| | K Lbs Cu | 26 | 21 | 30 | 115 | 138 | 80 | 273 | 251 | 223 | 571 | 298 | 272 | - | 2,300 |
| Total Cut and Fill Stopes | Tonnes | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 3 | - | - | - | 140 |
| | g Ag/t | 61.8 | 67.3 | 81.9 | 86.5 | 86.9 | 98.0 | 97.2 | 107.7 | 86.9 | 81.6 | - | - | - | 86.1 |
| | Oz Ag | 31 | 30 | 41 | 42 | 43 | 47 | 48 | 54 | 42 | 8 | - | - | - | 386 |
| | % Zn | 1.79 | 1.28 | 1.47 | 1.13 | 1.39 | 1.44 | 1.53 | 1.48 | 1.47 | 0.57 | - | - | - | 1.43 |
| | K Lbs Zn | 613 | 395 | 503 | 374 | 475 | 475 | 523 | 505 | 487 | 39 | - | - | - | 4,388 |
| | % Pb | 0.94 | 1.09 | 0.60 | 0.76 | 0.95 | 0.69 | 0.90 | 0.63 | 0.74 | 0.22 | - | - | - | 0.80 |
| | K Lbs Pb | 321 | 336 | 205 | 251 | 325 | 228 | 308 | 214 | 243 | 15 | - | - | - | 2,447 |
| | % Cu | 0.13 | 0.21 | 0.18 | 0.22 | 0.13 | 0.28 | 0.29 | 0.31 | 0.25 | 0.45 | - | - | - | 0.23 |
| | K Lbs Cu | 45 | 66 | 60 | 72 | 44 | 91 | 98 | 108 | 82 | 31 | - | - | - | 697 |
| Total Ore Mined | Tonnes | 46 | 42 | 46 | 45 | 46 | 45 | 46 | 46 | 45 | 46 | 45 | 32 | - | 533 |
| | g Ag/t | 81.4 | 102.0 | 114.0 | 92.3 | 88.4 | 84.7 | 103.6 | 101.8 | 82.1 | 109.9 | 94.6 | 133.0 | - | 98.2 |
| | Oz Ag | 122 | 138 | 170 | 134 | 132 | 123 | 155 | 152 | 119 | 164 | 137 | 138 | - | 1,683 |
| | % Zn | 2.04 | 1.71 | 1.68 | 1.65 | 1.46 | 1.35 | 2.23 | 1.78 | 2.03 | 1.67 | 1.70 | 1.44 | - | 1.74 |
| | K Lbs Zn | 2,090 | 1,580 | 1,722 | 1,641 | 1,495 | 1,337 | 2,289 | 1,828 | 2,012 | 1,709 | 1,688 | 1,019 | - | 20,411 |
| | % Pb | 0.65 | 0.72 | 0.77 | 1.08 | 0.89 | 0.96 | 1.27 | 0.96 | 0.91 | 0.91 | 0.74 | 0.66 | - | 0.88 |
| | K Lbs Pb | 666 | 668 | 794 | 1,067 | 909 | 951 | 1,306 | 980 | 905 | 930 | 736 | 466 | - | 10,378 |
| | % Cu | 0.07 | 0.09 | 0.09 | 0.19 | 0.18 | 0.17 | 0.36 | 0.35 | 0.31 | 0.59 | 0.30 | 0.38 | - | 0.25 |
| | K Lbs Cu | 72 | 87 | 90 | 187 | 182 | 171 | 372 | 359 | 305 | 602 | 298 | 272 | - | 2,997 |

**Table 16.2 Reserve Case Development Schedule**

| | Units | Jan-13 | Feb-13 | Mar-13 | Apr-13 | May-13 | Dec-13 | Total |
|---|---|---|---|---|---|---|---|---|
| Main ramp | meters | 75 | - | - | - | - | - | 75 |
| Cross-cut / Access to Stope | meters | 104 | 67 | - | - | - | - | 171 |
| Cross-cut access to raise | meters | 17 | 1 | - | - | - | - | 18 |
| Main haulage drift | meters | 53 | 155 | 42 | - | - | - | 250 |
| Ramp (Upper levels - Santa Teresa) | meters | - | 39 | 215 | 132 | - | - | 385 |
| Main haulage drift (Upper levels - Santa Teresa) | meters | - | 74 | 23 | 83 | 39 | - | 219 |
| Vent raise | meters | - | 25 | - | - | - | - | 25 |
| Nuestra Senora sub-level ramp | meters | 173 | - | - | - | - | - | 173 |
| Nuestra Senora haulage drift | meters | 75 | 70 | - | - | - | - | 145 |
| Total Development | meters | 496 | 432 | 279 | 215 | 39 | - | 1,461 |

## 16.2 PEA Case

The PEA Case for Nuestra Señora, El Cajón, and San Rafael was developed using Measured, Indicated, and Inferred resources as shown by deposit and resource classification in Table 16.3 and Table 16.4, respectively. Note that a preliminary economic assessment is preliminary in nature. It includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied that would enable them to be classified as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

**Table 16.3 PEA Case Material Processed by Deposit**

| | Underground | | | Open Pit San Rafaell | |
|---|---|---|---|---|---|
| Units | Nuestra Senora | El Cajon | San Rafael | Main / Upper | 120 Zone |
| K Tonnes | 1,461 | 2,319 | 518 | 5,474 | 438 |
| g Ag/t | 99.5 | 144.3 | 151.5 | 94.1 | 149.8 |
| KOz Ag | 4,675 | 10,760 | 2,523 | 16,563 | 2,110 |
| % Zn | 1.63 | - | - | 3.61 | - |
| K Lbs Zn | 52,475 | - | - | 435,276 | - |
| % Pb | 0.78 | - | - | 1.49 | - |
| K Lbs Pb | 25,142 | - | - | 179,443 | - |
| % Cu | 0.28 | 0.47 | 0.41 | - | 0.41 |
| K Lbs Cu | 9,049 | 24,053 | 4,668 | - | 3,933 |
| g Au/t | - | 0.21 | 0.12 | 0.13 | 0.17 |
| K Oz Au | - | 15 | 2 | 23 | 2 |

***PEA Case designs are based on a $60 NSR cutoff grade***

***Dilution includes grades for Measured, Indicated, and Inferred material within designs***

***Dilution also includes internal and external waste tonnage at zero grades***

**Table 16.4 PEA Case Material Processed by Classification**

| | Measured | Indicated | Inferred | Internal Dilution | Ore Loss | External Dilution | Fully Diluted Proven & Probable |
|---|---|---|---|---|---|---|---|
| K Tonnes | 2,208 | 6,537 | 982 | 425 | 285 | 343 | 10,211 |
| g Ag/t | 107.1 | 120.3 | 155.8 | 28.9 | 169.8 | - | 111.6 |
| KOz Ag | 7,603 | 25,271 | 4,920 | 395 | 1,558 | - | 36,631 |
| % Zn | 3.57 | 2.07 | 1.42 | 0.27 | 2.78 | - | 2.17 |
| K Lbs Zn | 173,627 | 298,384 | 30,726 | 2,505 | 17,492 | - | 487,751 |
| % Pb | 1.57 | 0.84 | 0.63 | 0.13 | 1.33 | - | 0.91 |
| K Lbs Pb | 76,483 | 121,484 | 13,749 | 1,250 | 8,381 | - | 204,585 |
| % Cu | 0.02 | 0.22 | 0.49 | 0.09 | 0.48 | - | 0.19 |
| K Lbs Cu | 1,006 | 32,304 | 10,596 | 814 | 3,016 | - | 41,703 |
| g Au/t | 0.14 | 0.14 | 0.06 | - | - | - | 0.13 |
| K Oz Au | 10 | 30 | 2 | - | - | - | 43 |

***PEA Case designs are based on a $60 NSR cutoff grade***

***Dilution includes grades for Measured, Indicated, and Inferred material within designs***

***Dilution also includes internal and external waste tonnage at zero grades***

MDA created stope designs for Nuestra Señora and open pit designs for San Rafael, while Damian Spring of Premier Mining Services Ltd. created the stope designs for El Cajón and San Rafael.

### 16.2.1 Underground Design

MDA created the designs for Nuestra Señora based on the design parameters as discussed in the Reserves section. The El Cajón and San Rafael designs were created by Damian Spring of Premier

Mining Services Ltd., and use the same general design criteria as Nuestra Señora, with additional consideration to use cemented rock fill ("CRF") for portions of El Cajón and San Rafael, dependent on opening sizes. CRF allows for stopes to be mined out next to each other without the requirement of leaving pillars in place.

El Cajón and San Rafael designs are based on a $60.00 NSR cutoff grade. The NSR values are calculated in a similar manner as the Nuestra Señora; however metallurgical factors have been used according to the test work of the individual mineralized zones. Ore mined from the San Rafael Main and Upper zones will produce separate zinc and lead concentrates, but no copper concentrates. Ore from El Cajón and the San Rafael 120 zone will only produce copper concentrates. The NSR values were calculated for each zone accordingly using the same treatment and transportation costs used for Nuestra Señora.Ore haulage from El Cajón and San Rafael was assumed to be performed by a contractor. A design has been developed for the required road by Scorpio, and it was assumed to be constructed in the PEA.

### 16.2.2 Open Pit Design

Open pit design was done for a portion of San Rafael. The design process used Whittle software to develop optimized pit shells and then used the pit shells for guidance in designing the ultimate pit limits along with interior pit phases. The pit phases were based on lower gold prices. The pit economic parameters used are shown in Table 16.5.

**Table 16.5 Open Pit Economic Parameters**

| San Rafael Open Pit Economic Parameters | | | |
|---|---|---|---|
| Mining Cost | $ | 2.00 | $/t Mined |
| Process Cost | $ | 10.97 | $/t Processed |
| Process Maintenance | $ | 5.41 | $/t Processed |
| Technical Services | $ | 2.47 | $/t Processed |
| Safety and Environment | $ | 1.79 | $/t Processed |
| Administration | $ | 8.07 | $/t Processed |
| Ore Haulage to NS | $ | 3.68 | $/t Processed |

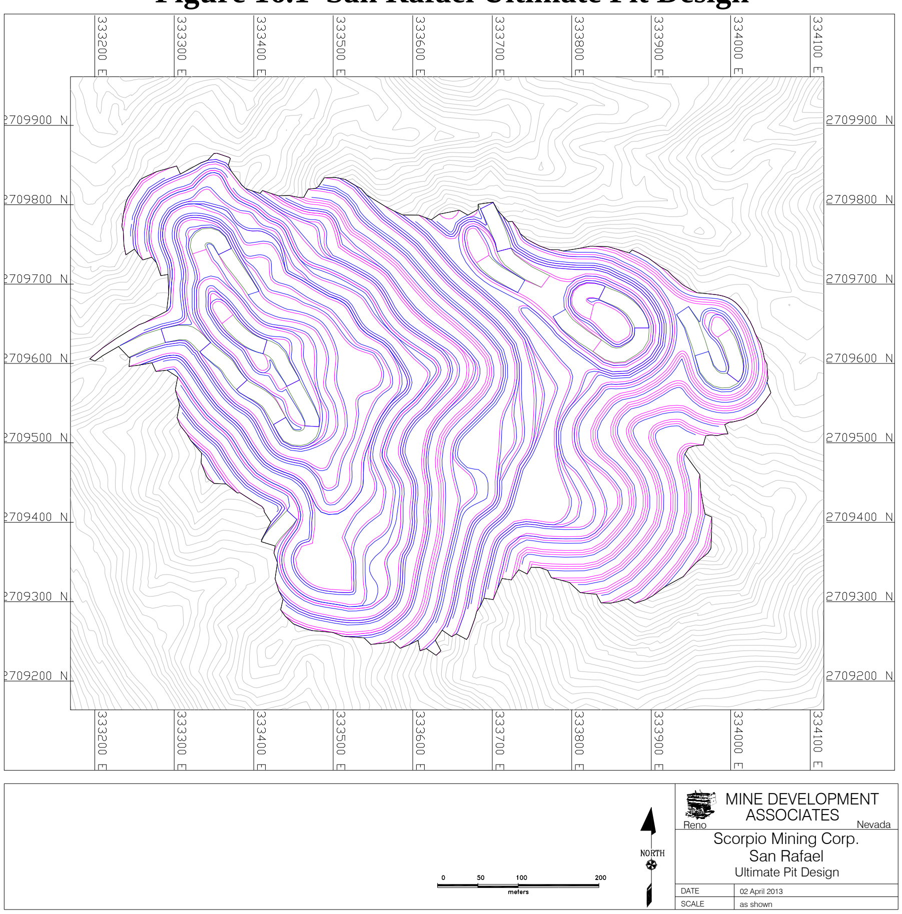
The $2.00 per tonne mining cost was used to represent contract mining. In addition to these economic parameters, metallurgical recovery factors were applied to each zone according to the test work of the individual zones and a 1.25% royalty was considered for mining of ore in the El Cajón concession (note that this is a concession and not the El Cajón mining project). However, the resulting pit optimizations produced no potential ore from the consession, so the royalty consideration was inconsequential. Due to a current lack of geotechnical slope studies, a basic 45 degree angle was used for the overall slope angle for both pit optimization and design. For pit design, 6m benches were assumed as well as safety catch benches 9m wide every 3 benches. The pit design also used a 65 degreee bench face angle, resulting in an inner-ramp slope of 46 degrees.

Pit optimization results are shown in Table 16.6 from $9.00 to $35.00 per ounce of silver in $1.00 increments. The ultimate pit was based on a $25.00 per ounce silver equivalent price, and the ultimate pit design is shown in Figure 16.1.

## Table 16.6 Whittle Pit Optimization Results

| | Metal Price | | | | Material Processed | | | | | | | | | Waste | Total | Strip |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pit | Ag | Pb | Zn | Cu | K Tonnes | Pb% | Pb K Lbs | Zn% | Zn K Lbs | Cu% | K Cu Lbs | g Ag/t | K Ozs Ag | K Tonnes | K Tonnes | Ratio |
| 1 | $ 9.00 | $ 0.34 | $ 0.32 | $ 1.22 | 11 | 10.55 | 2,654 | 17.65 | 4,439 | - | - | 275.3 | 101 | 62 | 74 | 5.45 |
| 2 | $ 10.00 | $ 0.38 | $ 0.36 | $ 1.36 | 20 | 9.77 | 4,247 | 13.32 | 5,790 | - | - | 271.0 | 172 | 102 | 122 | 5.19 |
| 3 | $ 11.00 | $ 0.42 | $ 0.40 | $ 1.50 | 29 | 8.97 | 5,811 | 10.37 | 6,717 | - | - | 258.8 | 244 | 148 | 177 | 5.02 |
| 4 | $ 12.00 | $ 0.46 | $ 0.43 | $ 1.63 | 38 | 8.26 | 6,958 | 8.89 | 7,488 | 0.00 | 0 | 244.6 | 301 | 192 | 230 | 5.02 |
| 5 | $ 13.00 | $ 0.49 | $ 0.47 | $ 1.77 | 42 | 7.86 | 7,298 | 8.42 | 7,812 | 0.00 | 0 | 235.6 | 319 | 203 | 245 | 4.82 |
| 6 | $ 14.00 | $ 0.53 | $ 0.50 | $ 1.90 | 60 | 6.67 | 8,823 | 7.28 | 9,621 | 0.00 | 0 | 201.9 | 389 | 291 | 351 | 4.86 |
| 7 | $ 15.00 | $ 0.57 | $ 0.54 | $ 2.04 | 317 | 1.97 | 13,792 | 3.64 | 25,428 | 0.58 | 4,033 | 290.5 | 2,960 | 2,792 | 3,109 | 8.81 |
| 8 | $ 16.00 | $ 0.61 | $ 0.58 | $ 2.18 | 371 | 1.81 | 14,802 | 3.45 | 28,264 | 0.58 | 4,756 | 286.4 | 3,419 | 3,056 | 3,427 | 8.23 |
| 9 | $ 17.00 | $ 0.65 | $ 0.61 | $ 2.31 | 444 | 1.75 | 17,114 | 3.35 | 32,820 | 0.58 | 5,672 | 280.7 | 4,011 | 3,547 | 3,992 | 7.98 |
| 10 | $ 18.00 | $ 0.68 | $ 0.65 | $ 2.45 | 487 | 1.70 | 18,265 | 3.26 | 34,921 | 0.55 | 5,928 | 267.6 | 4,186 | 3,675 | 4,162 | 7.55 |
| 11 | $ 19.00 | $ 0.72 | $ 0.68 | $ 2.58 | 539 | 1.61 | 19,167 | 3.14 | 37,368 | 0.53 | 6,330 | 258.0 | 4,471 | 3,931 | 4,470 | 7.29 |
| 12 | $ 20.00 | $ 0.76 | $ 0.72 | $ 2.72 | 1,109 | 1.76 | 42,945 | 3.65 | 89,292 | 0.29 | 7,093 | 163.7 | 5,838 | 9,123 | 10,233 | 8.22 |
| 13 | $ 21.00 | $ 0.80 | $ 0.76 | $ 2.86 | 2,033 | 1.51 | 67,486 | 3.34 | 149,732 | 0.29 | 12,942 | 151.9 | 9,932 | 18,820 | 20,853 | 9.26 |
| 14 | $ 22.00 | $ 0.84 | $ 0.79 | $ 2.99 | 4,882 | 1.53 | 164,290 | 3.69 | 396,751 | 0.14 | 14,835 | 118.8 | 18,649 | 54,260 | 59,143 | 11.11 |
| 15 | $ 23.00 | $ 0.87 | $ 0.83 | $ 3.13 | 5,420 | 1.47 | 175,133 | 3.53 | 421,860 | 0.13 | 15,896 | 116.0 | 20,218 | 58,003 | 63,423 | 10.70 |
| 16 | $ 24.00 | $ 0.91 | $ 0.86 | $ 3.26 | 5,677 | 1.43 | 178,894 | 3.44 | 431,166 | 0.13 | 16,441 | 113.9 | 20,792 | 58,933 | 64,611 | 10.38 |
| 17 | $ 25.00 | $ 0.95 | $ 0.90 | $ 3.40 | 5,878 | 1.40 | 181,525 | 3.38 | 437,715 | 0.13 | 16,714 | 111.9 | 21,152 | 59,219 | 65,097 | 10.08 |
| 18 | $ 26.00 | $ 0.99 | $ 0.94 | $ 3.54 | 6,113 | 1.38 | 185,381 | 3.31 | 446,758 | 0.13 | 16,972 | 109.8 | 21,571 | 59,903 | 66,016 | 9.80 |
| 19 | $ 27.00 | $ 1.03 | $ 0.97 | $ 3.67 | 6,377 | 1.34 | 188,422 | 3.23 | 453,609 | 0.12 | 17,380 | 108.2 | 22,192 | 60,849 | 67,226 | 9.54 |
| 20 | $ 28.00 | $ 1.06 | $ 1.01 | $ 3.81 | 6,605 | 1.31 | 191,037 | 3.15 | 458,898 | 0.12 | 17,732 | 106.5 | 22,606 | 61,298 | 67,903 | 9.28 |
| 21 | $ 29.00 | $ 1.10 | $ 1.04 | $ 3.94 | 6,836 | 1.28 | 193,515 | 3.09 | 464,910 | 0.12 | 18,027 | 104.6 | 22,980 | 61,680 | 68,515 | 9.02 |
| 22 | $ 30.00 | $ 1.14 | $ 1.08 | $ 4.08 | 7,061 | 1.26 | 196,257 | 3.03 | 471,075 | 0.12 | 18,228 | 102.7 | 23,323 | 62,087 | 69,149 | 8.79 |
| 23 | $ 31.00 | $ 1.18 | $ 1.12 | $ 4.22 | 7,303 | 1.23 | 198,806 | 2.96 | 476,797 | 0.11 | 18,464 | 100.8 | 23,668 | 62,485 | 69,788 | 8.56 |
| 24 | $ 32.00 | $ 1.22 | $ 1.15 | $ 4.35 | 7,523 | 1.21 | 200,897 | 2.91 | 481,976 | 0.11 | 18,701 | 99.1 | 23,961 | 62,621 | 70,144 | 8.32 |
| 25 | $ 33.00 | $ 1.25 | $ 1.19 | $ 4.49 | 7,792 | 1.19 | 203,827 | 2.84 | 488,673 | 0.11 | 18,978 | 97.1 | 24,314 | 63,183 | 70,975 | 8.11 |
| 26 | $ 34.00 | $ 1.29 | $ 1.22 | $ 4.62 | 8,359 | 1.15 | 211,318 | 2.76 | 509,108 | 0.11 | 20,004 | 93.7 | 25,168 | 66,959 | 75,317 | 8.01 |
| 27 | $ 35.00 | $ 1.33 | $ 1.26 | $ 4.76 | 8,628 | 1.12 | 213,870 | 2.71 | 515,076 | 0.11 | 20,354 | 91.9 | 25,503 | 67,490 | 76,118 | 7.82 |

## Figure 16.1 San Rafael Ultimate Pit Design



### 16.2.3 Production Schedule

MDA completed production schedules for Nuestra Señora and the San Rafael open pit. Damian Spring created the production schedule for El Cajón and San Rafael underground mining. The individual production schedules were developed to achieve an initial process capacity of 1,500 tonnes per day expanding in the fourth quarter of year two to 2,750 tonnes per day. Production is based on continuation of Nuestra Señora through the first half of year five. El Cajón mining would start in late year one, with expansion of the processing plant being completed in year two coinciding with the ramp up in production in El Cajón and the startup of the San Rafael open pit. San Rafael underground mining would start in year six at or near the completion of mining in El Cajón. Upon completion of underground mining, the open pit production is expanded to meet the mill requirements through year 11.

Table 16.7 and Table 16.8 show the PEA Case schedules for mine production and underground development respectively.

# Table 16.7 PEA Case Mine Production Schedule

| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Nuestra Senora UG Mining*** | K Tonnes | 486 | 274 | 273 | 274 | 154 | - | - | - | - | - | - | 1,461 |
| | g Ag/t | 98.3 | 92.3 | 108.5 | 88.7 | 119.5 | - | - | - | - | - | - | 99.5 |
| | K Oz Ag | 1,536 | 812 | 954 | 783 | 591 | - | - | - | - | - | - | 4,675 |
| | % Zn | 1.69 | 1.78 | 1.46 | 1.75 | 1.24 | - | - | - | - | - | - | 1.63 |
| | K Lbs Zn | 18,144 | 10,725 | 8,825 | 10,563 | 4,219 | - | - | - | - | - | - | 52,475 |
| | % Pb | 0.80 | 0.88 | 0.72 | 0.89 | 0.44 | - | - | - | - | - | - | 0.78 |
| | K Lbs Pb | 8,569 | 5,332 | 4,351 | 5,410 | 1,480 | - | - | - | - | - | - | 25,142 |
| | % Cu | 0.24 | 0.32 | 0.36 | 0.20 | 0.35 | - | - | - | - | - | - | 0.28 |
| | K Lbs Cu | 2,610 | 1,910 | 2,164 | 1,183 | 1,183 | - | - | - | - | - | - | 9,049 |
| ***El Cajon Underground Mining*** | K Tonnes | 61 | 343 | 548 | 549 | 548 | 271 | - | - | - | - | - | 2,319 |
| | g Ag/t | 96.3 | 118.9 | 153.5 | 138.9 | 156.1 | 156.1 | - | - | - | - | - | 144.3 |
| | K Oz Ag | 190 | 1,310 | 2,702 | 2,452 | 2,747 | 1,361 | - | - | - | - | - | 10,760 |
| | % Cu | 0.41 | 0.42 | 0.49 | 0.44 | 0.50 | 0.50 | - | - | - | - | - | 0.47 |
| | K Lbs Cu | 551 | 3,187 | 5,919 | 5,335 | 6,060 | 3,002 | - | - | - | - | - | 24,053 |
| | g Au/t | 0.16 | 0.17 | 0.20 | 0.20 | 0.23 | 0.23 | - | - | - | - | - | 0.21 |
| | K Oz Au | 0 | 2 | 4 | 4 | 4 | 2 | - | - | - | - | - | 15 |
| ***San Rafael Underground Mining*** | Tonnes | - | - | - | - | - | 185 | 333 | - | - | - | - | 518 |
| | g Ag/t | - | - | - | - | - | 151.7 | 151.3 | - | - | - | - | 151.5 |
| | Oz Ag | - | - | - | - | - | 902 | 1,621 | - | - | - | - | 2,523 |
| | % Cu | - | - | - | - | - | 0.42 | 0.40 | - | - | - | - | 0.41 |
| | K Lbs Cu | - | - | - | - | - | 1,706 | 2,962 | - | - | - | - | 4,668 |
| | g Au/t | - | - | - | - | - | 0.13 | 0.15 | - | - | - | - | 0.14 |
| | K Oz Au | - | - | - | - | - | 1 | 2 | - | - | - | - | 2 |
| ***San Rafael Open Pit Mining*** | K Tonnes | - | - | 15 | 104 | 114 | 123 | 82 | - | - | - | - | 438 |
| ***120 Zone*** | g Ag/t | | | 179.0 | 273.0 | 162.6 | 78.3 | 78.3 | - | - | - | - | 149.8 |
| | K Oz Ag | - | - | 87 | 911 | 595 | 310 | 207 | - | - | - | - | 2,110 |
| | % Cu | | | 0.44 | 0.69 | 0.44 | 0.24 | 0.24 | - | - | - | - | 0.41 |
| | K Lbs Cu | - | - | 148 | 1,589 | 1,112 | 650 | 434 | - | - | - | - | 3,933 |
| | g Au/t | | | 0.50 | 0.24 | 0.15 | 0.13 | 0.13 | - | - | - | - | 0.17 |
| | K Oz Au | - | - | 0.2 | 0.8 | 0.5 | 0.5 | 0.3 | - | - | - | - | 2 |
| ***San Rafael Open Pit Mining*** | K Tonnes | - | - | 167 | 79 | 189 | 424 | 589 | 1,007 | 1,004 | 1,004 | 1,012 | 5,474 |
| ***Main and Upper Zones*** | g Ag/t | - | - | 445.5 | 336.8 | 211.2 | 111.1 | 78.1 | 109.8 | 69.7 | 54.1 | 45.6 | 94.1 |
| | K Oz Ag | - | - | 2,397 | 858 | 1,282 | 1,515 | 1,479 | 3,553 | 2,250 | 1,747 | 1,482 | 16,563 |
| | % Zn | - | - | 2.55 | 2.52 | 2.03 | 5.04 | 2.57 | 3.11 | 3.94 | 4.24 | 3.70 | 3.61 |
| | K Lbs Zn | - | - | 9,417 | 4,407 | 8,466 | 47,188 | 33,356 | 68,932 | 87,111 | 93,808 | 82,592 | 435,276 |
| | % Pb | - | - | 0.58 | 0.62 | 0.56 | 3.01 | 1.05 | 1.32 | 1.56 | 1.67 | 1.40 | 1.49 |
| | K Lbs Pb | - | - | 2,150 | 1,075 | 2,335 | 28,130 | 13,655 | 29,314 | 34,564 | 36,933 | 31,287 | 179,443 |
| | g Au/t | - | - | 0.65 | 0.41 | 0.29 | 0.11 | 0.12 | 0.19 | 0.10 | 0.05 | 0.05 | 0.13 |
| | K Oz Au | - | - | 4 | 1 | 2 | 2 | 2 | 6 | 3 | 2 | 1 | 23 |
| ***Total Mine Production*** | K Tonnes | 547 | 616 | 1,003 | 1,006 | 1,004 | 1,004 | 1,004 | 1,007 | 1,004 | 1,004 | 1,012 | 10,211 |
| | g Ag/t | 98.1 | 107.1 | 190.3 | 154.6 | 161.5 | 126.7 | 102.4 | 109.8 | 69.7 | 54.1 | 45.6 | 111.6 |
| | K Oz Ag | 1,725 | 2,122 | 6,140 | 5,003 | 5,214 | 4,088 | 3,306 | 3,553 | 2,250 | 1,747 | 1,482 | 36,631 |
| | % Zn | 1.50 | 0.79 | 0.82 | 0.67 | 0.57 | 2.13 | 1.51 | 3.11 | 3.94 | 4.24 | 3.70 | 2.17 |
| | K Lbs Zn | 18,144 | 10,725 | 18,242 | 14,969 | 12,685 | 47,188 | 33,356 | 68,932 | 87,111 | 93,808 | 82,592 | 487,751 |
| | % Pb | 0.71 | 0.39 | 0.29 | 0.29 | 0.17 | 1.27 | 0.62 | 1.32 | 1.56 | 1.67 | 1.40 | 0.91 |
| | K Lbs Pb | 8,569 | 5,332 | 6,502 | 6,485 | 3,815 | 28,130 | 13,655 | 29,314 | 34,564 | 36,933 | 31,287 | 204,585 |
| | % Cu | 0.26 | 0.38 | 0.37 | 0.37 | 0.38 | 0.24 | 0.15 | - | - | - | - | 0.19 |
| | K Lbs Cu | 3,161 | 5,097 | 8,230 | 8,106 | 8,354 | 5,358 | 3,395 | - | - | - | - | 41,703 |
| | g Au/t | 0.02 | 0.10 | 0.23 | 0.17 | 0.20 | 0.15 | 0.13 | 0.19 | 0.10 | 0.05 | 0.05 | 0.13 |
| | K Oz Au | 0 | 2 | 7 | 5 | 6 | 5 | 4 | 6 | 3 | 2 | 1 | 43 |

# Table 16.8 PEA Case Underground Development

| ***Nuestra Senora*** | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary Development | m | 1,785 | - | - | - | - | - | - | - | - | - | - | 1,785 |
| Secondary Development | m | 240 | - | - | - | - | - | - | - | - | - | - | 240 |
| Vertical Raises | m | 25 | - | - | - | - | - | - | - | - | - | - | 25 |
| Total Development | m | 2,050 | - | - | - | - | - | - | - | - | - | - | 2,050 |
| ***El Cajon*** | | | | | | | | | | | | | |
| Primary Development | m | 1,398 | 2,122 | - | - | - | - | - | - | - | - | - | 3,520 |
| Secondary Development | m | 2,836 | 4,610 | 389 | - | 90 | - | - | - | - | - | - | 7,925 |
| Vertical - Airleg | m | 24 | 36 | - | - | - | - | - | - | - | - | - | 60 |
| Vertical - Escapeway | m | 89 | 90 | - | - | - | - | - | - | - | - | - | 179 |
| Vertical Raise Bore | m | 90 | 164 | - | - | - | - | - | - | - | - | - | 253 |
| Total Development | m | 4,437 | 7,022 | 389 | - | 90 | - | - | - | - | - | - | 11,938 |
| ***San Rafael*** | | | | | | | | | | | | | |
| Primary Development | m | - | - | - | - | - | 1,607 | 100 | - | - | - | - | 1,708 |
| Secondary Development | m | - | - | - | - | - | 2,198 | 736 | - | - | - | - | 2,934 |
| Vertical - Airleg | m | - | - | - | - | - | - | - | - | - | - | - | - |
| Vertical - Escapeway | m | - | - | - | - | - | 341 | 43 | - | - | - | - | 384 |
| Vertical Raise Bore | m | - | - | - | - | - | 316 | 72 | - | - | - | - | 388 |
| Total Development | m | - | - | - | - | - | 4,462 | 951 | - | - | - | - | 5,414 |
| ***Total Development*** | | | | | | | | | | | | | |
| Primary Development | m | 3,182 | 2,122 | - | - | - | 1,607 | 100 | - | - | - | - | 7,012 |
| Secondary Development | m | 3,076 | 4,610 | 389 | - | 90 | 2,198 | 736 | - | - | - | - | 11,099 |
| Vertical - Airleg | m | 49 | 36 | - | - | - | - | - | - | - | - | - | 86 |
| Vertical - Escapeway | m | 89 | 90 | - | - | - | 341 | 43 | - | - | - | - | 562 |
| Vertical Raise Bore | m | 90 | 164 | - | - | - | 316 | 72 | - | - | - | - | 641 |
| Total Development | m | 6,487 | 7,022 | 389 | - | 90 | 4,462 | 951 | - | - | - | - | 19,401 |

# 17.0 RECOVERY METHODS

In 2004, Scorpio purchased the decommissioned San Manuel plant from Phelps Dodge in Arizona. The plant was stored in Arizona until the end of 2006 when it was transported to Cosalá. The plant's civil construction commenced on site in August 2007, and commissioning began in May 2008. Commercial production from the process plant was achieved in January 2009, with a total plant throughput of 1,742,139 tonnes through the end of December 2012.

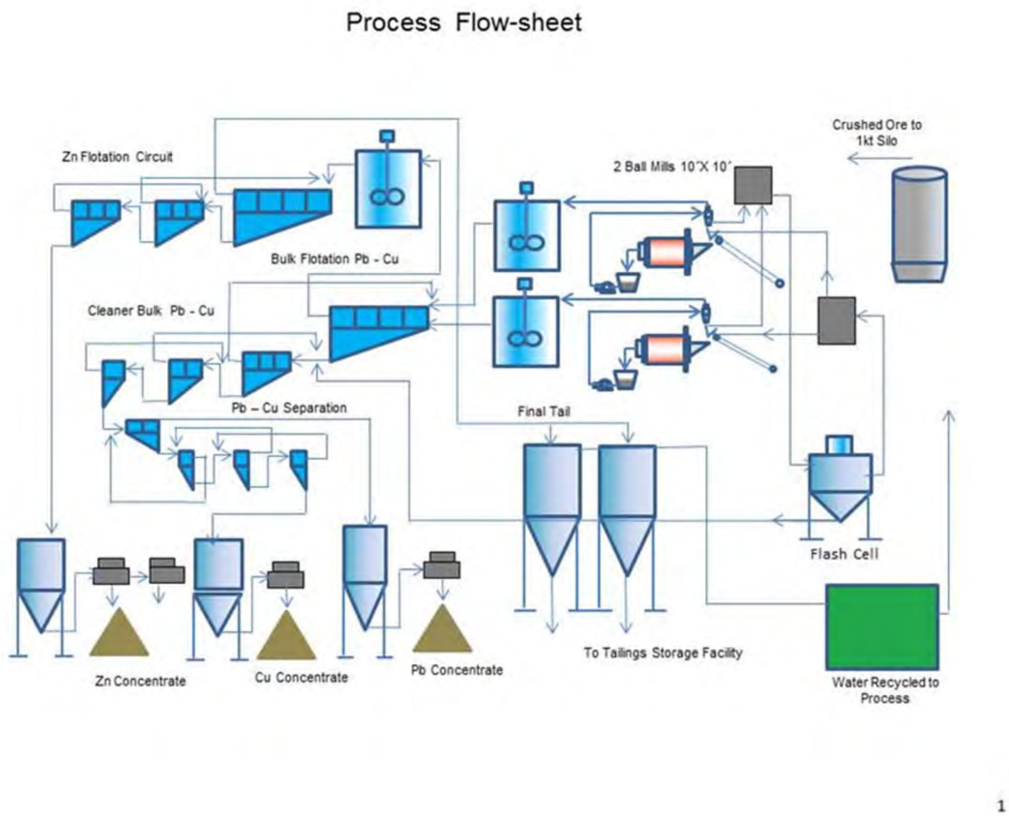
Since production began, the metallurgical performance of the plant has undergone a continual process of improvement. These improvements have been attained through the replacement of aging equipment components, on-line analytical controls, operational controls, and reagent optimization. Monthly throughput has increased from 12,000t (January 2009) to 43,500t (average of 2012).

The Nuestra Señora mine has several ores of differing metallurgical characteristics. Base metal and silver grades vary, as do the ratios of each metal to the others. Mineralogical characteristics such as species, fluid inclusions, and grain size limit the flotation process selectivity achievable on a production scale.

Selectivity of lead and copper remains one of the most important technical challenges of processing ore from the Nuestra Señora mine. Reagent concentrations are monitored continuously to optimize selectivity, but on a daily production scale, improvements for one concentrate generally lead to a deterioration of the other.

The Nuestra Señora process plant is a conventional concentrator producing zinc, lead, and copper concentrates. A schematic diagram of the plant is shown in Figure 17.1.

**Figure 17.1 Schematic Diagram of the Nuestra Señora Process Plant**
(Provided by Scorpio)




Electrical power for the plant is supplied from the national grid. Electrical consumption during the most recent 18 months has averaged 1.3mwh per month, equivalent to an average of 25.3kw per tonne processed.

Of the total water used in the process plant, between 67% and 75% is recovered from the tailings thickeners and recirculation from the tailings storage facility. Fresh, make-up water is provided from operational dewatering of the Nuestra Señora mine and is equivalent to an average of 44,000m$^3$ per month.

Average metal recoveries to each of the concentrates for the last 18 months are shown on Table 17.1.

**Table 17.1 Average Metal Recoveries at Nuestra Señora**
(From Scorpio, 2012)

| Concentrate | Zinc Recovery | Lead Recovery | Copper Recovery | Silver Recovery |
|---|---|---|---|---|
| **Zinc** | 78.1% | 5.5% | 8.0% | 7.0% |
| **Lead** | 3.1% | 67.5% | 14.0% | 48.4% |
| **Copper** | 1.1% | 9.8% | 50.6% | 24.7% |

The most important process materials and relative consumptions are shown on Table 17.2.

**Table 17.2 Consumption of Process Material at Nuestra Señora**
(From Scorpio, 2012)

| Material | Consumption kg per tonne processed |
|---|---|
| Reagent $ZnSO_4$ | 0.90 |
| Reagent $CuSO_4$ | 0.36 |
| Steel Grinding Balls | 0.50 |
| Reagent Sodium Metabisulfite | 0.40 |

# 18.0 PROJECT INFRASTRUCTURE

The Nuestra Señora property is located approximately 10km east of the town of Cosalá in the state of Sinaloa, Mexico. As described in Section 5.1, the principal Pacific coast highway is located 55km to the west of Cosalá, and 18km farther west are a toll highway and the railway. The ports at Mazatlán, 160km southwest of Cosalá, Topolobampo (Los Mochis), 300km northwest, and Manzanillo, 870km southwest, are all capable of handling bulk materials as well as containers. Currently, all offshore shipments of containerized concentrate produced at the Nuestra Señora mine are handled through Manzanillo.

The Nuestra Señora property is accessible from the town of Cosalá via two roads that can accommodate standard highway vehicles and heavy equipment. A 12km road that passes through the hamlet of La Seca accesses the Nuestra Señora, Santo Domingo, and Santa Teresa workings. A Bailey bridge over the Habitas River connects the road to the Nuestra Señora mine portal. A 28km road that passes through the hamlet of Santa Ana accesses the upper Candelaria workings 120m above river level. In 2007, Scorpio completed the 4.3km bypass road around the town of Cosalá to accommodate all heavy-equipment traffic and the transfer of metal concentrates to smelters without impacting the town.

In 2007, 14 hectares of land were purchased near the town of Cosalá for the purpose of housing a permanent facility camp which is currently used. The site has electrical power and is connected to the municipality’s water supply and sewage system.

Comisión Federal de Electricidad, the government utility, is the supplier of electricity in Mexico. Construction of Scorpio’s 100%-owned, dedicated 34km power line from the main hydro dam to the Nuestra Señora processing facility and electrical sub-stations at the hydro dam and at the plant site were completed in March 2008. The power line is now connected to the mine.

As described in Section 5.3, Scorpio has access to all required water for its mining and processing operations on the Nuestra Señora property. Water seepage into the mine provides a sufficient supply for the diamond drilling and underground equipment requirements. Dewatering from the mine also supplies water to the processing facility via a six-inch pipeline. Wastewater is being recycled, with only minor amounts from the underground workings being treated and discharged into the river. The discharged water is monitored to ensure it conforms to Canadian and Mexican environmental standards.

The Habitas River, which runs all year, is located in a steep-sided canyon that traverses the project area. Initially, two bridges (one for pedestrians and the other for vehicles) had been constructed to ensure there would be no disruption to the operation during times of flooding. The former has been dismantled for security reasons, and now access for vehicles and other traffic is restricted to the Bailey bridge. Flooding due to a tropical depression in September 2006 produced significant scouring of the alluvial approaches to each side of the Bailey bridge, but the bridge itself suffered no damage. The approaches were quickly rebuilt and access re-established to the mine. Scorpio plans to construct flood protection walls to avoid any potential business interruption. After previously giving its approval to build the wall, at the end of 2011 SEMARNAT reversed its prior decision. Scorpio intends to extend its current contingency plans to protect mine production for another year and make a further submission for wall construction to SEMARNAT by Q4-2013.

# 19.0 MARKET STUDIES AND CONTRACTS

Since June 2008, Scorpio has engaged an independent agent to procure orders, negotiate sales agreements, assist in freight negotiations, and administer sales of its concentrates. The original agreement has once been mutually modified to reflect changed market conditions and is based upon standard industry terms. That agreement is valid for several years.

Scorpio also uses the services of a global industry expert for marketing consultancy through a long-term contract.

Currently Scorpio has concentrate off-take contracts with two buyers. The sale of lead, zinc, and copper concentrates is contracted through mid-2013. All contracts are based upon standard industry terms benchmarked against current global conditions in accordance with the quality of each concentrate produced.

Scorpio frequently sells its concentrates on the basis of receiving a sales advance when the concentrates are delivered, with the advance based on market prices of metals at the time of the advance. Final settlement of the sale is then made at a later time, based on metals prices at that later time. Due to volatility in the metals markets, Scorpio at times elects to fix the price of a concentrate sale at the time of initial delivery. Currently there is no hedging of metal sales.

Scorpio receives payment for contained silver from all concentrates. Lead and copper concentrates both have arsenic, bismuth, and antimony levels which generally attract a smelter penalty. Those concentrates also have a gold content which results in a payment credit. Due to metal selectivity limitations of ore processing, the copper concentrate has a relatively high lead content which generally causes a smelter penalty. The zinc concentrate from Nuestra Señora has no elements which incur payment penalties or credits. Average concentrate qualities, as agreed with the buyers, for the past 12 months are shown in Table 19.1.

**Table 19.1 Average Concentrate Qualities for Nuestra Señora**

| Concentrate | Zn/Pb/Cu % | Ag g/t | As % | Bi % | Sb % | Pb % | Total Penalties $/t | Total Credits $/t |
|---|---|---|---|---|---|---|---|---|
| Zinc | 54.77 | 192.46 | | | | | 0.00 | 0.00 |
| Lead | 51.23 | 3180.12 | .19 | .51 | .25 | 51.23 | 2.62 | 14.23 |
| Copper | 23.77 | 2,644.51 | .434 | .192 | .811 | 9.58 | 41.14 | 21.97 |

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

Permitting requirements for the Nuestra Señora project are described in Section 4.5.1. Rehabilitation issues are described in Section 4.6.1. Water management is described in Section 18.0. The following information has been provided by Scorpio.

## 20.1 Environmental Studies

Scorpio's environmental management systems are under continual development. These systems include:

- Annual and quarterly reporting to SEMARNAT and PROFEPA (the policing, auditing, and inspection authority of SEMARNAT)
- Downstream water quality monitoring
- Tailings storage facility development and monitoring
- Hazardous waste control systems
- Compliance with NOM 120-SEMARNAT-2010 regulations which dictate environmental protection requirements for exploration activities
- Ongoing reforestation program
- Participation in PROFEPA's national Environmental Leadership Program
- Participation in PROFEPA's certified national Environmental Audit Program.

As part of the permitting process, Scoprio is systematically performing archaeological surveys in operational and project areas. These surveys are conducted under the supervision of specialists from INAH (the National Institute of Archaeology and History) and are intended to result in the identification of restricted areas and the granting of archaeological clearance. Scorpio has received such clearance for its new projects at El Cajón and San Rafael.

## 20.2 Community Relations

There are 11 communities in the vicinity of Scorpio's mining tittles, including the capital of the municipality, Cosalá. Scorpio is the major local employer. A total of 308 people (representing 81.5% of the total workforce) are from the municipality of Cosalá, working in all operational departments. A total of 371 people (98%) of the workforce are Mexicans, and seven (less than 2%) are expatriates.

Scorpio has created the Social Assistance Committee of Minera Cosalá ("CASMIC") to support the local community. CASMIC is formed of a group of local community leaders that accepts requests, reviews those requests, and distributes assistance for initiatives that meet the basic needs of the Cosalá community, in accordance with the regulatory guidelines. CASMIC has been working since February 2, 2011, and is chaired by the Human Resources Manager of Minera Cosalá on behalf of Scorpio.

In the past, Scorpio has provided infrastructural projects (power, water, and communications) to local communities. Currently Scorpio is supporting various programs that promote education, local business development, road maintenance, and local communities (*ejidos)*.

# 21.0 CAPITAL AND OPERATING COSTS

## 21.1 Operating Costs

Although actual operating costs at Nuestra Señora have been subjected to inflationary pressures, they have been relatively stable in terms of unit costs over the last 24 months. This has been primarily due to increased production, incremental improvements in the process plant, and a relatively high proportion of underground ore provided from long-hole stoping.

Additional operating cost increases of underground mining have been experienced in the most recent six months due to increased development access, the temporary use of production drilling contractors, and an increased maintenance expense for aging mobile equipment.

Actual operating costs in terms of cost per tonne processed are shown on Table 21.1.

**Table 21.1 Operating Costs at Nuestra Señora**
(Shown as cost per tonne processed)

| | 2011 Average | 2012 Average |
|---|---|---|
| Mining | $19.63 | $25.86 |
| Process | $17.11 | $16.06 |
| Technical Services | $2.36 | $2.36 |
| Safety and Environment | $1.23 | $1.65 |
| Administration | $5.72 | $7.80 |

### 21.1.1 Reserve Case Operating Cost

Operating costs used for the Reserve Case are shown in Table 21.2 Reserve Case Operating Costs. The mining costs shown in Table 21.1include expensed development costs. A reduction in the mining costs from actual is realized in the Reseve Case due to a reduction in the amount of development required to complete mining of the stated reserves.

Plant, technical services, safety and environmental, and administrative costs have been modeled with variable and fixed components. This results in a slight increase in estimated costs compared to the actual costs shown in Table 21.1.

Total estimated operating cost for the Reserve Case is $26.6 million and is shown in Table 21.2.

**Table 21.2 Reserve Case Operating Costs**

| | | |
|---|---|---|
| Long Hole Mining Cost | $ 15.85 | $/t Processed |
| Cut and Fill Mining Cost | $ 20.97 | $/t Processed |
| Expensed Development | $ 0.61 | $/t Processed |
| Process Plant Costs | $ 16.05 | $/t Processed |
| Technical Services | $ 2.52 | $/t Processed |
| Safety and Environment | $ 2.12 | $/t Processed |
| Administration | $ 7.91 | $/t Processed |
| Cut and Fill Total | $ 50.18 | $/t Processed |
| Long Hole Total | $ 44.45 | $/t Processed |

### 21.1.2 PEA Case Operating Cost

Operating costs used for the PEA Case are shown in Table 21.3. The total life-of-mine operating cost is $480.6 million as shown in the PEA Case cash flow (see Table 22.2). Mining cost increases are realized from use of cemented rock fill in areas to improve resource recovery. Other operating costs show a reduction in dollars per tonne processed in comparison to the Reserve Case due to the expansion of the process plant. The processing of more tonnes per day reduces the unit cost per tonne.

**Table 21.3 PEA Case Operating Costs**

| | | |
|---|---|---|
| Long Hole Mining Cost | $ 21.57 | $/t Processed |
| Cut and Fill Mining Cost | $ 24.81 | $/t Processed |
| Expensed Development | $ 1.64 | $/t Processed |
| Open Pit Mining Cost | $ 21.66 | $/t Processed |
| Process Plant Costs | $ 13.41 | $/t Processed |
| Technical Services | $ 1.69 | $/t Processed |
| Safety and Environment | $ 1.73 | $/t Processed |
| Administration | $ 6.46 | $/t Processed |
| Cut and Fill Total | $ 49.74 | $/t Processed |
| Long Hole Total | $ 44.86 | $/t Processed |
| Open Pit Total | $ 44.95 | $/t Processed |

## 21.2 Capital Costs

Capital costs have been estimated for both the Reserve and the PEA Cases.

### 21.2.1 Reserve Case Capital Costs

The Reserve Case capital costs have been estimated based on both budgeted and non-budgeted items required to complete the Reserve Case mine production schedule. These Reserve Case capital cost estimates are made to determine the economic viability of the reserves. However, because of the complex geology, it is likely that definition drilling will continue to identify ore that is not part of the Proven and Probable reserves, which may then require additional capital to develop.

The total capital estimate is $4,870,000 over a 9-month period and is shown in Table 21.4.

**Table 21.4 Reserve Case Capital**

| | Units | Jan-13 | Feb-13 | Mar-13 | Apr-13 | May-13 | Jun-13 | Jul-13 | Aug-13 | Sep-13 | Oct-13 | Nov-13 | Dec-13 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mine Development | K USD | $ 566 | $ 509 | $ 421 | $ 324 | $ 58 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,879 |
| Mine | K USD | $ 188 | $ 261 | $ 624 | $ 250 | $ 250 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,573 |
| Process | K USD | $ - | $ 198 | $ 231 | $ 206 | $ - | $ 21 | $ - | $ - | $ - | $ - | $ - | $ - | $ 657 |
| Safety | K USD | $ 154 | $ 181 | $ 115 | $ 61 | $ 48 | $ 2 | $ 36 | $ - | $ 6 | $ - | $ - | $ - | $ 602 |
| Environment | K USD | $ - | $ 20 | $ 10 | $ 9 | $ 9 | $ 19 | $ 9 | $ - | $ - | $ - | $ - | $ - | $ 76 |
| Administration | K USD | $ - | $ 32 | $ 31 | $ 18 | $ 2 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 83 |
| Total Capital | K USD | $ 908 | $ 1,201 | $ 1,432 | $ 868 | $ 368 | $ 42 | $ 45 | $ - | $ 6 | $ - | $ - | $ - | $ 4,870 |

### 21.2.2 PEA Case Capital Costs

The PEA capital costs have been estimated based on development, equipment, drilling, and study costs that will be required to advance the PEA resources to a point where a decision can be made to put the resources into production. Table 21.5 shows the capital requirements for the PEA Case. The total capital estimate is $85,267,000 over an 11-year project.

Underground mine development capital is the estimated cost of extending primary development in Nuestra Señora and primary development of declines in El Cajón and San Rafael. Other underground mining capital has been estimated for equipment, electrical distribution, ventilation fans and doors, pumping stations, and refuge chambers.

Open pit capital includes pre-stripping capital with the cost of mining 4.7 million tonnes of waste in year two. Additional capital has been estimated for feasibility studies, definition drilling, environmental permitting, and contractor mobilization and demobilization.

Process capital has been estimated based on current designs to expand the processing capacity from 1,500 to 2,750 tonnes per day along with sustaining capital. The plant would be expanded during year two. Included in the capital is continuing expansion of the tailings facility.

Safety, environmental, and administration sustaining capital has been included in the capital estimate.

Infrastructure capital includes the construction of a new road from Cosalá Norte to the Nuestra Señora process plant (5.8 km of road), improvements to current surface roads, surface shops for El Cajón and San Rafael, and electrical distribution on the surface.

**Table 21.5 PEA Case Capital**

| | Units | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UG Mine Development | K USD | $ 5,484 | $ 4,159 | $ - | $ - | $ - | $ 4,708 | $ 568 | $ - | $ - | $ - | $ - | $ 14,919 |
| Open Pit Pre-Stripping | K USD | $ - | $ 9,313 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 9,313 |
| UG Mining Capital | K USD | $ 3,391 | $ 4,541 | $ 10,177 | $ 1,897 | $ 1,088 | $ 680 | $ - | $ - | $ - | $ - | $ - | $ 21,774 |
| OP Mining Capital | K USD | $ 1,470 | $ 500 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 300 | $ 2,270 |
| Process Capital | K USD | $ 3,101 | $ 14,500 | $ 2,000 | $ 2,000 | $ 2,000 | $ 2,000 | $ 2,000 | $ 1,600 | $ 1,200 | $ 800 | $ - | $ 31,201 |
| Safety | K USD | $ 977 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 50 | $ - | $ 1,827 |
| Environmental | K USD | $ 76 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 50 | $ - | $ 926 |
| Administration | K USD | $ 113 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 50 | $ - | $ 963 |
| Infrastructure | K USD | $ 2,074 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,074 |
| Total PEA Capital | K USD | $ 16,687 | $ 33,313 | $ 12,477 | $ 4,197 | $ 3,388 | $ 7,688 | $ 2,868 | $ 1,900 | $ 1,500 | $ 950 | $ 300 | $ 85,267 |

# 22.0 ECONOMIC ANALYSIS

Cash-flows have been developed for both the Reserve and PEA cases. The economic analysis assumes:

- Metal prices of $25.00 per ounce silver, $0.85 per pound zinc, $0.90 per pound lead, $3.40 per pound of copper, and $1,400 per ounce of gold (note that the Reserve Case does not contain any gold resources);
- All ore is to be processed through the Nuestra Señora process plant;
- Nuestra Señora metal recoveries are based on equations using historical performance;
- Underground development and mining costs are based on current Nuestra Señora mining costs;
- NPV discounting is done using 5%, 7%, and 10% annual rates for sensitivity;
- Tax deductions and a 30% taxable rate were provided by Scorpio;
- Cash costs have been calculated using zinc, lead, and copper revenues as a credit against costs;
- Smelting costs and transportation have been based on current contracts;
- The Reserve Case assumes that only Proven and Probable reserves are processed and that the mine and plant are shut down upon completion;
- The PEA Case assumes mining of Measured, Indicated, and Inferred resources for Nuestra Señora, El Cajón, and San Rafael;
- Plant salvage and closure were included in each case.

## 22.1 Reserve Case Economic Analysis

The Nuestra Señora Reserve Case mines the Proven and Probable reserves to completion and assumes that the plant would be shut down at the end of mine life with closure costs and salvage value applied in the cash-flow. This evaluation was done only to confirm that Proven and Probable reserves can be economically extracted. It is not intended to imply the coming closure of the Nuestra Señora mine or plant in the near future because mining of resources is anticipated to continue as additional ore is defined by short-term definition drilling.

The Reserve Case cash-flow model is shown in Table 22.1. The cash-flow is shown for monthly periods starting at the beginning of 2013. To calculate the reserves net present value, annual discount rates were divided by 12 months to yield monthly discount rates.

Proven and Probable reserves are estimated to create $53.07 million in revenue after payment of transportation and treatment charges. Operating costs are estimated to be $26.6 million, and capital is estimated to be $4.9 million. The life-of-mine cash-flow for Nuestra Señora reserves is estimated as $21.4 million, showing that the reserves are economically viable and meet the definition of Proven and Probable reserves. An additional credit of $10.0 million is taken at the end of the mine life for salvage of the plant facilities.

At 5%, the one- year net present value is estimated to be $20.5 million.

# Table 22.1 Reserve Case Cash-Flow

| | Units | Jan-13 | Feb-13 | Mar-13 | Apr-13 | May-13 | Jun-13 | Jul-13 | Aug-13 | Sep-13 | Oct-13 | Nov-13 | Dec-13 | Jan-14 | Feb-14 | Mar-14 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Ore Processed | K Tonnes | 46 | 42 | 46 | 45 | 46 | 45 | 46 | 46 | 45 | 46 | 45 | 32 | - | - | - | 533 |
| | g Ag/t | 81.4 | 102.0 | 114.0 | 92.3 | 88.4 | 84.7 | 103.6 | 101.8 | 82.1 | 109.9 | 94.6 | 133.0 | - | - | - | 98.2 |
| | K Oz Ag | 122 | 138 | 170 | 134 | 132 | 123 | 155 | 152 | 119 | 164 | 137 | 138 | - | - | - | 1,683 |
| | % Zn | 2.04 | 1.71 | 1.68 | 1.65 | 1.46 | 1.35 | 2.23 | 1.78 | 2.03 | 1.67 | 1.70 | 1.44 | - | - | - | 1,736 |
| | K Lbs Zn | 2,090 | 1,580 | 1,722 | 1,641 | 1,495 | 1,337 | 2,289 | 1,828 | 2,012 | 1,709 | 1,688 | 1,019 | - | - | - | 20,411 |
| | % Pb | 0.65 | 0.72 | 0.77 | 1.08 | 0.89 | 0.96 | 1.27 | 0.96 | 0.91 | 0.91 | 0.74 | 0.66 | - | - | - | 883 |
| | K Lbs Pb | 666 | 668 | 794 | 1,067 | 909 | 951 | 1,306 | 980 | 905 | 930 | 736 | 466 | - | - | - | 10,378 |
| | % Cu | 0.07 | 0.09 | 0.09 | 0.19 | 0.18 | 0.17 | 0.36 | 0.35 | 0.31 | 0.59 | 0.30 | 0.38 | - | - | - | 255 |
| | K Lbs Cu | 72 | 87 | 90 | 187 | 182 | 171 | 372 | 359 | 305 | 602 | 298 | 272 | - | - | - | 2,997 |
| Total Mine Production | Tonnes | 46 | 42 | 46 | 45 | 46 | 45 | 46 | 46 | 45 | 46 | 45 | 32 | - | - | - | 533 |
| ***Net Smelter Return*** | | | | | | | | | | | | | | | | | |
| Payable Metal - Ag | K Oz Ag | 86 | 97 | 125 | 98 | 96 | 88 | 116 | 111 | 88 | 119 | 100 | 98 | - | - | - | 1,221 |
| Payable Metal - Zn | K Lbs Zn | 1,460 | 1,080 | 1,174 | 1,116 | 998 | 880 | 1,615 | 1,257 | 1,404 | 1,164 | 1,153 | 678 | - | - | - | 13,979 |
| Payable Metal - Pb | K Lbs Pb | 299 | 311 | 374 | 555 | 444 | 478 | 711 | 493 | 447 | 461 | 340 | 207 | - | - | - | 5,120 |
| Payable Metal - Cu | K Lbs Cu | 17 | 30 | 25 | 80 | 77 | 73 | 203 | 193 | 158 | 377 | 152 | 151 | - | - | - | 1,534 |
| Payable Equivelant Silver | K Oz AgEq | 149 | 149 | 181 | 167 | 156 | 145 | 224 | 198 | 173 | 226 | 172 | 149 | - | - | - | 2,090 |
| Gross Revenue - Ag | K USD | $ 2,161 | $ 2,432 | $ 3,117 | $ 2,442 | $ 2,392 | $ 2,203 | $ 2,891 | $ 2,784 | $ 2,193 | $ 2,972 | $ 2,490 | $ 2,460 | $ - | $ - | $ - | $ 30,536 |
| Gross Revenue - Zn | K USD | $ 1,241 | $ 918 | $ 998 | $ 949 | $ 848 | $ 748 | $ 1,372 | $ 1,068 | $ 1,194 | $ 990 | $ 980 | $ 577 | $ - | $ - | $ - | $ 11,882 |
| Gross Revenue - Pb | K USD | $ 269 | $ 280 | $ 336 | $ 499 | $ 400 | $ 430 | $ 640 | $ 444 | $ 402 | $ 415 | $ 306 | $ 187 | $ - | $ - | $ - | $ 4,608 |
| Gross Revenue - Cu | K USD | $ 56 | $ 100 | $ 85 | $ 274 | $ 261 | $ 249 | $ 689 | $ 656 | $ 536 | $ 1,282 | $ 518 | $ 512 | $ - | $ - | $ - | $ 5,217 |
| ***Shipping, Smelting, and Refining*** | | | | | | | | | | | | | | | | | |
| Ag | K USD | $ 131 | $ 145 | $ 180 | $ 118 | $ 113 | $ 105 | $ 128 | $ 115 | $ 94 | $ 105 | $ 102 | $ 91 | $ - | $ - | $ - | $ 1,426 |
| Smelter Treatment - Zn | K USD | $ 364 | $ 269 | $ 292 | $ 278 | $ 248 | $ 219 | $ 402 | $ 313 | $ 350 | $ 290 | $ 287 | $ 169 | $ - | $ - | $ - | $ 3,481 |
| Smelter Treatment - Pb | K USD | $ 178 | $ 177 | $ 216 | $ 276 | $ 238 | $ 247 | $ 319 | $ 245 | $ 229 | $ 227 | $ 189 | $ 120 | $ - | $ - | $ - | $ 2,662 |
| Smelter Treatment - Cu | K USD | $ 21 | $ 36 | $ 29 | $ 98 | $ 92 | $ 87 | $ 234 | $ 216 | $ 178 | $ 397 | $ 169 | $ 161 | $ - | $ - | $ - | $ 1,717 |
| Total Offsite Costs | K USD | $ 694 | $ 626 | $ 717 | $ 770 | $ 692 | $ 658 | $ 1,083 | $ 889 | $ 851 | $ 1,020 | $ 747 | $ 540 | $ - | $ - | $ - | $ 9,286 |
| Net Smelter Return | K USD | $ 3,034 | $ 3,104 | $ 3,819 | $ 3,394 | $ 3,209 | $ 2,973 | $ 4,509 | $ 4,062 | $ 3,473 | $ 4,637 | $ 3,547 | $ 3,195 | $ - | $ - | $ - | $ 42,956 |
| Royalty | K USD | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Salvage | K USD | | | | | | | | | | | | | | | $ 10,000 | $ 10,000 |
| Net Revenues | K USD | $ 3,034 | $ 3,104 | $ 3,819 | $ 3,394 | $ 3,209 | $ 2,973 | $ 4,509 | $ 4,062 | $ 3,473 | $ 4,637 | $ 3,547 | $ 3,195 | $ - | $ - | $ 10,000 | $ 52,956 |
| ***Operating Costs*** | | | | | | | | | | | | | | | | | |
| Mine Operations | K USD | $ 816 | $ 737 | $ 816 | $ 790 | $ 816 | $ 790 | $ 816 | $ 816 | $ 790 | $ 753 | $ 713 | $ 510 | $ - | $ - | $ - | $ 9,165 |
| Mine Development - Expensed | K USD | $ 181 | $ 142 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 323 |
| Plant Operations | K USD | $ 737 | $ 686 | $ 737 | $ 720 | $ 737 | $ 720 | $ 737 | $ 737 | $ 720 | $ 737 | $ 720 | $ 575 | $ - | $ - | $ - | $ 8,559 |
| Technical Services | K USD | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ 112 | $ - | $ - | $ - | $ 1,342 |
| Safety & Environment | K USD | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ 94 | $ - | $ - | $ - | $ 1,128 |
| Administration | K USD | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ 351 | $ - | $ - | $ - | $ 4,217 |
| Closure | K USD | | | | | | | | | | | | | $ 600 | $ 600 | $ 708 | $ 1,908 |
| Total Operating Costs | K USD | $ 2,291 | $ 2,122 | $ 2,110 | $ 2,067 | $ 2,110 | $ 2,067 | $ 2,110 | $ 2,110 | $ 2,067 | $ 2,047 | $ 1,990 | $ 1,642 | $ 600 | $ 600 | $ 708 | $ 26,641 |
| ***Capital Costs*** | | | | | | | | | | | | | | | | | |
| Mine Development | K USD | $ 566 | $ 509 | $ 421 | $ 324 | $ 58 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | | | $ 1,879 |
| Mining Capital | K USD | $ 188 | $ 261 | $ 624 | $ 250 | $ 250 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | | | $ 1,573 |
| Process Capital | K USD | $ - | $ 198 | $ 231 | $ 206 | $ - | $ 21 | $ - | $ - | $ - | $ - | $ - | $ - | | | | $ 657 |
| Safety & Environment | K USD | $ 154 | $ 201 | $ 125 | $ 70 | $ 57 | $ 21 | $ 45 | $ - | $ 6 | $ - | $ - | $ - | | | | $ 678 |
| Administration | K USD | $ - | $ 32 | $ 31 | $ 18 | $ 2 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | | | | $ 83 |
| Total Capital | K USD | $ 908 | $ 1,201 | $ 1,432 | $ 868 | $ 368 | $ 42 | $ 45 | $ - | $ 6 | $ - | $ - | $ - | $ - | $ - | $ - | $ 4,870 |
| Total Cost | K USD | $ 3,199 | $ 3,323 | $ 3,542 | $ 2,935 | $ 2,478 | $ 2,109 | $ 2,155 | $ 2,110 | $ 2,073 | $ 2,047 | $ 1,990 | $ 1,642 | $ 600 | $ 600 | $ 708 | $ 31,511 |
| Pre-Tax Cash Cost * | $/oz Ag | $ 14.90 | $ 13.42 | $ 9.85 | $ 10.21 | $ 12.33 | $ 13.53 | $ 3.15 | $ 6.43 | $ 7.90 | $ 2.32 | $ 8.35 | $ 8.29 | $ - | $ - | $ - | $ 10.48 |
| Pre-Tax Total Cost * | $/oz Ag | $ 25.40 | $ 25.77 | $ 21.34 | $ 19.09 | $ 16.18 | $ 14.01 | $ 3.54 | $ 6.43 | $ 7.96 | $ 2.32 | $ 8.35 | $ 8.29 | $ - | $ - | $ - | $ 14.46 |
| Net Operating Cash-Flow | K USD | $ 743 | $ 981 | $ 1,709 | $ 1,327 | $ 1,099 | $ 906 | $ 2,399 | $ 1,952 | $ 1,406 | $ 2,591 | $ 1,556 | $ 1,554 | $ (600) | $ (600) | $ 9,292 | $ 26,314 |
| Net Pre-Tax Cash-Flow | K USD | $ (165) | $ (220) | $ 277 | $ 459 | $ 731 | $ 864 | $ 2,354 | $ 1,952 | $ 1,400 | $ 2,591 | $ 1,556 | $ 1,554 | $ (600) | $ (600) | $ 9,292 | $ 21,444 |
| ***Tax Considerations*** | | | | | | | | | | | | | | | | | |
| Tax deductions Brought Forward | K USD | $ 52,000 | $ 52,165 | $ 52,385 | $ 52,108 | $ 51,649 | $ 50,918 | $ 50,054 | $ 47,701 | $ 45,749 | $ 44,348 | $ 41,758 | $ 40,201 | $ 38,648 | $ 39,248 | $ 39,848 | |
| Tax deductions available in period | K USD | $ 52,908 | $ 53,366 | $ 53,817 | $ 52,976 | $ 52,017 | $ 50,960 | $ 50,099 | $ 47,701 | $ 45,754 | $ 44,348 | $ 41,758 | $ 40,201 | $ 38,648 | $ 39,248 | $ 39,848 | |
| Net Operating Cash Flow | K USD | $ 743 | $ 981 | $ 1,709 | $ 1,327 | $ 1,099 | $ 906 | $ 2,399 | $ 1,952 | $ 1,406 | $ 2,591 | $ 1,556 | $ 1,554 | $ (600) | $ (600) | $ 9,292 | $ 26,314 |
| Taxable Income | K USD | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | |
| Tax Paid at 30% | K USD | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Tax deductions Carried Forward | K USD | $ 52,165 | $ 52,385 | $ 52,108 | $ 51,649 | $ 50,918 | $ 50,054 | $ 47,701 | $ 45,749 | $ 44,348 | $ 41,758 | $ 40,201 | $ 38,648 | $ 39,248 | $ 39,848 | $ 30,556 | |
| Net Cash-flow After Tax | K USD | $ (165) | $ (220) | $ 277 | $ 459 | $ 731 | $ 864 | $ 2,354 | $ 1,952 | $ 1,400 | $ 2,591 | $ 1,556 | $ 1,554 | $ (600) | $ (600) | $ 9,292 | $ 21,444 |

| | | |
|---|---|---|
| Net Cash-Flow | K USD | $ 21,444 |
| NPV (5%) | K USD | 20,470 |
| NPV (7%) | K USD | 20,095 |
| NPV (10%) | K USD | 19,547 |

## 22.2 PEA Case Economic Analysis

Note that a preliminary economic assessment is preliminary in nature. It includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied that would enable them to be classified as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

The Nuestra Señora - El Cajón - San Rafael PEA Case cash-flow is shown in Table 22.2. The estimated life-of-mine revenues after transportation and smelting charges are $863.1 million with operating costs of $480.6 million and capital costs of $85.3 million. The total life-of-mine after-tax cash-flow is estimated to be $229.8 million with a 5% net present value of $166.7 million. The initial capital of $50.0 million is invested during the first two years with return on the investment being realized in the following year. The capital is relatively low for a mining project due to the existing plant and infrastructure. Accordingly, the project has a high rate of return of 151%.

Tax deductions from the current operations have been carried forward into the economic analysis reducing the tax burden of the project. A federal Mexican tax rate of 30% has been assumed after deductions are applied.

## Table 22.2 PEA Case Cash Flow

| ***Mine Production*** | Units | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Ore Processed | K Tonnes | 547 | 616 | 1,003 | 1,006 | 1,004 | 1,004 | 1,004 | 1,007 | 1,004 | 1,004 | 1,012 | 10,211 |
| | g Ag/t | 98.1 | 107.1 | 190.3 | 154.6 | 161.5 | 126.7 | 102.4 | 109.8 | 69.7 | 54.1 | 45.6 | 111.6 |
| | Oz Ag | 1,725 | 2,122 | 6,140 | 5,003 | 5,214 | 4,088 | 3,306 | 3,553 | 2,250 | 1,747 | 1,482 | 36,631 |
| | % Zn | 1.50 | 0.79 | 0.82 | 0.67 | 0.57 | 2.13 | 1.51 | 3.11 | 3.94 | 4.24 | 3.70 | 2.17 |
| | K Lbs Zn | 18 | 11 | 18 | 15 | 13 | 47 | 33 | 69 | 87 | 94 | 83 | 488 |
| | % Pb | 0.71 | 0.39 | 0.29 | 0.29 | 0.17 | 1.27 | 0.62 | 1.32 | 1.56 | 1.67 | 1.40 | 0.91 |
| | K Lbs Pb | 9 | 5 | 7 | 6 | 4 | 28 | 14 | 29 | 35 | 37 | 31 | 205 |
| | % Cu | 0.26 | 0.38 | 0.37 | 0.37 | 0.38 | 0.24 | 0.15 | - | - | - | - | 0.19 |
| | K Lbs Cu | 3 | 5 | 8 | 8 | 8 | 5 | 3 | - | - | - | - | 42 |
| | g Au/t | 0.02 | 0.10 | 0.23 | 0.17 | 0.20 | 0.15 | 0.13 | 0.19 | 0.10 | 0.05 | 0.05 | 0.13 |
| | Oz Au | 0 | 2 | 7 | 5 | 6 | 5 | 4 | 6 | 3 | 2 | 1 | 43 |
| ***Net Smelter Return*** | | | | | | | | | | | | | |
| Payable Metal - Ag | K Oz Ag | 1,234 | 1,522 | 3,551 | 3,250 | 3,247 | 2,347 | 1,777 | 1,305 | 826 | 642 | 544 | 20,246 |
| Payable Metal - Zn | K Lbs Zn | 12,384 | 7,368 | 11,545 | 9,884 | 7,817 | 28,323 | 20,021 | 41,374 | 52,286 | 56,305 | 49,573 | 296,880 |
| Payable Metal - Pb | K Lbs Pb | 5,632 | 3,551 | 4,277 | 4,458 | 2,508 | 20,694 | 10,045 | 21,565 | 25,427 | 27,170 | 23,016 | 148,342 |
| Payable Metal - Cu | K Lbs Cu | 1,764 | 3,597 | 6,115 | 6,156 | 6,482 | 4,371 | 2,773 | - | - | - | - | 31,257 |
| Payable Metal - Au | K Oz Au | 0 | 1 | 2 | 2 | 2 | 1 | - | - | - | - | - | 7 |
| Payable Equivelant Silver | K Oz Ag | 2,106 | 2,438 | 5,018 | 4,675 | 4,586 | 4,700 | 3,196 | 3,488 | 3,519 | 3,534 | 3,058 | 40,318 |
| Gross Revenue - Ag | K USD | $ 30,855 | $ 38,048 | $ 88,782 | $ 81,260 | $ 81,184 | $ 58,681 | $ 44,417 | $ 32,622 | $ 20,658 | $ 16,043 | $ 13,604 | $ 506,154 |
| Gross Revenue - Zn | K USD | $ 10,527 | $ 6,263 | $ 9,813 | $ 8,402 | $ 6,645 | $ 24,074 | $ 17,018 | $ 35,168 | $ 44,443 | $ 47,859 | $ 42,137 | $ 252,348 |
| Gross Revenue - Cu | K USD | $ 5,997 | $ 12,230 | $ 20,791 | $ 20,932 | $ 22,037 | $ 14,860 | $ 9,428 | $ - | $ - | $ - | $ - | $ 106,275 |
| Gross Revenue - Au | K USD | $ 204 | $ 1,204 | $ 2,216 | $ 2,266 | $ 2,531 | $ 1,254 | $ - | $ - | $ - | $ - | $ - | $ 9,675 |
| ***Shipping, Smelting, and Refining*** | | | | | | | | | | | | | |
| Ag | K USD | $ 1,276 | $ 1,923 | $ 5,027 | $ 4,563 | $ 4,691 | $ 3,592 | $ 2,734 | $ 2,123 | $ 1,345 | $ 1,044 | $ 885 | $ 29,204 |
| Smelter Treatment - Zn | K USD | $ 3,084 | $ 1,835 | $ 2,228 | $ 2,159 | $ 1,365 | $ 3,813 | $ 2,695 | $ 5,570 | $ 7,039 | $ 7,580 | $ 6,674 | $ 44,042 |
| Smelter Treatment - Pb | K USD | $ 2,205 | $ 1,350 | $ 1,537 | $ 1,622 | $ 855 | $ 5,555 | $ 2,696 | $ 5,788 | $ 6,825 | $ 7,293 | $ 6,178 | $ 41,905 |
| Smelter Treatment - Cu | K USD | $ 1,938 | $ 3,899 | $ 6,567 | $ 6,660 | $ 6,919 | $ 4,683 | $ 2,971 | $ - | $ - | $ - | $ - | $ 33,636 |
| Smelter Treatment - Au | K USD | $ 2 | $ 13 | $ 24 | $ 24 | $ 27 | $ 13 | $ - | $ - | $ - | $ - | $ - | $ 104 |
| Total Offsite Costs | K USD | $ 8,506 | $ 9,020 | $ 15,383 | $ 15,029 | $ 13,858 | $ 17,655 | $ 11,096 | $ 13,481 | $ 15,208 | $ 15,917 | $ 13,737 | $ 148,891 |
| Net Smelter Return | K USD | $ 44,146 | $ 51,920 | $ 110,068 | $ 101,844 | $ 100,796 | $ 99,839 | $ 68,806 | $ 73,716 | $ 72,777 | $ 72,438 | $ 62,719 | $ 859,068 |
| Royalty | K USD | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Salvage | K USD | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,000 | $ - | $ - | $ 3,000 | $ 4,000 |
| Net Revenues | K USD | $ 44,146 | $ 51,920 | $ 110,068 | $ 101,844 | $ 100,796 | $ 99,839 | $ 68,806 | $ 74,716 | $ 72,777 | $ 72,438 | $ 65,719 | $ 863,068 |
| ***Operating Costs*** | | | | | | | | | | | | | |
| UG Mine Operations | K USD | $ 11,976 | $ 13,494 | $ 17,975 | $ 18,027 | $ 15,355 | $ 9,989 | $ 7,292 | $ - | $ - | $ - | $ - | $ 94,108 |
| OP Mine Operations | K USD | $ - | $ - | $ 9,980 | $ 9,952 | $ 11,402 | $ 11,968 | $ 24,488 | $ 32,258 | $ 19,954 | $ 6,002 | $ 2,023 | $ 128,026 |
| Mine Development - Expensed | K USD | $ 4,636 | $ 6,947 | $ 586 | $ - | $ 136 | $ 3,313 | $ 1,109 | $ - | $ - | $ - | $ - | $ 16,727 |
| Plant Operations | K USD | $ 8,376 | $ 9,116 | $ 13,247 | $ 13,278 | $ 13,251 | $ 13,249 | $ 13,251 | $ 13,279 | $ 13,249 | $ 13,249 | $ 13,353 | $ 136,897 |
| Technical Services | K USD | $ 1,342 | $ 1,409 | $ 1,610 | $ 1,610 | $ 1,610 | $ 1,610 | $ 1,610 | $ 1,610 | $ 1,610 | $ 1,610 | $ 1,623 | $ 17,252 |
| Safety & Environment | K USD | $ 1,128 | $ 1,269 | $ 1,692 | $ 1,692 | $ 1,692 | $ 1,692 | $ 1,692 | $ 1,692 | $ 1,692 | $ 1,692 | $ 1,705 | $ 17,638 |
| Administration | K USD | $ 4,217 | $ 4,744 | $ 6,325 | $ 6,325 | $ 6,325 | $ 6,325 | $ 6,325 | $ 6,325 | $ 6,325 | $ 6,325 | $ 6,375 | $ 65,937 |
| Closure | K USD | $ - | $ - | $ - | $ 331 | $ - | $ - | $ 200 | $ 200 | $ - | $ - | $ 3,300 | $ 4,032 |
| Total Operating Costs | K USD | $ 31,674 | $ 36,979 | $ 51,415 | $ 51,215 | $ 49,771 | $ 48,146 | $ 55,967 | $ 55,364 | $ 42,831 | $ 28,878 | $ 28,379 | $ 480,618 |
| ***Capital Costs*** | | | | | | | | | | | | | |
| Mine Development | K USD | $ 5,484 | $ 4,159 | $ - | $ - | $ - | $ 4,708 | $ 568 | $ - | $ - | $ - | $ - | $ 14,919 |
| OP Pre-Stripping | K USD | $ - | $ 9,313 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 9,313 |
| UG Mining Capital | K USD | $ 3,391 | $ 4,541 | $ 10,177 | $ 1,897 | $ 1,088 | $ 680 | $ - | $ - | $ - | $ - | $ - | $ 21,774 |
| OP Mining Capital | K USD | $ 1,470 | $ 500 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 300 | $ 2,270 |
| Process Capital | K USD | $ 3,101 | $ 14,500 | $ 2,000 | $ 2,000 | $ 2,000 | $ 2,000 | $ 2,000 | $ 1,600 | $ 1,200 | $ 800 | $ - | $ 31,201 |
| Other | K USD | $ 3,240 | $ 300 | $ 300 | $ 300 | $ 300 | $ 300 | $ 300 | $ 300 | $ 300 | $ 150 | $ - | $ 5,790 |
| Total Capital | K USD | $ 16,687 | $ 33,313 | $ 12,477 | $ 4,197 | $ 3,388 | $ 7,688 | $ 2,868 | $ 1,900 | $ 1,500 | $ 950 | $ 300 | $ 85,267 |
| Total Cost | K USD | $ 48,361 | $ 70,292 | $ 63,891 | $ 55,412 | $ 53,159 | $ 55,834 | $ 58,835 | $ 57,264 | $ 44,331 | $ 29,828 | $ 28,679 | $ 565,885 |
| Cash Cost * | $/oz Ag | $ 13.86 | $ 13.92 | $ 7.07 | $ 8.02 | $ 7.84 | $ 1.45 | $ 16.23 | $ 9.31 | $ (12.87) | $ (44.51) | $ (39.73) | $ 4.87 |
| Total Cost * | $/oz Ag | $ 27.38 | $ 35.81 | $ 10.58 | $ 9.31 | $ 8.89 | $ 4.72 | $ 17.85 | $ 10.76 | $ (11.05) | $ (43.03) | $ (39.18) | $ 9.08 |
| Net Operating Cash-Flow | K USD | $ 12,472 | $ 14,941 | $ 58,654 | $ 50,628 | $ 51,025 | $ 51,693 | $ 12,839 | $ 19,353 | $ 29,946 | $ 43,560 | $ 37,340 | $ 382,451 |
| Total Cash-Flow | K USD | $ (4,215) | $ (18,372) | $ 46,177 | $ 46,431 | $ 47,637 | $ 44,005 | $ 9,971 | $ 17,453 | $ 28,446 | $ 42,610 | $ 37,040 | $ 297,184 |
| ***Tax Considerations*** | | | | | | | | | | | | | |
| Tax deductions Brought Forward | K USD | $ 72,546 | $ 76,761 | $ 95,133 | $ 48,956 | $ 2,525 | $ - | $ - | $ - | $ - | $ - | $ - | |
| Tax deductions available in period | K USD | $ 89,233 | $ 110,074 | $ 107,610 | $ 53,153 | $ 5,913 | $ 7,688 | $ 2,868 | $ 1,900 | $ 1,500 | $ 950 | $ 300 | |
| Net Operating Cash Flow | K USD | $ 12,472 | $ 14,941 | $ 58,654 | $ 50,628 | $ 51,025 | $ 51,693 | $ 12,839 | $ 19,353 | $ 29,946 | $ 43,560 | $ 37,340 | $ 382,451 |
| Taxable Income | K USD | $ - | $ - | $ - | $ - | $ 45,112 | $ 44,005 | $ 9,971 | $ 17,453 | $ 28,446 | $ 42,610 | $ 37,040 | |
| Tax Paid at 30% | K USD | $ - | $ - | $ - | $ - | $ 13,534 | $ 13,202 | $ 2,991 | $ 5,236 | $ 8,534 | $ 12,783 | $ 11,112 | $ 67,391 |
| Tax deductions Carried Forward | K USD | $ 76,761 | $ 95,133 | $ 48,956 | $ 2,525 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | |
| Net Cash-Flow After Tax | K USD | $ (4,215) | $ (18,372) | $ 46,177 | $ 46,431 | $ 34,104 | $ 30,804 | $ 6,980 | $ 12,217 | $ 19,912 | $ 29,827 | $ 25,928 | $ 229,792 |

| | | |
|---|---|---|
| Total Cash-Flow | K USD | $ 229,792 |
| NPV (5%) | K USD | $ 166,653 |
| NPV (7%) | K USD | $ 147,740 |
| NPV (10%) | K USD | $ 124,268 |

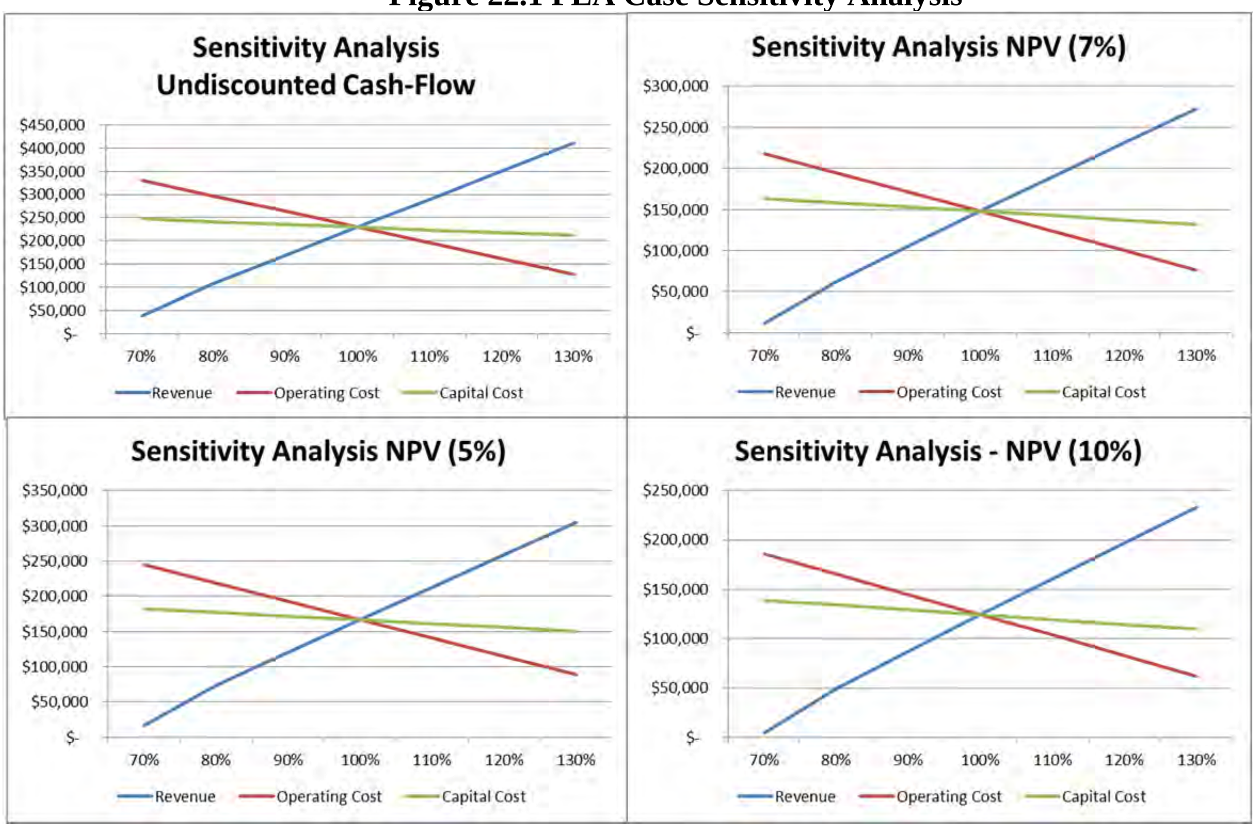
### 22.2.1 PEA Case Sensitivity

Economic model sensitivity of revenue, operating cost, or capital costs was evaluated for the PEA Case using change to the values of -30% to +30% in increments of 10%. Table 22.3 shows the PEA Case sensitivity, and Figure 22.1 shows graphs illustrating the sensitivity. Based on the slope of the graph, the PEA deposits are most sensitive to metal prices while they are comparatively less sensitive to operating costs.

**Table 22.3 PEA Case Sensitivity Analysis**

| *Revenue* | | | | | *Operating Costs* | | | | | *Capital Costs* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Factor | Cash-Flow | NPV (5%) | NPV (7%) | NPV (10%) | Factor | Cash-Flow | NPV (5%) | NPV (7%) | NPV (10%) | Factor | Cash-Flow | NPV (5%) | NPV (7%) | NPV (10%) |
| 70% | $ 38,263 | $ 17,396 | $ 11,562 | $ 4,674 | 70% | $ 330,722 | $ 244,038 | $ 217,982 | $ 185,569 | 70% | $ 247,699 | $ 182,670 | $ 163,117 | $ 138,780 |
| 80% | $ 108,963 | $ 73,100 | $ 62,518 | $ 49,531 | 80% | $ 297,079 | $ 218,253 | $ 194,581 | $ 165,151 | 80% | $ 241,730 | $ 177,341 | $ 158,004 | $ 133,958 |
| 90% | $ 169,378 | $ 120,299 | $ 105,647 | $ 87,509 | 90% | $ 263,436 | $ 192,468 | $ 171,179 | $ 144,733 | 90% | $ 235,761 | $ 172,012 | $ 152,891 | $ 129,136 |
| 100% | $ 229,792 | $ 166,653 | $ 147,740 | $ 124,268 | 100% | $ 229,792 | $ 166,653 | $ 147,740 | $ 124,268 | 100% | $ 229,792 | $ 166,653 | $ 147,740 | $ 124,268 |
| 110% | $ 290,207 | $ 212,675 | $ 189,410 | $ 160,499 | 110% | $ 196,149 | $ 140,667 | $ 124,082 | $ 103,531 | 110% | $ 223,824 | $ 161,246 | $ 142,527 | $ 119,322 |
| 120% | $ 350,622 | $ 258,667 | $ 231,041 | $ 196,684 | 120% | $ 162,506 | $ 114,668 | $ 100,410 | $ 82,777 | 120% | $ 217,855 | $ 155,838 | $ 137,315 | $ 114,376 |
| 130% | $ 411,037 | $ 304,500 | $ 272,466 | $ 232,604 | 130% | $ 128,863 | $ 88,329 | $ 76,319 | $ 61,526 | 130% | $ 211,886 | $ 150,431 | $ 132,102 | $ 109,430 |

**Figure 22.1 PEA Case Sensitivity Analysis**



# 23.0 ADJACENT PROPERTIES

The portion of the El Cajón deposit that is on the Silvia Maria concession, which is not controlled by Scorpio, has been exploited by private Mexican companies since 2011. Material is shipped to the 450tpd process plant in the town of Cosalá, although production details are not publicly available. Otherwise, MDA has no information on the concessions owned by other parties that lie within or adjacent to Scorpio's property boundaries.

# 24.0 OTHER RELEVANT DATA AND INFORMATION

MDA is not aware of any other data or information that is relevant to the mineral resource estimates, reserve calculation, or preliminary economic assessment described in this report.

# 25.0 INTERPRETATION AND CONCLUSIONS

Of the three deposits described in this report, Nuestra Señora is the only one currently in production. Nuestra Señora exhibits more extreme spatial variability in geometry, continuity, and grade than is typical even for skarn deposits. Detailed infill drilling to support stope design, as Scorpio has been implementing in recent years, will have to continue to overcome these inherent complexities. The large number of drill holes supported by a strong understanding of the deposit's geology imparts relatively high confidence that Inferred tonnes will, with additional infill drilling, be upgraded to Measured or Indicated. There is a history of successfully delineating mineable material at Nuestra Señora with infill drilling, both in areas predicted by exploration drilling and in areas not encountered by exploration drilling. This reflects the poddy nature of the deposit. It is likely this history of success will continue with the upgrade and/or discovery of additional resources.

Potential for discovery of new mineralization at Nuestra Señora is limited down-dip of mined material at level 12. The mineralizing granodiorite batholith has been encountered in the northern portion of existing workings and in drilling within ±100m below level 12. It is unlikely mineralization is present more than a few 10s of meters into the intrusive body. However, new interpretations regarding the nature of syn- and post-mineral faulting allow for the potential for discovery of new deposits in the Nuestra Señora area. Normal and/or strike-slip movement on the Hoag and related faults has likely displaced portions of the Main Zone and Candelaria into other locations. The Hoag Zone, which is bounded and internally sliced by numerous faults, appears to be one of these displaced bodies; Santa Teresa may be another example as well. Exploration along movement directions of the displacing faults, particularly to the northeast of Candelaria beneath the major thrust fault that bounds the district, could reveal hidden, undiscovered mineralization. Refinement of the understanding of these faults, as well as the nature of skarn alteration and mineralization, is critical.

There is limited potential for increasing the size of the San Rafael deposit Main Zone massive sulfide mineralization. The 120 Zone at depth beneath the Main Zone is still open to the east and northeast and could be expanded with further drilling.

Positive 2012 drill results at El Cajón indicate the potential for additional mineralization to the east down dip within the limestone, following up on structural targets, and to the south and east along the diorite contact. Additional mineralization could also be discovered along the diorite/limestone contact on the west and south edges of the diorite intrusion. An increase in classification of the El Cajón resource would be expected with further drilling and increased geologic confidence. Like all skarn deposits, interpretation will be complex and will require exceptionally good geologic data.

The Nuestra Señora mine has several ores of differing metallurgical characteristics. Base metal and silver grades vary, as do the ratios of each metal to the others. Mineralogical characteristics such as species, fluid inclusions, and grain size limit the flotation process selectivity achievable on a production scale. For the most recent 18-month period, with ore average head grades of 0.33% Cu, 0.92% Pb, 2.07% Zn, and 97 g Ag/t, the plant provided metal recoveries of 83.4% for Zn and 7.6% for Ag to the zinc concentrate, 68.6% for Pb and 46.7% for Ag to the lead concentrate, and 56.9% for Cu and 27.7% for Ag to the copper concentrate.

Metallurgical testing on the El Cajón mineralization established that this mineralization type was amenable to bulk sulfide flotation treatment with upgrading of a final concentrate product possible through reagent-optimization testing. Testing conducted on the San Rafael Main Zone sulfide mineralization type has shown this ore type can be processed using a sequential flotation scheme to produce separate lead/silver concentrate and zinc concentrate products. Reagent optimization for this mineralization type has proven to be significantly more difficult than for the El Cajón mineralization type, and carry-over of gangue minerals into the concentrate products presents a significant challenge. Further reagent-optimization, locked-cycle flotation, and ore variability testing will be required for the San Rafael Main Zone sulfide mineralization. Attempts at applying the flotation processing schemes optimized for the El Cajón and San Rafael mineralization types to the 120 Zone and Main/120 Overlap Zone mineralization types were not particularly successful; further testing is required for these two ore types.

The PEA for Nuestra Señora, El Cajón, and San Rafael shows a strong return on investment and good cash-flow to strengthen Scorpio's operations in Mexico. The high rate of return on the project is due to strong resources providing strong revenues and existing infrastructure reducing capital requirements. After additional drilling and metallurgical testing are completed, pre-feasibility or feasibility studies to advance the project should be persued.

# 26.0 RECOMMENDATIONS

## 26.1 Nuestra Señora

Recommendations for Nuestra Señora emphasize expanding the resource and reserve and evaluating the operations.

Exploration drilling has been ongoing and should continue in the near term in order to augment the reserves. However, some production efficiencies and optimization should also be studied and completed.

### 26.1.1 Drilling

First, drilling should continue in areas internal and immediately adjacent to the mined deposit where Inferred resources contain economic grades, as these most likely represent a substantial part of potentially economic material that can be upgraded to at least Indicated resources. Exploration should then be focused on expanding the resource by searching for extensions along strike and up- and down-dip from known mineralization. Potential for discovery of new mineralization is greater up-dip (including within the historic Asarco workings) and along strike; there is less potential down-dip of levels 12 and 13 where unmineralized granodiorite would be encountered within 100m. Potential also exists for discovery of new mineralized bodies on younger and older stratigraphic horizons in the limestone. Geology should guide the exploration by projecting favorable horizons or mineralized structures. This program should have 4,000m of drilling for a total of $400,000. Drilling would be conducted in-house.

Longer term, there is also the potential to discover additional deposits farther afield than in the immediately vicinity of the known Nuestra Señora deposits described in the previous paragraph. This work requires evaluation of all exploration data, making geologic cross sections for areas outside the mine-area proper, and evaluating surface and underground mapping, sampling, and any pertinent geophysics. In particular, the orientation and extent of syn-and post-mineral faulting that may have displaced portions of mineralized bodies, such as the Hoag fault and the Main Zone/Hoag Zone separator, should be determined. Aside from the geologic study leading up to the program, which would likely be funded from ongoing operations, 4,000m of underground drilling are justified that would cost approximately $400,000. Some additional exploration drilling should be done from the surface, and these costs are higher ($150/m); a program of 3,000m would cost approximately $450,000.

In total, $1,250,000 of exploration drilling is warranted.

### 26.1.2 Mine Production Efficiencies and Optimization

Any mine operation should have production and operation audits to ensure that all available efficiencies are being employed. Some observations MDA had while working with Scorpio that should be considered as part of ongoing operations (and thereby without any particular budget assigned to them) are:

- Maintain a constant underground mine mapping program, and incorporate these interpretations on the geologic cross sections. There are extreme complexities in this deposit which are not and, in fact, cannot be interpreted from the exploration drilling, but which are evident underground.

- Mined-out volumes should be archived into separate valid solids. The mining staff is currently updating a large solid to represent mined-out areas, which becomes difficult to maintain as a valid solid shape. Because of this, it is difficult if not impossible to go back through historic data and ascertain tonnage and grades mined based on block models and or ore control drilling on a period of location basis. These solids should be created to represent either monthly or stope by stope volumes. These can then be used as part of a reconciliation program.
- Regularly, for example on a monthly basis, compare production data to the block model to assess how the model has performed and how best to use it. Any future updates to the resource will certainly have to take these comparisons into account.
- Scorpio recently acquired an X-ray fluorescence ("XRF") analyzer, which is a more cost-effective way to determine grades of samples, if done on pulverized (e.g., homogenized) material. Scorpio should take on the task of assessing the quality and reliability of these analyses, as this method would provide significant operational efficiencies. Scorpio should set up a QA/QC program for the XRF analyzer.
- Presently Scorpio does not have a QA/QC program in place for grade-control sampling and their in-house laboratory. One should be implemented to assess the quality and reliability of the grade-control sampling and the laboratory's analytical results.
- A complete review of the mining and processing operations and material balances. MDA assumes that the cost of this would likely be for external auditors/consultants and could reach $50,000 for an engineer and metallurgist.

### 26.1.3 Process Optimization

The following recommendations are made for the optimization of processing operations:

- There is a need for continuing metallurgical test work to confirm ore hardness and to optimize the flotation processing route for each ore type, and then applying those results to variability test work samples. The ultimate objective is to attain predictive tools for the metallurgical response of various ore types available from the Nuestra Señora mine. Much of this work can be performed by operations personnel at the existing Nuestra Señora laboratory. However, the supplemental use of external consultants and laboratories should be considered. The cost of such external services could reach $50,000 on an annual basis.
- The recent installation of the flash flotation cell has undergone performance monitoring, but further work is required to confirm the expected concentrate product improvements. It is likely that several months may be spent in the optimization of its configuration and then inclusion into ongoing variability test work. This work can be incorporated into the existing operational work program and cost structure.

## 26.2 San Rafael and El Cajón

As the PEA shows a strong positive cash-flow, it is recommended that work be completed to a feasibility level of study for each of these deposits. This should include infill drilling, geotechnical work for pit slopes and facilities, and additional metallurgical studies as required. Feasibility study costs are estimated to be $750,000 with an additional $600,000 for more definition drilling. Infill drilling would primarily cover the open pit area; the feasibility study would combine El Cajón and San Rafael open pit and underground into a single integrated study. The study would also include hydrological and geotechnical issues.

Additional exploration drilling is recommended on the east side of El Cajón, following up on the structural targets, and to the south and east along the diorite contact. A 6,000m drill program is recommended at a cost of about $900,000.

# 27.0 REFERENCES

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## 28.0 DATE AND SIGNATURE PAGE

Effective Date of report: December 31, 2012

The effective date of the Nuestra Señora database on which the resource was previously estimated is February 20, 2012. The effective date of the previously reported Nuestra Señora resource estimate is June 22, 2012. The effective date of both the San Rafael and El Cajón databases on which the resources described in this Technical Report are estimated is July 20, 2012. The effective date of both the El Cajón and San Rafael resource estimates is September 7, 2012. The effective date of the new Nuestra Señora reserve and the PEA is December 31, 2012. The effective date of this report is December 31, 2012.

Completion Date of report: April 12, 2013

| | |
|---|---|
| ***"Thomas L. Dyer"*** | April 12, 2013 |
| Thomas L. Dyer, P.E. | Date Signed |
| ***"Steve Ristorcelli"*** | April 12, 2013 |
| Steven Ristorcelli, C.P.G | Date Signed |
| ***"Paul Tietz"*** | April 12, 2013 |
| Paul Tietz, C.P.G. | Date Signed |
| ***"Michael Lindholm"*** | April 12, 2013 |
| Michael S. Lindholm, C.P.G. | Date Signed |
| ***"Pierra Lacombe"*** | April 12, 2013 |
| Pierre Lacombe, Eng. | Date Signed |
| ***"Jack McParland"*** | April 12, 2013 |
| Jack McPartland, Q.P.M. | Date Signed |

## 29.0 CERTIFICATES OF QUALIFIED PERSONS

I, Thomas L. Dyer, P.E., do hereby certify that I am currently employed as Senior Enginer by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502 and:

1. I graduated with a Bachelor of Science degree in Mine Engineering from South Dakota School of Mines and Technology in 1996. I have worked as a mining engineer for a total of 16 years since my graduation.

2. I am a Registered Professional Engineer in the state of Nevada (#15729) and a Registered Member (#4029995RM) of the Soceity of Mining, Metallurgy and Exploration.

3. I have read the definition of "qualified person" 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. I am independent of Scorpio and its subsidiaries, applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am responsible or jointly responsible for sections 1 (excluding 1.5), 2, 15, 16, 18 through 22, 25, and 26 of this technical report titled *Technical Report and Preliminary Economic Assessment, Nuestra Señora, San Rafael, and El Cajón Deposits, Sinaloa, Mexico* for Scorpio Mining Corporation dated April 12, 2013 ("Technical Report"). I visited the property on June 4 to June 5, 2012.

5. I have had involvement with San Rafael and El Cajón having worked on a previous Preliminary Economic Assessment for Platte River Gold (U.S.) as described in this report.

6. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

7. 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.

Dated this 12th day of April 2013,

***"Thomas L. Dyer"***

Thomas L. Dyer, P.E.
Print Name of Qualified Person

I, Steven Ristorcelli, C.P.G., do hereby certify that I am currently employed as Principal Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502 and:

1. I graduated with a Bachelor of Science degree in Geology from Colorado State University in 1977 and a Master of Science degree in Geology from the University of New Mexico in 1980. I have worked as a geologist for a total of 35 years since my graduation from undergraduate university.

2. I am a Registered Professional Geologist in the states of California (#3964) and Wyoming (#153) and a Certified Professional Geologist (#10257) with the American Institute of Professional Geologists.

3. I have read the definition of "qualified person" 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. I am independent of Scorpio and its subsidiaries, applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am responsible or jointly responsible for Sections 1 (excluding 1.5 and 1.7 through 1.9) through 12, 14.2, and 23 through 27, except for those parts relating to El Cajón and San Rafael, of this technical report titled*Technical Report and Preliminary Economic Assessment, Nuestra Señora, San Rafael, and El Cajón Deposits, Sinaloa, Mexico* for Scorpio Mining Corporation dated April 12, 2013 ("Technical Report") and relied on other experts for Sections 4.2 through 4.6 as permitted by NI 43-101 and described in Section 3.0. I visited the property on March 12 to March 20, 2012 and again on June 28, 2012.

5. I have had involvement with San Rafael and El Cajón having worked on previous resource estimates for Platte River Gold (U.S.) as described in this report.

6. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

7. 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.

Dated this 12th day of April 2013,

***"Steven Ristorcelli"***

Steven Ristorcelli
Print Name of Qualified Person

## Paul Tietz, C.P.G.

I, Paul Tietz, C.P.G., do hereby certify that I am currently employed as Senior Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502.

1. I graduated with a Bachelor of Science degree in Biology/Geology from the University of Rochester in 1977 and a Master of Science degree in Geology from the University of North Carolina, Chapel Hill in 1981. I also received a Master of Science degree in Geological Engineering from the University of Nevada, Reno in 2004. I have worked as a geologist for a total of 34 years since my graduation from undergraduate university.

2. I am a Certified Professional Geologist (#11004) with the American Institute of Professional Geologists.

3. I have read the definition of "qualified person" 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. I am independent of Scorpio and its subsidiaries, applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am responsible or jointly responsible for Sections 1 (excluding 1.5 and 1.7 through 1.9) through 12, 14.3, 14.4, and 23 through 27, except for those parts related to Nuestra Señora, of this technical report titled*Technical Report and Preliminary Economic Assessment, Nuestra Señora, San Rafael, and El Cajón Deposits, Sinaloa, Mexico* for Scorpio Mining Corporation dated April 12, 2013 ("Technical Report"). I have relied on other experts for Sections 4.2 through 4.6 as permitted by NI 43-101. I visited the San Rafael and El Cajón projects from January 29 through February 3, 2007, and again September 19 through September 21, 2007. I visited the Nuestra Señora and San Rafael projects on September 27 through October 1, 2011.

5. I have had involvement with this project having worked on two previous resource estimates for Platte River Gold (U.S.) on El Cajón and San Rafael as described in this report.

6. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

7. 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.

Dated this 12th day of April 2013,

***"Paul Tietz"***

Paul Tietz
Print Name of Qualified Person

## Michael S. Lindholm, C. P. G.

I, Michael S. Lindholm, C. P. G., do hereby certify that:

1. I am currently employed as Project Geologist by Mine Development Associates, Inc., 210 South Rock Blvd., Reno, Nevada 89502.

2. I graduated with a Bachelor of Science degree in Geology from Stephen F. Austin State University in 1984 and with a Master of Science degree in Geology from Northern Arizona University in 1989.

3. I am a Professional Geologist in the state of California (#8152) and a Certified Professional Geologist (#11477) with the American Institute of Professional Geologists.

4. I have worked as a geologist for a total of 28 years since graduation from undergraduate university.

5. I have read the definition of "qualified person" 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 of "qualified person" for the purposes of NI 43-101.

6. I am jointly responsible for Sections 1 through 12 (excluding 1.5, and 4.2 through 4.6), 14.2, and 23 through 27, except for those parts relating to El Cajón and San Rafael, of this technical report titledTechnical Report and Preliminary Economic Assessment, Nuestra Señora, San Rafael, and El Cajón Deposits, Sinaloa, Mexico for Scorpio Mining Corporation dated April 12, 2013 ("Technical Report") and relied on other experts for Sections 4.2 through 4.6 as permitted by NI 43-101. I visited projects in the Cosalá District, including Nuestra Señora and San Rafael, September 27 through October 1, 2011 and the Nuestra Señora project from March 12 through March 20, 2012.

7. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

8. I am independent of Scorpio Mining Corporation and all its subsidiaries as defined in Section 1.5 of NI 43-101 and in Section 1.5 of the Companion Policy to NI 43-101.

9. 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.

10. The Technical Report contains information relating to mineral titles, permitting, environmental issues, regulatory matters and legal agreements. I am not a legal, environmental or regulatory professional, and do not offer a professional opinion regarding these issues.

11. A copy of this report is submitted as a computer readable file in Adobe Acrobat© PDF© format. The requirements of electronic filing necessitate submitting the report as an unlocked, editable file. I accept no responsibility for any changes made to the file after it leaves my control.

Dated this 12th day of April, 2013.

*"Michael S. Lindholm"*
Signature of Qualified Person
Michael S. Lindholm, C.P.G.

**Jack McPartland, Q.P.M.**

I, Jack McPartland, do hereby certify that I am currently employed as Metallurgist/V.P. Operations, McClelland Laboratories, Inc., 1016 Greg Street, Sparks, Nevada 89431, and:

1. I graduated with a Bachelor of Science degree in Chemical Engineering from the University of Nevada, Reno in 1986 and a Master of Science degree in Metallurgical Engineering from the University of Nevada, Reno in 1989. I have worked as a metallurgist for a total of 25 years since my graduation from undergraduate university.

2. I am a registered member of the Mining and Metallurgical Society of America, and recognized as a Qualified Professional (QP) Member with special expertise in Metallurgy/Processing (Member No. 01350QP).

3. I have read the definition of "qualified person" 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. I am independent of Scorpio and its subsidiaries, applying all of the tests in section 1.5 of National Instrument 43-101.

4. I am responsible for the preparation of the Mineral Processing and Metallurgical Testing section 13.2 and the summary in Section 1.5.2 of this technical report titled *Technical Report and Preliminary Economic Assessment, Nuestra Señora, San Rafael, and El Cajón Deposits, Sinaloa, Mexico* for Scorpio Mining Corporation dated April 12, 2013 ("Technical Report"). I have not visited the project.

5. I have had prior involvement with metallurgical testing programs conducted at McClelland Laboratories, Inc. on samples from the San Rafael and El Cajón deposits. I was a co-author of the 2009 Technical Report for Platte River Gold (U.S.) Inc. and Scorpio Mining Corporation on what was previously called the La Verde project. I was also co-author of the 2012 Technical Report for Scorpio Mining Corporation on the Nuestra Señora, San Rafael, and El Cajón deposits.

6. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

7. 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.

Dated this12th day of April, 2013.

***"Jack McPartland"***

Signature of Qualified Person
Jack McPartland

CERTIFICATE OF QUALIFIED PERSON

Pierre Lacombe, Eng.
Pershimco Resources Ltd
2500 Lapiniere Blvd, Brossard
Quebec, Canada, J4Z 3V1
Tel. (450) 656-5210

I, Pierre Lacombe, eng, do hereby certify that I am currently employed as Vice-President, Project Development with Pershimco Resources and that:

1. I graduated with a Bachelor of Engineering in Mining Engineering from Ecole Polytechnique of Montreal in 1984. I have worked, holding various technical and managerial positions, in the mining industry for a total of 29 years since my graduation.

2. I am a Registered Professional Engineer in the Province of Quebec (#39496), a Registered Member of the Society of Mining, Metallurgy and Exploration (#1816574) and of the Canadian Institute of Mining and Metallurgy (#94711).

3. I have read the definition of "qualified person" 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. I am not independent of Scorpio and its subsidiaries, as currently acting as a director, since March 2010, and due to take over the position of President and CEO as of April 22, 2013.

4. I am responsible for sections 1.5.1, 13.1 and 17 of this technical report titled *Technical Report and Preliminary Economic Assessment, Nuestra Señora, San Rafael, and El Cajón Deposits, Sinaloa, Mexico* for Scorpio Mining Corporation dated April 12, 2013 ("Technical Report").

5. As of the effective date of this Technical Report, to the best of my knowledge, information, and belief, those parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

7. 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

Dated this 14th day of April 2013,

Pierre Lacombe, Eng

# APPENDIX A

## List of Concessions Comprising Scorpio's Property

| Concession Name | Concession Title No. | DGM File No. | Issue Date | Expiry Date | Surface (Ha.) | Owner |
|---|---|---|---|---|---|---|
| Ampl. El Magistral | 226527 | 95/12357 | 23-Jan-2006 | 22-Jan-2056 | 614.6 | Minera Cosalá S.A. de C.V. |
| Ampliacion Los Cristos | 178095 | 321.1/9-204 | 11-Jul-1986 | 10-Jul-2036 | 95.7 | Minera Platte River Gold, S. de R.L. de C.V. |
| Anexas al Predio | 167217 | 95/02620 | 22-Oct-1980 | 21-Oct-2030 | 20.0 | Minera Cosalá S.A. de C.V. |
| Anexas del Angel | 167216 | 95/01947 | 22-Oct-1980 | 21-Oct-2030 | 56.0 | Minera Cosalá S.A. de C.V. |
| Biro | 237533 | 95/13225 | 21-Dec-2010 | 20-Dec-2060 | 183.1 | Minera Platte River Gold, S. de R.L. de C.V. |
| Brujita | 238634 | 95/12768 | 11-Oct-2011 | 10-Oct-2061 | 7.8 | Minera Platte River Gold, S. de R.L. de C.V. |
| Covadonga | 238329 | 2/1/02552 | 26-Oct-2005 | 25-Oct-2055 | 7.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| El Angel Tercero | 167215 | 95/01913 | 22-Oct-1980 | 21-Oct-2030 | 64.0 | Minera Cosalá S.A. de C.V. |
| El Cajón | 226288 | 2/1/02534 | 6-Dec-2005 | 5-Dec-2055 | 26.1 | Minera Cosalá S.A. de C.V. |
| El Cajón 2 | 210988 | 95/10547 | 29-Feb-2000 | 28-Feb-2050 | 922.8 | Minera Cosalá S.A. de C.V. |
| El Gallo | 237532 | 95/12767 | 21-Dec-2010 | 20-Dec-2060 | 17.5 | Minera Platte River Gold, S. de R.L. de C.V. |
| El Magistral | 225864 | 2/1/02555 | 4-Nov-2005 | 3-Nov-2055 | 80.6 | Minera Cosalá S.A. de C.V. |
| El Olvidado | 237679 | 95/11779 | 22-Nov-2001 | 21-Nov-2051 | 61.9 | Minera Platte River Gold, S. de R.L. de C.V. |
| El Pino | 227527 | 25/31898 | 6-Jul-2006 | 5-Jul-2056 | 40.0 | Minera Cosalá S.A. de C.V. |
| El Sabino | 213989 | 95/11585 | 13-Jul-2001 | 12-Jul-2051 | 13.9 | Minera Platte River Gold, S. de R.L. de C.V. |
| El Salto | 237531 | 95/12766 | 21-Dec-2010 | 20-Dec-2060 | 30.4 | Minera Platte River Gold, S. de R.L. de C.V. |
| El Venado | 155605 | 95/02048 | 30-Sep-1971 | 29-Sep-2021 | 21.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Frank | 216057 | 95/11820 | 2-Apr-2002 | 1-Apr-2052 | 59.3 | Minera Platte River Gold, S. de R.L. de C.V. |
| Gordon | 210637 | 95/10551 | 29-Oct-1999 | 28-Oct-2049 | 55.1 | Minera Platte River Gold, S. de R.L. de C.V. |
| Humaya | 238290 | 2/1.3/1481 | 8-Oct-1999 | 7-Oct-2049 | 289.1 | Minera Platte River Gold, S. de R.L. de C.V. |
| Jimmy 3 | 213060 | 95/11494 | 2-Mar-2001 | 1-Mar-2051 | 200.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Jimmy 4 | 213019 | 95/11498 | 2-Mar-2001 | 1-Mar-2051 | 56.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Jimmy 5 | 238287 | 95/11499 | 2-Mar-2001 | 1-Mar-2051 | 63.1 | Minera Platte River Gold, S. de R.L. de C.V. |
| Jimmy 6 | 214500 | 95/11517 | 2-Oct-2001 | 1-Oct-2051 | 170.4 | Minera Platte River Gold, S. de R.L. de C.V. |
| La Dora | 186334 | 321.1/2-547 | 29-Mar-1990 | 28-Mar-2040 | 15.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| La Dura | 171975 | 321.1/9-28 | 21-Sep-1983 | 20-Sep-2033 | 100.0 | Minera Platte River Gold, S. de R.L. de C.V. |

| Concession Name | Concession Title No. | DGM File No. | Issue Date | Expiry Date | Surface (Ha.) | Owner |
|---|---|---|---|---|---|---|
| La Escondida | 225865 | 2/1/02556 | 4-Nov-2005 | 3-Nov-2055 | 112.0 | Minera Cosalá S.A. de C.V. |
| La Estrella | 172855 | 961 | 29-Jun-1984 | 28-Jun-2034 | 55.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| La Roja | 238286 | 2/1/02219 | 11-Oct-2002 | 10-Oct-2052 | 590.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| La Seca 2 Fracc. 1 | 223178 | 95/12091 | 29-Oct-2004 | 28-Oct-2054 | 5,747.0 | Minera Cosalá S.A. de C.V. |
| La Seca 2 Fracc. 2 | 223179 | 95/12091 | 29-Oct-2004 | 28-Oct-2054 | 88.2 | Minera Cosalá S.A. de C.V. |
| La Seca 3 | 225354 | 95/12358 | 24-Aug-2005 | 23-Aug-2055 | 200.0 | Minera Cosalá S.A. de C.V. |
| La Seca Fracc. 1 | 222214 | 95/12083 | 3-Jun-2004 | 2-Jun-2054 | 7,514.6 | Minera Cosalá S.A. de C.V. |
| La Seca Fracc. 2 | 222215 | 95/12083 | 3-Jun-2004 | 2-Jun-2054 | 9.8 | Minera Cosalá S.A. de C.V. |
| La Verde | 156662 | 95/02214 | 14-Apr-1972 | 13-Apr-2020 | 100.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Las Guasimas | 214758 | 95/11778 | 22-Nov-2001 | 21-Nov-2051 | 9.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Las Milpas | 211200 | 95/10719 | 11-Apr-2000 | 10-Apr-2050 | 20.9 | Minera Platte River Gold, S. de R.L. de C.V. |
| Los Cristos | 221715 | 025/31229 | 17-Mar-2004 | 16-Mar-2004 | 599.3 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 2 | 226587 | 95/12242 | 27-Jan-2006 | 26-Jan-2056 | 519.7 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 2 Fracc. 2 | 226588 | 95/12242 | 27-Jan-2006 | 26-Jan-2056 | 0.5 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 3 | 237656 | 95/12786 | 20-Apr-2011 | 19-Apr-2061 | 13.3 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 4 | 237658 | 95/12824 | 20-Apr-2011 | 19-Apr-2061 | 0.5 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 5 | 237657 | 95/12623 | 20-Apr-2011 | 19-Apr-2061 | 0.3 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 6 | 237659 | 95/12825 | 20-Apr-2011 | 19-Apr-2061 | 0.8 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda 7 | 237660 | 95/12826 | 20-Apr-2011 | 19-Apr-2061 | 2.5 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda Fracc. A | 238288 | 2/2/00001 | 22-Nov-2002 | 21-Nov-2052 | 186.4 | Minera Platte River Gold, S. de R.L. de C.V. |
| Magda Fracc. B | 218572 | 2/2/00001 | 22-Nov-2002 | 21-Nov-2052 | 49.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Mina Magistral | 210893 | 95/10692 | 28-Jan-2000 | 27-Jan-2050 | 84.9 | Minera Platte River Gold, S. de R.L. de C.V. |
| Monica | 213950 | 95/11578 | 13-Jul-2001 | 30-Jul-2051 | 60.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Monica 2 | 213820 | 95/11497 | 3-Jul-2001 | 2-Jul-2051 | 16.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Norma | 207259 | 95/09629 | 27-May-1998 | 26-May-2048 | 148.6 | Minera Platte River Gold, S. de R.L. de C.V. |
| Penny | 238330 | 2/1/02566 | 27-Sep-2006 | 26-Sep-2056 | 198.9 | Minera Platte River Gold, S. de R.L. de C.V. |
| Real de Montecristo | 207640 | 2/1.3/01325 | 30-Jun-1998 | 29-Jun-2048 | 29.3 | Minera Platte River Gold, S. de R.L. de C.V. |
| Ricardo | 225146 | 95/12204 | 26-Jul-2005 | 25-Jul-2055 | 2,114.3 | Minera Platte River Gold, S. de R.L. de C.V. |
| Rich | 226568 | 25/31827 | 27-Jan-2006 | 26-Jan-2056 | 310.8 | Minera Platte River Gold, S. de R.L. de C.V. |
| Rich 1 | 226550 | 95/12374 | 26-Jan-2006 | 25-Jan-2056 | 179.9 | Minera Platte River Gold, S. de R.L. de C.V. |

| Concession Name | Concession Title No. | DGM File No. | Issue Date | Expiry Date | Surface (Ha.) | Owner |
|---|---|---|---|---|---|---|
| Rich 2 | 227568 | 95/12509 | 6-Jul-2006 | 5-Jul-2056 | 199.8 | Minera Platte River Gold, S. de R.L. de C.V. |
| Rich 3 | 237541 | 95/12827 | 21-Dec-2010 | 20-Dec-2060 | 1.7 | Minera Platte River Gold, S. de R.L. de C.V. |
| Rich 4 | 237827 | 95/12828 | 29-Apr-2011 | 28-Apr-2061 | 0.6 | Minera Platte River Gold, S. de R.L. de C.V. |
| Rich 5 | 237398 | 95/12829 | 9-Dec-2010 | 8-Dec-2060 | 1,601.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Rich 6 | 237399 | 95/12853 | 9-Dec-2010 | 8-Dec-2060 | 37.2 | Minera Platte River Gold, S. de R.L. de C.V. |
| Roja | 238285 | 321.1/2-00054 | 11-May-2001 | 10-May-2051 | 47.9 | Minera Platte River Gold, S. de R.L. de C.V. |
| San Jose | 238289 | 2/1.3/1323 | 8-Jul-1997 | 7-Jul-2047 | 240.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| San Ramon | 214827 | 95/11734 | 4-Dec-2001 | 3-Dec-2051 | 270.8 | Minera Platte River Gold, S. de R.L. de C.V. |
| Silvia Maria | 216419 | 95/11806 | 17-May-2002 | 16-May-2052 | 19.2 | Minera Platte River Gold, S. de R.L. de C.V. |
| Simon | 225867 | 2/1/02561 | 4-Nov-2005 | 3-Nov-2055 | 245.8 | Minera Cosalá S.A. de C.V. |
| Tano | 235521 | 95/13118 | 11-Dec-2009 | 10-Dec-2059 | 596.2 | Minera Platte River Gold, S. de R.L. de C.V. |
| Venado | 228013 | 95/12522 | 26-Sep-2006 | 25-Sep-2056 | 85.5 | Minera Platte River Gold, S. de R.L. de C.V. |
| Venado | 228014 | 95/12523 | 26-Sep-2006 | 25-Sep-2056 | 100.0 | Minera Platte River Gold, S. de R.L. de C.V. |
| Zaida | 231635 | 25/31900 | 28-Mar-2008 | 27-Mar-2058 | 1,141.3 | Minera Cosalá S.A. de C.V. |
| **TOTAL IN DISTRICT** | | | | | **26,818.9** | |
| | | | | | | |
| | NSR royalty of 1.25% payable on future production to subsidiary of Grupo Mexico | | | | | |

# APPENDIX B

## Sample Statistics for Nuestra Señora

| Silver Domain | 11 | Low-grade disseminated fine-grained sulfide domain | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 10,551 | 1.10 | 1.22 | | | 0.07 | 21.00 | m |
| **Ag** | **10,545** | **27.00** | **45.97** | **93.51** | **2.03** | **0.00** | **3980.00** | **g/t** |
| **AgC** | **10,545** | **27.00** | **45.43** | **78.08** | **1.72** | **0.00** | **1400.00** | **g/t** |
| Au | 9,826 | 0.05 | 0.10 | 0.24 | 2.49 | 0.00 | 14.85 | g/t |
| Cu | 10,539 | 0.05 | 0.14 | 0.36 | 2.62 | 0.00 | 10.32 | % |
| Pb | 10,539 | 0.24 | 0.69 | 1.30 | 1.88 | 0.00 | 25.09 | % |
| Zn | 10,541 | 0.43 | 1.23 | 2.21 | 1.81 | 0.00 | 36.05 | % |
| Density | 8,466 | 2.97 | 2.97 | 0.35 | 0.12 | 1.53 | 7.63 | $g/cm^3$ |

| Silver Domain | 12 | High-grade clotty massive and coarse-grained sulfide domain | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 4,498 | 1.00 | 1.09 | | | 0.03 | 6.00 | m |
| **Ag** | **4,494** | **143.00** | **265.24** | **505.74** | **1.91** | **0.50** | **13670.50** | **g/t** |
| **AgC** | **4,494** | **143.00** | **259.33** | **410.78** | **1.58** | **0.50** | **5000.00** | **g/t** |
| Au | 4,284 | 0.11 | 0.31 | 1.43 | 4.67 | 0.00 | 59.20 | g/t |
| Cu | 4,494 | 0.29 | 0.73 | 1.31 | 1.80 | 0.00 | 15.05 | % |
| Pb | 4,494 | 1.13 | 2.40 | 3.31 | 1.38 | 0.00 | 30.00 | % |
| Zn | 4,493 | 1.83 | 4.06 | 5.60 | 1.38 | 0.00 | 46.06 | % |
| Density | 3,663 | 3.00 | 3.01 | 0.40 | 0.13 | 1.71 | 6.54 | $g/cm^3$ |

| Silver Domain | 99 | Outside domains | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Valid N | Median | Mean | Std.Dev. | CV | Minimum | Maximum | Units |
| Length | 31,349 | 1.40 | 2.69 | | | 0.08 | 246.70 | m |
| **Ag** | **29,153** | **3.00** | **11.47** | **68.07** | **5.94** | **0.00** | **4960.00** | **g/t** |
| **AgC** | **29,153** | **3.00** | **10.24** | **35.11** | **3.43** | **0.00** | **500.00** | **g/t** |
| Au | 28,057 | 0.01 | 0.06 | 0.75 | 13.42 | 0.00 | 124.00 | g/t |
| Cu | 29,133 | 0.01 | 0.03 | 0.20 | 5.97 | 0.00 | 9.22 | % |
| Pb | 29,148 | 0.02 | 0.13 | 0.56 | 4.34 | 0.00 | 19.90 | % |
| Zn | 29,149 | 0.04 | 0.25 | 1.11 | 4.42 | 0.00 | 46.42 | % |
| Density | 23,502 | 2.90 | 2.91 | 0.35 | 0.12 | 1.52 | 7.97 | $g/cm^3$ |

| Zinc Domain | 21 | Low-grade disseminated fine-grained sulfide domain | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 9,536 | 1.10 | 1.17 | | | 0.04 | 12.00 | m |
| Ag | 9,532 | 25.00 | 69.46 | 216.77 | 3.12 | 0.00 | 10000.00 | g/t |
| Au | 9,170 | 0.04 | 0.12 | 0.93 | 7.83 | 0.00 | 59.20 | g/t |
| Cu | 9,527 | 0.05 | 0.19 | 0.54 | 2.87 | 0.00 | 14.75 | % |
| Pb | 9,527 | 0.33 | 0.73 | 1.33 | 1.83 | 0.00 | 25.09 | % |
| **Zn** | **9,528** | **0.63** | **1.08** | **1.73** | **1.60** | **0.00** | **30.00** | **%** |
| **ZnC** | **9,528** | **0.63** | **1.07** | **1.34** | **1.25** | **0.00** | **15.00** | **%** |
| Density | 8,129 | 3.00 | 2.97 | 0.34 | 0.12 | 1.73 | 7.63 | $g/cm^3$ |

| Zinc Domain | 22 | High-grade clotty massive and coarse-grained sulfide domain | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 3,647 | 1.00 | 1.03 | | | 0.03 | 3.90 | m |
| Ag | 3,646 | 99.00 | 225.55 | 463.67 | 2.06 | 0.50 | 13670.50 | g/t |
| Au | 3,541 | 0.09 | 0.21 | 0.53 | 2.49 | 0.00 | 8.41 | g/t |
| Cu | 3,646 | 0.26 | 0.73 | 1.31 | 1.81 | 0.00 | 15.05 | % |
| Pb | 3,646 | 2.00 | 2.98 | 3.40 | 1.14 | 0.00 | 30.00 | % |
| **Zn** | **3,646** | **4.17** | **5.91** | **5.63** | **0.95** | **0.00** | **46.06** | **%** |
| **ZnC** | **3,646** | **4.17** | **5.89** | **5.18** | **0.88** | **0.00** | **30.00** | **%** |
| Density | 3,183 | 3.08 | 3.08 | 0.39 | 0.13 | 1.71 | 6.54 | $g/cm^3$ |

| Zinc Domain | 99 | Outside domains | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 33,215 | 1.40 | 2.62 | | | 0.07 | 246.70 | m |
| Ag | 31,014 | 3.00 | 16.98 | 89.22 | 5.25 | 0.00 | 6980.00 | g/t |
| Au | 29,456 | 0.02 | 0.07 | 0.75 | 11.13 | 0.00 | 124.00 | g/t |
| Cu | 30,993 | 0.01 | 0.04 | 0.21 | 5.29 | 0.00 | 9.22 | % |
| Pb | 31,008 | 0.02 | 0.13 | 0.59 | 4.46 | 0.00 | 19.90 | % |
| **Zn** | **31,009** | **0.04** | **0.21** | **1.08** | **5.07** | **0.00** | **46.42** | **%** |
| **ZnC** | **31,009** | **0.04** | **0.18** | **0.49** | **2.69** | **0.00** | **6.00** | **%** |
| Density | 24,319 | 2.89 | 2.90 | 0.35 | 0.12 | 1.52 | 7.97 | $g/cm^3$ |

| Lead Domain | 31 | | Low-grade disseminated fine-grained sulfide domain | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 10,250 | 1.10 | 1.17 | | | 0.03 | 12.00 | m |
| Ag | 10,245 | 30.00 | 74.21 | 195.72 | 2.64 | 0.00 | 10000.00 | g/t |
| Au | 9,707 | 0.05 | 0.13 | 0.91 | 7.25 | 0.00 | 59.20 | g/t |
| Cu | 10,239 | 0.05 | 0.20 | 0.54 | 2.68 | 0.00 | 14.35 | % |
| **Pb** | **10,243** | **0.39** | **0.67** | **0.96** | **1.44** | **0.00** | **25.09** | **%** |
| **PbC** | **10,243** | **0.39** | **0.66** | **0.86** | **1.31** | **0.00** | **9.00** | **%** |
| Zn | 10,241 | 0.65 | 1.44 | 2.51 | 1.74 | 0.00 | 35.95 | % |
| Density | 8,583 | 2.97 | 2.96 | 0.34 | 0.12 | 1.73 | 7.63 | $g/cm^3$ |

| Lead Domain | 32 | | High-grade clotty massive and coarse-grained sulfide domain | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 2,837 | 1.00 | 1.01 | | | 0.10 | 3.90 | m |
| Ag | 2,837 | 120.00 | 279.02 | 552.96 | 1.98 | 0.50 | 13670.50 | g/t |
| Au | 2,793 | 0.09 | 0.26 | 0.63 | 2.46 | 0.00 | 8.41 | g/t |
| Cu | 2,837 | 0.33 | 0.85 | 1.44 | 1.70 | 0.00 | 15.05 | % |
| **Pb** | **2,837** | **3.09** | **4.12** | **3.59** | **0.87** | **0.00** | **30.00** | **%** |
| **PbC** | **2,837** | **3.09** | **4.09** | **3.44** | **0.84** | **0.00** | **20.00** | **%** |
| Zn | 2,837 | 4.06 | 5.86 | 5.97 | 1.02 | 0.01 | 46.06 | % |
| Density | 2,544 | 3.15 | 3.14 | 0.39 | 0.12 | 1.71 | 6.54 | $g/cm^3$ |

| Lead Domain | 99 | | Outside domains | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 33,311 | 1.40 | 2.62 | | | 0.08 | 246.70 | m |
| Ag | 31,110 | 3.00 | 14.76 | 75.03 | 5.08 | 0.00 | 4960.00 | g/t |
| Au | 29,667 | 0.02 | 0.06 | 0.74 | 11.59 | 0.00 | 124.00 | g/t |
| Cu | 31,090 | 0.01 | 0.04 | 0.22 | 5.46 | 0.00 | 9.22 | % |
| **Pb** | **31,101** | **0.02** | **0.11** | **0.53** | **4.88** | **0.00** | **19.90** | **%** |
| **PbC** | **31,101** | **0.02** | **0.10** | **0.34** | **3.47** | **0.00** | **4.00** | **%** |
| Zn | 31,105 | 0.04 | 0.23 | 1.05 | 4.63 | 0.00 | 46.42 | % |
| Density | 24,504 | 2.89 | 2.90 | 0.35 | 0.12 | 1.52 | 7.97 | $g/cm^3$ |

| Copper Domain | 41 | Low-grade disseminated fine-grained sulfide domain | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 7,337 | 1.10 | 1.19 | | | 0.03 | 6.00 | m |
| Ag | 7,334 | 33.00 | 63.68 | 138.06 | 2.17 | 0.00 | 3980.00 | g/t |
| Au | 7,013 | 0.04 | 0.12 | 1.50 | 12.50 | 0.00 | 124.00 | g/t |
| **Cu** | **7,329** | **0.09** | **0.16** | **0.31** | **1.97** | **0.00** | **8.59** | **%** |
| **CuC** | **7,329** | **0.09** | **0.15** | **0.26** | **1.66** | **0.00** | **3.00** | **%** |
| Pb | 7,329 | 0.32 | 0.90 | 1.53 | 1.69 | 0.00 | 25.09 | % |
| Zn | 7,330 | 0.58 | 1.52 | 2.68 | 1.76 | 0.00 | 38.52 | % |
| Density | 6,009 | 3.02 | 3.01 | 0.36 | 0.12 | 1.71 | 7.23 | $g/cm^3$ |

| Copper Domain | 42 | High-grade clotty massive and coarse-grained sulfide domain | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 3,478 | 1.00 | 1.08 | | | 0.07 | 3.90 | m |
| Ag | 3,476 | 140.00 | 267.24 | 486.16 | 1.82 | 0.50 | 10000.00 | g/t |
| Au | 3,337 | 0.11 | 0.32 | 1.59 | 5.02 | 0.00 | 59.20 | g/t |
| **Cu** | **3,476** | **0.52** | **1.00** | **1.43** | **1.43** | **0.00** | **15.05** | **%** |
| **CuC** | **3,476** | **0.52** | **0.99** | **1.32** | **1.34** | **0.00** | **9.00** | **%** |
| Pb | 3,476 | 1.37 | 2.70 | 3.52 | 1.30 | 0.00 | 30.00 | % |
| Zn | 3,476 | 2.33 | 4.44 | 5.71 | 1.29 | 0.00 | 46.06 | % |
| Density | 2,849 | 3.04 | 3.05 | 0.40 | 0.13 | 1.71 | 6.54 | $g/cm^3$ |

| Copper Domain | 99 | Outside domains | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Valid N** | **Median** | **Mean** | **Std.Dev.** | **CV** | **Minimum** | **Maximum** | **Units** |
| Length | 35,583 | 1.40 | 2.52 | | | 0.07 | 246.70 | m |
| Ag | 33,382 | 4.00 | 18.43 | 118.45 | 6.43 | 0.00 | 13670.50 | g/t |
| Au | 31,817 | 0.02 | 0.06 | 0.18 | 2.93 | 0.00 | 14.85 | g/t |
| **Cu** | **33,361** | **0.01** | **0.03** | **0.19** | **6.20** | **0.00** | **9.22** | **%** |
| **CuC** | **33,361** | **0.01** | **0.03** | **0.12** | **4.23** | **0.00** | **1.50** | **%** |
| Pb | 33,376 | 0.03 | 0.18 | 0.68 | 3.85 | 0.00 | 25.69 | % |
| Zn | 33,377 | 0.05 | 0.36 | 1.39 | 3.90 | 0.00 | 46.42 | % |
| Density | 26,773 | 2.89 | 2.90 | 0.35 | 0.12 | 1.52 | 7.97 | $g/cm^3$ |

# Appendix C

## Estimation Parameters for Nuestra Señora

# Silver Estimation Parameters

| **Description** | **Parameter** |
|---|---|
| **disseminated low-grade domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (g Ag/t : meters) | 250 : 20 |
| | |
| **clotty massive and coarse-grained sulfide high-grade** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (g Ag/t : meters) | 400 : 40 |
| | |
| **outside mineralization** | |
| Samples: minimum/maximum/maximum per hole | 2 / 10 / 3 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 25 / 25 / 10 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (g Ag/t : meters) | 9 : 5 |
| | |

# Zinc Estimation Parameters

| **Description** | **Parameter** |
|---|---|
| **disseminated low-grade domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Zn : meters) | 3.0 : 60 |
| | |
| **clotty massive and coarse-grained sulfide high-grade** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Zn : meters) | NA |
| | |
| **outside mineralization** | |
| Samples: minimum/maximum/maximum per hole | 2 / 10 / 3 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 25 / 25 / 10 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Zn : meters) | 0.3 : 5 |
| | |

## Lead Estimation Parameters

| Description | Parameter |
|---|---|
| **disseminated low-grade domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Pb : meters) | NA |
| | |
| **clotty massive and coarse-grained sulfide high-grade** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Pb : meters) | NA |
| | |
| **outside mineralization** | |
| Samples: minimum/maximum/maximum per hole | 2 / 10 / 3 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 25 / 25 / 10 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Pb : meters) | 0.2 : 5 |
| | |

# Copper Estimation Parameters

| Description | Parameter |
|---|---|
| **disseminated low-grade domain** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Cu : meters) | 0.6 : 20 |
| | |
| **clotty massive and coarse-grained sulfide high-grade** | |
| Samples: minimum/maximum/maximum per hole | 1 / 10 / 2 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 75 / 75 / 25 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Cu : meters) | 1.0 : 50 |
| | |
| **outside mineralization** | |
| Samples: minimum/maximum/maximum per hole | 2 / 10 / 3 |
| Rotation/Dip/Tilt (searches) | $60^o$ / $-40^o$ / $0^o$ |
| Search (m): major/semimajor/minor (vertical) | 25 / 25 / 10 |
| Type of search and weighting | anisotropic |
| Inverse distance power | 5 |
| High-grade restrictions (%Cu : meters) | 0.06 : 5 |
| | |