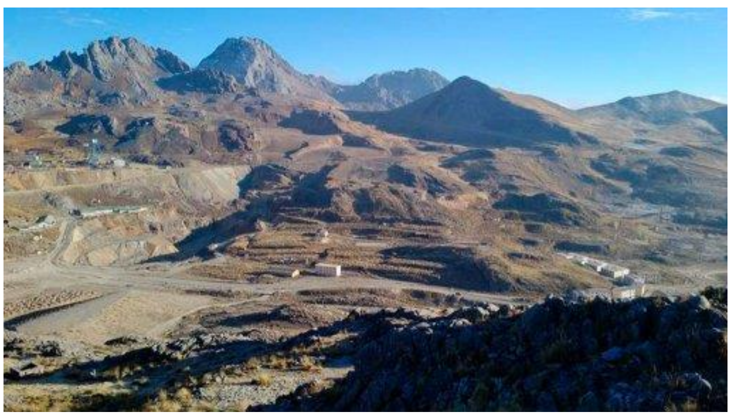
Independent Technical Report for the Cusi Mine, Chihuahua State, Mexico

Effective Date: August 31, 2020
Report Date: November 13, 2020

Prepared for:

Sierra Metals Inc.



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Prepared by

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SRK Consulting (Canada) Inc.
2US043.006
November 2020

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Important Notice

This report was prepared as a National Instrument 43-101 Technical Report for Sierra Metals Inc. ("Sierra Metals") by SRK Consulting (Canada) Inc. ("SRK"). The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in SRK's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Sierra Metals subject to the terms and conditions of its contract with SRK and relevant securities legislation. The contract permits Sierra Metals to file this report as a Technical Report with Canadian securities regulatory authorities pursuant to National Instrument 43-101, Standards of Disclosure for Mineral Projects. Except for the purposes legislated under provincial securities law, any other uses of this report by any third party is at that party's sole risk. The responsibility for this disclosure remains with Sierra Metals. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

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1 Executive Summary

1.1 Introduction

This Technical Report documents a Mineral Resource Statement for the Cusi Mine prepared by SRK Consulting. It was prepared following the guidelines of the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1. The Mineral Resource Statement reported herein was prepared in conformity with generally accepted CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines." A Mineral Reserve estimate has not been prepared for the Cusi Mine.

The Mineral Resource Statement reported herein is a collaborative effort between Sierra Metals Inc. and SRK Consulting (Canada) Inc. personnel. The exploration database was compiled and maintained by Sierra Metals and was audited and validated by SRK.

1.2 Property Description and Ownership

The Cusi property is held by Sierra Metals, formerly known as Dia Bras Exploration, Inc. It is located within the Abasolo Mineral District in the municipality of Cusihuiriachi, state of Chihuahua, Mexico. The property is 135 km from Chihuahua city by car and consists of 75 mineral concessions wholly owned by Sierra Metals. Included in these concessions are six historic Ag-Pb producers developed on several vein structures: San Miguel, La Bamba open pit, La India, Santa Eduwiges, San Marina, and Promontorio, as well as exploration concessions around the historic mine areas.

1.3 Geology and Mineralisation

The Cusi Project is located within the Sierra Madre Occidental, a 1,200 km by 300 km northwest-trending mountain system featuring a long volcanic plateau within a broad anticlinal uplift. The region is dominated by large-volume rhyolitic ash flow tuffs related to Oligocene (35 Ma to 27 Ma) calderas considered to be the Upper Volcanic Series. These volcanic rocks comprise calc-alkalic rhyolitic ignimbrites with subordinate andesite, dacite, and basalt with a cumulative thickness of up to a kilometer.

The property lies within a possible caldera that contains a prominent rhyolite body interpreted as a resurgent dome. The rhyolite dome trends northwest-southeast with an exposure of roughly 7 km by 3 km and hosts mineralization. It is bounded (cut) on the east side by strands of the NW-trending Cusi fault and on the west by the Border fault. The Cusi fault has both normal and right-lateral strike-slip senses of shear. Strands of the Cusi fault are intersected by NE-trending faults, some of which indicate left-lateral strike-slip shear. NE-trending veins associated with these faults dip steeply either NW or SE. High-grade and wide alteration and mineralization zones exist in the areas of intersection of NW and NE structures. The property tectonically formed during dextral transtension associated with oblique subduction of the Farallon plate beneath the North American plate. Strike-slip and normal faults related to this transtension controlled igneous and hydrothermal activity in the region. Regional NW-trending faults like Cusi are generally right-lateral strike-slip faults with a normal slip component. NE-trending faults are commonly left-lateral strike slip faults which were antithetic Riedel shears in the overall dextral transtensional tectonic regime.

Numerous epithermal mineralized veins exist on the property. Typically, these are moderately to steeply dipping to the southeast, southwest, and north, ranging from less than 0.5 m to 2 m thick, and extend 100 m to 200 m along strike and up to 400 m down-dip. There are nine major mineralized structural zones within the Cusi area as described in Section 7 of this report. Small open pits were typically developed at vein intersections. Mineralization mainly occurs in silicified faults, epithermal veins, breccias, and fractures ranging from 1 m to 10 m thick.

Low-grade mineralized areas exist adjacent to major structures, and they show intense fracturing and are commonly laced with quartz veinlets forming a stockwork mineralized halo around more discrete structures. The country rock in these zones is variably silicified. Pyrite and other sulfide minerals are disseminated in the silicified country rock and are also clustered in the quartz veinlets. A well-developed mineralized stockwork zone is in the Promontorio area, especially proximal to the Cusi fault. These stockwork zones are the current targets for expansion and infill drilling, and their importance to the greater Cusi area is being studied.

In addition to drilling, Sierra Metals has commissioned several geologic studies, conducted several geologic mapping campaigns, and completed surface and underground sampling programs as part of the operations of Cusi. In recent years, the exploration activities in Cusi have been focused on Promontorio, San Nicolas and Santa Rosa de Lima veins including the channel sampling of underground workings, and the underground level plans have been used as a guide for the interpretation and geological modeling.

1.4 Development and Operations

The Cusi mine is an underground mining operation that, together with its Mal Paso Mill, has been in operation since 2014. The primary underground mining method is overhand cut and fill which represents 93% of the production with the remaining 7% by shrinkage stoping. Sierra intends to adjust the mining methods to a combined cut and fill with longhole stoping, thereby eliminating the less productive shrinkage mining method.

Sierra reports that the Cusi mining operation is capable of producing as much as 1,100 t of mineralized material and 420 t of waste per day. The average production of mineralized material in 2019 was 780 t per day. As of the effective date of the Technical Report, further optimization is being done to both the mining and milling operation.

Cusi’s Mal Paso processing facility consists of a conventional concentration plant including crushing, grinding, flotation, dewatering of final concentrate, and a tailings disposal facility. It is located in the outskirts of Cuauhtemoc City, approximately 50 km by road from Cusi operations. Dump trucks, each hauling approximately 20 t of mineralized material, delivered 285,236 t in 2019 and 117,320 t in the first eight months of 2020. It should be noted however that production in 2020 was disrupted by Covid-19 and no run of mine mineralized material was processed in April, May or June. Table 1-1 shows the Metallurgical Balance (grades, recoveries and metal production) for previous years and for the period of January to August 2020.

Table 1-1: Recent Cusi Metallurgical Balance (2018 to August 2020)

	2018	2019	2020*
Tonnage (tonnes)	**186,889**	**285,236**	**117,320**
Head Grades			
Ag (g/t)	140.17	129.06	138.20
Pb	0.39%	0.19%	0.29%
Zn	0.43%	0.21%	0.33%
Au (g/t)	0.16	0.15	0.18
Metallurgical Recoveries			
Pb concentrate			
Ag recovery	83%	79%	90%**
Pb recovery	80%	75%	92%**
Pb grade in concentrate %	9%	5%	9%**
Au recovery	39%	36%	50%**
Zn concentrate			
Ag recovery	0.1%	N/A	N/A
Zn recovery	4%	N/A	N/A
Zn grade in concentrate %	45%	N/A	N/A
Metal Production (combined in concentrates)			
Ag (oz)	699,007	936,071	466,892
Zn (t)	32	N/A	N/A
Pb (t)	582	411	316
Au (oz)	372	493	331

Source: Sierra Metals, 2020

* January to August 31, 2020

** During April, May and June 2020, no mineralized material was received at the Mal Paso plant due to the stoppage caused by Covid-19, but the mineralized material within the circuit was treated, which generated an increase in fines which positively impacted the recovery of metals.

1.5 Mineral Resource Estimate

CIM Definition Standards for Mineral Resources and Mineral Reserves (May 10, 2014) defines a Mineral Resource as:

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

The "reasonable prospects for economic extraction" requirement generally imply that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade considering extraction scenarios and processing recoveries. Sierra Metals provided Cusi's budget containing the updated costs for mining and processing.

Table 1-2 presents the metal price assumptions and the operation costs for Cusi.

Table 1-2: Summary of Cut-Off Grade Assumptions and Operation Costs at Cusi

Metal	**Units**	**Price Assumptions**
Silver Price	US$/oz	20.0
Gold Price	US$/oz	1,541.00
Lead Price	US$/lb	0.91
Zinc Price	US$/lb	1.07
Operating Costs (Mine – Processing)		
Category	**Units**	**Cost**
Personnel	US$/t	10.56
Mine Operation, Transport and Maintenance	US$/t	24.86
Plant Operation and Maintenance	US$/t	11.86
G&A and others	US$/t	3.20
Subtotal	US$/t	50.48

Source: Sierra Metals, 2020

The metallurgical recoveries used were based on averages obtained from production data provided by Sierra Metals. The metallurgical recoveries used are: 87% Ag, 57% Au, 86% Pb, 51% Zn.

This cost equates to a grade of about 95 g/t AgEq. SRK has reported the mineral resource for Cusi at this cut-off. The August 31, 2020 consolidated mineral resource statement for the Cusi area is presented in Table 1-3.

Table 1-3: Cusi Mine Mineral Resource Estimate as of August 31, 2020 – SRK Consulting (U.S.), Inc.(1)(2)(3)(4)(5)(6)

Source	Class	AgEq (g/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes (000's)
SRL	**Measured**	231	213	0.06	0.26	0.3	850
Total Measured		*231*	*213*	*0.06*	*0.26*	*0.3*	*850*
Promontorio	**Indicated**	199	168	0.1	0.45	0.6	1,790
Eduwiges		270	194	0.17	1.3	1.27	828
SRL		231	198	0.16	0.42	0.54	644
San Nicolas		190	167	0.14	0.28	0.32	657
San Juan		179	165	0.11	0.14	0.17	179
Minerva		198	178	0.3	0.1	0.05	59
Candelaria		176	157	0.1	0.19	0.42	131
Durana		168	160	0.05	0.1	0.08	168
San Ignacio		149	113	0.05	0.33	1.1	49
Total Indicated		*212*	*176*	*0.13*	*0.54*	*0.63*	*4,506*
Measured + Indicated		**215**	**182**	**0.12**	**0.49**	**0.58**	**5,356**
Promontorio	**Inferred**	174	141	0.15	0.33	0.71	384
Eduwiges		186	117	0.18	1.16	1.1	549
SRL		222	188	0.19	0.37	0.59	1,579
San Nicolas		156	124	0.18	0.28	0.66	2,020
San Juan		171	160	0.05	0.13	0.22	102
Minerva		169	162	0.08	0.08	0.05	4
Candelaria		191	139	0.12	0.73	1.09	202
Durana		102	99	0.05	-	0.01	1
San Ignacio		118	96	0.13	0.27	0.29	53
Total Inferred		**183**	**146**	**0.18**	**0.43**	**0.69**	**4,893**

(1) Mineral Resources have been classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves, whose definitions are incorporated by reference into NI 43-101.
(2) Mineral resources are not ore reserves and do not have demonstrated economic viability. All figures rounded to reflect the relative accuracy of the estimates. Gold, silver, lead and zinc assays were capped where appropriate.
(3) Mineral resources are reported at a single cut-off grade of 95 g/t AgEq based on metal price assumptions*, metallurgical recovery assumptions, personnel costs (US$10.56/t), mine operation, transport and maintenance costs (US$24.86/t), processing operation and maintenance (US$11.86/t), and general and administrative and other costs (US$3.20/t).
(4) Metal price assumptions considered for the calculation of the cut-off grade and equivalency are: Silver (Ag): US$/oz 20.0, Lead (US$/lb. 0.91), Zinc (US$/lb. 1.07) and Gold (US$/oz 1,541.00). CIBC, Consensus Forecast, September 30, 2020
(5) The resources were estimated by SRK. Giovanny Ortiz, B.Sc., PGeo, FAusIMM #304612 of SRK, a Qualified Person, performed the resource estimation for the Cusi Mine.
(6) Based on the historical production information of Cusi, the metallurgical recovery assumptions are: 87% Ag, 57% Au, 86% Pb, 51% Zn.

1.6 Conclusion and Recommendations

SRK is of the opinion that the exploration and evaluation work completed at Cusi are sufficient for the definition of Mineral Resources. The primary exploration methods at Cusi have been diamond core drilling and sampling of underground working areas, and both have been successful in delineating a system of discrete epithermal veins and related stockwork mineralization. The drilling appears to be able to target and identify mineralized structures with reasonable efficacy, and the majority of drilling is oriented in a fashion designed to approximate the true thicknesses of the mineralized veins. The exploration planning should be designed to maximize conversion of higher-grade Inferred areas with less dense drilling to Indicated and Measured, and/or extending mineralization away from known areas accessed through channel sampling. The recent exploration activities have been focused on the area of SRL_HW zone that is characterized by several mineralized veins following a complex structural setting that will require detailed mapping combined with close-spaced drilling.

Mine development activities are utilized for exploration purposes, because the mining exposures provide direct access to the mineralized veins along underground drifts. These exposures allow the Cusi exploration team to better understand the mineralization on a local scale. It is recommended that greater effort is required to improve the underground survey data, channel sampling procedures, and the 3D as-built data.

SRK notes that recent efforts have improved the quality of the drilling and related information through more complete and thorough survey data (for drilling and underground development), as well as the implementation of QA/QC programs that are delivering reasonable results. This lends additional confidence to recently-defined resources or newly drilled portions of historic areas.

SRK also notes that some of the Mal Paso Mill laboratory's challenges identified in the previous technical reports are being addressed and the results of the QA/QC controls of the exploration team have shown improvements. These were related to significant differences between the values reported for duplicate samples between Mal Paso and third-party laboratories. These issues, combined with historic deficiencies in downhole surveying, detract from the overall confidence in the quality of the historic data.

SRK is aware that Sierra Metals continues to improve the collection and reporting of data supporting Mineral Resource estimation and classification exercises. This includes improving down-hole surveys, improved channel sampling and mine working surveys, and adopting commercial standards for QA/QC.

In SRK's opinion, a combination of these factors, once demonstrated to be in full use and functioning appropriately, should be validated through a simple quarterly check sample process to ensure that the Mal Paso Mill laboratory can produce results to the same precision and accuracy as commercial, independent laboratories. The implementation of detailed downhole surveys and updated industry-standard QA/QC protocols in the recent infill drilling campaign have resulted in the definition of Measured resources in the SRL zone.

SRK has the following recommendations for additional work to be performed at the Cusi mine:

- Continue identifying and drilling mineralized zones that are dominantly supported by channel sample data. This should be done at a regular spacing of approximately 25 m.

    - SRK recommends continuing with the program of drilling the new zones of high-grade mineralization, resulting in local high-grade Inferred blocks that could theoretically be converted to Measured and Indicated with additional drilling and mapping; these blocks should be prioritized.

    - Areas of cross-cutting veins may host high grade shoots that should be investigated and evaluated in further detail.

- Carry out additional investigations including hydrothermal alteration, lithology, structural, lithological and chemical that can provide information to orientate the exploration efforts of Sierra Metals.

- Continue the implementation and improvement of the current QA/QC program and maintain regularity in the rates of insertion of quality control samples including second lab checks.

- Continue the use of commercial standards for QA/QC monitoring taking into consideration the Ag, Au, Pb and Zn cut-off values and average grades of the deposit.

- All analyses supporting a Mineral Resource estimation should continue to be analyzed by an ISO-certified independent laboratory such as ALS Minerals.

- The results of the QA/QC controls sent to the Mal Paso laboratory have shown improvements in the sample preparation and analysis procedures, but this enhancement program should continue and be verified.

- Continued downhole surveys via Reflex or another appropriate survey tool for all drill holes completed.

- SRK recommends continuing the practice of using a total station GPS for surveying of drillhole collars and channel sample locations, as well as mine workings. Discrepancies between the precise locations of these three types of data occur regularly where they are closely spaced and reduces confidence in the data.

- A 3D mine survey can be completed for minimal cost and should be conducted on a quarterly basis to develop improved measurements of the mined out material to be used in reconciliation processes.

- Develop a simple method of reconciling the resource models to production, using stope shapes and grades derived from channel sampling.

- SRK recommends that Cusi evaluate the maximum head grade the mill is able to receive without compromising the quality of its lead concentrate because of the high presence of zinc (currently grading at about 9%). Improving selectivity will likely improve the overall lead grade in concentrate that needs to be at 50% Pb or higher to achieve better economic value.

1.7 Costs

SRK notes that the costs for the majority of recommended work are likely to be a part of normal operating budgets that Cusi would incur as an operating mine. These are cost estimates and would depend on actual contractor costs and scope to be determined by Sierra. SRK notes that the recommendations for metallurgy, mine design, geotechnical studies, or economic analysis are not included in these costs, and that these recommendations solely impact the quality of the mineral resource estimation.

Table 1-4 presents the general estimated cost of the 2021 exploration drilling according to Sierra's objectives which SRK has reviewed and considers appropriate.

Table 1-4: Summary of Costs for Recommended Work

Item	Quantity	Cost (US$)
Drilling (infill drilling)	17,400 m	$1,000,000
Drilling (Step out)	17,136 m	$1,490,000

Source: SRK, 2020

Note: The drilling full cost per meter is variable according to the drilling objective. Some costs are included in the on-going mine budget.

Total cost estimated for this work is approximately US$2,490,000

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2 Introduction

This Technical Report is an independent report that has been prepared and signed off by qualified personnel (QP) from SRK Consulting with the term QP used here as it is defined under Canadian Securities Administrator's National Instrument 43-101 (NI 43-101) guidelines. The QPs responsible for this report are listed in Sections 2.1 and 2.2.

Cusi is an operating mine, and this Technical Report presents an updated Mineral Resource following the completion of diamond drilling and an update of the previous 3D geology model. A Mineral Reserve Statement for Cusi has not been provided in this report.

This report is based on a Mineral Resource estimate that was prepared by SRK and is effective as of August 31, 2020.

2.1 Qualifications of Consultants (SRK)

The Consultants preparing this technical report are specialists in the fields of geology, exploration, Mineral Resource estimation and classification, underground mining, geotechnical, environmental, permitting, metallurgical testing, mineral processing, processing design, capital and operating cost estimation, and mineral economics.

None of the SRK consultants and associates employed in the preparation of this report has any beneficial interest in Sierra Metals or its subsidiaries. The Consultants are not insiders, associates, or affiliates of Sierra Metals or its subsidiaries. The results of this Technical Report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Sierra Metals and the Consultants. The Consultants are being paid a fee for their work in accordance with normal professional geology and engineering practice.

The following individuals, by virtue of their education, experience and professional association, are considered Qualified Persons (QP) as defined in the NI 43-101 standard, for this report, and are members in good standing of appropriate regulatory institutions. QP certificates of authors are provided in Appendix A. The QPs are responsible for specific sections as follows:

- Giovanny Ortiz, Principal Consultant (Geology), is the QP responsible for Geology and Mineral Resources, Sections 7 through 12, 14, and portions of Sections 1, 18 and 19 summarized therefrom, of this Technical Report.
- Carl Kottmeier, B.A.Sc., P. Eng., MBA, SRK Principal Consultant (Mining), is the QP responsible for Sections 2 through 6, 15 through 17, and portions of Sections 1, 18 and 19 summarized therefrom, of this Technical Report.
- Daniel H. Sepulveda, BSc, SRK Associate Consultant (Metallurgy), is the QP responsible for mineral processing and metallurgical testing in Section 13 and portions of Sections 1, 18 and 19 summarized therefrom, of this Technical Report.

Dr. Gilles Arseneau, P.Geo. (APEGBC, 23474) and Casey Hetman, P.Geo. (APEGBC, 30185), a Corporate Consultant with SRK, reviewed drafts of this technical report prior to their delivery to Sierra Metals as per SRK internal quality management procedures.

2.2 Details of Inspection

Table 2-1: Site Visit Participants

Personnel	Company	Expertise	Dates of Visit	Details of Inspection
Giovanny Ortiz	SRK	Resource Geology, Mineral Resources	January 14-17, 2020	Reviewed geology, resource estimation methodology, sampling and drilling practices, and examined drill core.
Carl Kottmeier	SRK	Mining, Infrastructure, Economics	April 7 & 8, 2019	Reviewed mining methods, UG and surface infrastructure.
Daniel Sepulveda	SRK	Metallurgy and Process	April 7 & 8, 2019	Reviewed metallurgical test work, tailings storage, and process plant.

Source: SRK, 2020

2.3 Sources of Information

The sources of information include data and reports supplied by Sierra Metals personnel, and the previous NI 43-101 Technical Report prepared by SRK. Documents cited throughout the report are referenced in Section 21.

2.4 Effective Date

The effective date of this report is August 31, 2020.

2.5 Units of Measure

The metric system has been used throughout this report. Tonnes (t) are metric comprised of 1,000 kilogram (kg), or 2,204.6 pounds (lb). All currency is in U.S. dollars (US$) unless otherwise stated.

3 Reliance on Other Experts

The consultants' opinions contained herein are based on information provided to the consultants by Sierra Metals throughout the course of the investigations.

The consultants used their experience to determine if the information from previous reports was suitable for inclusion in this Technical Report and adjusted information that required amending. This report includes technical information that required subsequent calculations to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the consultants do not consider them to be material.

SRK received statements of validity for mineral titles, surface ownership and permitting for various areas and aspects of the Cusi Mine and reproduced them for this report. Sierra has assured SRK that the mineral titles, surface ownership and permitting are all valid and in good order. As such, these items have not been independently reviewed by SRK and SRK did not seek an independent legal opinion of these items.

4 Property Description and Location

4.1 Property Location

The Cusihuiriachic (Cusi) property is held by Sierra Metals, formerly known as Dia Bras Exploration, Inc. It is located within the Abasolo Mineral District in the municipality of Cusihuiriachi, state of Chihuahua, Mexico. The property is 135 kilometers from Chihuahua city by car and consists of 75 mineral concessions wholly owned by Sierra Metals. Included in these concessions are six historic Ag-Pb producers developed on several vein structures: San Miguel, La Bamba open pit, La India, Santa Eduwiges, San Marina, and Promontorio, as well as exploration concessions around the historic mine areas. The shaft of the Promontorio mine is located at Northing 3,125,854 m and Easting 319,019 m in the 13R UTM grid in WGS84 ellipsoid. Figure 4-1 shows the location of the Cusi property.

Source: Sierra Metals, 2020

Figure 4-1: Location Map Showing the Cusi (Cusihuiriachic) Mine and Mal Paso Mill

4.2 Mineral Titles

Sierra wholly owns rights for exploration and mining for the Cusi Property for 75 mineral concessions covering an area of 11,815.3072 ha (Figure 4-2). Locations of the concessions for the Cusi project and their expiry dates are listed in Table 4-1.

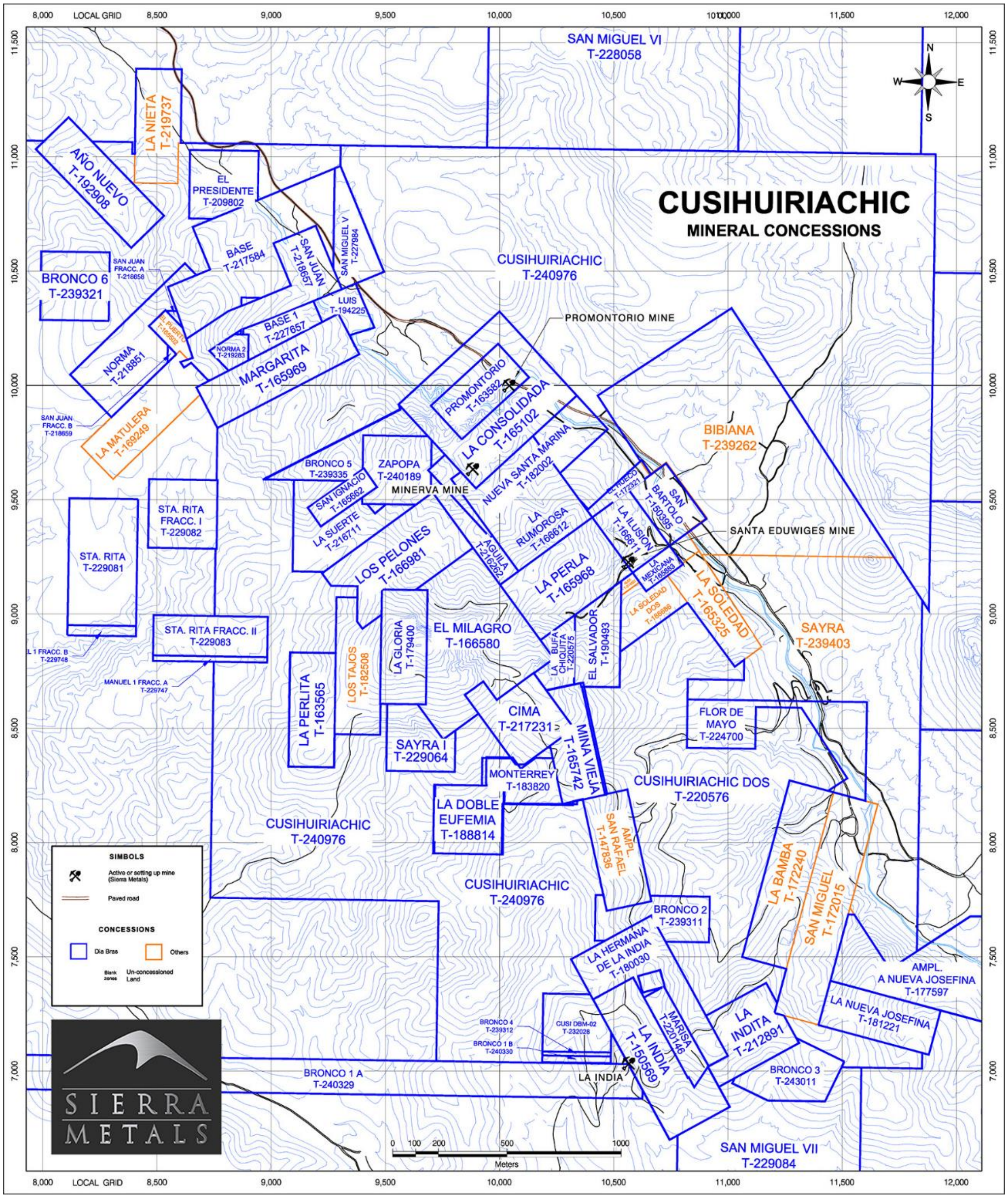
Table 4-1: Mineral Concessions at Cusi

Held By	Name	Type	Area (ha)	File No.	Title No.	Registration Date Rpm	Expiration Date
Sierra Metals	Base*	Exploration	23.8090	016/30975	217584	6/8/2002	5/8/2052
Sierra Metals	Flor de Mayo*	Exploration	14.4104	016/32699	224700	31/05/2005	30/05/2055
Sierra Metals	Base 1	Exploration	3.9276	016/33729	227657	28/07/2006	27/07/2056
Sierra Metals	Santa Rita	Exploration	16.6574	016/34624	229081	6/3/2007	5/3/2057
Sierra Metals	Sayra I	Exploration	7.2195	016/34623	229064	2/3/2007	1/3/2057
Sierra Metals	San Miguel	Exploration	96.2748	016/33730	229166	21/03/2007	20/03/2057
Sierra Metals	San Miguel I	Exploration	98.6218	016/33731	228484	24/11/2006	23/11/2056
Sierra Metals	San Miguel II	Exploration	100.0000	016/33732	227363	14/06/2006	13/06/2056
Sierra Metals	San Miguel III	Exploration	100.0000	016/33733	227364	14/06/2006	13/06/2056
Sierra Metals	San Miguel IV	Exploration	96.9850	016/33734	227485	27/06/2006	26/06/2056
Sierra Metals	San Miguel VI	Exploration	98.9471	016/34642	228058	29/09/2006	28/09/2056
Sierra Metals	San Miguel VII	Exploration	52.6440	016/34640	229084	6/3/2007	5/3/2057
Sierra Metals	Saira	Exploration	16.0000	016/33735	227365	14/06/2006	13/06/2056
Sierra Metals	Manuel	Exploration	100.0000	016/33714	227360	14/06/2006	13/06/2056
Sierra Metals	Santa Rita Fracc. I	Exploration	9.0000	016/34624	229082	6/3/2007	5/3/2057
Sierra Metals	Santa Rita Fracc. II	Exploration	8.8141	016/34624	229083	6/3/2007	5/3/2057
Sierra Metals	San Miguel V	Exploration	6.5328	016/34641	227984	26/09/2006	25/09/2056
Sierra Metals	San Juan	Exploration	12.3587	016/31500	218657	3/12/2002	2/12/2052
Sierra Metals	San Juan Fracc. A	Exploration	0.1727	016/31500	218658	3/12/2002	2/12/2052
Sierra Metals	San Juan Fracc. B	Exploration	0.1469	016/31500	218659	3/12/2002	2/12/2052
Sierra Metals	Norma	Exploration	12.2977	016/31700	218851	22/01/2003	21/01/2053
Sierra Metals	Norma 2	Exploration	1.7561	016/31715	219283	25/02/2003	24/02/2053
Sierra Metals	Cima	Exploration	9.9637	016/30957	217231	2/7/2002	1/7/2052
Sierra Metals	Manuel 1 Fracc A	Exploration	1.1858	016/34849	229747	13/06/2007	12/6/2057
Sierra Metals	Manuel 1 Fracc B	Exploration	1.3425	016/34849	229748	13/06/2007	12/6/2057
Sierra Metals	Alma	Exploration	80.4612	Valid	227982	25/09/2006	25/09/2056
Sierra Metals	San Bartolo	Mining	6.0000	Valid	150395	30/09/1968	29/09/2018
Sierra Metals	Marisa	Exploration	5.0800	Valid	220146	17/06/2003	16/06/2053
Sierra Metals	La India	Mining	15.7600	Valid	150569	29/10/1968	27/10/2018
Sierra Metals	Alma	Exploration	87.2041	Valid	227650	27/07/2006	27/07/2056
Sierra Metals	Alma I	Exploration	106.0000	Valid	226816	9/3/2006	9/3/2056
Sierra Metals	Alma II	Exploration	91.0000	Valid	227651	27/07/2006	27/07/2056
Sierra Metals	Nueva Recompensa	Mining	21.0000	Valid	195371	15/09/1992	13/09/2042
Sierra Metals	Monterrey	Mining	5.4307	Valid	183820	22/11/1988	21/11/2038
Sierra Metals	Nueva Santa Marina	Mining	16.0000	Valid	182002	8/4/1988	7/4/2038
Sierra Metals	San Ignacio	Mining	3.0000	Valid	165662	28/11/1979	27/11/2029
Sierra Metals	Promontorio	Mining	8.0000	Valid	163582	30/10/1978	29/10/2028

Held By	Name	Type	Area (ha)	File No.	Title No.	Registration Date Rpm	Expiration Date
Sierra Metals	La Perla	Mining	15.0000	Valid	165968	13/12/1979	12/12/2029
Sierra Metals	La Perlita	Mining	10.0000	Valid	163565	10/10/1978	9/10/2028
Sierra Metals	Luís	Mining	3.1946	Valid	194225	19/12/1991	18/12/2041
Sierra Metals	La Consolidada	Mining	22.0000	Valid	165102	23/08/1979	22/08/2029
Sierra Metals	La Doble Eufemia	Mining	9.0000	Valid	188814	29/11/1990	28/11/2040
Sierra Metals	La Gloria	Mining	10.0000	Valid	179400	9/12/1986	8/12/2036
Sierra Metals	La Indita	Exploration	9.9034	Valid	212891	13/02/2001	12/2/2049
Sierra Metals	La Suerte	Exploration	10.5402	Valid	216711	28/05/2002	27/05/2052
Minera Cusi	El Hueco	Mining	1.8379	Valid	172321	23/11/2003	23/11/2033
Sierra Metals	El Presidente	Mining	8.1608	Valid	209802	9/8/1999	8/8/2049
Sierra Metals	El Salvador	Mining	7.7448	Valid	190493	29/04/1991	28/04/2041
Sierra Metals	Cusihuiriachic Dos	Mining	87.6748	Valid	220576	28/08/2003	27/08/2053
Sierra Metals	La Bufa Chiquita	Mining	3.6024	Valid	220575	28/08/2003	27/08/2053
Sierra Metals	Aguila	Mining	4.2772	Valid	216262	23/04/2002	22/04/2052
Sierra Metals	Año Nuevo	Mining	12.0000	Valid	192908	19/12/1991	18/12/2041
Sierra Metals	Ampl. Nueva Josefina	Mining	18.2468	Valid	177597	2/4/1986	31/03/2036
Sierra Metals	El Milagro	Mining	26.8259	Valid	166580	27/06/1980	26/06/2030
Sierra Metals	Los Pelones	Mining	16.3018	Valid	166981	5/8/1980	4/8/2030
Sierra Metals	La Ilusión	Mining	6.0000	Valid	166611	27/06/1980	26/06/2030
Sierra Metals	La Hermana de la India	Mining	13.1412	Valid	180030	23/03/1987	22/03/2037
Sierra Metals	La Rumorosa	Mining	20.0000	Valid	166612	27/06/1980	26/06/2030
Sierra Metals	La Nueva Josefina	Mining	10.0000	Valid	181221	11/9/1987	10/9/2037
Sierra Metals	Mina Vieja	Mining	8.2500	Valid	165742	11/12/1979	10/12/2029
Sierra Metals	Margarita	Mining	14.0000	Valid	165969	13/12/1979	12/12/2029
Minera Cusi	Cusihuiriachic	Mining	472.2626	Valid	240976	16/11/2012	15/11/2062
Sierra Metals	CUSI-DBM	TCM	4,716.6600	Valid	229299	3/4/2007	2/4/2057
Sierra Metals	CUSI-DBM 02	TCM	4,695.1700	Valid	232028	10/6/2008	9/6/2058
Sierra Metals	Bronco 1 A	Exploration	55.6309	Valid	240329	23/05/2012	22/05/2062
Sierra Metals	Bronco 1 B	Exploration	0.8801	Valid	240330	23/05/2012	22/05/2062
Sierra Metals	Bronco 2	Exploration	7.5296	Valid	239311	13/12/2011	13/12/2061
Sierra Metals	Bronco 3	Exploration	8.1186	Valid	243011	30/05/2014	29/05/2064
Sierra Metals	Bronco 4	Exploration	0.5224	Valid	239312	13/12/2011	13/12/2061
Sierra Metals	Bronco 5	Exploration	6.7121	Valid	239335	13/12/2011	13/12/2061
Sierra Metals	Bronco 6	Exploration	9.0000	Valid	239321	13/12/2011	13/12/2061
Sierra Metals	Zapopa	Exploration	8.3867	Valid	240189	13/04/2012	12/4/2062
Minera Cusi	La Mexicana	Exploration	2.0000	To be Registered	165883	12/12/1979	13/12/2082
Sierra Metals	Sayra	Exploration	78.8400	Valid	239403	14/12/2011	14/12/2061
Sierra Metals	Bibiana	Exploration	71.8900	Valid	239262	7/12/2011	7/12/2061
			11,815.3072				

Source: Sierra Metals, 2020

In March 2020, the “Dirección General de Minería” has granted an extension of the validity of the San Bartolo Concession to September 29, 2068. Sierra is looking to obtain the extension of the validity of the La India Title in the coming months and is expected to be extended to 2068. The agreement of the Purchase of the Sayra and Bibiana Concessions is already registered in the "Dirección General de Minería"



Source: Sierra Metals, 2020

Figure 4-2: Map Showing Locations of Cusi Mineral Concessions as of 2020

4.2.1 Nature and Extent of Issuer's Interest

Sierra holds surface rights to an area of 1,020 ha located generally within the area where Sierra holds mineral concessions. Sierra's area of surface rights includes the access points to the Promontorio and Santa Eduwiges underground mines that are in operation, as well as surface rights over all resource areas delineated in this report, except for La India. Sierra has a working relationship with the local Santa Rita community, who view mining at the Promontorio mine and associated jobs favourably.

4.3 Royalties, Agreements and Encumbrances

Production from the Cusi Project area is subject to net smelter royalties ranging from 1.5% to 3%, depending on the origin of the mined quantity with respect to the mineral concession area.

Mineral concessions that make up the Cusi property were acquired from private entities and the Mexican Federal Government (Dirección General de Minas). The terms associated for the claim blocks are described below.

4.3.1 Purchase Agreement with Minera Cusi

Mineral concessions were purchased from Minera Cusi S.A. de C.V. under a purchase agreement dated April 15, 2008. A total of 31 mineral concessions for 862 ha were acquired from Minera Cusi. On May 10, 2019, Sierra signed an agreement buying the royalties rights to Minera Cusi (now Minera Largo S. de RL.)

4.3.2 Agreement with Mexican Government

Exploration and mining at the Cusi property are subject to semi-annual payments to the Mexican Federal Government. Fees are paid to the federal government twice each year, in January and July and the amounts paid change every year.

4.4 Environmental Liabilities and Permitting

4.4.1 Environmental Liabilities

Previous technical reports noted that as part of current mining operations, waste rock from mining at Promontorio and Santa Eduwiges is stored near the entrances of the respective mines. Management of these waste rock piles does not require permits.

Tailings are stored in two tailings piles in the vicinity of the Mal Paso Mill. Previous technical reports also noted that the tailings pile at the Mal Paso Mill may not be lined and may constitute a potential environmental liability.

4.4.2 Required Permits and Status

According to the information provided by Sierra, the following concessions are exempt from having to apply for the Environmental Impact Statement (Manifestación de Impacto Ambiental - MIA) and the Land Use Change permit, according to the document SG.IR.08-20141 / 93 from SEMARNAT dated May 2014 that recognizes the exception because Sierra proved that the mining concessions operate years before the 1988 law was implemented. Any other concession will need the MIA and the Land Use Change permit or to prove that operates before that year:

- San Bartolo (Title 150395);
- La India (Title 150569);
- Promontorio (Title 163582);
- La Consolidada (Title 165102);
- La Perla (Title 165968);
- El Milagro (Title 163580);
- La Ilusión (Title 166611);
- La Rumorosa (Title 163512);
- Los Pelones (Title 166981);
- La Hermana de la India (Title 180030);
- Nueva Santa María (Title 182002);
- La Gloria (Title 179400); and
- La Perlita (Title 163565).

Requirements for environmental and land-use change permits are managed by the Mexican Federal Government's Secretary of Environment and Natural Resources (Secretaria de Medio Ambiente y Recursos Naturales, or "SEMARNAT") and local government.

In the Cusi Mine there are no material emissions to the atmosphere other than nominal ventilation, and the Mal Paso Mill has its Unique Environmental License (Licencia Unica ambiental) dated August 2013.

The Mal Paso plant has the Water Discharge permit 02CHI141178/34EMDL15 dated August 2015. Cusi has the documents No B00.E 22.4.-420 and No B00.E.22.4.-419 dated November 12, 2014 that excludes Sierra for the obligation to have discharge permits as the water does not contain contaminants or is used in industrial processes. All these documents were granted by CONAGUA (National Water Commission).

According to Sierra, Cusi doesn't require Authorization for Utilization of National Surface Water (Water from the Gulf of California) because the mine uses the water from the mine for all processing and mining operations. Sierra holds explosives use permit (Number 4599) from the Mexican federal government's Secretary of National Defense (Secretaria de la Defensa Nacional, or "SEDENA"). This permit is in good standing and is renewed annually.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Topography, Elevation and Vegetation

The topography of the Cusi Project ranges from approximately 2,000 to 2,500 meters above mean sea level (masl).

The Cusi Project is covered by vegetation consisting of deciduous forest in the valleys and coniferous forest at higher altitudes. Land use around the Cusi property is agricultural, including crops and cattle ranching. Overburden thickness ranges from one to three meters and consists of unconsolidated conglomerate with pebbles and boulders of volcanic rocks, sand, clay, and volcanic ash. Wildlife in and surrounding Cusi property includes insects, lizards, snakes, birds, and small mammals.

5.2 Accessibility and Transportation to the Property

The Cusi property is situated within the municipality of Cusihuiriachic located in the central portion of Chihuahua State, Mexico, approximately 135 km by car west of the City of Chihuahua. Access to the village of Cusihuiriachic from the City of Chihuahua is 105 km along Federal Highway No. 16 to Cuauhtémoc, then south for 22 km along a paved road to the village of Cusihuiriachic, where the Cusi Property is located.

5.3 Climate and Length of Operating Season

The climate at the Cusi Project is described as semi-arid with average daily mean temperatures per month ranging from 7.5° to 21.7° Celsius, with hotter months occurring mid-year. Annual precipitation is approximately 448 mm, with monthly precipitation ranging from 4.1 to 121 mm. The highest rainfalls during the year are recorded between July and September. Climate is conducive for year-round mining operations.

5.4 Sufficiency of Surface Rights

Sierra Metals holds surface rights over most of the main mining and resource areas discussed in this report. The main mine shaft of the Promontorio Mine is close to the surface rights boundary, and there is a second, currently unused shaft, (Tiro Consolidada) which is just outside the surface rights area. Cusi does not currently control surface rights for the La India mine. Otherwise, surface rights are expected to be sufficient for mining.

5.5 Infrastructure Availability and Sources

5.5.1 Power

Electrical power at the Cusi Project and Mal Paso Mill is provided by the Mexican Electricity Federal Commission (Comisión Federal de Electricidad). At Cusi, electricity is conveyed in 33,000-volt power lines. At the Mal Paso Mill, electricity is delivered on a 1.29-megawatt power line. Existing electricity supply is expected to be adequate for foreseeable mining operations.

5.5.2 Water

At Cusi, Sierra Metals utilizes water recovered from the underground workings for process water and support of mining operations. Water was generated from dewatering operations in the Promontorio and Santa Eduwiges Mines. Potable water is trucked in.

5.5.3 Mining Personnel

At Cusi, approximately 100 persons are employed, and 67 persons are employed at the Mal Paso Mill.

5.5.4 Potential Tailings Storage Areas

Two tailings dams are located in the vicinity of the Mal Paso Mill. Land position within the Mal Paso Mill complex is expected to be adequate to support anticipated future milling operations.

Tailings are stored in two tailings piles in the vicinity of the Mal Paso Mill. Previous technical reports (Gustavson, 2014) noted that the existing tailings pile at the Mal Paso Mill may not be have been constructed using a low permeability under-liner (soil and/or geomembrane) and that this lack of liner system could pose a risk to underlying groundwater resources and potential long-term environmental liability from the leaching of the tailings materials by meteoric precipitation. Given the extremely arid conditions at the site, however, this would likely be a low to moderate risk.

Sierra has permitted additional tailings storage on-site to take on additional tailings in early 2018. After this, additional areas on previously permitted and dried tailing facilities as well as upstream from the latest dam and tailings impoundment are in authorized areas that have been previously permitted.

5.5.5 Potential Waste Rock Disposal Areas

Waste rock is generally used as backfill for ongoing mining operations at Cusi. Regardless, there is sufficient surface area and access for temporary storage and/or disposal of waste rock near the mine.

5.5.6 Potential Processing Plant Sites

Mineralized material from the Cusi Project is processed in the El Triunfo circuit of the Mal Paso Mill, which has a capacity of 750 tpd, and is expected to be sufficient for expected future operations.

6 History

6.1 Prior Ownership and Ownership Changes

The discovery of gold and silver in the Cusi area occurred in 1687 and the initial production of precious metals in the Cusi district is recorded from 1821. The ownership history is extensive and complex. This is summarized in Section 6.4.

6.2 Exploration and Development Results of Previous Owners

The extensive exploration history of the Cusi district is poorly documented. From surface sampling and exploration drifting in historic times to modern diamond drilling, the exploration has always been focused on the development of a more accurate understanding of the orientations and relationships of the many mineralized veins in the district.

Sierra Metals has commissioned several geologic studies culminating in reports summarizing their findings:

- Cusi Epithermal Ag-Au District, Chihuahua, Mexico. Prepared by Eric R. Braun for Dia Bras Exploration (now Sierra Metals Inc.) dated November 26, 2006;
- Geology and Geochemistry of Mineralized Zones. Prepared by Andre P. Ciesielski for Sierra Metals Exploration Inc. dated December 2007;
- Observations on the Cusihuiriachic District. Prepared by Lawrence D. Meinert of Smith College for Sierra Metals Exploration Inc. dated July 6, 2006;
- Mineralogy, Assay, and Fluid Inclusion Characteristics of Quartz-Sulfide Veins of the Cusihuiriachic District, Chihuahua, Mexico. Prepared by Lawrence D. Meinert for Dia Bras Exploration, Inc. (now Sierra Metals Inc.), dated January 17, 2007; and
- Mineralogy of High-Grade Ag Zones in the Cusihuiriachic District. Prepared by Lawrence D. Meinert for Dia Bras Exploration, Inc. (now Sierra Metals Inc.), dated April 13, 2007.

6.3 Historic Mineral Resource and Reserve Estimates

Previous exploration activities have been conducted by Slocan Development Corp., Minera Cusi, and Pacific Islands Gold. Slocan Development Corp. conducted mineralogical studies which were reported in 1975; these reports were not available. Minera Cusi conducted surface and geochemical studies and reported results in 1988 and 1989; these reports were not available. Pacific Gold conducted geologic mapping, surface and underground chip sampling, and reverse circulation (RC) drilling along the San Miguel vein; these results were not available.

The most recent Mineral Resource estimate for the Cusi Mine was prepared by SRK Consulting (U.S.) Inc. in August 31, 2017 (Table 6-1).

Table 6-1: Cusi Mine Mineral Resource Estimate as of August 31, 2017 – SRK Consulting (U.S.), Inc.

Source	Class	AgEq (g/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes (000's)
SRL	**Measured**	268	225	0.13	0.55	0.68	362
Total Measured		**268**	**225**	**0.13**	**0.55**	**0.68**	**362**
Promontorio	**Indicated**	241	213	0.08	0.37	0.44	1097
Eduwiges		293	198	0.26	1.35	1.32	928
SRL		296	242	0.32	0.62	0.64	1435
San Nicolas		195	176	0.13	0.21	0.22	414
San Juan		208	189	0.13	0.20	0.21	121
Minerva		222	198	0.40	0.09	0.05	57
Candelaria		386	366	0.14	0.17	0.28	46
Durana		224	219	0.06	0.05	0.02	97
Total Indicated		267	217	0.21	0.64	0.66	4,195
Measured+Indicated		**267**	**217**	**0.21**	**0.63**	**0.66**	**4,557**
Promontorio	**Inferred**	218	185	0.10	0.35	0.62	308
Eduwiges		229	115	0.09	1.78	1.79	147
SRL		216	158	0.22	0.55	1.04	658
San Nicolas		181	161	0.14	0.21	0.23	340
San Juan		200	186	0.04	0.15	0.27	44
Minerva		149	143	0.05	0.08	0.06	5
Candelaria		185	125	0.16	0.62	1.17	128
Durana		124	115	0.01	0.17	0.09	3
Total Inferred		**207**	**158**	**0.16**	**0.54**	**0.84**	**1,633**

(1) Mineral resources are reported inclusive of ore reserves. Mineral resources are not ore reserves and do not have demonstrated economic viability. All figures rounded to reflect the relative accuracy of the estimates. Gold, silver, lead and zinc assays were capped where appropriate.

(2) Mineral resources are reported at a single cut-off grade of 105 g/t AgEq based on metal price assumptions*, metallurgical recovery assumptions, mining costs (US$29.41/t), processing costs (US$18.3/t), and general and administrative costs (US$3.74/t).

* Metal price assumptions considered for the calculation of the cut-off grade and equivalency are: Silver (Ag): US$/oz 18.30, Lead (US$/LB 0.93), Zinc (US$/lb 1.15) and Gold (US$/oz 1,283.00).

The resources were estimated by SRK. Giovanny Ortiz, B.Sc., PGeo, FAusIMM #304612 of SRK, a Qualified Person, performed the resource calculations for the Cusi Mine.

** Based on the historical production information of Cusi, the metallurgical recovery assumptions are: 84% Ag, 57% Au, 86% Pb, 51% Zn.

This Mineral Resource estimate has been superseded by the Mineral Resource estimate shown in Section 14 of this report.

There are no reports of any historic Mineral Reserve estimates for the Cusi Mine and there is no current Mineral Reserve estimate.

6.4 Historic Production

Gold and silver were first discovered and exploited in the Cusi area within the San Miguel and La Candelaria zones by a Spaniard, Antonio Rodríguez, in 1687, and continued until the Mexican war of independence, which began in 1810. The amounts mined during the Spanish colonial time are not well documented.

The Mexican war of independence occurred from 1810 to 1821. The actual operators and production history in the vicinity of Cusi from 1821 to 1881 are not known. From 1881 to 1890, Don Enrique Mining Co. conducted mining operations. From 1896 to 1911, the Helena Mining Company purchased and conducted mining operations: during this period, the Santa Marina and San Bartolo shafts were sunk to the 1,000-foot level.

In 1911, Cusi Mexicana Mining Co. purchased the property from Helena Mining Company. During the period of the Mexican Revolution from 1910 to 1920, mining at the Cusi Project area occurred intermittently. Total tonnage mined from 1821 to 1920 is unknown.

From the 1920s to 1937, concessions of the Cusi Project area were acquired by The Cusi Mining Company of American Capital. As reported by Sierra Metals, one million tonnes were mined. As reported in RPA (2006), from 1924 to 1942, 504,048 t were mined, producing 265,460 kg of silver; however, the specific locations of mined areas were not reported. From 1937 to the 1970s, mining from the Cusi property was reportedly dormant. In the 1970s, mining occurred in several mines in the Cusi Project area: an estimated 3,000 t of mineralized material per month were being produced at an average silver grade of 12 to 18 ounces per ton silver. As reported in RPA (2006), during the 1980s, Minera Cusi conducted limited mining: no quantities were reported.

Commercial production was declared in 2014. Table 6-2 lists the 2014 to 2020 (up to August 31) production as reported by Sierra Metals.

Table 6-2: Cusi Yearly Production

Year	Plant	Tonnes Processed (dry)	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)
2014	Cusi concentrator	155,268	0.42	166.69	0.78	0.80
2015	Cusi concentrator	202,033	0.22	175.88	0.78	0.71
2016	Cusi concentrator	186,898	0.26	171.78	1.21	1.16
2017	Cusi concentrator	88,011	0.25	170.16	1.10	1.11
2018	Cusi concentrator	186,889	0.16	140.17	0.39	0.43
2019	Cusi concentrator	285,236	0.15	129.06	0.19	0.21
2020*	Cusi concentrator	117,320	0.18	138.20	0.29	0.33

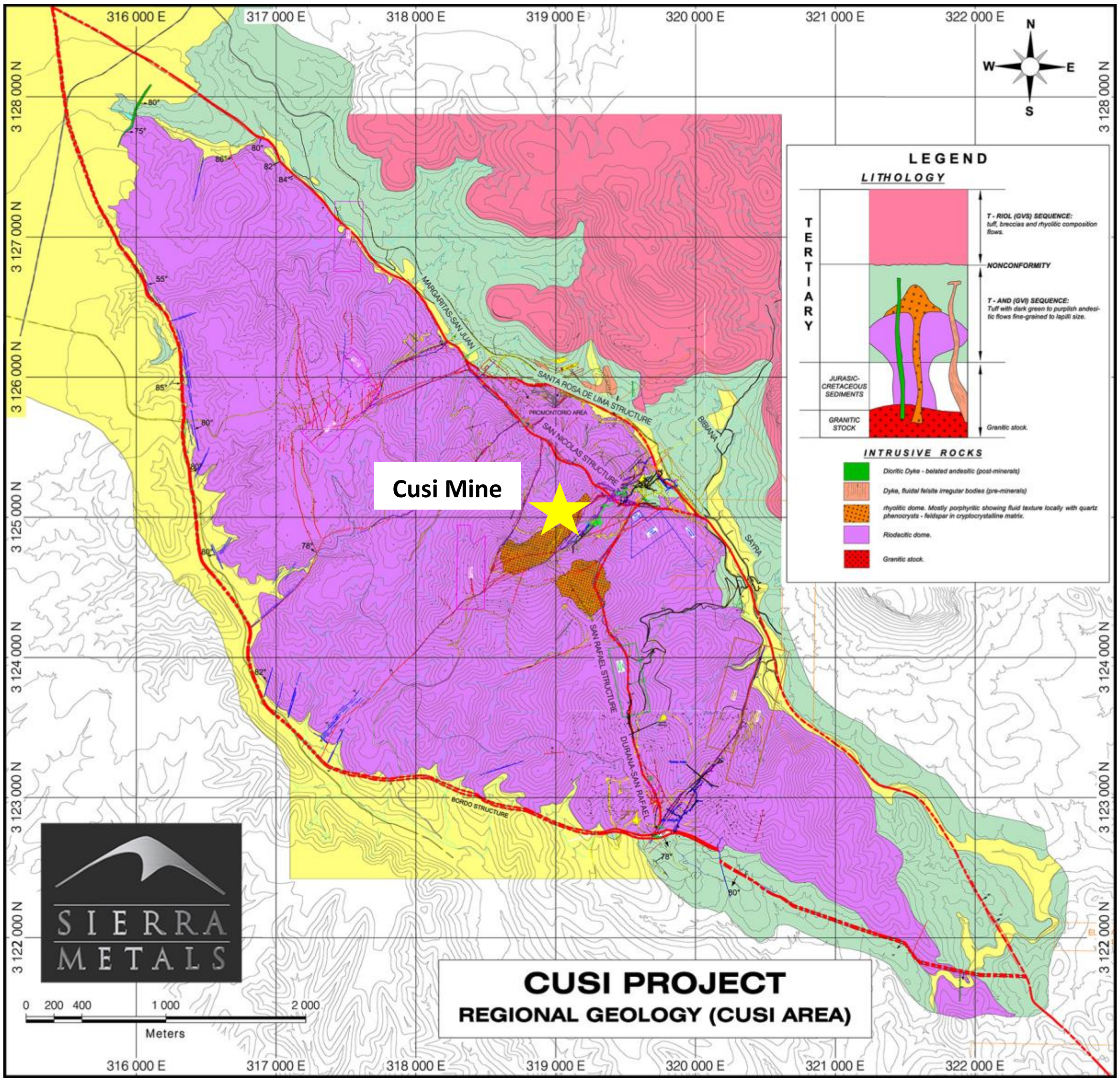
Source: Sierra Metals, 2020
* January to August 31, 2020

7 Geological Setting and Mineralization

7.1 Regional Geology

The Cusi Project is located within the Sierra Madre Occidental, a 1,200 km by 300 km northwest-trending mountain system featuring a long volcanic plateau within a broad anticlinal uplift. The region is dominated by large-volume rhyolitic ash-flow tuffs related to Oligocene (35 Ma to 27 Ma) calderas considered to be the Upper Volcanic Series. These volcanic rocks comprise calc-alkalic rhyolitic ignimbrites with subordinate andesite, dacite, and basalt with a cumulative thickness of up to a kilometre. The Upper Volcanic series unconformably overlies rocks of the slightly older Eocene (46 Ma to 35 Ma) Lower Volcanic Series which predominantly comprises andesite with interlayered felsic ash-flow tuffs (Figure 7-1).

Deposition of the Lower Volcanic Series was accompanied by the intrusion of hornblende-bearing quartz diorite and granodiorite batholiths and stocks. The Lower Volcanic Series hosts the majority of the epithermal and porphyry-related precious metals deposits in the Sierra Madre Occidental. Thin flows of basaltic to rhyodacitic composition of late Miocene and younger age cap many of the plateaus in the region. The oldest structural episode is related to the Laramide orogeny which produced east-striking, steeply dipping strike-slip faults, generally with a right-lateral sense of shear. Later transtensional tectonics resulted in the development of N-S normal faults and NNW-SSE trending subvertical faults with right-lateral strike-slip and normal sense of shear. Structures developed in the Cusi region are believed to have controlled emplacement of a series of north-northwest trending intrusions. Permeability associated with these and other faults and intrusive contacts formed conduits for hydrothermal fluids associated with mineralization.



Source: Sierra Metals, 2020

Figure 7-1: Regional Geology Map of Cusi (grid squares are 1000 m x 1000 m)

7.2 Local Geology

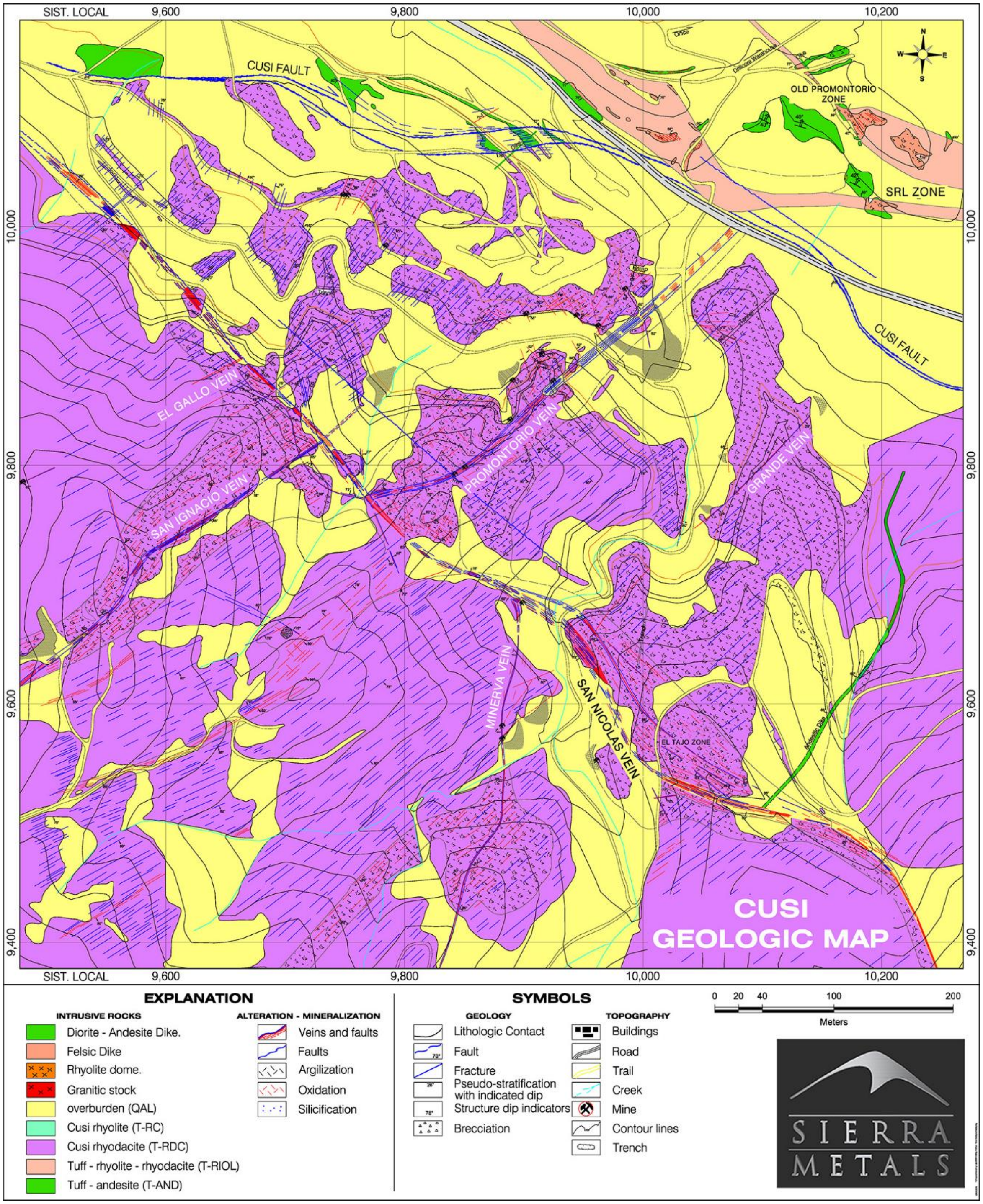
As reported in Geomaps (2012), the geology of the Cusi region ranges from andesitic volcanism of late Mesozoic to Eocene age, to the issuance of rhyolitic tuffs and ignimbrites of Oligocene-Miocene age.

The Oligocene Bufa Formation ignimbrite forms the dominant topographic feature in the Cusi area. Older andesites in the area are members of the Loma del Toro Formation, located mostly to the north and northeast of the mineralized Bufa Formation.

Mapping by CRM suggests that the property is hosted within a collapsed caldera (Geostat, 2008). The Cusi fault is a regional NW-trending fault that may have localized and then faulted the caldera.

Within the caldera, adjacent to the Cusi fault, a rhyolite dome has been identified which hosts much of the mineralization in the district. Hydrothermal mineralization at Cusi was episodic and accompanied by structural movement (Geostat, 2008). Galena, sphalerite, and chalcopyrite are the predominant sulfides commonly ranging from 5% to 10% with occasional massive sulfide zones.

Historical mining activity in the District exploited a series of planar veins that cut a lower andesitic volcanic unit and an upper rhyolitic unit. The veins occur in northwest and northeast-striking faults that appear to define an overall transtensional regime. All veins contain quartz with a variety of crustiform and banded textures typical of the epithermal environment. Most historical mining was shallow (<100 m) and appears to have concentrated on supergene-enriched mineralized zones including Ag chlorides and native silver (Meinert, 2007) (Figure 7-2).



Source: Sierra Metals, 2020

Figure 7-2: Local Geology Map Showing the Location of Mineralized Veins

7.3 Property Geology

The property lies within a possible caldera that contains a prominent rhyolite body interpreted as a resurgent dome. The rhyolite dome trends northwest-southeast with an exposure of roughly 7 km by 3 km and hosts mineralization. It is bounded (cut) on the east side by strands of the NW-trending Cusi fault and on the west by the Border fault. The Cusi fault has both normal and right-lateral strike-slip senses of shear. Strands of the Cusi fault are intersected by NE-trending faults, some of which indicate left-lateral strike-slip shear. NE-trending veins associated with these faults dip steeply either NW or SE. High-grade and wide alteration and mineralization zones exist in the areas of intersection of NW and NE structures.

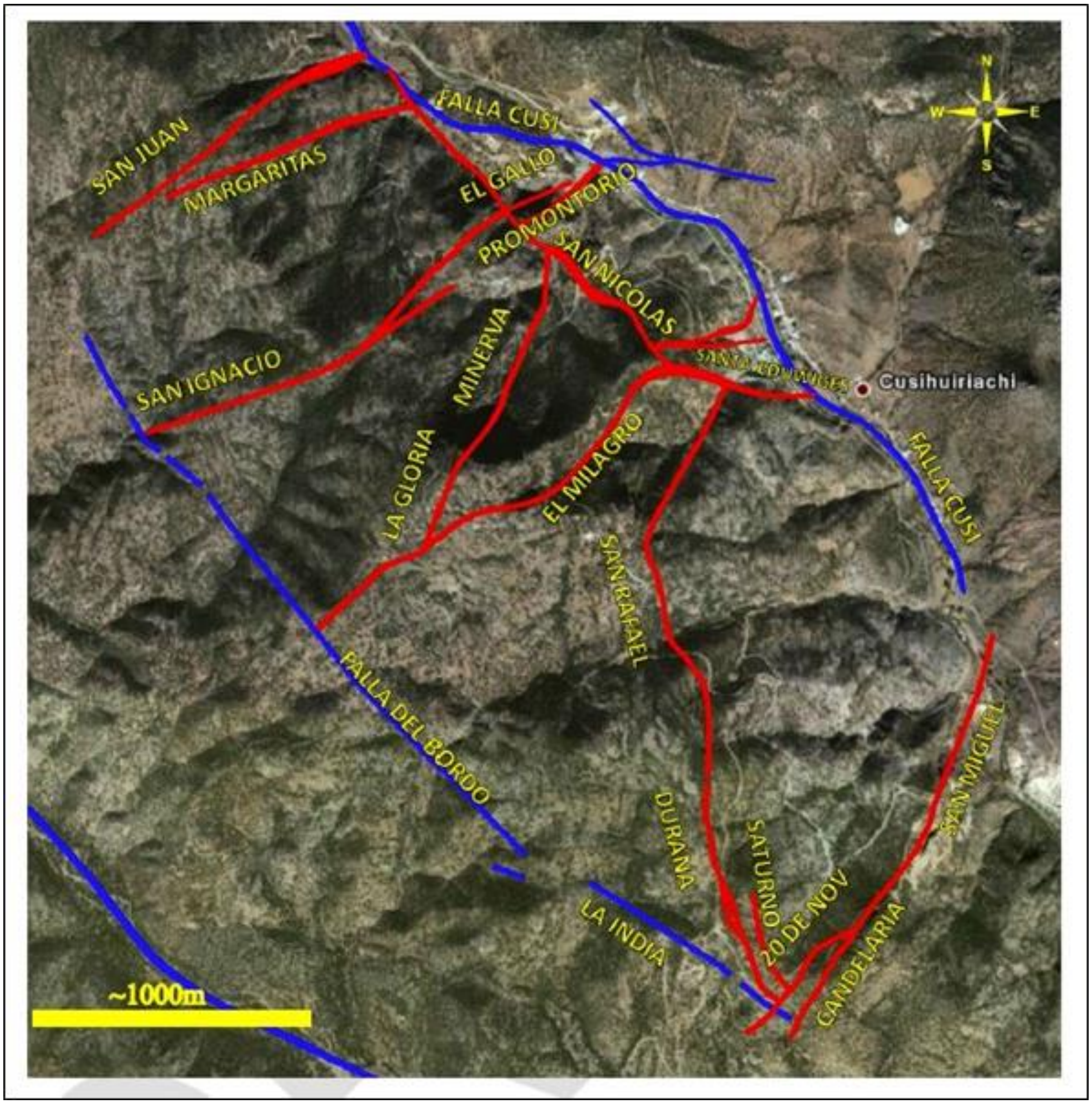
Structure

The property tectonically formed during dextral transtension associated with oblique subduction of the Farallon Plate beneath the North American Plate. Strike-slip and normal faults related to this transtension controlled igneous and hydrothermal activity in the region. Regional NW-trending faults like Cusi are generally right-lateral strike-slip faults with a normal slip component. NE-trending faults are commonly left-lateral strike slip faults which were antithetic Riedel shears in the overall dextral transtensional tectonic regime.

The Cusi fault is a regional fault that may have controlled the location of the caldera and resurgent dome. Continued movement on the Cusi fault and related faults cut and brecciated the caldera and dome rocks and provided conduits for mineralizing fluids.

The hydrothermal processes occur as filling structures associated to the Cusi regional fault which has been partially mineralized and reactivated tectonically. Post-mineral intrusive phase is characterized by basic and andesitic dikes.

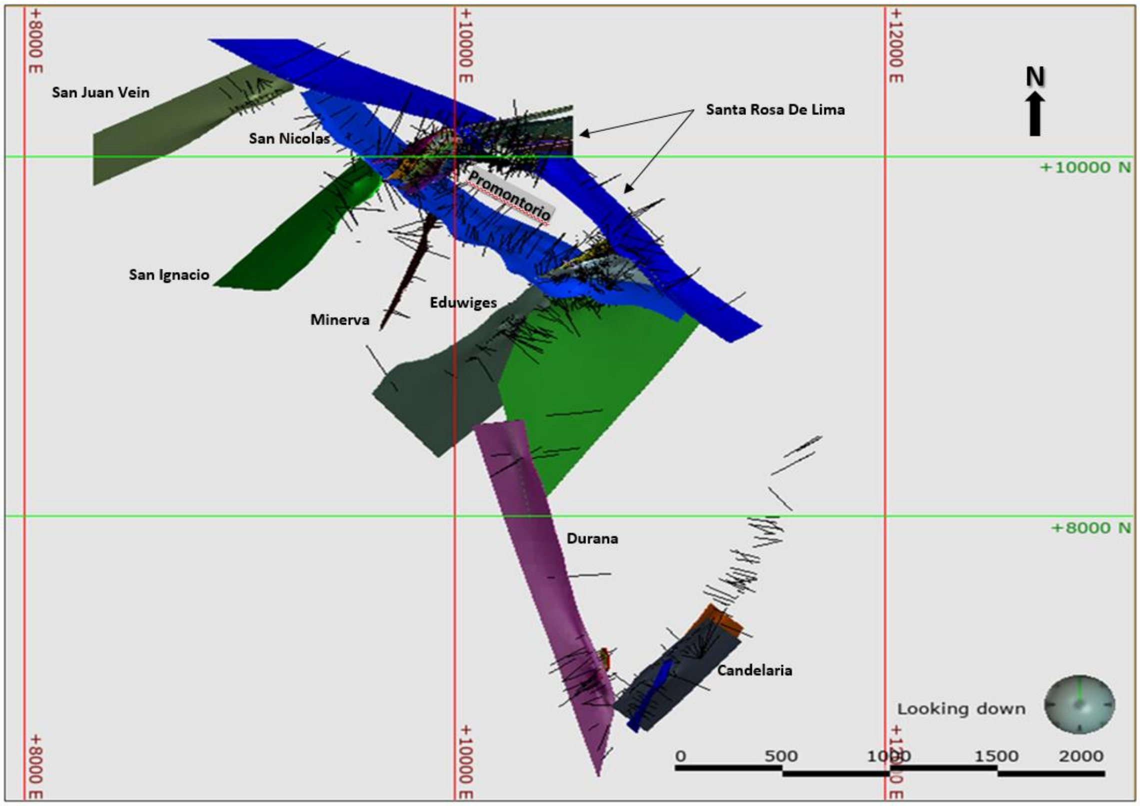
Figure 7-3 presents the structural areas in the Cusi property and shows the nine main structures, other structural zones, and the interactions between them.



Source: Sierra Metals, 2020

Figure 7-3: Aerial Photo of the Cusi Property Showing the Locations and Orientations Structures

Figure 7-4 presents the plan view of the main structures geological models (wireframes) prepared by Sierra and the drill hole traces.



Source: SRK, 2020

Figure 7-4: Plan View of Main Geological Structures within the Cusi Property

Mineralization and Alteration

Numerous epithermal mineralized veins exist on the property. Typically, these are moderately to steeply dipping to the southeast, southwest, and north, ranging from less than 0.5 m to 2 m thick, and extend 100 m to 200 m along strike and up to 400 m down-dip. Small open pits were typically developed at vein intersections.

The epithermal mineralization associated to structures, breccias and filling fractures ranging from less than 1 m to 10 m thick, with a polymetallic filling of Ag-Pb-Zn sulphides and minor contents of copper and variable contents of gold. Crustiform and banded epithermal textures are common, and there is pervasive silicification with some sericite and disseminated pyrite. Zones with argillic alteration are common at the borders of the pervasive silicification, including kaolinite and montmorillonite. Oxidation is characterized by hematite, limonite and manganese oxides.

Zones of micro-veinlets and dissemination associated to intense fracturing related to the main structures are observed in the area of Promontorio. In Eduwiges, veins and zones of “stockwork” of quartz with pyrite and silicification alteration of 60 m to 150 m width and 200 m to 250 m extension are observed (Geomaps, 2012).

In La Durana (La India) zone, quartz veins with argillic and silicification alteration halos form zones of low-grade mineralization. The San Ignacio structure is an SW extension of the Promontorio vein displaced by the San Nicolas vein and shows an apparently sterile 30 m to 40 m silicified halo of white quartz micro-veins (Geomaps, 2012).

The upper part of Promontorio is characterized by argillic-silica alteration and to depth an argillic-silica-propylitic alteration association (Geomaps, 2012).

Table 7-1 presents some characteristics of the nine main mineralized structural zones.

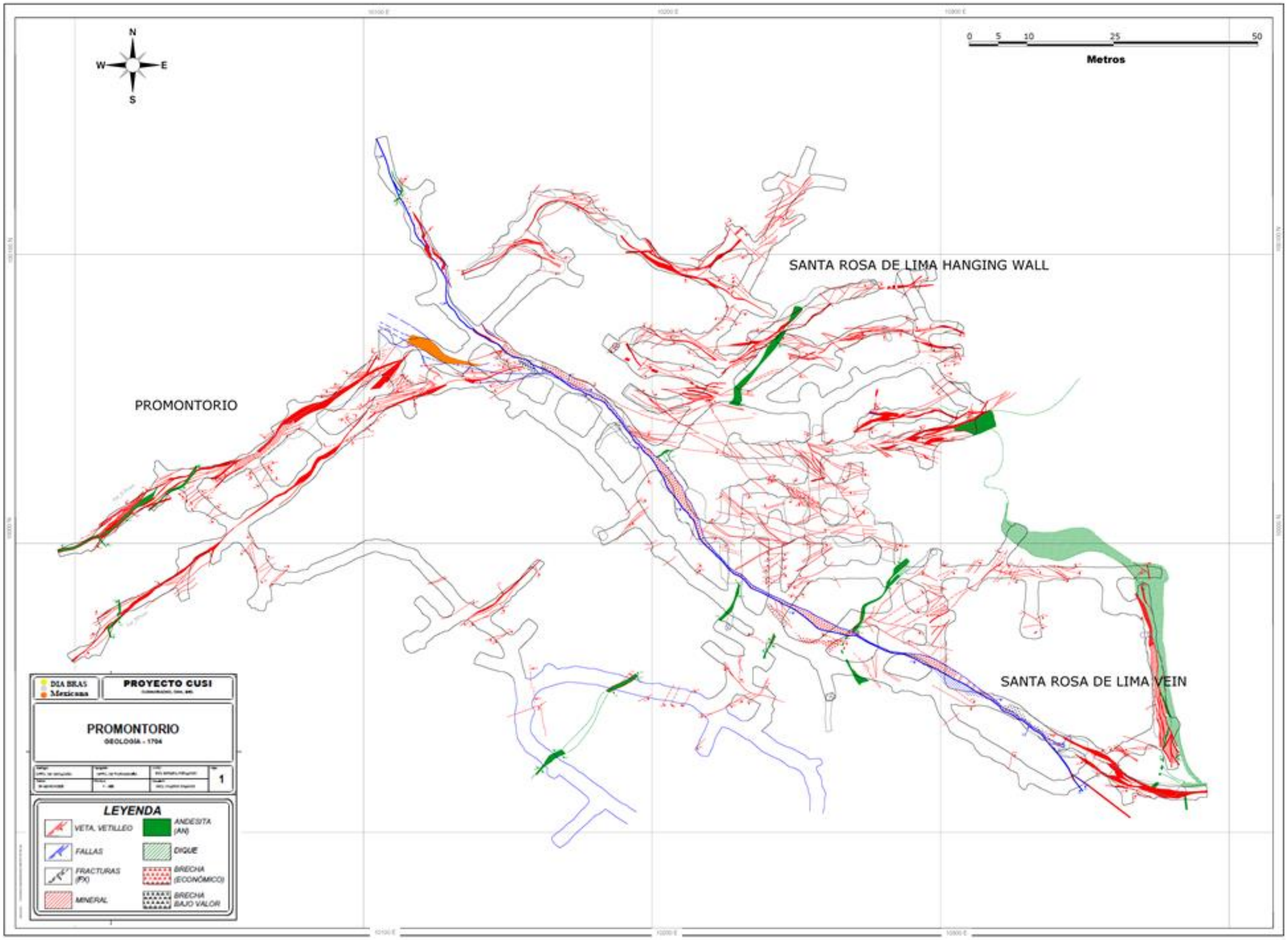
Table 7-1: Description of Main Mineralized Structural Areas

Area	Veins	Description
Promontorio	Alto El Gallo Bajo L El Gallo El Gallo Bajo H J K K' L L' Promontorio V1 V2 VBP Azucarera	Anastomosing sequence of NE-trending steeply dipping veins, locally appearing stacked or sheeted. Numerous crossings and truncations within the sequence. Locally featuring extraneous stockwork zones or splay structures, which may not be defined in drilling. The Azucarera zone is a area of veins and veintets in “stockwork” which has been accessed by workings and appears to be related to the intersection of multiple structures and favorable structural areas. Truncated to the north and south by the SRL and San Nicolas structures respectively. Explored extensively through drilling and exploration/development drifts. Primary production source
Santa Rosa de Lima	SRL Vein SRL-SW SRL-HW Veins	SRL vein are an anastomizing NW/SE trending, steeply dipping structure with a significant strike length. Appear to truncate most structures. SRL-HW are 25 sub-vertical vein structures located at the hanging wall of SRL vein in a structural complex setting where recent drilling and underground development and exploitation have been focused. SRL-SW is the zone between the SRL-SW veins where mineralization is in a “stockwork” of veinlets and veins in a structural favourable setting.
San Nicolas	San Nicolas	San Nicolas is a NW/SE trending, steeply dipping structure. There are some veins that cross San Nicolas vein with small (5 to 10 m) offsets. Significant potential for exploration and addition of resources.
Eduwiges	San Antonio San Bartolo Santa Marina Mexicana Mónaco Milagros Tajo San Antonio Moctezuma Portal CEV Eduwiges	Series of moderately to steeply dipping veins with variable strike trends. Thicknesses vary dramatically. The majority trend NE similar to Promontorio, but local cross structures are orthogonal. Some structures appear to be related to the trend of the San Nicolas vein, while others are perpendicular and appear to cross San Nicolas. All appear truncated by the SRL structure to the north. Extensively explored through drilling and exploration/development drifts. Primary production source. The CEV Eduwiges domain is a stockwork zone which is related to the intersection of multiple structures.

Area	Veins	Description
San Juan	San Juan	Variable thickness and orientation veins with NE-trending steeply dipping NW.
Minerva (La Gloria)	Minerva	Anasotomosing NE/SW trending steeply-dipping vein to the south of the San Nicolas vein. Dominantly explored via exploration drift. Limited production.
Candelaria	Candelaria 1 Candelaria 2	Veins of variable thickness and orientation veins with NE/SW trends located to the extreme south of the project. Although generally lower grade, there are selected areas of very high-grade mineralization noted. Exploration is not extensive.
Durana (La India)	Durana Durana Ramal 1 Durana Ramal 2	Set of veins with variable thickness and orientation veins with NW/SE trends located to the extreme south of the project. There are selected areas of very high-grade but in general low-grade mineralization noted. Exploration is not extensive.
San Ignacio	San Ignacio	Variable thickness and orientation veins with NE-trending steeply dipping NW.

Source: Sierra Metals, 2020

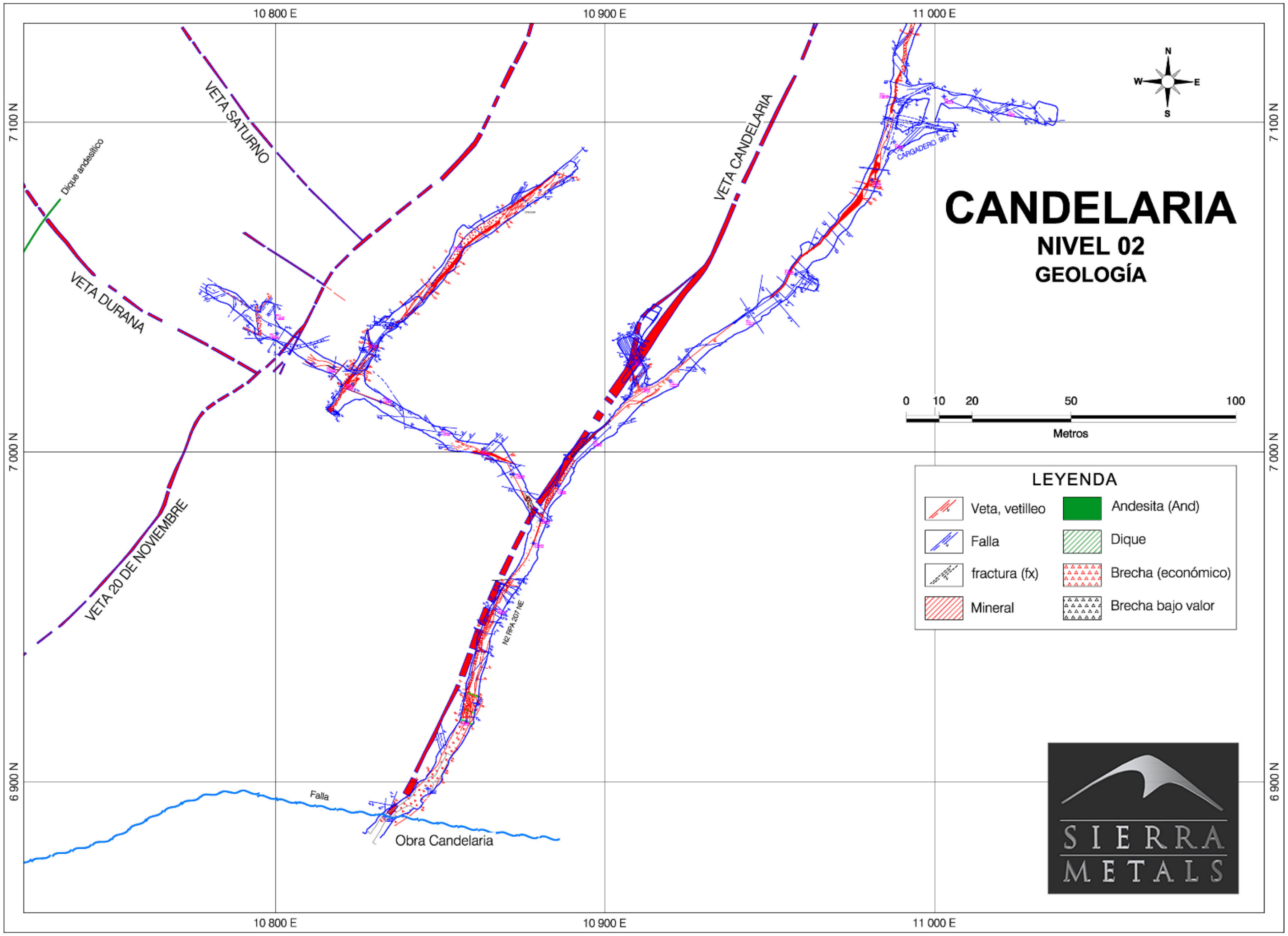
Figure 7-5 presents the geological map of the zone of Santa Rosa de Lima and Promontorio intersection zone. Towards the hanging wall of Santa Rosa de Lima Vein, the structural control of the mineralization is complex in a zone of cross-cutting structures with numerous veinlets and veins of variable thickness and trends.



Source: Sierra Metals, 2020

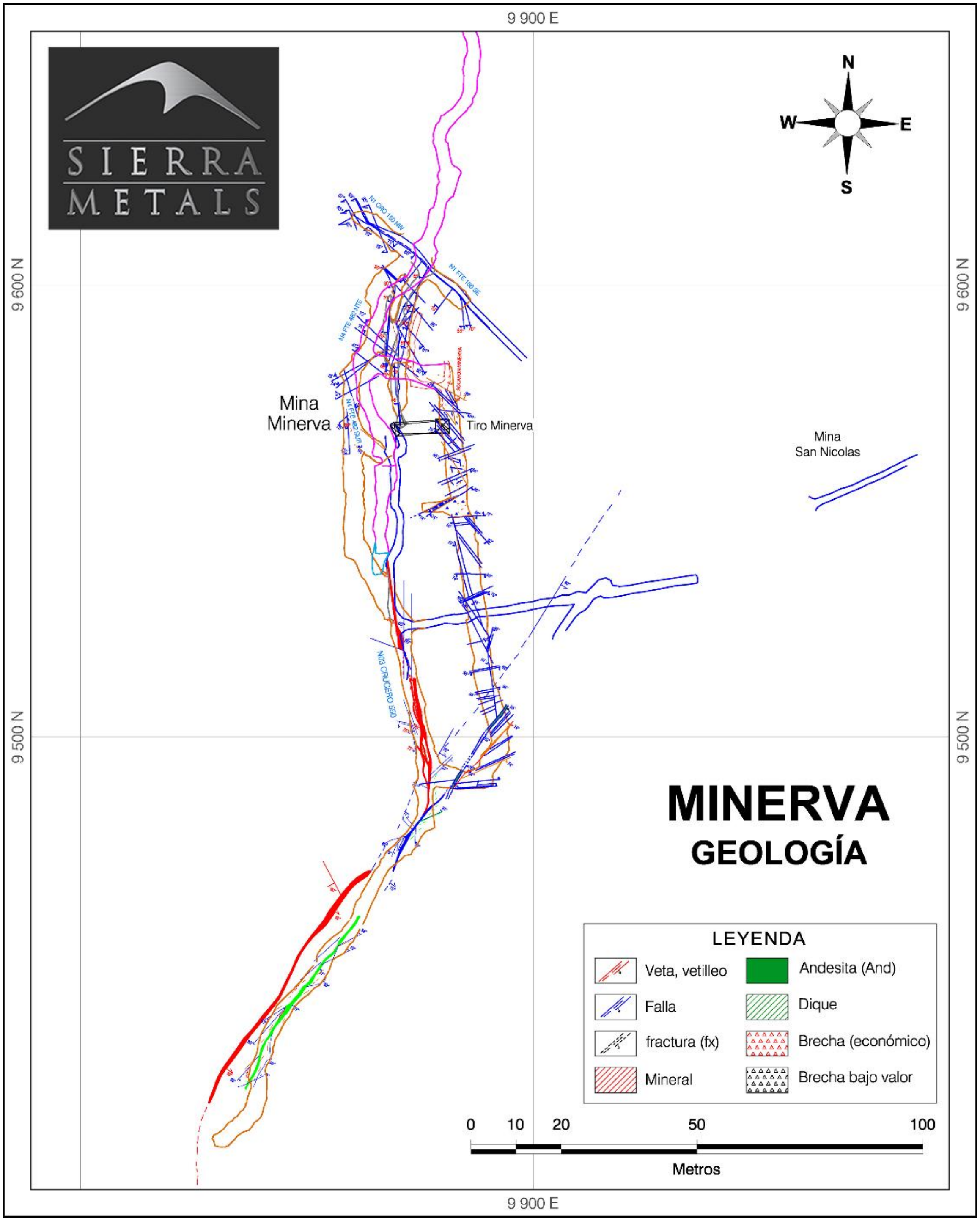
Figure 7-5: Geology and Mineralized Structures in the Area of Promontorio - Santa Rosa de Lima

Underground level plans have been used as a guide for interpretation and geological modeling. Figure 7-6 and Figure 7-7 show examples of level plans of the Candelaria and Minerva veins with the structural and geological mapping of some levels prepared by mine geologists.



Source: Sierra Metals, 2020

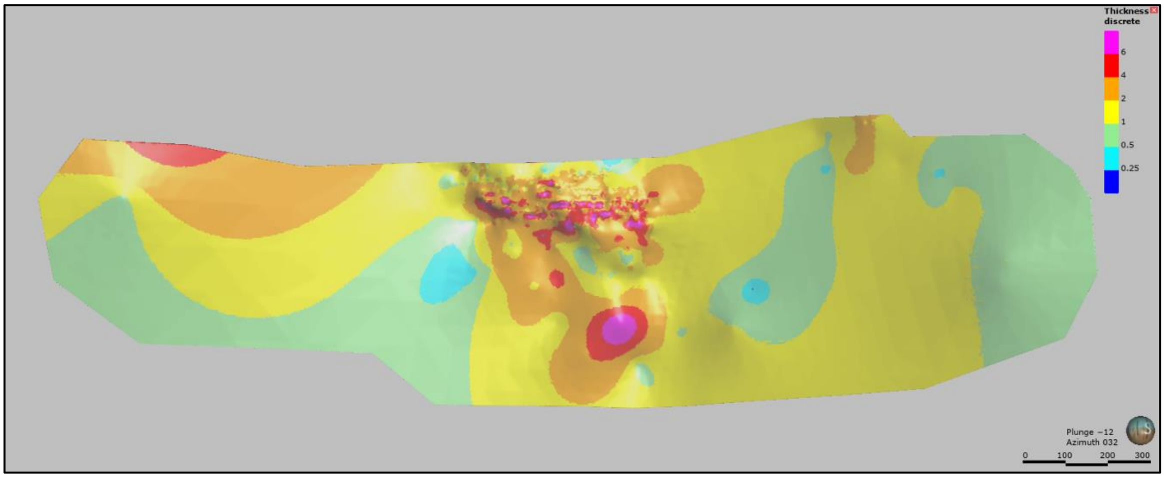
Figure 7-6: La Candelaria Vein - Level Plan Showing the Geology and Structural Mapping



Source: Sierra Metals, 2020

Figure 7-7: Minerva Vein - Level Plan Showing the Geology and Structural Mapping

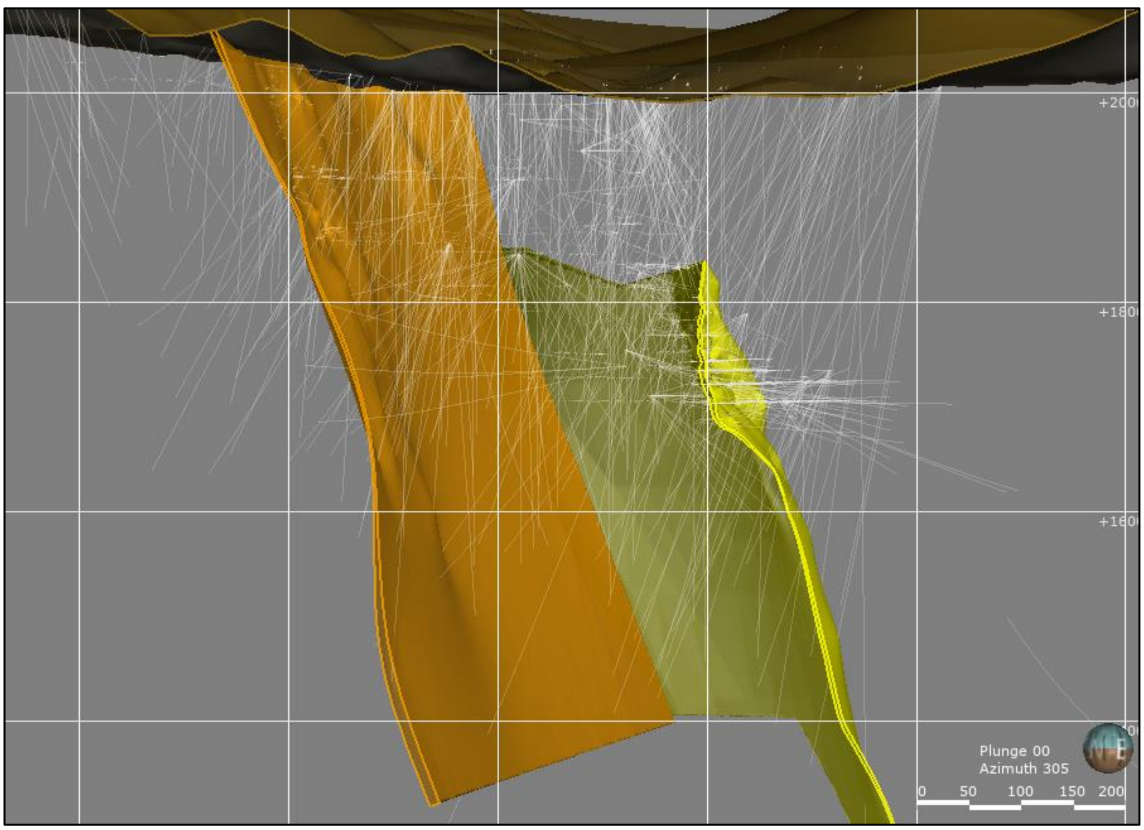
In general, the thickness of the mineralized veins varies from less than 1 m to 10 m. Figure 7-8 shows a long section of the interpreted Santa Rosa de Lima (SRL) vein, coloured by true thickness.



Source: Sierra Metals, 2020

Figure 7-8: Long Section of The Santa Rosa de Lima Vein (coloured by thickness)

Figure 7-9 is a vertical section showing the SRL and San Nicolas veins, the variation of their thickness, and the drilling and channel sampling distribution.



Source: Sierra Metals, 2020

Figure 7-9: Vertical Section – Santa Rosa de Lima Vein (Yellow) and San Nicolas Vein (Orange)

8 Deposit Types

8.1 Mineral Deposit

Mineralization at the Cusi Mine has been variously described as a) low-sulfidation epithermal (Ciesielski, 2007), b) high-sulfidation epithermal (SGS, 2008) and linked epithermal-base metal system (Meinhert, 2006). Meinhert (2006) notes that although shallow (<100 m) historic mining is reported to have encountered grades exceeding 1,000 oz/ton Ag, the veins currently exposed are more base-metal rich than would be expected in an epithermal system. However, Sierra Metals geologists consider the abundance of base metals on the property to be primarily a function of depth of exposure and SRK agrees with this interpretation. Mineralization occurs along narrow fractures containing quartz, sphalerite and galena, and wall rock alteration consists primarily of silicification and the development of clays and iron oxides. The veins contain quartz with crustiform and banded textures typical of epithermal systems.

8.2 Geological Model

The current geologic model for the Cusi property is described as follows:

The country rock on the property consists primarily of felsic volcanics interpreted to represent a caldera with a resurgent dome. Magma is interpreted to have intruded along the Cusi fault, a regional NW-trending, right-lateral strike-slip fault, and a subsequent eruption produced the collapsed caldera and Upper Volcanic Series felsic tuffs. A resurgent dome then arose within the caldera on the western side of the Cusi fault. This dome was then dissected by numerous northeast-trending, left-lateral faults, which acted as conduits for hydrothermal fluids and now host mineralized veins.

Two of the vein sets at Cusi are relatively large and have been mapped along strike for nearly a kilometre each. Within these vein sets, dilatational areas and structural intersections are known to host the best mineralization. The veins are composed of both wide, continuous areas of mineralization as well as zones of numerous smaller swarms of veins or stockwork veinlets. The mineralization is predominately Ag and Pb-rich with lesser amounts of Au, Zn and Cu present in some areas.

SRK is of the opinion that the geologic model developed by Sierra Metals, which focuses primarily on the interpretation of the discrete veins and their related splays/stockwork zones, is appropriate for the deposit type and mining method, and that this has been borne out by a history of production.

9 Exploration

This section summarizes the exploration activities carried out at the Cusi Mine to date. In addition to drilling, Sierra Metals has commissioned several geologic studies, conducted several geologic mapping campaigns, and completed surface and underground sampling programs as part of the operations of Cusi.

On behalf of Sierra Metals, Geomaps S.A. de C.V. has prepared geologic maps showing surface lithology at 1:5,000 scale and 1:1,000 scale, two regional cross-sections through the Cusi Project area and a stratigraphic column. Geomaps' surface lithology maps also contained structural measurements of faults and veins (Section 7).

In recent years, the exploration activities in Cusi have been focused on Promontorio, San Nicolas and Santa Rosa de Lima veins including the channel sampling of underground workings.

9.1 Sampling Methods and Sample Quality

On behalf of Sierra Metals, Geomaps conducted surface rock sampling in the Promontorio area to identify the presence of disseminated mineralization. From November to December 2012, Sierra Metals collected 571 samples from rock outcrops in an area of approximately 0.1 km^2 (650 m by 200 m). Samples were collected in lines perpendicular to the main structure and faults where quartz veins and fractures with oxidation were identified. Samples were assayed for gold, silver, lead, manganese, and zinc at Sierra Metal's internal laboratory in the Mal Paso Mill. Sierra Metals reviewed these data and found silver grades ranged from non-detect (less than 20 g/t) to 351 g/t. From these results, Sierra Metals concluded that disseminated mineralization near the surface within the Promontorio Viejo-San Ignacio and San Nicolas zones are restricted to the intersections of main structures. Geomaps continued to conduct surface sample work in 2013. Sampling has now been performed over the entire project area, totaling over 2,300 samples. Surface sample data for La Gloria / Minerva, and Monaco / Milagro areas only were used for this resource estimate. This set includes 116 surface channels at La Gloria/Minerva, and 67 surface channels at Monaco/Milagro.

Numerous mine workings are present at the Cusi Project area. Sierra Metals has conducted extensive sampling within these mine workings, the results of which were described in a 2014 technical report by Gustavson. All samples were analyzed at Sierra Metals' internal laboratory at Mal Paso. The 2014 report by Gustavson does not mention sample spacing or other factors that may have resulted in biases, but SRK notes that it is likely that the channel samples, simply by the nature of their collection predominantly in higher grade production areas, are likely higher grade on average than the exploration drilling samples.

The Table 9-1 presents the summary of the channel sampling completed since 2013 until August 31st, 2020. These samples were collected from La India (Durana), Minerva (La Gloria), Promontorio, San Juan, San Nicolas, Santa Eduwiges and the Santa Rosa de Lima veins (SRL vein, SRL HW, SRL HW veins) and other zones of the Cusi property.

Table 9-1: Summary of Channels by Year Since 2013

Year	Count	Meters	% of Total
2013	1,410	2,966	8%
2014	4,383	8,572	23%
2015	4,535	6,823	18%
2016	2,276	3,932	11%
2017	1,701	3,567	10%
2018	1,290	3,762	10%
2019	1,403	4,996	13%
2020*	804	2,768	7%
TOTAL	**17,802**	**37,386**	**100%**

Source: SRK, 2020

* January to August 31, 2020 inclusive.

Totals do not necessarily equal the sum of the components due to rounding adjustments.

Channel samples are taken from the underground workings distanced 2 m along the veins and perpendicular to the structures varying from 0.2 m to 5 m (average length of 0.67 m).

Table 9-2 shows the number of individual channel samples collected in the main structural zones of Cusi. Not all the areas have had channel sampling performed.

Table 9-2: Channel Samples Collected in the Main Structural Zones

Structural Zone	Vein Code	Number of Channel Samples
Santa Rosa de Lima	srl	5,495
Santa Rosa de Lima	srlsw	2,230
Santa Rosa de Lima	carolina	263
Santa Rosa de Lima	devora	123
Santa Rosa de Lima	diana	25
Santa Rosa de Lima	erika	6
Santa Rosa de Lima	francis	25
Santa Rosa de Lima	geraldine	19
Santa Rosa de Lima	lorena	90
Santa Rosa de Lima	lucia	56
Santa Rosa de Lima	margoth	124
Santa Rosa de Lima	miriam	42
Santa Rosa de Lima	monica	103
Santa Rosa de Lima	perla	124
Santa Rosa de Lima	priscila	121

Structural Zone	Vein Code	Number of Channel Samples
Santa Rosa de Lima	raquel	109
Santa Rosa de Lima	sandra	140
Santa Rosa de Lima	sonia	298
Santa Rosa de Lima	susana	85
Santa Rosa de Lima	veronica	287
Santa Rosa de Lima	victoria	106
Santa Rosa de Lima	yolanda	190
Promontorio	prom	2,747
Promontorio	aeg	78
Promontorio	azu	2,815
Promontorio	bajo_l	376
Promontorio	eg	1,792
Promontorio	egb	1,557
Promontorio	h	264
Promontorio	j	237
Promontorio	k	1,234
Promontorio	k_prime	379
Promontorio	l	2,343
Promontorio	l_prime	144
Promontorio	v1	149
Promontorio	v2	10
Promontorio	vbp	244
San Nicolas	snic	2,972
Eduwiges	ant	915
Eduwiges	bart	2,415
Eduwiges	ced	121
Eduwiges	mar	612
Eduwiges	mex	1,564
Eduwiges	mil	2,410
Eduwiges	moct	1,743
Eduwiges	port	485

Structural Zone	Vein Code	Number of Channel Samples
Candelaria	cand1	250
Candelaria	nov	700
Minerva	minerva	468
Total		**39,085**

Source: Sierra, 2020

Every day, a geologist accompanied by a group of helpers, channel sample the faces of the underground workings as part of the exploration process. The geologist describes and writes down the information of the geology and mineralization and defines the limits of the samples based on mineralization that includes intensity, style and lithology. The limits of each sample are marked with aerosol paint. The surface is cleaned and 1.5 to 2 Kg (1 m of sample) chip channel samples are collected with chisel and hammer to form a channel of approximately 10 cm width. The plastic bags with the rock chips are marked and sealed (Figure 9-1, Figure 9-2). The start point of the channel is located by the geologist using tape and compass from the nearest survey control point. The survey of the underground workings is performed using a total station system.

Source: SRK, 2020

Figure 9-1: Channel Sample Packing

Source: SRK, 2020

Figure 9-2: Channel Sample Packing

9.2 Significant Results and Interpretation

The surface mapping of structures has been used where possible, but the majority of interpretation for the veins is taken from underground development and sampling, with diamond and reverse circulation drilling comprising the remainder.

SRK has reviewed the sampling methods employed by Sierra and considers the sampling intervals and density of samples to be adequate for the definition of the mineralized structures and to perform the Mineral Resource Estimate. The results are representative of the geological units observed and acceptable minimal biases have been identified. Additional controls can be implemented to monitor the quality of the sampling, including continuous training of the helpers and the collection of field duplicates.

There are no other previous exploration results to be included.

10 Drilling

10.1 Type and Extent

The primary exploration method at Cusi has been diamond core drilling followed by limited underground development (Table 10-1 and Table 10-2). To date, 1,588 drillholes have been completed with an average length of 190 m and represent 297,158 m of drilling. The drillholes have historically been drilled primarily from surface in a wide variety of orientations, although recent drilling has been dominated by underground drilling. In the areas of focused exploration, the average drillhole spacing ranges between 25 m to 50 m. In the less explored areas, the average drillhole spacing ranges between 75 m and 150 m. Overall, the majority of the drilling completed by Sierra has been relatively closely spaced and not very deep (Figure 10-1). The closely spaced drilling has been designed to identify the base of historic mining and to direct resource definition. The wider spaced drilling has been designed to test down dip from surface vein exposures to attain vein orientation and mineralization grades.

Table 10-1: Drilling Summary by Type

Hole Type	Count	Meters
UNK	4	652
NQ/BQ	3	244
NQ	164	37,694
HQ/BQ	1	406
HQ/NQ	356	75,669
HQ	509	131,864
BQ	433	46,656
TT-46	118	3,973
Total	**1,588**	**297,158**

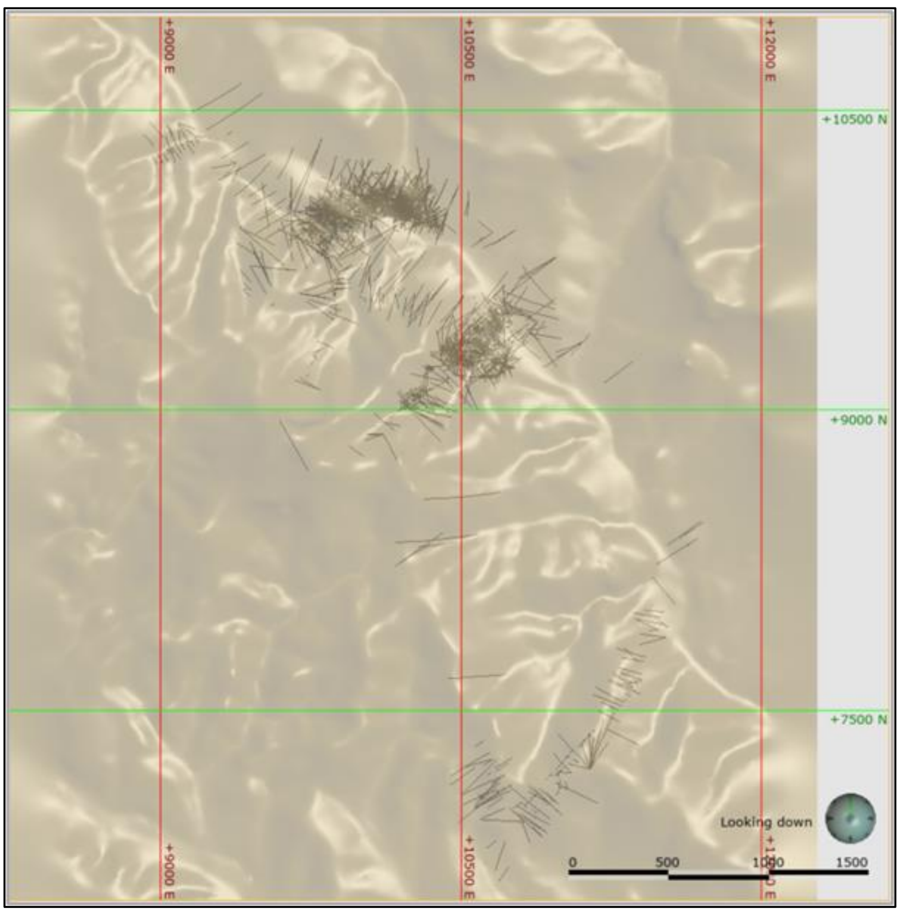
Source: SRK, 2020

Totals do not necessarily equal the sum of the components due to rounding adjustments.

Table 10-2: Drilling Summary by Period

Year	Count	Exploration (m)	Infill (m)	Drilling by Sierra (m)	Drilling by Contractor (m)	% of Total
2006	53	10,369	NA	10,369	NA	3%
2007	98	19,954	1,658	21,612	NA	7%
2008	87	8,787	5,125	13,912	NA	5%
2009	85	7,301	956	8,257	NA	3%
2010	69	9,475	214	9,689	NA	3%
2011	82	18,523	571	7,801	11,293	6%
2012	198	33,649	3,875	15,871	21,653	13%
2013	103	20,499	4,344	9,742	15,102	8%
2014	74	3,453	7,010	7,603	2,860	4%
2015	149	4,010	23,192	11,373	15,829	9%
2016	32	2,727	3,312	4,627	1,412	2%
2017	172	42,829	5,728	8,218	40,339	16%
2018	175	25,494	5,387	8,143	22,739	10%
2019	112	5,339	11,569	0	16,908	6%
2020*	99	3,276	7,073	0	10,349	4%
Total	**1,588**	**215,687**	**80,013**	**137,217**	**158,483**	**100%**

Source: SRK, 2020
* January to August 31, 2020
Totals do not necessarily equal the sum of the components due to rounding adjustments.



Source: SRK, 2020

Figure 10-1: Location Map Showing Drillholes Completed at Cusi

10.2 Procedures

The drilling has been conducted with Sierra-owned drills and outside contractors.

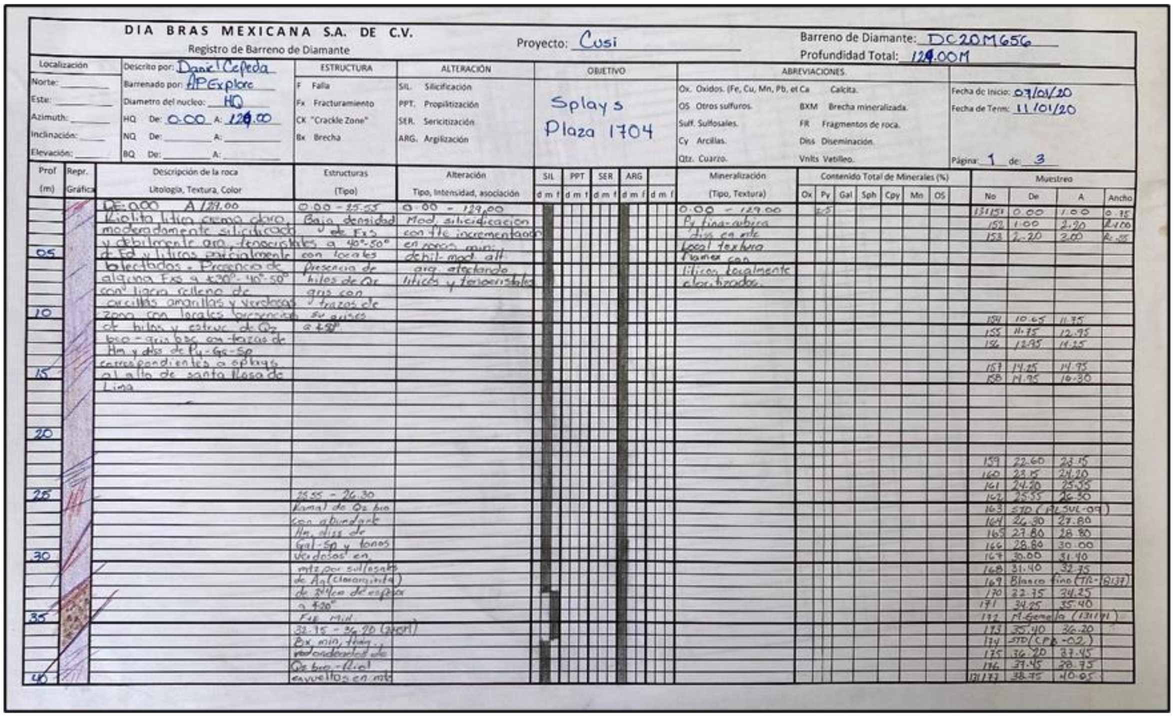
All drill core includes HQ, NQ and BQ sized rods and has been logged by Sierra staff geologists. Samples intervals are determined by the geologist and the core is then split in half and bagged by Sierra technicians.

Collar locations are surveyed on surface using handheld GPS, and underground using a total station system. Collar surveys are accurate for both types of drilling and underground drill stations generally correspond to clusters of underground drill collars. Core is transported by Sierra Metals personnel to the logging facility near the mine offices. Figure 10-2 shows the marked core boxes used at Cusi.

Source: SRK, 2020

Figure 10-2: Core Boxes

Core is logged by qualified Sierra Metals geologists for lithology, alteration, structure, and mineralization, with sampling intervals identified during logging to delineate mineralized areas. Figure 10-3 shows a core logging format used to write down the information. After logging, the information is entered into a database. Sample intervals are marked in the boxes along with a line down the core axis for splitting.



Source: SRK, 2020

Figure 10-3: Core Logging Format

Samples are split via an electrical core saw (Figure 10-4) and are then separated into labeled bags. A barcode system is used for the samples sent to ALS laboratory, however the samples sent to Sierra's Mal Paso laboratory are not controlled by a barcode.

Source: SRK, 2020

Figure 10-4: Electrical Core Saw

The remaining core is stored in a facility located at the Cusi operation (Figure 10-5).

Source: SRK, 2020

Figure 10-5: Core Storage Facility at Cusi

10.2.1 Downhole Deviation

About 40% (611) of the drillholes have downhole deviation surveys. Since 2014, when a survey tool was first acquired by the mine, the majority of drillholes have been surveyed. Surveys are completed using a Reflex deviation tool at intervals ranging between 25 m and 50 m, or as available due to drilling conditions. Deviations in the bearing (for non-vertical holes) average only 0.33 degrees but feature local significant deviations in excess of 15 degrees between intervals. Dip deviations range between 0 degrees and 11 degrees, with an average of 0.27 degrees between intervals.

Historic drillholes are relatively long and their precise location is considered uncertain due to the lack of downhole deviation surveys; this uncertainty contributes to the inaccuracy in the geological model. New drilling, completed using downhole deviation surveys, have improved the precision in areas of historic drilling. To reduce the inaccuracy related to non-surveyed drillholes, the historical non-surveyed drillhole intercepts with offsets of more than 5 m from the projection of the structures using new surveyed drill holes and/or channel samples, were not flagged and not used during the construction of the geological model and estimation.

Of the 776 drillholes which were not surveyed before 2014, the average length per hole is 179 m. This would indicate significant potential for deviation of these holes over these distances based on observed deviations in the surveyed holes. After 2014, a number of short drillholes have not been surveyed. SRK noted that there are areas where the drill stations have probably been over-used, rather than simply moving the drill to a new station closer to the targets that would reduce drilled metres. There are both cost and accuracy advantages that would be realized by moving the drill rig closer to drilling targets when available.

10.2.2 Core Recovery

Core recovery is assessed prior to logging and sampling. This is based on the percentage of an interval that is recovered into the core box compared to the expected length of the interval. Recoveries are generally very good at Cusi with an average recovery of 95% in mineralized intervals.

10.3 Interpretation and Relevant Results

SRK notes that Cusi is an advanced property with active mining ongoing focused in the Promontorio, Santa Rosa de Lima and San Nicolas zones.

Relationships between thicknesses of drilling intercepts and actual thicknesses in the mineralized veins underground have been confirmed through ongoing production. SRK notes that Sierra Metals generally attempts to intersect veins in a perpendicular fashion through drilling, but this is not always accomplished due to the difficulty of positioning the drill rigs from surface or underground.

There are local zones of structural complexity where the orientation of the drilling is not appropriately intercepting all of the mineralization trends. Special care has been taken whenever the drill holes are approximately parallel to the structures during the estimation. Selected veins are sometimes drilled near the plane of the structure, which may exaggerate mineralized intercept thicknesses. SRK is not reporting thicknesses or grades for any of these structures.

11 Sample Preparation, Analysis and Security

11.1 Security Measures

Samples are collected by the logging technicians or geologists after being marked and labelled in core boxes. These are grouped into larger batches of 10 samples per reinforced sack, with a weight of no more than 25 kg.

Each sack is noted with the intervals contained, the hole ID, and the order number for the laboratory. Samples are stored on-site and behind access-controlled gates until they are taken to the relevant laboratory. Historically, this has been the Mal Paso Mill, a Sierra Metals owned mill facility, or ALS Chemex ("ALS"), an independent and ISO-certified laboratory with processing facilities in Hermosillo and analytical facilities in Vancouver, Canada. Since the middle of 2016, samples have been first sent to the Mal Paso Mill for analysis and any samples with positive results warranting confirmation are also sent to ALS.

11.2 Sample Preparation for Analysis

The analytical history of the Cusi sampling is complex and includes various generations of analyses between the nearby Mal Paso Mill and ALS. For samples assayed at ALS in Vancouver, drill core samples were prepared at the ALS prep lab in Chihuahua, Mexico. Upon receipt of samples, ALS dries the samples, records the received sample weight, and processes the samples as follows:

1. Core is crushed to 70% passing 2 millimeters;
2. A 150-gram split is taken for pulp preparation; and
3. The split sample is pulverized to a pulp at 85% passing 75 micrometers.

Upon receipt of samples from the mine or exploration team, the Mal Paso Laboratory dries, weighs, and catalogs the samples. Drying times are four hours for channel samples and eight hours for drill core. The current sample preparation procedures in practice at the Mal Paso Mill are as follows:

1. Rock from core or channel is crushed to 19 mm and then is placed in a cone crusher with the sample passing 2 mm;
2. A split is taken from this crushed material for pulp preparation (200 g for channel samples; 400 g for core samples). Samples are dried again for 30 minutes; and
3. Split samples are pulverized to a pulp at 90% passing 75 micrometers.

Previous technical reports have noted that the sample preparation procedures at Mal Paso differ from those at ALS. For samples historically assayed at the Mal Paso Mill, samples were crushed initially to 3.175 mm grain size, then further pulverized to 85% passing rate of 100 mesh (152- micrometer) or 150 mesh (104-micrometer).

SRK is aware that The Mal Paso lab has been working to improve and adopt procedures such as those utilized by ALS. Currently, the Mal Paso Lab is crushing to 70% passing 10 mesh which matches the process used by ALS. Additionally, since 2017, the Mal Paso Mill has improved the quality of crushed samples by using coarse blank and fine blank material (silica) to clean the crushers and pulverizers and to control possible contamination. During the site visit to the laboratory in January 2020, it was observed that the Mal Paso lab now uses controls in the different phases of the preparation and chemical analysis process. The results of the QA/QC protocols of the laboratory were not available.

11.3 Sample Analysis

Sample analyses have been performed variably at ALS and Mal Paso Mill. Historically, all samples have been analyzed at Mal Paso, with periodic checks of analyses at ALS. This practice was deemed to be insufficient due to analytical and preparation inconsistencies in the Mal Paso Mill. Thus, a series of campaigns were run with the analyses being entirely duplicated at ALS, and the findings showed significant differences between the two labs (SRK, 2017).

Currently, all drill core analysis supporting the Mineral Resource estimation is performed by ALS, although an initial analysis of the sample is done at Mal Paso to determine whether it is warranted to send to ALS. The coarse reject from the initial crushing of the sample at Mal Paso is retained in case the sample needs to be analyzed by ALS. If the sample is analyzed at ALS, the coarse reject is submitted and the remainder of sample preparation is completed at the ALS Chihuahua-Mexico facility. Final analysis is conducted at the primary ALS laboratory in North Vancouver, BC, Canada.

SRK notes that the channel samples are still analyzed by the Mal Paso internal laboratory as this laboratory has a considerably better turnaround time on analyses than ALS, which is critical for timely production decisions, and the analytical techniques are appropriate for the mineralization. The analytical methods appear to be similar, but the Mal Paso laboratory has an extremely high lower limit of detection (20 g/t Ag). Most modern laboratories (such as ALS) have significantly lower limits of detection in the 1 to 5 g/t Ag range for higher mineralized grades. While this likely does not affect the results of the resource estimation, it should be noted that the methods used by Mal Paso may not be the same as ALS and therefore may introduce a bias in comparisons made between labs (SRK, 2017).

At the ALS lab in Vancouver, several analytical techniques are employed for different generations of data. For primary analysis, pulverized samples are digested by aqua regia, followed by analysis for three metals (silver, lead, and zinc, collectively identified as “Limited Metals”) by inductively coupled plasma atomic emission spectroscopy (ICP-AES) under Method ICP41. A large portion of samples were analyzed for the entire suite of 35 metals by ICP-AES. A large portion of samples were also analyzed for gold by fire assay and atomic absorption (AA). For over-limit analysis, detections of silver, lead, and zinc that exceed the reporting limit of ICP41 are reanalyzed by an ore grade (OG) ICP-AES method, AA, or fire assay gravimetric methods (Table 11-1) (SRK, 2017).

Currently, pulverized samples are digested with concentrated nitric acid. After cooling, hydrochloric acid is added to produce aqua regia and the mixture is digested again and then analyzed by Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP - AES) under Method ICP41a, High Grade Aqua Regia ICP-AES.

For samples analyzed at the Mal Paso Mill, pulverized material is assayed for gold and silver by fire assay and base metals by plasma atomic emission spectroscopy. Reporting limits for assays at ALS and Mal Paso are summarized in Table 11-1 and Table 11-2 respectively. SRK notes that the reporting limits for the Mal Paso lab are inconsistent with industry norms for analytical precision for all known metals, and that this should be rectified in order to have better confidence in these analyses. The uncertainty associated with stating material that may sit in the ranges of the lower limits of detection for Mal Paso allows for the possibility of the expectation for completely unmineralized material to have grades of 0.5 g/t Au and 20 g/t Ag, which would seem to have significantly more value than the actuals (SRK, 2017).

Currently, ranges of the lower limits of detection for Mal Paso have not changed, but the lab now is using a number of standards of evaluation for different detection techniques.

Table 11-1: Analytical Methods and Reporting Limits for ALS

Metal	Initial Assay		Over-Limit	
	Analytical Method	Reporting Limits (g/t)	Analytical Method	Reporting Limits (g/t)
Gold	AA23	0.005 to 10	GRA-21	0.05 to 1,000
Silver	MEICP-41 [1]	0.2 to 100	OG-46	1 to 1,500
			GRA-21	5 to 10,000
	ME-ICP41a [2]	1 to 200	OG-46	1 to 1,500
Lead	MEICP-41	2 to 1,000	OG-46	10 to 200,000
	ME-ICP41a	10 to 50,000		
Zinc	MEICP-41	2 to 1,000	OG-46	10 to 600,000
	ME-ICP41a	10 to 50,000		

Source: ALS Minerals Fee Schedule, 2016-2017

[1] ME-ICP41 Multi-Element (Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th, Ti, Tl, U, V, W, Zn) Trace Level Method.

[2] ME-ICP41a Multi-Element (Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Sr, Th ,Ti, Tl, U, V, W, Zn) High Grade Method.

Table 11-2: Analytical Methods and Reporting Limits for Mal Paso

Metal	Analytical Method	Lower Limit of Detection (g/t)
Gold	Fire Assay	0.5
Silver	Fire Assay	20
Lead	AES	8
Zinc	AES	8

Source: Sierra Metals, 2020

11.4 Quality Assurance/Quality Control Procedures

In general, Sierra has been drilling for the past ten years and instituted an industry standard QA/QC program in 2013. A typical QA/QC program includes the use of blanks, standard reference material and duplicates. The purpose is to submit sample with known values or properties which identifies sample mix ups, sample preparation contaminations, laboratory precision and accuracy and laboratory bias.

The review results for data 2014-2016 QA/QC monitoring at Cusi show significant failure rates or inconsistencies across all types of QA/QC, with these failures made all the more egregious by the fact that Sierra uses its own QA/QC materials for these tests, which feature standard deviations far in excess of industry-standard QA/QC (SRK, 2017). SRK's independent analyses therefore included developing of a set of failure criteria for each type of QA/QC data and determining failure rates.

In April 2017, SRK conducted a thorough review of the QA/QC procedures and performance at Cusi, using data to September 2016. The review process included auditing internal QA/QC charts prepared by Sierra, as well as independent analyses using data provided by the company for all QA/QC work completed since 2013 (SRK, 2017).

Since the latter part of 2017, Sierra has been implementing improvements to the QA/QC protocol such as the consistent use of reference materials, coarse and fine blanks, and coarse and fine duplicates. The blanks have been certified by round-robin analysis. Sierra has established failure criteria for the QA/QC samples and is continuously monitoring sample performance. To date, Sierra has obtained good results from the QA/QC program.

The insertion rate into the sample stream is established at a frequency of 1:20 for standards, 1:30 for blanks, and 1:50 for duplicates. This insertion rate is not reflected in the raw data because the insertion is made only in mineralized zones and is adjusted locally to account for particular observations in the core (i.e., insertion of blank material immediately after a mineralized vein to check for contamination). For 2017, the insertion rate was 4.4%. Table 11-3 presents the controls used and the total meters drilled per year.

Table 11-3: Historical Rate of Insertion of Laboratory Controls

	Insertion Rate	Prior 2013	2014	2015	2016	2017	2018	2019	2020
Standards	1:20	144	98	49	101	83	37	75	63
Fine blanks	1:30 or 1:50	173	72	194	82	52	28	42	42
Coarse blanks	1:30 or 1:50	-	-	-	-	-	26		22
Coarse duplicates	1:30 or 1:50	No data available			-	-	24	43	30
Fine duplicates					-	-	24	42	30
Core duplicates	1:30 or 1:50	208	-	377	1,073	25	23	43	27
External duplicates	1:30 or 1:50	No data available			-	-	0	-	-
Total		**525**	**170**	**620**	**1,256**	**160**	**162**	**245**	**214**
Meters Drilled		**145,621**	**10,560**	**27,232**	**8,706**	**45,349**	**30,607**	**16,908**	**12,282**

Source: SRK, 2020

11.4.1 Standard Reference Materials (SRM)

Following the implementation of a formal QA/QC program in 2013, Sierra began inserting standards (either high grade, medium grade, or low grade) into the sample stream regularly at a rate of one standard per twenty samples. The standards are internal standards prepared at the Mal Paso Mill, from material chosen for its similarity (mineralogical and in terms of appearance) to the samples from the Cusi exploration program. In 2017, SRK conducted a review of the use of standards for the period of 2014 to September of 2016 and the results are shown in Table 11-4.

The definition of the grade of the standards does not fully consider the averages in the area.

Table 11-4: List of Internal Standards of the 2014-2016 Program

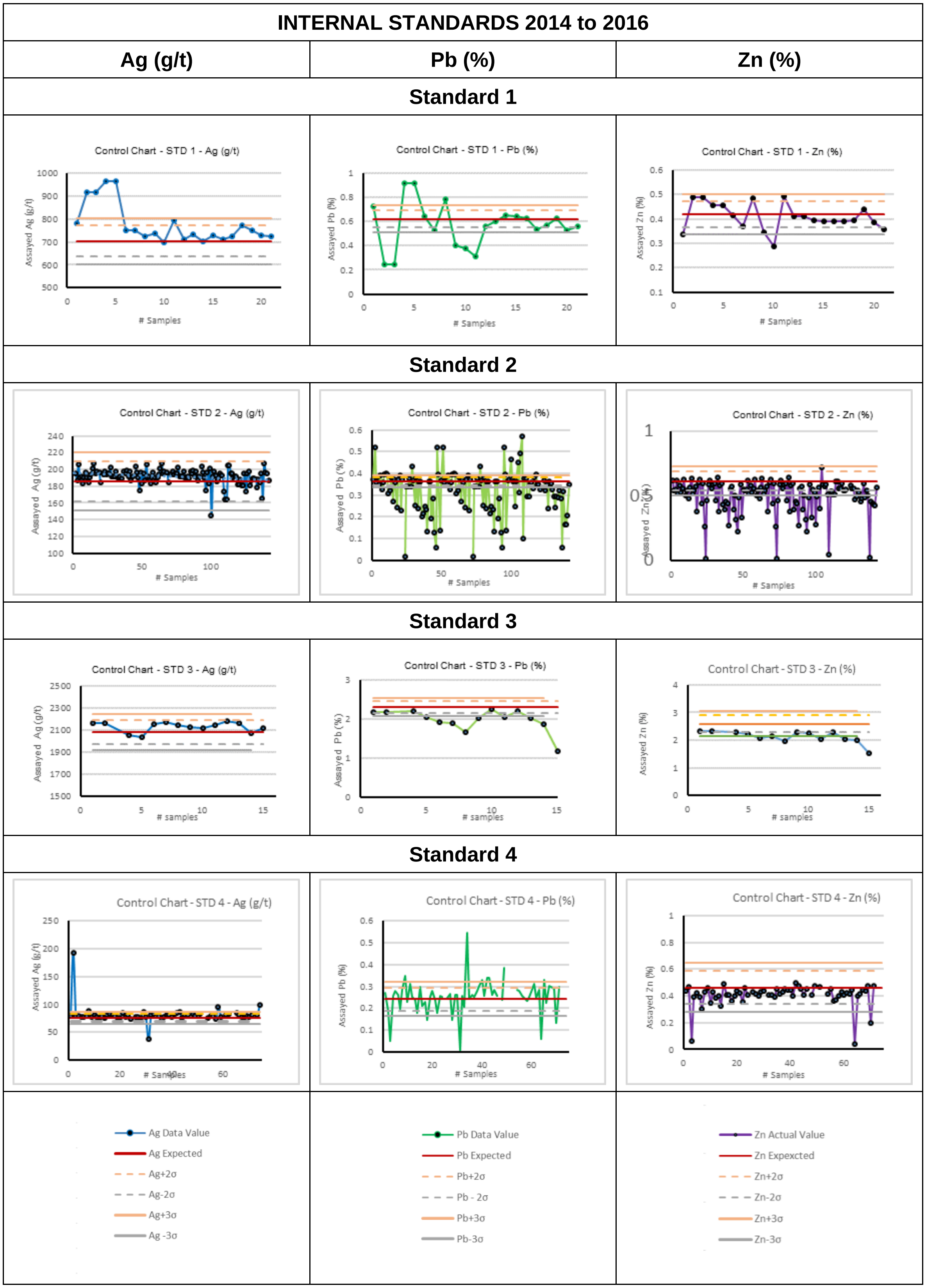
SRM	No. Samples	Ag (g/t) ± 2SD	Pb (%) ± 2SD	Zn (%) ± 2SD	Period
Standard 1	21	703.39 ± 67.44	0.623 ± 0.074	0.419 ± 0.054	April-Sep 2016
Standard 2	142	185.66 ± 23.446	0.364 ± 0.018	0.614 ± 0.076	2014 & April-Sep 2016
Standard 3	14	2,080.22 ± 107.354	2.303 ± 0.15	2.588 ± 0.304	April-Sep 2016
Standard 4	68	75.852 ± 6.784	0.242 ± 0.052	0.464 ± 0.122	2015 & May-Sep 2016
Total	**245**				

Source: SRK, 2017

SRK noted that the standard deviations used to define the failure criteria for standards were derived from the standards dataset and are higher than industry standard. Samples of each standard have been sent to three independent laboratories to define certified values for Ag, Pb, and Zn (ALS, SGM, and LIMSA); SRK noted that in most cases, the internally derived standard deviations are 2x to 3x higher than the standard deviations reported by external labs. This is not consistent with industry best practices for acceptable intra-lab performance. (SRK, 2017)

The results from internal standards used from 2014 to 2016 program are shown in charts for Ag, Pb and Zn on Figure 11-1.

Data has been examined for failures of each standard according to ± 3SD, defined by the Lab, and is shown in Table 11-5. For all cases, the QA/QC is assessed on the basis of failures over time. From 2014 to 2016, there is no documentation provided by Sierra regarding how failures of QA/QC were addressed, if the failures have been submitted for re-assay, or to find out the problem such as samples misnaming or mix-ups.



Source: SRK, 2017

Figure 11-1: Plots SRM Results for Ag, Pb, Zn, 2014 to 2016 Program

Table 11-5: Failure Statistics for Cusi Standards, 2014-2016 Program

Failure Statistics – Ag			
	Failure Criterion	**Number of Failures**	**% Failure**
Standard 1	± 3SD	4	19%
Standard 2	± 3SD	1	1%
Standard 3	± 3SD	3	21%
Standard 4	± 3SD	7	10%
Failure Statistics - Pb			
	Failure Criterion	**Number of Failures**	**% Failure**
Standard 1	± 3SD	8	38%
Standard 2	± 3SD	77	54%
Standard 3	± 3SD	9	65%
Standard 4	± 3SD	14	21%
Failure Statistics - Zn			
	Failure Criterion	**Number of Failures**	**% Failure**
Standard 1	± 3SD	1	5%
Standard 2	± 3SD	51	36%
Standard 3	± 3SD	6	43%
Standard 4	± 3SD	4	6%

Source: SRK, 2017

In 2017, five new CRM (certified reference materials) have been procured and certified via round-robin analysis for the current exploration programs. These CRM have been homogenized and packaged by Target Rocks Peru (S.A.) and the round-robin analysis conducted by Smee & Associates Consulting Ltd., a consultancy specializing in provision of CRM to clients in the mining industry.

Each CRM undergoes a rigorous process of homogenization and analysis using aqua regia digestion and AA or ICP finish, from a random selection of 10 packets of blended pulverized material. The six laboratories participating in the round-robin for the Target Rocks CRM are:

- ALS Minerals, Lima;
- Inspectorate, Lima;
- Acme, Santiago;
- Certimin, Lima;
- SGS, Lima; and
- LAS, Peru.

The CRMs used in the 2017 review included two low-grade CRM (MCL-01 and MCL-02), one CRM of medium grade (PSUL-03) which represents the material associated with the sulfide zone, a high-grade CRM (MAT-06) and a CRM (AUOX-10) to evaluate the Au values, associated with the Oxides zones. From 2018 to 2020, additional CRMs were used including a high Ag grade (CRM CPB-02, CRM PLSUL-30) and low and medium grade (CRM PLSUL-09, CRM PLSUL-11).

Protocol include insertion of the high-grade MAT-06 CRM, and MCL-02 CRM with moderate grade, and AUOX-10 CRM which monitors grade of Au, but there was not enough information to evaluate their performance.

The means, and between lab standard deviations (SD), are calculated from the received results of the round-robin analysis, and the certified means and tolerances are provided in certificates from Smee and Associates. The certified means and expected tolerances are shown in Table 11-6 and Table 11-7.

Table 11-6: CRM Expected Means and Tolerances, 2017 Program

CRM	No. Samples	Au (g/t) ± 2SD	Ag (g/t) ± 2SD	Cu (%) ± 2SD	Pb (%) ± 2SD	Zn (%) ± 2SD
MCL-01	28	-	26.4 ± 1.9	0.896 ± 0.054	0.326 ± 0.034	0.988 ± 0.07
MCL-02	8	-	40.8 ± 3.40	1.581 ± 0.084	0.653 ± 0.05	2.490 ± 0.09
MAT-06	5	-	469.0 ± 13.0	2.530 ± 0.12	7.750 ± 0.40	7.980 ± 0.46
PSUL-03	39	-	192.0 ± 4.0	1.033 ± 0.036	3.094 ± 0.084	3.150 ± 0.13
AUOX-10	3	3.24 ± 0.16	850.0 ± 34.0	-	-	-
Total	**83**					

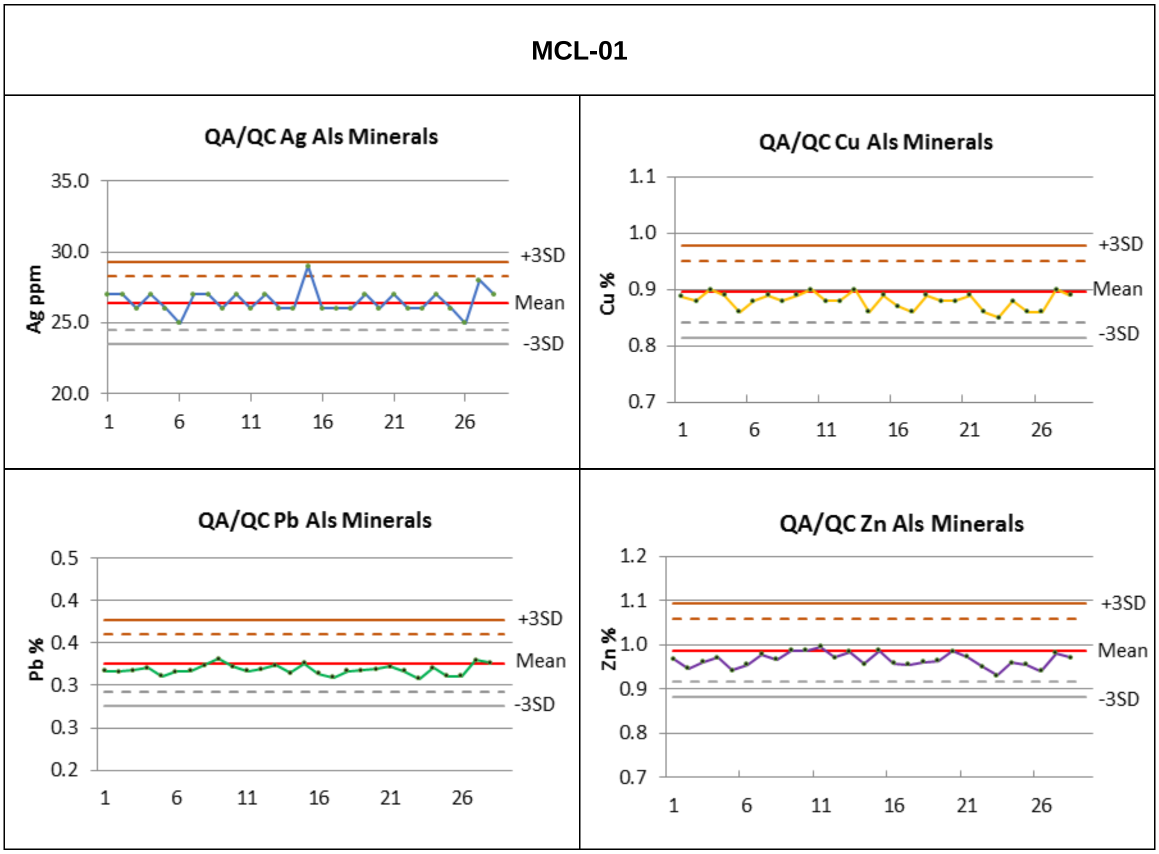
Source: SRK, 2017

Table 11-7: CRM Expected Means and Tolerances, 2018 - 2020 Program

CRM	No. Samples	Au (g/t) ± 2SD	Ag (g/t) ± 2SD	Cu (%) ± 2SD	Pb (%) ± 2SD	Zn (%) ± 2SD
MCL-01	1	-	26.4 ± 1.9	0.896 ± 0.054	0.326 ± 0.034	0.988 ± 0.07
MAT-06	4	-	469.0 ± 13.0	2.530 ± 0.12	7.750 ± 0.40	7.980 ± 0.46
PSUL-03	4	-	192.0 ± 4.0	1.033 ± 0.036	3.094 ± 0.084	3.150 ± 0.13
CPB-02	40	12.11 ± 0.56	2,083 ± 46.0	-	59.64 ± 0.58	4.190 ± 0.17
OXHYO-03	12	-	192.3 ± 6.9	1.025 ± 0.046	0.426 ± 0.018	-
HDRT-01	2	-	126 ± 8.0	-	0.760 ± 0.40	1.380 ± 0.54
HDRT-02	3	-	321 ± 15.0	-	0.810 ± 0.03	1.120 ± 0.04
PLSUL-11	17	-	113.0 ± 8.0	1.050 ± 0.03	7.93 ± 0.40	10.78 ± 1.08
PLSUL-09	53	-	67.0 ± 4.0	0.25 ± 0.016	2.24 ± 0.18	3.81 ± 0.12
PLSUL-30	58	3.24 ± 0.16	850.0 ± 34.0	-	-	-
Total	**192**					

Source: SRK, 2020

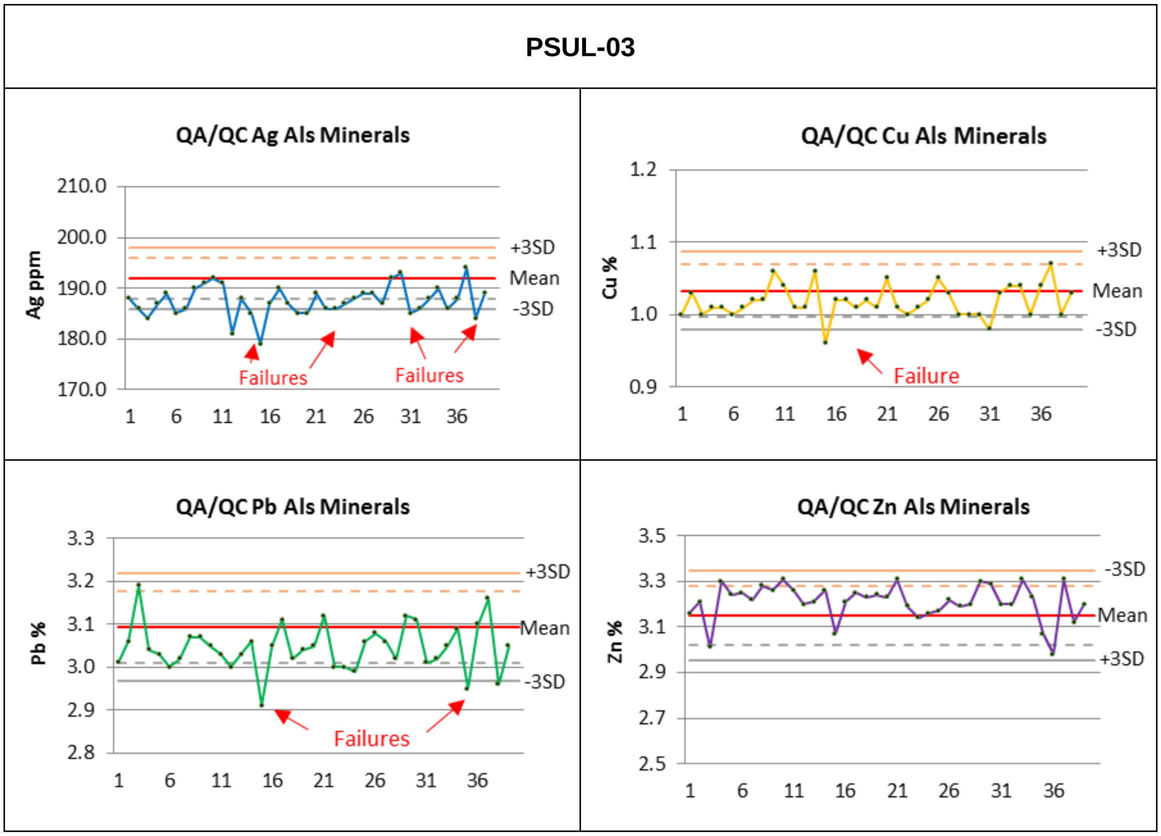
An evaluation for each CRM was conducted to evaluate performance and good practices of analysis for lab protocol. Examples of the behavior of the 2017-2020 CRM controls are shown in Figure 11-2, Figure 11-3, Figure 11-4, Figure 11-5 and Figure 11-6.



Source: SRK, 2017

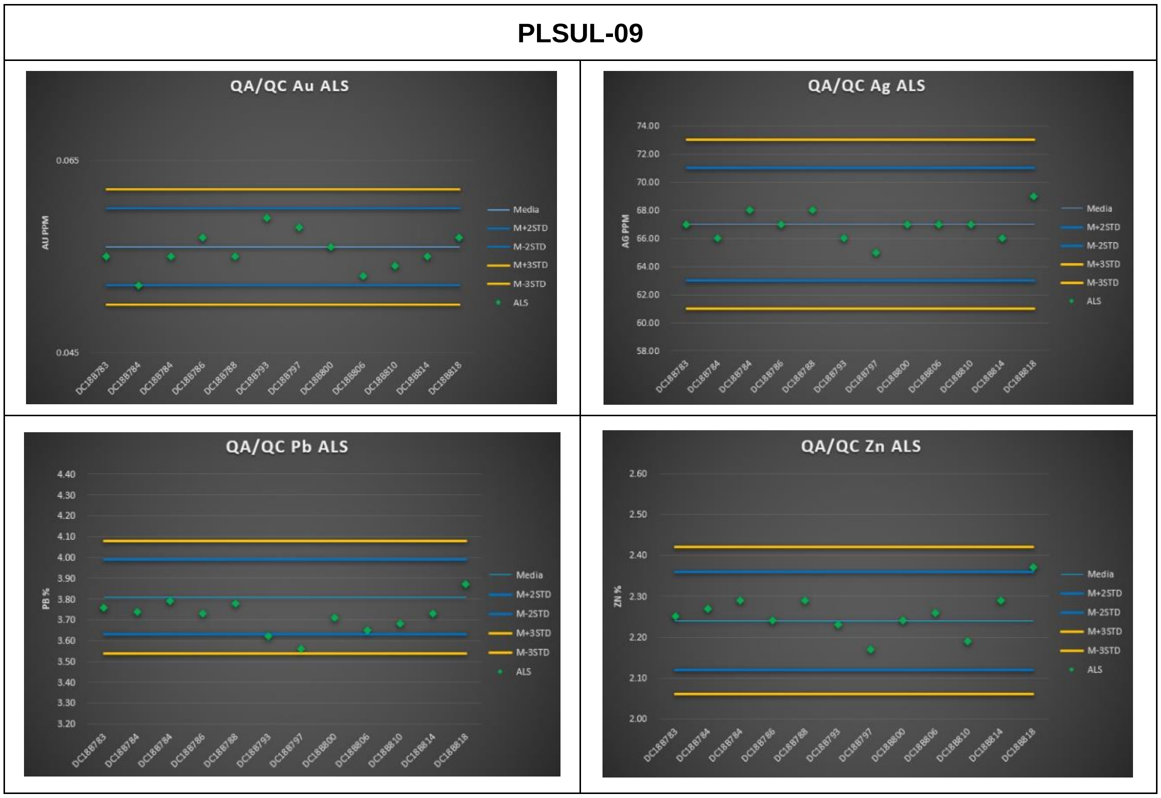
Figure 11-2: Plots MCL-01 CRM Results for Ag, Pb, Cu, Zn, 2017 Program

The CRM MCL-01 (low grade CRM) has good performance, with no noted failures; however, it is important to note that the Cu, Pb, Zn have a strong generalized trend of values below the average.



Source: SRK, 2017

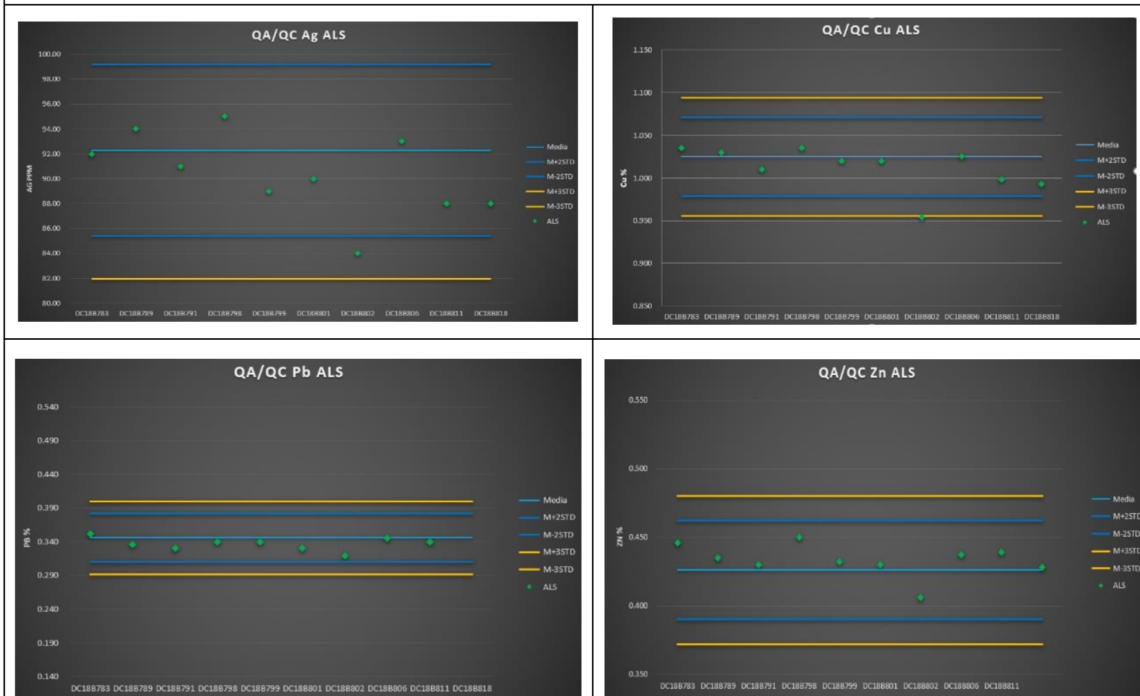
Figure 11-3: Plots PSUL-03 CRM Results for Ag, Pb, Cu, Zn, 2017 Program



Source: Sierra Metals, 2020

Figure 11-4: Plots PLSUL-09 CRM Results for Au, Ag, Pb, Zn, 2018 Program

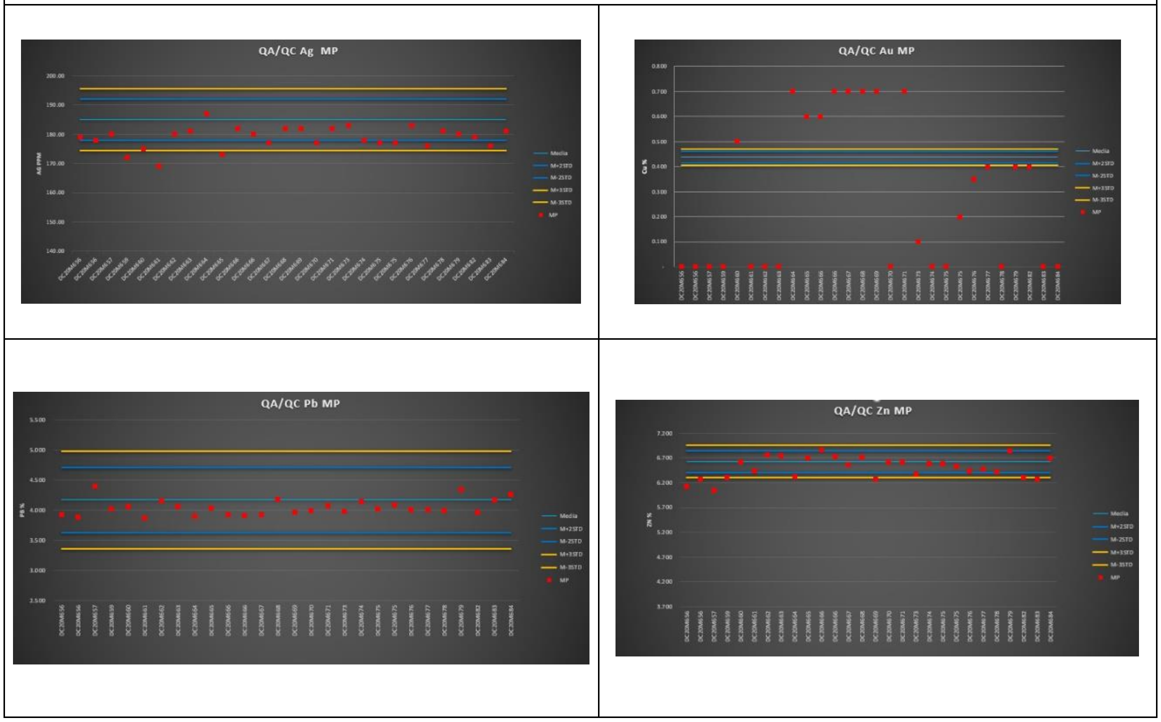
OXHYO-03



Source: Sierra Metals, 2020

Figure 11-5: Plots OXHYO-03 CRM Results for Ag, Cu, Pb, Zn for 2018

PLSUL-30



Source: Sierra Metals, 2020

Figure 11-6: Plots PSUL-30 CRM Results for Ag, Au, Pb, Zn, 2019-2020 – Mal Paso Laboratory

Results of the high grade PSUL-03 CRM show a strong downward trend for the Ag, Cu and Pb, while the Zn presents an upward trend of the mean. Failures occur mainly in Ag, and some in Cu and Pb. PSUL-09 and OXHYO-03 show general good behavior with no failures.

The PSUL-30 CRM results for the Mal Paso Laboratory show several failures and a slight downward trend for Ag. The results for gold show many inconsistencies and failures and the cause is not documented. In the failure summary table, the failure rate is observed for the recent QA/QC. The Cusi personnel mentioned that continue communication is maintained with the laboratory and that the corrective actions have been implemented. The documentation of the corrective actions should be improved, including management of failures, and a review made of the causes of the failures or re-assays of the CRM that failed and the samples around it.

11.4.2 Results

Whereas the results for the 2014-2016 QA/QC monitoring at Cusi showed significant failure rates or inconsistencies across all types of QA/QC, the 2017-2020 performance of the QA/QC was considerably improved from previous efforts and it can be said that the reference materials, with enough samples to evaluate, exhibit general satisfactory performance. The insertion of CRM control samples should be consistently maintained. The documentation of the corrective actions should be improved, including management of failures, such as reviewing the causes of the failures or re-assays of the CRM that failed and the samples around it.

11.4.3 Blanks

Prior to 2013, 173 blank samples were inserted into the sample stream at Cusi, also in 2012. These data results are not available. (SRK, 2017). The blank samples were prepared internally by Sierra from pulverized andesite presumed to be unmineralized.

Previous Technical Reports note that for gold, 97% of blank assays complied with acceptance criteria (values less than or equal to 5-times the ALS reporting limit); however, silver and lead performed less well (67% and 68% compliance, respectively), and for zinc, all blank assays exceeded the acceptance criteria. Gustavson (2014) concluded that unexpectedly high values for blank samples did not appear to be caused by carryover of the preceding sample and suggested that the andesite was in fact mineralized. Based on this result, it was recommended that Sierra purchase commercially prepared blank samples. (SRK, 2017)

Since 2013, Sierra has inserted blanks into the sample stream regularly, at a rate of one blank per every 30 to 50 samples. Blanks continue to be prepared internally from pulverized andesite. Data prior 2014 is not available. (SRK, 2017).

The results of SRK's QA/QC review (2014-2016 program) generally show poor performance for blank samples, particularly for Pb and Zn. Many blank samples for these elements report values above 10x the lower limit of detection. Although the failure rate for Ag is 1%, the lower limit of detection for Ag at the Mal Paso Mill is 20 g/t, significantly higher than at most commercial laboratories.

SRK noted that although Sierra tracks the performance of blanks at the mill, their results are compared to the standard deviation of the entire dataset for each element as opposed to the lower limit of detection for each element. The blanks dataset generally exhibits a high standard deviation, and it is SRK's opinion the performance of blanks is exaggerated in Sierra's internal QA/QC review as a result. SRK agrees with Gustavson's (2014) conclusion that internally prepared "blank" material at Cusi may not be unmineralized. (SRK, 2017)

Source: SRK, 2017

Figure 11-7: Blank Analysis for Ag, Pb and Zn, 2014-2016 Program

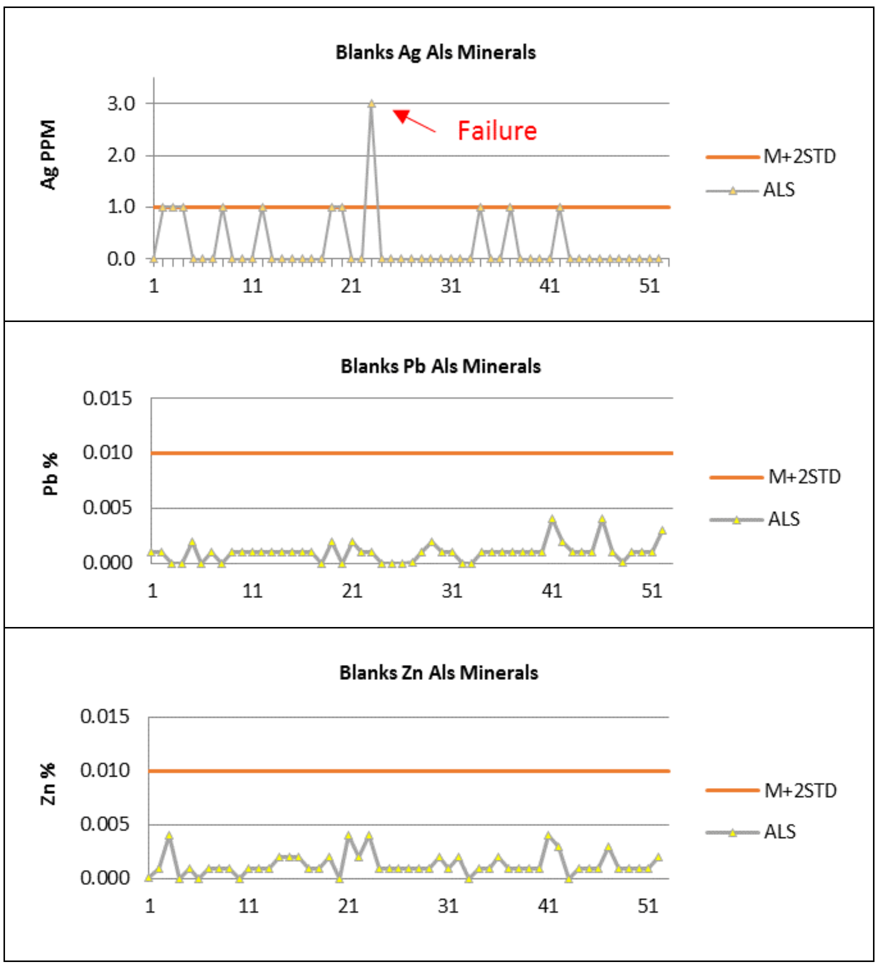
In 2017, a new blank was certified which limits of detection for the different elements are shown in Figure 11-7. This blank consists of barren limestone selected by the project geologists. The failure criteria of Cusi for blanks is roughly +2SD of the mean of the blanks. Table 11-8 presents the reporting limits for the blank used after 2017.

Table 11-8: Reporting Limits for Blank 2017

Metal	Lower Limit of Detection (g/t)	Acceptance limit (+2SD)
Ag	<1 ppm	1 ppm
Pb	<0.005 %	0.01%
Zn	<0.001 %	0.01%

Source: SRK, 2020

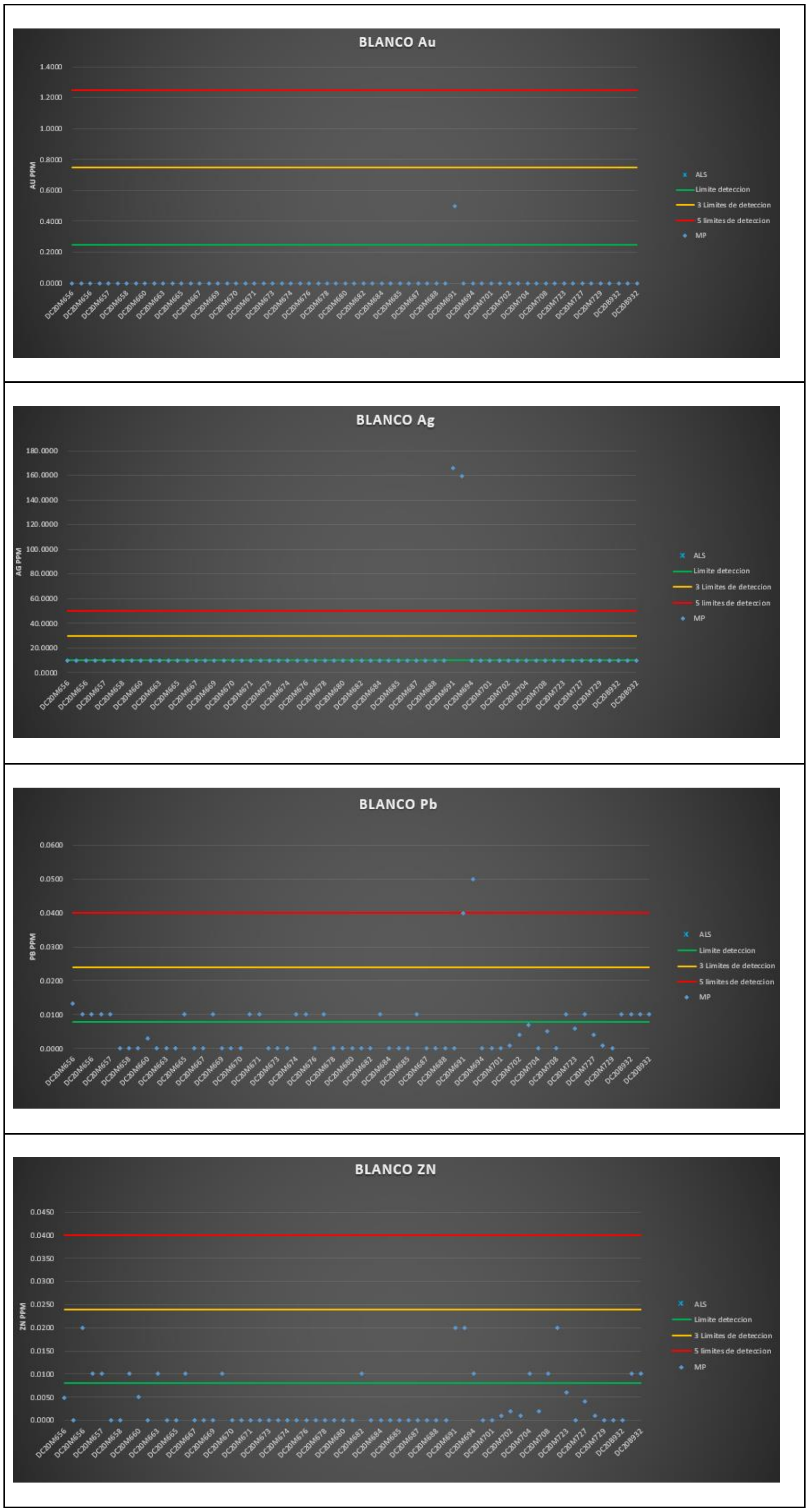
The blank for 2017 exhibits good performance. There is only one failure out of 52 blanks for Ag, with a high anomalous value of 3 ppm Ag. This could be a mix-up and should be addressed by re-assaying samples around the failure blank, including the failure and report to the lab. These are shown in Figure 11-8.



Source: SRK, 2017

Figure 11-8: Blank Analysis for Ag, Pb and Zn, 2017 Program

Figure 11-9 presents the results of the fine blanks sent to the Mal Paso laboratory for 2020. Although the detection limits are high, it is observed that there are few failures. It is possible that some of these failures are due to the mislabelling of samples. Documentation of the failures and management of these issues is incomplete and should be improved.



Source: SRK, 2020

Figure 11-9: Blank Analysis for Au, Ag, Pb and Zn, 2020 Program – Mal Paso Laboratory

11.4.4 Duplicates

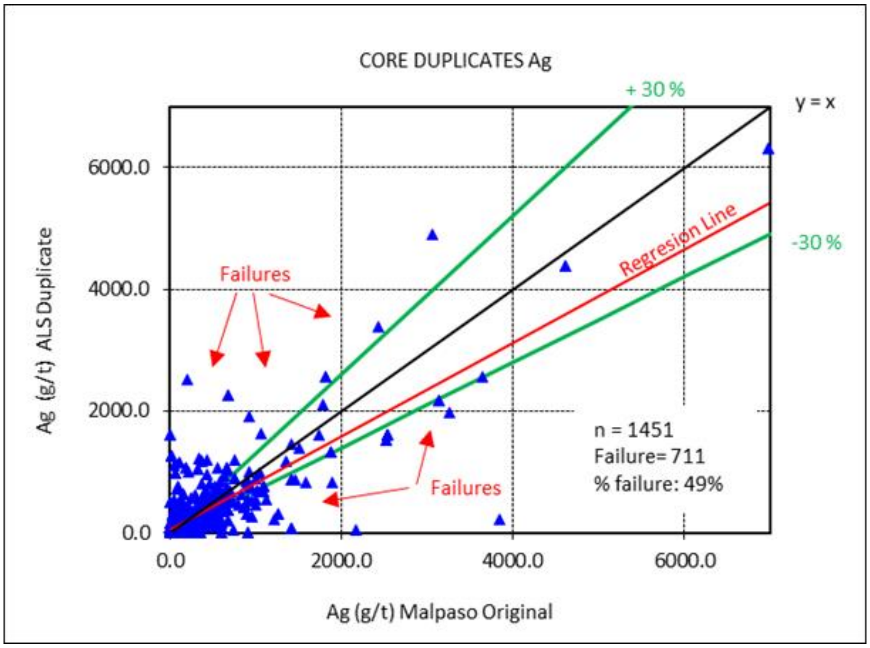
Prior to 2013, 208 duplicates were inserted into the sample stream at Cusi. Sierra provided Gustavson with the results of the duplicate sample but was not able to provide information on the corresponding original and so it was not possible to evaluate laboratory precision. (SRK, 2017)

Following the implementation of a more formal QA/QC program in 2013, Sierra devised a system whereby three types of duplicates (coarse duplicates, core duplicates, and external duplicates) are inserted into the sample stream every 30 to 50 samples. External duplicates are sent to ALS for comparison against the Mal Paso Mill to ensure that the internal lab is performing in a manner consistent with industry standards. (SRK, 2017)

Although a failure rate was not determined for duplicate samples, SRK's review determined that internal duplicates generally exhibit poor performance. The review suggests that the performance of the Mal Paso Mill is inconsistent, both internally and in comparison, to commercial laboratories; however, they also suggest that the precision of the internal lab is higher for coarse duplicates than for core duplicates. Sierra has not developed failure criteria for duplicates but acknowledges poor performance. (SRK, 2017).

SRK noted that the 2014-2016 intra-lab check analyses show a general agreement, which is encouraging. This agreement is only when evaluating the assays >20 g/t Ag, which is the Mal Paso lower detection limit. In a comparison of those assays above 20 g/t Ag, ALS reports average grades that are slightly higher than Mal Paso for all metals, but which generally agree. This would indicate that the Mal Paso Mill may be under-reporting grades in general, which may not be easy to perceive given the elevated lower limit of detection. (SRK, 2017)

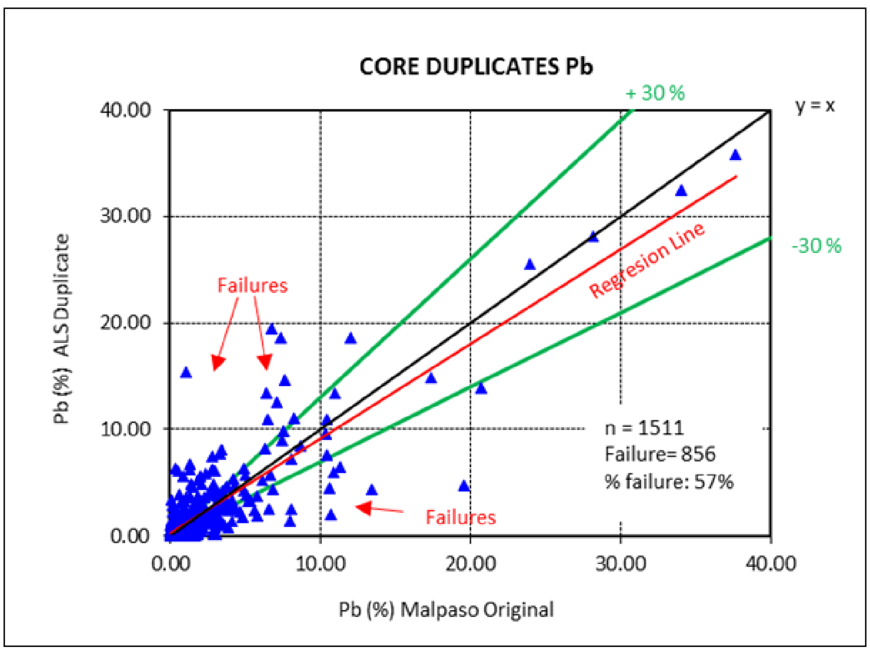
Data from core duplicates insert during the 2015-2016 program was evaluated using scatterplots using as a limit acceptance ±30%. Poor performance is observed, and failures occur throughout all ranges of grades as shown in Figure 11-10. The scatter plot shows a bias towards Mal Paso when compared to ALS and the bias averages 25% lower than ALS.



Source: SRK, 2017

Figure 11-10: Core Duplicates Analysis for Ag (g/t) - Mal Paso vs ALS, 2015 to 2016 Program

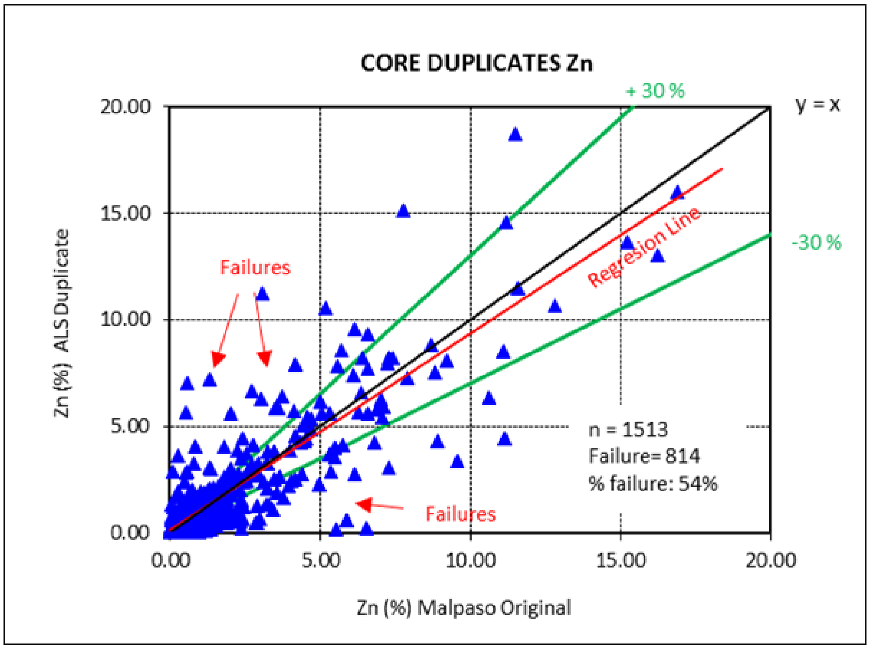
A high percentage of failures is observed for duplicates in Pb, following the acceptance limit of ±30%, with a slight bias towards Mal Paso. This bias is driven predominantly by grades greater than 20% Pb. This is shown in Figure 11-11.



Source: SRK, 2017

Figure 11-11: Core Duplicates Analysis for Pb - Mal Paso vs ALS, 2015 to 2016 Program

There is no definite trend for Zn between the two laboratories for all grades, but there is a slight bias or bias towards Mal Paso. This is shown in Figure 11-12.



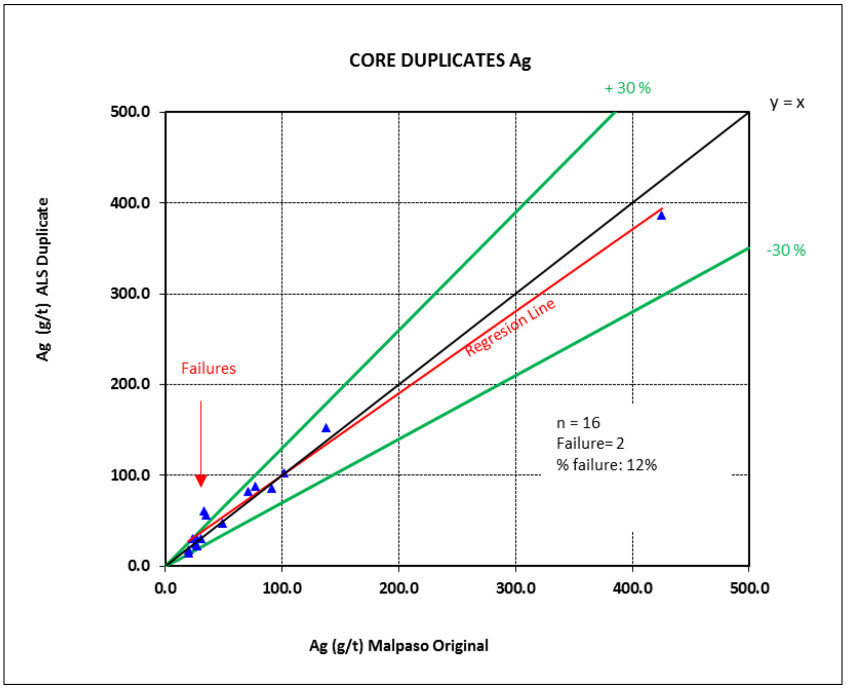
Source: SRK, 2017

Figure 11-12: Core Duplicates Analysis for Zn - Mal Paso vs ALS, 2015 to 2016 Program

In 2017, Sierra continued with the insertion of duplicates, but only with core duplicates. A total of 25 core duplicates were used which does not allow for adequate monitoring of sampling precision.

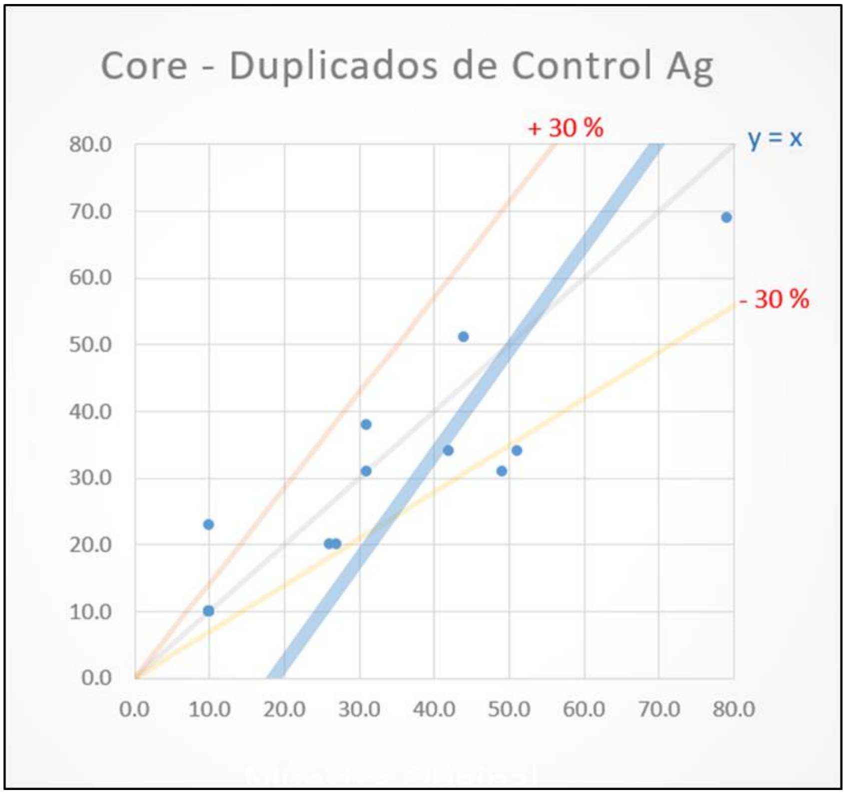
This type of duplicate should be assayed at the same time as the normal samples. Sierra is sending core duplicates to a secondary lab, which adds differences caused by laboratory drift, instrument set up etc., therefore these duplicates may be of limited use in determining sampling precision and sample representativity. In the case of core duplicates, ideally these should be similar in mass to a normal sample, should be taken as ½ half core as a duplicate and the other half as an original simple. SRK notes that quarter core can be difficult to sample correctly, especially if mineralization is controlled by structure. In this case, this procedure is likely adding more variability to the results and the sampling precision would be compromised.

The 2017 data was plotted, using a general rule of differential limits according to the type of duplicate, as follows: pulp duplicates is 10%, coarse reject duplicates is 20% and for the data available in this case of core duplicates is 30%. Examples of core duplicate results for Ag are shown in Figure 11-13 and Figure 11-14.



Source: SRK, 2017

Figure 11-13: Core Duplicates Analysis for Ag, 2017 Program

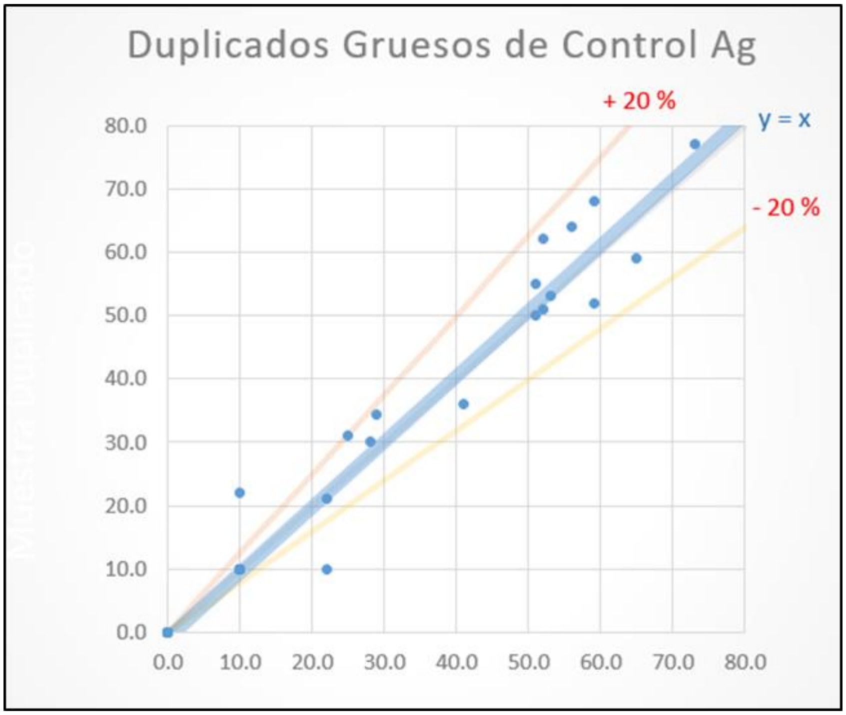


Source: Sierra Metals, 2020

Figure 11-14: Core Duplicates Analysis for Ag, 2020 Program

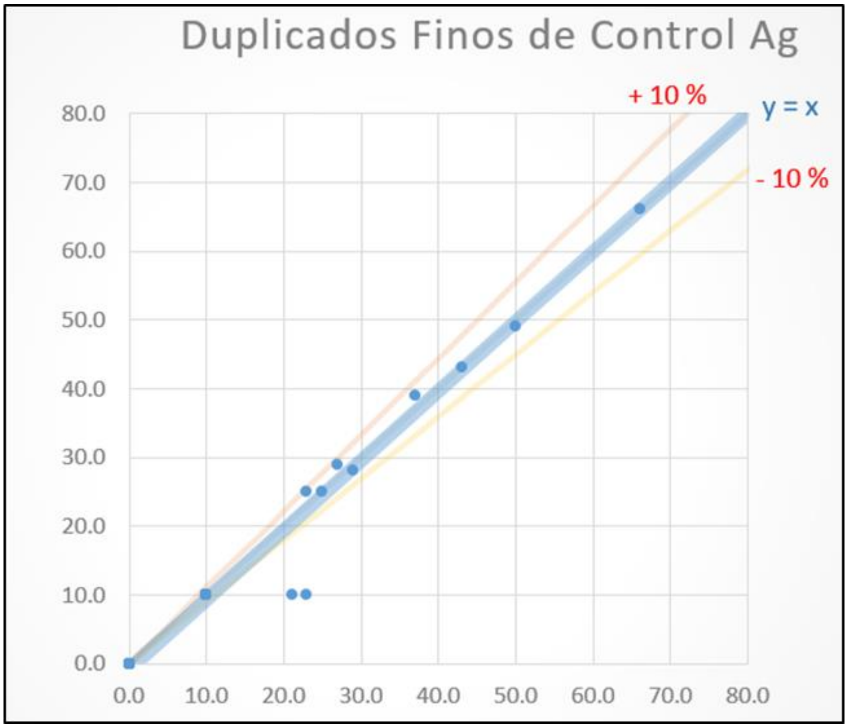
Twenty-five core duplicates were inserted in 2017 and eleven were inserted in 2020. In 2017, nine samples had an Ag grade below the detection limit of Mal Paso and therefore a comparison of these samples with ALS could not be made. Of the remaining 16 samples, only 2 failures were observed using a 30% acceptance limit. In 2020, 3 failures out of 11 samples were observed representing 27% and this rate is considered high.

There are very few samples to graph in order to evaluate precision, but in general good performance is observed. The proper insertion frequency should be reviewed. Fine and coarse duplicate controls are being used and in general they show acceptable results. The scatterplots for coarse and fine duplicates are shown in Figure 11-15 and Figure 11-16.



Source: Sierra Metals, 2020

Figure 11-15: Coarse Duplicates Analysis for Ag, 2020 Program



Source: Sierra Metals, 2020

Figure 11-16: Fine Duplicates Analysis for Ag, 2020 Program

11.5 Opinion on Adequacy

In previous evaluations of the QA/QC program, it has been noted that inconsistencies have been observed in the performance of the blanks, standards and duplicates, and these have been mainly explained by failures in the Mal Paso laboratory.

Some improvements have been made in the Mal Paso lab where the crushing and analysis processes are performed to select the core samples to be send to ALS. The Mal Paso lab does not fulfill all the requirements of an ISO certified laboratory, but improvements are being implemented. The preparation and quality control of the samples have shown good performance on the blanks, reference materials and duplicates.

Additionally, the use of new certified standards and blanks gives greater reliability to the processes of monitoring preparation and analysis of samples in the laboratory. This has been reflected in the results of the CRM which have indicated good performance of the analysis procedures and all samples returned grades within the accepted limits.

In addition to these improvements, it is recommended that Sierra improves the insertion rate of the controls. This is because in some cases the available controls are insufficient to make a real evaluation of the precision and accuracy in all the ranges of grades present in the area.

The insertion rate of core duplicates, coarse duplicates, fine duplicates has been improved. External intra-lab duplicates have not been consistent between 2017 and 2020.

SRK recommends that Sierra improve the insertion rates of QA/QC controls, maintain regularity in the insertion rates, and document appropriately all the corrective actions on the failures. The consolidation of the QA/QC results between 2014 to 2020 is recommended to evaluate the performance of the protocols.

It is also suggested to maintain the QA/QC training of the exploration team of Cusi to reinforce the understanding of the objectives and the concepts behind the quality control and quality assurance procedures.

Although additional improvements can be implemented by Sierra, the sample preparation, security and analytical procedures are adequate for inclusion in the Mineral Resource estimate.

12 Data Verification

12.1 Procedures

The data supporting the Mineral Resource estimation for Cusi has been validated in several ways by previous workers as well as by SRK. Detailed descriptions of these validations are found in Gustavson's 2014 report and are material to the consideration of the deposit. Since these validations were performed, SRK notes that Cusi has implemented marked improvements in things like verifying the location of drillholes and completing downhole surveys, aspects that were noted as issues in previous reports.

SRK visited the mine in 2016, 2017 and 2020 (January 14 -17, 2020), and was able to access the mine workings, reviewing the mineralization characteristics and controls, structural setting and the estimated vein thicknesses and grades in the mine, and found them to be appropriately stated. In addition, SRK witnessed the collection of channel samples as well as underground drilling at Cusi and noted these to be consistent with industry standards (Figure 12-1).

Source: SRK, 2020

Figure 12-1: Underground Drilling at Cusi

Sierra's Mal Paso Laboratory was visited in 2020. The procedures of reception, preparation and chemical analysis were observed and it was noted that although some improvements can still be implemented, there are controls in all the stages of the process. SRK did not review the laboratory's internal QA/QC results as the report was not provided by Sierra Metals.

12.1.1 Database Validation

As a part of the Mineral Resource estimation work, SRK also reviewed the drilling database against ALS Minerals assay certificates. In 2016, a selection of ALS analytical certificates was selected at random from the files provided to SRK by Sierra Metals, and these were compared with the drilling database. The selection consisted of 1,467 samples which represents about 2.6% of the drilling database. SRK noted that all of the samples reviewed from the certificates matched the database exactly. In 2017, an additional random selection of 350 sample analyses were checked by SRK and 100% of the results matched the database used for the estimation. In 2020, 300 samples analyzed by ALS were selected and 100% of the samples matched the database used for estimation.

In 2016, and due to the historic performance of the QA/QC and the intra-lab data between ALS and Mal Paso, SRK recommended that a series of re-analyses be run in areas which were judged to be critical to the mineral resource work completed in that year. The purpose of this work was to obtain a separate selection of samples taken from core or coarse reject material that could be submitted to ALS (which hadn't been done previously), along with appropriate QA/QC to support the mineral resource where previously the only support had been from the Mal Paso lab. In total, this small review program featured 233 samples from various areas of Cusi, across grades ranging from 0.2 g/t Ag to over 3,700 g/t Ag. Duplicates, blanks and standards were submitted with these samples, and they show reasonable performance across all grade ranges.

However, the intra-lab check samples did not show close agreement to expectations for the analysis quality and data between labs. For this small subset of samples, Mal Paso reported an average Ag of 142 g/t Ag compared to 111 g/t Ag from ALS. Although some of this discrepancy is related to the Mal Paso lab's inability to report grades less than 20 g/t Ag, and there are several intervals where Mal Paso reported very high grades, in excess of 500 g/t Ag, where ALS reported less than 20 g/t Ag. Although it is also possible that this is related to the highly variable nature of the mineralization at Cusi and its representation in split core halves, SRK would expect an average that is more similar between the two labs. SRK does note that, in general, the higher-grade samples occurring in a sequence of similar samples are repeated between the labs.

12.2 Limitations

No external auditor or consultancy, including SRK, has validated 100% of the database to date with independent samples or third-party laboratory checks.

12.3 Opinion on Data Adequacy

SRK notes that the database validation against provided certificates shows excellent agreement, but the results of the intra-lab comparison carried out in 2016 showed significant variation. This, combined with other factors such as the lack of consistent down-hole deviation, make the data adequacy only sufficient for the reporting of Indicated and Inferred Resources in most of the areas.

The drilling campaign performed since 2016 to 2020 has been focused in SRL vein, SRL-HW veins and SRL-SW zone, San Nicolas vein, and in select parts of Promontorio group of veins, and was developed using improved QA/QC procedures and appropriate down hole deviation measurements. The measured resources reported in this study are in the SRL vein, SRL-HW and SRL-SW zones where the recent exploration campaigns have been focused. The other areas of the project do not include Measured resources due to the data confidence issues mentioned previously.

13 Mineral Processing and Metallurgical Testing

Cusi's Mal Paso processing facility consists of a conventional concentration plant including crushing, grinding, flotation, dewatering of final concentrate, and a tailings disposal facility. Current capacity is 750 tpd but the plant has processed as much as 1,100 tpd in 2019.

Mineralized material produced from the Cusi mine is hauled to Mal Paso Mill using dump trucks. Trucks are weighed upon entry into the Mal Paso facility using a platform scale, and mineralized material is discharge on multiple stockpiles located around the primary crusher feed end. Mineralized material is reclaimed from the stockpiles using a front-end loader and fed to the primary crusher.

Additional facilities on site includes a spare parts warehouse and a metallurgical and chemical laboratory.

13.1 Testing and Procedures

Cusi's Mal Paso Mill facilities include an upgraded metallurgical laboratory. Sampling and testing are executed on an as-needed basis to support the industrial scale operation. No detailed metallurgical test work results are available for the areas being mined.

13.2 Recovery Estimate Assumptions

For the period of 2019 to August 2020, Mal Paso processed a total of 402,556 t of mineralized material which is an average of 23,680 tonnes per month. It is important to note however that this quantity is artificially low as the mill did not operate during April, May and June 2020 due to Covid-19.

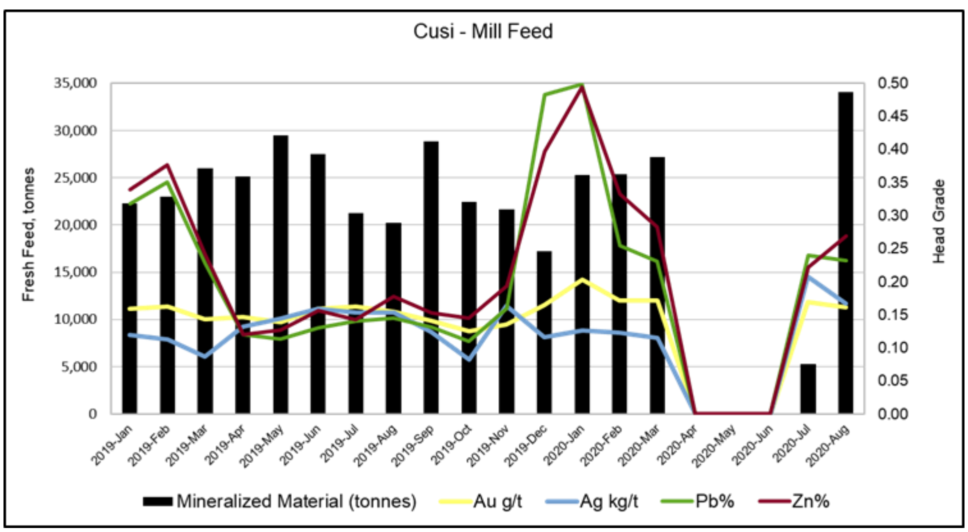
The mill's feed grade for gold and silver remained relatively steady during the period averaging 0.16 g/t Au and 0.13 g/t Ag respectively. Lead and silver head grade averaged 0.22% and 0.24% respectively over the same period, see Table 13-1 and Figure 13-1.

It seems that a seasonal spike in lead and zinc head grade occurs each year approximately between December to March. Whether this seasonal spike is due to technical reasons in the mining operation, or due to accumulation of high-grade material in stockpiles, it is an event that needs clarification as it has a direct impact of the inventories and the company's cash flow.

Table 13-1: Mineralized Material Tonnes and Head Grades, 2019 to August 2020

Mill Head Grade					
Period	Mineralized Material (tonnes)	Au (g/t)	Ag (g/t)	Pb (%)	Zn (%)
2019-Jan	22,306	0.16	119.61	0.32	0.34
2019-Feb	23,026	0.16	112.38	0.35	0.38
2019-Mar	26,017	0.14	86.68	0.23	0.24
2019-Apr	25,108	0.15	131.62	0.12	0.12
2019-May	29,467	0.14	144.18	0.11	0.13
2019-Jun	27,542	0.16	159.39	0.13	0.16
2019-Jul	21,288	0.16	153.58	0.14	0.14
2019-Aug	20,247	0.15	153.78	0.15	0.18
2019-Sep	28,871	0.14	123.98	0.13	0.15
2019-Oct	22,453	0.12	81.81	0.11	0.14
2019-Nov	21,668	0.14	163.69	0.16	0.19
2019-Dec	17,244	0.16	116.66	0.48	0.40
2020-Jan	25,294	0.20	125.99	0.50	0.49
2020-Feb	25,406	0.17	122.52	0.25	0.33
2020-Mar	27,211	0.17	114.60	0.23	0.28
2020-Apr	0	0	0	0	0
2020-May	0	0	0	0	0
2020-Jun	0	0	0	0	0
2020-Jul	5,310	0.17	208.15	0.24	0.22
2020-Aug	34,099	0.16	166.88	0.23	0.27
Totals	**402,556**	**0.16**	**131.72**	**0.22**	**0.24**

Source: Sierra Metals, 2020



Source: Sierra Metals, 2020

Figure 13-1: Mineralized Material Tonnes and Head Grades, 2019 to August 2020

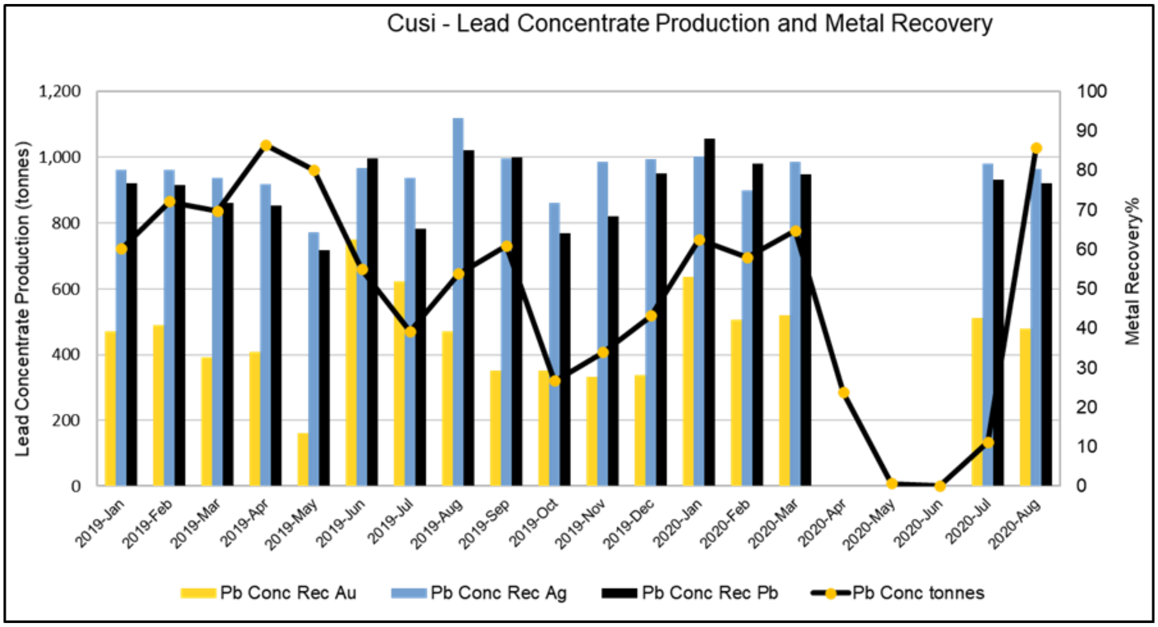
Metallurgical recovery of metals to lead concentrate is shown in Table 13-2 and Figure 13-2. The recovery of silver and lead seems to follow comparable trends. Over the period of 2019 to August 2020, lead recovery reached 74% and silver 77.3%.

Gold recovery shows a high degree of variability with an average of 36.8% while ranging from 13.5% to 62.5%.

Table 13-2: Lead Concentrate Production and Metal Recovery, 2019 to August 2020

Period	Pb Concentrate (tonnes)	Pb Conc Recovery Au	Pb Conc Recovery Ag	Pb Conc Recovery Pb
2019-Jan	722	39.2	80.1	76.8
2019-Feb	865	40.7	80.2	76.3
2019-Mar	837	32.7	78.1	71.8
2019-Apr	1,037	34.0	76.6	71.1
2019-May	962	13.4	64.4	59.8
2019-Jun	658	62.5	80.6	83.1
2019-Jul	470	52.0	78.1	65.2
2019-Aug	645	39.2	93.2	85.0
2019-Sep	731	29.3	83.1	83.4
2019-Oct	319	29.4	71.9	64.2
2019-Nov	406	27.6	82.2	68.5
2019-Dec	517	28.1	82.9	79.2
2020-Jan	750	53.1	83.5	88.0
2020-Feb	695	42.2	74.9	81.6
2020-Mar	776	43.4	82.2	79.0
2020-Apr	283	0	0	0
2020-May	7	0	0	0
2020-Jun	0	0	0	0
2020-Jul	134	42.5	81.8	77.7
2020-Aug	1,029	40.0	80.3	76.9
Total	**11,843**	**36.8**	**77.3**	**74.0**

Source: Sierra Metals, 2020



Source: Sierra Metals, 2020

Figure 13-2: Metal Recovery to Lead Concentrate, 2019 to August 2020

Table 13-3 shows the Metallurgical Balance (grades, recoveries and metal production) for previous years and for the period of January to August 2020.

Table 13-3: Cusi Metallurgical Balance (2014 to August 2020)

	2014*	2015*	2016*	2017*	2018	2019	2020**
Tonnage (tonnes)	**155,268**	**202,033**	**186,898**	**88,011**	**186,889**	**285,236**	**117,320**
Head Grades							
Ag (g/t)	166.69	175.88	171.78	170.16	140.17	129.06	138.20
Pb	0.78%	0.78%	1.21%	1.10%	0.39%	0.19%	0.29%
Zn	0.80%	0.71%	1.16%	1.11%	0.43%	0.21%	0.33%
Au (g/t)	0.42	0.22	0.26	0.25	0.16	0.15	0.18
Metallurgical Recoveries							
Pb concentrate							
Ag recovery	76%	76%	70%	70%	83%	79%	90%***
Pb recovery	79%	79%	82%	81%	80%	75%	92%***
Pb grade in concentrate %	28%	23%	34%	29%	9%	5%	9%***
Au recovery	62%	57%	62%	58%	39%	36%	50%***
Zn concentrate^							
Ag recovery	N/A	N/A	2%	2%	0.1%	N/A	N/A
Zn recovery	N/A	N/A	38%	43%	4%	N/A	N/A
Zn grade in concentrate %	N/A	N/A	53%	51%	45%	N/A	N/A
Metal Production (combined in concentrates)							
Ag (oz)	629,967	873,495	726,605	338,681	699,007	936,071	466,892
Zn (t)	N/A	N/A	818	417	32	N/A	N/A
Pb (t)	962	1,246	1,864	784	582	411	316
Au (oz)	1,289	831	954	419	372	493	331

Source: Sierra Metals, 2020

^ Zn concentrate details not reported in 2014 to 2015 as the Zn recovery circuit was being commissioned, and no concentrate was produced in 2019 and in the period of January to August 2020.

* Significant improvements were made to the Mal Paso plant in 2018 and therefore plant performance pre-2018 and post-2018 are significantly different.

** January to August 31, 2020

*** During the months of April, May and June, no mineral was received at the Mal Paso plant due to a stoppage caused by Covid-19, but the mineral within the circuit was treated, which generated an increase in fines which positively impacts via an increase in the recovery of metals.

14 Mineral Resource Estimates

The estimation presented in this report is an update of the previous estimation carried out by SRK in 2018. New drilling has been primarily focused on the area of SRL (SRL vein, SRL-HW veins and SRL-SW zone), part of the Promontorio zone and San Nicolas. The veins were re-modeled by the geology staff of Sierra Metals using the new data to update the 3-D geological model. SRK noted that the intercepts of some veins were re-evaluated and are now including the mineralization halo around the high-grade.

The estimation reported in 2017 was completed by Matthew Hastings, Senior Consultant, SRK Consulting (U.S.) Inc. who conducted the resource estimation for the San Juan vein. Bart Stryhas, Principal Consultant, SRK Consulting (U.S.) Inc., conducted the resource estimation for the Santa Eduwiges veins, Candelaria veins, and Durana veins, and this was done using a combination of mining software including Leapfrog Geo™, Maptek Vulcan™, and statistical analysis software such as Snowden Supervisor™ and X10 Geo™. Methods and validations for these estimations are detailed in the previous 2017 technical report and are not necessarily detailed herein.

The estimation reported in 2018 was completed by Giovanny Ortiz, now Principal Consultant of SRK Consulting (U.S.) Inc., who conducted the updated the resources for the SRL veins (SRL, SRL_ALT_1, SRL_ALT_2, SRL_ALT_3 SRL_ALT_4 and SRL_ALT_5), San Nicolas vein, and the mineralized structures of the Promontorio area.

For this study, Mr. Ortiz conducted the estimation for Eduwiges, San Juan, Durana (La India), Minerva (La Gloria), Candelaria, San Ignacio, Promontorio, San Nicolas and SRL (Santa Rosa de Lima Vein, SRL-HW veins, and SRL-SW zone). The methodology and validations for this update are summarized below and are similar to those provided in the previous technical report.

14.1 Drillhole Database

The drilling and channel sample databases are kept in separate Microsoft Excel files with separate tabs for drill collars, surveys, lithology, geochemistry, and assays. The lithologies logged are used in combination with the assay data to identify mineralization for the geologic model. Geotechnical parameters are included in different Excel filed and features rock quality designation (RQD) and recovery. Both geochemistry and assays feature the analyses for the primary elements to be reported at Cusi (Ag, Au, Pb, Zn), but the assays feature only these assays plus Cu, Fe, and Mn that were included in this estimation and As that is registered in the geochemistry tab. The geochemistry table also features other elements that have been analyzed for a small percentage of samples for other purposes. Cu, Fe, Mn and As were estimated for geo-metallurgical purposes.

The drillhole and channel assay database was provided to SRK by Sierra Metals on October 1, 2020. The database includes both drilling and channel samples which are updated to August 31, 2020. The final database contains over 85,000 assays from drilling and over 55,000 assays from channel sampling. The two data sets have been merged for the purposes of statistical analysis and estimation.

The distribution of samples between types and elements is summarized in Table 14-1.

Table 14-1: Summary of Sample Counts by Type

Element	Drill Assays	Channel Assays
Ag	84,930	54,883
Au	80,484	53,155
Pb	79,481	55,461
Zn	83,186	55,460
Cu	65,571	20,546
Mn	70,283	55,454
Fe	63,483	55,462
As	44,019	-

Source: SRK, 2020

The database features incomplete analyses for Au compared to the other elements which are relatively consistently analyzed for all intervals. The reason for the partial Au assays is unclear, but is likely related to older analyses not using fire assay or the inability to transcribe from historic assay sheets. SRK assigned a value of 0.001 to any element with missing assays for Ag, Au, Pb, Zn. Cu is also partially assayed at Cusi, but features fewer missing assays than the Au, and is generally quite low in grade. Cu was used in the estimation for Cusi. Arsenic (As), that was estimated as a deleterious element in this study, is present only in the drill hole database because the chemical analysis carried out by the Mal Paso laboratory don't include this element.

SRK notes that the database contains several drillholes that have no assay intervals due to lost data or other doubts regarding data accuracy. In some cases, the missing or unsampled intervals in the drilling are given a value of 0 for Au, Ag, Pb and Zn, on the assumption that the geologists logging did not identify any mineralization or alteration of interest in the rock. SRK notes that, due to the aforementioned inaccuracy of some of the unsurveyed drilling, that these unsampled intervals may cut through historic areas of production and would artificially bias the grades lower.

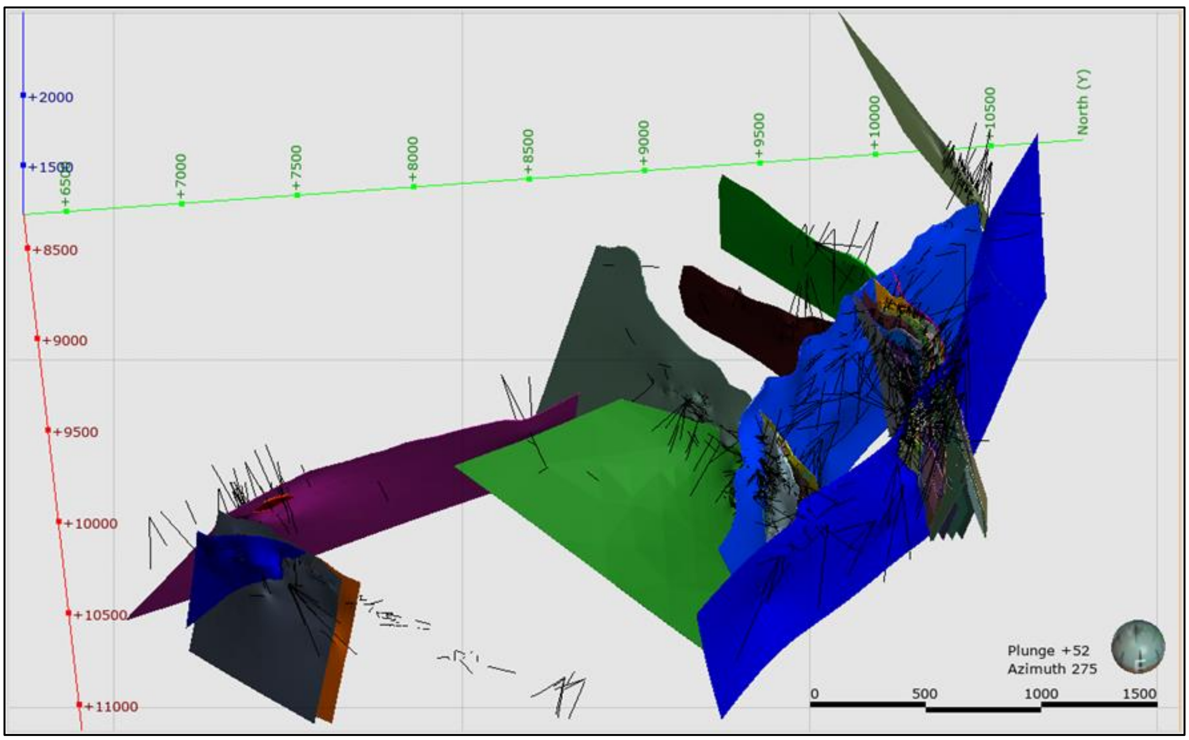
14.2 Geologic Model

The updated three-dimensional wireframe models for the Cusi veins were constructed by Sierra Metals using Leapfrog Geo™ software. SRK reviewed the Leapfrog project for Cusi and suggested some modifications of the triangulation parameters used in Leapfrog. The geology models are developed on a combination of geology codes and Ag grades, and effectively are built using hanging wall and footwall surfaces derived through selection of these points in the drilling and channel sample database, with subsequent interpolation of the points into 3D surfaces and volumes.

There are nine main mineralized areas within the greater Cusi area (Section 7), defined based on similarity of mineralization or orientation of structures. These areas were used to define capping limits, on the assumption that all mineralization within the area is related to the same processes, based on the cross-cutting relationships of the veins. Within these areas, the geologic model defines separate structures or stockwork zones (as in the case of Azucarera), all of which are considered discrete domains for the purposes of resource estimation. The volumes defined in the geologic model serve to constrain and guide the estimation.

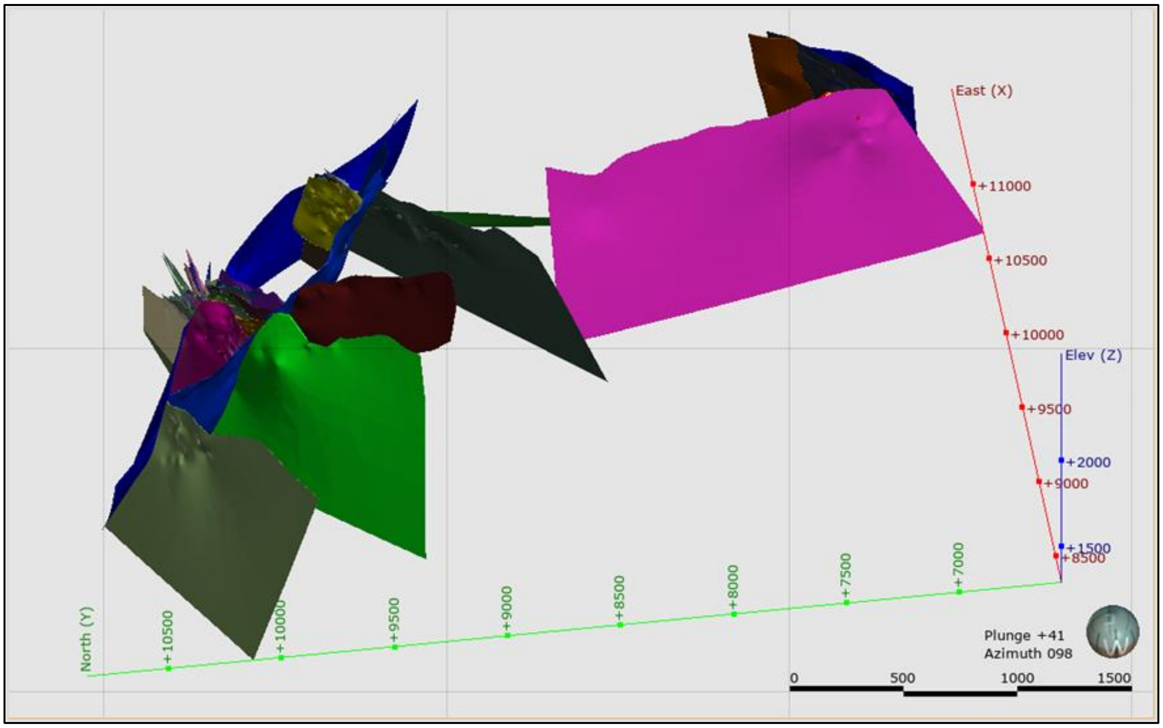
Examples of the geology models are shown in Figure 14-1, Figure 14-2, and Figure 14-3.

SRK notes that the surveyed channel samples play a critical role in the modeling of the mineralized structures. Where an unsurveyed drillhole intercept does not align with the projection of the vein from nearby channel samples, the drillhole intercept is ignored in favor of the geometry from the mine workings. Sierra Metals and SRK agree that the mine workings are more accurate than the drilling in these cases. The net result of this is improved and valid vein geometries, but locally includes samples within the vein that may not be within the vein due to the deviation from the drillhole that was not measured. This generally occurs in the vicinity of previous production as all new drillholes are being surveyed and appear to track well with the projection of the veins from the mine workings.



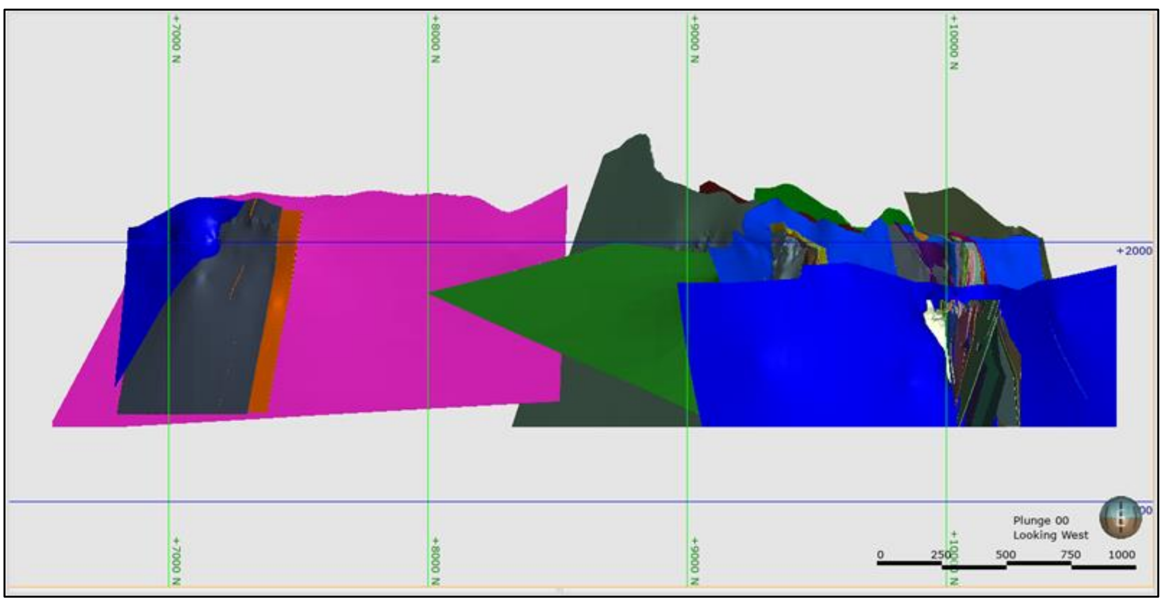
Source: SRK, 2020

Figure 14-1: Oblique View of the Cusi Geologic Model



Source: SRK, 2020

Figure 14-2: Oblique View of the Cusi Geologic Model, Looking East

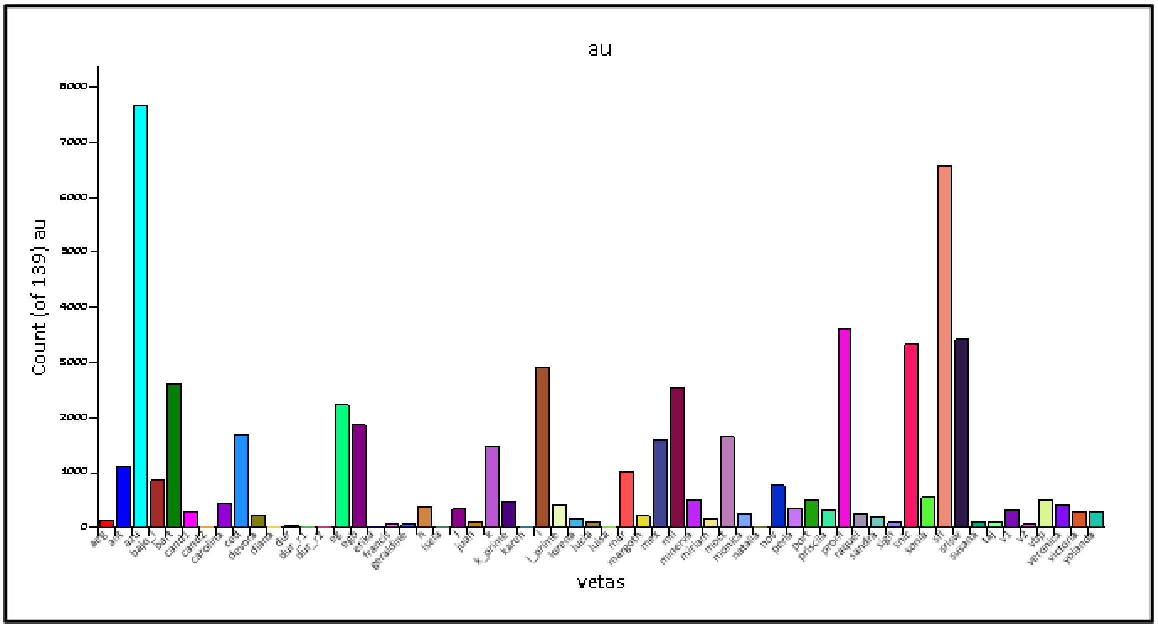


Source: SRK, 2020

Figure 14-3: Northeast Cross-Section Through the Cusi Geologic Model, Showing Complex Vein Interactions

14.2.1 Domain Analysis

SRK considered each vein its own domain for the purposes of statistical analysis and estimation. As shown in Figure 14-4, the number of samples per vein domain are highly variable, influenced largely by the amount of channel sampling in development along structures.



Source: SRK, 2020

Figure 14-4: Sample Count by Vein Domain

The individual resource domains also feature a wide range of grade distributions. The unweighted mean grades for each element by vein using the raw data are shown in Table 14-2. As shown, Ag is the obvious and most dominant contributor to the economic value of the mineralization. Veins in the Eduwiges area commonly feature more base metals than others.

Table 14-2: Unweighted Grade Means by Structure

ZONE	CODE	COUNT	MEAN Ag(g/t)	MEAN Au (g/t)	MEAN Zn (%)	MEAN Pb (%)	MEAN Cu (%)	MEAN Mn (%)	MEAN Fe (%)
Candelaria	cand1	297	48	0.02	0.19	0.10	0.06	1.20	1.15
	cand2	27	96	0.09	1.44	0.74	0.02	1.20	1.34
	nov	758	71	0.03	0.19	0.08	0.02	1.80	1.25
Durana	dur	45	87	0.03	0.20	0.19	0.03	0.30	1.30
	dur_r1	13	188	0.08	0.02	0.05	0.01	0.22	1.37
	dur_r2	13	146	0.06	0.02	0.02	0	0.28	1.06
Eduwiges	ant	1340	207	0.19	2.29	1.94	0.07	0.50	1.19
	bart	2656	237	0.23	1.02	1.45	0.05	0.41	1.19
	ced	1694	47	0.05	0.41	0.30	0.03	0.38	1.35
	mar	1051	284	0.54	1.26	1.76	0.11	0.56	1.19
	mex	1602	162	0.39	1.66	1.08	0.10	0.33	0.91
	mil	2591	164	0.95	1.28	1.01	0.03	1.45	2.20
	moct	1895	133	0.27	2.84	3.02	0.07	1.04	1.60
	port	509	331	0.40	1.54	1.52	0.02	0.38	1.13
	taj	109	83	0	0.14	0.15	0.04	0.25	1.08
Minerva	minerva	511	87	0.19	0.04	0.09	0	0.74	0.91
Promontorio	aeg	139	124	0.08	0.19	0.12	0.03	0.60	1.28
	azu	7803	117	0.06	0.34	0.29	0.03	0.58	1.24
	bajo_l	852	106	0.05	0.36	0.27	0.02	0.65	1.82
	eg	2221	210	0.09	0.38	0.31	0.04	0.59	1.19
	v1	326	213	0.08	0.38	0.35	0.07	0.54	1.25
	egb	1857	234	0.14	0.32	0.26	0.02	0.61	1.33
	h	380	226	0.10	0.44	0.44	0.04	0.73	1.17
	j	340	144	0.04	0.30	0.24	0.03	0.66	1.23
	k	1530	221	0.08	0.42	0.42	0.05	0.82	1.20
	k_prime	483	232	0.10	0.38	0.40	0.04	0.57	1.18
	l	2904	327	0.09	0.34	0.33	0.05	0.84	1.82
	l_prime	417	141	0.09	0.38	0.30	0.03	1.43	2.10
	prom	3610	190	0.07	0.54	0.53	0.08	1.15	1.23
	v2	58	115	0.05	0.42	0.37	0.03	0.72	1.34
	vbp	514	156	0.09	0.31	0.33	0.03	1.24	1.16
San Ignacio	sign	90	67	0.04	0.87	0.30	0.03	0.45	1.05
San Juan	juan	115	156	0.28	0.18	0.14	0.02	2.70	1.16
San Nicolas Vein	snic	3649	202	0.19	0.45	0.39	0.04	1.07	1.66
SRL Vein	srl	6568	232	0.07	0.61	0.56	0.05	0.68	1.31
SRL-HW Veins	carolina	448	353	0.09	0.30	0.22	0.04	0.59	1.89
	devora	218	205	0.09	0.34	0.41	0.03	0.69	2.05
	diana	32	655	0.14	0.50	0.30	0.10	0.57	1.30
	erika	38	100	0.02	0.63	0.50	0.03	0.26	1.03
	francis	77	147	0.07	0.21	0.14	0.03	0.23	1.64
	geraldine	65	69	0.01	0.12	0.09	0.02	0.24	0.97
	isela	27	80	0.01	0.13	0.10	0.02	0.39	1.09
	karen	10	212	0.09	0.59	0.31	0.05	0.61	1.45
	lorena	174	191	0.05	0.24	0.16	0.04	0.24	0.91
	lucia	103	358	0.10	0.52	0.46	0.07	0.41	1.23
	luisa	19	153	0.03	0.14	0.11	0.04	0.58	1.51
	margoth	210	158	0.02	0.25	0.15	0.03	0.38	1.05
	miriam	157	90	0.03	0.15	0.11	0.01	0.53	1.39
	monica	254	94	0.02	0.25	0.24	0.02	0.27	1.07
	natalia	12	90	0.02	0.30	0.22	0.03	0.31	1.31
	perla	346	252	0.06	0.12	0.12	0.02	1.04	1.22
	priscila	320	96	0.02	0.16	0.11	0.01	0.35	1.12
	raquel	266	273	0.10	0.35	0.34	0.03	1.74	2.99
	sandra	195	182	0.03	0.12	0.12	0.03	0.47	1.45
	sonia	552	109	0.03	0.15	0.12	0.02	0.57	1.42
	susana	114	177	0.04	0.17	0.16	0.02	0.89	1.28
	veronica	420	137	0.03	0.13	0.10	0.02	0.45	1.45
	victoria	298	250	0.05	0.18	0.14	0.02	0.45	1.72
	yolanda	287	122	0.02	0.13	0.12	0.02	0.64	1.30
SRL-SW	srlsw	3413	92	0.01	0.11	0.08	0.02	0.39	1.20

Source: SRK, 2020

14.3 Assay Capping and Compositing

In order to minimize the variance in the estimation due to the inherent variability in grade distributions within domains and provide a more homogenous data set for estimation, SRK used the capping of high grades as well as the compositing of sample lengths.

14.3.1 Outliers

SRK limited high grade outlier samples by capping the maximum grades for each area and by limiting samples above the cap to the grade of the cap. Capping analysis was done on the raw sample data, evaluating each data set by relevant area of mineralization and using only the assayed samples. Capping was not reviewed for every individual vein, as the paucity of sampling for many of the veins did not yield appropriate populations for statistical analysis. Thus, areas of the model were selected for similarity in mineralization style, orientation, and other parameters that would suggest that the grouped veins were related to a single mineralizing event.

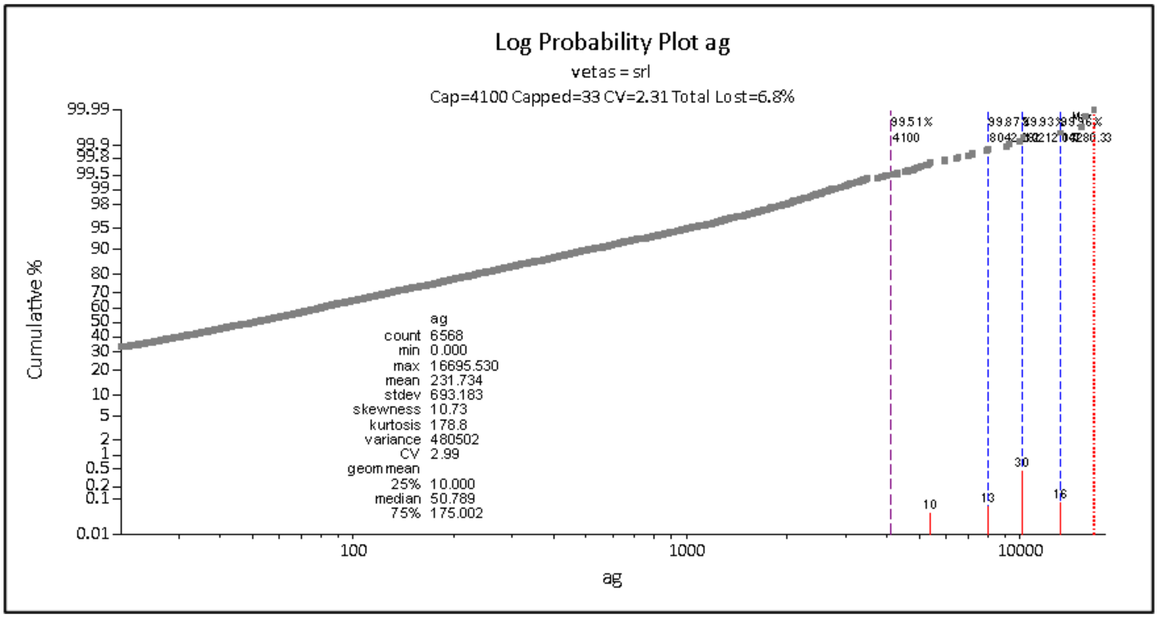
After the data was grouped by these areas, SRK generated log probability plots (to assess the frequency at various grade ranges and evaluate continuity, changes in slope, and other factors that would indicate high grade sub-populations within the domained assay data. As these were identified, sample plots were generated within the domained areas to determine if any high-grade continuity could be developed and modeled. In the case of Cusi, the veins are considered highly variable and no significant high-grade chutes or zones within the structures were modeled separately. Using the probability plots and statistics of the capping (i.e. percentages of data capped, impact of capping on CV, total metal lost, etc.) SRK selected appropriate capping limits for each of the areas as shown in Table 14-3.

Examples of the capping analysis can be seen in Figure 14-5 and Figure 14-6, and Table 14-4 and Table 14-5.

Table 14-3: Capping Limits Utilized for the Cusi MRE

Area	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Cu (%)	Fe (%)	Mn (%)
Promontorio Veins	4,000	5.30	8.50	10.00	1.500	9.5	10.0
Azucarera	4,332	3.90	5.00	9.00	1.200	6.8	6.5
SRL Vein	4,100	5.50	7.00	7.50	0.800	8.4	11.0
SRL-HW Veins	3,200	2.10	2.60	4.20	0.500	7.6	7.2
SRL-SW	900	0.30	0.75	1.00	-	-	-
San Nicolas Vein	4,050	5.50	4.20	5.00	0.370	7.3	9.5
Eduwiges Veins	4,000	15.00	26.00	21.00	0.900	13.5	18.0
CEV Eduwiges	1,200	3.13	9.50	7.00	0.500	5.0	3.2
Tajo San Antonio	360	-	0.55	0.31	0.140	1.7	0.8
Candelaria	850	1.60	2.70	2.70	0.170	3.9	9.0
Durana	750	0.16	1.00	0.80	0.100	1.4	0.9
Minerva	1,270	3.00	0.55	0.60	0.007	3.2	5.5
San Juan	451	0.80	0.60	0.80	0.100	1.8	5.0
San Ignacio	360	0.50	1.00	2.50	0.100	2.1	1.6

Source: SRK, 2020



Source: SRK, 2020

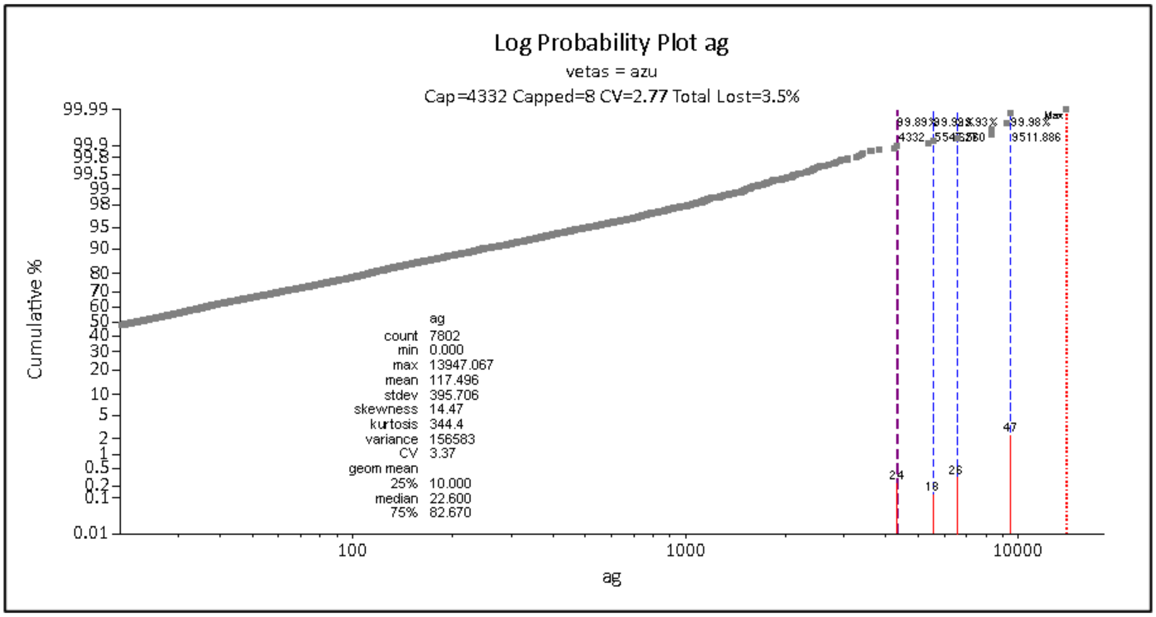
Figure 14-5: Example Log Probability Plot – SRL vein – Ag (g/t)

Table 14-4: Example Capping Analysis –SRL – Ag (g/t)

Cap	Capped	Percentile	Capped (%)	Lost Mean (%)	Lost CV (%)	Count	Max	Mean	CV
						6,568	16,696	232	2.99
13,280	3	99.96%	0.05%	0.50%	3.20%		13,280	231	2.90
10,212	4	99.93%	0.10%	1.30%	7.20%		10,212	229	2.78
8,042	8	99.87%	0.10%	2.30%	11.00%		8,042	226	2.66
4,100	33	99.74%	0.50%	6.80%	23.00%		4,100	216	2.31

Source: SRK, 2020

Red = Capping Limit



Source: SRK, 2020

Figure 14-6: Example Log Probability Plot – Azucarera – Ag (g/t)

Table 14-5: Example Capping Analysis – Azucarera – Ag (g/t)

Cap	Capped	Percentile	Capped (%)	Lost Mean (%)	Lost CV (%)	Count	Max	Mean	CV
							13,947	118	3.37
9,512	1	99.98%	0.01%	0.50%	3.80%		9,512	117	3.24
6,560	5	99.93%	0.10%	1.80%	11.00%	7,802	6,560	115	3.00
5,547	6	99.92%	0.10%	2.50%	14.00%		5,547	115	2.90
4,332	8	99.89%	0.10%	3.50%	18.00%		4,332	113	2.77

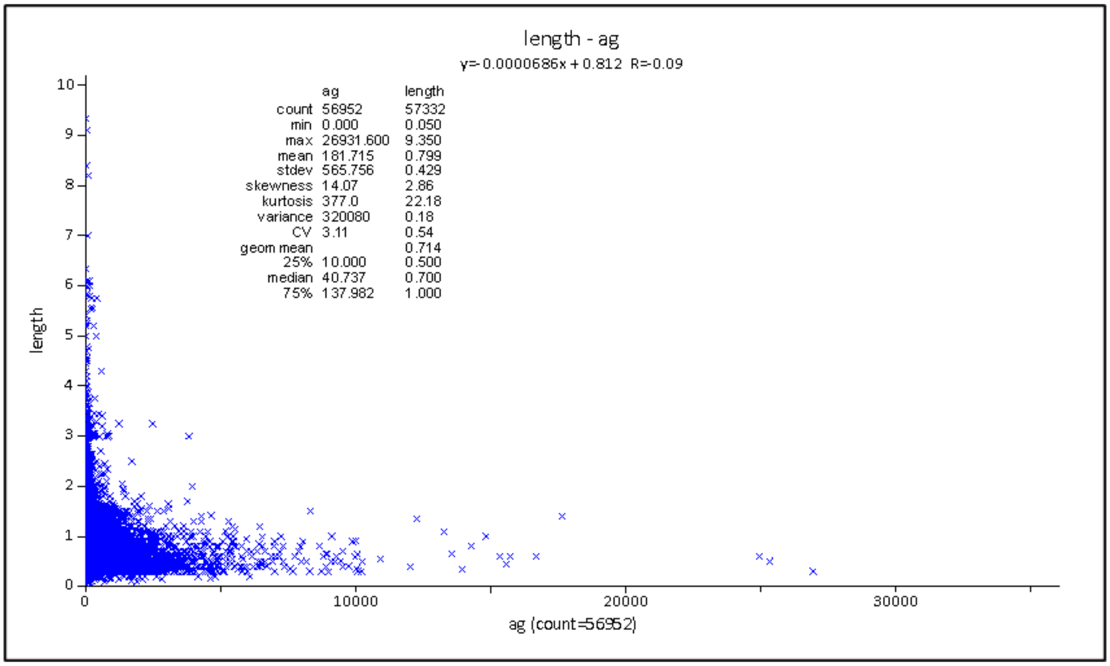
Source: SRK, 2020

Red = Capping Limit

14.3.2 Compositing

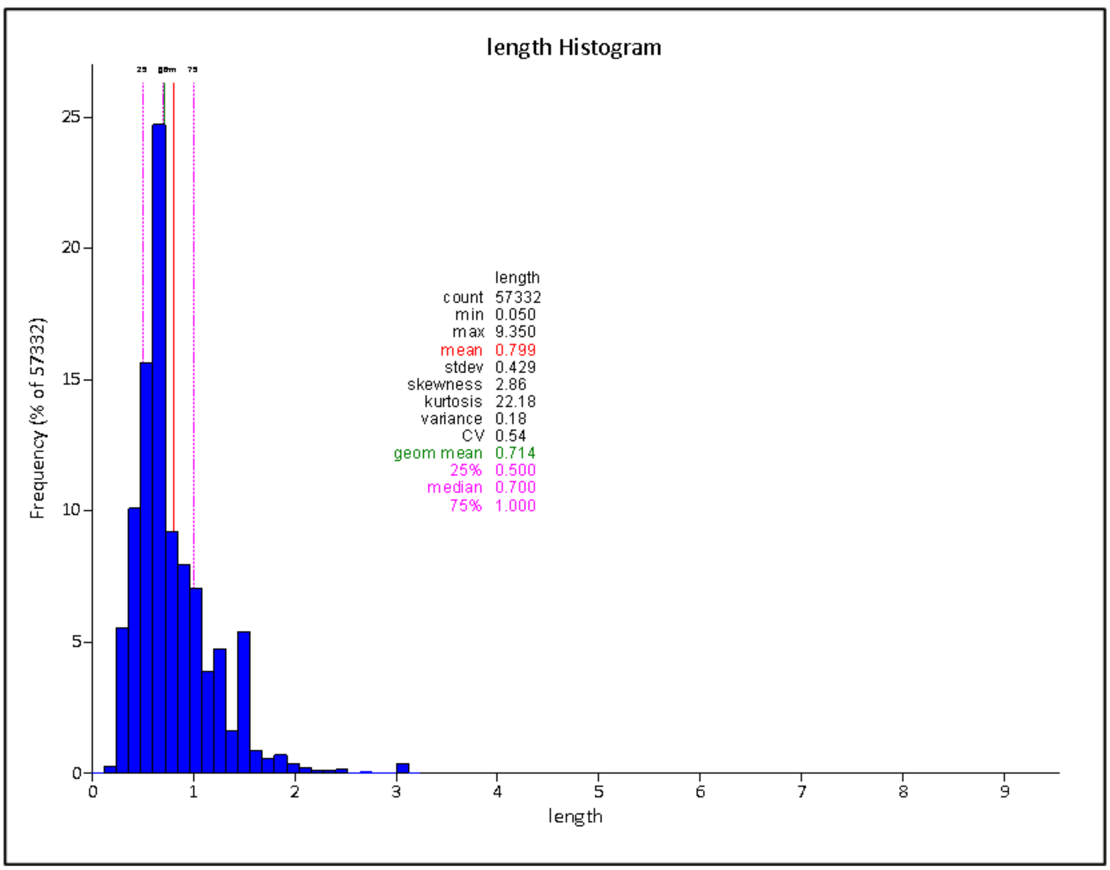
SRK evaluated the sample lengths within the mineralized domains defined by the geological model. The mean sample length within the mineralized domains is 0.795 m, with a maximum sample length of 9.1 m. SRK examined the relationship between sample length and Ag grade to determine if there were significant populations of high-grade samples that were greater than 1.5 m. The overwhelming majority of samples with significant grade are in samples where the length is less than 1.5 m as shown in Figure 14-7. SRK notes that there are very few samples that would be affected by a compositing length of 1.5 m that would in turn affect the estimation.

A histogram distribution of sample lengths (Figure 14-8) within the mineralized domains shows that the relative percentages of sample lengths above the 1.5 m composite length is small. SRK selected a nominal composite length of 1.5 m, retaining short samples for use in the estimation.



Source: SRK, 2020

Figure 14-7: Scatter Plot of Length (m) vs. Ag (g/t)



Source: SRK, 2020

Figure 14-8: Histogram of Sample Lengths (m)

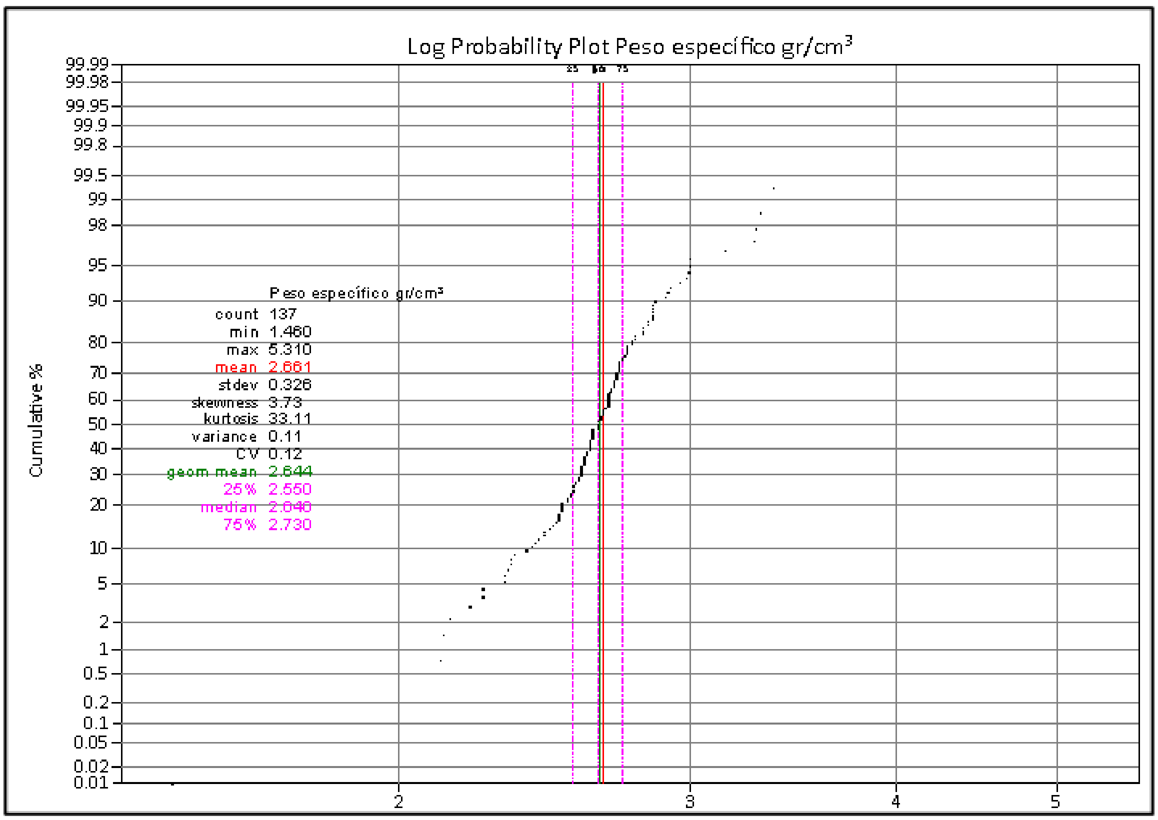
14.4 Density

Since 2017 the density measurements are made by Sierra Metals in the insitu laboratory. The pycnometer method-procedure is being used at Cusi. In previous years, the bulk density was assigned on the basis of the results of density samples analyzed by the Servicio Geologico Mexicano (SGM) on behalf of Sierra Metals.

The samples are ground to 100% passing -100 mesh (150 microns) and are analyzed via the use of a pycnometer using ethanol as a solution. Distilled water is used as a reference (0.99712 g/cm^3) in the evaluations.

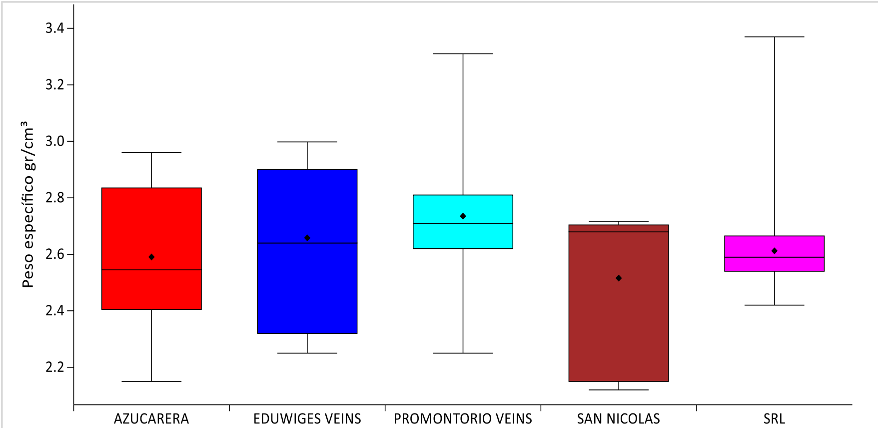
Figure 14-9 presents the log probability plot of all the measurements collected from 2017 to 2020 and the samples analyzed by SGM.

Figure 14-10 shows the box plot of the specific gravity measurements by zones and the statistics after the elimination of outliers.



Source: SRK, 2020

Figure 14-9: Density Measurements Probability Plot



Domain	*Count*	*Min* g/cm^3	*Max* g/cm^3	*Mean* g/cm^3	*Total*	*Variance*	*StDev*	*CV*
TOTAL	135	2.12	3.37	2.65	357.8	0.04	0.212	0.08
AZUCARERA	19	2.15	2.96	2.59	49.22	0.05	0.229	0.09
EDUWIGES VEINS	8	2.25	2.998	2.66	21.27	0.07	0.274	0.1
PROMONTORIO VEINS	49	2.25	3.31	2.74	134	0.05	0.223	0.08
SAN NICOLAS	9	2.12	2.717	2.52	22.64	0.07	0.273	0.11
SRL	50	2.42	3.37	2.61	130.6	0.02	0.136	0.05

Source: SRK, 2020

Figure 14-10: Density Measurements by Zone

The density values flagged into the block model for use in the resource calculations are shown in the Table 14-6.

Table 14-6: Density Values

ZONE	**DENSITY (g/cm^3)**
Total (Other Zones)	2.64
Azucarera	2.58
Eduwiges	2.65
PROMONTORIO Veins	2.73
San Nicolas Vein	2.51
SRL	2.60

Source: SRK, 2020

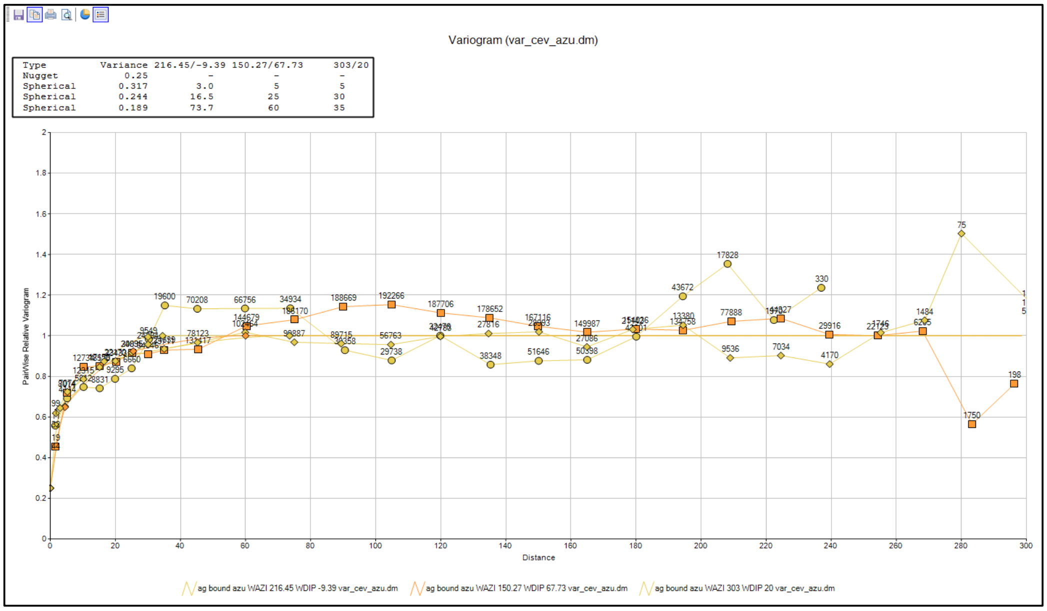
The methodology used to determine the density should be reviewed to ensure that the characteristics of the insitu rock are appropriately considered, including the use of a different methodology.

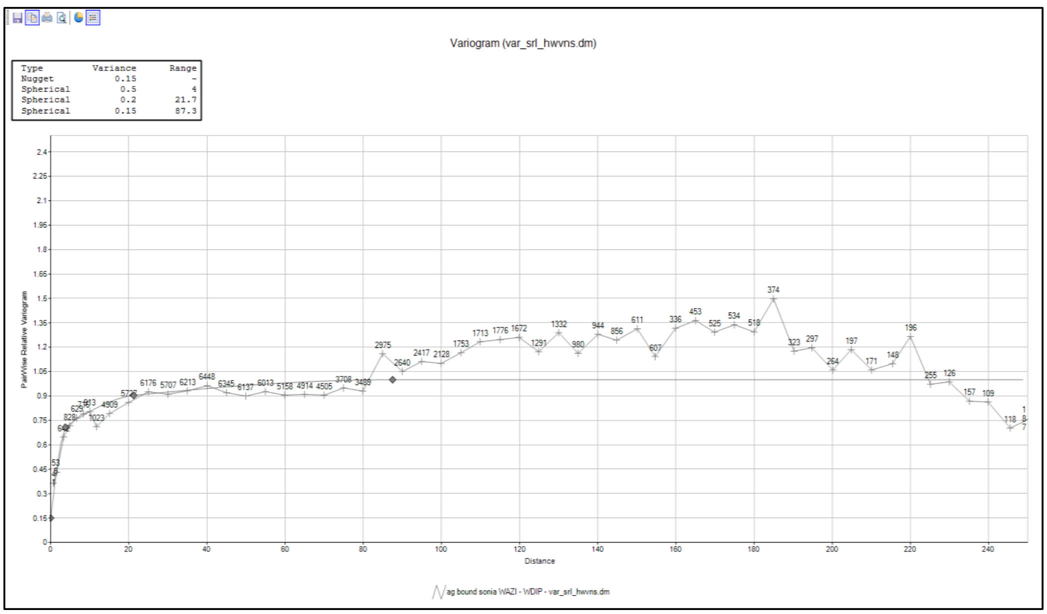
14.5 Variogram Analysis and Modeling

The capped 1.5 m composites were used to perform the variography analysis for Au, Ag, Pb and Zn in each zone. To define the variograms, the data has been calculated using semi variogram or pairwise relative variograms, which removes the influence of some of the variability in some areas.

The nugget effect was defined using short lag omnidirectional variograms or down-hole variograms. Longer lag directional variograms were done to define the spatial continuity. In the veins or zones where the anisotropic variogram model was obtained, this was used. In other veins where the data quantity is poor, the standardized omnidirectional variogram obtained from the vein with more information was used. Further infill drilling is necessary to improve the variography analysis in some zones and individual veins. In general, strong anisotropy was not observed. Some variograms shows the existence of some trending that was managed adjusting the sill and using normalized variograms.

Figure 14-11 shows examples of some variograms obtained.





Source: SRK, 2020

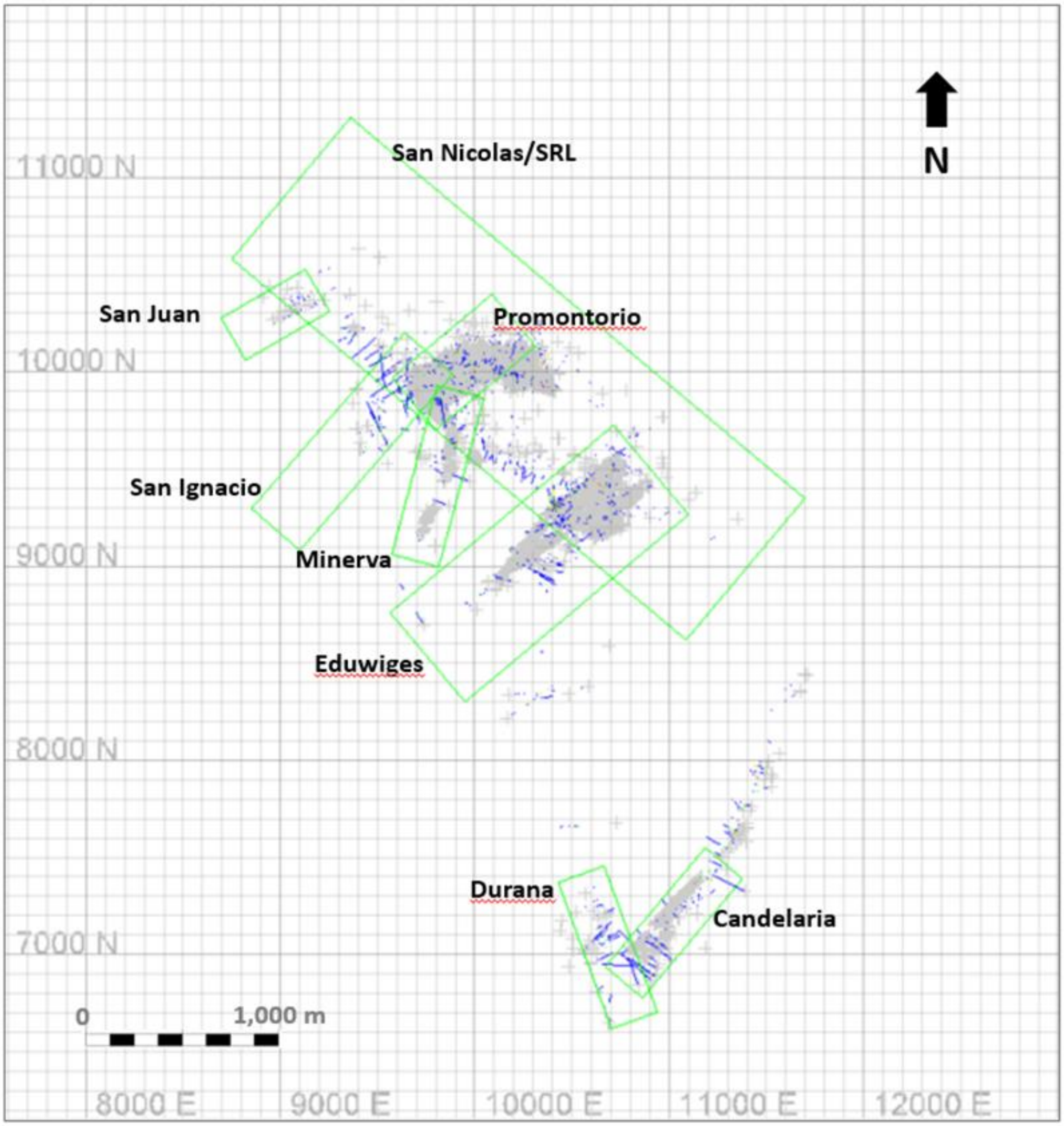
Figure 14-11: Examples of Variography Analysis, Azucarera Ag g/t (Top), Sonia Vein (Bottom)

The variograms obtained show moderate to high nugget effect and a rapid reduction of dependence of silver grades as distances increase.

SRK is of the opinion that the variogram analysis supports, to some degree, the search distances and classification criteria used in the resource estimation. Besides this, the orientations of continuity are established through the mapped or logged interpretation of the veins, and that the ranges of the estimation and search strategy should ensure the selection of multiple holes/channel samples from different areas to interpolate grade between these points.

14.6 Block Model

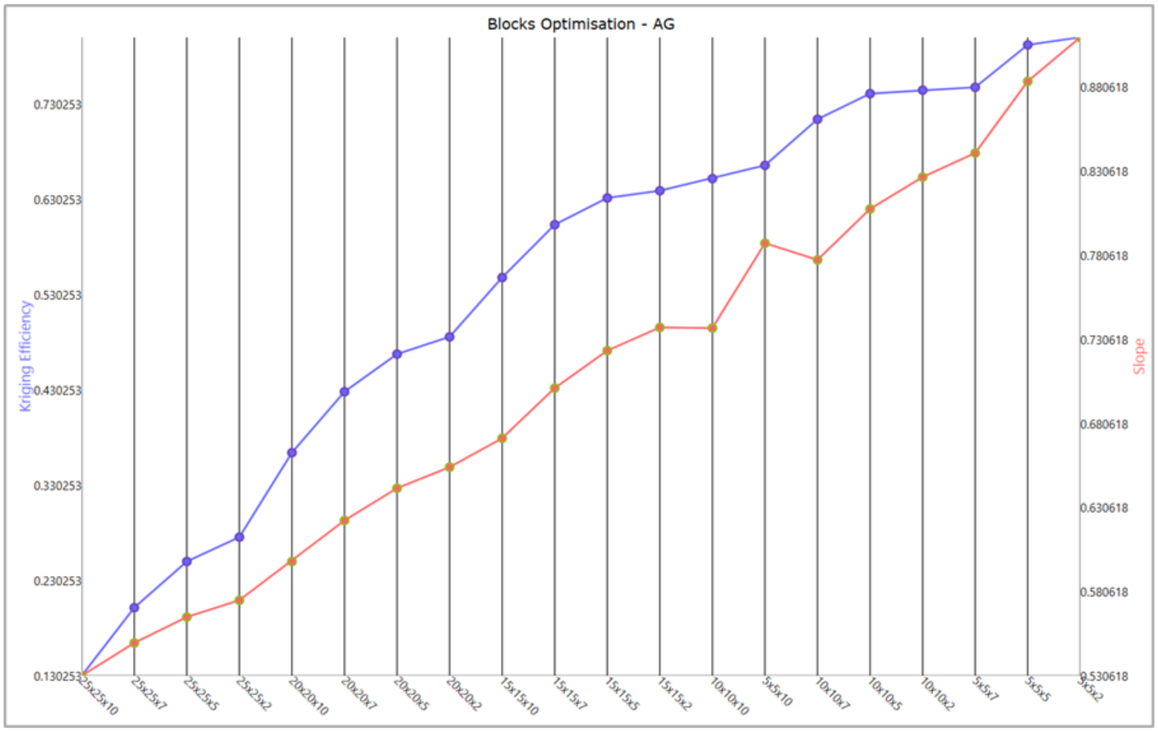
Eight block models were built in Maptek Vulcan™ software and were designed to approximate the orientation of the strike for the major structures contained in each model. The models are rotated about the Z axis (and only the Z axis) and limited to the footprint of the structures contained in each model. The model extents are shown in Figure 14-12. The models are sub-blocked along the mineralized domain margins.



Source: SRK, 2020

Figure 14-12: Block Model Extents and Positions

Based on the Kriging neighborhood analysis (KNA) completed for Eduwiges, and considering the mining operation at Cusi, the parent cell size of 10 m x 10 m x 5 m and sub-blocks of 1 m x 1 m x 0.5 m minimum size were selected. Figure 14-13 presents the result of the block optimization result from the KNA where the 10 x 10 x 5 m parent block size have acceptable slope of regression and kriging efficiency. Details regarding the block models and their parameters are shown in Table 14-7.



Source: SRK, 2020

Figure 14-13: Block Optimization Size – Kriging Neighborhood Analysis (KNA)

Table 14-7: Block Model Details

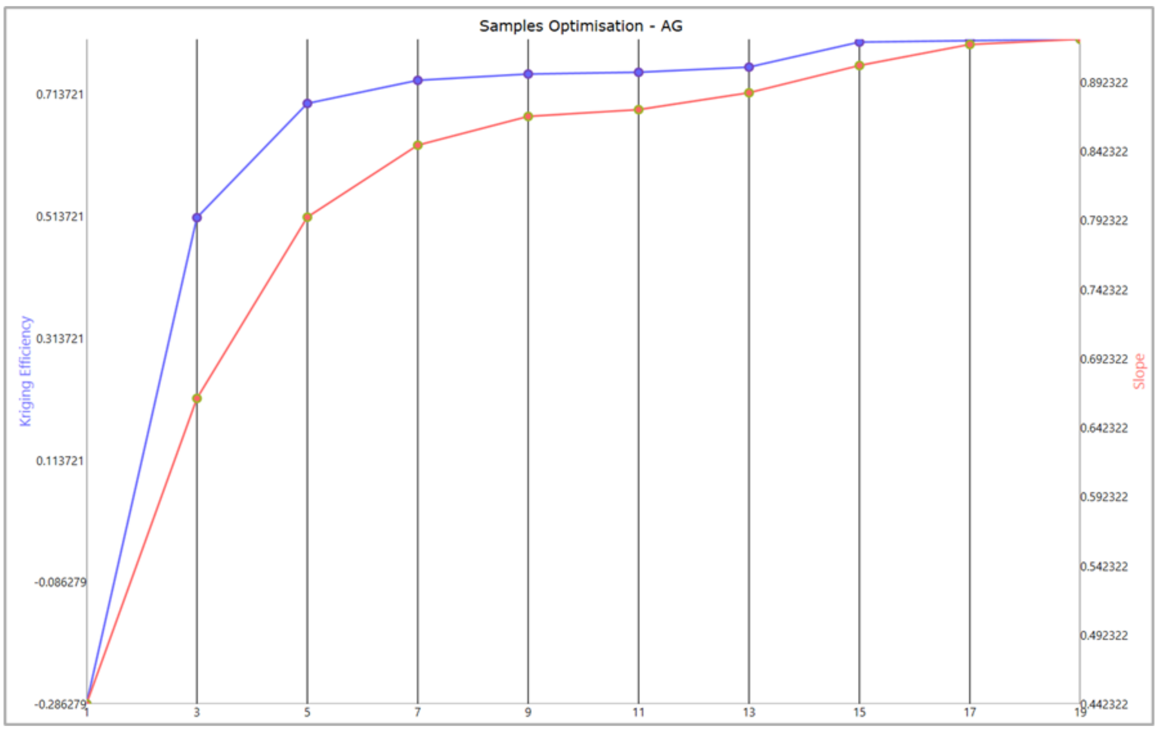
Model	Origin			Bearing	Extents (m)		
	X	Y	Z		X	Y	Z
Promontorio	9,800	9,700	1,250	50	670	350	1,000
Eduwiges	9,950	8,300	1,380	50	1,500	600	1,000
San Nicolas/SRL	8,750	10,580	1,300	130	3,050	950	900
Minerva	9,814	8,995	1,380	15	900	250	1,000
Durana	10,430	7,370	1,380	160	800	250	1,000
Candelaria	10,863	6,776	1,380	40	800	250	1,000
San Juan	8,820	10,060	1,380	60	500	250	1,000
San Ignacio	9,100	9,080	1,300	41	1,200	330	1,005

Source: SRK, 2020

14.7 Estimation Methodology

SRK interpolated grades for Ag, Au, Pb, and Zn using an inverse distance squared (ID2) and ordinary kriging (OK) estimation methods in the parent cells. In general, a nested three-pass estimation was used with higher restrictions on sample selection criteria in the initial shorter search passes, to less restrictive criteria in the subsequent, larger ellipsoids. Ellipsoid orientations are controlled by the hanging wall and footwall surface of each structure. A flattened "pancake" ellipsoid shape is used to mirror the vein anisotropy, with the orientations varying as a function of the bearing, dip, and plunge of the structure. These three parameters are estimated into the block model from the hanging wall and footwall surfaces of each vein, using the varying local anisotropy tool in Vulcan, and they ultimately control the orientation of the search ellipsoid at each block in the model.

The results of the KNA study carried out to optimize the minimum and maximum number of 1.5 m composites for the estimation of Ag is shown in the Figure 14-14, where it is observed that above five samples (composites), the slope of regression starts to stabilize. The first search in each estimation used the optimized minimum and higher number of composites.



Source: SRK, 2020

Figure 14-14: Block Model Extents and Positions

Maximum numbers of samples per hole, in combination with sample minimums, ensure that all estimates in the first and second passes must use more than one hole. The variations in the distribution of samples and the issue of clustering of high-grade channel samples is dealt with using an octant restriction on the estimation in the first and second search. This permits a maximum number of samples to be selected from one octant, working with the sample selection criteria to force a minimum number of octants to be used in the estimate. In this way, the amount of data used to estimate from a single area is limited, and other samples must be used from areas that may not be as clustered. SRK implemented this methodology for the estimation on every domain.

SRK varied parameters like the minor ellipsoid ranges, sample selection criteria, and octant restrictions based on performance of the estimation during review of the validation, but notes that the parameters selected are very similar between the individual structures and seem to work well given the wide variety of data spacing. The Au, Ag, Pb, and estimation parameters used for each area are summarized in Table 14-8. Ordinary kriging was not used in San Ignacio due to lack of information to produce a variogram.

The estimation of Cu, Mn and Fe was completed using the same search strategy and only Inverse Distance Weighted (Power 2) estimation methodology.

The third search in San Nicolas, SRL vein, SRL-HW veins and Promontorio was extended to 200 m x 200 m x 60 m to improve the estimation in zones with a low density of data to ensure the use of more than one hole in the estimation of the blocks. In SRL-HW veins, a sliding cap was used in the third search to avoid overestimation of isolated high-grade intercepts.

Table 14-8: Estimation Parameters

SRL – SNICOLAS – SRL-HW (Veins)							ID2/OK			
Pass	**Bearing (Z) (1)**	**Plunge (Y) (1)**	**Dip (X) (1)**	**Major (m)**	**Semi-Major (m)**	**Minor (m)**	**Min # Composites**	**Max # Composites**	**Max Composites/DH**	**Max Composites/Octant**
1	NA	NA	NA	25	25	10	6	18	3	2
2				50	50	20	4	16	3	2
3				200	200	60	1	10	3	NA

SRL-SW – AZUCARERA – CED EDUWIGES (“Stockwork”)							ID2/OK			
Pass	**Bearing (Z) (1)**	**Plunge (Y) (1)**	**Dip (X) (1)**	**Major (m)**	**Semi-Major (m)**	**Minor (m)**	**Min Composites**	**Max**	**Max/DH**	**Max/Octant**
1	NA	NA	NA	25	25	10	6	18	4	2
2				50	50	20	5	16	4	2
3				75	75	30	1	12	4	NA

PROMONTORIO (Veins)							ID2/OK			
Pass	**Bearing (Z) (1)**	**Plunge (Y) (1)**	**Dip (X) (1)**	**Major (m)**	**Semi-Major (m)**	**Minor (m)**	**Min**	**Max**	**Max/DH**	**Max/Octant**
1	NA	NA	NA	25	25	10	6	18	3	2
2				50	50	20	4	16	3	2
3				200	200	60	1	10	3	NA

EDUWIGES, CANDELARIA, SAN JUAN, DURANA, MINERVA, SAN IGNACIO (Veins)							ID2/OK			
Pass	**Bearing (Z) (1)**	**Plunge (Y) (1)**	**Dip (X) (1)**	**Major (m)**	**Semi-Major (m)**	**Minor (m)**	**Min**	**Max**	**Max/DH**	**Max/Octant**
1	NA	NA	NA	25	25	10	6	18	3	2
2				50	50	20	4	16	3	2
3				75	75	30	1	10	3	NA

Source: SRK, 2020

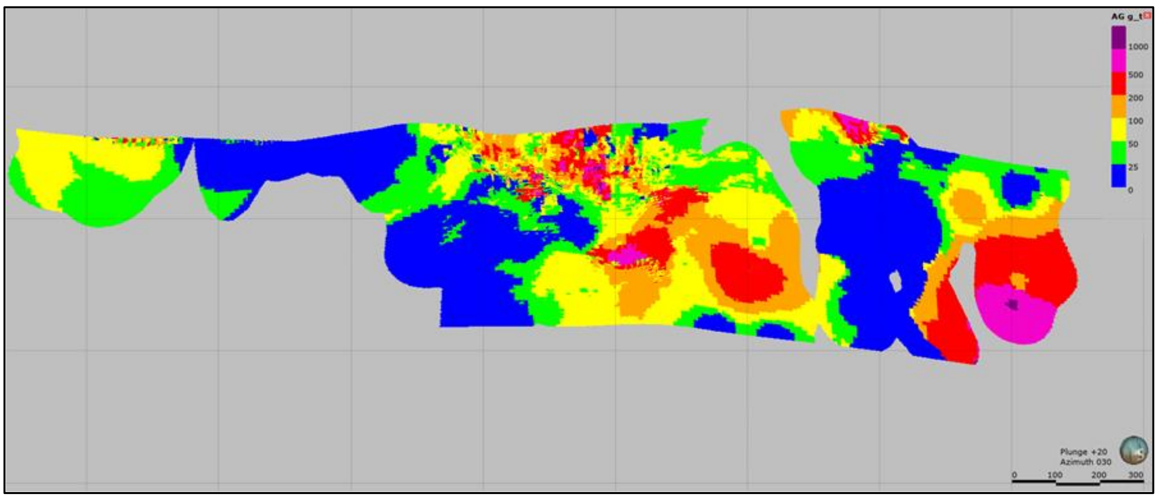
(1) Controlled by VLA unfolding using hangingwall and footwall vein surfaces

14.8 Model Validation

SRK has validated the estimation for each model using a variety of methods considered to be industry standard. These include a visual comparison of the blocks versus the composites, an assessment of the quality of the estimate, and comparative statistics of block vs. composites.

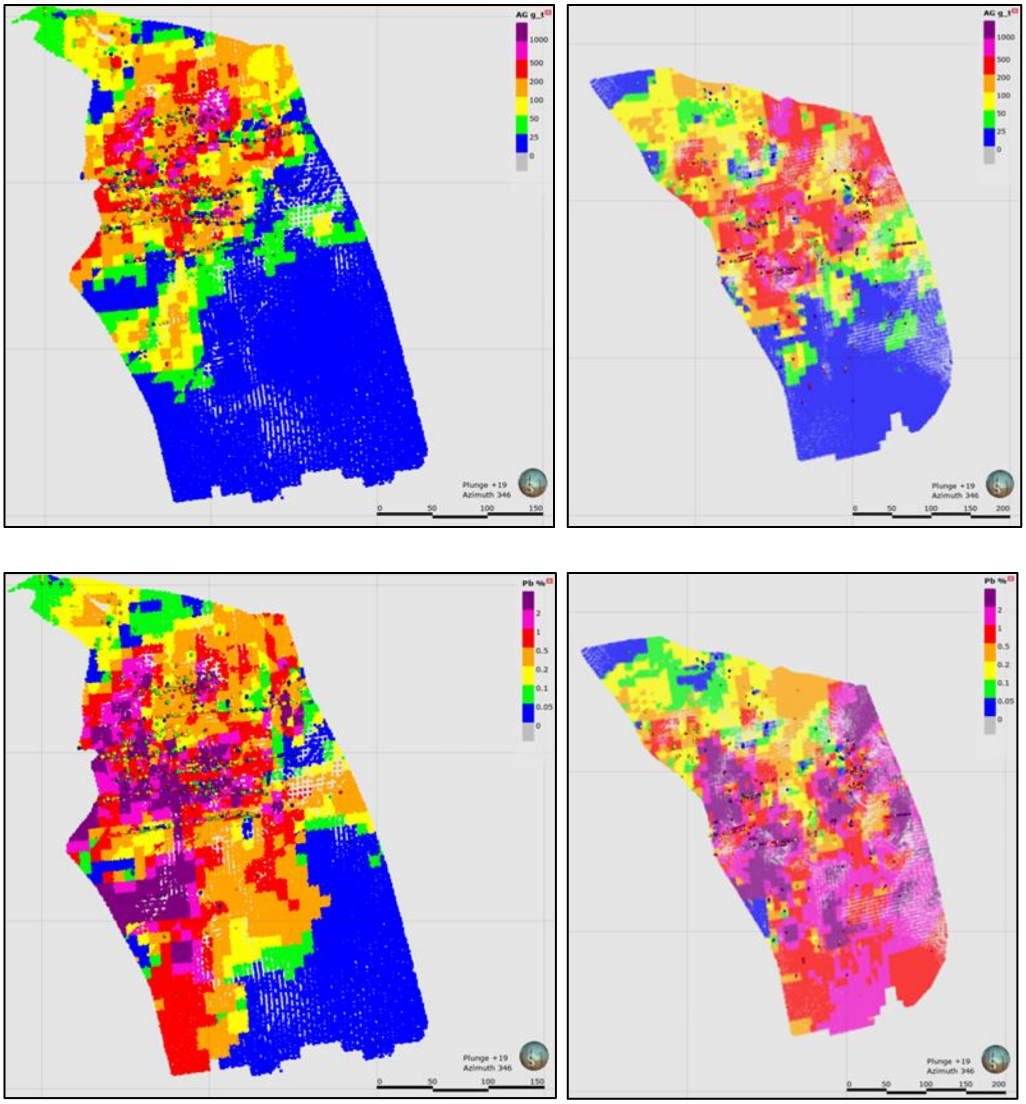
14.8.1 Visual Comparison

SRK reviewed the block estimation visually in comparison with the composite grades to determine any potential for obvious bias. In general, the objective is to identify areas where the composites do not closely approximate the blocks. SRK reviewed all models in this context and noted that they all seem to match the drilling well. Examples are shown in Figure 14-15 and Figure 14-16.



Source: SRK, 2020

Figure 14-15: Example of Visual Validation - Ag - Long Section of Santa Rosa de Lima (SRL) Vein



Source: SRK, 2020

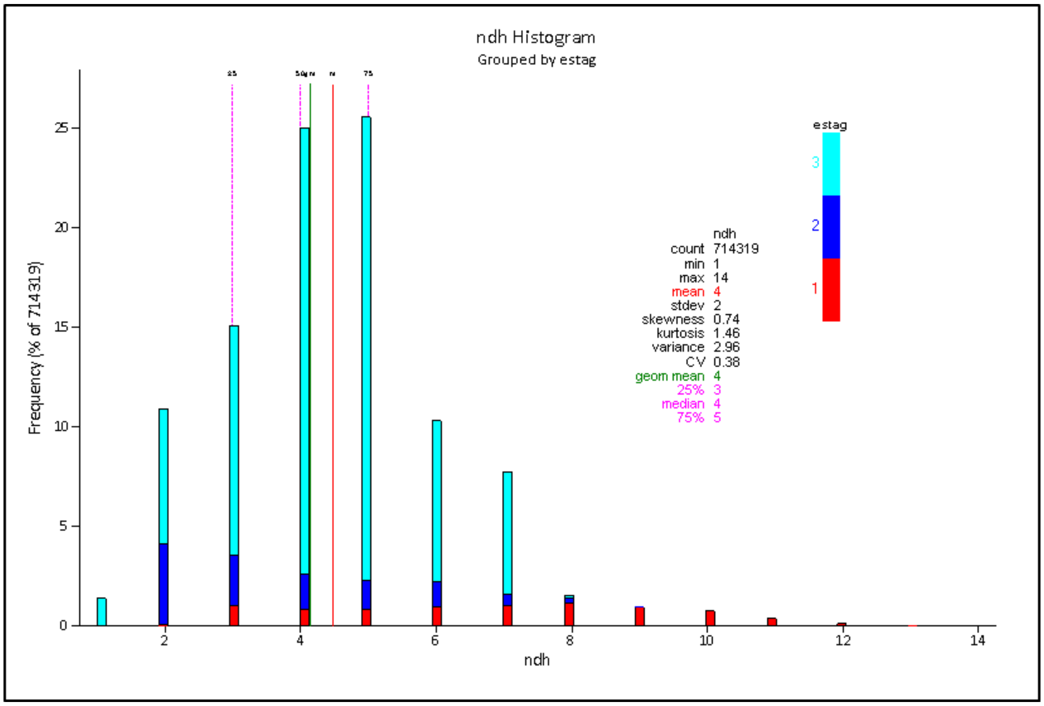
Figure 14-16: Example of Visual Validation of Ag and Pb in Eduwiges – Long Sections of San Bartolo Vein (Left) and Santa Marina Vein (Right)

14.8.2 Estimation Quality

SRK reviews the quality of the estimation using a combination of statistical comparisons of the number of holes, samples, and average distances per estimation pass. As the estimation passes are used to help assign confidence to the estimate, it is helpful to understand how much data is being used in the passes to have confidence that the passes are ensuring high quality estimates in passes 1 and 2 and complete estimation of the blocks in the ranges in the third pass.

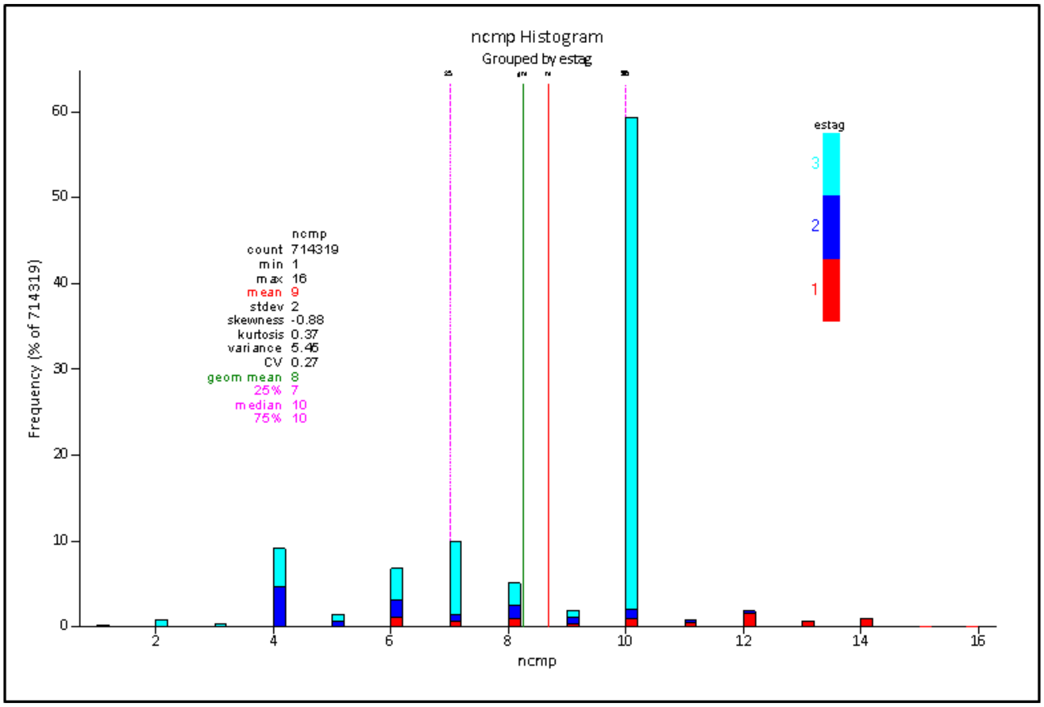
The example histograms shown in Figure 14-17, Figure 14-18, and Figure 14-19 illustrate that the SRL vein estimation passes are using more data in the first and second passes, at a closer spacing than the third pass. Importantly, the first and second passes are always using more than one hole to estimate, and for the most part are using three to six holes with three to eight composites.

SRK is satisfied from this analysis that the estimations are appropriate for each model.



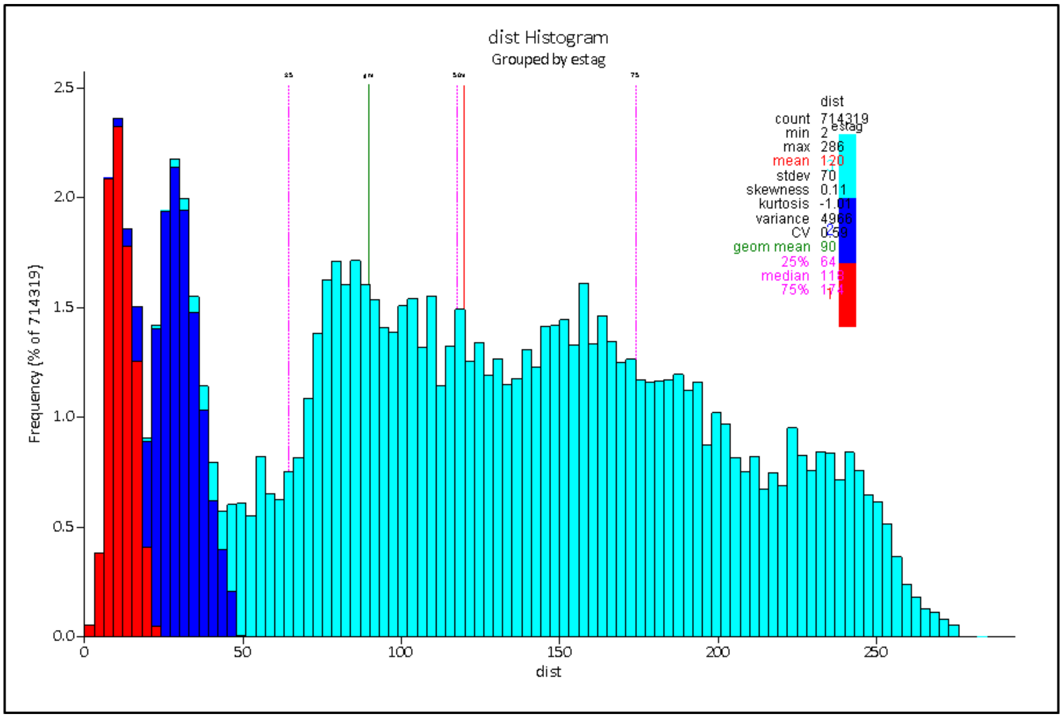
Source: SRK, 2020

Figure 14-17: Histogram of Number of Holes – SRL Vein



Source: SRK, 2020

Figure 14-18: Histogram of Number of Composites – SRL Vein



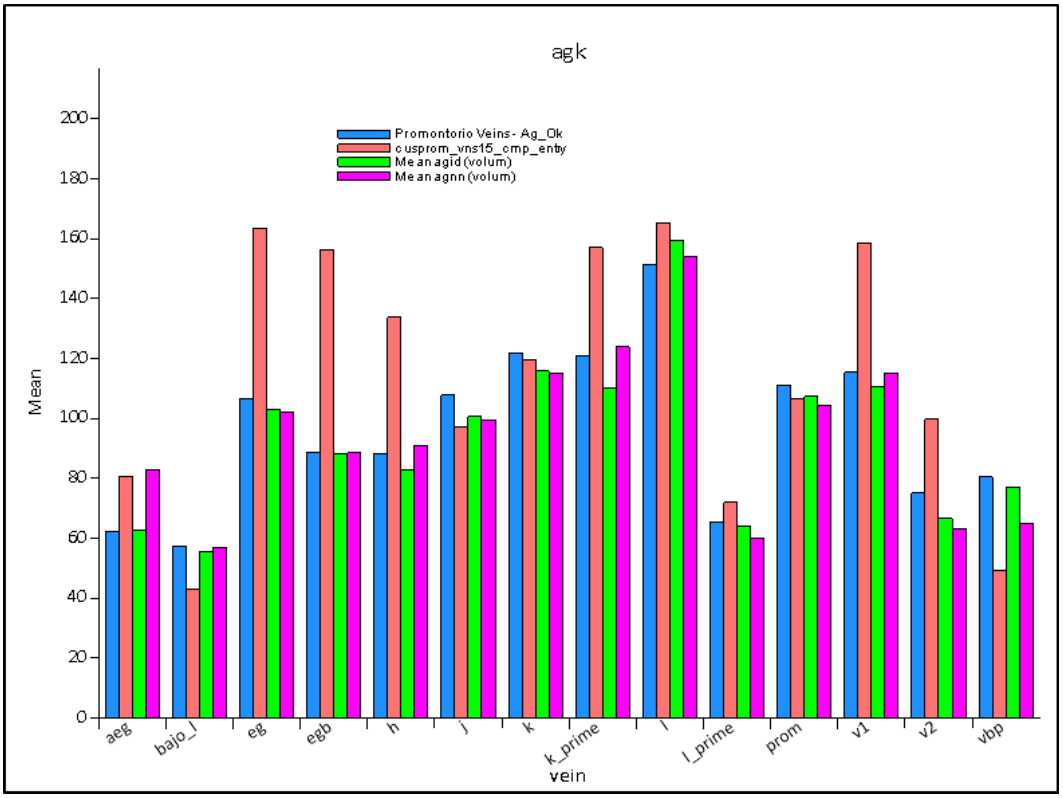
Source: SRK, 2020

Figure 14-19: Histogram of Average Distances – SRL Vein

14.8.3 Comparative Statistics and Swath Plots

SRK compared the estimated block grades to the composite grades on a vein by vein basis as well as on a global basis, assessing for local and global biases which may indicate over-estimation. Means are compared against the raw composite data as well as a nearest neighbor estimate (the theoretical declustered composite mean). In the case of many of the Cusi veins, the composite grades tend to be biased high due to the concentration of channel samples which are collected predominantly in the mineralized areas. The degree of bias depends on a number of factors including the relative number of channel samples and the percentage of these samples taken in high grade areas (tends to be higher). Thus, SRK completed the declustering analysis in each zone and performed a nearest-neighbor estimation of Au, Ag, Pb, Zn, Cu, Mn and Fe, as part of the validation process.

An example of a simple mean comparison at Promontorio is shown in Figure 14-20. This shows that the OK block estimates (blue) are generally comparing well against the declustered composite means (red), Nearest-neighbor (purple), and are generally approximating the grades of the ID2 (green). However, in some cases such as the EGB , EG, H, V1, and K-prime veins, the impact of the clustered data is resulting in higher grades in the declustered composites compared to the interpolated values. SRK is of the opinion that this is acceptable.

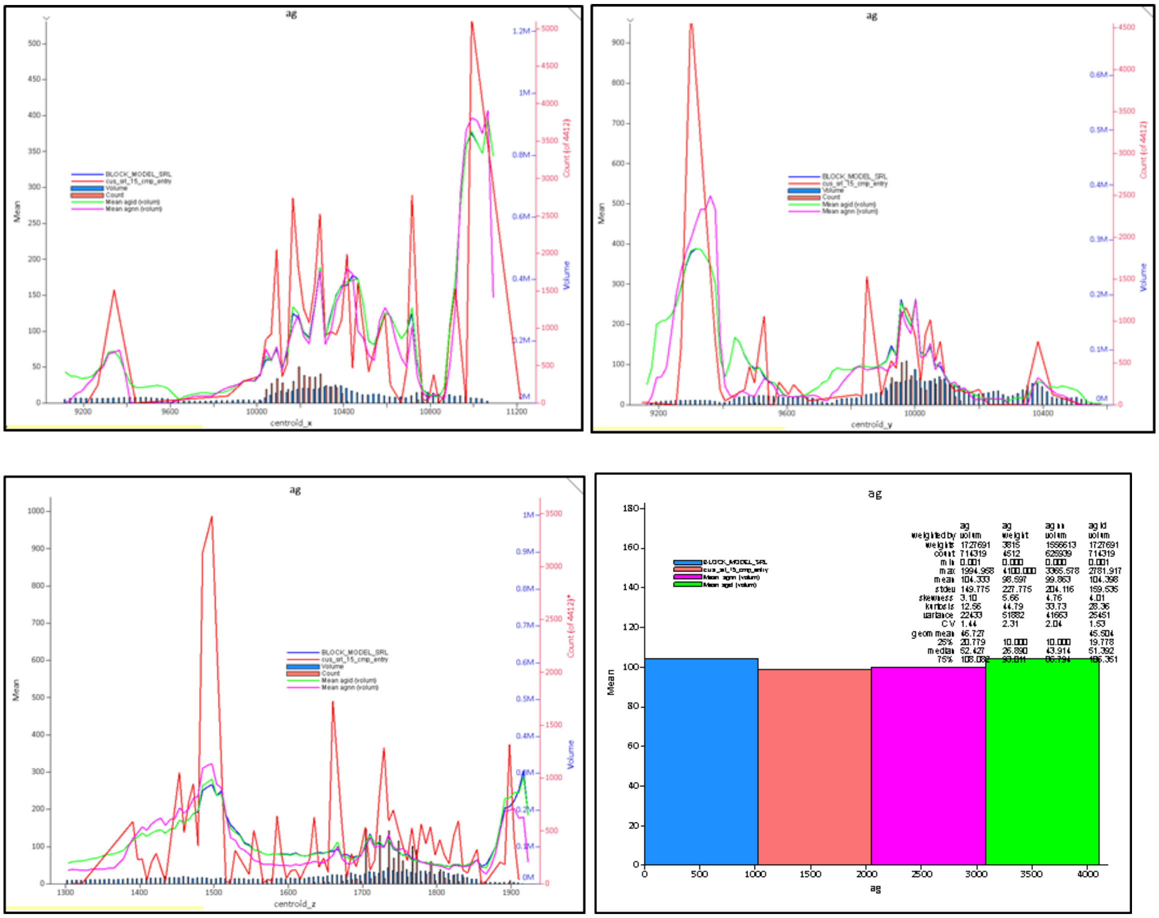


Source: SRK, 2020

Figure 14-20: Mean Analysis by Domain – Promontorio Ag (g/t)

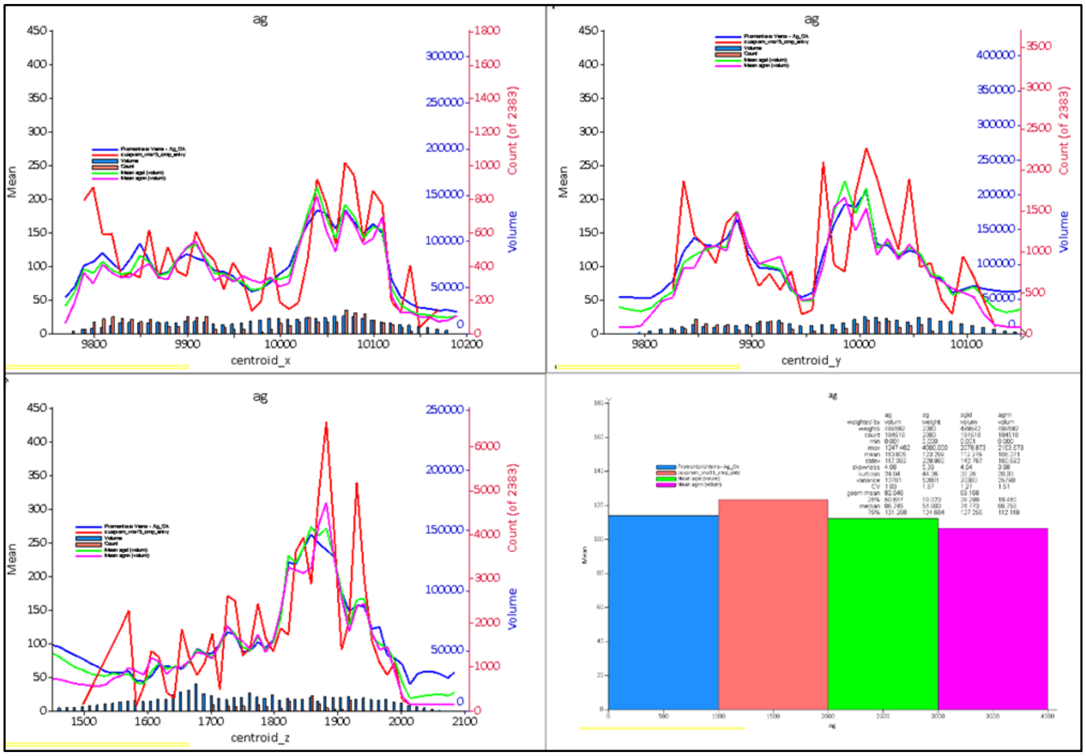
The input declustered composite samples were compared to the estimated block model within a series of coordinates through swath plot graphs that show the behavior of the composites, OK, ID2, NN estimation estimations in X, Y and Z, and the discrepancies between grades. The graphs and the comparative statistics for Ag in different areas are shown in Figure 14-21, Figure 14-22, Figure 14-23, Figure 14-24 and Figure 14-25.

In general, the results indicate a reasonable comparison between the composites and the block estimates using the different methods. In zones with a low quantity of data, there are some discrepancies between the grades.



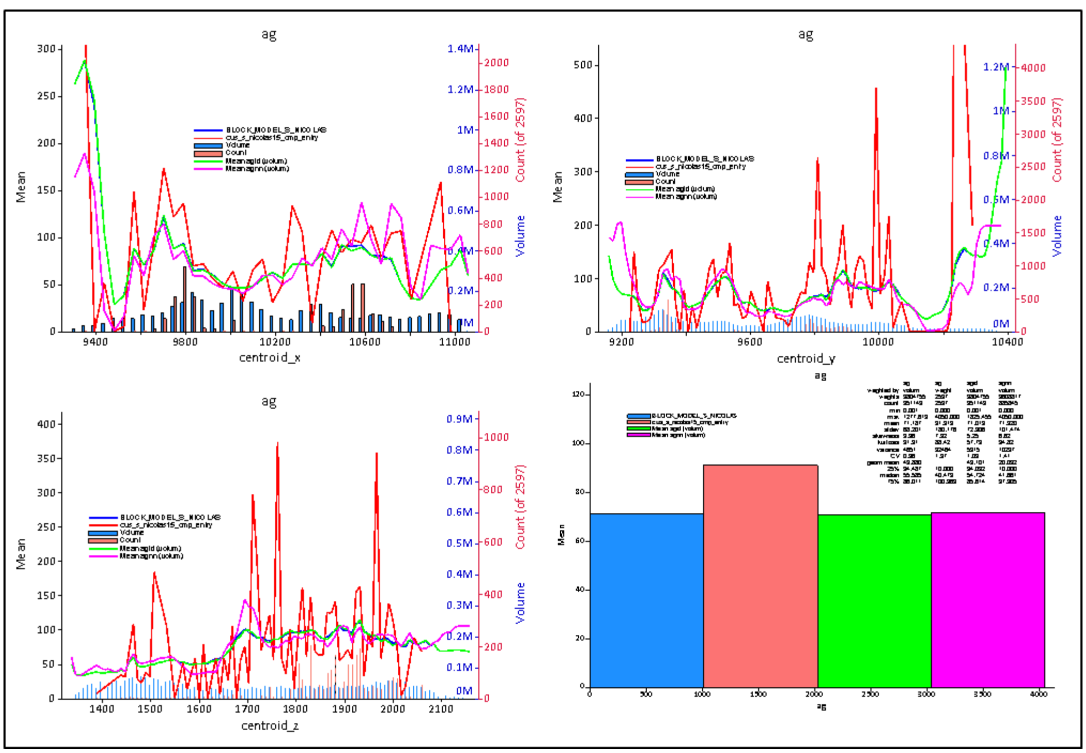
Source: SRK, 2020

Figure 14-21: Swath Plots and Statistics - Ag - SRL Vein



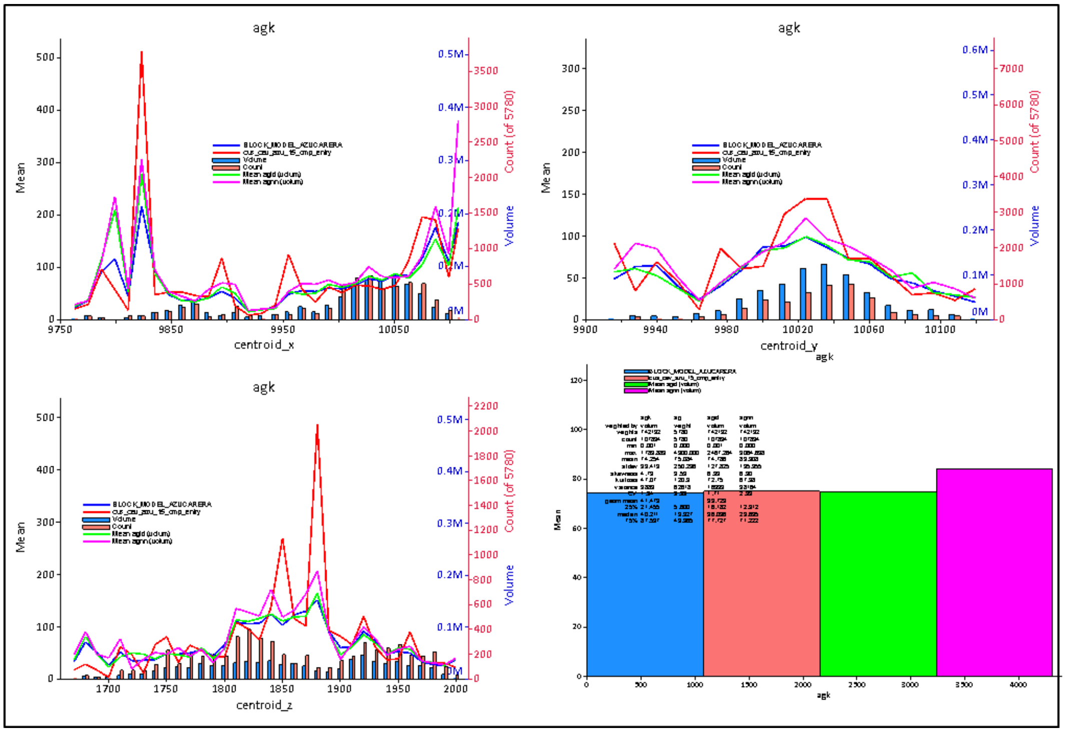
Source: SRK, 2020

Figure 14-22: Swath Plots and Statistics – Ag – Promontorio Vein



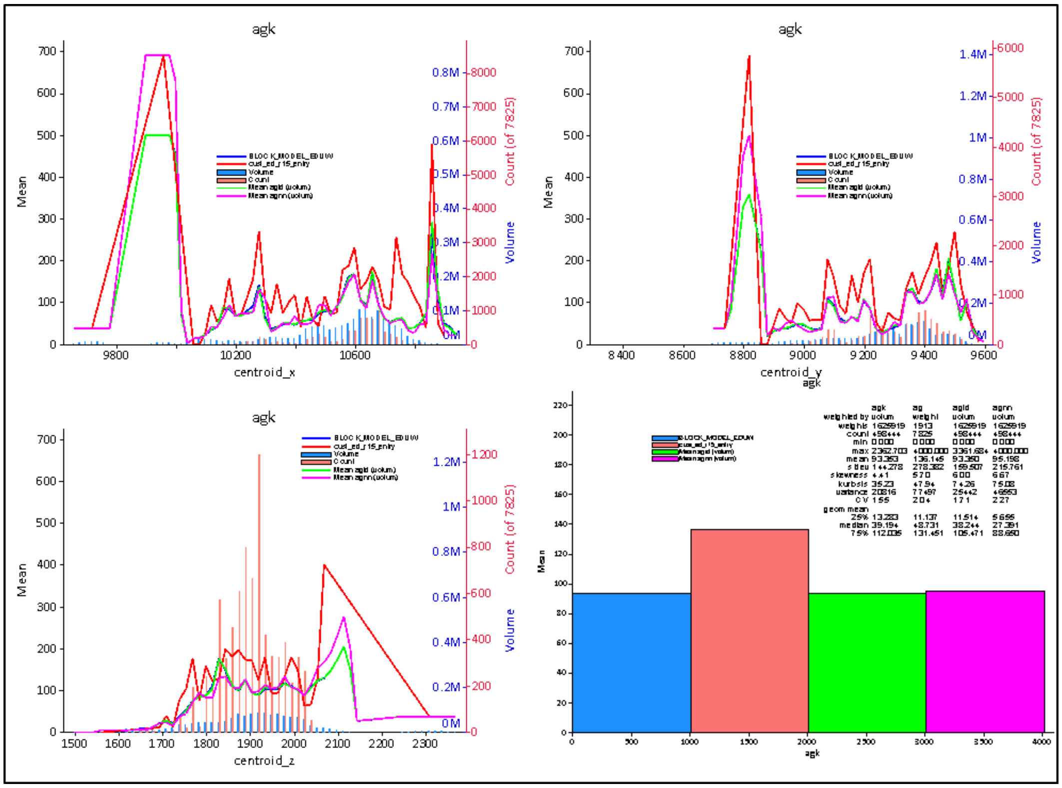
Source: SRK, 2020

Figure 14-23: Swath Plots and Statistics – Ag – San Nicolas Vein



Source: SRK, 2020

Figure 14-24: Swath Plots and Statistics – Ag – Azucarera



Source: SRK, 2020

Figure 14-25: Swath Plots and Statistics – Ag – Eduwiges

14.9 Resource Classification

Mineral resource classification is a subjective concept, and industry best practices suggest that resource classification should consider both the confidence in the geological continuity of the mineralized structures, the quality and quantity of exploration data supporting the estimates, and the geostatistical confidence in the tonnage and grade estimates. Appropriate classification criteria should aim at integrating all of these concepts to delineate regular areas of similar resource classification.

SRK is satisfied that the geological modeling honours the current geological information and knowledge. The location of the samples and the assay data are sufficiently reliable to support resource estimation. The sampling information was acquired primarily by core drilling and channel sampling from mine development.

Significant factors affecting the classification include:

- Lack of historic and consistent QA/QC program;
- Lack of downhole surveys for drillholes and measured deviations;
- Spacing of drilling compared to observed geologic continuity; and
- Mine production with a successful operating history dating more than 10 years.

As described in Section 12.1.1, at the recommendation of SRK in 2016, Sierra Metals carried out the re-analysis in ALS lab of 233 samples (Rejects) previously analyzed in Mal Paso lab that were supporting the resources estimation. The samples from various areas of Cusi included QA/QC controls. The intra-lab check samples did not show close agreement to expectations for the analysis quality and data between labs. SRK noted that the higher-grade samples occurring in a sequence of similar samples are repeated between the labs. The improved QA/QC procedures used in the recent work for SRL has provided more confidence.

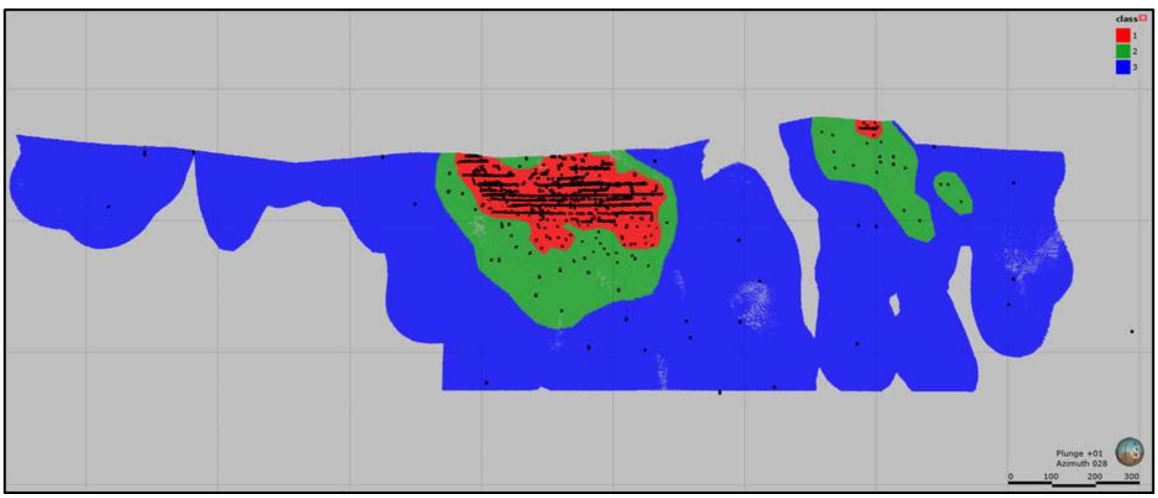
SRK has classified the resources according to CIM Definition Standards for Mineral Resources and Mineral Reserves, May 2014.

In order to classify mineralization as Measured or Indicated Mineral Resource, SRK has based both on the continuity observed in well-drilled areas of the Project, as well as geologic continuity observed from underground exposures of the mineralization.

The classification is generally based on the block estimation passes, quality of estimation and average distances to the samples used in the grade interpolation. A script was used to do a first classification in some zones and manually digitized polygons were finally used to assign the final classification to eliminate local inconsistencies in the block-by-block. An example of the classification results from SRL vein is shown in Figure 14-26 and Figure 14-27.

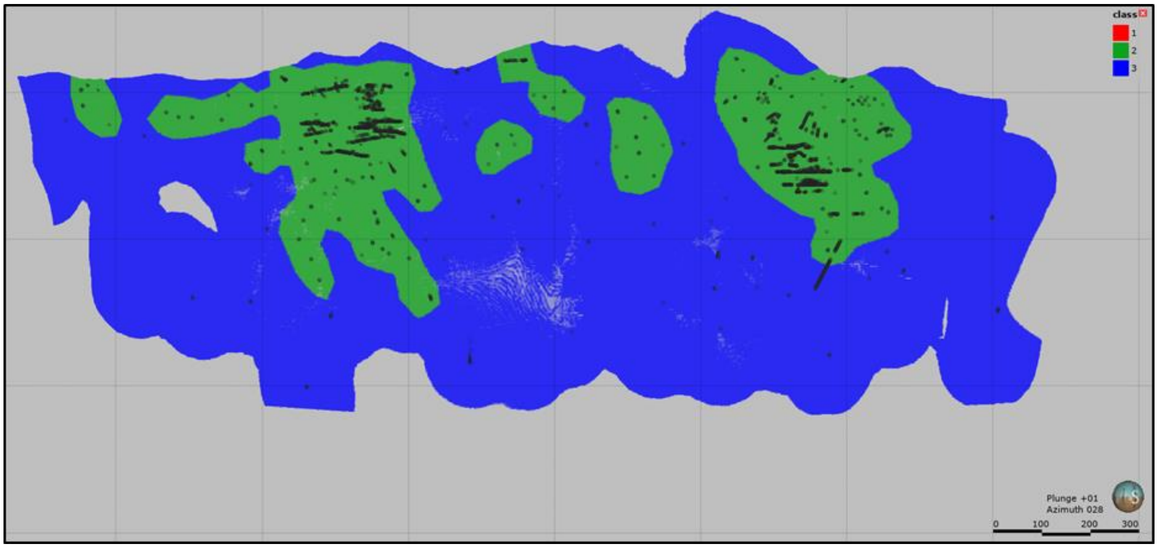
The general category for classification is as follows:

- **Measured**: The measured resources are mostly limited zones that are being mined by the company and estimated within the 25 m first search that required minimum of 6 and maximum 18 composites from at least three channels or drillholes. It is considered that these areas have strong geological knowledge based on the geological mapping and channel sampling that provide enough information to define the internal grade variability.
    - SRK classified Measured resources only in the veins of SRL, SRL-HW veins and SRL-SW where the recent drilling campaign was carried out implementing the QA/QC program.
- **Indicated**: SRK delineated Indicated mineral resources at Cusi according to the search volume used to estimate and as a function of the data spacing according to the following criteria:
    - Vein blocks estimated in the first or second pass, with continuity along strike between more than two holes.
    - For the Azucarera, CED Eduwiges and SRL-SW areas, a script was used to flag Indicated blocks which the average distance to the samples used in the interpolation is less than 15 m and the number of holes greater than two.
- **Inferred**: In general, the Inferred Mineral Resources are limited to zones of reasonable continuity, grade estimate and geological confidence that were estimated within the three passes. These zones are extended no further than 100 m from peripheral drilling.



Source: SRK, 2020

Figure 14-26: Example Classification Results – Long Section of SRL Vein Block Model (Red: Measured, Green: Indicated, Blue: Inferred)



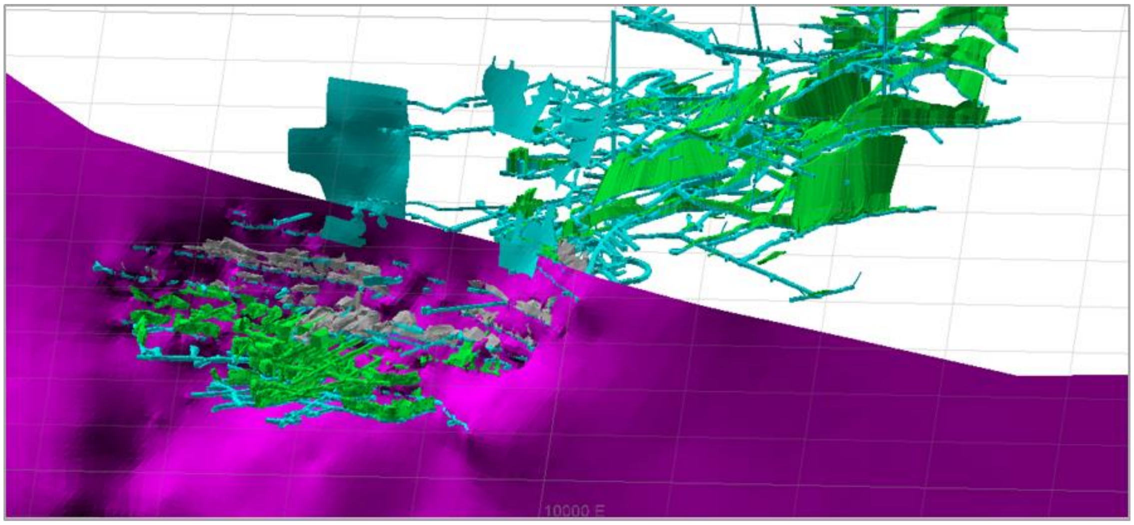
Source: SRK, 2020

Figure 14-27: Example Classification Results – Long Section of San Nicolas Vein Block Model (Green: Indicated, Blue: Inferred)

14.10 Depletion for Mining

SRK depleted the block models for previous mining prior to reporting. A variable called "mined" is coded into all models that contain any areas with existing mine workings. The variable is coded between 0-1, with 0 being completely available for mining and 1 being completely mined out. This variable is used in Vulcan's reporting tools to eliminate mined tonnes from the resource reporting.

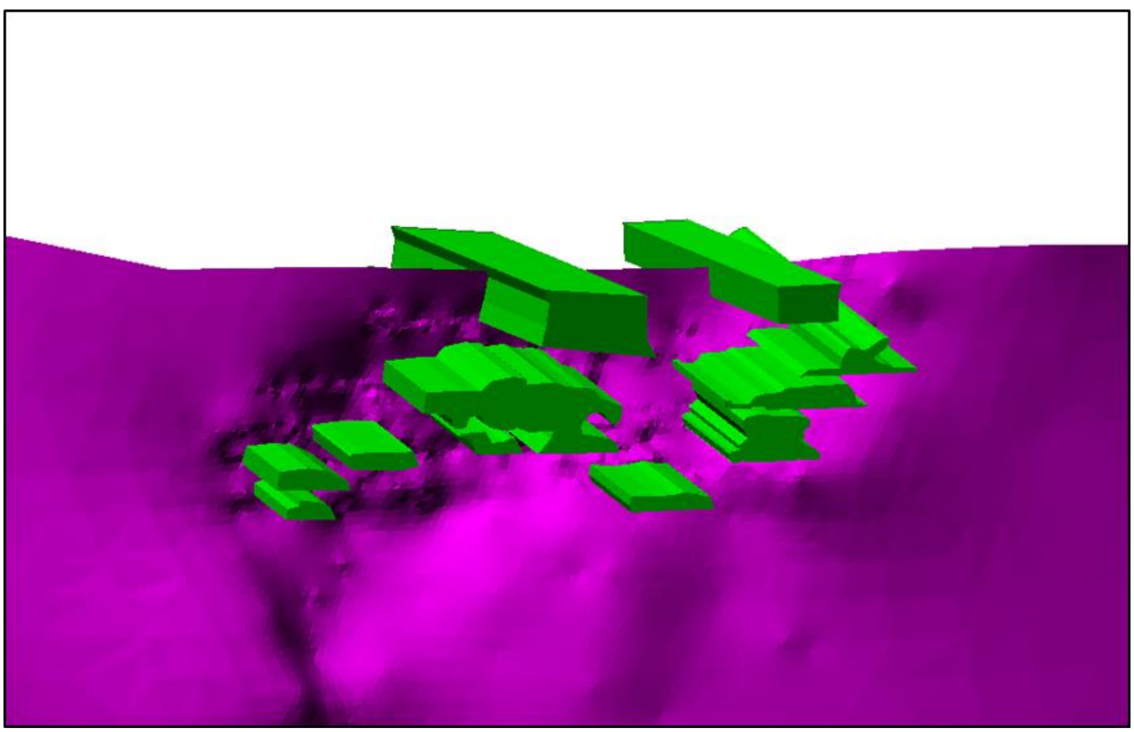
Two methods have been employed to account for mined areas. First, the 3D as-built mine workings were provided to SRK by Sierra Metals for all surveyed areas. SRK noted that these are locally reasonable and well-surveyed, but are also inaccurate in other areas, where the channel samples do not plot inside of the surveyed workings, or where drilling does not approximate the location of the workings. It is suspected that poor survey practices are to blame for these discrepancies. Regardless, the 3D solids were used to complete an initial pass at depleting the models. An example of the surveyed 3D is shown in Figure 14-28.



Source: SRK, 2020

Figure 14-28: 3D As-built Shapes and SRL Vein

In addition to the surveyed workings, Sierra Metals also provided simple polygons projected onto long sections of each vein, which delineate areas where mining has occurred that have not been consistently surveyed. Many of these are historical. SRK constructed additional polygons to delineate some areas of exploitation. These polygons were made into extruded 3D solids, and the veins were flagged as mined (0-1) within the extruded polygons, as shown in Figure 14-29.



Source: SRK, 2020

Figure 14-29: Example of Extruded Polygons used to Mine the Block Model in SRL Vein

14.11 Mineral Resource Statement

CIM Definition Standards for Mineral Resources and Mineral Reserves (May 10, 2014) defines a mineral resource as:

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

The "reasonable prospects for economic extraction" requirement generally imply that the quantity and grade estimates meet certain economic thresholds and that the Mineral Resources are reported at an appropriate cut-off grade considering extraction scenarios and processing recoveries. Sierra Metals provided Cusi's budget containing the updated costs for mining and processing.

Table 14-9 presents the metal price assumptions and the operation costs for Cusi.

Table 14-9: Summary of Cut-Off Grade Assumptions and Operation Costs at Cusi

Metal	**Units**	**Price Assumptions**
Silver Price	US$/oz	20.00
Gold Price	US$/oz	1,541.00
Lead Price	US$/lb	0.91
Zinc Price	US$/lb	1.07
Operating Costs (Mine – Processing)		
Category	**Units**	**Cost**
Personnel	US$/t	10.56
Mine Operation, Transport and Maintenance	US$/t	24.86
Plant Operation and Maintenance	US$/t	11.86
G&A and others	US$/t	3.20
Subtotal	**US$/t**	**50.48**

Source: Sierra Metals, 2020

The metallurgical recoveries used were based on averages obtained from production data provided by Sierra Metals. The metallurgical recoveries used are: 87% Ag, 57% Au, 86% Pb, 51% Zn.

This cost equates to a grade of about 95 g/t AgEq. SRK has reported the mineral resource for Cusi at this cut-off.

The August 31, 2020 consolidated mineral resource statement for the Cusi area is presented in

Table 14-10.

Table 14-10: Cusi Mine Mineral Resource Estimate as of August 31, 2020 – SRK Consulting (U.S.), Inc. [(1)(2)(3)(4)(5)(6)]

Source	Class	AgEq (g/t)	Ag (g/t)	Au (g/t)	Pb (%)	Zn (%)	Tonnes (000's)
SRL	**Measured**	231	213	0.06	0.26	0.30	850
Total Measured		*231*	*213*	*0.06*	*0.26*	*0.30*	*850*
Promontorio	**Indicated**	199	168	0.10	0.45	0.60	1,790
Eduwiges		270	194	0.17	1.30	1.27	828
SRL		231	198	0.16	0.42	0.54	644
San Nicolas		190	167	0.14	0.28	0.32	657
San Juan		179	165	0.11	0.14	0.17	179
Minerva		198	178	0.30	0.10	0.05	59
Candelaria		176	157	0.10	0.19	0.42	131
Durana		168	160	0.05	0.10	0.08	168
San Ignacio		149	113	0.05	0.33	1.10	49
Total Indicated		*212*	*176*	*0.13*	*0.54*	*0.63*	*4,506*
Measured + Indicated		**215**	**182**	**0.12**	**0.49**	**0.58**	**5,356**
Promontorio	**Inferred**	174	141	0.15	0.33	0.71	384
Eduwiges		186	117	0.18	1.16	1.10	549
SRL		222	188	0.19	0.37	0.59	1,579
San Nicolas		156	124	0.18	0.28	0.66	2,020
San Juan		171	160	0.05	0.13	0.22	102
Minerva		169	162	0.08	0.08	0.05	4
Candelaria		191	139	0.12	0.73	1.09	202
Durana		102	99	0.05	-	0.01	1
San Ignacio		118	96	0.13	0.27	0.29	53
Total Inferred		**183**	**146**	**0.18**	**0.43**	**0.69**	**4,893**

(1) Mineral Resources have been classified in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definition Standards on Mineral Resources and Mineral Reserves, whose definitions are incorporated by reference into NI 43-101.

(2) Mineral resources are not ore reserves and do not have demonstrated economic viability. All figures rounded to reflect the relative accuracy of the estimates. Gold, silver, lead and zinc assays were capped where appropriate.

(3) Mineral resources are reported at a single cut-off grade of 95 g/t AgEq based on metal price assumptions*, metallurgical recovery assumptions, personnel costs (US$10.56/t), mine operation, transport and maintenance costs (US$24.86/t), processing operation and maintenance (US$11.86/t), and general and administrative and other costs (US$3.20/t).

(4) Metal price assumptions considered for the calculation of the cut-off grade and equivalency are: Silver (Ag): US$/oz 20.0, Lead (US$/lb. 0.91), Zinc (US$/lb. 1.07) and Gold (US$/oz 1,541.00). CIBC, Consensus Forecast, September 30, 2020

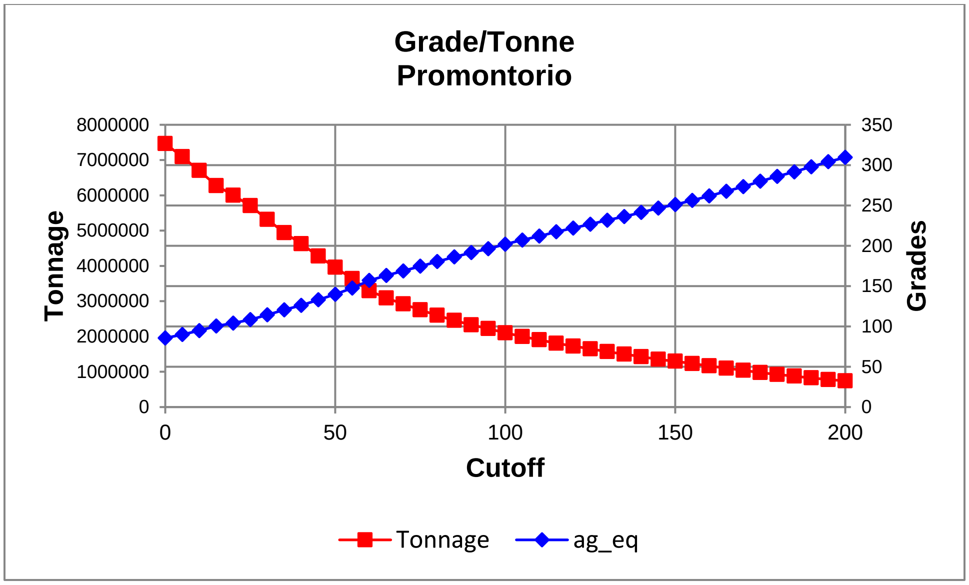
(5) The resources were estimated by SRK. Giovanny Ortiz, B.Sc., PGeo, FAusIMM #304612 of SRK, a Qualified Person, performed the resource estimation for the Cusi Mine.

(6) Based on the historical production information of Cusi, the metallurgical recovery assumptions are: 87% Ag, 57% Au, 86% Pb, 51% Zn.

14.12 Mineral Resource Sensitivity

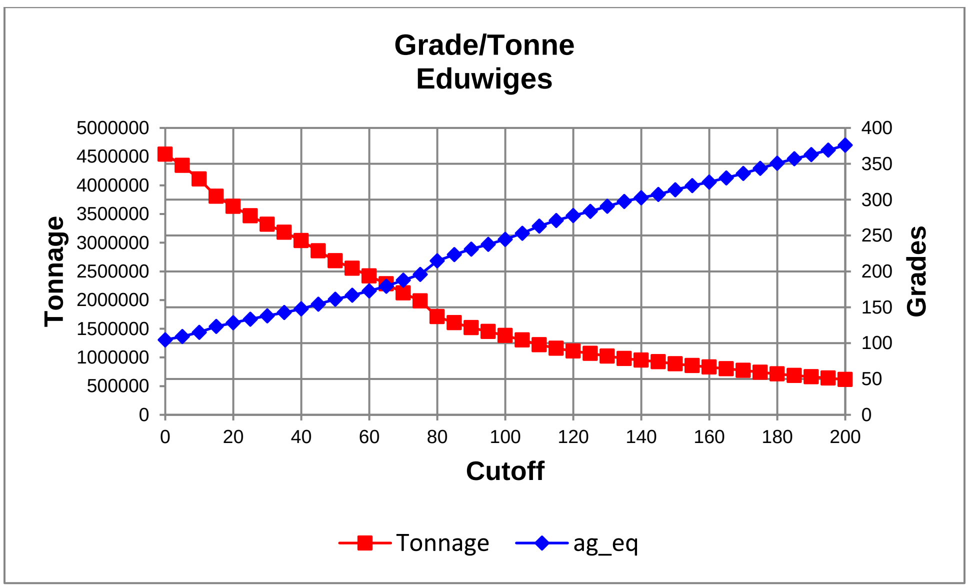
The mineral resource presented in Section 14.11 is sensitive to the selection of the reporting cut-off grade (CoG). SRK has generated grade-tonnage charts to illustrate the change in tonnage and

AgEq grade as a function of the cut-off grade. These are shown in Figure 14-30, Figure 14-31, Figure 14-32, Figure 14-33, Figure 14-34, Figure 14-35, Figure 14-36, Figure 14-37 and Figure 14-38.



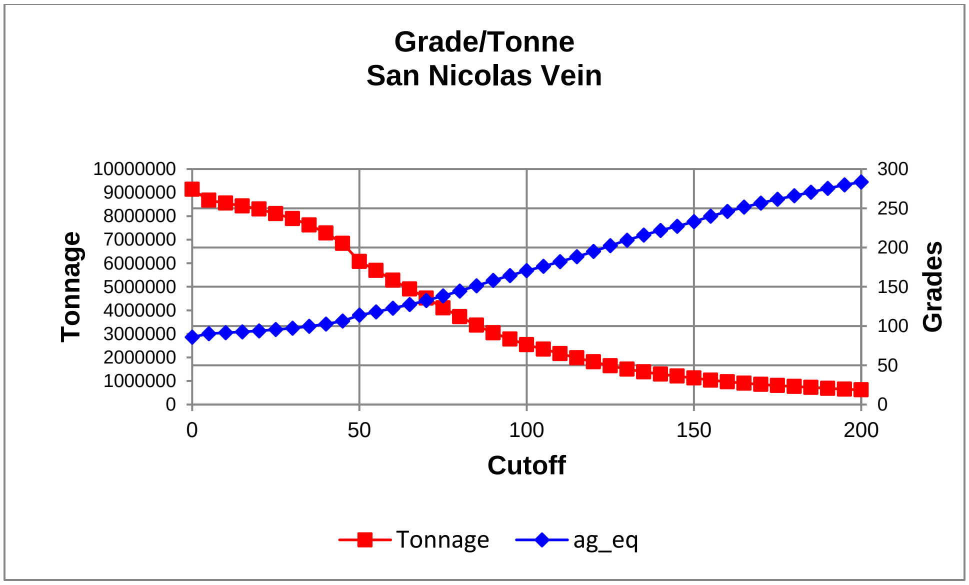
Source: SRK, 2020

Figure 14-30: Grade-Tonnage Chart – Promontorio Area



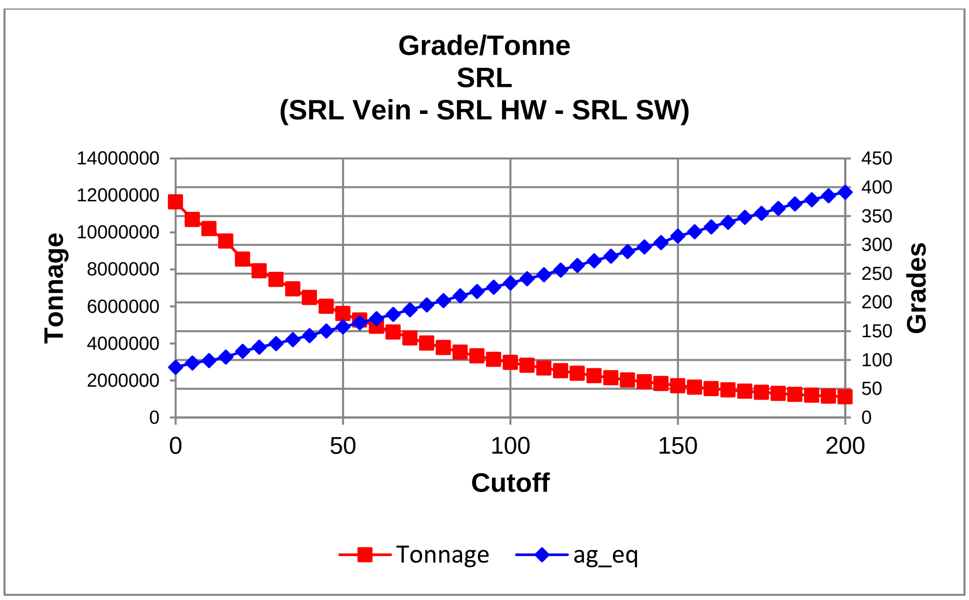
Source: SRK, 2020

Figure 14-31: Grade-Tonnage Chart – Santa Eduwiges Area



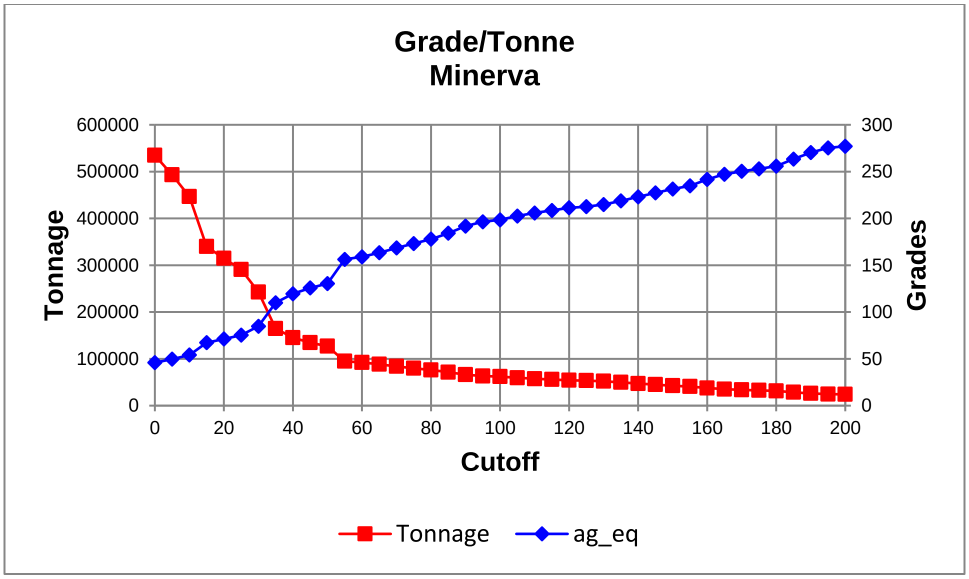
Source: SRK, 2020

Figure 14-32: Grade Tonnage Chart – San Nicolas



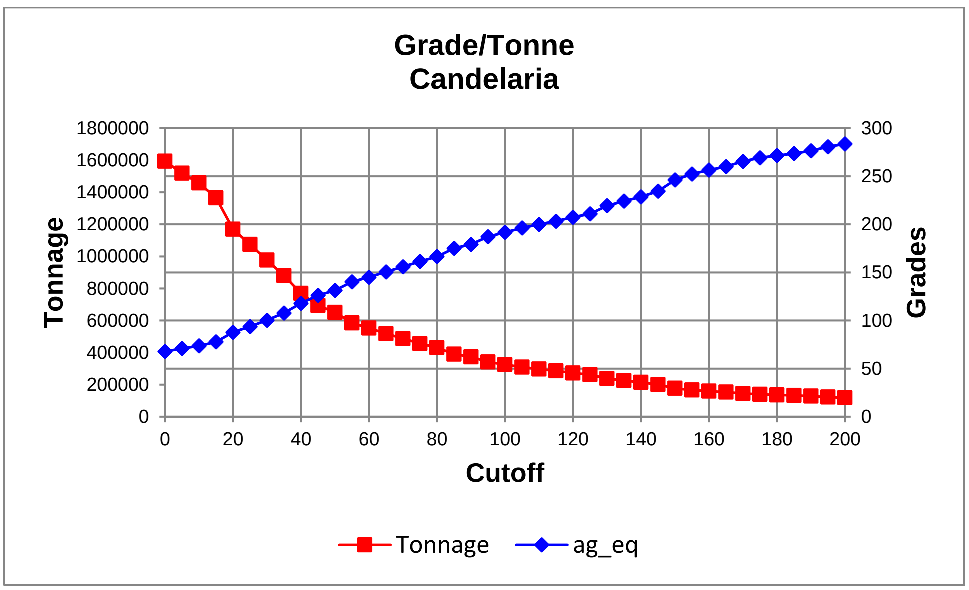
Source: SRK, 2020

Figure 14-33: Grade Tonnage Chart – SRL



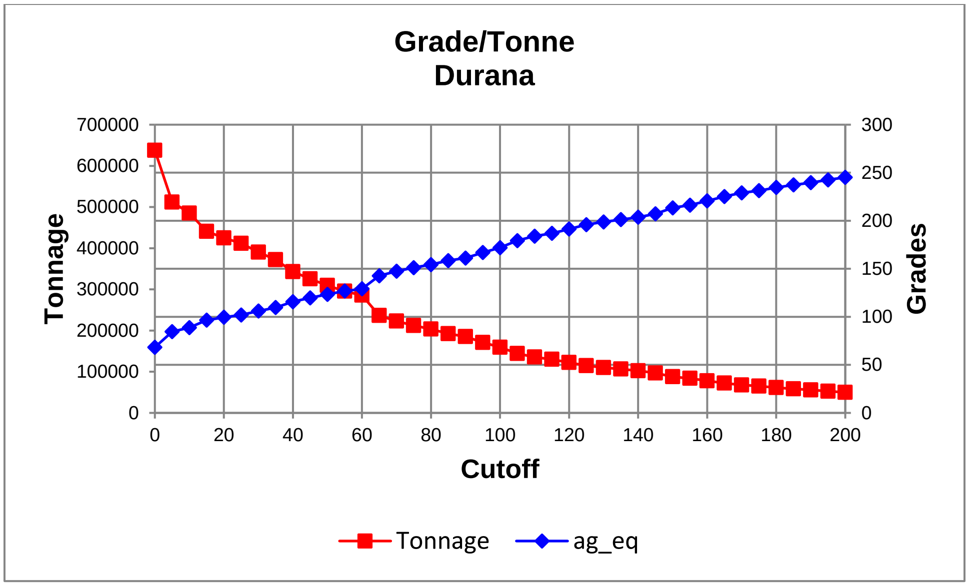
Source: SRK, 2020

Figure 14-34: Grade Tonnage Chart – Minerva Area



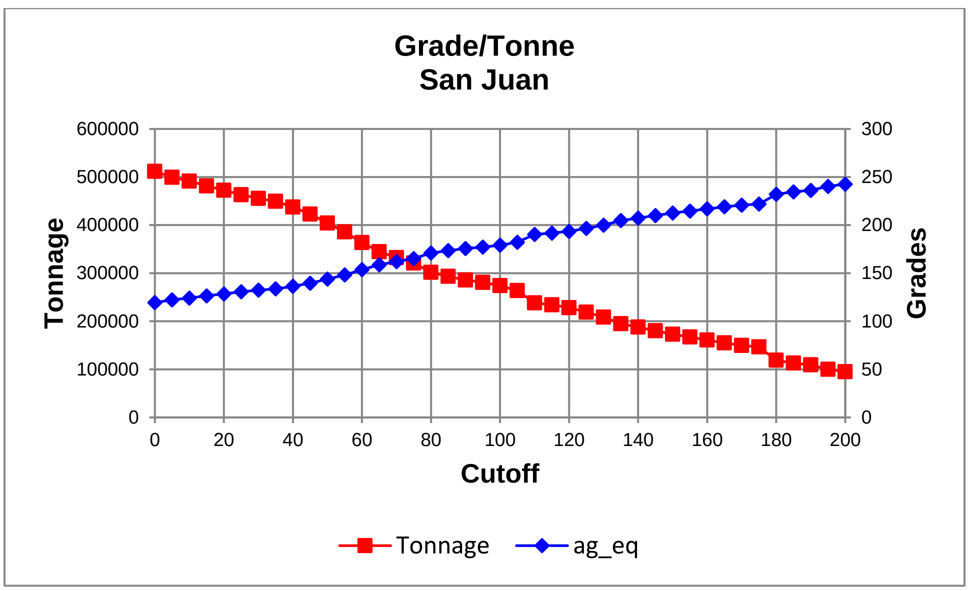
Source: SRK, 2020

Figure 14-35: Grade Tonnage Chart – Candelaria



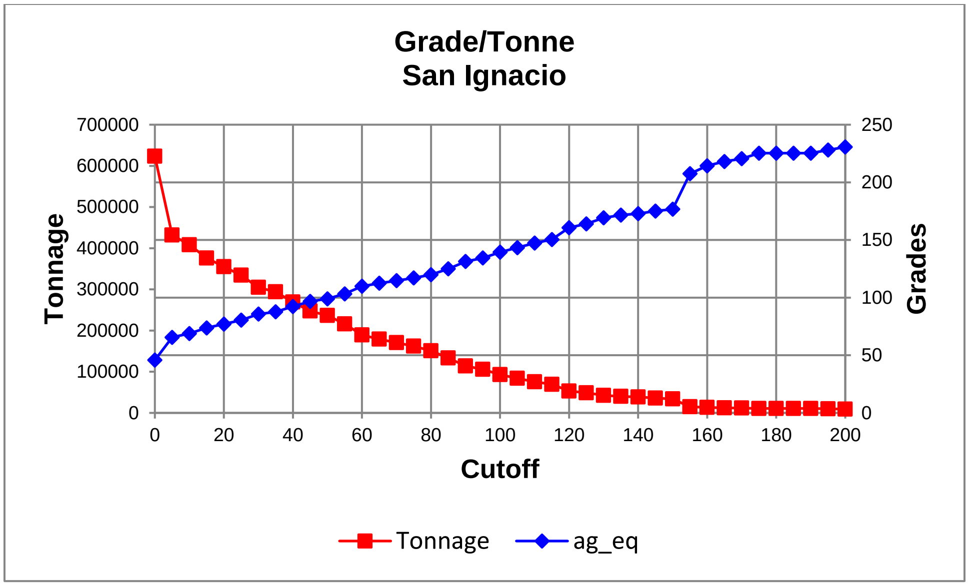
Source: SRK, 2020

Figure 14-36: Grade Tonnage Chart – Durana



Source: SRK, 2020

Figure 14-37: Grade Tonnage Chart – San Juan



Source: SRK, 2020

Figure 14-38: Grade Tonnage Chart – San Ignacio

14.13 Comparison to Previous Estimates

A comparison to the previous (2018) Mineral Resource Estimate for the Cusi Project shows changes in the global estimates. It is important that any changes be appropriately explained in any future press release to avoid potential issues of investor confidence. The changes in the Mineral Resource Statement can be explained as follows:

- The increase in Measured Resources is due to the additional drilling and underground workings completed in SRL, SRL-SW and SRL-HW veins, where the underground development, exploitation activities and the infill drilling have been focused in the recent years.
- A minor reduction in the Indicated Resources is related to a combination of factors including the increase of the infill drilling in some zones of San Nicolas vein, SRL vein and Promontorio, a tonnage reduction due to the exploitation in SRL and Promontorio. The changes In Eduwiges are associated to modifications in the structural and geological interpretation, including the addition of the mineralization in "stockwork" that was not evaluated in previous resource estimates. In addition to this, most of the updated vein wireframes were constructed including part of the mineralized halo around the high-grade of the veins, with the effect of reducing the grades.
- The Inferred Resources increased greatly, primarily in the areas of SRL, San Nicolas and Eduwiges. The exploration drilling completed in the recent years tested low grade and high-grade extensions of the mineralized structures in SRL, SRL-HW and San Nicolas Vein. This new Mineral Resource Estimate included the use of an extended third search to improve the grade interpolation in the new explored areas, resulting in a better definition of the horizontal and vertical extension of the structures in comparison to 2018 where a restricted search

strategy was used. The inclusion of the mineralization in “stockwork” in Eduwiges (CED-Eduwiges) increased the low to moderate grade mineralization in this zone.

14.14 Relevant Factors

SRK is not aware of any additional relevant factors that would impact the statement of mineral resources at this time.

15 Mineral Reserve Estimates

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Resource. It includes diluting material and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Prefeasibility or Feasibility level as appropriate that include the application of Modifying Factors.

A Mineral Reserve has not been estimated for the Project as part of this Technical Report.

16 Adjacent Properties

As noted in Section 4, Figure 4-2, a number of mining claims within the Cusi area are not controlled by Sierra Metals. Mineral Resources are not reported within these areas. No publicly disclosed Mineral Resource or Reserve estimates exist for these areas.

17 Other Relevant Data and Information

SRK is not aware of any additional relevant data, information or explanation necessary to make the Technical Report understandable and not misleading. The Cusi Mine is an operating mine and information regarding the mining methods and the recovery method are provided in Section 18.

18 Interpretation and Conclusions

18.1 Exploration

SRK is of the opinion that the exploration efforts and assay results achieved at Cusi are sufficient for the definition of Mineral Resources. The primary exploration methods at Cusi have been diamond core drilling and channel sampling of underground working areas, and both have been successful in delineating a system of discrete mineralized epithermal veins and related mineralized stockwork. The drilling appears to be able to intersect and to identify mineralized structures with reasonable efficacy, and the majority of drilling is oriented in a fashion designed to approximate true thicknesses of the veins. The exploration planning should be designed to maximize conversion of higher-grade Inferred areas with less dense drilling to Indicated and Measured, and/or extending mineralization away from known areas accessed through channel sampling. The recent exploration activities have been focused in the area of SRL_HW zone that is characterized by a number of mineralized veins following a complex structural setting that will require detailed mapping and close spaced drilling.

Mine development is also used for exploration, as direct access of the veins along underground drifts is an excellent and efficient way for Cusi to understand the mineralization on a more local basis. More effort should be made to improve underground survey data, channel sampling consistency, and 3D as-built data.

SRK notes that recent efforts have improved the quality of the drilling and related information through more complete and thorough survey data (for drilling and underground development), as well as the implementation of QA/QC programs that are delivering improved results. This lends additional confidence to recently-defined resources or newly drilled portions of historic areas.

SRK also notes that some of the Mal Paso Mill laboratory's challenges identified in the previous technical reports are being addressed and the results of the QA/QC controls of the exploration team have shown improvements. These were related to significant differences between the values reported for identical samples between Mal Paso and third-party laboratories. These issues, combined with historic deficiencies in downhole surveying, detract from the overall confidence in quality of the historic data.

18.2 Mineral Resource Estimate

The current geology model has been constructed by Sierra geologists and reviewed by SRK using Leapfrog Geo™ software. Drilling and channel sample data, as well as sectional interpretation, was used in the development of the 3D solids representing veins and stockwork zones. These are used as resource domains to constrain and control the interpolation of grade during the estimation process.

SRK constructed individual block models for the main resource areas, which have been rotated and sub-blocked to better fit the geology contacts in each area. Grade was interpolated from capped and composited sample data using kriging and inverse distance squared algorithm, and sample selection criteria designed to decluster the channel sample data compared to the drilling. A nested three-pass estimation was used with decreasing data selection criteria.

SRK is of the opinion that the Mineral Resource estimate has been conducted in a manner consistent with industry best practices and that the data and information supporting the stated Mineral Resources is sufficient for declaration of Measured, Indicated and Inferred classifications of resources. SRK classified resources in the Measured category in the SRL veins where the recent exploration drilling was carried out implementing an improved QA/QC program. Due to the uncertainties regarding the data supporting the Mineral Resource estimate, the other areas of the project do not contain Measured resources.

The deficiencies in the geology and grade information for areas other than the SRL vein include:

- The lack of a historic QA/QC program which has only been supported by a recent resampling and modern QA/QC program for a limited number of holes. This will be required in order to continue achieving Measured Resource classifications which generally are supported by high resolution drilling or sampling data that feature consistently implemented and monitored QA/QC.
- The lack of consistently-implemented down-hole surveys in the historic drilling. Observations from the survey data which has been done to date show significant down-hole deviations that influence the exact position of mineralized intervals. These discrepancies are confirmed by nearby workings that project the mineralized structures in a different position than that defined by the unsurveyed holes.
- The lack of industry-standard 3D surveyed as-built data delineating mined areas. This has been defined using a combination of the existing survey data, as well as polygons defining other areas thought to be mined. SRK believes these polygons to be conservative, as it is likely that pillar areas or other partially mined areas exist within the limits of the polygons but are being excluded by this rudimentary methodology.

18.3 Metallurgy and Mineral Processing

The metallurgical balance as stated by Sierra is based on actual production data as reported to SRK. SRK is of the opinion that this is more than sufficient support for the statement of Mineral Resources, where the cut-off grade is based partially on expectations of recovery.

The Cusi processing facilities include two interconnected process plants, which are the Mal Paso Mill, purchased from Rio Tinto, and the El Triunfo mill. Both mills are conventional ball mill and flotation plants fed from a single crushing circuit. The flotation circuit has the ability to produce lead concentrate and zinc concentrate.

Cusi's highly variable fresh feed head grades pose a challenge to the steady metallurgical performance of the processing facilities. Additional studies in mine optimization and tailoring of production schedules could potentially mitigate this risk.

18.4 Mining Methods

The primary underground mining method currently employed at Cusi is overhand cut and fill. SRK also notes that shrinkage stoping has been in use in modern mining at Cusi, but currently makes up a comparably minor portion of the active mining operations.

Despite lacking a prefeasibility or feasibility study in the public market, which discloses mineral reserves, the Cusi Mine is in fact in operation and producing mineralized material from the underground mine. SRK notes that pre-feasibility and feasibility studies are required for a statement of Reserves, but are not required for a company to initiate production for a property. SRK recommends that the Cusi Mine develop an industry-compliant Mineral Reserve estimation based on the updated mineral resource estimation, including a detailed mine design, production schedule, and cash flow model.

The current mining operation produces approximately 23,800 t of mineralized material per month on average (2019 FY data). The production has been reduced due to preparation works in the area of SRL. The source of mined material is split evenly between the Promontorio and Santa Eduwiges.

18.5 Recovery Methods

The Cusi concentrator is located in the outskirts of Cuauhtémoc City, approximately 50 km by road from Cusi operations. Dump trucks, each hauling approximately 20 t of mineralized material, delivered 285,236 t in 2019 and 117,320 t in the first eight months of 2020. It should be noted however, that production in 2020 was disrupted by Covid-19 and no run of mine mineralized material was processed in April, May or June.

Recent improvements in the plant have resulted in higher metal recoveries.

18.6 Infrastructure

The Project is an active mine that has fully developed infrastructure including access roads, an exploration camp, administrative offices, a processing plant and associated facilities, tailings storage facility, a core logging shed, water storage reservoir and water tanks.

The site has electric power from the Mexican power grid, backup diesel generators, and heating from site propane tanks. The overall Project infrastructure is built out and functioning well to support the mine and mill.

18.7 Environmental and Permitting

Based on communications with representatives from Sierra Metals, it does not appear that there are currently any known environmental issues that could materially impact the extraction and beneficiation of mineral resources or reserves. However, given the pre-regulation vintage of the original tailings storage facilities, there is a likelihood that these facilities are not underlain by low-permeability liners, increasing the risk of a long-term liability of metals leaching and groundwater contamination.

18.8 Foreseeable Impacts of Risks

SRK notes that the main risks associated with the mineral resources at Cusi are in areas where historic drilling or poorly surveyed channel sampling data has been used to deter,mine the location and morphology of the vein. It has been demonstrated, where new data juxtaposes old, that there can be material offsets to the projections of the mineralized zones and related structures. This will predominantly affect older areas of Cusi, many of which have already been mined out, although SRK notes this also includes some newer areas where the effect is material on the statement of Mineral Resources.

Ongoing risks associated with the performance of the Mal Paso Mill internal laboratory is difficult to quantify, and is probably not material to the declaration of Mineral Resources beyond the reduction in confidence noted in this report.

The discrepancies between assay results determined by the Mal Paso Laboratory and ALS are significant and an issue particularly in areas where efforts are being made to elevate the level of resource classification to a Indicated or Measured level.

No Mineral Reserves are estimated for the Cusi Mine at this time. SRK is aware that Sierra is aggressively pursuing improvements to the methods and procedures at Cusi for the purpose of improving the current Resource and moving towards a Reserve statement.

19 Recommendations

19.1 Recommended Work Programs and Costs

SRK has the following recommendations for additional work to be performed at the Cusi mine:

- Continue Identifying and drilling areas that are dominantly supported by channel sample data. This should be done at a regular spacing of approximately 25 m.
- SRK recommends continuing with the program of drilling the new zones of high-grade mineralization, resulting in local high-grade Inferred blocks that could theoretically be converted to Indicated or potentially Measured Resources with additional drilling and mapping; these blocks should be prioritized.
- Areas of cross-cutting veins could host high-grade shoots that should be studied in detail.
- Carry out additional investigations including hydrothermal alteration, lithology, structural, lithological and chemical that can provide information to orientate the exploration efforts of Sierra Metals.
- Continue the implementation and improvement of the current QA/QC program and maintain regularity in the rates of insertion of controls including the second lab checks.
- Continue the use of commercial standards for QA/QC monitoring taking into consideration the Ag, Au, Pb and Zn cutoff and average grades of the deposit.
- All analyses supporting a Mineral Resource estimation should be submitted for treatment at an ISO-certified independent laboratory such as ALS Minerals.
- The results of the QA/QC controls sent to the Mal Paso laboratory have shown improvements in the sample preparation and analysis procedures, but this enhancement program should continue.
- Continue the downhole surveys via Reflex or other appropriate survey tool. This is currently being implemented at the mine but has not historically and consistently been the case.
- SRK recommends continuing the practice of using a total station GPS for surveying of drillhole collars and channel sample locations, as well as mine workings. Discrepancies between the precise locations of these three types of data occur regularly where they are closely spaced and reduces confidence in the data.
- A 3D mine survey could be accomplished relatively easily for minimal cost and should be conducted quarterly to determine the volume of mined material to be used in reconciliation processes.
- Develop a simple method of reconciling the resource models to production, using stope shapes and grades derived from channel sampling.
- SRK recommends that Cusi evaluate the maximum head grade the mill is able to receive without compromising the quality of its lead concentrate because of the high presence of zinc

(currently grading at about 9%). Improving selectivity will likely improve the overall lead grade in concentrate that needs to be at 50% Pb or higher to achieve better economic value.

19.2 Costs

SRK notes that the costs for the majority of recommended work are likely to be a part of normal operating budgets which Cusi has as an operating mine. These are cost estimates and would depend on actual contractor costs and scope to be determined by Sierra. SRK notes that the recommendations for metallurgy, mine design, geotechnical studies, or economic analysis are not included in these costs, and that these recommendations solely impact the quality of the mineral resource estimation.

Table 19-1 presents the general estimated cost of the 2021 exploration drilling according to Sierra's objectives which SRK has reviewed and considers appropriate.

Table 19-1: Summary of Costs for Recommended Work

Item	Quantity	Cost (US$)
Drilling (infill)	17,400 m	$1,000.000
Drilling (step out)	17,136 m	$1,490,000

Source: SRK, 2020

Note: The drilling full cost per meter of Sierra Metals is variable according to the drilling objective. Some costs are included in the on-going mine budget.

The total cost estimated for this work is approximately US$2,490,000

20 Acronyms and Abbreviations

The following abbreviations may be used in this report.

Table 20-1: Abbreviations

Abbreviation	Unit or Term
AA	atomic absorption
Ag	silver
Au	gold
AuEq	gold equivalent grade
bhp	brake horsepower
°C	degrees Centigrade
CoG	cut-off grade
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
cfm	cubic feet per minute
°	degree (degrees)
dia.	diameter
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
g	gram
gal	gallon
g/L	gram per litre
g-mol	gram-mole
gpm	gallons per minute
g/t	grams per tonne
ha	Hectares
HDPE	Height Density Polyethylene
hp	Horsepower
ICP	induced couple plasma
ID2	inverse-distance squared
ID3	inverse-distance cubed
kg	Kilograms
km	Kilometre
km^2	square kilometre
koz	thousand troy ounce
kt	thousand tonnes
kt/d	thousand tonnes per day
kt/y	thousand tonnes per year
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour

Abbreviation	Unit or Term
kWh/t	kilowatt-hour per metric tonne
L	Litre
L/sec	litres per second
L/sec/m	litres per second per meter
lb	pound
m	meter
m^2	square meter
m^3	cubic meter
masl	meters above sea level
mg/L	milligrams/liter
mm	Millimetre
mm^2	square millimetre
mm^3	cubic millimetre
Moz	million troy ounces
Mt	million tonnes
MW	million watts
m.y.	million years
NI 43-101	Canadian National Instrument 43-101
OSC	Ontario Securities Commission
oz	troy ounce
%	percent
ppb	parts per billion
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RC	rotary circulation drilling
RoM	Run-of-Mine
RQD	Rock Quality Description
SEC	U.S. Securities & Exchange Commission
sec	second
t	tonne (metric ton) (2,204.6 pounds)
t/h	tonnes per hour
tpd	tonnes per day
t/y	tonnes per year
TSF	tailings storage facility
µm	micron or microns
V	volts
W	watt
XRD	x-ray diffraction
y	year

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