NI 43-101 Technical Report on the Pirquitas Mine,

Jujuy Province, Argentina.

Effective Date December 23, 2011

Prepared by:

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Date and Signature Page

The effective date of this Technical Report, titled "NI 43-101 Technical Report, on the Pirquitas Mine, Jujuy Province, Argentina", is December 23, 2011.

Signed,

"signed and sealed"

Dr. Warwick S. Board, P.Geo.

Dated: December 23, 2011

Signed,

"signed and sealed"

R. Bruce Kennedy, P.E.

Dated: December 23, 2011

Signed,

"signed and sealed"

Trevor J. Yeomans, P.Eng., ACSM

Dated: December 23, 2011

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Definitions

Currency used in this report is in United States dollars. At the time of estimations presented within this report, the average United States dollar exchange rate with the Argentine peso for the six months preceding September 30 2011 was 4.1254 pesos to the dollar. Definitions of terms and acronyms used in this report are listed below:

AAS	atomic absorption spectroscopy
Ag	silver
As	arsenic
Au	gold
Bi	bismuth
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CAD	computer assisted design
cm	centimetres
Cu	copper
dmt	dry metric tonnes
EIR	environmental impact report
g	grams
g/t	grams per tonne
Fe	iron
ha	hectares
IMC	International Mining Consultants
kg	kilograms
kg/h	kilogram/hour
km	kilometres
Km^3	cubic kilometer
Kg/t	kilogram per tonne
lb	pounds
lps	litres per second
m	metres
Ma	million years ago
masl	metres above sea level
MDA	Mine Development Associates

MPI	Mina Pirquitas, Inc.
Moz	million ounces
Mlbs	million pounds
Mt	million tonnes
MW	megawatts
oz	troy ounce
oz/t	ounce per tonne
NI 43-101	Canadian National Instrument 43-101
NSR	net smelter return
Pb	lead
Pirquitas deposit	The rock hosted mineralized body exploited by MPI
pH	acidity
ppm	parts per million
RC	reverse circulation
ROM	run of mine.
RQD	rock quality designation
Sb	antinomy
Sn	tin
Silver Standard	Silver Standard Resources Inc.
t	tonne
t/m^3	tonnes per cubic metre
The Property	All land titles and infrastructure operated by MPI
The Company	Silver Standard Resources Inc.
tpd	tonnes per day
UG	underground
µm	micron
W	tungsten
Zn	zinc
$/t	dollars per tonne

1 Summary

1.1 Property Description and Location

The Pirquitas Mine or the Property, is located in the Puna de Jujeña region of northwestern Argentina, in the Province of Jujuy and is centered at 22 degrees 42 minutes south latitude and 66 degrees 30 minutes west longitude. The Property consists of 50 semi-contiguous exploitation concessions that cover 3,621 ha and surface rights covering 7,502 ha that partially overlie the concession, as further described in Section 4.2.

1.2 Ownership

Silver Standard Resources Inc (Silver Standard) holds a 100% interest in the Property through its wholly-owned Delaware incorporated subsidiary, Mina Pirquitas, Inc., which has registered a branch in Argentina.

1.3 Geology and Mineralization

The Pirquitas deposit, as described in Section 1.4, occurs in the Puna belt, an elevated plateau in the Andean subduction system. Rocks in this belt consist of uplifted and folded Ordovician to Devonian marine meta-sediments overlain by Cretaceous to Middle Miocene continental and marine sediments and volcaniclastics, intruded by mafic to intermediate igneous bodies. This sequence is unconformably overlain by sub-horizontal Late Miocene to Pleistocene andesitic to dacitic lavas and ash-flow deposits.

The Pirquitas deposit is hosted by the Ordovician Acoite Formation, a strongly-folded package of low-grade metamorphosed marine sandstone, siltstone and minor shale beds. These rocks crop out within fault-bounded, probably uplifted structural blocks that occur southwest and east of the mine area. Late Ordovician to Early Devonian compressional tectonism resulted in strong folding of the Paleozoic sedimentary formations with the development of well-defined axial planar cleavage. High-angle thrust faults were also generated during this event. In the area of the mine, the axial planes of the folds strike NS to NNE-SSW and are sub-vertical to moderately inclined.

A major system of sulphide-rich veins cuts the axial surfaces of the folds and the related cleavage fabric at high angles. Two main vein sets are recognized on the Property:

- Vein Set 1
  In the dominant Set 1 veins, vein orientations strike close to 105° and dip steeply either to the south or north. Veins in this set include the Potosí, San Miguel, Chocaya-Oploca, San Pedro, Llallagua, Chicharron and Colquiri veins. The Potosí Vein is the largest known vein on the property, with a strike length of about 500 m and maximum thickness of 2.5 to 3 m. The other veins of this set

more typically have strike lengths of between 50 and 150 m, with average widths of 30 to 50 cm. The larger of these veins, such as the Potosí Vein, include localised matrix supported breccias with angular clasts of quartz-sericite altered wallrock in a matrix of iron and Zn +/- Sn-Ag-Cu sulphides.

- Vein Set 2

  The secondary vein set is represented by the Veta Blanca and Colquechaca veins. These lie north of the Potosi Vein; and trend NW-SE.

The open pit on the Property exploits previously un-mined portions of the Potosí and San Miguel veins in addition to a set of sheeted sulphide veinlets with associated disseminated mineralization.

The Pirquitas deposit is an example of the Ag-Sn sub-group of the epithermal class of mineral deposits (Panteleyev, 1996). Also known as Bolivian-type polymetallic deposits, examples of this deposit type are numerous in the Bolivian Tin Belt that extends between the San Rafael Sn(-Cu) deposit in southern Peru and the Pirquitas deposit in northwestern Argentina.

Bolivian-type Ag-Sn deposits generally consist of sulphide and quartz-sulphide vein systems typically containing cassiterite and a diverse suite of base and trace metals, including silver, in a complex assemblage of sulphide and sulfosalt minerals. The vein systems are generally spatially and likely genetically associated with epizonal (subvolcanic) quartz-bearing peraluminous intrusions one to two kilometres in diameter although the mineralization may be entirely hosted by the country rocks into which the intrusive stocks were emplaced.

At the Pirquitas Mine fracture and breccia-hosted mineralization consists of iron and zinc sulphides with accessory cassiterite (tin oxide) and a large variety of Ag-Sn-Zn(-Pb-Sb-As-Cu-Bi) sulphides and sulfosalts. Crystalline quartz, along with chalcedony in the upper levels of the system, and kaolinite are the main gangue minerals in the veins and mineralized breccias. The main sulphides, specifically pyrite, pyrrhotite, sphalerite and wurtzite, form colloform bands parallel to vein margins, which together with crustiform and drusy vein textures suggest that the mineralization is epithermal in origin. However, mineralogical evidence indicates that the initial temperature of the mineralizing fluids was possibly greater than 400°C, with the deposition of an initial suite of minerals that were later overprinted by the bulk of the silver mineralization which was at lower temperatures, and is indicative of epithermal mineralization.

1.4 **Mineral Resource**

Silver Standard has prepared an updated Mineral Resource estimate for the Property following completion of the recent (2010 to 2011) drilling program, which was conducted as part of the Company's ongoing deposit delineation, production-reserve reconciliation, and mine planning. The Mineral Resource estimate is as of September 30, 2011 and is classified in accordance with CIM (2010) Definition Standards, it forms the basis for the updated Mineral Reserve.

Silver Standard considers the Pirquitas deposit as consisting of the Mining Area, which includes the San Miguel, Potosi, and Oploca Zones, and the Cortaderas Area. The Cortaderas Area consists of the Cortaderas Breccia Zone and the Cortaderas Valley Zone. In order to reflect the geological differences within these areas a total of 5 domains were defined (one for each zone) and the resource was estimated separately within each of these domains using geostatistical estimation techniques applicable to the style of mineralization present in each.

The Mineral Resource estimated for the Pirquitas deposit is presented in Table 1-1 and Table 1-2.

Table 1-1 Mineral Resources Estimate for the Pirquitas Property, as of September 30, 2011

Cut-off Ag (g/t)	Resource Category	Tonnes (Mt)	Ag (g/t)	Zn (%)	Sn (%)	Contained Ag (Moz)	Contained Zn (Mlbs)	Contained Sn (Mlbs)
Resource								
40	Measured	15.3	143.4	0.50	0.23	70.5	167.2	76.9
50	Measured	**13.5**	**156.2**	**0.49**	**0.24**	**68.0**	**144.9**	**72.2**
60	Measured	11.9	169.7	0.48	0.25	65.2	126.1	67.0
40	Indicated	19.3	127.0	0.89	0.19	79.0	380.7	78.9
50	Indicated	**16.3**	**142.3**	**0.91**	**0.20**	**74.6**	**328.4**	**70.3**
60	Indicated	13.9	157.4	0.93	0.21	70.4	283.8	63.1
40	Measured + Indicated	34.6	134.2	0.72	0.20	149.5	548.0	155.8
50	Measured + Indicated	**29.8**	**148.6**	**0.72**	**0.22**	**142.6**	**473.3**	**142.4**
60	Measured + Indicated	25.8	163.1	0.72	0.23	135.5	409.9	130.1
Stockpiles								
[1]See note	Indicated	3.0	78.5	1.50	0.11	7.5	98.1	7.3
Combined Mineral Resource and Stockpiles								
[1]See note	Measured + Indicated	32.8	142.2	0.79	0.21	150.1	571.4	149.7

Notes:

- Reported Mineral Resources are estimated below the as-mined surface as of September 30, 2011, and are presented inclusive of Mineral Reserves.
- The above Mineral Resources are reported at a range of potentially economic silver cut-off grades to demonstrate sensitivity, whilst retaining reasonable prospects for economic extraction (coherent zones of mineralization are retained at each cut-off presented such that pit optimization studies would be able to potentially mine all of the reported mineralization under appropriate mining, economic, socio-economic, environmental, and political conditions).
- Dr. Warwick S. Board, B.Sc. Ph.D P.Geo. is the qualified person for the reported Mineral Resource estimate.
- A cut-off grade of 50 g/t Ag is considered the most appropriate cut-off grade for reporting the Pirquitas Mineral Resources, based on Silver Standard's knowledge of the grade continuity and likely economic extractability of the mineralization within the Pirquitas deposit, experience with its other silver deposits, and the relative value of silver compared to zinc and tin for the Pirquitas deposit. This cut-off grade has not been demonstrated by detailed mine planning and economic studies, and does not take the economics of zinc or tin into account.
- Figures may not total exactly due to rounding.
- [1] Stockpile data based on inclusion of mined material reported above an NSR cut-off of $15.00/tonne, the majority of which is above 50 g/t Ag. NSR cut-off was based on economic parameters used in 2009, including: $11.00/oz Ag, $0.70/lb Zn, $5.00/lb Sn. Silver Standard added the stockpile data above an NSR cut-off of $15.00/tonne to the Measured and Indicated Mineral Resource above a 50 g/t Ag cut-off to provide the final September 30, 2011 Mineral Resource estimate.

Table 1-2 Inferred Mineral Resources Estimate for the Pirquitas Property, as of September 30, 2011

Area	Cut-off Ag (g/t)	Resource Category	Tonnes (Mt)	Ag (g/t)	Zn (%)	Sn (%)	Contained Ag (Moz)	Contained Zn (Mlbs)	Contained Sn (Mlbs)
Mining Area	40	Inferred	0.05	69.7	0.9	0.2	0.1	1.0	0.3
	50		**0.03**	**82.4**	**0.6**	**0.3**	**0.1**	**0.5**	**0.2**
	60		0.02	108.5	0.8	0.3	0.1	0.3	0.1
Cortaderas Breccia Zone	40	Inferred	2.3	139.4	5.1	0.1	10.3	258.6	6.1
	50		**2.0**	**152.0**	**5.4**	**0.1**	**9.9**	**239.3**	**5.8**
	60		1.9	160.6	5.5	0.1	9.6	227.1	5.5
Cortaderas Valley Zone	40	Inferred	7.5	67.4	1.1	0.01	16.2	172.2	1.02
	50		**5.0**	**78.6**	**1.1**	**0.01**	**12.6**	**120.8**	**0.5**
	60		3.6	87.8	1.1	0.00	10.2	89.2	0.4
Total	40	Inferred	9.8	84.2	2.0	0.03	26.6	431.8	7.3
	50		**7.0**	**99.7**	**2.3**	**0.04**	**22.6**	**360.5**	**6.5**
	60		5.5	112.5	2.6	0.05	19.9	316.5	6.0

Notes:

- Mining Area includes San Miguel, Potosí, and Oploca Vein zones.
- Reported Inferred Mineral Resource for Mining Area is estimated below the as-mined surface as of September 30, 2011.
- Reported Inferred Mineral Resource for Cortaderas Breccia and Valley zones is estimated below topography.
- All comments with respect to the selected Ag cut-off grades noted in Table 1-1 apply to Table 1-2.
- Figures may not total exactly due to rounding.

The September 30, 2011 Mineral Resource estimate is based on all data available for the Pirquitas deposit as of the end of September 2011. Silver Standard is unaware of any current environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the September 30, 2011 Mineral Resource estimate. Dr. Warwick S. Board, P.Geo., Senior Resource Geologist at Silver Standard, is the Qualified Person responsible for September 30, 2011 Pirquitas Mineral Resource estimate and relevant sections of this NI 43-101 Technical Report.

1.5 **Mineral Reserve**

The Mineral Reserve was estimated for the Pirquitas Mine as presented in Table 1-3. The estimate was prepared by Andrew Sharp, Vice President, Technical Services for Silver Standard, and approved by the Qualified Persons, R. Bruce Kennedy, P.E. and Trevor J. Yeomans, P.Eng., ACSM,. Trevor Yeomans is the Qualified Person who provided metallurgical parameters incorporated in the Mineral Reserve Estimate.

This is the fifth reported Mineral Reserve prepared for the Pirquitas Mine. The previous reported Mineral Reserve was in 2008 and is summarized in Section 6. Since the 2008 Mineral Reserve estimate was reported:

- Mining and processing has occurred resulting in 2.5 Mt at 230 g/t Ag and 0.72% Zn for 18.6 Moz contained Ag being processed through the plant. This material is not included in the September 30, 2011 Mineral Reserve estimate.
- Exploration drilling was undertaken and detailed grade control information was obtained.
- A new Mineral Resource model was developed.
- A new pit design was completed on the new Mineral Resource model using current cost and pricing knowledge.

The Mineral Reserve estimate for the Pirquitas Mine was estimated using the mined surface at September 30, 2011 and was made using the following assumptions and parameters:

- The Mineral Reserve classification converts Measured Mineral Resource to Proven Mineral Reserve and Indicated Mineral Resource to Probable Mineral Reserve within the pit design. There is no Inferred Mineral Resource within the design.
- The mining recovery was taken as 100% within the pit design.
- The Mineral Resource was not diluted (reconciliation data is provided in Section14.9).
- The Mineral Reserve assumes that mining uses the current Pirquitas Mine mining methods (i.e. that current dilution characteristics, bench heights etc. are applicable for the mine life).
- The cut-off grade assigned was $35.52/tonne NSR and is detailed in Table 15-2 of Section 15.1.
- Unlike the previous Mineral Reserve estimates, tin was not considered to be of current economic benefit.
- The NSR value uses non-linear grade-recovery relationships outlined in Section 15.1.

Table 1-3 Mineral Reserve Estimate for the Pirquitas Property, September 30, 2011.

	Tonnage Mt	**Silver g/t**	**Tin %**	**Zinc %**	**Silver Moz**	**Tin Mlb**	**Zinc Mlb**
Proven	10.4	181.2	0.26	0.52	60.4	59.7	117.9
Probable	5.1	168.9	0.19	1.04	27.6	21.4	117.1
Reserve Stockpiles	1.2	129.2	0.15	1.03	5.0	4.1	27.6
Total	16.7	173.7	0.23	0.71	93.1	85.1	262.5

Notes:

- CIM (2010) Definition Standards were used in the generation of Mineral Reserve estimate classification.
- Mineral Reserve is estimated at a cut-off grade of $35.52/tonne NSR.
- Mineral Reserve is estimated using an average silver price of $25.00 per ounce and an average zinc price of $1.09 per pound (equivalent to $2,403/tonne).
- Figures may not total due to rounding.
- R. Bruce Kennedy, BS (Mining Engineering), P.E. is the Qualified Person for the reported Mineral Reserve estimate.
- Trevor Yeomans, B.Sc. (Mineral Processing), P.Eng. is the Qualified Person who provided metallurgical parameters that were incorporated in the Mineral Reserve estimates.
- Mineral Reserve was estimated using the Measured and Indicated Mineral Resources shown in Table 1-1, excluding the 1.2 Mt Indicated Mineral Resource estimated for the Oploca Vein to contain approximately 8.2 million ounces of silver. The estimated Oploca Vein Mineral Resource lies just beyond the southern limits of the current pit design and therefore is not included in the Mineral Reserve estimate, see Section 15.9.1.
- Mining costs are as per 2011 actual costs, with estimated productivity changes incorporated.
- Mill and general administrative costs were estimated on the basis of 2011 actual costs, incorporating projections to full and stable production.
- The Mineral Reserve is quoted within a pit design that utilizes geotechnical parameters proven from actual performance. The design was created using a geometry guideline from a Lerchs-Grossman algorithm that maximizes the Mineral Reserve cash flow.
- Average open-pit strip ratio of 4.89:1 total:ore was used.
- Metallurgical recovery formulas were applied for silver and zinc concentrates that reflect increasing recovery with increasing head grade. Average metallurgical recovery for silver is 79.8% and for zinc 42.9%.

1.6 **Mining Operations**

The Pirquitas Mine uses a standard open pit mining method, and has a current mining rate of near to 50,000 tpd. The mine undertakes conventional drilling and blasting activities with a pre-split to ensure stable wall rock conditions. RC grade control drilling is used in the pit to define the structurally controlled vein and breccia hosted ore zones.

1.7 **Mineral Processing**

The Pirquitas Mine processing plant consists of primary, secondary and tertiary crushing operations which deliver ore to a stockpile. The maximum crushing circuit throughput is currently 6,000 tpd. Ore is transferred from the stockpile to a pre-concentration system that consists of jigs to upgrade the normal mine grade to a higher grade product.

Wet milling is performed on the feed from the jig plant and can be augmented by a by-pass feed system in the event of jig downtime or milling capacity in excess of jig capacity. The maximum wet milling throughput is currently 4,000 tpd. Mill discharge is pumped through a cyclone system and oversize is fed back into the mill for additional grinding. Fines are fed into a conditioning and reagent addition tank and then flow into the silver flotation circuit.

The tailings from the silver flotation process are routed to a separate conditioning tank and from there flows to the zinc flotation circuit. Tails from the zinc flotation circuit can be directed to the tin circuit or to the tailings thickener, as appropriate.

Tailings are thickened and stored at a permitted facility on-site. A simplified plant flow sheet is presented as Figure 17-1.

1.8 **Environmental Considerations**

MPI holds environmental permits for the Project, these permits are updated biannually and remain valid and in force.

1.9 **Manpower**

At present 504 of the 665 site personnel are sourced from the province of Jujuy. Approximately 218, of the personnel from Jujuy, are sourced from the villages surrounding the mine. There are 8 non-Argentine employees in technical roles. Employees not living in their respective villages are accommodated in an on-site camp and work overlapping rosters.

1.10 **Conclusions and Recommendations**

An updated Mineral Resource estimate was prepared for the Pirquitas deposit, following the completion of Silver Standard's recent 2011 drilling program. The Mineral Resource estimate is based on drilling and underground sampling data of acceptable quality from a series of drilling and sampling programs conducted between 1996 and 2011. A combination of non-linear (Single and Multiple Indicator Kriging) and linear (Ordinary Kriging) estimation techniques was used to model the complex polymetallic mineralization hosted in the deposit.

This Technical Report includes all new drilling and assay information (available as of September 30, 2011). This Technical Report also represents the most recent interpretation of the Mineral Reserve available at the effective date of this report. The Mineral Resource and Mineral Reserve estimates generated from this new information are presented in Table 1-1, Table 1-2, and Table 1-3. The conversion of Mineral Resource to Mineral Reserve was made using industry recognized methods, actual operational costs, capital costs, and plant performance data. Thus, it is considered to be representative of actual operational conditions.

This Technical Report has been prepared with the latest information regarding environmental and closure cost requirements and has indicated that future work is in-progress in this regard.

In recognition of Silver Standard's ongoing commitment to Mineral Resource and Mineral Reserve development, metal production, and cost control, whilst maintaining a high standard of social benefit and environmental compliance, the authors of this technical report recommended the following:

- Additional exploration and resource delineation drilling be conducted on the Pirquitas Property in 2012. Silver Standard has proposed a surface drilling program of approximately 15,000 m on exploration targets peripheral to the open pit, with an additional 3,000 m of diamond drilling from underground workings on the Oploca-Chocaya Vein system. The proposed budget to cover these work programs is estimated at $5.6 million.
- Geophysical surveys be undertaken to refine exploration drill targets. Specific geophysical programs are planned for 2012.
- A conditional simulation study be undertaken on the Pirquitas deposit to facilitate a risk assessment of Mineral Resources. Post-processing options available subsequent to such a study can greatly assist in mine planning and scheduling.
- Investigations into the reduction of mining and processing costs be commenced. Silver Standard expects that specific targets for cost control will be identified within the first half of 2012.
- Conducting a trade-off study between underground operations and an expanded open pit over the next two years.
- In addition to optimizing the existing silver and zinc recovery processes, it has been recommended that investigations be made into the recovery of tin from the Pirquitas ore.
- Investigations into the application of dry stack tailings and coincident recovery and reuse of the extracted water should continue.

- The results from the ongoing environmental studies, which are anticipated in 2012, should be incorporated into mine closure plans so as to minimize future closure costs.

2 Introduction

Silver Standard Resources Inc. ("Silver Standard" or "the Company") has prepared this Technical Report on the Pirquitas Mine (the "Property"), their 100% owned property in Jujuy Province, Argentina in order to fulfill their obligation to file a technical report in accordance with Section 4.2 (1)(j)(ii) of Canadian National Instrument 43-101 "Standards of Disclosure for Mineral Projects" ("NI 43-101"). The obligation to file the current Technical Report was triggered by Silver Standard's public disclosure of a reduction to its Mineral Resource and Reserve at the Pirquitas Mine on November 9 2011. This report was prepared by Qualified Persons employed by Silver Standard. The Company fulfills the requirements of a producing issuer as defined in NI 43-101

Silver Standard is a Canadian-based mining, development and exploration company, with a pipeline of projects ranging from grassroots exploration to production in Argentina, Peru, Mexico, Canada, Chile, and the United States. Silver Standard's shares are listed on the Toronto Stock Exchange under the symbol SSO and on the NASDAQ Global Market under the symbol SSRI.

The principal metals of interest at Pirquitas are silver, zinc and tin. In September 2011 Silver Standard prepared a Mineral Resource and Mineral Reserve Estimate for the Pirquitas Project, compliant with the guidelines set out by the CIM (2010). This document is written in accordance with the NI 43-101 and is suitable for filing with Canadian Securities Commissions.

This Technical Report references historical reports and the work of Hazen Research Inc. (1996, 1998 a, b, c and 1999), Dawson Metallurgical Laboratories Inc. (Dawson 1997,1998 and 1999), Colorado Minerals Research Institute (CMRI 1998), Knight Piésold LLC (1998), The Winters Company (TWC 1999), Jacobs Engineering Group, Inc, (Jacobs 1999 and 2000), Behre Dolbear, (1999), H.M. Hamilton Associates Inc, (2005), Mine Development Associates (MDA 1999, 2002, 2003 and 2004) Hatch Engineering and MDA 2006 (Hatch and MDA a, b and c), BGC Engineering (BGC 2010), EPCM Consultores SRL, (2010 a and b), G&T Metallurgical Services Ltd, (2011) and Met-Solve Laboratories Inc., (Metsolve 2011), as well as certain reports, opinions and statements of lawyers and other experts as discussed in Section 3. All expert reports are clearly referenced in Section 27.

The sample information used to develop the Mineral Resources estimate and for metallurgical testwork was collected over a number of years and includes that information compiled by the previous owners of Pirquitas; the Sunshine Mining and Refining Company (Sunshine), through its wholly-owned Argentine branch Sunshine Argentina Inc. with a branch office registered in Argentina ("Sunshine Argentina") as well as sample information acquired by Silver Standard personnel.

Table 2-1 Qualified Person Responsible for Each Section of the Technical Report.

Author	**Responsible for Sections**
Dr. Warwick S. Board	1: Summary; 2: Introduction; 3: Reliance on Other Experts; 4: Property Description and Location; 5: Physiography, Climate, Access, Local Resources, and Infrastructure; 6: History; 7: Geological Setting and Mineralization; 8: Deposit Types; 9: Exploration; 10: Drilling; 11: Sample Preparation, Analysis and Security; 12: Data Verification; 14: Mineral Resource Estimates; 23: Adjacent Properties; 25: Interpretations and Conclusions; 26: Recommendations; 27: References
R. Bruce Kennedy	1: Summary; 2: Introduction; 3: Reliance on Other Experts; 4. Property Description and Location;15: Mineral Reserve Estimates; 16: Mining Methods; 18: Project Infrastructure; 19: Markets and Contracts; 20: Environmental Studies, Permitting and Social or Community impact; 21: Capital and Operating Costs; 22: Economic Analysis; 24: Other Relevant Data and Information; 25: Interpretations and Conclusions; 26: Recommendations; 27: References
Trevor J. Yeomans	1: Summary; 2: Introduction; 3: Reliance on Other Experts; 13: Metallurgical Processing and Metallurgical Testwork; 17: Recovery Methods: 25: Interpretations and Conclusions; 26: Recommendations; 27: References

The Mineral Resource estimate was prepared by Dr. Warwick Board P.Geo. and the Mineral Reserve estimate was prepared under the supervision of R. Bruce Kennedy, P.E. Dr. Board visited the site on three occasions for a total of eleven days on site, most recently in October 2011 for three days and Mr. Bruce Kennedy, P.E. is the General Manager for the Pirquitas Mine. Sections pertaining to metallurgical testwork and recovery were prepared by Mr. Trevor Yeomans, P.Eng. Mr. Yeomans visited the Project on four occasions for a total of 29 days on site, most recently in December 2011 for four days.

3 Reliance on Other Experts

In preparing this report, Silver Standard has partly relied upon the opinions and reports of consultants as well as certain reports, opinions and statements of lawyers and other experts. These reports, opinions and statements, the makers of each such report, opinion or statement and the extent of reliance are described below. Silver Standard considers the reliance on other experts, as described in this section as being reasonable based on their knowledge, experience and qualifications.

3.1 Legal

For matters related to title to the property and related property rights, Silver Standard has relied on the opinions of Estudio Randlel Abogados and Estudio Gamez each Argentine law firms retained by Silver Standard (see Section 4.4.1).

3.2 Metallurgical Testing

Most of the metallurgical testwork performed on the Project was undertaken from 1996 to 1999, with samples collected by and for Sunshine Argentina and testwork was undertaken by various respected research organizations. Their work was summarized in a Feasibility Report by Jacobs (1999) and by Hatch and MDA (2006a). The metallurgical reports were prepared by Dawson (1997, 1998 a,b,c,d and 1999), CMRI (1998), Hazen. (1999), and Hamilton and Associates Inc., (2005), reference details are provided in Section 27. Silver Standard has relied wholly on the information in these reports for Section 13.1.

Metallurgical testwork and reports were prepared for Silver Standard by EPCM Consultores SRL (2010), Silver Standard has relied on the testwork results in these reports for information from which the discussion in Section 13.2 was derived.

3.3 **Environmental and Tailings**

An EIR was completed by Knight Piésold in 1998 and environmental permits were granted to MPI. Environmental Impact Studies are required biannually and remain valid and in force. The last update which was prepared by BGC Engineering (2010) was submitted in 2010. It fulfills requirements for community consultation as brought about by a May 6, 2010 decree (N° 5.772) to the Argentine National Law for the Environment for Mining Activity N° 24.585. The site is currently engaged in studies in support of the anticipated 2012 update.

Silver Standard has relied partly on the information in the Knight Piésold and BGC Engineering reports for Section 4.6 and Section 20.1. Tailings are currently stored in a permitted and lined surface tailings storage facility that consists of a dam with successive lifts. The tailings dam design is performed by the engineering contractor, Ausenco Vector Engineering, they have verified that work done on the Property meets or exceed the design requirements of the seismic zone and have had other design inputs.

4 Property Description and Location

4.1 Property Location

The Pirquitas Mine and Property are located in the Puna de Jujeña region of the Rinconada Department in the Province of Jujuy, Northwestern Argentina (). The property is centered at 22 degrees 42 minutes south latitude and 66 degrees 30 minutes west longitude. The city of San Salvador de Jujuy, (Jujuy) the provincial capital, is located approximately 335 km southeast of the property (Figure 4-2). The property is characterized by sparsely vegetated, mountainous terrain at elevations of between 4,000 and 4,450 masl.

Figure 4-1 Map of Argentina Showing the Location of the Pirquitas Property.

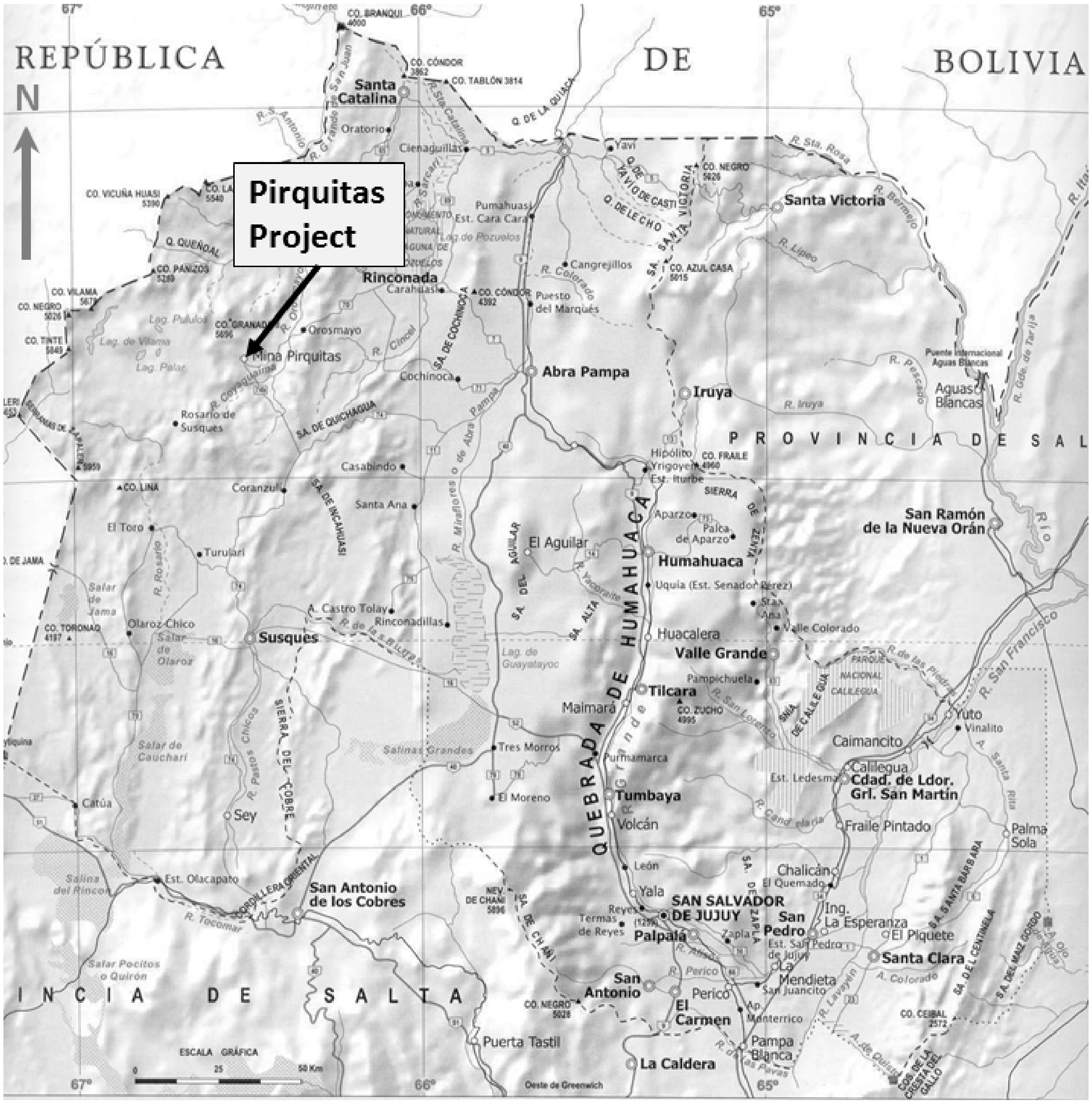


Figure 4-2 Map of the Province of Jujuy, Argentina Showing the Location of the Pirquitas Property. Source Silver Standard, 2011.

4.2 Land Tenure

The Pirquitas Property is defined as the group of mining concessions and the surface rights that partially overlie the mining concessions which are displayed in Figure 4-3 and presented in Table 4-1.

MPI has also applied for a single exploration concession that adjoins the mining concessions. The area covered by the mining concessions totals 3,621 ha. The total area of the surface rights property is 7,502 ha. The property rights to the Pirquitas Mine are described in the following Sections, with detailed information provided in the accompanying tables.

4.2.1 Exploitation Concessions

The core of the Pirquitas Property comprises 50 semi-contiguous exploitation concessions. Exploitation concessions in Argentina are called minas (or mines), and one or more minas can be grouped together to form a grupo minero (or group of mines), as described below. MPI has also applied, but not yet received registration, for one additional mina (Enrique Dionisi).

A mina is comprised of one or more pertenencias, which are the basic units of mining properties in Argentina. Pertenencias must be rectangular in shape and for lode (i.e. vein) deposits can have boundaries no greater than 200 m by 300 m for a maximum area of 6 ha. Pertenencias that are claimed over deposits of disseminated mineralization in the first category (which includes Ag, Zn and Sn) are allowed to cover up to 100 ha. Under Argentine mining law, such concessions are considered ‘real property’ and give the concessionaire the rights to recover pre-determined metals from the subsurface vertically underneath the concession for an unlimited period of time provided an annual fee or canon is paid in the amount of ARS $80 per 100 ha for disseminated mineralization and ARS $500 per lode deposit. The owner or owners of adjacent minas may choose to consolidate them into a group of minas. Each mina within a group of minas is still subject to the same obligations as are the individual minas within the group, namely the annual payment of canons. Listed in Table 4-1 and shown on Figure 4-3 are the 48 minas and two groups of minas having a combined area of 3,621 ha and the one mina that MPI has under application.

4.2.2 Exploration Concession

MPI, has applied for a single mineral exploration concession, known in Argentina as a *cateo*, which adjoins the southern boundary of the main group of minas forming the Pirquitas mining property. A cateo is an exploration lease that allows individuals or companies to explore for various minerals. Each cateo comes with the exclusive right of being converted into a mina once a mineral discovery has been made. Cateos are subject to a one-time payment or *canon* of ARS $400 per 500 ha and are generally reduced in size over time if a discovery is not made. The time period for the valid existence of a cateo can range from 150 days to a maximum of 1,100 days depending on the size of the cateo. The boundaries of cateos are defined by corner points that are assigned survey coordinates. To maintain a cateo, the holder must also present to the mining authority a minimum exploration work program and schedule. The cateo subject to application has the docket number 701-S-2007 and covers an area of 1,658 ha. MPI has no reason to believe that the cateo will not be registered. The cateo with the docket number 701-S-2007 is presented on the property tenure map Figure 4-3.

4.3 Surface Rights Property

Silver Standard owns the surface rights to a group of nine contiguous land parcels that together partially overlie the block of exploitation concessions and the exploration concession that the Company has applied for on the Pirquitas mining property Figure 4-3. These land parcels (listed in Table 4-2) which cover a total area of 7,502 ha, were purchased so that the Pirquitas Mine could erect mine buildings, an ore processing plant and other infrastructure to support a mining operation as well as for waste rock and mine tailings disposal sites.

4.4 Obligations and Property Expiration Dates

Under Argentine mining law, such concessions are considered ‘real property’ and give the concessionaire the rights to recover pre-determined metals from the subsurface vertically underneath the concession for an unlimited period of time provided an annual fee or canon is paid in the amount of ARS $80 per 100 ha for disseminated mineralization and ARS $500 per lode deposit. MPI is up to date in the payment of these fees. As such there is no expiration date on the mining claims held by MPI.

MPI is the freehold title holder of the area covered by surface rights.

MPI does not currently hold an exploration lease in or adjacent to the Pirquitas Mine area shown in Figure 4-3. An application for an exploration lease (cateo 701-S-207) has been submitted and is pending registration.

Table 4-1 List of Mining Claims Forming the Pirquitas Property. Source MPI 2011.

231-B-1936	San Marcos	Ag Sn Zn Aluv	2	1	10
256-B-1936	San Pablo	Ag Sn Zn	1	6	36
284-B-1937	General Urquiza	Ag Sn Zn	1	6	36
287-B-1937	Pampa	Ag Sn Zn	1	4	24
288-B-1937					
494-S-1974	Ramírez de Velazco	Ag Sn Zn	1	6	36
313-B-1938	Galvani	Ag Sn Zn	1	6	36
315-B-1938	Volta	Ag Sn Zn	1	6	36
158-C-1993	Antigua	Ag Sn Zn Aluv	2	3	30
248-C-1937	Gorriti	Ag Sn Zn	1	6	36
211-G-1935	María Cristina	Ag Sn Zn	1	6	36
212-G-1935	Blanca Fany	Ag Sn Zn	1	6	36
276-G-1937					
830-P-1977	Zegada	Ag Sn Zn	1	6	36
65-L-1934	Roma	Ag Sn Zn Aluv	2	5	50
66-L-1934					
812-P-1977	Varsovia	Ag Sn Zn Aluv	2	5	50
67-L-1934	Londres	Ag Sn Zn Aluv	2	5	50
68-L-1934	Buenos Aires	Ag Sn Zn Aluv	2	5	50
69-L-1934	Argentina	Ag Sn Zn Aluv	2	5	45
74-L-1934					
1269-D-1977	Rosario	Ag Sn Zn Aluv	2	5	50
80-L-1935					
1269-D-1977	La Cueva	Ag Sn Zn	1	6	36
92-L-1936	San Mateo	Ag Sn Zn	1	6	36
93-L-1936	San Santiago	Ag Sn Zn	1	6	36
94-L-1937	Gral. San Martín	Ag Sn Zn	1	6	36
95-L-1937	Gral. Belgrano	Ag Sn Zn	1	6	36
96-L-1937	Gral. Lavalle	Ag Sn Zn	1	6	36
97-L-1937	9 de Julio	Ag Sn Zn	1	6	36
98-L-1937	12 de Octubre	Ag Sn Zn	1	6	36
99-L-1937	18 de Noviembre	Ag Sn Zn	1	6	36
87-L-1935					
389-J-1986	Santa Ana	Ag Sn Zn	1	6	36
100-L-1937	23 de Agosto	Ag Sn Zn	1	6	36
101-L-1937	25 de Mayo	Ag Sn Zn	1	6	36
102-L-1937	1º de Mayo	Ag Sn Zn	1	6	36
99-P-1929	Cabalonga	Ag Sn Zn Aluv	1	5	30
145-P-1932					
393-J-1986	Pirquitas	Ag Sn Zn	1	7	42
201-P-1934	Galán	Ag Sn Zn Aluv	2	5	50
319-P-1936	Potosí	Ag Sn Zn	1	6	36
320-P-1936	Bolivia	Ag Sn Zn	1	6	36
321-P-1936	Oruro	Ag Sn Zn	1	6	36
324-P-1936	Los Andes	Ag Sn Zn	1	6	36
325-P-1936	La Paz	Ag Sn Zn	1	6	36
329-P-1936					
390-J-1986	Nueva Granada	Ag Sn Zn	1	6	36
334-P-1936	Santa Cruz	Ag Sn Zn	1	6	36
476-P-1945					
412-J-1987	San Lucas	Ag Sn Zn	1	3	18
486-S-1973	Grupo Minero San Migue	Ag Sn Zn	1	96	576
501-S-1974	Grupo Minero Rinconad	Ag Sn Zn Aluv	2	43	430
195-V-1945					
391-J-1986	Orosmayo	Ag Sn Zn Aluv	2	3	30
050-S-2.000	Jack Planta	Ag Sn Zn	1	4	444
051-S-2.000	Nancy Norte	Ag Sn Zn	1	4	416
054-S-2.000	Cinthya Centro	Ag Sn Zn	1	3	122
525-S-1977	Enrique Dionisi #	Ag Sn Zn Aluv			
* Superseded lot number replaced by number below			# Lease in Application		
	Category 1 = Hard Rock Lease 2 = Aluvial Lease				

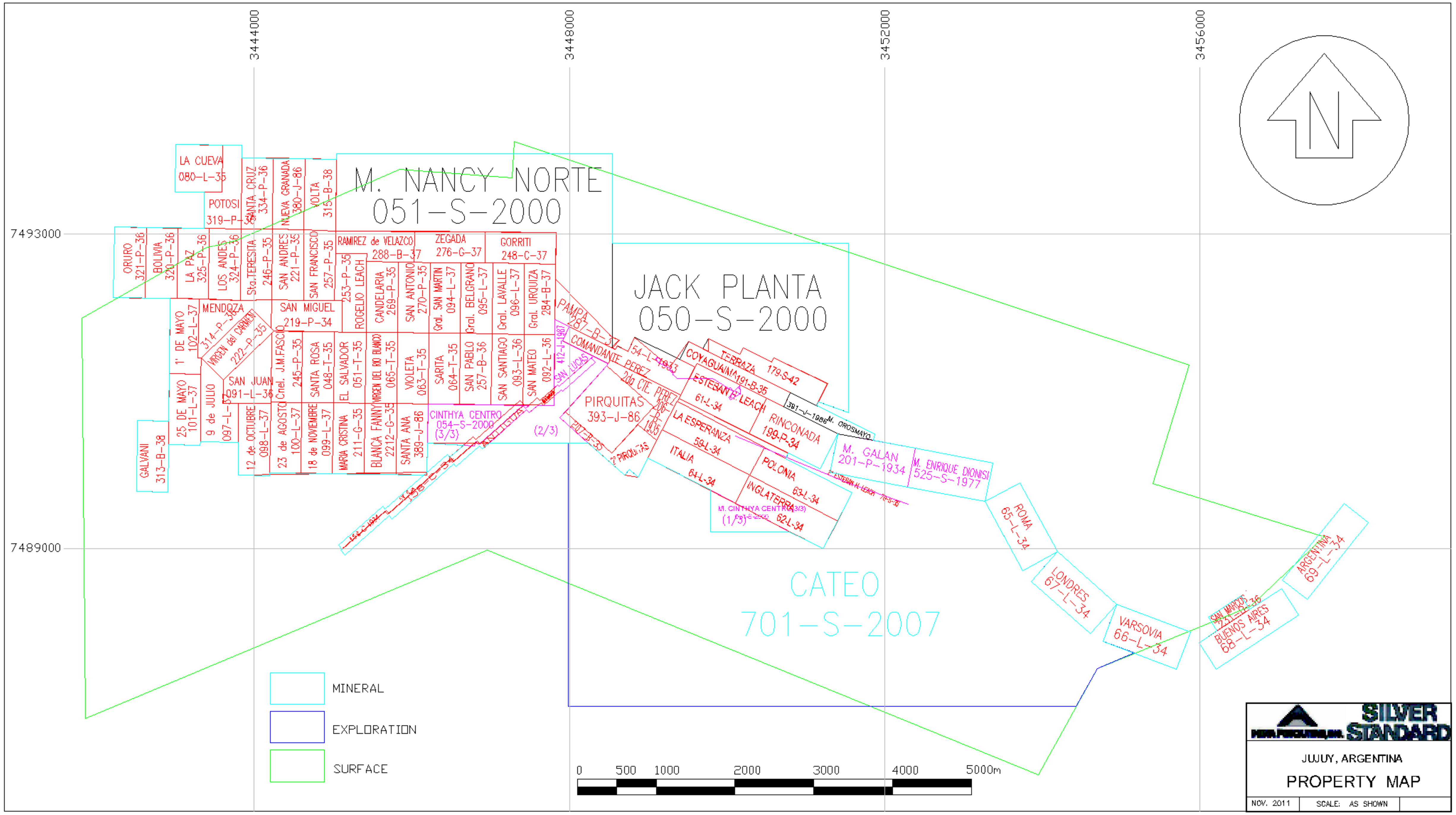


Figure 4-3 Locations of the Mining, Exploration and Surface Rights Properties that Constitute the Pirquitas Property

Note: Grid Co-ordinate System: Gaus Kuger. Source MPI (2011). Notes The exploration property 701-S-207 and one non-material mining lease Enrique Dionisi 525-S-1977 included on Figure 4.3 are under application. Silver Standard expects that the claims will be granted.

Table 4-2 Surface Rights Property, Pirquitas Mine

Parcel No.	Registration No.	Area (ha)
531	L-1111	1,000.1
532	L-1112	1,000.0
533	L-1113	750.0
534	L-1114	749.6
535	L-1115	1,000.0
536	L-1116	1,000.0
537	L-1117	1,005.7
538	L-1118	496.0
539	L-1119	500.1
Total		7,501.5

4.4.1 Legal Title

Silver Standard obtained a legal opinion on the titles of the exploitation concessions, i.e. its Pirquitas mining property, (defined in the opinion as “Pirquitas”), from the Jujuy-based law firm of Estudio Gamez, with offices at Pje. Charcas number 1041, San Salvador de Jujuy, 4600, Jujuy Argentina. The firm’s legal opinion, dated December 6, 2011, stated the following:

“Therefore, in accordance with the above mentioned considerations and qualifications, and to the best of my knowledge, MPI has ownership of Pirquitas, which grants MPI the legal, right under Argentine law to:

a) occupy and enter Pirquitas for purposes related to mining,
b) build new facilities on Pirquitas,
c) use and exploit Pirquitas,
d) extract ore from Pirquitas,
e) refurbish old and build new ore processing and other facilities on Pirquitas,
f) process ore into metal,
g) engage in any process necessary for the concentrate produced at Pirquitas to be ready for sale, and
h) sell the concentrate produced at Pirquitas.”

4.5 Operating Permits, Taxes and Royalties

The original Feasibility Study to operate an open-pit mine at Pirquitas was submitted by Sunshine Argentina (now MPI) in early 1999 to the Argentine Ministry of Mines and Energy. With approval of the study in July of that year, Sunshine was granted all permits necessary for construction, development and operation of the Pirquitas open-pit mine. At the time of writing this report, all permits necessary for the existing defined Mineral Reserves of the Pirquitas Mine are in place.

The Piquitas Mine also holds Permit No. 201/002, giving it the rights to withdraw a total of 32 litres of water per second from the Pirquitas, Collahuaima, and Porvenir rivers. These water rights were granted by the Dirección Provincial de Recursos Hidricos de

Jujuy and were recorded by the Ministerio de Obras y Servicios Publicos on July 23, 1998.

On approval of the Feasibility Study by the Ministry of Mines and Energy, Sunshine Argentina was issued a Memorandum of Understanding in 1999, effective April 28, 1998, which states that the company is entitled to the benefits of Fiscal Stability, under the Mining Investment Law, whereby the annual income tax rate for the project would be set at approximately 33% of net income for the mine. As a result of MPI being a Delaware-incorporated company that operates as a branch in Argentina, the company is also subject to US income tax, which is currently at a rate of 35%. Foreign tax credits in the US are available to offset the majority of taxes paid in Argentina.

In December 2007 the National Customs Authority of Argentina levied an export duty of approximately 10% on concentrates for projects with fiscal stability agreements predating 2002. The Company has been advised that Pirquitas is subject to this export duty despite contrary rights detailed under the 1998 fiscal stability agreement. The legality of the export duty has been challenged and is currently under review by the court in Argentina. In July 2010, the Company filed a claim in the provincial court for repayment of export duties paid on silver concentrate sales, and for an order to cease payment of the export duties payable on future silver concentrate sales until the legality of the export duty is decided by the court. An order was granted effective September 29, 2010 to cease payment of the export duties payable on future silver concentrate sales pending the decision of the courts on the legality of the export duty; and in April 2011 a government appeal against this order was denied. The Company continues to pay export duties on zinc concentrate sales, as taxes payable on revenue generated from zinc production is not subject to the fiscal stability agreement. Silver and zinc concentrates produced at the mine are also subject to a maximum 3% “mouth of mine value” royalty that is payable to the Province of Jujuy. This royalty payment is based on the net recoverable value of the contained metals less certain operating costs, depreciation and depletion.

As the Pirquitas Mine is in operation and subject to income tax, the value added tax (VAT) that was paid on construction expenditures and is payable on operational expenditures is now recoverable from the national taxation office. The process to recover the VAT paid from the federal government is underway and MPI anticipates recovering the full amount.

On October 26, 2011, the Argentina government announced a decree that requires all funds from export sales to be repatriated to Argentina and converted into Argentine pesos within the Sole Foreign Exchange Market in Argentina. The Argentine pesos can then be exchanged back into the original currency, again through the Sole Foreign Exchange Market. Each transfer is subject to a 0.6% transfer tax. Although the fiscal stability agreement includes stability over foreign exchange controls, the government has removed such benefits.

MPI may also be subject to withholding tax in Argentina at a rate of 35% on any repayment of interest on loans back to the U.S.A.

4.6 Environmental Liabilities

Consulting engineering firm Knight Piésold LLC was commissioned in April 1998 to complete an EIR for Sunshine Argentina which it presented to the company in December 1998. In this EIR, potential environmental problems that existed at the time as well as foreseeable potential effects that development of the project could have on the surrounding environment were described and evaluated. The scope of the EIR was commensurate with the norms for environmental protection associated with Law 24.585 of the Argentine Mining Code (November, 1995) and with guidelines established by international lending institutions such as the World Bank. The following discussion is either paraphrased or taken directly from Knight Piésold's (1998) report.

The Pirquitas Project area is known to be a suitable habitat for 26 animal species and one plant species that are considered to be protected species in Argentina. Of these 26 species, the plant Yareta, two mammals (Vicuña and Mountain Vizcacha) and seven birds (Lesser Rhea, Puna Tinamou, Andean Flamingo, Puna Flamingo, Andean Condor, Puna Ground Tyrant, and Chestnut Canastero) are known to inhabit the area of the mine. None of the 'protected' species observed on the property are listed as *Threatened* or *Endangered* in Argentina.

Remnants of historic mining activities at Pirquitas included derelict buildings, mine structures as well as tin-silver jig tailings and tin placer tailings along the Río Pircas. Flotation tailings had been discharged into the Río Pircas and scattered piles of gold placer tailings were left about 150 m above the current level of the Río Pircas on paleo-river terraces to the south of the central mine camp. These areas comprise some 107 ha of surface disturbance that existed prior to Sunshine Argentina's acquisition of the property, some of which are now associated with acid rock drainage into the Pircas River watershed.

Surface and ground waters are known to be acidic and metalliferous down gradient from the historic mines above the Río Pircas canyon at Tres Placas which is located approximately 1.5km downstream from the Pirquitas Mine open pit. As well, acidic and metalliferous ground water is present in the abandoned underground workings and in some natural springs in the area, suggesting that natural oxidation of sulphide mineralization which is widespread in the rocks found on the property is also contributing to background surface water contamination.

When it acquired the Pirquitas mining property, Sunshine Argentina made note of the fact that documents in the bankruptcy auction files did not mention environmental liabilities against the property, but did mention that Sunshine was "grandfathered" against environmental liabilities related to historic mining activities. Furthermore, the only condition the Ministry of Mines and Energy applied to its approval of Sunshine's EIR, apart from the mandatory two-year update to the report, was the requirement that water quality monitoring be carried out.

In 2008, a second EIR was completed by Knight Piésold (2008) following start-up of mining activities and initiation of plant construction. While there were no observations or restrictions placed on the company at that time, this study began a focus on the water management plan and on conceptual plans for mine waste stockpiles. A conceptual water treatment plant, for neutralization of acid waters was anticipated with a treatment capacity estimated to be as much as 150 litres per second.

The most recent Environmental Impact Assessment update for the Pirquitas mining operation was undertaken by BGC Engineering and submitted to the appropriate government agency in November 2010. This report was compliant with the Argentine National Law for the Environment for Mining Activity, N°24.585 (November 1995). This report expanded the water management focus but did not result in a design of the water treatment plant.

MPI has initiated engineering studies for the design of water management structures and for mine closure design to be included in the next update. An environmental update report will be issued by the Pirquitas Mine in 2012.

Argentina currently has no specific mine closure legislation or requirements. MPI is currently anticipating that the eventual requirements will be similar to those used in Peru and that closure options will have to be proposed that may include passive or active neutralization features to return water to baseline conditions (acidic at the time of baseline studies) and have some monitoring requirements.

4.7 Other Significant Factors and Risks

There are no other known significant risks that may affect access, title or the right or ability to perform mining-related work on the property.

5 Physiography, Climate, Access, Local Resources and Infrastructure

5.1 Physiography, Climate and Vegetation

The terrain of the Pirquitas Property area is rugged and steep, typical of the central Andean *Altiplano* which in Argentina is referred to as the *Puna*. Elevations on the property range from about 4,000 to 4,450 masl, and some 20 km to the north is the extinct volcano of Cerro Granada which peaks at 5,696 masl. Patchy to sparse shrub and grass vegetation cover the slopes surrounding the mine and provide habitat for a few mammals, including vicuña, puna fox and the vizcacha, as well as more than 50 species of birds.

The processing plant, tailings impoundment and main workers camp are located in the eastern third of the property in an area of relatively open ground that lies at an elevation of 4,100 masl. The San Miguel open pit is situated about seven km west of the mill, and since mining began in 2009 waste rock is stockpiled in nearby, relatively steep drainage valleys to the north and northwest of the pit (Figure 5-1).

The climate of the area is typical for the Puna region: below-freezing, dry and often windy conditions prevail during winter months (June to August), with moderate temperatures and occasional rains typifying the rest of the year. Annual precipitation averages about 260 mm with most of this falling during the months of December to February. Average humidity levels are typically 40-50%.

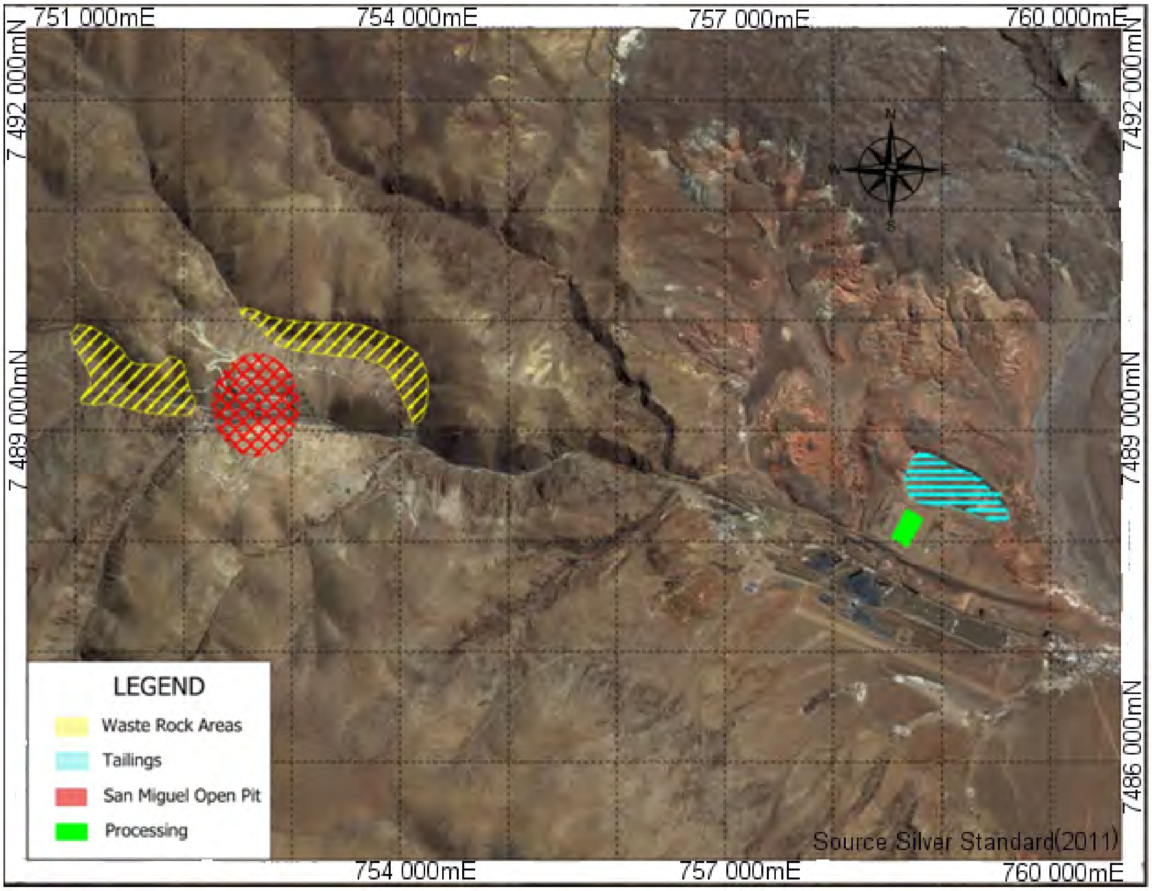


Figure 5-1 IKONOS Satellite Image (2007) of the Pirquitas Mine Area Showing Areas Affected by Mining.

Note: Grid coordinates in UTM Zone 19S (WGS84 datum) system.

5.2 **Access**

There are two main access routes to the Pirquitas Mine from the provincial capital of San Salvador de Jujuy. Heavy transport vehicles generally follow Highway 9 northwards from Jujuy to Purmamarca, then turn to the northwest on paved road No.52 and then turn onto gravel road No.16 heading to the town of Susques. From there gravel roads No. 74 and No. 74b are followed northwards to the mine (refer to Figure 4-2). This trip takes approximately five hours. Trucks hauling silver concentrate from the mine pass through Susques then to the west to the Argentina-Chile border at Paso de Jama from where they pass through northern Chile to the port city of Antofagasta. The zinc concentrate is shipped to Arica which is located approximately 600 km to the north of Antofagasta in Chile The second route to Pirquitas from Jujuy follows Highway 9 northwards along the Humahuaca Valley to the town of Abra Pampa. From there, gravel roads Nos. 7

and 70 continue westwards to the mine site, passing south of the nature reserve at Laguna Pozuelos. About five hours are required for this trip.

5.3 Local Resources and Infrastructure

The nearest community to the mine is the village of Nuevo Pirquitas which is located approximately 10 km from the mill site. This small community has a population of approximately 200 people, with many of the adults employed at the mine. Prior to start-up of operations at Pirquitas, the villagers were almost entirely dependent on animal husbandry (sheep and llamas). The small towns of Susques and Abra Pampa, both situated approximately 2.5 hours by road from Pirquitas, provide some very basic amenities, but almost all supplies for the mine come through the city of Jujuy, (population of 280,000), which has an airport with daily commercial air service to Buenos Aires.

For its source of electricity, Pirquitas Mine uses natural gas to power 3 Wärtsila generator sets, each with a capacity of 5 MW per hour. In addition, the same electrical plant has 3 diesel-powered Cummins generators, each yielding 1.1 MW per hour. To bring the natural gas to the plant it was necessary to construct 36.7 km of pipeline from the Trans-Andean Natural Gas Pipeline system which required easements and right of ways and other agreements with communities and land owners. There is 6.65 km of gas pipeline on the Pirquitas Property. The pipeline is 6" diameter, constructed of API5L Grade B steel with 4.8 mm wall thickness in normal applications and 7.1 mm wall thickness at river or drainage crossings.

Water supply for the mine comes from the northwards flowing Collahuaima River which lies immediately east of the property. Water is pumped to the mill from a site known as San Marcos which is located within the Property a short distance downstream from where the Pirquitas River drains into the Collahuaima River. By means of Permit No. 201/002, originally granted to Sunshine Argentina by the Dirección Provincial de Recursos Hidricos de Jujuy and recorded by the Ministerio de Obras y Servicios Publicos on July 23, 1998, the mine is allowed to draw up to 32 lps of water from the river.

Approximately 76% of employees at the mine come from population centers in the Province of Jujuy. Except for those workers living in Nuevo Pirquitas, the majority of employees (~70%) are accommodated at the mine camp typically for periods of between 8 to 10 days. There are 8 non-Argentine employees at the mine.

MPI owns sufficient surface rights for purposes of the current mining operation, including tailings dam and waste rock disposal areas. The processing plant and tailings dam are permitted and operational.

6 History

6.1 General Area History

The Orosmayo River drainage, including the Collahuaima River that passes east of the property, was prospected for placer gold in the early 1930's when economic quantities of cassiterite were discovered in the gravel deposits of the Pircas River, east of the old town of Pirquitas. These tin placers were dredged between 1933 and 1949. A few years after the alluvial tin deposits began to be exploited, the bedrock source of the cassiterite was discovered further up the valley of the Pircas River and by 1936 a number of silver and tin lode deposits were being mined from small underground workings. Over the next half century, as many as twelve mines operated in the camp, making Pirquitas the largest historical producer of tin and silver in Argentina. The main mines were the San Miguel, Chocaya, Llallagua and Potosí. It has been estimated that 777,600 kg of silver and 18,200 t of tin were recovered from the vein systems, with another 9,100 t of tin coming from the placer deposits.

6.2 Sunshine Argentina

The Argentine branch of Sunshine Mining and Refining Company acquired the Pirquitas mining concessions through a bankruptcy auction proceeding in November 1995 that was duly carried out under the pertaining rules set forth by the Procedure Code of the Auction. Sunshine paid a total purchase amount of $1,720,000, executed the Deed and had it duly registered before the Registro Inmobiliaro de Jujuy and the Escribania de Minas de Jujuy as required by Argentine law. Having met all the rules set forth by the Court at the time, Sunshine was granted valid ownership of all the mining titles constituting the Pirquitas Property.

In the years following its acquisition of Pirquitas, Sunshine Argentina carried out comprehensive mineral exploration on the property, including geological mapping, geophysical surveying (44 line-km of ground magnetics and 19.2 line-km of induced polarization surveying), underground rock sampling and multiple programs of RC and diamond drilling. The work programs completed by Sunshine Argentina are summarized in Table 6-1.

Table 6-1 Summary of Exploration Work Programs completed by Sunshine Argentina During the Period 1996-1998.

Work Program	Area of Work	No. of Samples (metres)	No. of Drillholes	No. of Metres Drilled
Geology mapping 1:1000 scale	San Miguel mine area	n/a	n/a	n/a
Underground sampling/mapping	Upper 5 levels San Miguel mine	1,604	n/a	n/a
Underground sampling/mapping	Potosí mine	1,085	n/a	n/a
Underground sampling/mapping	Oploca mine	552	n/a	n/a
Underground sampling/mapping	Veta Blanca - San Pedro	55	n/a	n/a
Phase I diamond drilling program	San Miguel mine area	n/a	42	10,196 (includes 4,285UG)
Phase I RC drilling	San Miguel mine	n/a	90	20,106
Phase II diamond drilling program	San Miguel in-fill	n/a	23	5,516
Phase II RC drilling	San Miguel in-fill	n/a	69	13,821
Condemnation drilling	Cortaderas and Picas drainages	n/a	4 RC 5 diamond	771 1218.
Water monitoring holes		n/a	7 diamond	236

Sunshine Argentina's drilling programs ended in September 1998 after which the parent company completed an internal Pre-Feasibility Study of the project. This study was meant to be the basis for a Feasibility Study to be done later by an independent engineering firm. Sunshine's Pre-Feasibility Study encompassed all aspects of the envisioned project, including Mineral Resource and Mineral Reserve estimates, pre-production development and construction, mining, ore processing, marketing of mineral concentrates, waste rock disposal, employee housing, infrastructure, support and taxation. It did not include trade-off studies for project optimization, but instead was based on a set of assumptions for mill through-put, mine operations and process flow-sheet .

Encouraged by results from its own internal Pre-Feasibility Study, in April 1998, Sunshine commissioned Jacobs to complete a Feasibility Study of the Pirquitas deposit. The scope of the Jacobs' Feasibility Study included the preparation of preliminary designs, capital cost estimates, operating cost estimates and implementation plans for the proposed open-pit mine, processing facilities, utilities and ancillary facilities. At Sunshine's request, Jacobs subcontracted the work relating to geology, resource estimation, mine design and mining cost estimation to TWC. Sunshine also commissioned engineering consultants Knight Piésold, (1998b) to develop designs and operating plans for the tailings impoundment, haul road, waste rock dumps, water supply and surface water management facilities. In addition, Knight Piésold (1998a) prepared an EIR for the proposed mining operation. Sunshine's responsibilities for the study included all aspects relating to land acquisition, mineral rights, drilling programs, metallurgical test work and permitting. Jacobs (1999) completed the update to the Feasibility Study in April, 1999 and presented an addendum to this study in February of 2000, Jacobs (2000).

In order to satisfy conditions for debt financing, Sunshine also requested Mine Development Associates (MDA) of Reno, Nevada to complete an independent third-party Mineral Resource estimate for the Pirquitas silver-tin-zinc deposit. The request originated from Barclays Capital and its independent engineering firm Behre-Dolbear (1999). MDA (1999) generated a geologic model of the Pirquitas deposit, performed a statistical and geo-statistical analysis of silver, tin and zinc data, determined capping grades and made estimates of the silver, tin and zinc resources but did not classify these resources.

6.3 Silver Standard

In May 2002, Silver Standard acquired 43.4% of Sunshine Argentina from Stonehill Capital Management of New York. At that time Sunshine Argentina was the holder of the mineral rights to the Pirquitas Property. Silver Standard then commissioned MDA to complete an independent Technical Report and Mineral Resource estimate for the Pirquitas Property that would comply with NI 43-101 guidelines and requirements. MDA (2003) completed the report, in May 2003. In this report, MDA (2004) expanded on the work that it did earlier for Sunshine Argentina and also classified the estimated Mineral Resource. This report was amended in August of 2004.

In October 2004, Silver Standard acquired the remaining 56.6% of Sunshine Argentina from Elliott International L.P., The Liverpool Limited Partnership and Highwood Partners, L.P. (SSR Press Release, October 2004). Silver Standard operated the Pirquitas Property as Sunshine Argentina until it changed the company name to Mina Pirquitas, Inc., in May 2008.

Silver Standard conducted a diamond drilling program from May to September 2005. The campaign consisted of 14 drillholes for a combined length of 3,299.65 m and was designed to test targets along the Oploca, Llallagua and Colquechaca Vein systems, including the No. 3, 4 and 6 veins at Oploca, the No. 1, 2 and Potosí veins of the Potosí vein system along with the Veta Blanca, Colquechaca and Ramales Veins in the Colquechaca area.

While the 2005 drilling program was underway, the company initiated an underground exploration program on the Oploca sulphide vein system, with the first blast at the portal taking place in May of that year. Development on the Oploca ramp started in December 2005 and continued intermittently until August of 2007. The underground decline at Oploca was designed to pass below the old mine workings so as to provide access for underground exploration drilling that would test for the continuity to depth of the high-grade Ag-Sn-Zn veins. The Oploca ramp and new galleries totaled 2,361.7 m of underground development. Rock-chip sampling that was done along the ramp and in pre-existing galleries yielded 2,108 analyses corresponding to 2,318.68 m of sampled rock face.

In September 2005, Hatch and MDA were awarded a contract to update the Feasibility Study for the Pirquitas Property. The scope of the study included an update of the capital and operating costs and a new mine plan. Hatch and MDA (2006a) completed and presented the Feasibility Study update to Silver Standard in March 2006, soon after which they were requested to prepare an independent Technical Report for the project. The Hatch-MDA Technical Report (2006b) was completed in April of 2006, and was then amended a month later (Hatch and MDA, 2006c); the original Technical Report incorporated the Mineral Resource and Mineral Reserve estimates and mining scenarios that were presented in the March 2006 Feasibility Study Update.

From the time the Hatch and MDA (2006b) Technical Report was publically available until December of 2008, Silver Standard, through its subsidiary Sunshine Argentina (now Mina Pirquitas, Inc.), completed a number of drilling campaigns on the Pirquitas Property, with both reverse circulation and diamond drilling methods being used. Some drillholes were located for mine-related condemnation purposes; others were drilled to test exploration targets identified in areas beyond the limits of the San Miguel open-pit, while the majority of the holes were designed to provide assay data that were deemed necessary to enhance the definition of the Mineral Resource models of the Ag-Zn-Sn deposit. Additional details of Silver Standard's 2005 through 2008 drilling programs are presented in Section 10.2.

6.4 Historical Mineral Resource and Mineral Reserve Estimates

All historical Mineral Resource estimates summarized in this section are classified using CIM definition standards applicable at the time that the Mineral Resources were estimated. Historic Mineral Resources estimates presented in this section are not treated as current, and they were not relied upon during the generation of the September 30, 2011 Mineral Resource estimate described in this report. They are presented here to illustrate the progression of the understanding of the deposit.

6.4.1 The Winters Company (TWC) and Jacobs Engineering Group (Jacobs), April 1999

TWC was commissioned by Sunshine Argentina to complete a Mineral Resource estimate for the Pirquitas silver-tin deposit (then largely focused on the San Miguel sheeted vein system) in 1999 (TWC, 1999). The Mineral Resource estimate generated by TWC is presented in Table 6-2, and formed the basis for the Pirquitas Mineral Reserve presented in the Jacobs (1999) Feasibility Study update. Jacobs (1999) and TWC (1999) estimated a Mineral Reserve of 21.6 Mt grading an average of 167 g/t Ag, 0.33% Sn and 0.57% Zn for the Pirquitas deposit, with a total of 117.1 Mt of waste for a waste:ore ratio of 5.4:1. See The Winters Company (1999) and Jacobs (1999) reports for further details.

Table 6-2 Pirquitas Mineral Resources The Winters Company, (1999)

Cut-off Grade Ag g/t	Resource classification	Tonnes (Mt)	Silver (g/t)	Tin (%)	Zinc (%)
60	Measured	7.1	242	0.32	0.62
	Indicated	15.7	165	0.29	0.6
	Total (M + I)	22.8	189	0.30	0.61
	Inferred	11.5	128	0.09	0.58
80	Measured	5.7	283	0.35	0.6
	Indicated	12.0	195	0.32	0.59
	Total (M + I)	17.7	223	0.33	0.59
	Inferred	8.1	154	0.11	0.50
100	Measured	4.9	316	0.37	0.59
	Indicated	9.4	224	0.35	0.58
	Total (M + I)	14.3	256	0.35	0.58
	Inferred	5.6	183	0.12	0.48

Notes: Reported in accordance with CIM definition standards current at the time.

6.4.2 Mineral Development Associates, May 2003

Mineral Development Associates (MDA) completed an NI 43-101 compliant Technical Report on the Property for Silver Standard subsequent to its transaction with Sunshine Argentina (MDA, 2003; see Section 6.3). The Mineral Resources prepared by MDA (2003) is presented in Table 6-5.

Table 6-3 Pirquitas Mineral Resources above a cut-off of 30 g/t Ag - Mineral Development Associates.

Category	Tonnes (Mt)	Silver (g/t Ag)	Ag (Moz)	Tin (% Sn)	Sn (Mlbs)	Zinc (% Zn)	Zn (Mlbs)
Measured	5.35	158	27.25	0.21	24.26	0.75	77.14
Indicated	28.42	136	123.97	0.14	86.83	0.55	341.52
Measured + Indicated	33.77	139	151.22	0.15	111.09	0.56	418.66
Inferred	17	80	44	0.05	19	0.3	112

Notes:

- Reported at a 30 g/t Ag cut-off grade, which was deemed economic by MDA (2003).
- Reported in accordance with CIM definition standards current at the time.
- Inferred Mineral Resources from TWC (1999).

6.4.3 Mineral Development Associates and Hatch Engineering, May 2006

Hatch and MDA (2006b) presented updated Mineral Resources and Mineral estimates for the Pirquitas Property in a NI 43-101 Technical Report dated April 28, 2006 (Table 6-4 and Table 6-5, respectively). Although not specifically stated in the original report, Silver Standard considers the Mineral Resources presented in Table 6-4 as being inclusive of the Mineral Reserve presented in Table 6-5. Additional details relating to the Mineral Resources and Mineral Reserve presented in Table 6-4 and Table 6-5 can be found in Hatch Engineering and MDA (2006b and c). The Mineral Resources and Mineral Reserve were reported above a 30 g/t silver cut-off.

Table 6-4 Pirquitas Mineral Resources above a cut-off of 30 g/t Ag - Mineral Development Associates.

Category	Tonnes (Mt)	Silver (g/t Ag)	Ag (Moz)	Tin (% Sn)	Sn (Mlbs)	Zinc (% Zn)	Zn (Mlbs)
Measured	5.28	149	25.30	0.19	21.86	0.66	76.17
Indicated	28.04	128	115.54	0.13	79.73	0.54	336.23
Measured + Indicated	33.32	131	140.84	0.14	105.59	0.56	412.40
Inferred	17	80	44	0.05	19	0.3	112

Notes:

- Reported at a 30 g/t Ag cut-off grade, which was deemed economic by Hatch Engineering and MDA (2006b).
- Reported in accordance with CIM definition standards current at the time.
- Inferred Mineral Resources from TWC (1999).

Table 6-5 Pirquitas Property Mineral Reserve above a cut-off of 30 g/t Ag - Mineral Development Associates.

Category	Tonnes (Mt)	Silver g/t Ag	Tin % Sn	Zinc % Zn
Proven	3.34	191	0.25	0.67
Probable	15.12	172	0.19	0.62
Proven + Probable (in pit)	18.46	175	0.21	0.62
Tailings* (Probable)	0.40	234	0.37	0.13
Total Proven + Probable + Tailings	18.86	177	0.21	0.61

Note: 400 000 tonne high grade (234 g/t Ag, 0.37% Sn and 0.13% Zn). Jig tailings, stockpiles from previous operations.

6.4.4 Silver Standard Resources, May 2008

Silver Standard (2008) prepared an internal update to the Mineral Resources and Mineral Reserve estimate in May 2008. Mineral Resources and Mineral Reserve estimates presented in the Silver Standard NI 43-101 Technical Report are shown in Table 6-6 and Table 6-7. Readers interested in additional details pertaining to these updates are referred to the Silver Standard (2008) Technical Report, which is filed with SEDAR and available on the SEDAR website.

Table 6-6 Pirquitas Property Mineral Resources - Silver Standard

Category	Tonnes (Mt)	Silver g/t Ag	Tin % Sn	Zinc % Zn	Ag (Moz)
Measured	15.1	152.8	0.20	0.69	74.2
Indicated	30.1	152.1	0.16	0.82	147.0
Measured + Indicated	45.2	152.3	0.17	0.78	221.2
Inferred	2.4	247.8	0.07	0.78	18.8

Notes:

- Mineral Resources estimate reported at a 50 g/t AgEQ cut-off grade, which was deemed economic by Silver Standard at the time of the Silver Standard (2008) report.
- Silver equivalent cut-off grade based on metal prices of $11/oz Ag, $5.00/lb Sn, and $1.05/lb Zn.
- Reported in accordance with CIM definition standards current at the time.
- Inferred Mineral Resources from TWC (1999).

Table 6-7 Pirquitas Mineral Reserve - Silver Standard

Category	Tonnes (Mt)	Silver g/t Ag	Tin % Sn	Zinc % Zn	Ag (Moz)
Proven	10.7	194.5	0.28	0.70	67.1
Probable	19.3	201.7	0.23	0.90	125.0
Probable jigs*	0.4	234.0	0.37	0.13	3.0
Total Reserve	30.4	199.6	0.25	0.82	195.1

*Note: Includes 400 000 t high grade jig tailings in stockpiles from previous operations

6.5 **Prior Mineral Production**

Historical records for metal production from the Pirquitas Property between 1933 and 1989 indicate that approximately 777,600 kg of silver, or about 25 Moz, along with 18,200 t of tin were recovered. An additional 9,100 t of tin were reportedly recovered from the placer deposits found downstream from the lode deposits.

In December 2009, Silver Standard began commercial production of silver and zinc concentrates from its Pirquitas Mine. From start-up until September 30, 2011, the Pirquitas Mine has processed a total of 2.5 Mt of ore at 230 g/t Ag and 0.72% Zn for 18.6 Moz of contained silver and 40 Mlbs of contained zinc.

7 Geological Setting and Mineralization

7.1 Regional Geology

Northwestern Argentina consists of three main geological belts or terranes that together trend NNE-SSW. These are, from east to west, the Sub-Andean Range (*Sierras Subandinas*), the Eastern Cordillera (*Cordillera Oriental*), and the Argentine Altiplano or *Puna* belt (Figure 7-1).

The Pirquitas Ag-Sn-Zn deposit is located in the Puna belt. These belts are distinguished by their basement lithology complexes, tectonic histories, magmatism, metallogeny and geomorphological features.

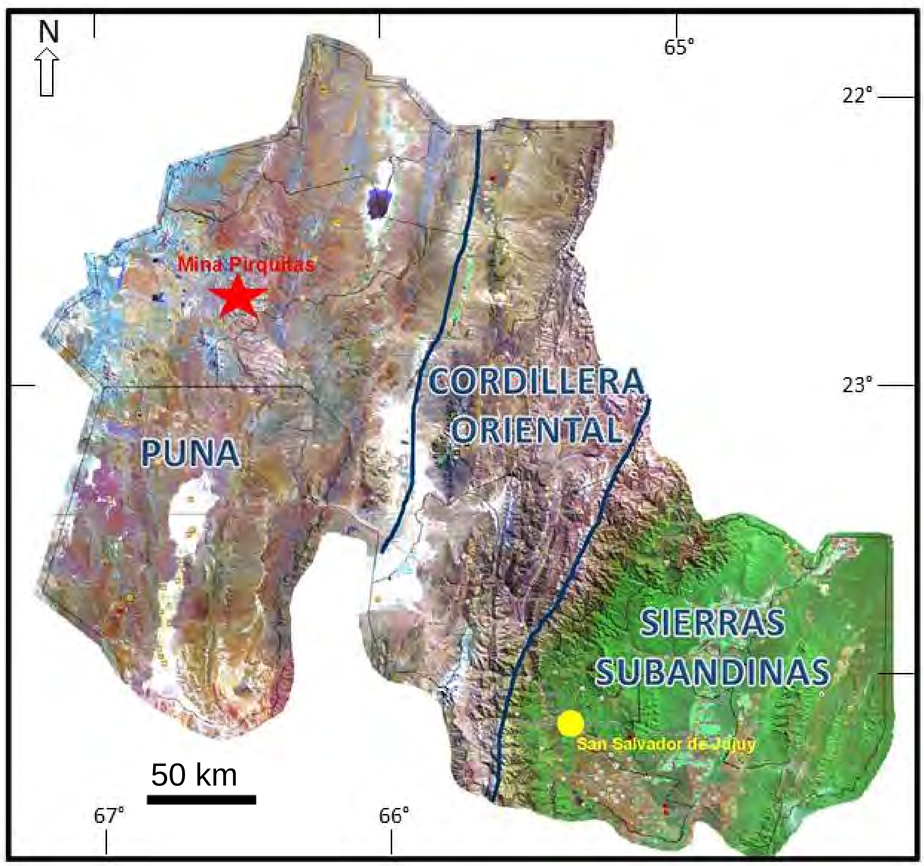


Figure 7-1 Landsat Satellite Image of Jujuy Province Showing Major Geomorphological Belts.

Source MPI 2011. Grid Co-ordinate System: Longitude and Latitude.

7.1.1 The Sub-Andean Belt

The Sub-Andean belt comprises a number of north to northwest trending, low mountain ranges separated by broad flatlands. Elevations range from about 300 masl to a maximum of 2,500 masl. An Early Cambrian to Middle Ordovician carbonate platform, which defines a passive continental margin, dominates this belt. Middle to Upper Ordovician clastic marine rocks cover the carbonate platform in the eastern and central sectors. Large intrusions and volcanic complexes related to Andean tectonism are not present in this belt. Paleozoic sedimentary successions display regional-scale open folds. Mineral deposits of economic significance are rare, although natural gas fields are exploited in the eastern lowlands.

7.1.2 The Eastern Cordillera

The Eastern Cordillera is a 70 to 130 km wide “fold and thrust belt” where elevations range from 1,300 to 6,200 masl. In this belt Proterozoic basement rocks of medium-grade metamorphosed sediments are unconformably overlain by Paleozoic sediments deposited in a back arc basin. This back arc sequence is composed of Early Cambrian to Middle Ordovician clastic marine sedimentary rocks, which in turn are unconformably overlain by Silurian to Devonian sediments (Ramos, 2000). The Paleozoic successions are locally covered by predominantly Cretaceous rift fill continental sediments belonging to the Salta Group.

Late Ordovician to Devonian collision of the composite Arequipa-Antofalla metamorphic basement terrane with the Pampian terrane, that forms the crustal basement to most of northwestern Argentina, resulted in strong folding and faulting of the Paleozoic rocks at Pirquitas (Ramos, 2000). The faults and axial planes of the larger scale folds formed during this event trend north to northeast. Pronounced uplift of some structural blocks has exposed elongate, Ordovician batholithic granitoid intusions.

The metallogeny of the Eastern Cordillera is relatively a simple one; by far the most important mineral deposit in the belt is the Aguilar Sedex-type deposit of Ordovician Pb-Zn(-Ag) mineralization which is located about 50 km south of Abra Pampa. The location of Abra Pampa is shown on Figure 4-2.

7.1.3 Puna Belt

To the west of the Eastern Cordillera, at elevations of 3,900 to 6,700 masl, is the Puna belt. In the Puna, rocks are represented by essentially the same sedimentary sequences that occur in the Eastern Cordillera. Late Ordovician to Early Devonian compressive tectonism also affected the Paleozoic formations in the Puna, but to a lesser degree than in the Eastern Cordillera. A Paleogene compressive event, caused by Andean-style tectonics, resulted in some minor folding and thrust-faulting, but by the late Miocene the tectonic regime in the region had changed to one of extension and a basin and range geomorphology developed. The extensional tectonic event resulted in the upwelling of magma and the development of andesitic to dacitic stratovolcanoes as well as a number of very large caldera structures. Regionally extensive ignimbrite sheets were erupted from the calderas with an enormous volume of material ejected. It is estimated that 1,800 to 1,200 km^3 of material was ejected, from the Valdema caldera alone (Soler et al., 2007). The subaerial volcanism continued into the Pleistocene.

In recent time, the Puna belt has seen the eruption of basaltic lavas, continental sedimentation and the formation of high-altitude salt flats. In terms of mineral deposit endowment, the Puna is by far the most important of the three terranes in Jujuy Province. Highlighted below are the main types of deposits known to exist in the Puna:

- Devonian mesothermal quartz veins and saddle reefs containing native gold, minor base metals and accessory gangue minerals of ankerite and chlorite, with the Rinconada district being the most important for this type of mineralization.
- Polymetallic quartz-sulphide veins related to eroded Neogene volcanic centers, with the veins containing variable amounts of Pb, Zn, Sb, As, Ag, and Au.
- Bolivian-type Sn-Ag sulphide-rich veins related to Middle to Late Miocene subvolcanic intrusive stocks.
- Pleistocene to recent placer deposits of Au (Rinconada), Sn (Pirquitas) and in the case of the Eureka deposit close to the Argentina-Bolivia border, Au-Cu.

7.2 **District Geology**

The Pirquitas deposit is hosted by the Ordovician Acoite Formation, a strongly folded package of low-grade metamorphosed marine sandstone, siltstone and minor shale beds. These rocks are exposed within fault-bounded, probably uplifted structural blocks that occur southwest and east of the mine area (Figure 7-2). Late Ordovician to the Early Devonian compressional tectonism resulted in strong folding of the Paleozoic sedimentary formations. High-angle thrust faults were also generated during this event. In the area of the mine, the axial planes of the folds strike NS to NNE-SSW and are sub-vertical to moderately inclined.

A major unconformity separates the folded sedimentary rocks of the Acoite Formation from Oligocene to Middle Miocene continental sedimentary and volcaniclastic lithologies. The Oligocene to Middle Miocene sedimentary rocks crop out to the east and north of the Pirquitas Mine and include polymictic conglomerate, arkosic sandstone and reworked tuffs. These beds were likely deposited while the region was covered by a regressing shallow inland sea that was eventually replaced by continental highlands where colluvial and alluvial sedimentation prevailed.

Between Upper Miocene time, around 11 Ma, and the Pleistocene, the geologic history around Pirquitas was dominated by subaerial volcanism; four major volcanic centers are recognized in the region (Figure 7-2). About 40 km southwest of the Pirquitas Mine is the Pairique Volcanic Complex which comprises the remnants of a stratovolcano composed of dacitic lavas and pyroclastics. Approximately 15 km north of Pirquitas is the Abra Granada Volcanic Complex which is centered on the 5,700 m high Cerro Granada. This volcanic center is formed by extensive dacite ignimbrites, lavas and a central dome which are dated at 9.8 to 7.8 Ma (Caffe et al., 2008). The very large Vilama Caldera is located about 50 km northwest of Pirquitas. A huge volume of dacitic crystal-rich and pumice-poor ignimbrites were extruded from this caldera structure around 8.5 Ma, with extra-caldera pyroclastic deposits extending to within 12 km of the Pirquitas mine area. The fourth volcanic center that affected the region is the Coranzuli Caldera which is located 50 km southeast of the Pirquitas Mine. Pyroclastic deposits flowed northwestwards from this caldera to within 10 km of the current mine location.

Undoubtedly, substantial deposits of volcanic rock, the bulk of which most likely came from the Abra Granada Volcanic Complex, once covered the area of the Pirquitas Mine. Differential tectonic uplift and associated erosion removed the volcanics and somewhat older volcaniclastic formations in certain areas, including the area surrounding the mine complex, to expose the Paleozoic sedimentary rocks. Quaternary alluvial fan and braided river sediments are found in valleys and restricted basins of the present landscape, most notably in the valley of the Collahuaima River. Fine clastic sediments and minor evaporite deposits have accumulated in the salt flat of Laguna Catal located a few kilometres west of the Pirquitas Mine Figure 7-2.

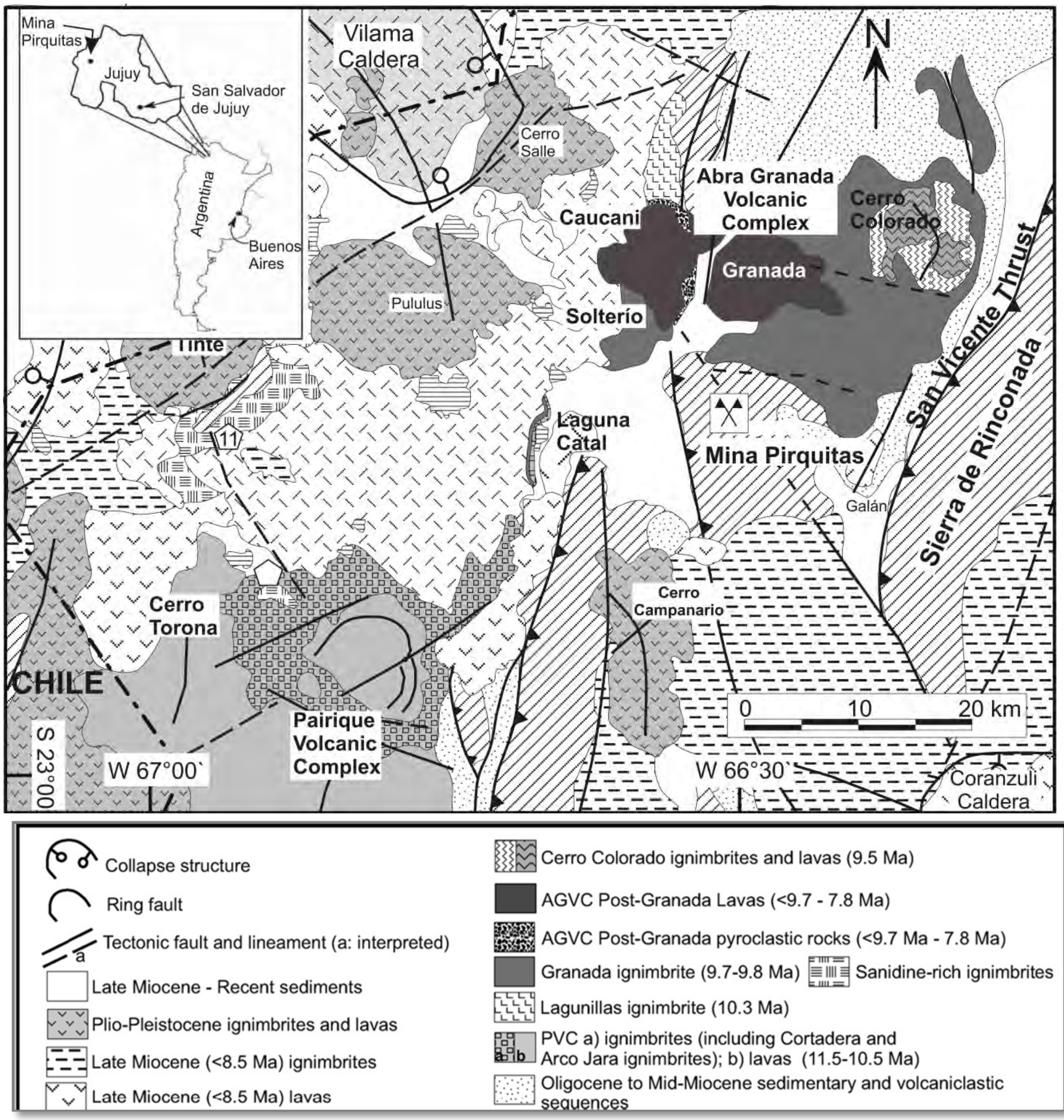


Figure 7-2 Geology Map of the Region Surrounding the Pirquitas Property.

From Caffe et al. (2007).Grid Co-ordinate System: Longitude and Latitude.

7.3 Property Geology

The geology of the host rocks on Pirquitas Property is considered to be relatively simple. Discounting areas with recent alluvial and colluvial sediments, the bulk of the property covers intensely folded Ordovician Acoite Formation marine sedimentary rocks (Figure 7-3). Well exposed along the length of the Pirquas River valley, this formation is composed of beds of fine to medium grained lithic wacke, tens of centimetres to a few metres thick, interbedded with greywacke siltstone and less abundant black shale layers that range in thickness from a few centimetres up to several metres. Underlying the northeastern sector of the property is a sequence of continental sedimentary rocks, mainly hematite-stained arkosic sandstone intercalated with thin polymictic conglomerate beds and cream-coloured reworked dacitic tuff units. This sequence is inferred to belong to the shallow east-northeast dipping, Tiomayo Formation of Early to Middle Miocene age. A few kilometres east of the property a medium-grained granodiorite intrusion forms the small mountain of Cerro Galan, which represents the only substantial intrusive rock body in the area of the mine.

Impressive structural geology is visible in outcrops along the Pirquas Valley, where the Pirquitas deposit is situated. Folds with shallow-plunging axes and amplitudes ranging from tens of metres up to a maximum of a few hundred metres crop out in this area, (Figure 7-4). Mining on the north face of the San Miguel open pit has exposed a ‘textbook’ example of chevron-shaped anticline (Figure 7-5). In Figure 7-5 high-angle, mostly reverse faults can be observed cutting the folds, displacing fold limbs by metres to tens of metres.

Axial planar cleavage is well developed in the Paleozoic rocks, especially in the siltstone and shale beds. Surprisingly, the well-formed cleavage does not appear to have acted as a receptive structural fabric for quartz hosted Ag-bearing Fe-Zn-Sn-Pb sulphide veins, although a minor amount of weakly-auriferous quartz veining does appear to be deposited along cleavage planes.

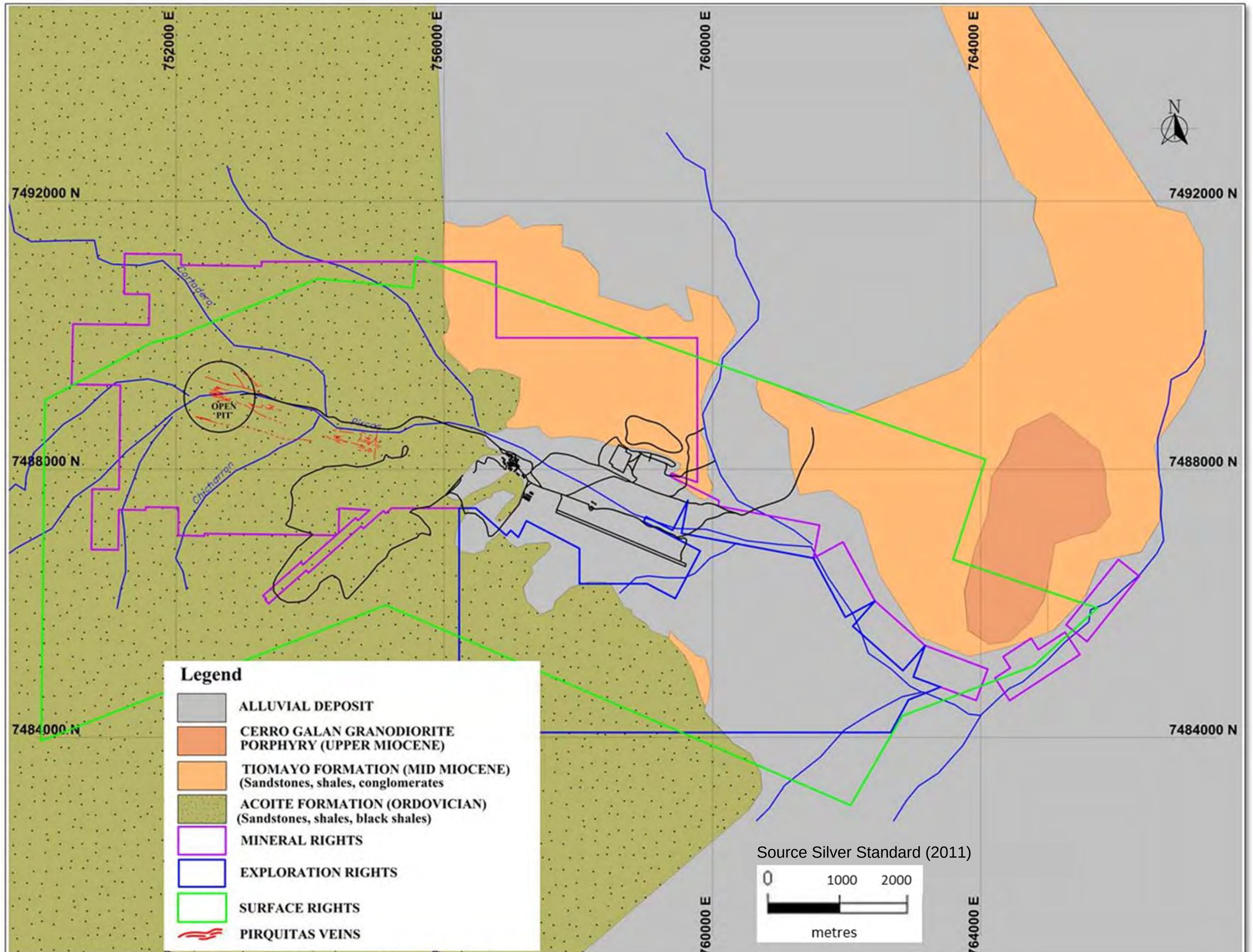


Figure 7-3 Property Geology Map, Pirquitas Mine.
Grid coordinates in UTM Zone 19S (WGS84 datum) system.

Figure 7-4 Anticline Developed in Interbedded Sandstone, Siltstone and Shale of the Ordovician Acoite Formation, Pircas River valley, Pirquitas Mine area.

Note well-developed Axial Planar Cleavage Cutting Bedding Planes at a High Angle. Source Silver Standard (2011).

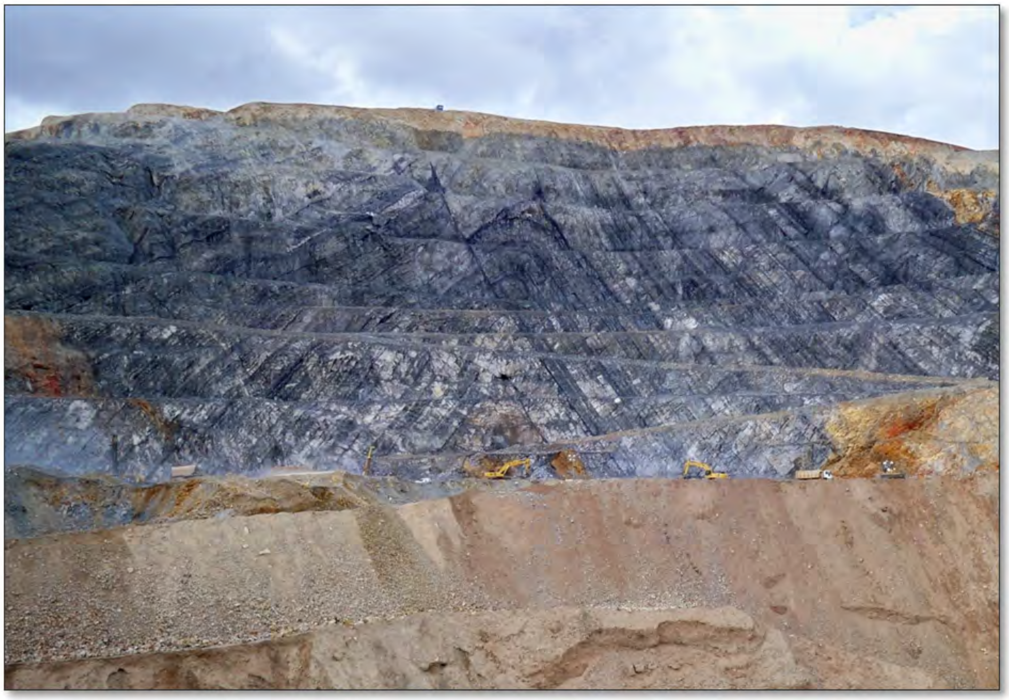


Figure 7-5 Chevron Fold and High Angle Thrust Fault in the Acoite Formation Host Rocks. North Wall San Miguel Open Pit.

Source MPI February (2010).

A major system of sulphide-rich veins cut the axial surfaces of the folds and the related cleavage fabric at high angles. Two main vein sets are recognized at the Pirquitas Mine:

- Vein Set 1
  In the dominant Set 1 veins, vein orientations strike close to 105° and dip steeply either to the north (e.g. Potosí) or to the south (San Miguel). Veins in this set include the Potosí, San Miguel, Chocaya-Oploca, San Pedro, Llallagua, Chicharron and Colquiri veins (Figure 7-5). The Potosí Vein is the largest known vein on the property, with a strike length of about 500 m and maximum thickness of 2.5 to 3 m. The other veins of this set more typically have strike lengths of between 50 and 150 m, with average widths of 30 to 50 cm. The larger of these veins, such as the Potosí Vein, include localised matrix supported breccias with angular clasts of quartz-sericite altered wallrock in a matrix of Fe and Zn +/- Sn-Ag-Cu sulphides.

- Vein Set 2
  The secondary vein set is represented by the Veta Blanca and Colquechaca veins. These are located north of the Potosi Vein; and trend NW-SE.

The Pirquitas Mine open pit exploits previously un-mined portions of the Potosí and San Miguel veins in addition to a set of sheeted sulphide veinlets with associated disseminated mineralization. The sheeted veins occur in a swarm that is 120 to 140 m wide in the north-south direction and a maximum of 300 m along strike in the east-west direction. The Potosí Vein is located in the northern margin of the current pit; with the Chocaya Vein system located to the south of the open pit (Figure 7-6 and Figure 7-7).

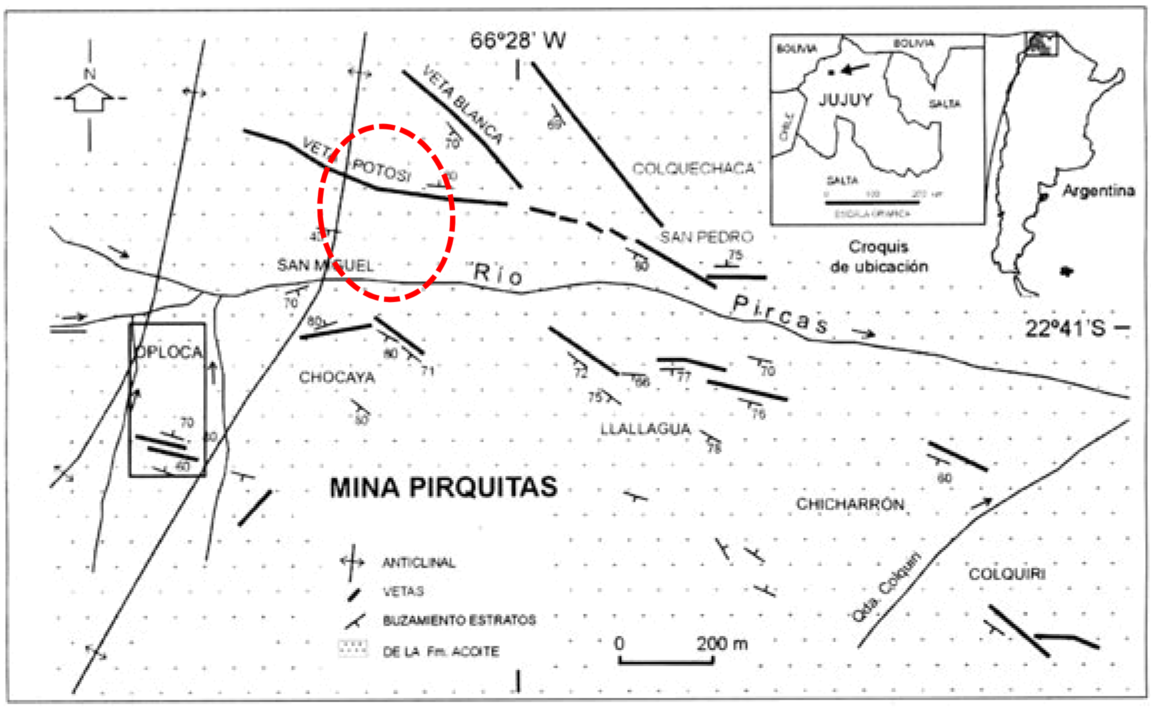


Figure 7-6 Map of the Pircas Valley Showing Main Ag-Sn-Zn Vein Systems.

Red Ellipse Represents Approximate Limits of San Miguel Open Pit. Source MPI (2011). Grid Co-ordinate System: Latitude and Longitude.

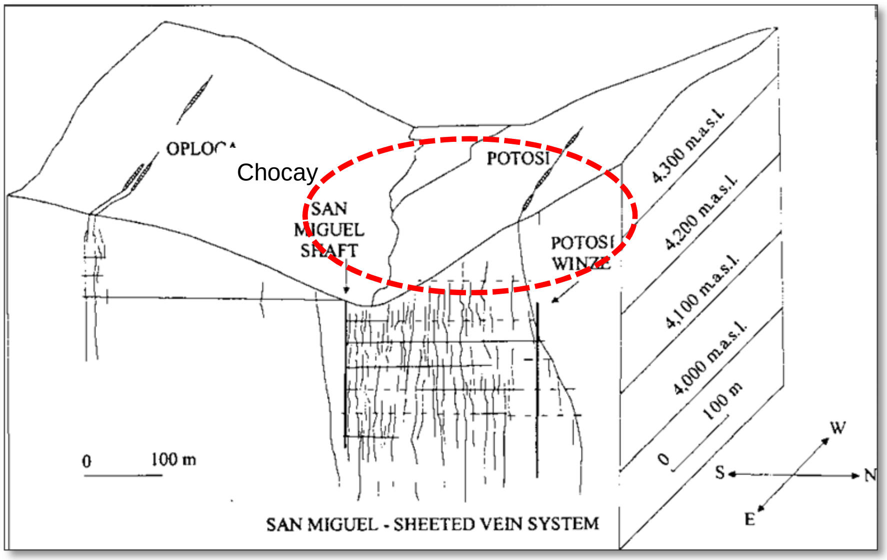


Figure 7-7 Schematic Diagram of the Potosi vein and San Miguel Sheeted Vein System Mined by the Pirquitas Mine Open Pit (red ellipse). Adapted from Jacobs (1999).

7.4 Mineralization and Hydrothermal Alteration

The fracture and breccia-hosted mineralization at the Pirquitas Mine consists of Fe and Zn sulphides with accessory cassiterite (Sn oxide) and a large variety of Ag-Sn-Zn (-Pb-Sb-As-Cu-Bi) sulphides and sulfosalts. Crystalline quartz, along with chalcedony in the upper levels of the system, and kaolinite are the main gangue minerals in the veins and mineralized breccias. The main sulphides, specifically pyrite, pyrrhotite, sphalerite and wurtzite, form colloform bands parallel to vein margins (Figure 7-8), which together with crustiform and drusy vein textures suggest that the mineralization is epithermal in origin. The vein textures imply that the mineralization was deposited from relatively low temperature hydrothermal fluids within about 500 m of the paleosurface. However, mineralogical evidence (Section 7.4.1) suggests that the initial temperature of the mineralizing fluids was possibly greater than 400°C.

Figure 7-8 Photograph of Banded Sphalerite-Wurtzite (schalenblende), Pyrrhotite, Stannite, possible Cassiterite and Ag sulfosalts, No.3 Vein, Chocaya (Oploca) mine.
Source Silver Standard (2011).

7.4.1 Stages of Mineralization

As reported in a study of the Pirquitas Sn-Ag veins, L. Malvicini (1978) interpreted observations of paragenetic relationships between the more than 26 sulphide and sulfosalt phases to indicate two main episodes of mineralization occurred at the Pirquitas deposit, with the first episode comprising two stages.

- The early stage of the first mineralization event was dominated by the deposition of pyrite and pyrrhotite along with accessory amounts of cassiterite and arsenopyrite. Pyrrhotite appears to have crystalized first, with partial replacement by pyrite and later by Zn and Sn sulphides. Quartz was deposited episodically from these early-stage fluids. According to Malvicini (1978), a granular form of cassiterite was deposited during this stage of mineralization in the upper levels of the larger veins, with the grain size of the Sn oxide diminishing from about 300 µm down to 20 µm in lower levels of the veins. Fine, granular cassiterite is also disseminated in wallrock adjacent to sulphide-rich veins.
- The late stage of the first episode of mineralization is characterized by colloform bands of *schalenblende,* which at the Pirquitas deposit is a brownish botryoidal intergrowth of sphalerite and wurtzite.

Stannite and a few other rare Sn-rich sulphides, along with minor galena and a variety of sulfosalts of Sn, Pb-Sb (boulangerite, bournonite) and Ag (pyrargyrite, miargyrite, polybasite) were also mainly deposited during this stage of mineralization. Kaolinite and drusy quartz crystallized as gangue with the ore-forming mineralization. Sulfosalt phases replaced grains of pyrrhotite, cassiterite, *schalenblende* and galena (Malvicini, 1978).

- The bulk of the Ag at the Pirquitas deposit was deposited during a second stage low temperature hypogene mineralization phase. Ag occurs in the sulfosalt minerals freiburgite, pyrargyrite, miargyrite and polybasite, and as minute inclusions in argentopyrite. Rare sulfosalts of Ag-Sn-Ge are also identified. Together with Ag, the presence of bismuth in the form of Bi sulfosalts characterizes the second mineralization event.

The co-existence of pyrite, pyrrhotite, cassiterite and arsenopyrite in mineralization primarily found at intermediate and deep levels in the major veins indicates that temperatures of the hydrothermal fluids that deposited the earlier mineralization were about 400°C or slightly greater. The predominance of sulfosalt minerals in the second episode of mineralization suggests late stage hydrothermal fluid temperatures between 150° and 300°C.

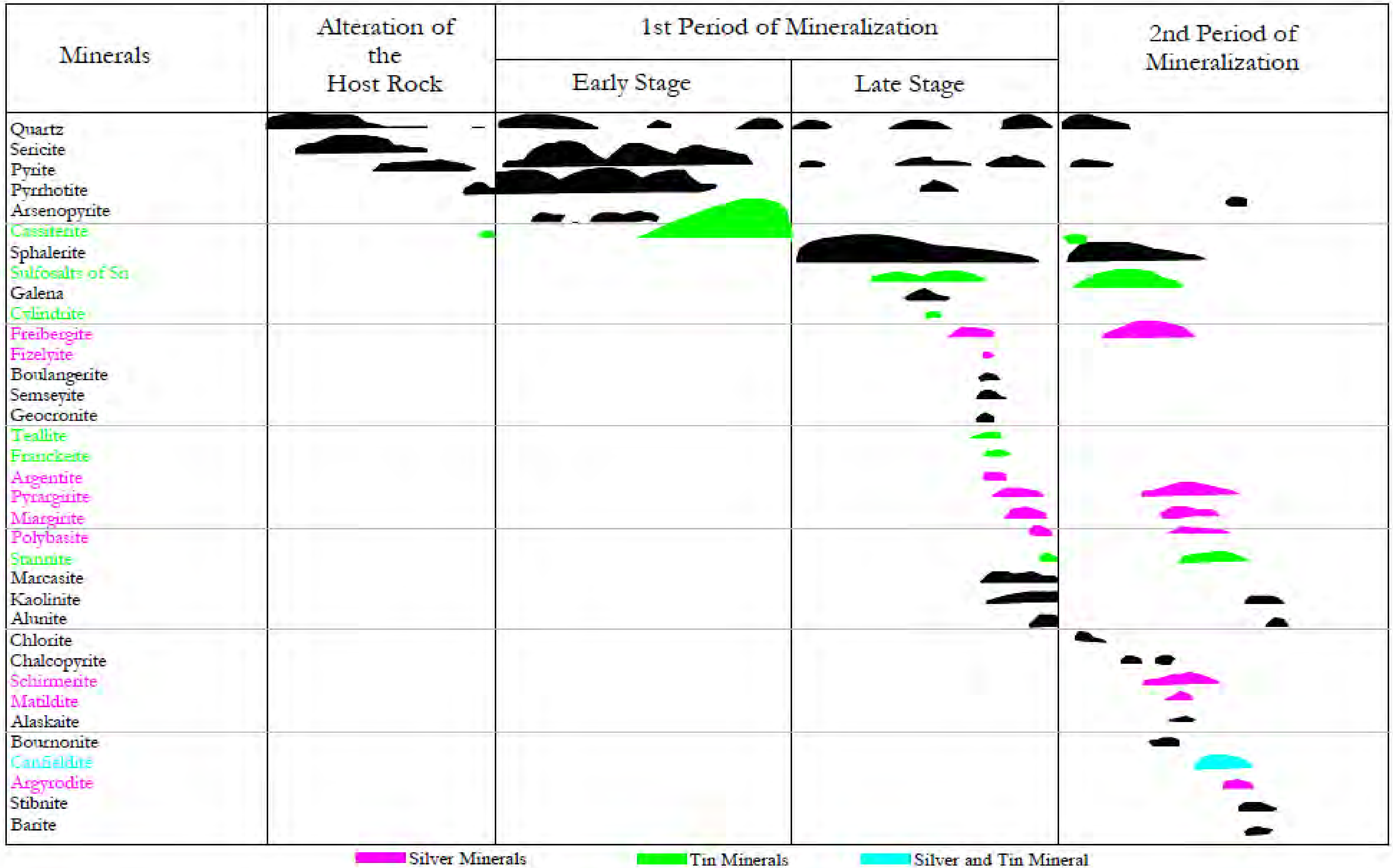


Figure 7-9 Stages of Mineralization and Paragenesis for the Pirquitas Mine.
Source Malvicini (1978).

7.4.2 Mineral and Metal Zonation

During the first mineralizing event, the hydrothermal fluids passed upwards through major easterly trending fractures as well as through stockwork and sheeted fracture systems depositing pyrite and pyrrhotite along with lesser amounts of cassiterite and arsenopyrite. This mineralization was deposited over a vertical span of more than 400 metres, with little or no vertical or lateral zonation of metals or minerals developed. Following the crystallization of Fe sulphides and Sn oxide, the essentially massive veins and veinlets were fractured, probably by hydrothermal fluid overpressures. Base metal sulphides (sphalerite, wurtzite, galena), Sn sulphide (stannite) and various sulfosalts of Sn, Pb, Sb and Ag were then deposited into these fractures. Sphalerite, galena and stannite were generally deposited at deeper levels of the mineral system, with schalenblende (wurtzite-sphalerite) and Sb-Pb sulfosalts concentrated at intermediate levels, and Ag sulfosalts forming in the upper parts.

The second mineralizing event is not considered to be a progressive continuation of the first event, since veinlets of mineralization of the inferred second event are seen crosscutting veins composed of mineralization that is diagnostic of the first event. Thus, the mineralization of the second event is interpreted to be superimposed on the mineralization of the first event, resulting in a *telescoped* mineral system being developed at Pirquitas. This is based on observations of lower temperature mineralization of the second event coexisting with or lying at greater depths than higher temperature mineralization of the earlier event; an example being the occurrence of stringer veinlets of Ag and Bi sulfosalts (second mineralization event) 50 to 100 m below sheeted veinlets of schalenblende-stannite-galena (late-stage of first mineralization event).

A consequence of the overprinting of mineralization assemblages at the Pirquitas deposit is that conventional ore mineral and metal zonation schemes are not easily recognized. Moreover, the two episodes of mineralization combined with the different vertical positions of occurrence has resulted in poor correlation factors for Ag, Sn and Zn assays, even though these metals characterize the deposit. Notwithstanding the complex nature of the mineralization in the Pirquitas deposit, geological and Mineral Resources modeling of the deposit done by Silver Standard (Section 14) has shown that Ag and Sn are overall more concentrated in the core of the Pirquitas deposit, whereas Zn grades are higher in the western half of the Pirquitas deposit.

7.4.3 Supergene Mineralization

Within about 50 m or less of the present surface, the mineralized veins and sheeted veinlets that constitute the ore at the Pirquitas Mine were oxidized by surface waters that penetrated into the deposit over thousands if not millions of years. Within the “oxide” zone, the Fe and Zn sulphides that originally formed the veins and veinlets were replaced by Fe oxide minerals, mainly goethite and hematite, while the Sn sulphides and sulfosalts were replaced by the fibrous and acicular forms of cassiterite. Native Ag and the Ag halide cerargyrite are the main supergene Ag minerals in the deposit. Cu from stannite and very minor chalcopyrite forms covellite in the near-surface oxides zone. A variety of sulphates, including jarosite, alunite and few hydrous Zn sulphates, are also present in the oxidized mineralization.

Oxidation of disseminated and veinlet pyrite and pyrrhotite in the near-surface part of the deposit is inferred to have produced acidic meteoric waters that caused rock-forming silicate minerals to be replaced by layered clays. It is this supergene argillic alteration that is seen as a large zone of cream-coloured ‘bleached’ rock in satellite images of the Pirquitas Mine area.

7.4.4 Hydrothermal Alteration

Hydrothermal alteration is not particularly well-developed in the host rocks of the Pirquitas deposit. An assemblage of sericite + quartz + disseminated pyrite replaces original wallrock minerals along the margins of the larger veins, thus forming thin bleached *halos* to the veins. This sericite-quartz-pyrite alteration is also recognized in wallrock clasts of vein breccia. Disseminated subhedral pyrite is widespread in the deposit, generally constituting less than a few percent of the wallrocks by volume; it tends to be more abundant in shale and siltstone beds.

8 Deposit Types

The Pirquitas deposit is an example of the Ag-Sn sub-group of the epithermal class of mineral deposits (Panteleyev, 1996). Also known as Bolivian-type polymetallic deposits, examples of this deposit type are numerous in the Bolivian Silver -Tin Belt that extends between the San Rafael Sn(-Cu) deposit in southern Peru and the Pirquitas deposit in northwestern Argentina(Table 8-1).

Bolivian-type Ag-Sn deposits generally consist of sulphide and quartz-sulphide vein systems typically containing cassiterite and a diverse suite of base and trace metals, including Ag in a complex assemblage of sulphide and sulfosalt minerals. The vein systems are generally spatially and likely genetically associated with epizonal (subvolcanic) quartz-bearing peraluminous intrusions one to two kilometres in diameter, although the mineralization may be entirely hosted by the country rocks into which the intrusive stocks were emplaced.

The suite of principal and subordinate ore minerals that characterize this deposit type includes, but is not limited to, pyrite, cassiterite, pyrrhotite, marcasite;,sphalerite, galena, chalcopyrite, stannite, arsenopyrite, tetrahedrite, scheelite, wolframite, andorite, jamesonite, boulangerite, ruby silver (pyrargyrite), stibnite, bismuthinite, native bismuth, molybdenite, argentite, gold and a variety of complex sulfosalt minerals. Metal zoning from depth to surface and from centers outward shows: Sn + W, Cu + Zn, Pb + Zn, Pb + Ag, and Ag ± Au; commonly there is considerable 'telescoping' of zones. Oxidized zones may have secondary silver minerals such as Ag halides.

Quartz and sericite are the main gangue minerals, with tourmaline appearing at deeper levels and kaolinite + chalcedony commonly present close to surface. Quartz-sericite-pyrite alteration is characteristic of these deposits; it is pervasively developed in certain lithologies and restricted to narrow vein halos in rocks that are less susceptible to reactions with the hydrothermal fluids.

Sn-Ag vein deposits are believed to be the source of cassiterite that has been mined from placer deposits around the world, and the lodes themselves are extensively mined in South America, particularly Bolivia. At present, the San Rafael deposit in southern Peru is the world's largest and richest underground tin mine, while the Pirquitas deposit is Argentina's largest silver mine.

Table 8-1 Map Showing Extent of the Bolivian Sn-Ag belt.

Source Dulskie et al., (1982). Grid Co-ordinate System: Longitude and latitude.

9 Exploration

9.1 1996 to 2008 Exploration Programs

Mineral exploration on the Pirquitas Property since Silver Standards purchase of Sunshine Argentina has predominantly involved RC and diamond core drilling. The Sunshine Argentina drilling campaigns, previously discussed in Silver Standard (2008), are summarized in Section 6.2 of this report. Drilling undertaken by Silver Standard since 2005 is summarized in Table 10.3. As noted in Section 6.2, non-drilling exploration at the Pirquitas Property is limited. Sunshine Argentina completed relatively detailed geological mapping on the property and commissioned approximately 44 line-kilometers of ground magnetics surveying and 19.2 line-kilometers of induced polarization surveying over an area that now has at its center the San Miguel open pit.

9.2 Post 2008 Surface Exploration

As part of its assessment of the mineral potential of the Pirquitas Property, Silver Standard has undertaken detailed geological mapping; with minor mechanical trenching and intermittent rock-chip sampling programs. A total of 908 samples (711 composite rock-chip and 197 trench channel samples) were collected and submitted for analysis, with approximately 9% (78 samples) of these Quality Control (QC) samples. A total of 135 samples were submitted to the Pirquitas Mine analytical laboratory for sample preparation and Ag, Sn, and Zn analysis, the remaining 773 samples were sent to the ALS Chemex analytical laboratory in Mendoza, Argentina for sample preparation and multi-element analysis (see Section 11.2.2 for more detail on Silver Standard's 2010 to 2011 analytical techniques). Surface rock-chip and trench samples, are used to define and prioritize future drill targets.

A total of 19 exploration targets have been identified in the vicinity of the Pirquitas deposit (Figure 9-1). These targets include sulphide vein-hosting structures, hydrothermally-formed crackle breccias and polymictic magmato-hydrothermal breccias containing polymetallic sulphide mineralization similar to that currently being mined (see Table 9-1). Of particular significance is target T1, also known as the Cortaderas Breccia target (refer to Figure 9-1). This prospective zone was defined by surface rock chip sampling and mapping and by mineralized drillhole intercepts made by a number of pre-2010 exploration boreholes. Follow-up diamond drilling at the T1 target in 2011 resulted in the discovery of a steeply-plunging body of breccia-hosted sulphide mineralization that is significantly enriched in silver and zinc. Exploration drilling is planned to determine the size and metal content of this mineralized breccia body as well as to test several of the other defined targets.

With the exception of minor confirmatory surface sampling, mapping, trenching, drilling has been the primary exploration tool used to explore the Pirquitas deposit since the September 2008 NI 43-101 Technical Report, Silver Standard, (2008). Exploration drilling is detailed in Section 10.

Table 9-1 Pirquitas Mine Exploration Targets

Sector	Targets	Description
Central North (CN)	T1	Crackle and diatreme breccia zone with veins (grades between 17-887 ppm Ag)
	T3	Crackle breccia (grades up to 1,250 ppm Ag)
	T4	Oxidized crackle breccia and quartz vein (grades up to 81 ppm Ag)
	T5	Crackle vein (grades up to 10 ppm Ag)
Northwest (NW)	T2	Crackle breccia (grades up to 83 ppm Ag; 0.3% Sn)
	T17	Crackle and diatreme breccia zone (grades less than 5 ppm Ag)
Central South (CS)	T6	Crackle breccia and oxidized veins (grades up to 1,179 ppm Ag and 6.7% Sn)
	T8	Veins with some oxidized breccia (grades up to 2,000 ppm Ag)
	T13	Metapelite with quartz veins (grades between 10-50 ppm Ag)
Southeast (SE)	T9	Veins with some oxidized breccia (grades up to 2,000 ppm Ag and 12% Sn)
	T10	
	T11	
Southwest (SW)	T7	Breccia zones (grades between 30-2,000 ppm Ag and 0.2-12% Sn)
	T12	Veins and crackle breccia (grades between 5-110 ppm Ag)
Central West (CW)	T14	Oxidized veins and crackle breccia (grades up to 217 ppm Ag)
	T15	Oxidized veins and crackle breccia (grades between 10-52 ppm Ag)
	T16	Oxidized veins and crackle breccia (grades up to 4 ppm Ag)
Northeast (NE)	T19	Oxidized veins and crackle breccia (grades up to 10 ppm Ag)
	T18	Vein and breccia with very low grades at surface

Note: Sector and targets defined in Figure 9-1.

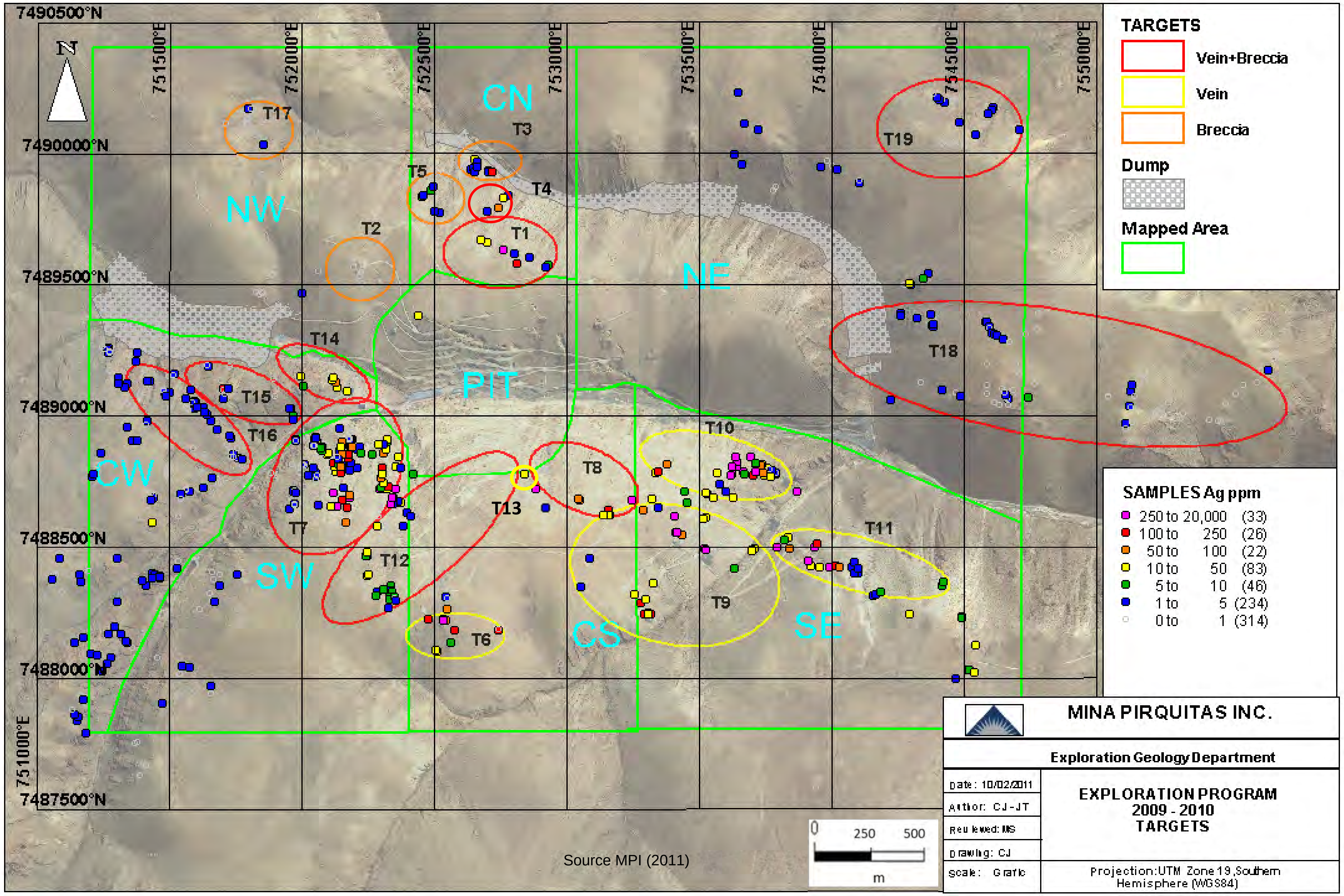


Figure 9-1 Current Exploration Targets on the Pirquitas Property.
Grid coordinates in UTM Zone 19S (WGS84 datum) system. Quadrants: NW=Northwest, CN=Central North, NE=Northeast, SE=Southeast, CS=Central South, SW=Southwest, CW=Central West, PIT=mining area. Targets: T1 through T19 (see Table 9-1)

10 Drilling

10.1 Sunshine Argentina

The following description of drilling conducted on the Pirquitas deposit by Sunshine Argentina is summarized from Silver Standard (2008). Initial drilling on the Pirquitas Property was conducted by Sunshine Argentina, which drilled a total of 51,863.62 m in 241 drillholes (see Table 10-1).

Table 10-1 Summary of Sunshine Argentina Drilling on the Pirquitas Property

Drilling Area	Drilling Type	Drilling Objectives	No. Drillholes	Metres Drilled
Main Deposit (from surface)	Diamond	Resource Definition/ Exploration	41	11,428.03
Surroundings (from surface)	Diamond	Condemnation	5	1,217.69
Main Deposit (underground)	Diamond	Resource Definition/ Exploration	25	4,284.50
Main Deposit (from Surface)	RC	Resource Definition/ Exploration	159	33,926.90
Surroundings (from surface)	RC	Condemnation	4	771.00
Monitoring Wells (from surface)	RC	Water monitoring	7	235.50
		Total	241	51,863.62

Sunshine Argentina's survey control work included the conversion of the local mine survey grid and survey monuments into the UTM Zone 19S coordinate system (using a WGS84 datum). All drillhole collar coordinates were surveyed in the UTM Zone 19S coordinate system (WGS84 datum). RC drilling (approximately 67% of the total meterage drilled by Sunshine Argentina) was used extensively because of its ability to continue drilling through open underground workings, thereby increasing the chance of reaching the desired drillhole depth. Furthermore, TWC (1999) noted that RC drilling was an effective sampling tool for the nature of the mineralization in the Pirquitas deposit as it provided a volumetrically larger sample than the smaller diameter diamond core drillholes. Diamond core drilling augmented the RC drilling to verify results obtained and to better define the boundaries of mineralized zones. In addition diamond drilling was used to obtain structural and geotechnical information. TWC (1999) noted that the competency of the rocks and lack of open fractures rendered recovery results of 80% to 100% for the RC drilling.

Diamond core and RC drilling was predominantly oriented at azimuths of 15° to 195° (i.e., perpendicular to the predominant mineralization trend), with dips ranging from sub-horizontal (underground diamond core drilling) to between 45° and 60° (occasionally steeper, but rarely vertical). These dips result in the drillholes intersecting the main WNW-ESE trending vertical to sub-vertical veins and veinlet stockwork mineralized system at an oblique angle. Mineralized drillhole intersections are therefore slightly longer than true mineralization thicknesses. Information derived from the surface diamond core drilling program was used to gain additional understanding of structural controls of mineralization and to increase confidence in the RC drillhole data.

Most of the drillholes were surveyed downhole using a continuous downhole survey instrument (Tropari Maxibor), being reported on three metre intervals. Approximately 25% of the drillholes were not surveyed due to an initial misconception by Sunshine Argentina that the RC drillholes would not deviate significantly. Once downhole survey results became available it was apparent that the deviation of some drillholes was significant. Older unsurveyed holes were re-entered and surveyed, where possible. It was not possible to re-enter and survey a total of 57 drillholes. Further analysis showed that geological structures were controlling drillhole deviation and that the degree and direction of the deflection was predictable. Sunshine Argentina used this knowledge to calculate deviations for the unsurveyed drillholes. An additional nine drillholes were drilled in areas where confirmation of mineralization defined by unsurveyed drillholes was needed TWC, (1999). The additional drilling confirmed the presence and grade of mineralization where it was indicated by the factored drillhole locations, validating the use of Sunshine Argentinas's factored downhole surveys for Mineral Resources estimation.

10.2 Silver Standard

Since acquiring the Pirquitas Property in October 2004 (see Section 6) Silver Standard has drilled a total of 82,350.45 m in 414 exploration drillholes (see Table 10-2). All drilling conducted to date by Silver Standard has been from surface. A summary of the drilling contractors used by Silver Standard is presented in Table 10-3.

10.2.1 2005 to 2008 Drilling Programs

The 2005 drilling program was designed to test targets in the Oploca, Llallagua, and Colquechaca areas (Figure 7-6). The 2007 and 2008 drilling programs included exploration drilling, resource definition drilling, minor drilling for metallurgical testing, and condemnation drilling. All drilling was from surface, with the majority being RC drilling (approximately 84% of the total meterage drilled). Diamond core drillholes were generally drilled to generate HQ-size core (where possible). Drillhole core size was sequentially reduced to NQ-size and then BQ-size at depth, where necessary.

All drillhole collar coordinates were surveyed in the UTM Zone 19S coordinate system (WGS84 datum). Downhole surveys were made using a combination of Single Shot (DDH 072-DDH 084) and Reflex EZ-AQ I surveying instrument with readings taken every 50 m to 100 m. Diamond core and RC drilling was predominantly oriented at azimuths of 15° to 195° (i.e. perpendicular to the predominant mineralization trend), with dips generally ranging between 45° and 70° (occasionally steeper, but rarely vertical). These dips result in the drillholes intersecting the main WNW-ESE trending vertical to sub-vertical veins and veinlet stockwork mineralized system at an oblique angle. Mineralized drillhole intersections are therefore slightly longer than true mineralization thicknesses. Drilling recovery generally ranged between 95% and 100% for diamond core drillholes, and generally between 80% and 100% for RC drillholes, except where drillholes intersected old underground workings. RC drilling was generally more successful than diamond drilling in reaching planned end-of-drillhole depths where the drillhole passed through the underground workings.

Data, derived from these earlier Silver Standard drilling programs, were used in the generation of the May 2008 Pirquitas Mineral Resources estimate presented in Silver Standard (2008). A total of 27,891.50 m of drilling in 158 drillholes had been completed by the cut-off date for the May 2008 Pirquitas Mineral Resources estimate Silver Standard (2008).

Table 10-2 Summary of Silver Standard Drilling on the Pirquitas Property

Drilling Program	Drilling Type	Drilling Areas	Drilling Objectives	No. of Drillholes	Metres Drilled
May-Sep. 2005	Diamond	Oploca (4), Llallagua (6) Colquechaca (4)	Exploration	14	3,299.65
May-Dec. 2007	Diamond	San Miguel (24), Cortaderas (6)	Resource Definition/ Exploration	30	7,353.35
		Open Pit San Miguel (4), Potosí (1)	Metallurgical Samples	5	370.10
Jul. 2007-Dec. 2008	RC	San Miguel (115), Potosí (52), Oploca (32)	Resource Definition/ Exploration	199	34,181.00
		Cortaderas (12), Pircas (4), Médanos (10)	Condemnation	26	6,931.00
Jul. 2010-Mar. 2011	Diamond	San Miguel (38), Oploca (17), Veta Blanca (2), Cortaderas (4)	Resource Definition/ Exploration	61	12,665.40
Apr.-Sep. 2011	Diamond	San Miguel (69), Cortaderas (5), Other Targets (5)	Resource Definition/ Exploration	79	17,549.95
			Total	414	82,350.45

Note: number of drillholes for each are is in parenthesis.

Table 10-3 Drilling Contractors used During Silver Standard's Pirquitas Drilling Programs

Drillhole Series	Type	Drilling Year	Contractor	Equipment
DDH 071-DDH 084	Diamond core	2005	Patagonia Drill S.A.	LY-44
AR 170-AR 394	RC drilling	2007-2008	Boart Longyear	Drilltech D40 KX
			Major Perforaciones S.A.	Schramm
DDH 085-DDH 118	Diamond core	2007 2008	Major Perforaciones S.A.	ED-48
DDH 119-DDH 224	Diamond core	2010-2011	Eco Minera S.A.	UDR-650
				UDR-200
			Falcon Drilling (Barbados)	LY-38

10.2.2 2010 to 2011 Drilling Programs

Diamond core drilling was conducted between July 2010 and September 2011. A total of 30,215 m was drilled in 140 diamond core drillholes. The majority of this drilling was for resource definition in and around the existing open pit (approximately 89% of the drillholes), with the remaining drillholes being exploration drillholes targeting the Cortaderas Breccia Zone (some 6% of the drillholes) and other exploration targets (e.g. Veta Blanca see Figure 7-6). Drillholes were generally drilled to generate HQ-size core. Drillhole core size was sequentially reduced to NQ-size and then BQ-size at depth, where necessary.

All drillhole collar coordinates were surveyed in the UTM Zone 19S coordinate system (WGS84 datum). All drillholes were surveyed downhole using a combination of Single Shot (DDH 119-DDH 132) and Reflex EZ Trac downhole survey tools. Downhole survey measurements were collected at intervals ranging between 3 m and 50 m, depending on the degree of deviation noted in the drillhole. Almost all of the drillholes were oriented at azimuths of 15° to 195° (i.e. perpendicular to the predominant mineralization trend). A total of 39 drillholes were oriented at azimuths of 130° to 310°, approximately perpendicular to an inferred secondary mineralization direction that was roughly parallel to the NNE-SSW trending anticline fold axis. This secondary mineralization direction was suggested by a combination of in-pit mapping and detailed geostatistical spatial continuity analyses. Mineralization along this secondary direction was, however, found to be insignificant in comparison to the main WNW-ESE trending vein and veinlet stockwork-hosted mineralization. The dip of all drillholes was between 45° and 70°. These dips result in the drillholes intersecting the main WNW-ESE trending vertical to sub-vertical veins and veinlet stockwork mineralized system at an oblique angle. Drilling recovery generally ranged between 95% and 100% for diamond core drillholes.

The presence of existing underground workings prevented several of the diamond core drillholes from reaching their target depths. In such cases a second (ten occasions), third (six occasions), fourth (two occasions), and on one occasion a fifth drillhole, was drilled at slightly different angles, and from slightly different collar positions so as to avoid the underground workings and reach the target depth.

Drilling in the Cortaderas Breccia zone of the Cortaderas Area (see Section 14.3) was at a shallow angle to the inferred plunge of the mineralized body. This was unavoidable due to topographic, drillhole deviation and economic considerations (to drill perpendicular to the breccia body would require setting up shallow angle drillholes on top of a hill with intersections likely only after drilling more than 500 m, assuming the drillhole did not deviate off target). Mineralized intersections through the Cortaderas Breccia zone are therefore essentially down-plunge directions. Silver Standard has recognized the uncertainty in the sampling associated with such a drilling orientation by limiting confidence in the Mineral Resources generated for this body to the Inferred category (see Section 14), despite the relatively close-spaced nature of the current drilling density in this zone. Additional exploration will be conducted to further define the mineralization in the Cortaderas Breccia zone (see Section 26).

10.3 Drilling Plan and Drill Sections through the Pirquitas Deposit

Drilling plans and a series of representative drill sections through the Pirquitas deposit are presented in Figure 10-1,Figure 10-2 ,Figure 10-3 and Figure 10-4 only silver and zinc are shown as these are currently considered as the most economically significant elements present in the deposit. These sections display combined information from all drilling campaigns up to September 30, 2011.

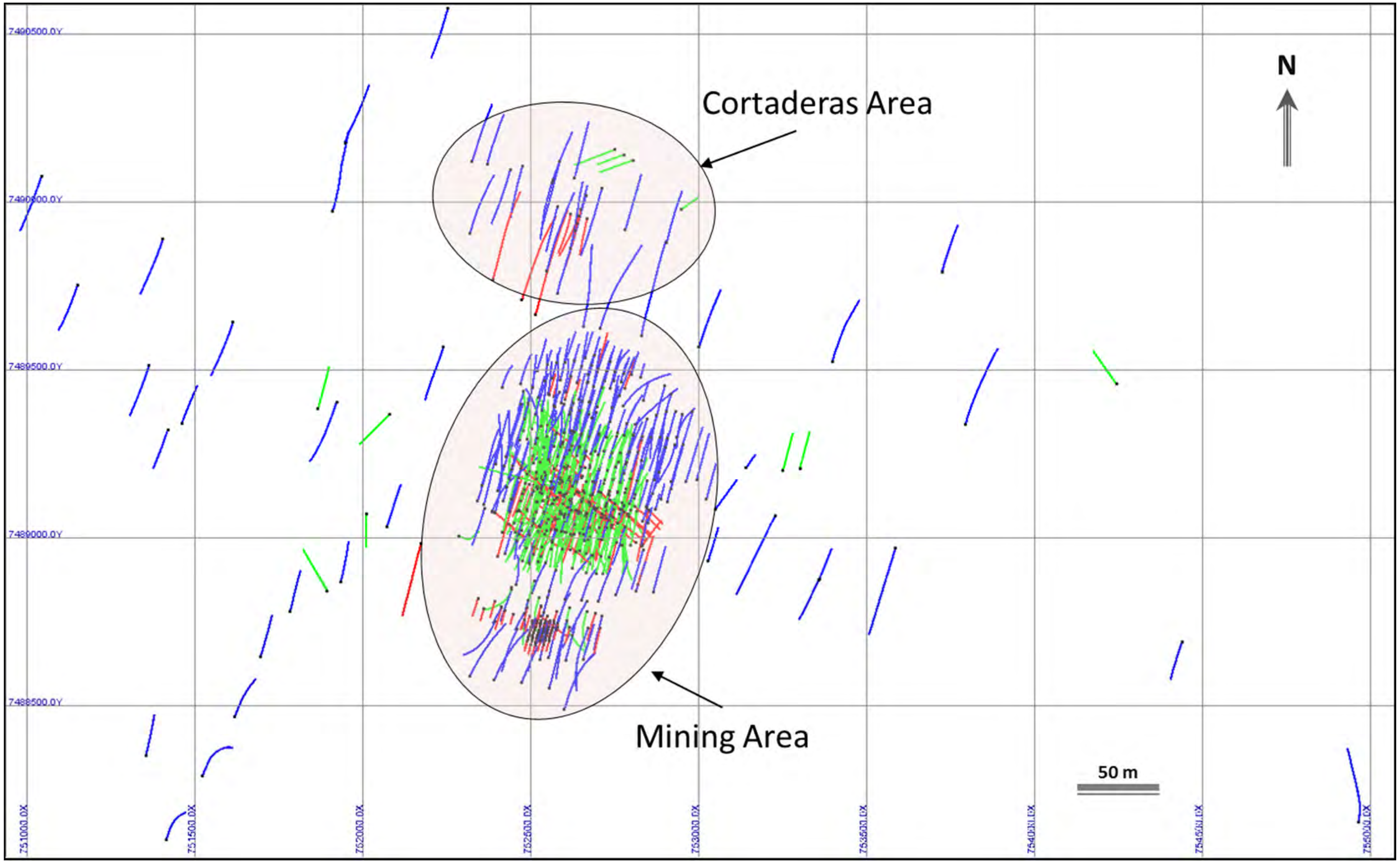


Figure 10-1 Drillhole Location Plan Showing all Exploration Drilling on the Pirquitas Property to Date Colour coded according to drilling program phase

(Green = drilling conducted pre-2004 by Sunshine; Blue = drilling conducted between 2005 and 2008 by Silver Standard; Red = drilling conducted between 2009 and 2011 by Silver Standard). Black dots represent drillhole collars. Grid coordinates in UTM Zone 19S (WGS84 datum) system. Approximate locations of the Mining Area (containing the San Miguel, Potosi, and Oploca Vein Zones) and the Cortadera Area (containing the Cortaderas Breccia and Valley Zones) are highlighted (see Section 14.3).

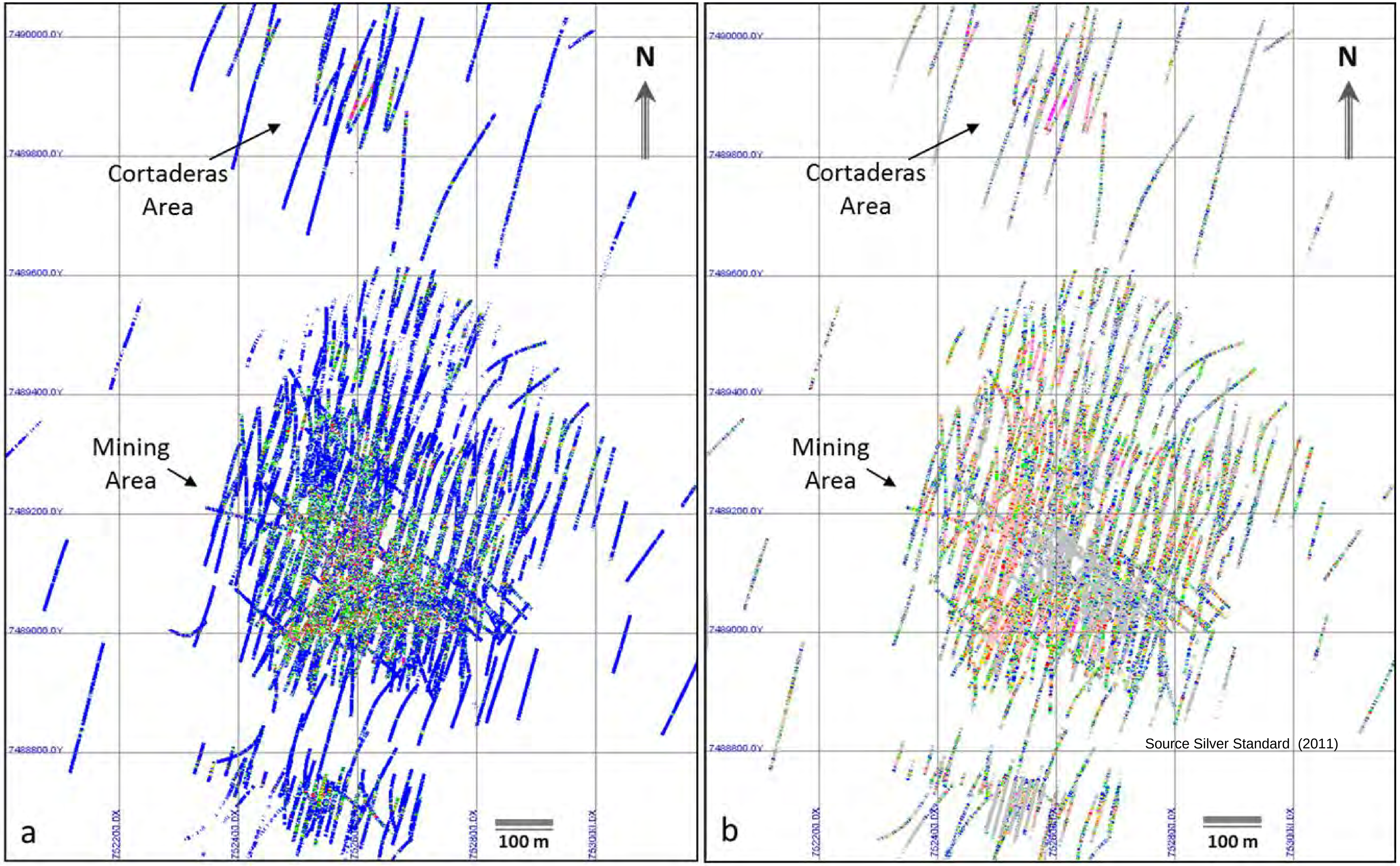


Figure 10-2 Drillhole Location Plan Showing all Exploration Drilling on the Pirquitas Property to Date

Drillhole location plan showing all exploration drilling on the Pirquitas Property to date colour-coded according to (a) Silver grade in g/t, and (b) Zinc grade in %. Unsampled drillhole traces not shown for simplification purposes. Warm colours represent high grade in both plots: (a) Silver grades represented by blues (<20 g/t), greens (20-60 g/t), yellow (60-100 g/t), and reds (>100 g/t); (b) Zinc grades represented by grey (<0.1%), blues (0.1-0.4%), greens (0.4-0.6%), yellow (0.6-0.7%), dark orange to red (0.7-1.0%), pink (1.0-5.0%), and magenta (5-30%).

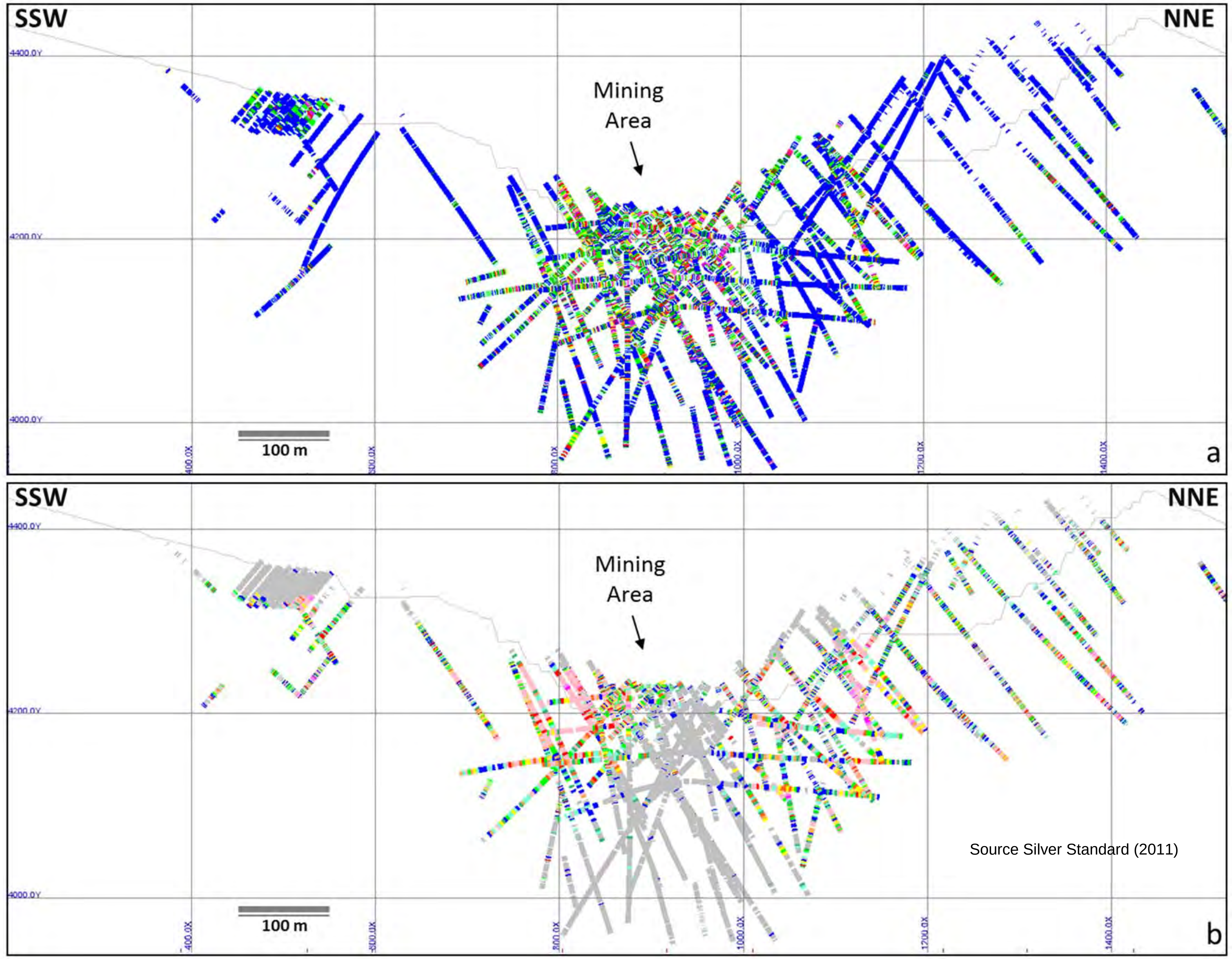


Figure 10-3 SSW-NNE Cross Section along Section Line 1265E with Drillhole Data

Colour-coded according to (a) Silver grade in g/t, and (b) Zinc grade in %. Colour scheme same as that for Figure 10-2. Also shown is the end-of-September 2011 as-mined surface (grey line. Viewing window is 25 m either side of line of section. Grid coordinates in UTM Zone 19S (WGS84 datum) system.

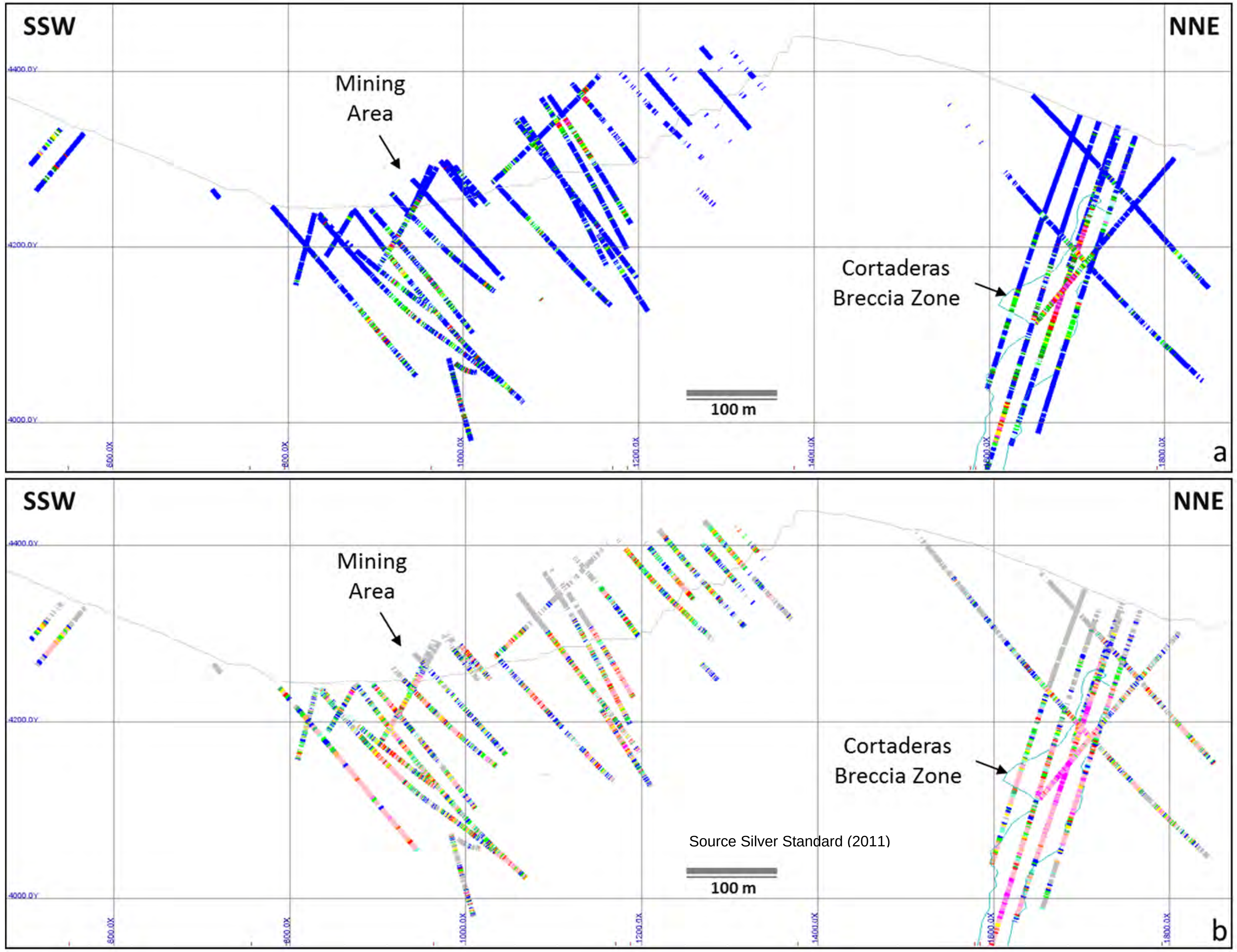


Figure 10-4 SSW-NNE Cross Section along Section line 1090E with Drillhole Data

Colour-coded according to (a) Silver grade in g/t, and (b) Zinc grade in %. Colour scheme same as that for Figure 10.2. Also shown are the end-of-September 2011 as-mined surface (grey line); interpreted Cortaderas Breccia Zone wireframe solid (blue outline). Viewing window is 25 m either side of line of section. Grid coordinates in UTM Zone 19S (WGS84 datum) system.

11 Sample Preparation, Analyses and Security

11.1 Sunshine Argentina

Information in this section is summarized from two previous NI 43-101 Technical Reports on the Pirquitas Property, as prepared by MDA (2004), and Silver Standard, (2008).

11.1.1 Sampling

11.1.1.1 RC Samples

RC drillhole cuttings were collected and split into 30 kg to 40 kg samples at the drill rig. A three-tier Jones-style splitter was used to split these samples in half. One half was logged in detail (for lithology, alteration, mineralogy, and mineralization) and stored on site at Pirquitas and the other half was split into a 3 kg to 5 kg sample, which was sent to the relevant analytical laboratory (see Section 11.1.2) for sample preparation and analysis. Sample splits from approximately 5% of the locally-stored samples were collected and submitted to the analytical laboratory as field duplicate control samples.

11.1.1.2 Diamond Drillhole Core Samples

Diamond drillhole core (HQ and NQ) was transported from the drill site to the on-site geology laboratory, where geotechnical core logging (principally the measurement of core recovery and RQD) was undertaken. Drillhole core was then marked for sampling by a geologist and cut in half using a diamond saw. One half of the drillhole core was geologically logged (for lithology, alteration, mineralogy, mineralization, and structure) in detail and stored on site. Drillhole core samples were collected from the other half of the core and sent to the relevant analytical laboratory (see Section 11.1.2) for sample preparation and analysis. Approximately 5% of the samples collected were split in half (i.e., quarter-core field duplicates) and sent to the analytical laboratory as field duplicate control samples.

11.1.1.3 Underground Channel Samples

Underground channel samples were collected along continuous one-metre intervals, perpendicular to the strike of the sheeted vein systems. Samples of approximately 2 kg per linear metre in weight were chiselled from channels that generally had dimensions of 5 cm wide, by 2 cm deep, by 1 m long. Pneumatic and hand hammering were used to chisel the channels. A total of 2,788 underground channel samples were collected over a total distance of 1,600 m from mineralized veins and sheeted vein systems in the main ore zone of the San Miguel zone, as well as from the Oploca, Potosí, Blanca, San Pedro, and Llallagua vein systems.

11.1.2 Sample Preparation and Analysis

11.1.2.1 Sample Preparation

Sunshine Argentina's drilling program was effectively conducted in two phases, with the transition being marked by a change in analytical laboratories from American Assay Laboratories (AAL) to the SGS Chile laboratory partway through its drilling program. RC drillholes AR 001-AR 092 and diamond core drillholes DDH 001-DDH 042 were analysed by AAL, RC drillholes AR 093-AR 164 and diamond core drillholes DDH 043-DDH 069 were analysed by SGS Chile. Both analytical labs took possession of the samples at Pirquitas and were in custody of them throughout the sample preparation and analysis steps (including sample transportation from site to the respective analytical laboratory). AAL set up sample preparation facilities on-site at Pirquitas whilst SGS Chile transported the samples to their analytical laboratory in Salta, Argentina. Each laboratory implemented QC programs that were reviewed and monitored by Sunshine Argentina and an independent consultant.

Sample preparation procedures were similar at both analytical laboratories:

- Samples were initially dried for two to three hours at 105°C.
- Dried samples were crushed to less than 18 mm in diameter using a jaw crusher, through to less than 2 mm to less than 0.18 mm in diameter using a roll crusher.
- A Jones-style riffle splitter was used to collect sample splits of between approximately 250 g (AAL) and 400 g (SGS Chile).
- Sample splits were pulverized in ring/disk pulverisers to less than 0.102 mm in diameter, homogenized, and packaged for analysis.
- All coarse rejects from the AAL prepared sample splits were stored on-site at Pirquitas; a minimum of 0.25 kg per sample was returned for on-site storage at Pirquitas by SGS Chile. A split of each sample pulp was also returned for on-site storage at Pirquitas.

11.1.2.2 Sample Analysis

Standard Ag and Sn analytical methods were used. Sample pulps were digested in aqua regia and analyzed for Ag using atomic absorption spectrometry (AAS). Samples with values higher than 500 ppm Ag (less than 3% of the total exceeded this threshold) were analyzed a second time using fire assay methods. For Sn analyses, the sample pulps were fused with sodium peroxide and caustic pellets to ensure the Sn was completely dissolved before being analyzed by AAS.

A total of six assay laboratories were used during Sunshine's two drilling phases:

- *Phase I* - After sample preparation, AAL sent the samples to the Laboratorio Quimíco Guayacan Ltda. analytical laboratory in La Serena, Chile for silver analysis, and to the AAL analytical laboratory in Santiago, Chile for tin analysis. Samples were also submitted to the Centro de Investigación Minera y Metalúrgica (CIMM) in Santiago, Chile for check assaying of silver, and to the Instituto de Investigaciónes Minero-Metalúrgicas in Oruro, Bolivia for check assaying of tin.
- *Phase II* – Prepared samples were sent to the SGS Chile analytical laboratory in Quilicura, Santiago, Chile for assaying, and to the Acme Labs in Santiago, Chile analytical laboratory for check assaying purposes. The analytical laboratories received 60 g pulps for silver analyses and 20 g pulps for tin analyses.

11.1.3 Quality Assurance/Quality Control

All of the analytical laboratories used by Sunshine Argentina were (at the time) and currently are internationally recognized. Silver Standard does not, however, have a record of the international certifications held by these various analytical laboratories at the time of the generation of the Sunshine Argentina assay data.

TWC (1999) noted that Sunshine Argentina established a Quality Assurance\Quality Control (QA\QC) program for monitoring and validating analytical results reported by the Pirquitas exploration program. Standard, blank, and duplicate field control samples were generated and submitted along with regular field samples to the relevant analytical laboratories to measure accuracy, precision, bias, and potential cross-contamination in the sample preparation and analysis process. Details of the creation and certification of the field control standard and blank samples are presented in TWC (1999). Review of control samples, with appropriate control limits, resulted in sample batches being resubmitted for re-analysis, where necessary. The final control sample dataset was reviewed in detail by TWC (1999), which noted that:

- Approximately 12% of the samples submitted for assays were QC samples consisting of field standard, blank, and duplicate control samples.
- Overall, silver analyses of standard and blank control samples were within acceptable limits (i.e., accurate, unbiased, and uncontaminated).

- Field duplicate control samples of silver were considered acceptable (i.e., reporting at an acceptable degree of precision given the inherent variability or nugget effect present in the Pirquitas mineralization).
- Tin analyses of standard control samples for Sunshine Argentina's drilling were initially biased low, resulting in the re-assaying of 3,252 samples. No significant biases were noted in the tin assay data for the Phase II drilling. Limited cross-contamination in tin assay data was rectified through a program of sample batch re-assaying. Tin data displayed a relatively high degree of inherent variability.

11.1.4 Sample Security

No specific mention was made of sample security during Sunshine Argentina's exploration program at Pirquitas.

11.2 Silver Standard

11.2.1 2005 to 2008 Drilling Programs

Information in this section is adapted from Silver Standard (2008).

11.2.1.1 Sampling

11.2.1.1.1 RC Samples

RC cuttings were collected and split to smaller samples at the drill rig. The total weight of each sample averaged about 40 kg. The RC sampling protocol used depended upon whether the sample was dry or wet:

- Dry samples were split to approximately one-eighth (~12.5%) of the original sample size using a three-tier Jones-style splitter. The remaining sample (seven-eighths) was bagged and stored on-site at Pirquitas. The smaller sample was split further into two 3 to 5 kg (effectively one-sixteenth) samples using a one-tier Jones-style splitter. One of these samples was submitted to the analytical laboratory for sample preparation and analysis, with the other stored on site. Field duplicate control samples were selected from this second batch of samples and submitted when required.
- Wet samples of manageable size were obtained using a cyclone wet splitter at the drill rig. The original sample was initially split in half using the wet splitter, with one-half further split down to a sample one-eighth of the total sample weight using a three-tier Jones-style splitter. This sample was then split in half to obtain two smaller samples each one-sixteenth the weight of the total sample. One of these samples was submitted to the analytical laboratory for sample preparation and analysis, with the other stored on site. Field duplicate control samples were selected from this second batch of small samples and submitted when required. All of the remaining seven-eighths of a given sample are stored on site.

11.2.1.1.2 Diamond Core Drillhole Samples

Diamond drillhole core was transported from the drill site to the core shack by pickup truck. The core was photographed, geotechnically (recovery and RQD) and geologically logged (lithology, alteration, mineralogy, mineralization, and structure), and sample intervals were marked on the core and core boxes by a geologist.

Drillhole core was generally sampled on one m intervals, starting from the top of the drillhole, with sample intervals selected so as to honour geological contacts. Underground drillhole core samples were collected over 0.3 m to 2.0 m intervals, honouring geological contacts. Drill core samples were generated by sawing the core in half using a diamond saw. One-half of the drill core was stored on site, with the other half submitted to the analytical laboratory for sample preparation and analysis. Field duplicate control samples were generated from quarter core sawn splits of selected samples.

Labeled core samples were placed in plastic bags and closed with a security seal. The plastic sample bags were then placed in larger labeled rice bags with each bag containing between five and ten samples depending on the sample weight. The samples were then sent by company truck to the MPI office in Jujuy, Argentina.

11.2.1.2 Sample Preparation

RC and diamond drill core samples were shipped by independent transportation companies from MPI's Jujuy office to the ALS Chemex analytical laboratory in Mendoza, Argentina. The following sample preparation was conducted by ALS Chemex:

- Received samples were logged into the ALS Chemex Webtrieve sample tracking system (ALS Chemex procedure LOG-21), weighed (WEI-21), and then dried (DRY-21).
- Dried samples were crushed to between 70% and 80% passing a nominal -2 mm (CRU-31 or CRU-35), and split using a riffle splitter (SPL-21) to produce a representative 250 g split for pulverization. The sample split was pulverized to better than 85% passing 75 µm (PUL-31 or PUL-32, depending on sample size).

11.2.1.3 Sample Analysis

Analytical methodology changed during Silver Standard's 2005-2008 drilling program. The various analytical methodologies utilized were as follows:

- *Method I* - Lithium borate fusion followed by a 38 element mass spectrometry ICP, plus indium (ME-MS81). Over-limit Pb (>1%), Zn (>1%), Sn (>1%), and Ag (>1,000 ppm) grades were re-analyzed using a four acid digestion followed by AAS finish (Pb or Zn-AA62, Sn-AA82, Ag-AA62 procedures). Ag grades still over limit (>1,500 ppm) were analyzed by fire assay with a gravimetric finish (Ag-GRA21).
- *Method II* - Aqua regia digestion followed by 36 element atomic emission ICP spectroscopy (ME-ICP41). Over limit Pb (>1%), Zn (>1%), Sn (>1%), and Ag (>100 ppm) grades were re-analyzed using a four acid digestion followed by AAS finish ((Pb, Zn or Ag-OG46, Sn-AA82 procedures). Ag grades still over limit (>1,500 ppm) were analyzed by fire assay with a gravimetric finish (Ag-GRA21).
- *Method III* – four acid 'near total' digestion followed by 34 element atomic emission ICP spectroscopy (ME-ICP61a, including Sn). Over limit Pb (>10%), Zn (>10%), and Ag (>200 ppm) grades were re-analyzed using a four acid digestion followed by AAS finish (Pb, Zn or Ag-AA62 procedures). Ag grades still over limit (>1,500 ppm) were analyzed by fire assay with a gravimetric finish (Ag-GRA21). Additional Sn analyses were conducted using AAS (Sn-AA82).

Samples were initially analyzed using the ICP mass spectrometry method (Method I), before the agua regia method (Method II) was added to the work orders. Ag grades were found to be understated by both the ICP mass spectrometry method and, to a lesser degree, the ICP agua regia method. As a result of this Silver Standard elected to switch to the ICP with four acid 'near total' digestion analytical technique. All ICP mass spectrometry samples were re-assayed using Method III by ALS Chemex.

11.2.1.4 Quality Assurance/Quality Control

ALS Chemex is a large international analytical laboratory with most of its analytical laboratories being registered or pending registration to ISO 9001:2008 certification. ALS Chemex is independent from Silver Standard.

Silver Standard's QC program for the 2005 to 2008 drilling programs utilized standard reference materials, blanks, field duplicates and third party analytical laboratory check assays.

Standard, blank, and field duplicate control samples were inserted into the sample stream on a one in twenty basis, for both RC and diamond drillhole core samples. Approximately 5% of the total number of submitted samples was submitted to the third party analytical laboratory for check assaying. QC samples included six different reference standards (covering a representative range of Ag, Sn, and Zn grades), blanks generated from barren sandstone, and field duplicates (prepared as discussed above).

Silver Standard has reviewed the QC results from the 2005 through 2008 drilling programs and notes the following:

- The control values (mean, standard deviations) of the standard reference materials were not initially correctly calibrated, resulting in extensive failures of the field standard control samples relative to no failures in the analytical laboratory standard control samples. Recalibration of these values indicates that the key assay data from the 2005 through 2008 drilling programs are unbiased and accurate, and therefore suitable for use in Mineral Resources estimation.
- Field blank control samples essentially indicated that sample cross-contamination was not an issue during the analytical work conducted on Silver Standard's 2005 to 2008 drilling data.
- Field duplicate control samples, whilst indicating a degree of variability in the assay data, were reported at acceptable levels of precision for Ag, Sn, and Zn, given the nugget effect (inherent variability) and the variability associated with quarter-core versus half-core samples.

11.2.1.5 Sample Security

Drillhole core and samples were in Silver Standard's custody from collection, through labeling and bagging, to initial transportation from the Pirquitas mine to the Jujuy office. Thereafter they were in the custody of independent transportation companies which transported them to ALS Chemex in Mendoza. Sample bags were sealed at the mine and none of the seals were reported tampered by the receiving analytical laboratory. Silver Standard is not aware of any deliberate attempts to compromise samples.

11.2.2 2010 to 2011 Drilling Programs

11.2.2.1 Sampling

All drillhole samples generated from the 2010 to 2011 drilling programs were diamond drillhole core samples. Diamond drillhole core was transported from the drill site to the core shack by pickup truck. The core was photographed before being geotechnically (recovery and RQD) and geologically logged (lithology, alteration, mineralogy, mineralization, and structure), with relevant logging codes recorded in accordance with standard MPI logging protocols.

Drillhole core sampling was conducted subsequent to geological logging. Sample intervals were marked on the core and core boxes by a geologist, with sample intervals selected so as to honour geological contacts. Sample lengths were generally up to 2 m in waste rock and 1 m or less in mineralized rock. A minimum sample length of 0.1 m was imposed on samples from highly mineralized structures like veins, stockworks, and breccias. A sample of 0.1 m in length was collected from the core of every drillhole every 12 m to 20 m for point load testing by the Pirquitas Mine Geotechnical Department. Drill core samples were generated by sawing the core in half using a diamond saw. One half of the drill core is stored on site, with the other half submitted to the analytical laboratory for sample preparation and analysis. Field duplicate control samples were generated from quarter core sawn splits of selected samples.

Labeled core samples were placed in plastic bags and closed with a security seal. The plastic sample bags were then placed in larger labeled rice bags with each bag containing between five and ten samples depending on the sample weight. The samples were then sent by company truck to the MPI office in Jujuy, Argentina.

11.2.2.2 Sample Preparation

Diamond drill core samples were shipped by independent transportation companies from Silver Standard's Jujuy office to the ALS Chemex preparation laboratory in Mendoza, Argentina. Sample preparation procedures were similar to those used for the 2005-2008 drilling programs:

- Received samples were logged in to the ALS Chemex Webtrieve sample tracking system (ALS Chemex procedure LOG-22 or LOG-24), weighed (WEI-21) and then dried (DRY-21), where necessary.
- Dried samples were crushed to 70% passing a nominal -2 mm (CRU-31), and split using a riffle splitter (SPL-21) to produce a representative 250 g split for pulverization. The sample split is pulverized to better than 85% passing 75 µm (PUL-31 or PUL-32, depending on sample size). All primary analyses were conducted at the ALS Chemex analytical laboratory in Mendoza, Argentina. A split of the pulps was shipped by ALS Chemex to the ALS Chemex analytical laboratory in Vancouver, Canada for additional Sn analysis.

11.2.2.3 Sample Analysis

Four acid 'near total' digestion followed by 34 element atomic emission ICP spectroscopy (ME-ICP61a, including Sn) was the primary analytical technique used during the 2010-2011 drilling program. Over-limit Pb (>10%), Zn (>10%), and Ag (>200 ppm) grades were re-analyzed using a four acid digestion followed by AAS finish (Pb, Zn or Ag-AA62 procedures). Ag grades still over limit (>1,500 ppm) were analyzed by fire assay with a gravimetric finish (Ag-GRA21). Additional Sn analyses were conducted using pressed pellet trace XRF analysis (Sn-XRF05), with over range Sn values (>1%) being re-analyzed using an ore grade fusion XRF analysis (ME-XRF10).

Sn grades were found to be understated in the ICP atomic emission spectroscopy technique. Silver Standard therefore decided to adopt the XRF analytical technique for Sn analysis. Silver Standard will re-submit sample pulps not analyzed for Sn by this technique once the Sn metallurgical issues are resolved.

11.2.2.4 Quality Assurance/Quality Control

A discussion on ALS Chemex's analytical laboratory certification is presented in Section 11.2.1. Silver Standard used a similar QC protocol for the 2010 to 2011 drilling programs as it used in the 2005 to 2008 drilling programs (see Section 11.2.1). Standard, blank, and field duplicate control samples were inserted into the sample stream on a one in twenty basis. QC sample data were monitored on a real-time basis (i.e., upon receipt of data from the analytical laboratory) to ensure that sample batches with control sample data outside of acceptable limits were re-submitted for analysis in a timely manner. Approximately 5% of the total number of submitted samples will be submitted to a third party analytical laboratory for check assay QC samples included three different reference standards (covering a representative range of low, medium, and high grade Ag, Sn, and Zn), blanks generated from barren sandstone, and field duplicates (prepared as discussed above). The three reference standards (PR1, PR2, and PR3) were created for the Pirquitas deposit by CDN Resources Laboratories Ltd., and certified by Smee & Associates Consulting Ltd. following Round Robin analysis at 5 independent analytical laboratories.

Silver Standard has reviewed the QC results from the 2010 to 2011 drilling programs and notes the following:

- Based on the results of the standard control samples, the assay data generated as part of the recent 2010 to 2011 drilling programs are unbiased and accurate, and therefore suitable for use in Mineral Resources estimation.
- Field blank control samples indicated that sample cross-contamination was not an issue during the analytical work conducted on Silver Standard's 2010 to 2011 drilling data.
- Field duplicate control samples, whilst indicating a degree of variability in the assay data, were reported at acceptable levels of precision for Ag, Sn, and Zn, given the nugget effect (inherent variability) and the variability in sample volume associated with quarter-core versus half-core samples

11.2.2.5 Sample Security

Drillhole core and samples were in Silver Standard's custody from collection, through labeling and bagging, to initial transportation from the Pirquitas mine to the Jujuy office. Thereafter they were in the custody of independent transportation companies that transported them to ALS Chemex in Mendoza. Sample bags were sealed at the mine and none of the seals were reported tampered by the receiving analytical laboratory. Silver Standard is unaware of any deliberate attempts to compromise samples.

11.3 Opinion on Adequacy of Sample Preparation, Security, and Analytical Procedures

Silver Standard's Senior Resource Geologist Dr. Warwick S. Board, P.Geo. has reviewed the sampling, sample preparation, analytical and security procedures for the various drilling programs conducted on the Pirquitas deposit, and considers them as having been conducted in accordance with acceptable industry standards. The procedures discussed in Section 11 are considered adequate for the generation of quality data suitable for use in Mineral Resource and Mineral Reserve estimation and for mine planning purposes.

12 Data Verification

The following data verification steps were conducted as part of the generation of the September 30, 2011 Mineral Resources estimate presented in this report:

- Visits to inspect geology and mineralization in the open pit (San Miguel and Potosi zones) and underground in the Oploca Vein zone.
- Detailed review of selected drillhole core from the Mining and the Cortaderas Areas (see Section 14), to assess the nature of the mineralization, and the effectiveness of the selected drilling orientation in the delineation thereof.
- Ongoing input into exploration drilling, and real-time involvement in drillhole location, downhole survey validation, and assay data validation.
- Data verification steps conducted by TWC (1999) and Silver Standard (2008) were reviewed in detail.
- Drillhole collar locations were confirmed with the mine site geologists. The drillhole collar locations were validated by an independent surveyor.
- The locations of pre-existing underground mine workings relative to underground channel samples were checked.
- Downhole survey data were reviewed for all drillholes to assess drillhole traces.
- QC information for all exploration drilling programs (see Sections 10 and 11) conducted on the Pirquitas Property was analysed.
- Approximately 10% of the pre-2010 drilling assay data set was checked and compared to the original assay certificates, to generate additional confidence in this data.
- Review of grade control drilling data (including spatial analysis of Ag, Zn, and Sn data) in the upper parts of the deposit in the Mining Area to assess continuity models for the relevant grade variables in the different zones.
- Detailed checks of assay data from the 2010 to 2011 drilling program in conjunction with Silver Standard's database manager, with iterative correction for any anomalies (generally typographic errors, including mislabelled samples and mislabelled sample intervals).
- Review of real-time QC data monitoring by Silver Standard's database manager, especially timing and effectiveness of remedial action taken with respect to failed batches.
- Comparison analyses were conducted between data derived from different drilling (and underground channel sampling) generations and types (e.g., RC, diamond core drilling) to validate their use in a single database.
- Data was validated at each manipulation stage throughout the database compilation until the completion of Mineral Resources grade tonnage estimates (see Section 14).

All assay data are provided directly to Silver Standard by the relevant analytical laboratory, and directly imported into the DataShed database management system. Silver Standard checked a randomly selected proportion (10%) of the

2010-2011 assay data in the DataShed Pirquitas assay database against the assay certificates provided by ALS Chemex and no errors were noted.

Based on the data verification steps outlined above, Silver Standard's Senior Resource Geologist Dr. Warwick S. Board, P.Geo. considers the Sunshine Argentina and Silver Standard exploration drilling data (including, collar, survey, lithology, and assay data) to be suitable for use in the generation of classified Mineral Resources and Mineral Reserve estimates, which can form the basis for mine planning studies.

13 Mineral Processing and Metallurgical Testwork

Historical metallurgical testwork was undertaken in the years 1996 to 1999 for a Feasibility Study on the Pirquitas Property led by Jacobs (1999) and prepared for Sunshine Argentina.

13.1 Metallurgical Testwork 1996 to 2010

Silver, zinc and tin testwork undertaken between the years 1996 and 1999 was reported in a Feasibility Study document by Jacobs (1999). This was reviewed, summarized and reported in the Hatch and MDA (2006b) Feasibility Study Update.

During 1996 to 1998 bulk samples for metallurgical testwork were collected from the underground workings in the San Miguel ore zone and were used to develop the process envisioned for metal recovery at the Pirquitas deposit. Diamond drill core samples from Pirquitas were also used to test the developed process. A proposed treatment circuit is discussed in the Jacobs (1999) report.

The laboratories which performed the testwork from 1996 to 1999 included Hazen Research Inc., Colorado Minerals Research Institute and Dawson Metallurgical Laboratories Inc. Their reports are appended to the Jacobs (1999) report.

Mineralogical studies undertaken by Hazen (1996 and 1998) showed that silver is present primarily as silver sulphides and sulphosalts, with most of the silver mineral grains in the range of 20 to 100 μm in size.

Tin is present almost entirely as cassiterite. Most of the cassiterite occurs as 50 to 500 µm aggregates of fine crystals (5 to 15 µm individual crystal size) that often contain inclusions of pyrite. Typically one-third of the tin occurs as fine grains of cassiterite intergrown with or included in pyrite Hazen (1996). Zinc occurs primarily as medium to coarse grained sphalerite (30 to 150 μm + 800 μm).

Section 4.1 of their Feasibility Study Update report Hatch and MDA (2006b) summarized the mineralogy of the Pirquitas deposit when considering processing options. They recognized that most of the Ag and Sn mineralization in the Pirquitas deposit is hosted within sheeted quartz veins, while zinc occurs both within these veins and the wall-rock. At Pirquitas between 5 and 20 % of the mineralized rock is composed of pyrite and other sulphides with the pyrite commonly associated with silver and tin minerals. The remainder of the mineralized rock is composed of siliceous gangue with inter-grown quartz and feldspar grains in a micaceous matrix. Hatch and MDA (2006b) used these observations to recommend crushing to 12.5 mm and pre-concentration of the run-of-mine ore using jigs with rejection of 40% to 50% of the ore to tailings and a minimal loss of silver and tin.

13.1.1 Historical Silver Testwork and Results

The silver mineralogy is complex and silver is present as a series of sulphides and sulfosalts, containing silver–bismuth, and silver–antimony minerals. Hazen (1998). Electron-microprobe analyses indicated the following principal silver minerals:

Freibergite	**$(Ag,Cu)_{10}(Fe,Zn)_2(Sb,As)_4\ S_{13}$**
Maltidite	**$AgBiS_2$**
Pyrargyrite	**$AgSbS_3$**
Acanthite	**Ag_2S**

In addition a complex sulphide mineral, Ag_2ZnSnS_4 was identified, and named Pirquitasite, after the mine.

The Colorado Minerals Research Institute (1998) performed silver flotation pilot plant tests, which are further summarized in Table 13-1.

Table 13-1 Silver Recovery by Flotation after Colorado Minerals Research Institute, 1998

Test	**Head * Ag kg/t**	**Rougher + Scavenger Concentrate Ag kg/t**	**Silver Distribution %**
1	0.47	9.12	86.0
2	0.38	4.94	81.8
3	0.44	4.57	68.9
4	0.55	8.90	86.9
Av	0.46	6.89	80.9

* After upgrading by Jigs Distribution

The 1998 test program was based on initial flotation of a silver concentrate, depressing the pyrite with sodium cyanide and zinc sulphate. This was said to be possible because the silver minerals are generally not associated with pyrite or cassiterite, and are well liberated at a relatively coarse grind.

Silver flotation testwork was also developed at Dawson and their complete work is available as appendices in Jacobs (1999)

Work presented in Dawson's second progress report (1998a) indicated to Hatch and MDA (2006b) that a silver recovery of approximately 80% to a 500 oz/t concentrate (17.0 kg/t) could be achieved. It also illustrated that the metallurgy was insensitive to the primary grinds between a P_{80} of 50 to 200 µm, resulting in the selection of a P_{80} = 180 µm grind. It indicated that regrinding of the rougher concentrate prior to cleaning was not beneficial.

Dawson's third progress report (1998b) describes the 150 kg/h continuous pilot plant at CMRI, Hatch and MDA (2006b) concluded that this work could at best be described as only moderately successful, in that the primary grind was P_{80} = 110 µm (target 180 µm), and the two-day run did not achieve circuit stability (described as due to "lack of ore" and "process upsets"). An 81.8% Ag recovery was achieved, at a grade of 144 oz/t (5.0 kg/t Ag), reportedly due to 80% of the Zn reporting to this concentrate.

Further bench testwork is reported in Dawson's fourth progress report (1998d). Seventeen tests were summarized that yielded an average of 74.3% Ag recovery from a 8.18 oz/t Ag (276 g/t) head grade. There was a reasonably clear correlation between head grade and recovery. The data presented in that report suggested to Hatch and MDA (2006b) that silver recoveries of 76-78% could be achieved with concentrate grades of 500 oz/t Ag (17.0 kg/t).

In their Seventh and final Progress Report Dawson (1999) work focused on attempts to improve the silver recovery and concentrate grade. They stated that, "Attempts to increase the silver grade of the final silver concentrate by the use of Carboxy Methyl Cellulose addition, concentrate regrinding, or gravity separation of the final concentrate were not successful". There were indications that the grade could be improved by further cleaning stages with relatively little silver loss. The results presented in that report indicated recoveries of 75-80% with concentrate grades in the order of 500-600 oz/t Ag. The low grade silver concentrates, (20 kg/t Ag is 2% Ag), must reflect the complex silver mineralogy and the flotation of other sulphide minerals. A complete concentrate analysis is provided in Table 13-2. Despite comments in some reports that silver minerals appeared relatively well liberated and that pyrite could be effectively depressed, the Hazen (1998), report indicated finely inter-grown particles of silver and other sulphosalts with pyrite and sphalerite. From this Hatch and MDA (2006b) concluded that it would be difficult to separate silver into a concentrate grade greater than 20-22 kg/t Ag.

In their Due Diligence Report, Behre Dolbear (1999) provided analysis, which was supported by data given here in Table 13-3, that yields an average silver recovery of 80.5% to a 19.9 kg/t Ag (580 oz/t) concentrate. This, in Hatch and MDA's view (2006b), was a closer assessment of the concentrate grade.

While agreeing that a silver recovery of 79% may be possible, Hatch and MDA (2006b) proposed the selection of 78% silver recovery (from ore). Due to the lack of consistency in the test results, Hatch and MDA (2006a) took a somewhat conservative view of the concentrate grade, with a base case of 20 kg/t Ag, and a probable range between 18 and 22 kg/t, from the average mine head grade.

Table 13-2 Concentrate Elemental Composition Extracted from Jacobs (1999).

Chemical Element	Silver Concentrate	Zinc Concentrate	Tin Concentrate
Silver	22,300 g/t	160 g/t	82 g/t
Tin	2.63%	0.52%	55.00%
Zinc	7.94%	53.00%	6.00%
Gold	3.2 g/t	0.034 g/t	n/a
Copper	1.00%	0.26%	0.05%
Iron	14.50%	4.00%	3.00%
Sulphur	22.30%	30.80%	1.19%
Silica (oxide)	31.80%	6.90%	22.69%
Lead	0.22%	0.18%	0.02%
Arsenic	0.42%	0.22%	0.03%
Antinomy	0.73%	0.03%	<0.01%
Bismuth	0.80%	<0.01%	0.02%
Aluminum (oxide)	10.77%	1.61%	4.86%
Titanium	0.27%	0.10%	0.29%
Cadmium	0.07%	0.44%	<0.01
Nickel	110 g/t	20 g/t	200 g/t
Tellurium	60 g/t	40 g/t	300 g/t
Selenium	<30 g/t	<20 g/t	<100 g/t
Mercury	<100 g/t	<50 g/t	<100 g/t
Cobalt	25 g/t	<20 g/t	100 g/t
Manganese	40 g/t	23 g/t	400 g/t
Gallium	0.03%	n/a	0.20%
Germanium	0.02%	0.00%	10 g/t
Indium	0.11%	0.07%	<0.04%
Tungsten (oxide)	0	0	0.10%

Table 13-3 Silver Sulphide Flotation, Metallurgical data – from Behre Dolbear, (1999).

Test No.	**Head (oz/t Ag) 1**	**Rougher Ag Recovery (%)**	**Cleaner Tail Ag Recovery (%) 2**	**Silver Flotation Ag Recovery (%)**	**Overall Circuit Ag Recovery (%)**	**Concentrate Ag Grade kg/t**
61	176.6	81.8	2.2	82.9	80.1	17.9
163	176.6	81.6	2.7	83.0	80.1	18.0
164	176.6	83.5	2.3	84.2	81.3	18.5
Mean	176.6	82.3	2.4	83.4	80.5	18.1
Design	**167.1**				**79.0**	**22.3**

[1] Ore Grade from levels 1 and 3 of San Miguel Mine.
[2] 50 percent of the silver contained in the cleaner tailings is presumed recovered in the final concentrate.

Table 13-4 Selected Silver Flotation Tests.

Test No.	Ag Oz/ton	Ag kg/t	Recovery%
144	344.72	11.8	82.73
145	508.41	17.4	78.76
146	485.91	16.6	79.08
147	575.63	19.7	79.18
148	717.15	24.5	91.49
149	463.95	15.9	93.65
150	293.85	10.0	80.03
151	552.28	18.9	78.91
152	514.19	17.6	78.87
153	773.02	26.4	66.53
154	638.38	21.8	74.82
155	759.95	26.0	74.95
156	435.93	14.9	79.23
158	354.64	12.1	92.01
159	419.77	14.4	88.35
160	305.55	10.4	90.25
161	599.9	20.5	76.82
163	525.12	17.9	92.82
164	540.36	18.5	94.08
24	849.64	29.1	74.5
25	310.85	10.6	85.05
43	461.48	15.8	81.51
50	489.4	16.7	80.1
61	522.01	17.9	81.77

* Oz per short tonne

13.1.2 Historical Zinc Testwork and Results

Hatch and MDA (2006b) stated, that an accurate assessment of zinc recovery was difficult, due to the relatively little specific zinc testwork undertaken in the 1996 - 1998 program. The zinc feed grade is low and it was the smallest contributor to the overall revenue (less than 10%). Nonetheless, at 2006 zinc prices, it was an economic product. Jig testwork indicated that 70 to 75% of the zinc would be recovered to the jig concentrate.

Testwork was carried out to separate a zinc concentrate from the re-ground bulk sulphide concentrate. Whereas re-grinding of the silver rougher concentrate was found by Dawson (seventh report) to be of no value, re-grinding of the bulk sulphide concentrate, (to a P_{80} = 50 to 55 µm), was found to be essential in order to liberate cassiterite from sulphides, as well as sphalerite from pyrite.

In conclusion, Hatch and MDA (2006b) concurred with Behre Dolbear (1999) that an overall zinc recovery of 46% should be possible (73% to jig concentrate, then 63% by flotation, hence 73% x 63% = 46%).

In view of the 0.61% Zn feed grade, which was higher than that in the 1999 Jacob's study, but which remained relatively low, Hatch and MDA (2006c) considered a concentrate grade of 50% Zn was appropriate for the base case, (with 52% Zn as an upper value) at a recovery of 48%. However, in view of the very limited testwork, this number could not be regarded as anything more than a reasonable estimate.

13.1.3 Historical Tin Testwork and Results

According to mineralogical works by Hazen (1996), the tin at Pirquitas is almost entirely present as 50 to 500 µm aggregates of 5 to 15 µm cassiterite crystals, with less than 5% as other tin minerals.

Typically, one third of the tin occurs as fine grains of cassiterite, intergrown primarily with and included in pyrite.

From their testwork Hazen (1998) reported approximately 4 to 5% of the tin was rejected as tailings from jig concentrators. In addition, 4 to 5% reports to the silver concentrate and 12% to the zinc flotation concentrate. The remaining 78% (of tin in ROM ore), reports to the tin circuit (as the sulphide scavenger and cleaner tailings). The primary grind P_{80} of 180 µm supports optimal silver recovery and liberation of cassiterite.

A large amount of testwork, both bench and pilot, was carried out to investigate the tin metallurgy. Although this work was comprehensive, it looked at unit operations, and not the overall, complex, multi-stage gravity and flotation circuits, with all of its circulating loads. (Hatch and MDA (2006) acknowledged that full piloting of such a complex circuit would be a major undertaking). There was no clear, calculated number presented in any of the reports that in Hatch and MDA's (2006b) opinion clearly illustrated the basis of the 61% tin recovery used in Jacobs (1999). Hatch and MDA (2006b) evaluated the data, to establish an independent assessment of the tin concentrate grade and recovery. They saw the following as key data:

- The average tin head grade was 0.21% Sn, (this was significantly less than the value of 0.33% Sn in the 1999 Study and less than most of the samples tested, but in line with the Addendum report of Jacobs (1999)).
- Approximately 85% of the tin in the flotation feed reported to a 5% Sn rougher concentrate.
- This rougher concentrate could be upgraded to 20 to 27% Sn by cleaning, and this further upgraded by multi-gravity or centrifugal concentration to 50 to 60% Sn.
- Tin flotation was reported to be "relatively" insensitive to the slimes content of the flotation feed, between the 4 and 17% -6 µm appeared acceptable. However, experience at Wheal Jane tin mine in the United Kingdom and other tin operations indicated that less than 10% of -6 µm produces the best results.

- A pH of 2 was used for tin flotation; although no pH optimization appears to have been done in the 1996 to 1998 testwork. World practice at the time was more frequently in the range pH 5 to 5.5.

- An overall tin balance in the Jacobs *(*1999) study provides the result presented in Table 13-5.

Table 13-5 Tin Distribution after Jacobs (1999)

Product Stream	**Distribution Sn % of Total**
Silver Concentrate	6.7
Bulk Sulphide Cleaner Concentrate	16.1
Slimes (cyclone overflow)	10.3
Gravity Concentrate Feed	49.9
Tin Flotation Feed	16.9
Total	**100.0**

- Detailed release analyses were conducted on all size fractions, to a 5% Sn concentrate grade, summarized in Table 13-6.

Table 13-6 Release Analyses, after Hatch and MDA (2006).

Size Fraction	**Total Sn in Size Fraction %**	**% Sn Recovered from Size Fraction at 5% Sn Grade**	
		Fraction	**Overall**
+300	2.3	60	1.4
-300+212	14.7	90	13.2
-212+180	10.6	94	10.0
-180+150	13.0	93	12.1
-150+106	9.8	90	8.8
-106+75	8.1	80	6.5
-75+53	4.7	80	3.7
-53+45	6.2	78	4.9
-45+37	0.8	80	0.6
-37	29.9	23	6.9
Total	**100.0**		**68.0**

On the basis of this data, overall recovery from ROM feed would be:

0.96* (49.9 x 88% + 16.9 x 85%) = 55.95%

*(0.96 is 96% Sn recovery to process plant feed from run-of-mine ore, i.e. Jig recovery).

Hatch and MDA (2006b) predicted that the ore would be ground to P_{80} = 180 µm, with much of the -37 µm reporting to tin flotation. Amending this release analysis data would indicate an overall recovery of about 85% from the tin circuit feed, equivalent to 63.6% from Run-of-Mine ore (ie. 85% x 96% x 78%).

Hatch and MDA (2006b) accepted the conclusions of previous reports that a 61% overall tin recovery could be achieved, but in their view this should be considered the upper limit. However, as the MDA (2004) mine plan had a tin head grade of 0.21% Sn, Hatch and MDA (2006b) therefore proposed the base case Sn recovery to be reduced to 57%.

13.1.4 Assessment of Recoveries and Concentrate Grades

Based upon their assessment of the 1996 to 1969 test work reports, Hatch and MDA (2006b) concluded that the concentrate grades and metal recoveries presented in Table 13-7 appeared to be possible.

Table 13-7 Concentrate Grades and Recoveries.

	Head Grade (MDA 2006)	Base Case		Limits	
		Concentrate Grade	Recovery	Concentrate Grade	Recovery
Silver	177 g/t Ag	20 kg/t	78%	18-22.3 kg/t	75-79 %
Tin	0.21% Sn	50%	57%	47-55 %	55-61 %
Zinc	0.61% Zn	50%	48%	48-52 %	40-50 %

13.2 Recent Metallurgical Testwork (2011)

During 2011, metallurgical testwork was focused upon improving the silver and zinc concentrate quality and recovery, and investigative tin circuit appraisals. Testwork included mineralogical examination of plant composite concentrate samples and bench top duplications of the entire plant ahead of tin flotation and gravity recovery circuits. The results of these studies are discussed below.

13.2.1 Flotation Concentrate Mineralogy

Representative composite concentrate samples from the plant were analyzed by G&T Metallurgical Services (G&T report KM3049, June 2011), to identify contained minerals. Their results are presented in Table 13-8 and Table 13-9.

Table 13-8 Mineralogical Composition of Silver Concentrates after G&T Metallurgical Services

Minerals	Silver 1st Cleaner Concentrate	Silver Column Concentrate	Silver Flash Concentrate	Silver Final Concentrate
Native Silver	0.00	0.00	0.00	0.00
Acanthite/Argentite	1.10	0.30	1.90	1.53
Pyrargyrite	0.46	0.03	1.39	0.82
Freibergite	0.23	0.02	0.71	0.47
Copper Sulphides	0.59	0.15	0.36	0.34
Galena	0.16	0.04	1.05	0.58
Sphalerite	20.1	12.6	14.1	13.1
Pyrite	21.0	24.7	22.7	23.1
Arsenopyrite	0.37	0.40	0.29	0.29
Iron Oxides	0.03	0.08	0.05	0.06
Quartz	37.0	42.9	35.1	38.2
Feldspars	4.65	5.35	4.69	4.80
Muscovite	4.53	4.95	6.11	6.27
Rutile/Anastase	0.43	0.42	0.41	0.44
'Kaolinite' (clay)	2.93	3.24	3.43	3.81
Cassiterite	1.95	2.16	1.58	1.63
Alunite	1.32	0.81	2.58	1.79
Bismuthinite	0.05	0.01	0.12	0.06
Others	3.05	1.79	3.47	2.71
Total	100	100	100	100

Note:
1) Copper Sulphides includes Chalcopyrite, Bornite, Chalcocite/Covellite, Tennantite and Stannite.
2) Iron Oxides includes Goethite, Limonite, Magnetite, and Hematite.
3) Feldspars includes K Feldspar, Plagioclase Feldspar, Feldspar Albite, and Alkali Feldspar.
4) Muscovite includes Biotite/Phlogopite.
5) 'Kaolinite' (clay) includes Sillimanite.
6) Others includes trace amounts of molybdenite, Apatite, Calcite, Chromite and unresolved mineral species.

Table 13-9 Mineralogical composition of Zinc concentrates after G&T Metallurgical Services.

Minerals	Zinc 1st Cleaner Concentrate	Zinc 2nd Cleaner Concentrate	Zinc Final Concentrate	Zinc Rougher Concentrate
Native Silver	0.00	0.00	0.00	0.00
Acanthite/Argentite	0.14	0.11	0.10	0.01
Pyrargyrite	0.00	0.00	0.00	0.00
Freibergite	0.00	0.01	0.00	0.00
Copper Sulphides	0.12	0.09	0.03	0.01
Galena	0.01	0.01	0.01	0.00
Sphalerite	48.0	46.0	66.6	15.5
Pyrite	40.7	41.8	28.3	64.1
Arsenopyrite	0.33	0.26	0.18	0.18
Iron Oxides	0.35	0.28	0.52	0.14
Quartz	5.49	6.35	1.92	12.9
Feldspars	0.76	0.93	0.29	1.52
Muscovite	0.52	0.63	0.16	1.59
Rutile/Anastase	0.11	0.08	0.06	0.19
'Kaolinite' (clay)	1.27	1.52	0.52	2.09
Cassiterite	0.94	0.90	0.58	0.45
Alunite	0.10	0.14	0.05	0.48
Bismuthinite	0.02	0.00	0.00	0.00
Others	1.13	0.94	0.70	0.86
Total	100	100	100	100

Note:

1) Copper Sulphides includes Chalcopyrite, Bornite, Chalcocite/Covellite, Tennantite and Stannite.
2) Iron Oxides includes Goethite, Limonite, Magnetite, and Hematite.
3) Feldspars includes K Feldspar, Plagioclase Feldspar, Feldspar Albite, and Alkali Feldspar.
4) Muscovite includes Biotite/Phlogopite.
5) 'Kaolinite' (clay) includes Sillimanite.
6) Others includes trace amounts of molybdenite, Apatite, Calcite, Chromite and unresolved mineral species.

13.2.2 Flotation Concentrates Minor Elements

Continuous minor element analysis of the produced silver and zinc concentrates has enabled typical minimum, maximum and expected values to be determined; these are listed in Table 13-10. These can be directly compared to the composite elemental composition values in Table 13-2

Table 13-10 2011 Testwork Silver and Zinc concentrates, Minor Element Content

		Silver Concentrate			**Zinc Concentrate**		
		Minimum	Maximum	Average	Minimum	Maximum	Average
Silver	g/t	13,000	30,000	20,000	800	2,000	1,600
Tin	%	1.4	2.8	2	0.5	1.5	1
Zinc	%	5	13	8	45	55	50
Gold	g/t	0.1	2	1	0.1	2	1
Copper	%	6.7	13	8	0.25	0.5	0.3
Iron	%	5	15	10	4	8	6
Lead	%	0.3	3	0.7	0.1	0.5	0.3
Antinomy	%	0.3	0.7	0.5	0.02	0.07	0.04
Arsenic	%	0.2	0.5	0.3	0.15	0.25	0.2
Bismuth	%	0.1	0.5	0.3			
Titanium	%	0.1	0.3	0.2			
Nickel	ppm	40	80	50	45	55	50
Tellurium	ppm	20	90	30	1	2	1.5
Selenium	ppm	30	90	50	40	50	45
Cobalt	ppm	15	30	18	10	20	15
Manganese	ppm	30	90	60	30	150	80
Gallium	ppm	75	150	100	220	350	300
Germanium	ppm	1.5	7	3	0.5	0.8	0.6
Indium	ppm	300	600	450	800	1,200	1,000

13.2.3 Tin Recovery Metallurgical Testing

The investigation of the improved recovery of tin from the zinc flotation tailings stream was completed by EPCM Consultores SRl (2010 a,b) and Metsolve Laboratories Inc (2011).

The ECPM directed testwork was completed at The Technical University of Oruro (Department of Metallurgy) and at Geological and Technical Services for Mines Sergeotechmin, both located in Bolivia, and knowledgeable in tin mineral recovery.

Metsolve Laboratories, performs metallurgical testwork, and specializes in traditional metallurgical processes combined with centrifugal gravity stages. They contract commercial laboratories in Vancouver for all chemical analyses.

Summary results table of the EPCM (2010) directed programs, are shown in Table 13-11 with the two alternate testing flow sheets shown in Figure 13-1 and Figure 13-2.

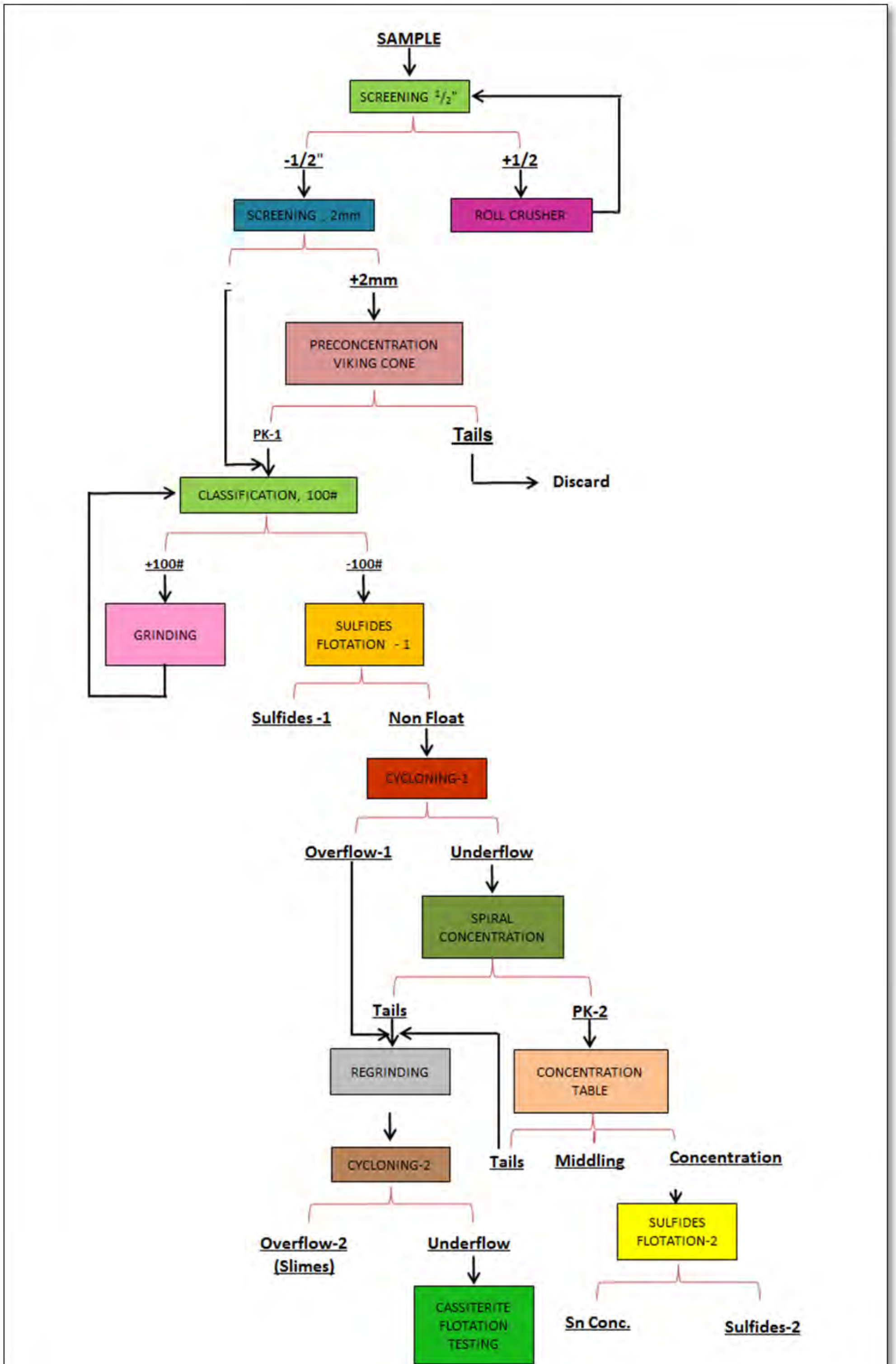
Table 13-11 EPCM, Tin Recovery Testwork Summary

Metallurgical Data - 1				
	UTO Metallurgical		Sergiotecmin	
	M-1	M-2	M-1	M-2
	Plant	Ore Control	Plant	Ore Control
% Sn (Head Grade)	0.35	0.25	0.52	0.31
Gravimetric				
% Sn concentrate	63.0	46.8	53.0	41.3
% Mass Recovery	17.5	7.7	19.7	11.4
Flotation				
% Sn concentrate	7.8	3.7	9.4	2.9
% Mass Recovery	5.2	10.9	7.7	6.1
% Sn composite concentration	33.6	13.3	22.3	6.3
% Total Recovery	22.7	18.7	27.4	17.5

Metallurgical Data - 2				
	UTO Metallurgical		Sergiotecmin	
	M-1	M-2	M-1	M-2
	Plant	Ore Control	Plant	Ore Control
% Sn (Head Grade)	0.35	0.25	0.52	0.31
Gravimetric				
% Sn concentrate	63.0	46.8	53.0	41.3
% Mass Recovery	17.5	7.7	19.7	11.4
Flotation (Falcon con upgrade)				
% Sn concentrate	48.9	58.1	58.4	45.8
% Mass Recovery	1.9	2.4	2.8	1.3
% Sn composite concentration	62.2	47.4	53.6	41.7
% Total Recovery	19.3	10.1	22.5	12.7

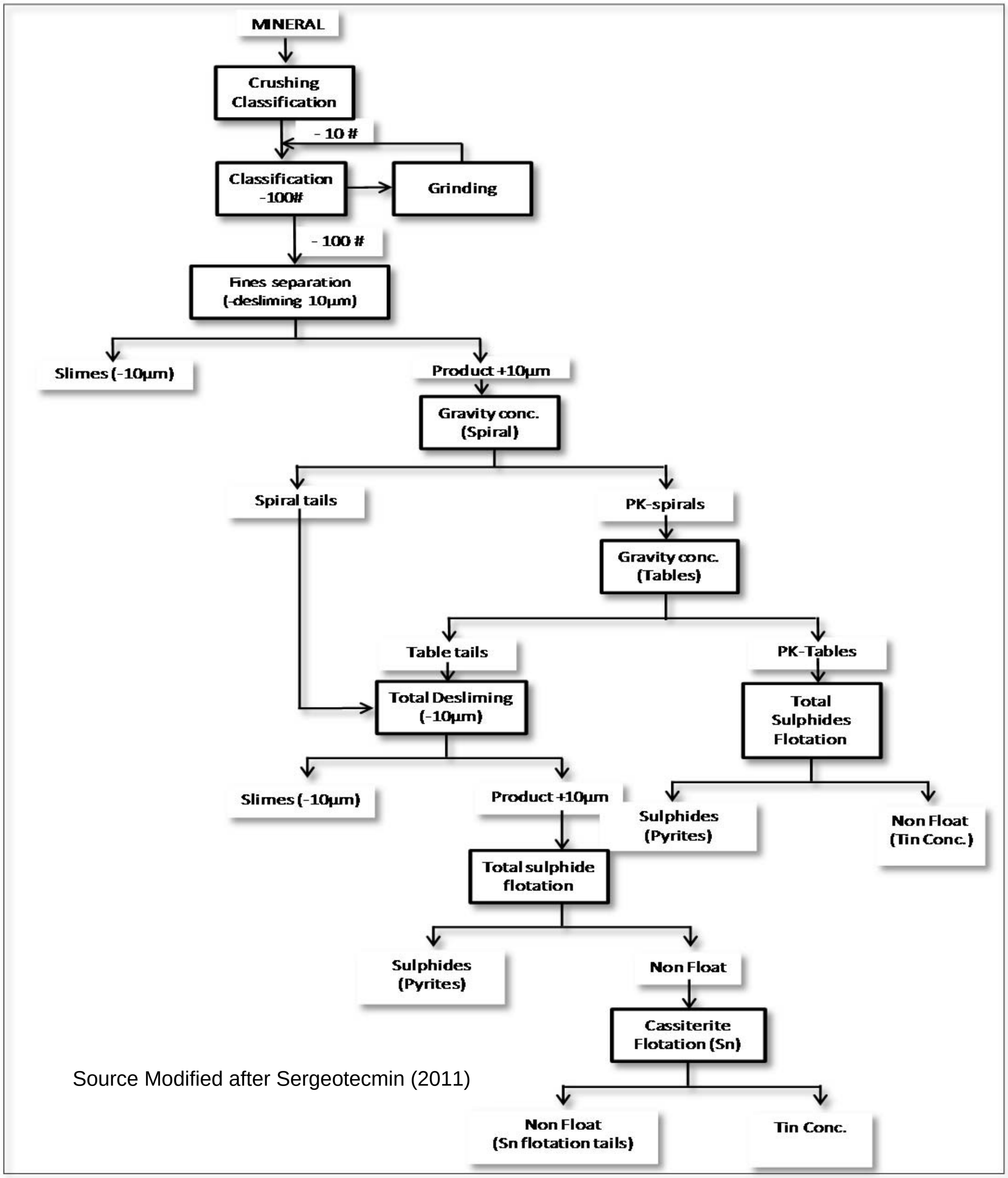
In all of these results, there is a common trend of gravity processes recovering the most tin, with the highest concentrate grade, whereas the tin flotation recovery decreases rapidly when a marketable grade of (40% + tin) concentrate is produced.

The tin recovery methods explored by Metsolve were based upon laboratory duplication of the plant silver and zinc flotation stages, followed by two alternate routes. Firstly pyrite rejection by bulk-sulphides flotation followed by centrifugal gravity recovery, and secondly by centrifugal recovery only. In both cases, the centrifugal gravity concentrate was cleaned by using a shaking table. These results are presented in Table 13-12.



Source Adapted from University of Oruro (2011)

Figure 13-1 University of Oruro, Tin Testing Process Flowsheet



Source Modified after Sergeotecmin (2011)

Figure 13-2 Sergeotecmin, Tin Testing Process Flowsheet

Table 13-12 Effect of Pyrite Flotation ahead of Gravity Tin Recovery Metsolve (2011)

		Pyrite Concentrate		Final Tin Concentrate		
Test	Pyrite Float	Sn Recovery (%)	S Recovery (%)	Mass Yield (%)	Sn Recovery (%)	Sn Grade (%)
PM107v1	yes	38.6	67.6	0.19	8.5	13.95
PM107v2	yes	38.6	67.6	1.20	14.5	3.77
PM108v1	yes	17.6	77.9	0.11	11.9	31.40
PM108v2	yes	17.6	77.9	0.77	17.8	6.58
PM204	no	0	0	3.20	15.3	1.55
PM205	no	0	0	3.99	25.9	1.84

The testwork results show the benefit of sulphide flotation, ahead of centrifugal gravity recovery. In all cases the final tin product grade is greater, there is, however, a loss of tin into the sulphide flotation concentrate decreasing overall tin recovery. These tin losses to Pyrite (sulphide) concentrate are due to both non-liberated cassiterite-sulphide particles and to the identified tin sulphide minerals.

13.3 **Tin Testwork Summary:**

The tin recovery testwork completed in 2011 explored a variety of tin mineral recovery processes.

To date the current testwork based on current plant recovered samples is not able to achieve Hatch and MDA (2006b) estimated (57% tin recovery). However, recent testwork recovery is markedly improved over actual plant performance indicating further understanding of practical up-scaling of testwork is required. The 2011 testwork demonstrated the importance of the association of cassiterite with sulphide particles (principally pyrite, as seen in Hazen (1996 and 1998) mineralogy work) and the presence of complex tin sulphide minerals upon both the overall tin recovery, and the achievable concentrate grade.

The testwork and actual plant performance for tin recoveries are summarized in Table 13-13.

Ongoing developments to improve tin metallurgy will continue to focus upon tin gravity recovery stages, combined with bulk sulphide flotation ahead of tin specific flotation.

Table 13-13 Summary of Tin Performance

	Process Type to Recover Sn	**Sn Head Grade (%)**	**% Sn Concentrate**	**% Sn Recovery**
Hatch Feasibility	Gravity + Flotation	0.21	47-55	55-61
Pirquitas Plant (Cumulate Data 14/12/10)	Gravity	0.33	49.3	2.5
1st Stage of Testing (Tin): UTO + Sergeotecmin	Gravity + Flotation	0.35	51.2	16.2
2nd Stage of Testing (Tin): UTO	Gravity + Flotation	0.32	51.6	17.6
Metsolve	Pyrite Flotation + Centrifugal Gravity	0.28	31.4	11.9

14 Mineral Resource Estimates

14.1 Introduction

Silver Standard has prepared an updated Mineral Resources estimate for the Pirquitas deposit located in the Jujuy Province of Argentina following completion of a recent (2010 to 2011) drilling program. The September 30, 2011 Mineral Resources estimate presented below forms the basis for the updated Mineral Reserve presented in Section 15.

The September 30, 2011 Mineral Resources estimate is based on all data available for the Pirquitas deposit as of the end of September 2011.

This section presents a summary of the key database, statistical, geostatistical and block modeling parameters that were used in the generation of the September 30, 2011 Pirquitas Mineral Resources estimate. Dr. Warwick Board, P.Geo., Senior Resources Geologist at Silver Standard, prepared the September 30, 2011 Pirquitas Mineral Resources estimate and relevant sections of the current report.

14.2 Mineral Resources Database Preparation

Following compilation of the Pirquitas Project database in Datashed (see Sections 14 and 12), a final stage of review was completed on the exported drillhole data prior to resource modeling. Extracted files, in MS Excel format, of drillhole collar, downhole survey, and assay data from the recent drilling programs were reviewed against field notes, logs, and assay certificates, and irregularities or errors noted, these were then investigated and iteratively corrected. Final compilation of Ag, Sn, and Zn data into the existing drillhole database for the Pirquitas Property was conducted in MS Excel in preparation of the assay file for resource estimation:

- Ag, Sn, and Zn data in the existing drillhole database were reviewed and validated, as discussed in Section 12.
- Final Ag grade data (in g/t) from the recent drilling programs were compiled using the ME-ICP61a (high grade four acid digestion with an ICP-AES finish; see Section 11) Ag data for grades below 200 g/t, Ag-AA62 (four acid digestion with an AAS finish) data for Ag grades in the range 200-1,500 g/t, and AG-GRA21 (30 g fire assay with a gravimetric finish) data for Ag grades above 1,500 g/t. Values higher than the upper level of detection for the fire assay technique (>10,000 g/t) were set to 10,000 g/t.
- Final Zn grade data (in %) from the recent drilling programs were compiled using the ME-ICP61a (high grade four acid digestion with an ICP-AES finish) Zn data for grades below 10% (100,000 g/t) and the Zn-AA62 (four

acid digestion with an AAS finish) data for Zn grades above 10% (those samples which returned overlimit results on the upper detection limit for ME-ICP61a). Values higher than the upper level of detection for the latter technique were set to 30%.
- Final Sn grade data (in %) from the recent drilling programs were compiled using, in order of precedence: Sn-XRF05 (trace level XRF analytical technique) Sn data, followed by ME-ICP61a (high grade four acid digestion with an ICP-AES finish) Sn data.
- Ag, Sn, and Zn grade data below the lowest level of detection for the various analytical techniques used were set to half the detection limit for the relevant technique.

The September 30, 2011 Mineral Resources estimate database contains assay data derived from diamond core drillholes, RC drillholes, and underground channel samples. Based on a series of validation checks Silver Standard considers that the three assay datasets are comparable and can be combined for use in Mineral Resource estimation. Validated drillhole collar, downhole survey, and assay data were imported into the Gemcom GEMS version 6.3.1 mining software and subject to a final stage of data validation using tools provided in that program. The finalized valid drillhole database used as input for the September 30, 2011 Mineral Resource modeling contains 836 collar (703 drillhole and 133 underground), 11,697 downhole (or along-channel) survey, and 120,062 assay data records.

14.3 Geological Domain Definition

Silver Standard considers the Pirquitas deposit as consisting of the Mining Area, which includes the San Miguel, Potosi, and Oploca Vein zone, and the Cortaderas area, which consists of the Cortaderas Breccia zone and the Cortaderas Valley zone (see Figure 14-1).

Silver Standard conducted a detailed investigation into domain definition for the Pirquitas deposit, both in the field and using the Gemcom GEMS mining software, and concluded that:

- It is impractical to generate a wireframe interpretation on a sectional basis for the Mining Area (which includes the San Miguel, Potosí, and Oploca zones) due to the highly variable nature of the vein stockworks between different sections through the deposit at the current exploration drillhole spacing (and might not even be possible at a significantly tighter drillhole spacing for the San Miguel and Potosi zones).
- With additional drilling it might be possible to generate a wireframe interpretation for the Oploca Vein zone.
- A wireframe solid interpretation could be generated for the Cortaderas Breccia zone.
- It was not possible, at the current drillhole spacing, to define a detailed wireframe interpretation on a sectional basis for the Cortaderas Valley zone.

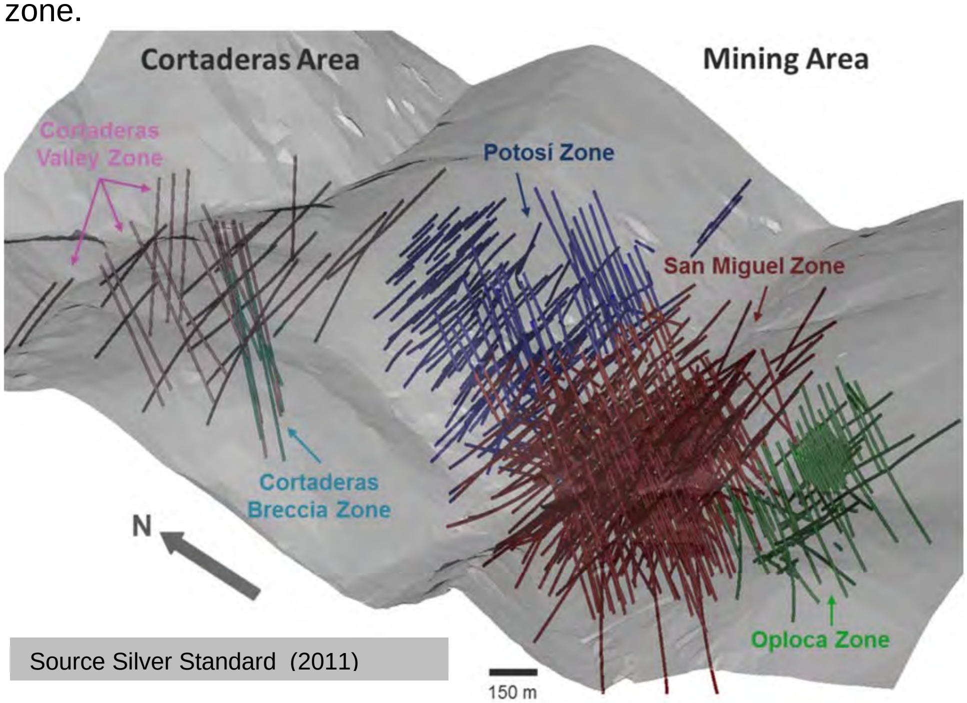


Figure 14-1 Oblique View down and to the Northeast at the Pirquitas Deposit showing Drillhole Traces Colour-coded According to Domain.

Based on the above mentioned conclusions, Silver Standard decided to assess the possibility of utilizing an unconstrained (i.e. not constrained within a wireframe solid) model for the Mining Area through the generation of a Categorical Kriging model. In this approach mineralization continuity shells are generated at a series of different probabilities of being greater than selected background-to-mineralization values for the relevant grade variable (e.g., a Ag grade shell for blocks with a 30% likelihood of being greater than 20 g/t, etc.; background-to-mineralization values identified from log probability plots as 0.2% for Zn and 0.1% for Sn) using Ordinary Kriging on indicator-transformed (data set to 0 for values less than the relevant back-ground-to mineralization value, and 1 for values greater than the relevant background-to-mineralization value values). All generated grade shells were iteratively reviewed with respect to conditioning data, as well as field and mining observations and the results indicated that an unconstrained approach was indeed applicable for use in the modeling of the mineralization in the Mining Area provided that a non-linear estimation technique with restricted search parameters (especially in the across-vein direction) was used. This approach is considered equally suitable for modeling the similar style mineralization in the Cortaderas Valley zone. Silver Standard was able to generate a wireframe solid for the Cortaderas Breccia zone, based on geology and Zn grade data.

The Mining Area was broadly sub-domained into three zones based on differences in vein dips:

- The central San Miguel zone – characterized by essentially sub-vertical veins and vein stockworks.
- The northern Potosí zone – characterized by veins and vein stockworks steeply dipping toward the north.
- The southern Oploca Vein zone – characterized by veins steeply dipping toward the south.

The boundary between the San Miguel and Potosí zones has been modeled as a soft boundary due to the transitional nature of the dips of the veins and stockwork veinlets in this area. The boundary between the San Miguel and Oploca Vein zones has been modeled as a hard boundary at this stage due to limited drilling information between these two zones.

Details of the domain coding used in the generation of the September 30, 2011 Mineral Resources estimate are presented in Table 14-1.

Table 14-1 Domain Code Details

Area	Zone	Domain Code
Mining Area	San Miguel	10
	Potosí	20
	Oploca	30
Cortaderas Area	Cortaderas Breccia	50
	Cortaderas Valley	55

14.4 Exploratory Data Analysis

Domain-coded raw (un-composited) drillhole data were extracted and exported from the Gemcom GEMS mining software for exploratory data analysis in the Snowden Supervisor (version 7.10.16) geostatistical software.

Basic visual analysis of the colour-coded un-composited grade data was conducted to assess trends and mineralization geometry within the different domains. Additional analyses conducted on the raw data included correlation analyses and drillhole sample length analyses. Results of these analyses were used to guide continuity parameter and composite length parameter selection.

Data were composited to the selected composite length from drillhole collar (for Domains 10, 20, 30, and 55), and within the interpreted wireframe solid (Domain 50) using the Gemcom Mining software, with residual lengths retained. Composites generated were subject to a series of validation tests. An extraction of drillhole composites was then exported to Supervisor for further exploratory data analysis, including basic statistics (including correlation analyses on the composited data) coupled with visual analysis to assess the potential for sub-domain generation, as well as mineralization trends and geometry, and to guide the selection of appropriate grade estimation techniques. Topcut (upper grade capping) analyses were conducted on all finalized domain-coded drillhole composite data to assess the potential impact of extreme values during grade estimation.

The following observations were made based on the exploratory data analysis:

- A composite length of 2.0 m is most suitable for the Pirquitas drillhole data.
- Ag, Sn, and Zn can be treated independently for grade estimation purposes as they are essentially uncorrelated.
- Care needs to be taken to restrict the across-vein (i.e. vein thickness in the NNE-SSW direction) direction during the grade estimation of Ag and Sn, as this mineralization is strongly focused in narrow veins and stockwork veinlets with a WNW-ESE trend. Zn mineralization is spatially more extensive and therefore does not require the same level of restriction.
- Significantly skewed and mixed grade distributions are developed for Ag, Sn, and Zn in the Mining Area. The extremely complex nature of the vein and stockwork veinlet structures in this area precludes effective domain definition. Consequently a non-linear grade estimation technique is required. Multiple Indicator Kriging (MIK) was considered the most appropriate technique for grade estimation in the Mining Area of the Pirquitas deposit. Although the grade variable distributions in the Cortaderas Valley zone are similarly skewed and mixed, the limited number of drillhole data available for this domain effectively precludes using MIK. Consequently the Single Indicator Kriging (SIK) interpolation technique was selected for grade estimation in this domain.
- Ordinary Kriging (OK) with a topcut is suitable for grade estimation in the Cortaderas Breccia zone.
- Topcuts are unnecessary for the Ag, Zn, and Sn grade variables in the Mining Area, as the upper tail of the grade distributions for these variables could be effectively modeled using a hyperbolic model (see Section 14.7), thereby eliminating the requirement for grade capping during MIK.
- Topcuts were used during the SIK and OK grade estimation of the Cortaderas Valley and Breccia zones, respectively. Details are presented in Table 14-2.

Table 14-2 Details of Topcuts Applied During Grade Estimation

Domain	Estimation Technique	Grade Variable	Topcut	Topcut Percentile	Uncut Mean	Cut Mean
50	Ordinary Kriging	Ag	1,600.0 g/t	98.4%	155.9 g/t	131.0 g/t
		Zn	-	-	4.62 %	4.62%
		Sn	1.700%	99.4%	0.132%	0.114%
55	Single Indicator Kriging	Ag	235.0 g/t	99.8%	7.4 g/t	7.0 g/t
		Zn	10.00%	99.7%	0.56%	0.55%
		Sn	2.700%	99.8%	0.025%	0.020%

14.5 **Variography**

14.5.1 Mining Area

Three dimensional continuity analyses (variography) were conducted on the domain-coded composite data for the Mining Area using Supervisor geostatistical software. Structural observations from the open pit were used to guide the selection of horizontal, across-strike, and dip-plane directions during variogram fan analysis. Variogram fans were generated for each of the modeled indicator thresholds (see Section 14.7 for more details) as part of the Multiple Indicator Kriging estimation technique selected for the three Mining Area zones (see Section 14.4). Variogram fans were viewed as indicator-transformed data.

Four experimental variograms were generated at each indicator threshold, which were selected using decluster-weighted grade data (see Section 14.7.1), for each grade variable (Ag, Zn, and Sn) in each Mining Area domain. A downhole variogram and three directional variograms, one along each of the three principal directions of the modeled continuity ellipse from the variogram fans, were generated. The downhole variogram was viewed at a 2.0 m lag (equivalent to the vertical sample spacing, where lag refers to spacing between data pairs used to generate the semi-variogram) to assess the inherent variability or nugget of the data at the relevant indicator threshold. Experimental variograms for each of the three principal directions were generated with an angular tolerance of generally 12° (widening to 20° and more at higher indicator thresholds, where fewer datapoints were available within narrow tolerance search cones to generate meaningful experimental variograms). Nugget, one, two, and occasionally three structure standardized spherical models were used to model the experimental variograms in indicator-transformed space, at each selected indicator threshold for each grade variable in each domain. Variogram models, once generated, were viewed and individually assessed for robustness across a range of lags (with lags generally selected to approximate different drillhole spacings from 10 m through 50 m). Variogram model ranges were checked (and iteratively refined, where necessary) for each model at each indicator threshold by viewing relative to the models generated at other indicator thresholds for the same grade variable and domain (particularly those immediately below and above the threshold in question). Care was taken to ensure smooth transitions in modeled orientations, ranges and variance contributions in the variogram models between indicator thresholds of a given grade variable in a given domain to minimize the risk of introducing order relations problems during grade interpolation.

A continuity ellipse, based on the variogram models, was generated at each indicator threshold for each grade variable in each of the three Mining Area domains for resource estimation and continuity model validation purposes. Both GSLIB ZXY and Gemcom GEMS ZXZ (with X set as principal direction D1) angles were recorded for grade interpolation. Continuity ellipses for each grade variable in each domain validated in the Gemcom GEMS mining software. A summary of the Mining Area indicator variography parameters used in the generation of the September 30, 2011 Pirquitas Mineral Resources estimate is presented in Table 14-3, Table 14-4 and Table 14-5.

Table 14-3 Multiple Indicator Variography Parameters for Ag in the Mining Area

Domain	Percentile	Declustered cut-off (g/t)	Undeclustered cut-off (g/t)	Direction			C_0	C_1	Range1 (m)			C_2	Range2 (m)			C_3	Range3 (m)		
				Major (D1)	Semi-Major (D2)	Minor (D3)			D1	D2	D3		D1	D2	D3		D1	D2	D3
10	60.000	13.5	17.5	-90°→000°	00°→285°	00°→015°	0.30	0.30	22.0	5.0	5.0	0.24	45.0	10.0	25.0	0.16	170.0	90.0	90.0
	70.000	21.0	27.0	-90°→000°	00°→285°	00°→015°	0.30	0.30	20.0	2.5	2.5	0.24	40.0	5.0	15.0	0.16	50.0	22.0	25.0
	75.000	27.0	35.0	-90°→000°	00°→285°	00°→015°	0.30	0.30	20.0	2.5	2.5	0.24	35.0	5.0	10.0	0.16	35.0	10.0	15.0
	80.000	36.5	48.0	-90°→000°	00°→285°	00°→015°	0.30	0.30	20.0	2.5	2.5	0.24	30.0	5.0	5.0	0.16	30.0	7.0	10.0
	85.000	53.5	71.0	-90°→000°	00°→285°	00°→015°	0.35	0.25	20.0	2.5	2.5	0.24	20.0	5.0	2.5	0.16	20.0	5.0	4.0
	90.000	91.0	122.5	-90°→000°	00°→285°	00°→015°	0.40	0.20	17.0	2.5	2.5	0.24	17.0	4.0	5.0	0.16	17.0	4.0	5.0
	92.500	130.5	173.0	-90°→000°	00°→285°	00°→015°	0.40	0.15	16.0	2.5	2.5	0.25	16.0	4.0	5.0	0.20	16.0	4.0	5.0
	95.000	210.0	275.0	-90°→000°	00°→285°	00°→015°	0.45	0.15	12.0	2.5	2.5	0.24	12.0	4.0	5.0	0.16	12.0	4.0	5.0
	96.500	301.0	395.0	-90°→000°	00°→285°	00°→015°	0.45	0.15	12.0	2.5	2.5	0.24	12.0	4.0	2.5	0.16	12.0	4.0	4.0
	97.500	422.0	532.0	-90°→000°	00°→285°	00°→015°	0.45	0.15	12.0	2.5	2.5	0.24	12.0	4.0	2.5	0.16	12.0	4.0	4.0
	98.750	746.5	939.0	-90°→000°	00°→285°	00°→015°	0.50	0.10	5.0	2.5	2.5	0.24	6.0	4.0	2.5	0.16	8.0	4.0	2.5
	99.375	1,289.8	1,583.0	-90°→000°	00°→285°	00°→015°	0.55	0.05	5.0	2.5	2.5	0.24	6.0	4.0	2.5	0.16	8.0	4.0	2.5
20	70.000	9.50	12.00	-85°→015°	00°→285°	-05°→195°	0.21	0.54	20.0	25.0	10.0	0.25	50.0	80.0	15	-	-	-	-
	80.000	16.50	21.50	-85°→015°	00°→285°	-05°→195°	0.21	0.46	10.0	15.0	5.0	0.33	30.0	30.0	8	-	-	-	-
	85.000	23.20	30.40	-85°→015°	00°→285°	-05°→195°	0.25	0.20	5.0	5.0	2.5	0.55	25.0	10.0	2.5	-	-	-	-
	87.500	28.40	37.50	-85°→015°	00°→285°	-05°→195°	0.25	0.20	5.0	5.0	2.5	0.55	25.0	15.0	2.5	-	-	-	-
	90.000	35.50	50.00	-85°→015°	00°→285°	-05°→195°	0.25	0.20	5.0	8.0	2.5	0.55	25.0	10.0	2.5	-	-	-	-
	91.250	41.00	58.00	-85°→015°	00°→285°	-05°→195°	0.25	0.17	3.0	3.5	2.5	0.58	20.0	7.5	2.5	-	-	-	-
	92.500	48.30	69.00	-85°→015°	00°→285°	-05°→195°	0.25	0.15	5.0	3.0	2.5	0.60	20.0	5.0	2.5	-	-	-	-
	93.750	58.00	86.00	-85°→015°	00°→285°	-05°→195°	0.25	0.20	8.0	3.0	2.5	0.55	20.0	5.0	2.5	-	-	-	-
	95.000	72.50	116.00	-85°→015°	00°→285°	-05°→195°	0.25	0.12	7.0	2.5	2.5	0.63	20.0	5.0	2.5	-	-	-	-
	96.000	90.00	160.90	-85°→015°	00°→285°	-05°→195°	0.25	0.11	10.0	1.5	2.5	0.64	20.0	3.5	2.5	-	-	-	-
	97.000	124.00	227.50	-85°→015°	00°→285°	-05°→195°	0.30	0.21	15.0	3.0	2.5	0.49	20.0	3.5	2.5	-	-	-	-
	98.000	194.50	421.30	-85°→015°	00°→285°	-05°→195°	0.35	0.14	10.0	3.0	2.5	0.51	20.0	3.5	2.5	-	-	-	-
30	70.000	5.00	8.60	-85°→195°	00°→285°	-05°→015°	0.15	0.24	8.0	25.0	5.0	0.38	20.0	27.0	25.0	0.23	40.0	60.0	25.0
	80.000	9.60	19.00	-85°→195°	00°→285°	-05°→015°	0.15	0.30	13.0	15.0	6.0	0.28	18.0	20.0	20.0	0.27	30.0	25.0	20.0
	85.000	15.50	30.70	-85°→195°	00°→285°	-05°→015°	0.20	0.25	10.0	15.0	2.0	0.43	20.0	15.0	18.0	0.12	30.0	20.0	20.0
	87.500	20.00	39.20	-85°→195°	00°→285°	-05°→015°	0.20	0.36	12.0	17.0	5.0	0.31	22.0	17.0	17.0	0.13	30.0	20.0	20.0
	90.000	27.00	57.00	-85°→195°	00°→285°	-05°→015°	0.25	0.32	10.0	15.0	5.0	0.30	25.0	15.0	18.0	0.13	30.0	20.0	20.0
	92.500	38.50	87.60	-85°→195°	00°→285°	-05°→015°	0.25	0.11	6.0	3.0	2.0	0.39	25.0	8.0	13.0	0.25	30.0	15.0	20.0
	94.000	49.90	118.80	-85°→195°	00°→285°	-05°→015°	0.25	0.33	25.0	2.0	8.0	0.25	25.0	12.0	12.0	0.17	30.0	15.0	12.0
	95.000	64.00	159.50	-85°→195°	00°→285°	-05°→015°	0.25	0.31	25.0	3.0	2.5	0.17	25.0	4.0	5.0	0.27	30.0	12.0	5.0
	96.000	80.80	261.00	-85°→195°	00°→285°	-05°→015°	0.30	0.23	25.0	3.0	2.5	0.24	25.0	4.0	2.5	0.23	30.0	12.0	2.5
	96.500	93.20	207.50	-85°→195°	00°→285°	-05°→015°	0.30	0.19	25.0	3.0	2.5	0.28	25.0	4.0	2.5	0.23	30.0	12.0	2.5
	97.000	109.00	354.00	-85°→195°	00°→285°	-05°→015°	0.35	0.15	5.0	3.0	2.5	0.31	12.0	4.0	2.5	0.19	20.0	8.0	2.5
	97.500	131.60	489.10	-85°→195°	00°→285°	-05°→015°	0.35	0.33	5.0	3.0	2.5	0.21	12.0	4.0	2.5	0.11	15.0	5.0	2.5

Notes: GSLIB ZXY angles are {0, -90, 15} for Domain 10, {15,-85,-180} for Domain 20, and {-165,-85,-180} for Domain 30. Orientation convention: -85° → 195° means a plunge of 85° along an azimuth of 195° (i.e. a steep plunge toward the south-southeast). C_0, C_1, C_2, C_3 are variance contributions from nugget through sills for structures 1, 2, and 3, respectively.

Table 14-4 Multiple Indicator Variography Parameters for Zn in the Mining Area

Domain	Percentile	Declustered cut-off (%)	Undeclustered cut-off (%)	Direction			C_0	C_1	Range1 (m)			C_2	Range2 (m)			C_3	Range3 (m)		
				Major (D1)	Semi-Major (D2)	Minor (D3)			D1	D2	D3		D1	D2	D3		D1	D2	D3
10	50.00	0.260	0.262	-90°→000°	00°→285°	00°→015°	0.10	0.25	15.0	15.0	15.0	0.15	175.0	160.0	115.0	0.50	175.0	200.0	135.0
	60.00	0.405	0.413	-90°→000°	00°→285°	00°→015°	0.15	0.25	20.0	15.0	15.0	0.22	210.0	170.0	130.0	0.38	210.0	170.0	130.0
	65.00	0.497	0.510	-90°→000°	00°→285°	00°→015°	0.15	0.30	25.0	15.0	15.0	0.20	210.0	165.0	130.0	0.35	210.0	165.0	130.0
	70.00	0.602	0.620	-90°→000°	00°→285°	00°→015°	0.20	0.25	25.0	15.0	15.0	0.05	230.0	80.0	125.0	0.50	230.0	165.0	125.0
	75.00	0.725	0.746	-90°→000°	00°→285°	00°→015°	0.20	0.28	20.0	15.0	15.0	0.08	230.0	40.0	120.0	0.44	230.0	165.0	120.0
	80.00	0.885	0.910	-90°→000°	00°→285°	00°→015°	0.20	0.20	20.0	15.0	15.0	0.12	60.0	40.0	110.0	0.48	230.0	155.0	110.0
	85.00	1.095	1.120	-90°→000°	00°→285°	00°→015°	0.25	0.20	20.0	10.0	5.0	0.14	60.0	40.0	35.0	0.41	230.0	150.0	95.0
	90.00	1.420	1.445	-90°→000°	00°→285°	00°→015°	0.30	0.18	15.0	10.0	5.0	0.20	35.0	40.0	25.0	0.32	120.0	140.0	75.0
	92.50	1.660	1.690	-90°→000°	00°→285°	00°→015°	0.35	0.15	10.0	10.0	5.0	0.20	30.0	35.0	25.0	0.30	115.0	140.0	70.0
	95.00	2.020	2.050	-90°→000°	00°→285°	00°→015°	0.40	0.15	10.0	10.0	5.0	0.20	20.0	35.0	15.0	0.25	85.0	140.0	30.0
	97.50	2.720	2.770	-90°→000°	00°→285°	00°→015°	0.45	0.15	5.0	10.0	5.0	0.10	20.0	35.0	15.0	0.30	70.0	100.0	40.0
	98.75	3.580	3.612	-90°→000°	00°→285°	00°→015°	0.45	0.15	5.0	10.0	5.0	0.13	5.0	35.0	15.0	0.27	60.0	100.0	40.0
20	50.00	0.289	0.409	-85°→015°	00°→285°	-05°→195°	0.25	0.24	15.0	35.0	25.0	0.19	37.0	140.0	80	0.32	80.0	300.0	120.0
	60.00	0.540	0.562	-85°→015°	00°→285°	-05°→195°	0.25	0.20	6.0	12.0	9.0	0.24	25.0	65.0	28	0.31	65.0	260.0	125.0
	70.00	0.731	0.769	-85°→015°	00°→285°	-05°→195°	0.25	0.22	10.0	10.0	7.0	0.19	20.0	45.0	12	0.34	40.0	185.0	40.0
	80.00	1.065	1.115	-85°→015°	00°→285°	-05°→195°	0.28	0.35	6.0	30.0	8.0	0.16	20.0	100.0	8.0	0.21	25.0	140.0	12.0
	85.00	1.325	1.410	-85°→015°	00°→285°	-05°→195°	0.28	0.38	3.0	15.0	8.0	0.23	18.0	90.0	8.0	0.11	50.0	90.0	10.0
	90.00	1.750	1.860	-85°→015°	00°→285°	-05°→195°	0.28	0.15	3.0	13.0	8.0	0.22	6.0	25.0	8.0	0.35	14.0	55.0	10.0
	92.50	2.138	2.255	-85°→015°	00°→285°	-05°→195°	0.28	0.29	4.0	13.0	8.0	0.24	7.0	35.0	10	0.19	10.0	45.0	10.0
	95.00	2.685	2.850	-85°→015°	00°→285°	-05°→195°	0.28	0.23	3.5	20.0	8.0	0.28	8.0	30.0	10	0.21	8.0	35.0	10.0
	96.00	3.070	3.185	-85°→015°	00°→285°	-05°→195°	0.29	0.15	4.0	25.0	8.0	0.42	4.0	30.0	10	0.14	10.0	30.0	10.0
	97.00	3.663	3.885	-85°→015°	00°→285°	-05°→195°	0.30	0.23	2.5	25.0	8.0	0.39	5.0	30.0	10	0.08	10.0	30.0	10.0
	98.00	4.700	4.750	-85°→015°	00°→285°	-05°→195°	0.30	0.22	4.0	10.0	8.0	0.19	10.0	15.0	10	1.29	10.0	25.0	10.0
	99.00	6.335	6.700	-85°→015°	00°→285°	-05°→195°	0.30	0.24	4.0	15.0	8.0	1.23	10.0	25.0	10	0.23	10.0	25.0	10.0
30	60.00	0.430	0.431	-85°→195°	00°→285°	-05°→015°	0.20	0.27	30.0	75.0	70.0	0.53	40.0	95.0	125	-	-	-	-
	70.00	0.635	0.673	-85°→195°	00°→285°	-05°→015°	0.20	0.22	25.0	75.0	50.0	0.58	40.0	75.0	100	-	-	-	-
	75.00	0.769	0.863	-85°→195°	00°→285°	-05°→015°	0.20	0.13	8.0	17.0	16.0	0.67	35.0	70.0	90	-	-	-	-
	80.00	0.959	1.141	-85°→195°	00°→285°	-05°→015°	0.20	0.24	10.0	45.0	20.0	0.56	35.0	65.0	90	-	-	-	-
	85.00	1.263	1.617	-85°→195°	00°→285°	-05°→015°	0.20	0.27	15.0	35.0	17.0	0.53	30.0	55.0	70	-	-	-	-
	87.50	1.468	1.975	-85°→195°	00°→285°	-05°→015°	0.20	0.30	10.0	30.0	15.0	0.50	30.0	50.0	65	-	-	-	-
	90.00	1.787	2.564	-85°→195°	00°→285°	-05°→015°	0.22	0.34	5.0	30.0	8.0	0.44	30.0	45.0	65	-	-	-	-
	92.50	2.165	3.270	-85°→195°	00°→285°	-05°→015°	0.22	0.28	5.0	10.0	2.5	0.50	30.0	40.0	25	-	-	-	-
	94.00	2.673	3.956	-85°→195°	00°→285°	-05°→015°	0.25	0.21	10.0	3.0	2.5	0.54	30.0	25.0	20	-	-	-	-
	95.00	2.910	4.498	-85°→195°	00°→285°	-05°→015°	0.25	0.16	7.0	3.0	4.0	0.59	30.0	10.0	12	-	-	-	-
	96.00	3.518	5.321	-85°→195°	00°→285°	-05°→015°	0.25	0.19	25.0	3.0	12.0	0.56	30.0	10.0	12	-	-	-	-
	97.00	4.131	6.545	-85°→195°	00°→285°	-05°→015°	0.30	0.24	20.0	3.0	10.0	0.46	30.0	10.0	10	-	-	-	-

Notes: GSLIB ZXY angles are {0, -90, 15} for Domain 10, {15,-85,-180} for Domain 20, and {-165,-85,-180} for Domain 30. Orientation convention: -85° → 195° means a plunge of 85° along an azimuth of 195° (i.e. a steep plunge toward the south-southeast). C_0, C_1, C_2, C_3 are variance contributions from nugget through sills for structures 1, 2, and 3, respectively.

Table 14-5 Multiple Indicator Variography Parameters for Sn in the Mining Area

Domain	Percentile	Declustered cut-off (%)	Undeclustered cut-off (%)	Direction			C_0	C_1	Range1 (m)			C_2	Range2 (m)			C_3	Range3 (m)		
				Major (D1)	Semi-Major (D2)	Minor (D3)			D1	D2	D3		D1	D2	D3		D1	D2	D3
10	75.00	0.065	0.075	-90°→000°	00°→285°	00°→015°	0.40	0.28	10.0	10.0	7.0	0.14	25.0	20.0	17.0	0.18	70.0	60.0	50.0
	80.00	0.085	0.099	-90°→000°	00°→285°	00°→015°	0.40	0.25	10.0	10.0	7.0	0.14	35.0	15.0	10.0	0.21	55.0	40.0	30.0
	85.00	0.120	0.142	-90°→000°	00°→285°	00°→015°	0.40	0.15	10.0	5.0	5.0	0.25	35.0	7.0	5.0	0.20	35.0	16.0	15.0
	87.50	0.153	0.183	-90°→000°	00°→285°	00°→015°	0.45	0.15	10.0	5.0	5.0	0.25	27.0	7.0	5.0	0.15	27.0	10.0	10.0
	90.00	0.205	0.247	-90°→000°	00°→285°	00°→015°	0.50	0.15	20.0	5.0	5.0	0.25	23.0	5.0	5.0	0.10	23.0	5.0	5.0
	92.50	0.293	0.363	-90°→000°	00°→285°	00°→015°	0.55	0.15	20.0	5.0	5.0	0.20	20.0	5.0	5.0	0.10	20.0	5.0	5.0
	95.00	0.470	0.550	-90°→000°	00°→285°	00°→015°	0.60	0.15	20.0	5.0	5.0	0.15	20.0	5.0	5.0	0.10	20.0	5.0	5.0
	96.50	0.657	0.790	-90°→000°	00°→285°	00°→015°	0.60	0.15	17.0	5.0	5.0	0.13	17.0	5.0	5.0	0.12	17.0	5.0	5.0
	97.50	0.908	1.098	-90°→000°	00°→285°	00°→015°	0.65	0.10	14.0	5.0	5.0	0.13	14.0	5.0	5.0	0.12	14.0	5.0	5.0
	98.75	1.565	1.875	-90°→000°	00°→285°	00°→015°	0.75	0.08	10.0	5.0	5.0	0.12	10.0	5.0	5.0	0.05	10.0	5.0	5.0
20	90.00	0.052	0.071	-85°→015°	00°→285°	-05°→195°	0.28	0.20	5.0	8.0	2.5	0.52	15.0	8.0	2.5	-	-	-	-
	92.00	0.066	0.095	-85°→015°	00°→285°	-05°→195°	0.30	0.12	5.0	5.0	2.5	0.58	15.0	5.0	2.5	-	-	-	-
	93.00	0.075	0.113	-85°→015°	00°→285°	-05°→195°	0.30	0.09	7.0	5.0	2.5	0.61	12.0	5.0	2.5	-	-	-	-
	94.00	0.090	0.138	-85°→015°	00°→285°	-05°→195°	0.32	0.30	10.0	5.0	2.5	0.38	12.0	5.0	2.5	-	-	-	-
	95.00	0.111	0.174	-85°→015°	00°→285°	-05°→195°	0.32	0.03	8.0	5.0	2.5	0.65	12.0	5.0	2.5	-	-	-	-
	96.00	0.142	0.228	-85°→015°	00°→285°	-05°→195°	0.35	0.05	7.0	5.0	2.5	0.60	12.0	5.0	2.5	-	-	-	-
	96.50	0.165	0.269	-85°→015°	00°→285°	-05°→195°	0.35	0.04	7.0	5.0	2.5	0.61	10.0	5.0	2.5	-	-	-	-
	97.00	0.210	0.309	-85°→015°	00°→285°	-05°→195°	0.35	0.14	8.0	5.0	2.5	0.51	10.0	5.0	2.5	-	-	-	-
	97.50	0.249	0.361	-85°→015°	00°→285°	-05°→195°	0.35	0.16	8.0	2.5	2.5	0.49	10.0	5.0	2.5	-	-	-	-
	98.00	0.307	0.428	-85°→015°	00°→285°	-05°→195°	0.40	0.34	8.0	2.5	2.5	0.26	10.0	2.5	2.5	-	-	-	-
30	87.50	0.070	0.150	-85°→195°	00°→285°	-05°→015°	0.15	0.70	10.0	8.5	7.0	0.15	12.0	10.0	9.0	-	-	-	-
	90.00	0.092	0.217	-85°→195°	00°→285°	-05°→015°	0.15	0.73	10.0	5.0	7.0	0.12	12.0	10.0	8.5	-	-	-	-
	92.00	0.125	0.288	-85°→195°	00°→285°	-05°→015°	0.15	0.78	10.0	5.0	6.0	0.07	12.0	10.0	8.5	-	-	-	-
	94.00	0.199	0.406	-85°→195°	00°→285°	-05°→015°	0.15	0.16	10.0	5.0	2.5	0.69	12.0	10.0	5.0	-	-	-	-
	95.50	0.275	0.576	-85°→195°	00°→285°	-05°→015°	0.15	0.16	10.0	5.0	2.5	0.69	12.0	10.0	5.0	-	-	-	-
	97.00	0.416	0.970	-85°→195°	00°→285°	-05°→015°	0.15	0.16	10.0	5.0	2.5	0.69	12.0	10.0	5.0	-	-	-	-
	97.50	0.520	1.145	-85°→195°	00°→285°	-05°→015°	0.15	0.16	10.0	5.0	2.5	0.69	12.0	10.0	5.0	-	-	-	-
	98.00	0.668	1.480	-85°→195°	00°→285°	-05°→015°	0.17	0.16	8.0	5.0	2.5	0.67	12.0	10.0	2.5	-	-	-	-
	98.50	0.904	1.805	-85°→195°	00°→285°	-05°→015°	0.17	0.14	8.0	5.0	2.5	0.69	12.0	10.0	2.5	-	-	-	-
	99.00	1.217	2.434	-85°→195°	00°→285°	-05°→015°	0.17	0.24	10.0	5.0	2.5	0.59	12.0	10.0	2.5	-	-	-	-
	99.40	1.830	3.300	-85°→195°	00°→285°	-05°→015°	0.25	0.36	8.0	5.0	2.5	0.39	8.0	10.0	2.5	-	-	-	-
	99.70	2.910	5.000	-85°→195°	00°→285°	-05°→015°	0.30	0.25	5.0	5.0	2.5	0.45	5.0	10.0	2.5	-	-	-	-

Notes: GSLIB ZXY angles are {0, -90, 15} for Domain 10, {15,-85,-180} for Domain 20, and {-165,-85,-180} for Domain 30. Orientation convention: -85° → 195° means a plunge of 85° along an azimuth of 195° (i.e. a steep plunge toward the south-southeast).C_0, C_1, C_2, C_3 are variance contributions from nugget through sills for structures 1, 2, and 3, respectively.

14.5.2 Cortaderas Area

A summary of the Cortaderas Breccia Area variography parameters used in the generation of the September 30, 2011 Pirquitas Mineral Resources estimate is presented in Table 14-6.

14.5.2.1 Cortaderas Breccia Zone

Variography was conducted on the topcut domain-coded composite data using the Supervisor geostatistical software. The modeled breccia body dimensions were used to control the selection of horizontal, across-strike, and dip-plane directions during variogram fan analysis. Variogram fans were viewed as traditional and normal-score transformed data to check on the directions selected.

Experimental variograms and variogram models were generated for each grade variable (Ag, Zn, and Sn) in the Cortaderas Breccia zone in a similar way to that described in Section 14.5.1 with the exception that only four experimental variograms were modeled per grade variable (no indicator thresholds to consider). In this way a downhole variogram and three directional variograms, one along each of the three principal directions of the modelled continuity ellipse from the variogram fans, were generated for each grade variable. The nugget was determined from the downhole variogram. The best experimental variograms were developed in normal space. Nugget, one- and two-structure standardized spherical models were used to model the experimental variograms. Variogram models, once generated, were checked across a range of lags to assess robustness. Variogram model ranges were checked and iteratively refined, where necessary. A continuity ellipse, based on the variogram models, was generated for each variable for validation purposes. Compatibility was set to Gemcom ZXZ rotation convention (with X set to principal direction D1). All continuity ellipses were validated in the Gemcom GEMS mining software orientations.

14.5.2.2 Cortaderas Valley Zone

The limited and relatively widely-spaced nature of the drillhole data in this domain generally precluded the generation of meaningful experimental variograms for modeling. Mineralization in the Cortaderas Valley zone is, however, considered as being similar to that in the San Miguel zone of the Mining Area and consequently variogram parameters from appropriate indicator thresholds (generally the threshold considered to best define the boundary between mineralization and background grades) for the relevant grade variable in Domain 10 were used to model the grade continuity in the Cortaderas Valley zone.

Table 14-6 Variography parameters for Ag, Zn, and Sn in the Cortaderas Area

Domain	Element	Direction			Nugget	Sill1	Range1 (m)			Sill2	Range2 (m)			Sill3	Range3 (m)		
		Major (D1)	Semi-Major (D2)	Minor (D3)			D1	D2	D3		D1	D2	D3		D1	D2	D3
50	Ag	-75°→200°	00°→290°	-20°→020°	0.20	0.24	6.0	5.0	5.0	0.56	16.0	10.0	10.0	-	-	-	-
	Zn	-75°→200°	00°→290°	-20°→020°	0.08	0.26	7.0	5.0	5.0	0.66	33.0	10.0	10.0	-	-	-	-
	Sn	-75°→200°	00°→290°	-20°→020°	0.11	0.45	10.0	5.0	5.0	0.44	20.0	10.0	10.0	-	-	-	-
55	Ag	-90°→000°	00°→285°	00°→015°	0.30	0.30	20.0	2.5	2.5	0.24	40.0	5.0	15.0	0.16	50.0	25.0	25.0
	Zn	-90°→000°	00°→285°	00°→015°	0.15	0.30	25.0	15.0	15.0	0.20	210.0	165.0	130.0	0.35	210.0	165.0	130.0
	Sn	-90°→000°	00°→285°	00°→015°	0.40	0.25	10.0	10.0	7.0	0.14	35.0	15.0	10.0	0.21	55.0	40.0	30.0

Notes: GEMCOM ZXZ (X = Direction 1) angles are {-20, 70, -90} for Domain 50 and {-15, -90, 90} for Domain 55. Orientation convention: -75° → 200° means a plunge of 75° along an azimuth of 200° (i.e. a steep plunge toward the south-southeast).

14.6 Block Model Preparation

An un-rotated block model prototype was generated in the Gemcom GEMS mining software in such a way that the blocks were of an appropriate size for the drillhole spacing (e.g., Vann *et al*., 2003), and that block heights and elevations exactly matched those of mine benches. Principal model parameters and fields are presented in Table 14-7 and Table 14-8.

Table 14-7 Block Model Parameters for the September 30, 2011 Mineral Resources Model

Block Model Item	Parameter
Origin	752072 mE; 7488400mN; 4478 m elevation
Block size	8 mE by 8 mN by 8 m elevation
No. blocks in easting	132
No. blocks in northing	244
No. blocks in elevation	80
Discretization	None for MIK estimates (Domains 10, 20, 30) 3 x 3 x 3 for OK and SIK estimates (Domains 50, 55)

Note: MIK = Multiple Indicator Kriging, OK = Ordinary Kriging, SIK = Single Indicator Kriging

Table 14-8 Block Model Fields

Field	Detail
Rock Type	Block model rock coding 0 = waste below topography 10, 20, 30, 50, 55 as per Table 14.1 90 = overburden 95 = air (i.e., blocks above topography)
Density	Density (see discussion in text)
Percent	Proportion of block model below September 30 2011 wireframe surface
OVB%	Proportion of block outside of overburden wireframe solid
UGVOID%	Proportion of block inside of underground workings wireframe solids
AGFINAL	Ag grade data (in g/t)
ZNFINAL	Zn grade data (in %)
SNFINAL	Sn grade data (in %)
CLASS	Resource classification grade data 1 = Measured, 2= Indicated, 3 = Inferred, 0 = unclassified
SVOL	Search volume for Ag
SVOLZN	Search volume for Zn
SVOLSN	Search volume for Sn
AGDISTANCE	Average distance of samples used to estimate block (Ag grade variable)

Block model coding was conducted in the Gemcom GEMS mining software using wireframe solids and surfaces and a precedence-based approach. Blocks above and below topography were coded as air (95) and waste (0). Blocks within the modeled overburden wireframe solid were coded as overburden (90). The proportion of a given block outside of (below) the overburden solid was coded (OVB%) into the model for grade dilution during final model compilation (see Section 14.7). Blocks below topography and overburden were coded according to grade domain as per Table 14-1 (see Section 14.3). The proportion of a given block below the base of the end September 2011 as-mined surface was coded (Percent) into the model for resource reporting. The proportion of a given block inside of the modeled wireframe solid of the underground workings was coded (UGVOID%) into the model such that the resource could be discounted for previously mined material. Density was coded into the model in the following way:

- Blocks coded as air were assigned a density of 0.001 t/m^3.
- Blocks coded as overburden (wholly within the overburden wireframe) were assigned a density value of 1.80 t/m^3.
- All blocks below topography or the overburden (wholly outside of the overburden wireframe) were assigned a density value of 2.67 t/m^3. This average density value has been generated from detailed bulk density sampling in the San Miguel, Potosi, and Oploca Vein zones, and has been confirmed through mining.
- Blocks straddling the base of overburden surface (i.e., those with an OVB% value ranging between 0.001% and 99.999%) were assigned a weighted density based on block proportion above and below this

interface (i.e., block density assigned was between 1.80 t/m^3 and 2.67 t/m^3).

- Blocks wholly within underground workings wireframe solids were assigned a density value of 0.00 t/m^3. This was done to remove tonnage and therefore contained metal associated with the underground workings from the final block model.
- Blocks partially straddling the underground workings wireframe solids were assigned a weighted density based on block proportion within the wireframe, with the resulting density ranging between 0.00 t/m^3 (blocks wholly within the underground workings solids) and 2.67 t/m^3 (blocks wholly outside of the underground workings solids). This density assignation was conducted in such a way that the density differences on either side of the base of overburden surface were honoured.
- Blocks inside of the Cortaderas Breccia zone were assigned a density of 2.80 t/m^3.
- Blocks inside of the Cortaderas Valley zone and below topography were assigned a density of 2.67 t/m^3.

Validation was conducted at the end of each model preparation step, as well as of the completion of the process. Model validation included visual validation in plan and section, and statistical validation by domain, of block model codes. Additional validation was conducted on blocks coded with UGVOID% values of greater than 0.001% to ensure that the September 30, 2011 Mineral Resources estimate was correctly discounted for previously mined material.

14.7 Grade Estimation

14.7.1 Mining Area

Ag, Zn, and Sn grades were estimated into Domains 10, 20, and 30 in the block model using Multiple Indicator Kriging (MIK). Detailed modeling of the cumulative distribution function (CDF) for the relevant grade variable in the relevant Mining Area domain was conducted on decluster-weighted domain-coded drillhole composites using Supervisor geostatistical software (Table 14-9). A three-fold expanding search was used for grade interpolation, with geometry, ranges, and number of samples for each search pass based on a combination of geology and variography considerations, and optimized through a series of modeling iterations. Search parameters used in the generation of the Mining Area MIK estimate are presented in Table 14-10. Variogram parameters used in the generation of the Mining Area MIK estimate are presented in Section 14.5.1

MIK grade estimation was conducted using the GSLIB geostatistical software of Deutsch and Journel (1998). Order relations problems were checked for and corrected (where necessary) during the modeling process. Block model data were imported into the Gemcom GEMS mining software for final model compilation, validation, and grade-tonnage reporting. Grade variables in blocks straddling the base of overburden surface were diluted using a block proportion weighting approach.

Table 14-9 Mining Area MIK Grade Estimation - Lower and Upper Tail Model Parameters

Variable	Domain	CDF Tail	Model	Model Parameter
Ag	10	Lower	Power	0.59
		Upper	Hyperbolic	1.82
	20	Lower	Power	0.36
		Upper	Hyperbolic	1.22
	30	Lower	Power	0.33
		Upper	Hyperbolic	1.00
Zn	10	Lower	Power	0.39
		Upper	Hyperbolic	2.62
	20	Lower	Power	0.61
		Upper	Hyperbolic	2.60
	30	Lower	Power	0.52
		Upper	Hyperbolic	2.11
Sn	10	Lower	Power	0.40
		Upper	Hyperbolic	2.28
	20	Lower	Power	0.14
		Upper	Hyperbolic	1.16
	30	Lower	Power	0.15
		Upper	Hyperbolic	2.40

Note: Based on decluster-weighted data to remove influence of clustering on grade variable population. Indicator thresholds also based on decluster-weighted data, with interpolation conducted on undeclustered drillhole composite data.

Table 14-10 Mining Area MIK Grade Estimation - Search Parameters

Domain	Grade Variable	Search Volume 1						Search Volume 2						Search Volume 3					
		Min. Samp.	Max. Samp.	Max. per octant	D1	D2	D3	Min. Samp.	Max. Samp.	Max per octant	D1	D2	D3	Min. Samp.	Max. Samp.	Max. per octant	D1	D2	D3
10	Ag	12	24	4	30.0	20.0	2.5	12	24	5	40.0	30.0	2.5	8	24	5	55.0	35.0	15.0
	Zn	12	24	4	50.0	30.0	20.0	10	24	5	60.0	40.0	30.0	8	20	-	80.0	50.0	40.0
	Sn	12	30	4	40.0	25.0	2.5	12	30	5	50.0	30.0	2.5	8	24	5	55.0	35.0	5.0
20	Ag	12	24	4	50.0	35.0	2.5	10	24	5	60.0	40.0	2.5	8	24	5	60.0	40.0	3.0
	Zn	12	24	4	40.0	25.0	2.5	10	20	5	50.0	30.0	3.0	8	20	-	80.0	50.0	7.5
	Sn	12	24	4	50.0	35.0	2.5	10	24	5	60.0	40.0	2.5	8	24	-	60.0	40.0	3.0
30	Ag	12	24	3	30.0	20.0	2.5	10	24	5	40.0	25.0	2.5	8	24	5	40.0	25.0	3.0
	Zn	10	20	3	40.0	25.0	2.5	10	20	5	50.0	30.0	3.0	8	20	-	80.0	50.0	7.5
	Sn	12	24	3	35.0	20.0	2.5	10	24	4	40.0	25.0	2.5	8	24	-	40.0	25.0	2.5

Notes: Min. Samp. = minimum number of samples. Max. Samp. = maximum number of samples. Max. per octant = maximum number of samples per octant. D1, D2, and D3 = search ranges in directions 1, 2, and 3, respectively. GSLIB ZXY search angles are {0,-90, 15} for Domain 10, {15,-85,-180} for Domain 20, and {-165,-85,-180} for Domain 30. Search ellipse orientations are identical to modeled anisoptropy orientations defined from variograms (see Section 14.5).

14.7.2 Cortaderas Area

14.7.2.1 Cortaderas Breccia Zone

Ag, Zn, and Sn grades were estimated into Domain 50 in the block model using Ordinary Kriging (OK). A block discretization of 3 x 3 x 3 was used. Topcut domain-coded drillhole composite data was used as input for grade estimation. Range restrictions were placed on extremely high grade Zn (above 19% Zn) and Sn (above 1% Sn) values during estimation. A two-fold expanding search was used to ensure all blocks within the interpreted wireframe solid were interpolated. Grade estimation was conducted using the Gemcom GEMS mining software. Details of the search parameters used in the generation of the Cortaderas Breccia zone OK estimate are presented in Table 14-11. Variogram parameters used in the generation of this estimate are presented in Section 14.5.2.

Grade estimation validation steps included checking (and correcting, if necessary) for empty blocks and blocks with negative grades (in the few areas where low grade samples shielded extreme values during the kriging run).

14.7.2.2 Cortaderas Valley Zone

Ag, Zn, and Sn grades were estimated into Domain 55 in the block model using Single Indicator Kriging (SIK). A block discretization of 3 x 3 x 3 was used. Domain-coded drillhole composite data was used as input for grade estimation. Grade estimation was constrained by search ellipse parameters within a broad wireframe solid interpretation. Indicator grade ranges used for estimation (with thresholds derived from population statistics) included: 10.0-651.0 g/t Ag; 0.10-22.75% Zn; and 0.01-5.78% Sn. A single search was used. Grade estimation was conducted using the Gemcom GEMS mining software. Details of the search parameters used in the generation of the Cortaderas Valley zone SIK estimate are presented in Table 14-11. Variogram parameters used in the generation of this estimate are presented in Section 14.5.2.

Table 14-11 OK and SIK Search Parameters

Domain	Grade Variable	Search Volume 1						Search Volume 2						High grade search range (restrict influence of high grade samples)			
		Min. Samp.	Max. Samp.	Max. per drillhole	D1	D2	D3	Min. Samp.	Max. Samp.	Max. per drillhole	D1	D2	D3	High grade threshold	D1	D2	D3
50	Ag	12	30	8	20.0	15.0	15.0	8	30	-	40	30	30	-	-	-	-
	Zn	12	30	8	20.0	15.0	15.0	8	30	-	40	30	30	19%	15	10	10
	Sn	12	30	8	20.0	15.0	15.0	12	30	-	40	30	30	1%	15	10	10
55	Ag	8	30	7	90.0	70.0	5.0	-	-	-	-	-	-	-	-	-	-
	Zn	10	30	7	80.0	50.0	30.0	-	-	-	-	-	-	-	-	-	-
	Sn	8	30	7	90.0	70.0	5.0	-	-	-	-	-	-	-	-	-	-

Notes: Min. Samp. = minimum number of samples. Max. Samp. = maximum number of samples. Max. per drillhole = maximum number of samples per drillhole. D1, D2, and D3 = search ranges in directions 1, 2, and 3, respectively. OK = Ordinary Kriging. SIK = Single Indicator Kriging. GEMCOM ZXZ (X = Direction 1) search angles are {-20,70,-90} for Domain 50 and {-15, -90, 90} for Domain 55. Search ellipse orientations are identical to modeled anisoptropy orientations defined from variograms.

14.8 **Mineral Resource Confidence Classification**

Mineral Resources estimates presented in this report are classified in accordance with CIM Definition Standards (CIM, 2010). A Mineral Resource is a concentration or occurrence of (in this case) base and precious metals in or on the Earth's crust in such a form and quantity and of such a grade and quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics, and continuity of a Mineral Resource are known, estimated, or interpreted from specific geological evidence and knowledge (adapted from CIM, 2010).

- A **Measured Mineral Resource** (CIM, 2010) is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough to confirm both geological and grade continuity. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit. Measured Resources can be converted, considering appropriate modifying parameters (e.g., mining, metallurgical, economic, marketing, legal, environmental, social, and governmental factors), to Proven Mineral Reserves and, in cases of lower confidence in some or all of the modifying factors, to Probable Mineral Reserves as per CIM Definition Standards (2010).

- An **Indicated Mineral Resource** (CIM, 2010) is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough for geological and grade continuity to be reasonably assumed. An Indicated Mineral Resource is of sufficient quality to support studies forming the basis for major development decisions, and can be converted to Probable Mineral Reserve as per CIM Definition Standards (CIM, 2010), taking the abovementioned modifying factors into account.

- An **Inferred Mineral Resource** (CIM, 2010) is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes. An Inferred Mineral Resource must be excluded from estimates forming the basis of feasibility or other economic studies as confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure.

Resource model confidence classification for the September 30, 2011 Mineral Resource was conducted using a combination of drillhole spacing, search volume, distance from underground workings, mineralization continuity considerations, comparisons in locations of high grade vein and stockwork structures between the block model and open-pit observations, reconciliation between the resource model and grade control and production data (see Section 14.9), and discussions with mine-based geological staff. Resource confidence classification was focussed on the Ag variable, being the economically most important constituent of the Pirquitas deposit. Prior to finalization, the classification was reviewed with respect to Zn and Sn to ensure that there were no anomalies. Care was taken to ensure that coherent zones of high (Measured Mineral Resources) and reasonably good (Indicated Mineral Resources) confidence mineralization were modeled to avoid a ‘postage stamp’ approach to resource classification. To this end the various model classification criteria discussed above were incorporated in the generation of wireframe solids for the classification of the Mineral Resource into Measured Mineral Resources and Indicated Mineral Resources. The September 30, 2011 Mineral Resource confidence classification scheme can be broadly simplified as follows:

- All blocks informed by the third search pass in the Mining Area (Domains 10, 20, and 30) were classified as Inferred Mineral Resource.
- All blocks informed by sufficient samples from drillholes spaced closer than effectively 40 m (generally 20 m to 35 m), in areas where there is reasonably good confidence in the modeled location of the mineralized veins and for which there is reasonably good confidence in the modeled location of the underground workings, were classified as Indicated Mineral Resource.
- Blocks classified as Measured Mineral Resource were informed by sufficient samples from drillholes spaced closer than effectively 25 m (generally less than 15 m), in areas for which there is high confidence in the modeled location of the mineralized veins and for which there is high confidence in the modeled location of the underground workings.
- All blocks informed inside of the interpreted Cortaderas Breccia zone wireframe were classified as Inferred Mineral Resource. Although the data is sufficiently closely spaced to support an Indicated Mineral Resource classification for the Cortaderas Breccia zone model, an Inferred Mineral Resource classification for this area was retained, due to uncertainties associated with tonnage estimates as a function of insufficient bulk density data, as well as the shallow angle between the exploration drilling and the inferred plunge orientation of the mineralized breccia body.

- All blocks informed during the unconstrained grade estimation of the Cortaderas Valley zone were classified as Inferred Mineral Resource model Validation.

The block model that forms the basis of the September 30, 2011 Mineral Resources was subjected to the following validation steps, in addition to the iterative validation steps conducted throughout the modeling process:

- Visual comparison of block grades for Ag, Zn, and Sn against the input drillhole data on a series of plan views and NNE-SSW cross sections through the model. This was reviewed at numerous times during model generation to ensure that the modeled grades and grade distribution closely reflected that of the input data.
- Comparison of average grades for each grade variable in each estimation domain between the input drillhole data (decluster-weighted composites, topcut where applicable) and block model (especially in the Indicated Mineral Resource and Measured Mineral Resource parts of the block model), to assess potential global estimation bias in the model.
- Comparison of average grades for each grade variable in each estimation domain between the input drillhole data (as above point) and the block model along northing, easting, and elevation swath plots to assess potential spatial bias in the model.
- Global change of support checks were conducted on modeled Ag grade data in the Mining Area to assess level of smoothing in the Mineral Resource.
- Grade-tonnage data were reported using different software to ensure validity of final grade-tonnage reports.
- Reconciliation of the block model to grade control and production data on a bench-by-bench basis in the mined-out part of the deposit.

Results of the various detailed model validation steps outlined above indicate that the September 30, 2011 block model grade estimates are globally and spatially unbiased, honor the input conditioning geological and drillhole data both globally and locally, and have an acceptable level of smoothing for the block size selected.

Based on all of the validation steps conducted on the block model, as well as all checks conducted during the model preparation, Silver Standard's Senior Resource Geologist, Dr. Warwick Board, P.Geo., is of the opinion that the September 30, 2011 Pirquitas block model is suitably valid and of an acceptable quality such that it can support the definition of Measured and Indicated Mineral Resources for use in the generation of a Mineral Reserve for continued mine planning purposes. Those parts of the model classified as Inferred Mineral Resources, whilst providing indications as to the future Mineral Resource growth potential, require additional exploration (e.g., geophysics and drilling) to be raised into higher confidence resource classification categories.

14.9 **Ore Reconciliation**

Reconciliation between resource model estimates and mined production is the most effective means of validating a block model estimate. Reconciliation included consideration of the following:

- The reconciled ore production was calculated from plant and mill-feed and stockpile data. The plant feed was adjusted to the final smelter outturns.
- The grades and tonnes of mineralised material between the pre-mining topographic surface and the end of September 2011 as-mined surface (from survey), from the 2011 resource model, serve as the estimate of the 'mined production' for the reconciliation.

Comparisons between the estimate of mined production (as predicted by the Mineral Resource model) and the actual mined production were undertaken using the same NSR-based cut-off grades

The summary of the total reconciled ore production from mine start up as of July 2009 to September, 30, 2011 and the model estimate for the same period is given in Table 14-12.

Table 14-12 Pirquitas Reconciled Ore Production and Model Estimate from Mine Start as of July 2009 up to September 30, 2011 – for all Ore, Including Low Grade Stockpiles.

Data Sources	**Tonnes (000)**	**Ag (g/t)**	**Sn (%)**	**Zn (%)**	**Ag ozs (000)**
Plant Feed - Total	2,731	214	0.26	0.71	18,794
- Other Feed (Old Jig Tails, etc.)	406	220	0.50	0.26	2,871
+ Ending Ore Stockpiles	1,159	121	0.14	1.06	4,502
Reconciled Production	**3,484**	**182**	**0.19**	**0.88**	**20,426**
2011 Resource Model	**3,850**	**171**	**0.18**	**0.74**	**21,208**
Percent Difference	11%	-6%	-2%	-15%	4%

Note: Totals may not agree due to rounding.

Table 14-13 Pirquitas Reconciled Ore Production and Model Estimate from Mine Start as of July 2009 up to September 30, 2011 – for High and Medium Grade Ore Only.

Data Sources	**Tonnes (000)**	**Ag (g/t)**	**Sn (%)**	**Zn (%)**	**Ag ozs (000)**
Plant Feed - Total	2,731	214	0.26	0.71	18,794
- Low Grade Millfeed	71	85	0.13	0.37	196
- Other Feed (Old Jig Tails, etc.)	406	220	0.50	0.26	2,871
+ Ending HG & MG Ore Stockpiles	776	145	0.15	0.96	3,610
Reconciled Production	**3,030**	**199**	**0.20**	**0.84**	**19,338**
2011 Resource Model	**3,035**	**197**	**0.21**	**0.71**	**19,271**
Percent Difference	0%	-1%	4%	-16%	0%

Note: Totals may not agree due to rounding.

Table 14-13 shows the same reconciliation data, with low grade stockpile data excluded.

The reconciliation between production and the 2011 Mineral Resources model shows excellent agreements for all of the variables except zinc grade. The zinc value represents less than 3% of the total NSR on average so it is not material in an economic sense.

14.10 Grade-tonnage Reports

The global classified September 30, 2011 Pirquitas Mineral Resource estimate is presented at a series of potentially economic silver cut-off grades in Table 14-14 and Table 14-15.

Table 14-14 Measured and Indicated Mineral Resources Estimate for the Pirquitas Property, as of September 30, 2011

Cut-off Ag (g/t)	Resource Category	Tonnes (Mt)	Ag (g/t)	Zn (%)	Sn (%)	Contained Ag (Moz)	Contained Zn (Mlbs)	Contained Sn (Mlbs)
Resource								
40	Measured	15.3	143.4	0.50	0.23	70.5	167.2	76.9
50		**13.5**	**156.2**	**0.49**	**0.24**	**68.0**	**144.9**	**72.2**
60		11.9	169.7	0.48	0.25	65.2	126.1	67.0
40	Indicated	19.3	127.0	0.89	0.19	79.0	380.7	78.9
50		**16.3**	**142.3**	**0.91**	**0.20**	**74.6**	**328.4**	**70.3**
60		13.9	157.4	0.93	0.21	70.4	283.8	63.1
40	Measured + Indicated	34.6	134.2	0.72	0.20	149.5	548.0	155.8
50		**29.8**	**148.6**	**0.72**	**0.22**	**142.6**	**473.3**	**142.4**
60		25.8	163.1	0.72	0.23	135.5	409.9	130.1
Stockpiles								
[1]See note	Indicated	3.0	78.5	1.50	0.11	7.5	98.1	7.3
Combined Mineral Resource and Stockpiles								
[1]See note	Measured + Indicated	32.8	142.2	0.79	0.21	150.1	571.4	149.7

Notes:

- Reported Mineral Resources are estimated below the as-mined surface as of September 30, 2011, and are presented inclusive of Mineral Reserves.
- The above Mineral Resources are reported at a range of potentially economic silver cut-off grades to demonstrate sensitivity, whilst retaining reasonable prospects for economic extraction (coherent zones of mineralization are retained at each cut-off presented such that pit optimization studies would be able to potentially mine all of the reported mineralization under appropriate mining, economic, socio-economic, environmental, and political conditions).
- Dr. Warwick S. Board, B.Sc. Ph.D P.Geo. is the qualified person for the reported Mineral Resource estimate
- A cut-off grade of 50 g/t Ag is considered the most appropriate cut-off grade for reporting the Pirquitas Mineral Resources, based on Silver Standard's knowledge of the grade continuity and likely economic extractability of the mineralization within the Pirquitas deposit, experience with its other silver deposits, and the relative value of silver compared to zinc and tin for the Pirquitas deposit. This cut-off grade has not been demonstrated by detailed mine planning and economic studies, and does not take the economics of zinc or tin into account.
- Figures may not total exactly due to rounding.
- [1] Stockpile data based on inclusion of mined material reported above an NSR cut-off of $15.00/tonne, the majority of which is above 50 g/t Ag. NSR cut-off was based on economic

parameters used in 2009, including: $11.00/oz Ag, $0.70/lb Zn, $5.00/lb Sn. Silver Standard added the stockpile data above an NSR cut-off of $15.00/tonne to the Measured and Indicated Mineral Resource above a 50 g/t Ag cut-off to provide the final September 30, 2011 Mineral Resources estimate.

Table 14-15 Inferred Mineral Resources Estimate for the Pirquitas Property, as of September 30, 2011

Area	Cut-off Ag (g/t)	Resource Category	Tonnes (Mt)	Ag (g/t)	Zn (%)	Sn (%)	Contained Ag (Moz)	Contained Zn (Mlbs)	Contained Sn (Mlbs)
Mining Area	40	Inferred	0.05	69.7	0.9	0.2	0.1	1.0	0.3
	50		**0.03**	**82.4**	**0.6**	**0.3**	**0.1**	**0.5**	**0.2**
	60		0.02	108.5	0.8	0.3	0.1	0.3	0.1
Cortaderas Breccia Zone	40	Inferred	2.3	139.4	5.1	0.1	10.3	258.6	6.1
	50		**2.0**	**152.0**	**5.4**	**0.1**	**9.9**	**239.3**	**5.8**
	60		1.9	160.6	5.5	0.1	9.6	227.1	5.5
Cortaderas Valley Zone	40	Inferred	7.5	67.4	1.1	0.01	16.2	172.2	1.02
	50		**5.0**	**78.6**	**1.1**	**0.01**	**12.6**	**120.8**	**0.5**
	60		3.6	87.8	1.1	0.00	10.2	89.2	0.4
Total	40	Inferred	9.8	84.2	2.0	0.03	26.6	431.8	7.3
	50		**7.0**	**99.7**	**2.3**	**0.04**	**22.6**	**360.5**	**6.5**
	60		5.5	112.5	2.6	0.05	19.9	316.5	6.0

Notes:

- Mining Area includes San Miguel, Potosí, and Oploca Vein zones.
- Reported Inferred Mineral Resource for Mining Area is estimated below the as-mined surface as of September 30, 2011.
- Reported Inferred Mineral Resource for Cortaderas Breccia and Valley zones is estimated below topography.
- All comments with respect to the selected Ag cut-off grades noted in Table 14-14 apply to Table 14-15
- Figures may not total exactly due to rounding.

The September 30, 2011 Mineral Resources estimate for the Pirquitas deposit was prepared by Dr. Warwick Board, Ph.D. (Geology), P.Geo., Senior Resource Geologist for Silver Standard. All Mineral Resources presented in this report have been classified in accordance with CIM, 2010. Mineral Resources that are not Mineral Reserve do not have demonstrated economic viability.

14.11 Discussion of Material Effects on the Resource

Silver Standard is unaware of any current environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the September 30, 2011 Mineral Resources estimates presented in Section 14.

15 Mineral Reserve Estimates

The Mineral Reserve was estimated for the Pirquitas Mine as presented in Table 15-1. The estimate was prepared by Andrew Sharp the Vice President, Technical Services for Silver Standard under the supervision of the Qualified Person, R. Bruce Kennedy, P.E. responsible for this section.

This is the fifth reported Mineral Reserve prepared for the Pirquitas mine. Since the 2008 Reserve estimate was made:

- mining and processing has occurred resulting in 2.5 Mt at 230 g/t Ag and 0.72% Zn for 18.6 Moz contained silver being processed through the plant. This material is not included in the September 2011 Mineral Reserve,
- exploration drilling was undertaken and detailed grade control information was obtained,
- a new Mineral Resources model was developed (Section 14) and,
- a new pit design was completed on the updated Mineral Resource using current cost and pricing knowledge.

The Mineral Reserve for the Pirquitas Mine was calculated using the as-mined surface as of September 30, 2011 and was made using the following assumptions and parameters:

- the reserve classification converts Measured Mineral Resource to Proven Mineral Reserve and Indicated Mineral Resource to Probable Mineral Reserve within the pit design. There is no Inferred Mineral Resource within the design,
- the mining recovery was taken as 100% within the pit design,
- the Mineral Resource was not diluted (reconciliation data is provided in Section 14.9),
- the Mineral Reserve assumes that mining uses the current Pirquitas mining methods (i.e. that current dilution characteristics, bench heights etc. are applicable for the mine life),
- the cut-off grade assigned was $35.52/tonne NSR and its derivation detailed in Table 15-2,
- unlike the May 2008 Silver Standard Mineral Reserve, tin was not considered as a cash flow contributor,
- the NSR value uses non-linear grade-recovery relationships outlined in Section 15.1.

Table 15-1 Mineral Reserve Estimate for the Pirquitas Property, as of September 30, 2011.

	Tonnage Mt	**Silver g/t**	**Tin %**	**Zinc %**	**Silver Moz**	**Tin Mlb**	**Zinc Mlb**
Proven	10.4	181.2	0.26	0.52	60.4	59.7	117.9
Probable	5.1	168.9	0.19	1.04	27.6	21.4	117.1
Reserve Stockpiles	1.2	129.2	0.15	1.03	5.0	4.1	27.6
Total	**16.7**	**173.7**	**0.23**	**0.71**	**93.1**	**85.1**	**262.5**

Notes:

- CIM (2010) Definition Standards were used in the generation of Mineral Reserve estimate classification.
- Mineral Reserve is estimated at a cut-off grade of $35.52/tonne NSR.
- Mineral Reserve is estimated using an average silver price of $25.00 per ounce and an average zinc price of $1.09 per pound (equivalent to $2,403/tonne). No economic benefit was assigned to the tin grade.
- Figures may not total due to rounding.
- R. Bruce Kennedy, BS (Mining Engineering), P.E. is the Qualified Person for the reported Mineral Reserve estimate.
- Trevor Yeomans, B.Sc. (Mineral Processing), P. Eng. is the Qualified Person who provided metallurgical parameters that were incorporated in the Mineral Reserve estimate.
- Mineral Reserve was estimated using the Measured and Indicated Mineral Resources shown in Table 14-14, excluding the 1.2 Mt Indicated Mineral Resource estimated for the Oploca Vein to contain approximately 8.2 million ounces of silver. The estimated Oploca Vein Mineral Resource lies just beyond the southern limits of the current pit design and therefore is not included in the Mineral Reserve estimate, see Section 15.9.1.
- Mining costs are as per 2011 actual costs, with estimated productivity changes incorporated.
- Mill and general administrative costs were estimated on the basis of 2011 actual costs, incorporating projections to full and stable production.
- The Mineral Reserve is quoted within a pit design that utilizes geotechnical parameters proven from actual performance. The design was created using a geometry guideline from a Lerchs-Grossman algorithm that maximizes the Mineral Reserve cash flow.
- Average open-pit strip ratio of 4.89:1 total:ore was used.
- Metallurgical recovery formulas were applied for silver and zinc concentrates that reflect increasing recovery with increasing head grade. Average metallurgical recovery for silver is 79.8% and for zinc 42.9%.

15.1 **Cut-off Grade**

The cut-off grade for Mineral Reserve was estimated based upon the metal prices selected and current operating costs and metallurgical performance. Smelter terms consistent with experience were included for the treatment of the concentrates. Factors used in the cut-off grade determination are outlined in Table 15-2. Factors such as transport and refining charges and penalties as well as payable metal values were also taken into account when estimating the cut-off grade and are summed as metal costs. The derivation of the summary metal costs is discussed in Section 22.

Table 15-2 Economic Parameters for Mineral Reserve Estimate Cut-off, September 30, 2011

Mill Cost	
Operating	17.05 $/tonne
HR Distribution	3.16 $/tonne
Sustaining	0.82 $/tonne
Tails Storage	6.15 $/tonne
Total	**27.18 $/tonne**
Incremental Mining	0.60 $/tonne
Admin Cost	
Operating	6.37 $/tonne
HR Distribution	0.96 $/tonne
Sustaining	0.41 $/tonne
Total	**7.74 $/tonne**
Total Cost	35.52 $/tonne
Silver Price	25.00 $/oz
Silver Metal Costs	2.90 $/oz payable
Net Silver Metal Price	**22.10 $/oz payable**
Zinc Price	2,403.00 $/tonne
Zinc Metal Price	1,260.00 $/tonne payable
Net Zinc Metal Price	**1,143.00 $/tonne payable**
Royalties	**2% NSR**

Payable recovery (the combination of metallurgical recovery and payable metal proportions) were analysed from production data and contract sales and were reduced to a non-linear function as described below and detailed in Section 22.

Silver Payable Recovery was calculated by the formula

$$-0.00000074*Ag^2 + 0.00087004*Ag + 0.63259$$

Zinc Payable Recovery was calculated by the formula

$$(0.00077*Zn^3 - 0.01046*Zn^2 + 0.05276*Zn + 0.32944) - 0.00012*Ag$$

Where,

- Ag is the block mined grade in g/t.
- Zn is the mined grade in %.

- Silver Payable Recovery (SilverPayRec) defines the combination of payable silver metal proportions and metallurgical recovery as a value between 0 and 1. Typically SilverPayRec is between 63.3% (at 0 g/t Ag) and a maximum of 88% at 550 g/t Ag. This value averages 78.7% in the current Mineral Reserve estimate.
- Zinc Payable Recovery (ZincPayRec) defines the combination of payable zinc metal proportions and metallurgical recovery as a value between 0 and 1. ZincPayRec not only depends on the zinc grade but also the silver grade and typically ranges between 30% and 45%. This value averages 36.0% in the current Mineral Reserve Estimate.
-

The final NSR formula applied to a block was calculated as

$$\left(\left(\frac{NetZincPrice}{100} * Zn * ZincPayRec\right) + \left(\frac{NetSilverPrice}{31.10} * Ag * SilverPayRec\right)\right) * (1 - NSRRoyalty)$$

Where

- NSRRoyalty is the NSR Royalty (actual value = 0.02).
- NetZincPrice is the effective payable Zinc price (actual value = $1,143/tonne).
- NetSilverPrice is the effective payable silver price net of metal costs actual value = $22.10/oz).
- 31.10 is the troy ounce conversion to grams.
- 100 is the percentage conversion for the zinc grade in %.
- Zn is the mined zinc grade in %.
- Ag is the mined silver grade in g/t.
- NSR is a value in $ per tonne.

Unlike the previous May 2008 Mineral Reserve estimate, tin did not contribute to the revenue or cost function used in the September 30, 2011 Mineral Reserve estimate.

15.2 **Net Metal Price**

Net metal prices were developed from sales contract terms and conditions. The modelling of the terms and conditions are discussed in this section:

15.2.1 Metal Prices

The Payable metal price basis for the optimizations and Mineral Reserve cut-off are presented in Table 15-3.

Table 15-3 Payable Metal Price Basis for the Optimizations and Mineral Reserve Cut-off.

Ag	$25/troy oz
Zn	$1.09/lb ($2,403/tonne)

15.3 Payable Metal Proportions

The payable silver metal proportions are based on existing agreements with Silver Standard for silver and zinc concentrates, and are presented in Table 15-4

Table 15-4 Payable Metal Proportions

Payable Ag percentage in Ag concentrate	96.75%
Payable Ag in Zn concentrate	66.00%
Payable Zn in Ag concentrate	0.00%
Payable Zn in Zn concentrate	84.00%

15.4 Payable Recoverable Metal Formulas

The recoverable payable silver and zinc proportions were developed from August and September 2011 actual plant performance and applied metal sales terms. Key parameters are presented in Table 15-5.

Table 15-5 Parameters for Determination of the Recoverable Silver and Zinc Proportions.

Jig plant mass pull	74.5%
Jig plant by-pass	12% of total throughput
Jig plant Ag recovery	87.0%
Jig plant Zn recovery	80.0%
Ag concentrate mass pull	0.0453%
Zn concentrate mass pull	1.0%

Silver concentrate silver recovery was calculated from the formula

-0.00006*Ags*Ags + 0.0902*Ags + 56.962 (range 57 to 89%)

Where

Ags is the silver head grade to the silver concentrate circuit (after jig circuit).

Silver concentrate zinc grade was calculated from formula

12% if Zns greater than 3%, if not = 6.2 * Zns–85 * Zns * Zns.

Zinc concentrate silver recovery was calculated from the formula

0.35*Agz

Where

Agz is the Silver head grade to the zinc circuit (after jig and silver concentrate circuits).

Zinc grade in the zinc concentrate was calculated by the formula

0.48341* (Znz) ^ 0.0807

Where

Znz is the zinc grade reporting to the zinc concentrate circuit (after jig and silver concentrate circuits).

The interaction of the recovery, the proportions of metal reporting to the zinc or silver concentrates and the effect of the jig circuit create a moderately complex formula interaction. This interaction was modelled and summarized to two Payable Recoverable metal formulae, one for silver and the other for zinc.

The Payable Silver (PayAg) recoverable proportion was based on the formula

-0.00000074 * Ag * Ag + 0.00087004 * Ag + 0.63.259571

Where

Ag is the silver block grade in g/t.

Silver payable recovery includes the proportion of silver in the zinc concentrate.

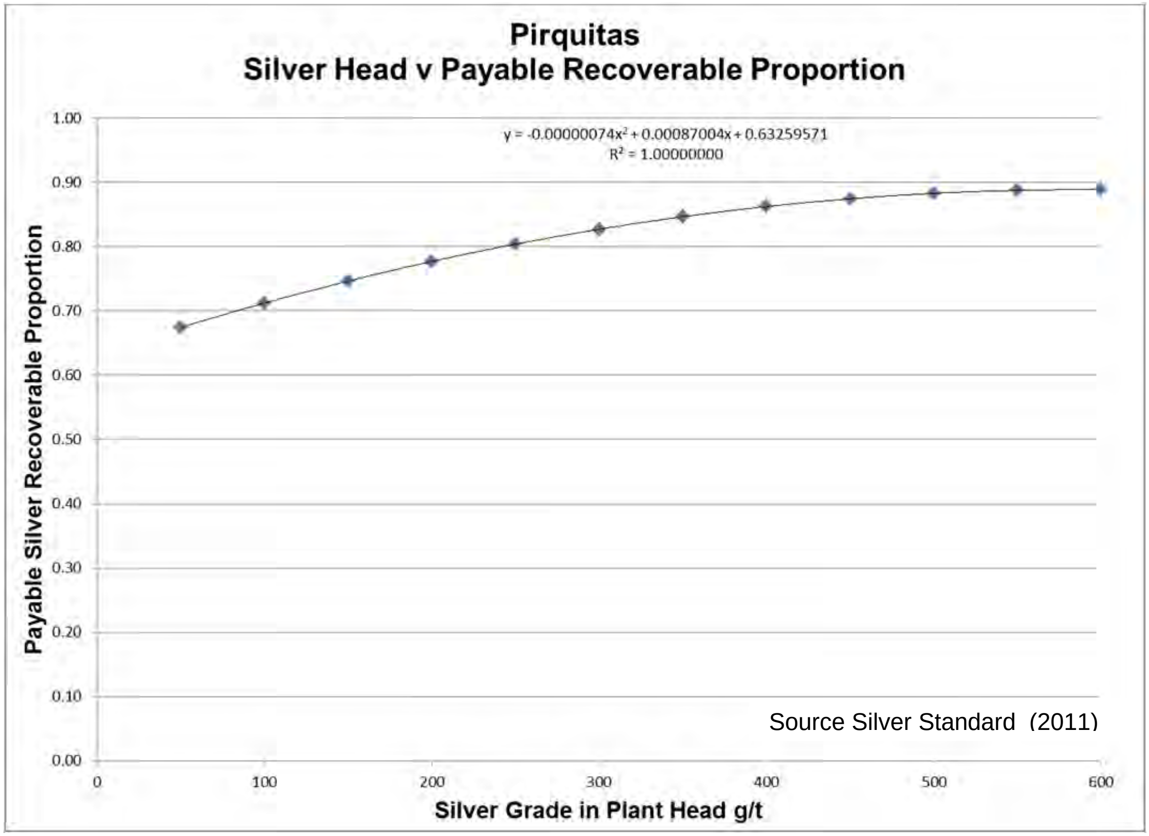


Figure 15-1 Relationship of Silver Head Grade and Payable Recoverable Proportion at the Pirquitas Mine.

The Payable Zinc (PayZinc) recoverable proportion was based on the formula

0.00077 * Zn * Zn * Zn – 0.01046 * Zn * Zn + 0.05276 * Zn + 0.32944 – 0.00012 * Ag
Where

Zn is the block zinc grade in %.

For a constant zinc head grade, zinc payable recovery decreases as silver head grade increases due to more zinc reporting to the silver concentrate.

No cost was attributed to zinc reporting to the silver concentrate (minimal penalty payment).

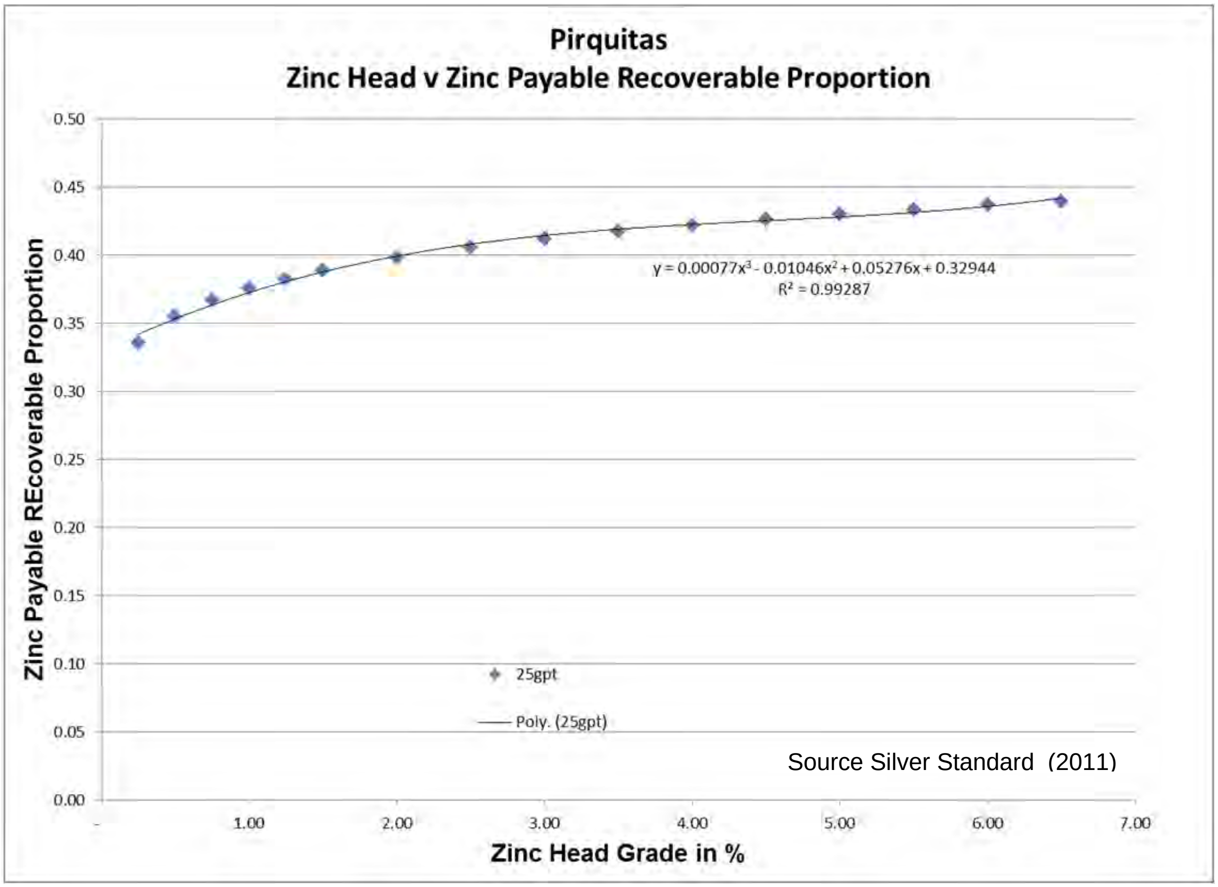


Figure 15-2 Relationship of Zinc Head Grade and Payable Recoverable Proportion at Low Silver Content (25 g/t silver) at the Pirquitas Mine.

15.5 **Metal Sales Costs**

The silver concentrate metal sales costs were summarized as $1,285/dmt concentrate. These sales costs are for any charges after the concentrate leaves the Pirquitas plant site and include:

- Treatment charges
- Refining costs
- Penalties
- Land and sea transportation
- Warehousing charges
- Representation
- Losses
- Insurance

The metal costs vary in relationship to the payable metal ounce due to varying head grades in the concentrate. A graph of the total treatment and refining costs per payable metal ounce are shown in Figure 15-3. To simplify the cost estimation, a value of $2.90 was selected per payable silver ounce based on the average delivered grade of around 180 g/t Ag.

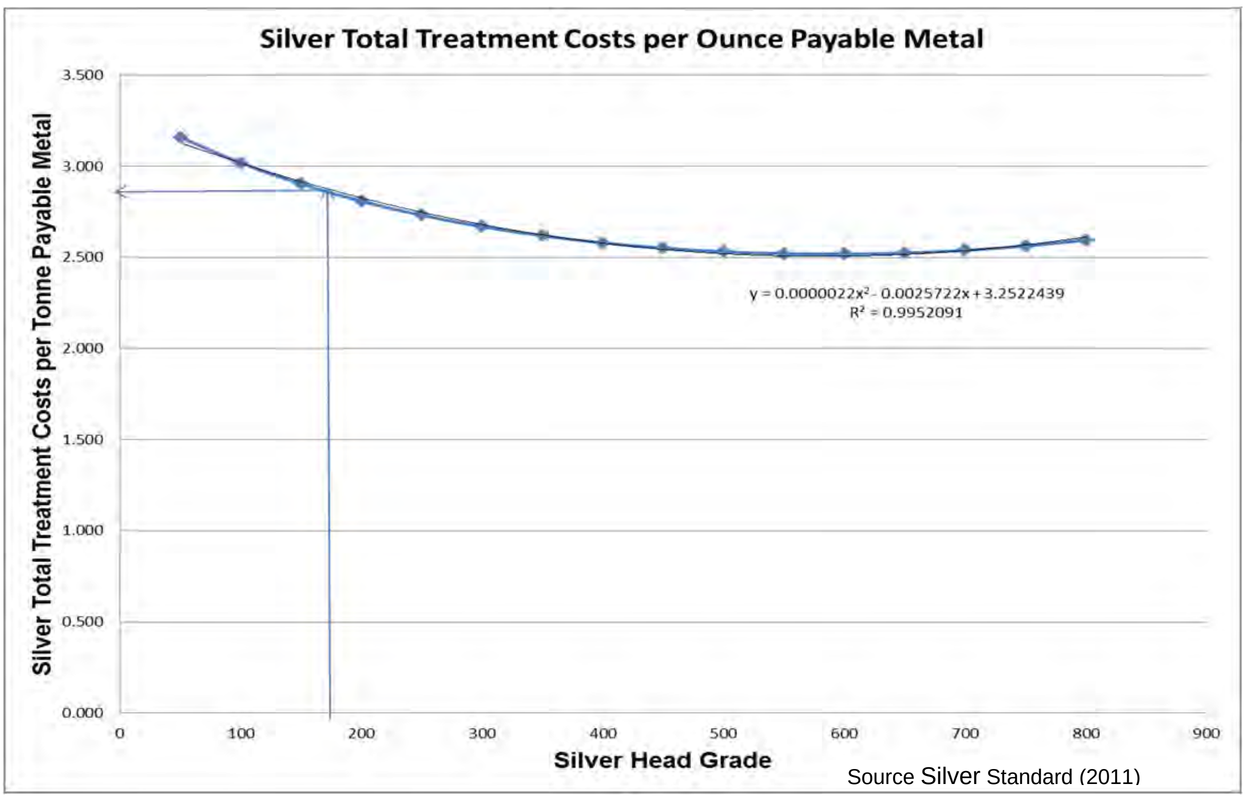


Figure 15-3 Relationship of Silver Total Treatment Costs per Ounce Payable Metal and Silver Head Grade at the Pirquitas Mine.

The sum of zinc concentrate treatment, transport penalties and losses were summarized as $505.73/dmt concentrate.

Zinc concentrate charges include:

- Treatment Charges
- Penalties
- Transportation charges
- Losses
- Insurance
- Representation

Any silver charges in the zinc concentrate are included in the silver metal cost function only.

The total zinc refining costs were estimated per zinc payable tonne. The metal costs vary with respect to the payable metal tonne due to varying head grades in the concentrate leading to various concentrate grades and hence costs per tonne of concentrate. A graph of the costs per payable metal tonne is shown in Figure 15-4. To simplify the cost estimation, a value of $1,260 was selected per payable zinc tonne based on the average delivered grade of 0.70%. This simplification has a small tendency to overstate the cut-off by 2 to 3% as compared to a complex zinc metal cost formula, but on average, models the total metal costs of the Mineral Reserve.

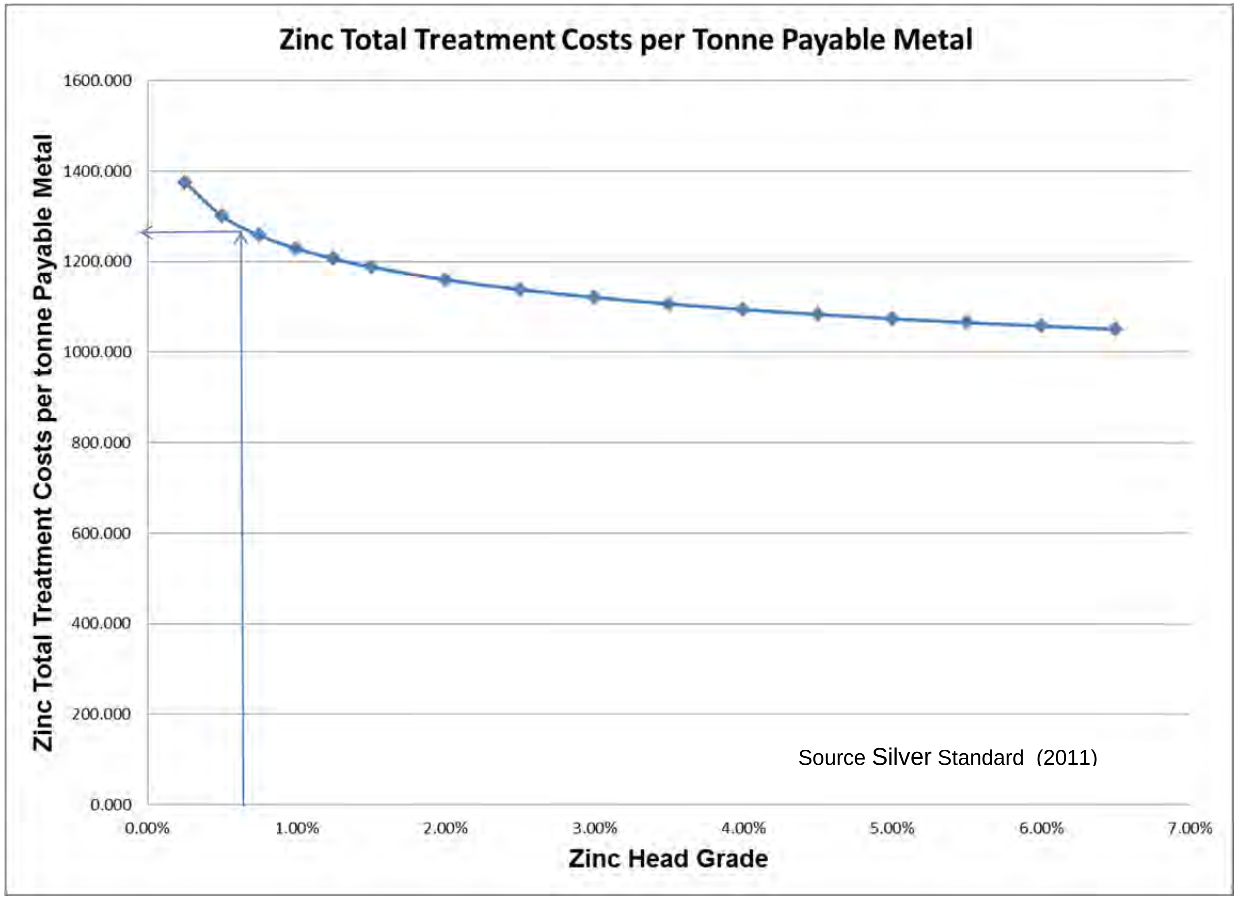


Figure 15-4 Relationship of Zinc Total Treatment Costs per Tonne Payable Metal and Zinc Head Grade at the Pirquitas Mine.

15.6 **Royalties**

A 2% provincial royalty calculated on a NSR basis is included. The actual provincial royalty is 3% margin based which for simplicity is modeled in equal value as a 2% NSR.

The 10% Argentine Federal tax on exports has been omitted based on MPIs fiscal stability agreement and is discussed in Section 4.5 of this report.

15.7 **Dilution and Mining Recovery**

Dilution and mining recovery were taken as included in the block estimate of the resource (therefore no further dilution was included for mining and mining recovery was assumed to be 100%). This is due to the good overall performance of the reconciliation of the new resource model (Section 14.9) with no additional dilution or mining recovery subtracted (see formulae) in Section 15.4.

15.8 **Reserve Classification**

Measured Mineral Resource was converted to Proven Mineral Reserve and Indicated Mineral Resource to Probable Mineral Reserve within the pit design. There is no Inferred Mineral Resource within the design. These categories are appropriate based upon the information in the mineral resource estimates and the current mining experience at the Pirquitas Mine. These classifications include the consideration that there are no known legal, political, environmental or other risks that could materially affect the continued development of the Mineral Reserve estimate.

15.9 **Mineral Reserve Further Estimate Details**

The current Mineral Reserve block model was estimated between the surveyed mine surface of September 30, 2011 and the latest design (PQDesign20111103) and includes estimates for stockpiled ore as of the same date (see Section15.9.5).

The 3oth September 2011 Mineral Reserve estimate assumes that the current Pirquitas mining methods (i.e. that current dilution characteristics, bench heights etc. are applicable for the mine life). The mining costs assume that marginal grade material will continue to be stockpiled as a hedge against upward price movement. In addition a low grade ore fraction will be stockpiled as a downward price hedge mechanism.

Unlike the previously reported Mineral Reserve estimate, tin has not been considered as a cash flow contributor.

Geometry shells (also termed “pit shells”) were developed using the Lerch-Grossman optimization algorithm maximizing for undiscounted cash flow (particular program Medsystem V5.50 m720v3). The overall slope angle for the base shell was developed from the inter-ramp angles specified in Section 16.1 and a number of trials of including ramp effects. The shells were developed on measured and indicated category resource blocks only.

15.9.1 Oploca Vein Consideration

The block values in all of the optimizations were limited to the cost of mining the ore by underground methods. This methodology excludes high cost / high strip ratio ore from the open cut design. This has implication only for the Oploca Vein. The Oploca Vein can be mined by either open cut or underground methods. More knowledge is required in order to finalise the extraction method selection for underground mining and the vein requires additional definition drilling that might influence the decision as to the appropriate method. Due to the uncertainty of the mining method selection, the Oploca Vein was not included in the September 30, 2011, Mineral Reserve estimate. This will be determined in years 2012 and 2013 based on additional drilling and modelling.

15.9.2 Pit Design Details

Pit shells were developed at 10% increments of price from 50% to 120% of the metal price.

A graph of the effect on the overall cash flow (before capital and tax considerations) of using the same base metal price on various pit shells is included in Figure 15-5.

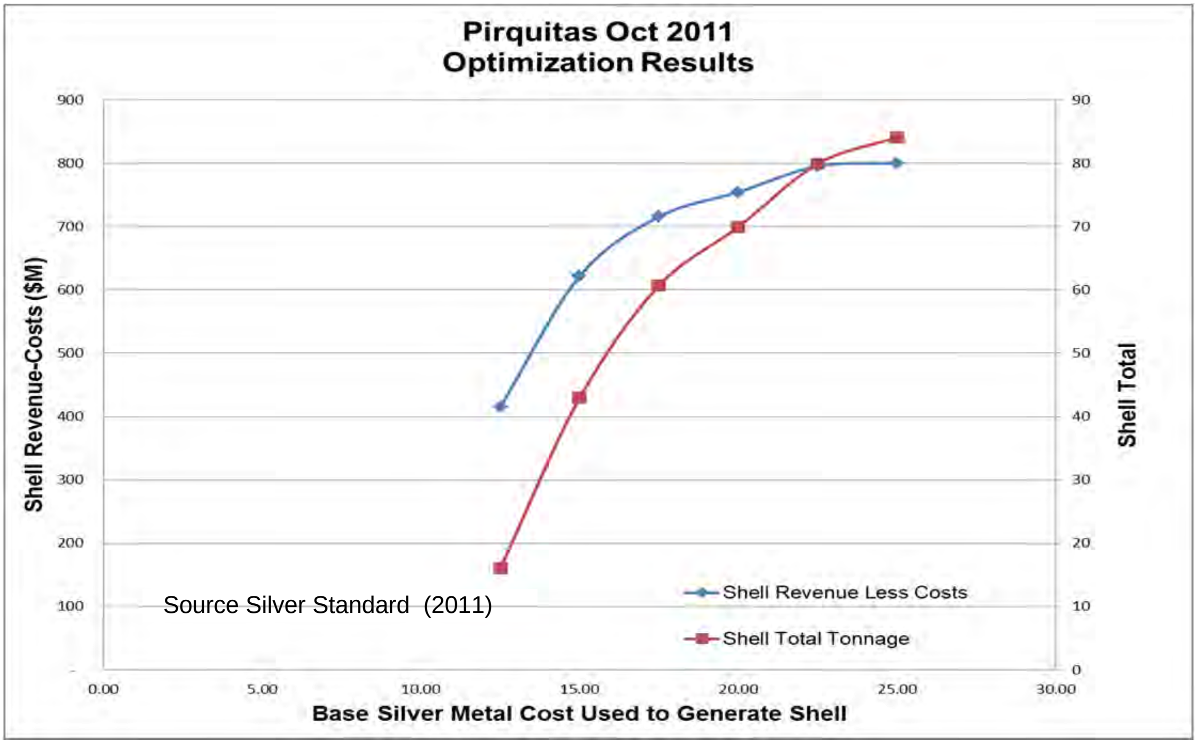


Figure 15-5 Optimization Cash flow and Shell Total Tonnage Results at the Pirquitas Mine

The Reserve design PQDesign20111103 (Figure Figure 15-6) includes geometry specifications of:

- 8 m mining benches.
- 1 berm per 3 mining benches.
- Batter angle 65 degrees (this is to volumetrically mimic the actual mining situation of 8 m pre-split faces that use 80 degree 8 m batters with small offsets per 8 m bench).
- Berm widths of 7.05 m.
- The ramp width is 25 m, enabling dual haulage with 100t off highway trucks, a safety berm, drainage and a small leeway for road crest deterioration. The deepest (final) 2 benches utilize a narrower 1 way ramp.
- The ramps connect to the berms with single berm access.
- The inter ramp angle used was 52.5º degrees for all sectors.
- The resulting overall slope angle was 45º above the 4,148 elevation and 30º below this elevation.
- The design used a combination of the 90% price pit shell and the 100% price shell as guides during ramp and wall CAD design.

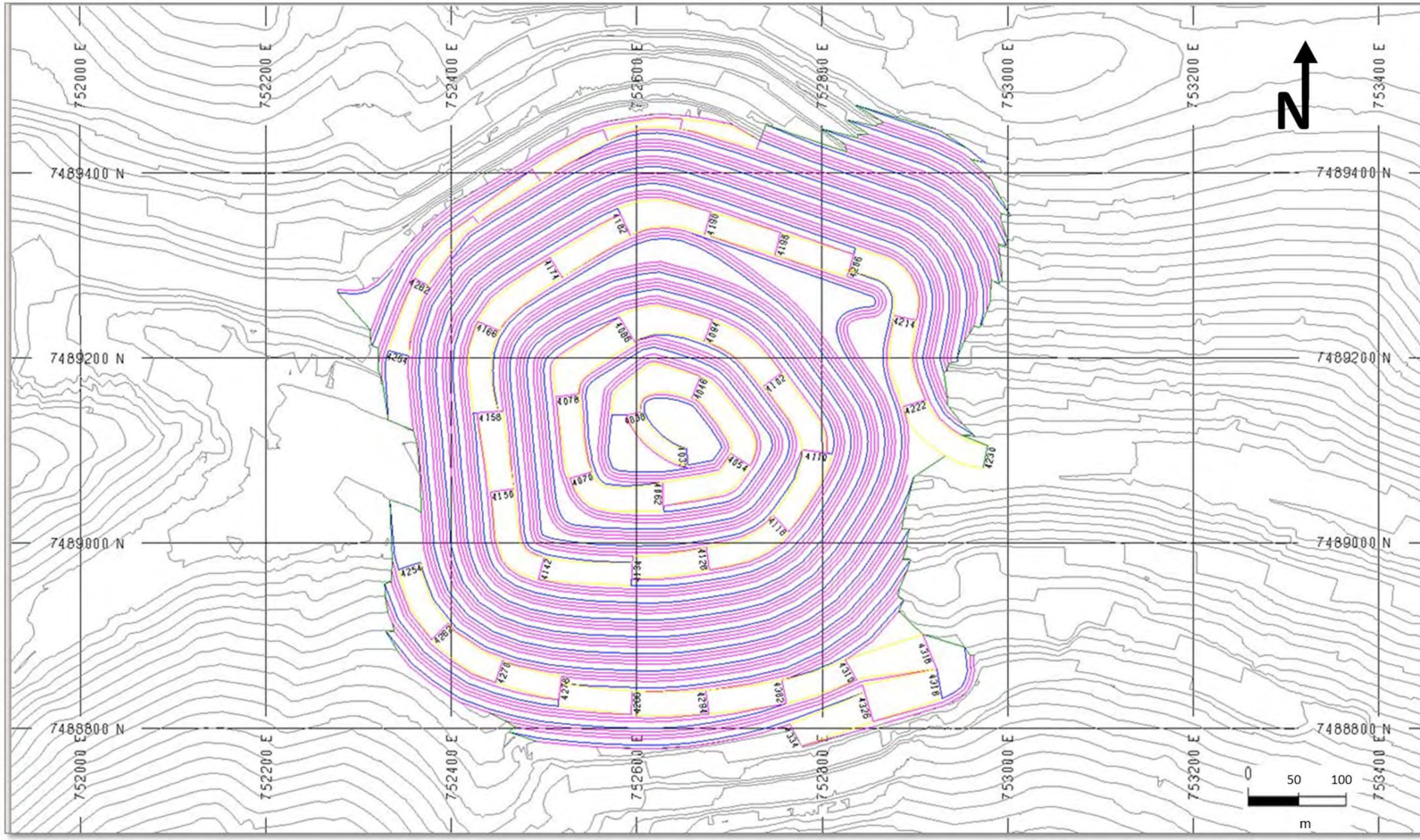


Figure 15-6 Pirquitas Mine Pit Design Number PQDesign20111103.
Grid coordinates in UTM Zone 19S (WGS84 datum) system.

15.9.3 Cut-back Potential

Within the geometry of the valley and previous mining, larger development for higher prices alone is retarded by the pit-walls that are already developed. Larger pit shells are not shown due to the impracticality of development of thin cut-backs for a wide range of prices.

A minimum width cutback could be developed if metal prices are increased by 40% over the base and simultaneously mining costs are decreased by 20% (this cutback concept is termed the “Phase 3 shell”). This shell includes the majority of the Oploca Vein and so should not be considered additive to the commentary on the Oploca Vein. The potential Mineral Resource in such a combination may have the characteristics shown in Table 15-6 within the cut-back alone:

Table 15-6 Potential Mineral Resource that Sits Within the Phase 3 Shell

Mineral Resource Within Phase 3 Shell

	Tonnage	Silver	Tin	Zinc	Silver	Tin	Zinc
	Mt	g/t	%	%	Moz	Mlb	Mlb
Measured	0.7	129.4	0.25	0.25	2.8	3.7	3.8
Indicated	7.0	138.2	0.21	1.21	30.9	32.1	185.1
Stockpiles	0.0	0.0	0.00	0.00	0.0	0.0	0.0
Total	**7.6**	**137.5**	**0.21**	**1.12**	**33.7**	**35.7**	**188.9**

The cut-back has a strip ratio (total/ore) of 15.5:1.

15.9.4 Marginal Grade Potential

The Mineral Reserve pit design PQDesign20111103 includes low grade resources. Should the metal price increase 40% above the base and sufficient tailings storage capacity developed, then these low grade Mineral Resources could be converted into Mineral Reserve. These low grade Mineral Resources are currently being stockpiled should this case occur (MPI stockpile terminology “Marginal”).

Table 15-7 presents the in pit design potential Marginal Mineral Resource. If the marginal material becomes economic, it will be processed at the end of the life of the mine, after the low grade stockpile processing.

Table 15-7 Potential Marginal In-Pit Mineral Resource

Marginal Mineral Resource within Reserve Design PQDesign20111103 and Stockpiled on Surface

	Tonnage	Silver	Tin	Zinc	Silver	Tin	Zinc
	Mt	**g/t**	**%**	**%**	**Moz**	**Mlb**	**Mlb**
Measured	2.8	57.4	0.15	0.60	5.1	9.1	36.7
Indicated	1.8	53.8	0.11	1.00	3.1	4.1	39.0
Marginal Stockpiles	1.8	43.9	0.08	1.82	2.5	3.2	70.7
Total	**6.3**	**52.6**	**0.12**	**1.05**	**10.7**	**16.4**	**146.4**

15.9.5 Mineral Reserve Stockpile

Mineral Reserve estimates were completed for all mineral stockpiles at Pirquitas as of September 30, 2011 and presented in Table 15-8. The estimates were completed based on estimates from mined production and depletion by processing. Where any doubt exists to tonnage estimates, stockpile volumes have been surveyed and stockpile density estimated.

Within the detail of the stockpile inventory is included the category of Marginal mineral. This mineral is not included as Mineral Reserve and is shown removed from the final inventory summary line.

Table 15-8 Mineral Reserve Estimates were Completed for all Mineral Stockpiles at the Pirquitas Mine as of September 30, 2011.

MPI - Ore Stockpiles as of September 30, 2011

MPI - Mineral Stockpiles as of September 30, 2011							Payable Recovery		Revenue net of sales costs			Revenue less costs
							Silver	Zinc	Silver	Zinc	Total	
	Stockpile Name	Ktonnes	Ag (g/t)	Sn (%)	Zn (%)	Ag (kozs)	%	%	$/tonne	$/tonne	$/tonne	$/tonne
Stockpile Details	HG-Ag-Ve-Pri	13	347.7	0.298	0.180	140	85%	30%	204.72	0.60	205.32	168.90
	HG-Ag-Ve-Tri	17	260.4	0.345	0.417	140	81%	32%	146.68	1.49	148.16	111.74
	HG-Ag-Ve-Can	6	306.2	0.317	0.334	59	83%	31%	176.90	1.16	178.06	141.64
	HG-Ag-Tr-Can	55	216.7	0.210	1.095	383	79%	35%	118.64	4.29	122.93	86.51
	JIG TAIL 1	13	417.3	0.590	0.198	175	87%	29%	251.84	0.64	252.48	216.06
	JIG TAIL 3	17	223.9	0.460	0.113	124	79%	31%	123.21	0.39	123.60	87.18
	Cola Sulfurada 1	3	878.2	1.533	1.519	91	83%	28%	505.37	4.81	510.18	473.76
	Cola Sulfurada 5	2	810.8	1.170	3.030	60	85%	32%	480.75	10.77	491.52	455.10
	JIG TAIL 4	10	162.1	0.300	0.163	50	75%	32%	85.11	0.58	85.69	49.27
	MG-Ag-Ve-Can	35	132.0	0.188	1.107	150	73%	36%	67.54	4.47	72.01	35.59
	MG-Ag-Ve-F	20	167.2	0.188	0.759	108	76%	34%	88.15	2.92	91.08	54.66
	MG-Ag-Ve-Tri	19	116.5	0.138	0.767	71	72%	35%	58.73	3.01	61.74	25.32
	MG-Ag-Bx-Pri	1	112.1	0.011	2.867	5	72%	40%	56.25	12.83	69.08	32.66
	MG-Ag-Bx-Pla	58	104.1	0.036	4.859	194	72%	41%	51.85	22.57	74.42	38.00
	MG-Ag-Tr-Can	479	122.0	0.126	0.530	1,878	73%	34%	61.80	2.02	63.82	27.40
	LG-Ag-Ve-Can	220	73.2	0.153	0.693	519	69%	35%	35.29	2.74	38.02	1.60
	LG-Ag-Tr-Can	86	73.2	0.103	1.182	202	69%	37%	35.29	4.89	40.18	3.76
	LG-Ag-Bx-Cur	9	80.9	0.000	3.532	23	70%	41%	39.35	16.20	55.55	19.13
	LG-Ag-Bx-Pla	68	68.2	0.030	2.863	149	69%	40%	32.68	12.98	45.66	9.24
	Marg-Zn-Bx-Pit	162	40.1	0.035	2.420	209	67%	40%	18.62	10.90	29.51	-6.91
	Marg-Zn-Bx_Ve-Pla	629	44.2	0.058	1.952	893	67%	39%	20.59	8.59	29.18	-7.24
	Marg-Zn-Bx_Ve-Com	494	44.5	0.082	1.714	707	67%	39%	20.77	7.44	28.22	-8.20
	Marg-Zn-Bx_Ve-Tri	367	42.6	0.066	1.931	503	67%	39%	19.84	8.50	28.34	-8.08
	Marg-Sn-Bx_Ve-Com	107	48.9	0.356	0.357	169	67%	34%	22.94	1.36	24.31	-12.11
	Marg-Sn-Ox	3	45.9	0.096	0.530	5	67%	35%	21.46	2.07	23.53	-12.89
	Cono Planta	73	204.2	0.202	0.933	481	78%	35%	110.82	3.61	114.43	78.01
	Total	**2,967**	**78.5**	**0.111**	**1.503**	**7,488**	**70%**	**38%**	**38.06**	**6.37**	**44.43**	**8.01**

MPI - Mineral Stockpiles as of September 30, 2011							Payable Recovery		Revenue net of sales costs			Revenue less costs
							Silver	Zinc	Silver	Zinc	Total	
	Category	Ktonnes	Ag (g/t)	Sn (%)	Zn (%)	Ag (kozs)	%	%	$/tonne	$/tonne	$/tonne	$/tonne
Stockpile Summary	HG-Ag	199	258.0	0.306	0.784	1,654	81%	33%	145.12	2.93	148.05	111.63
	MG-Ag	622	122.8	0.126	0.980	2,456	73%	36%	62.25	3.92	66.17	29.75
	LG-Ag	383	72.5	0.116	1.253	892	69%	37%	34.92	5.22	40.14	3.72
	Marg Zn & Sn	1,762	43.9	0.082	1.824	2,486	67%	39%	20.45	7.97	28.42	-8.00
	Total	**2,967**	**78.5**	**0.111**	**1.503**	**7,488**	**70%**	**38%**	**38.06**	**6.37**	**44.43**	**8.01**
	Total less Marg	**1,204**	**129.2**	**0.153**	**1.034**	**5,002**	**73%**	**36%**	**65.90**	**4.15**	**70.05**	**33.63**

The economic parameters used for stockpile estimates are presented in Table 15-9.

Table 15-9 Economic Parameters Used for Stockpile Estimates – September 30, 2011

Mill Cost		
Operating	17.05	$/tonne
HR Distribution	3.16	$/tonne
Sustaining	0.82	$/tonne
Tails Storage	6.15	$/tonne
Total	**27.18**	**$/tonne**
Trucked Re-handle	**1.50**	**$/tonne**
Admin Cost		
Operating	6.37	$/tonne
HR Distribution	0.96	$/tonne
Sustaining	0.41	$/tonne
Total	**7.74**	**$/tonne**
Total Cost	**35.52**	**$/tonne**
Silver Price	25.00	$/oz
Silver Metal Costs	2.90	$/oz payable
Net Silver Metal Price	**22.10**	**$/oz payable**
Zinc Price	2,403.00	$/tonne
Zinc Metal Price	1,260.00	$/tonne payable
Net Zinc Metal Price	**1,143.00**	**$/tonne payable**
Royalties	**2%**	**NSR**

15.10 Discussion Mineral Reserve Material Effects

The Pirquitas Mine is an operating entity and as such all infrastructure projects are complete. Further to this operating time benefit, the operating costs are based on 2011 actual performance and include production variations in accordance with a long term mine plan; they should therefore be a robust estimate of future performance.

The orebody has now been mined over 25% of its known vertical continuity and the operation has been exposed to all variances in metallurgical properties that may constitute material variance. No further variance of material concern is reasonably expected in the life of the current designed operation.

The tailing storage facility is designed and permitted, and is developed in accordance with the long term plan and is designed for 100% of the Mineral Reserve (there is in fact a small surfeit of capacity).

All permits required for operation are in hand and in force, as discussed in Section 4.

Test work will examine ways to produce a positive value tin concentrate and further improve plant performance. Furthermore cost control programs are in place and are designed to deliver benefits through the operating life. The sensitivity of the Mineral Reserve estimate to these factors is discussed in Section 22.

16 Mining Methods

Pirquitas uses a standard open pit mining method, and has a current mining rate of near to 50,000 tpd. The mine undertakes conventional drilling and blasting activities with a pre-split to assure stable wall rock conditions. RC grade control drilling is used in pit in order to define the structurally-controlled vein and breccia hosted ore zones.

The pit is designed to mine remnant and in-situ ore grade material which was left from previous underground mining operations.

Loading operations are mostly performed with a hydraulic shovel and front-end loaders with small excavator equipment used in areas requiring detailed ore control operations. Waste haulage is performed using a fleet of mine-owned 100 tonne capacity haul trucks with ore hauled primarily by a mining contractor (Jujuy Mining) using 25-39 tonne capacity haul trucks.

Equipment maintenance activities are performed at an on-site workshop.

16.1 Geotechnical, Hydrological and Other design Parameters

The mine design anticipates 52-55° inter-ramp (IR) slope angles, the principal IR angle applied is 52.5°. The overall slope angle is approximately 45° down to 4,148 masl then changing to 30°. These angles were determined based on geotechnical studies performed by A. Karzulovic & Associates, the last update to this study was performed in May, 2008. The pit is mined in 8 metre benches and is triple benched to achieve a 24 metre bank height.

Due to the location of the deposit in the sides and bottom of a valley, the pre-mine phreatic level was 4,230 masl. Historic underground mining and current mining have depressed this water level, via pumping, to approximately 4,100 masl. Phase 2 mining which began in April 2010 will require dewatering to reduce water levels to 4,030 masl. Silver Standard does not anticipate any hydrological factors adversely affecting mine production.

Haul road width is designed for 2-way use by 100 tonne trucks and is at least 22 m wide. The haul road width will be expanded to 25 m in an updated design which will be applied from 2012.

16.2 Production Rates, Mine Life, Dimensions and Dilution Factors

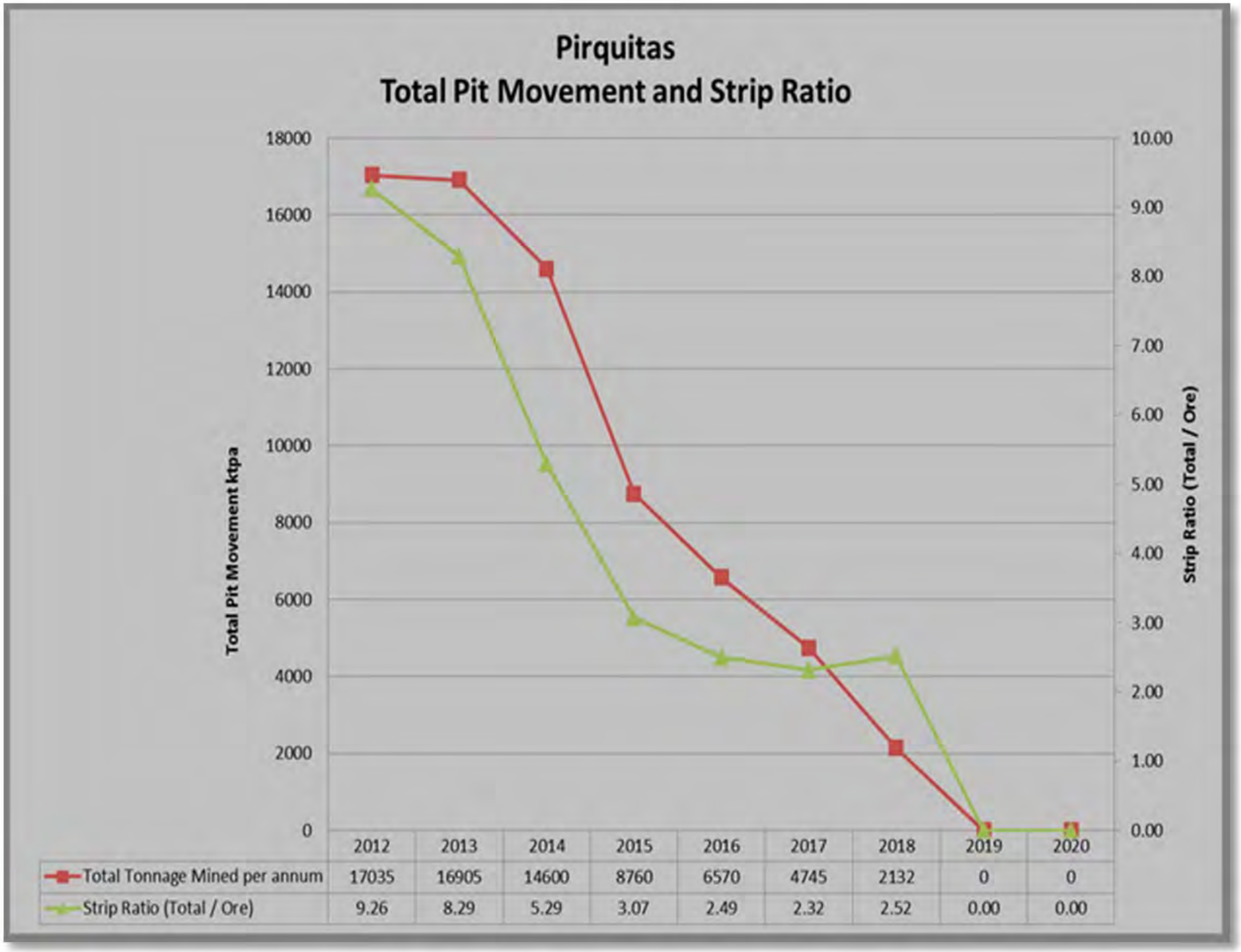
The mine production rate has gradually increased to near 50,000 tpd. With the current pit design, expected mine life is 6.5 years with an annual production of 8 to 10 million ounces of silver. Mining is scheduled to cease in mid 2018 with the milling of stockpiled material continuing for a further 2.5 years (to the end of 2020) producing 3 million ounces of silver per year.

The mine was developed in two phases: Phase 1 and a split (north and south) Phase 2. The diameter of the Phase 2 pit is roughly 960m at the upper limits of the pit. Ore control dilution is estimated to be less than 10% using excavators for loading units.

Ore zones are commonly m wide and mined on 8 m benches. Ore zones are commonly longer than 8 m in the N-S direction, however, based on reconciliation it appears that the appropriate selective mining unit dimension is 8 x 8 x 8 m. This mining unit is inclusive of mined dilution. Detailed reconciliation is discussed in Section 14.9.

16.3 **Stripping Requirements**

The mine stripping requirements decrease over the remaining life from approximately 9:1 in 2012 to 2.5 to 3 to 1 in the final years. Based on truck haulage productivities to waste stockpile areas, truck numbers can be reduced to around seven units during 2015, until that time Silver Standard considers that all 13 primary truck units will be required. In 2018 reductions of work hours to single shift operation is expected to occur.



	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Tonnage Mined per annum	17035	16905	14600	8760	6570	4745	2132	0	0
Strip Ratio (Total / Ore)	9.26	8.29	5.29	3.07	2.49	2.32	2.52	0.00	0.00

Figure 16-1 Total Pit Movement and Strip Ratio Pirquitas Mine. Source Silver Standard (2011).

16.4 Required Mining Fleet and Machinery

The mining fleet owned by MPI consists of:

- 13 x 100 tonne capacity CAT 777 haul trucks,
- 1 x 170tonne Terex hydraulic shovel,
- 2 x CAT 992 loaders,
- 2 x CAT 834 RTD wheel dozers,
- 3 x CAT D8 track dozers,
- 2 x Atlas Copco DM45 blast hole drills,
- 1 x Tamrock Pantera drill,
- 1 x Sandvik Ranger drill,
- 1 x Atlas Copco L8 drill (used for ore control drilling),
- 2 x motor graders,
- 1 x back hoe,
- 1 x lube truck and
- 1 x fuel truck.

The mine is currently using a mining contractor to assist in ore mining. This contractor currently uses:

- 2 x 33 tonne excavators with a bucket capacity of 0.9 m^3
- 11 x 25-39 tonne haul trucks
- 1 front-end loader (at the primary crusher for blending and ore delivery from stockpiles).

This equipment fleet, including that provided by the mining contractor, is considered sufficient for the extraction of the Mineral Reserve estimated as of September, 30 2011.

16.5 **Ore Control Drilling and Method**

Due to the style, orientation and location of the vein-hosted mineralization, grade control drilling is required to help define the ore zones in pit.

The grade control drilling at the mine utilizes an Atlas Copco rig that bores RC holes at an angle of 52°. The hole angle is designed to ensure that the vein systems are intercepted and crossed. Typically drilling is performed to cover two benches and the grade control drill pattern is shown as Figure 16-2.

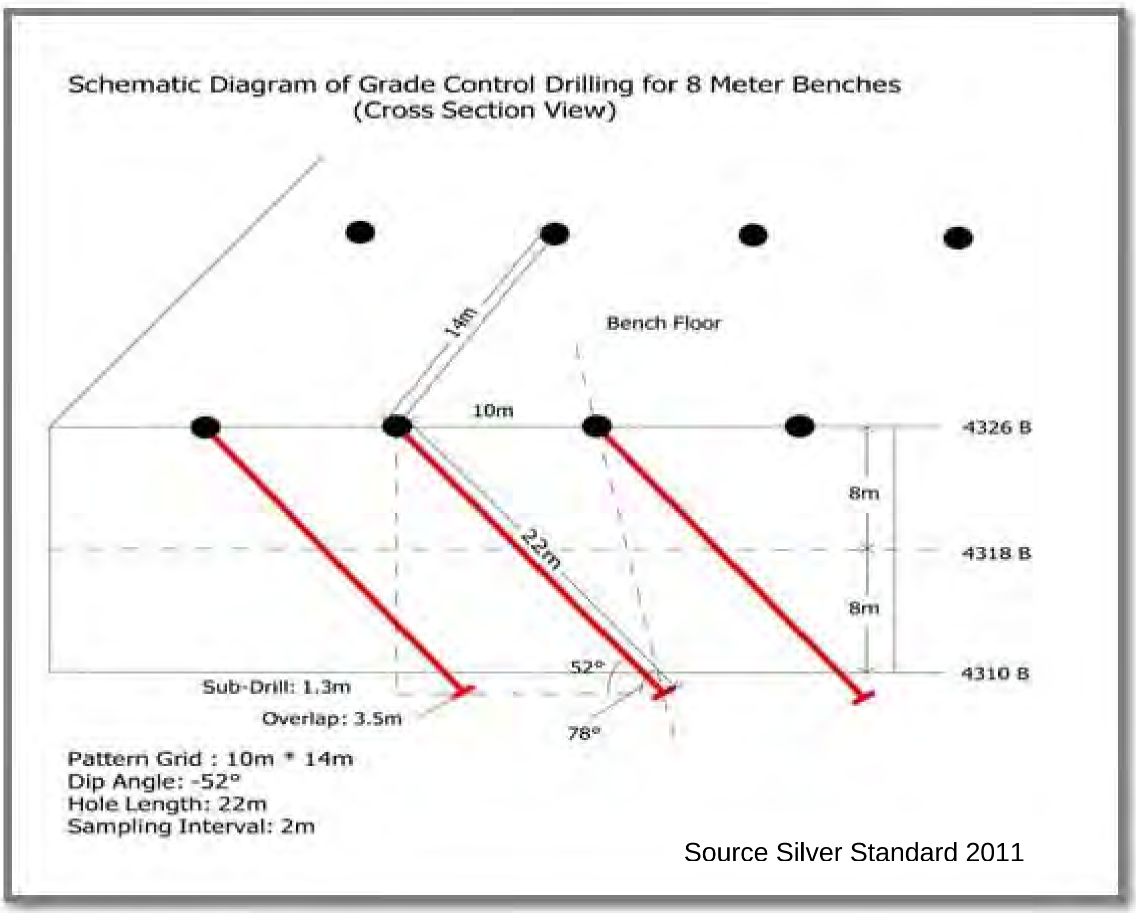


Figure 16-2 Schematic Showing Grade Control Drillhole Layout for Pirquitas.

The 22 m long grade control drillholes have a diameter of 14 cm. Eleven samples are collected per hole for a sample interval of 2 m. Approximately 15% of the material produced during drilling of each interval is captured using a cyclone splitter to return a sample mass of between 10 to 15 kg. The samples are bagged and labeled and are taken to the onsite SGS run laboratory where they are analyzed for Ag, Zn, Fe and Pb by AAS with a 3 acid digest, (SGS method AAS42B); samples which return over limits on Ag (>1,500 ppm Ag) are re-analyzed by fire assay with a gravimetric finish, (SGS method FAG515); Sn is analyzed using a caustic digest followed by fire assay with acid dissolution and an AAS finish, (SGS method AAS90B).

Results of the grade control drilling are modeled using the mine planning software Gemcom, version 6.14. This information is used by the grade control geologists to define material type boundaries and for extraction planning. Ore markup plans produced by the grade control geological team are given to the Mining Engineers and Operations personnel on a daily basis.

16.6 Drilling and Blasting

Blast hole drilling is performed with two Atlas Copco DM45 rigs which drill 20cm diameter blast holes. The normal explosive used is ANFO, which is placed by a blasting contractor. Slurry-based explosives are available, and used as needed.

The blast pattern is adjusted according to rock fabric and the blast hole spacing is adjusted such that ore material is blasted finer than waste material. The finer blasting in ore zones is required to assure proper fragmentation when blasting adjacent to older underground mine workings.

Mining is performed on 8 m benches for ore and wall control purposes.

Pre-splitting of the highwall is performed with every 8 m bench. This assures good wall conditions and minimizes the potential to have wall failures. This work is performed with a smaller diameter drill on close spacing. A new crest and catch berm is formed every 24 m.

16.7 Loading Operations

Loading operations are performed with a 170 tonne hydraulic shovel, which has a bucket capacity of 8 m^3 and two wheel loaders with bucket capacities of 11 m^3. Digging faces are defined by ore control procedures and are marked in the field and on maps provided to the operators.

In addition, the mine uses 2 x 30 tonne excavators with bucket capacities of 0.9 m^3 and smaller trucks provided by a mining contractor to provide good ore to waste separation in the areas of veining.

Rock is separated based on mineral grades and mineral content. Waste rock is hauled to two waste stockpiles named the Pircas and the Cortaderas waste stockpiles. The Pircas waste stockpile is located uphill from the mine and starts immediately west of the Phase 1 pit limit, and extends for about 1,400 m to the west from the pit. The Cortaderas waste stockpile is located to the north and approximately 1,200 m to the east which is downhill from the mine. These waste stockpiles are canyon fill designs. The stockpile locations are shown in Figure 16-3 Pirquitas Mine, Site Plan with contour lines. Ore material is hauled directly to the primary crusher or is stockpiled based on grade and mineral (silver, zinc or tin) content for future processing.

16.8 **Haulage**

The mine has a fleet of 100 tonne dump trucks (CAT 777) that are primarily used for waste haulage but are also used for ore haulage. Contracted 25-39 tonne trucks are used primarily for ore haulage or for the fine separation of waste from ore. Ore haulage distance is approximately 7 km from the mine to the primary crusher.

16.9 **Other Activities**

Other mine activities include mine dewatering ahead of mining, slope stability monitoring, road and access maintenance. The mine has some underground workings that are accessible and these are used for dewatering and exploration. No underground mining is currently performed, Silver Standard is investigating the possibility of underground mining as part of ongoing mine planning.

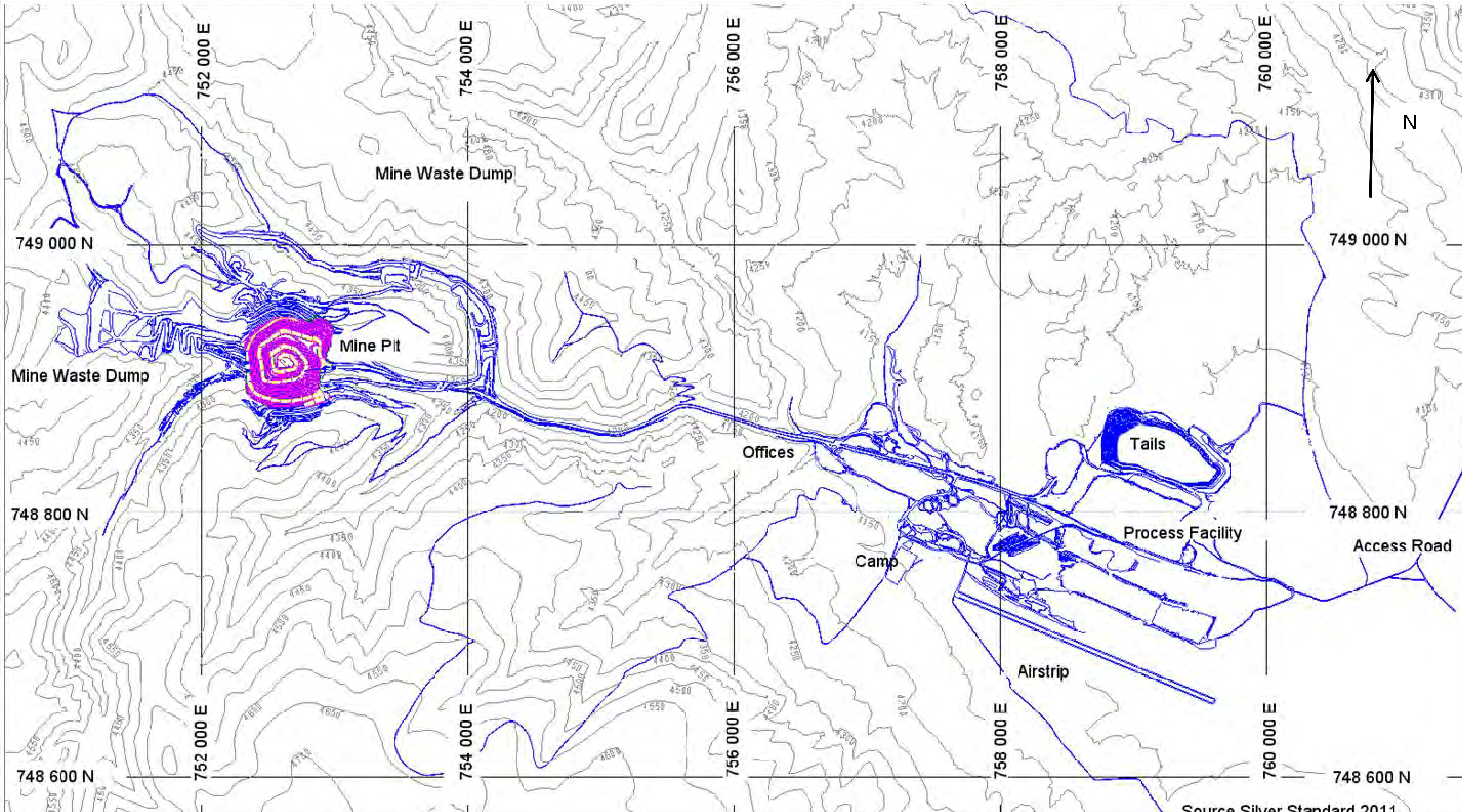


Figure 16-3 Pirquitas Mine, Site Plan with contour lines

Grey Colour – contour lines in masl, Blue lines show roads and infrastructure, Pink lines denote the planned open pit defined from the September 30, 2011 Mineral Reserve. Grid coordinates in UTM Zone 19S (WGS84 datum) system.

17 Recovery Methods

The Pirquitas processing plant consists of a primary crusher, secondary and tertiary crushing operations delivering ore to a stockpile. Ore is transferred from the stockpile to a pre-concentration system that consists of jigs to upgrade the normal mine grade to a higher grade product.

Milling is performed on the feed from the jig plant and can be augmented by a by-pass feed system in the event of jig downtime or milling capacity in excess of jig capacity. Mill discharge is pumped through a cyclone system and oversize is fed back into the mill for additional grinding. Fines are then fed into a conditioning and reagent addition tank and then flow into the silver flotation circuit.

The tailings from the silver flotation process are routed to a separate conditioning tank and from there flows to the zinc flotation circuit. Tails from the zinc flotation circuit can be directed to the tin circuit or to the tailings thickener, as appropriate.

Tailings are thickened and stored at a permitted facility on-site. A simplified plant flow sheet is presented as Figure 17-1.

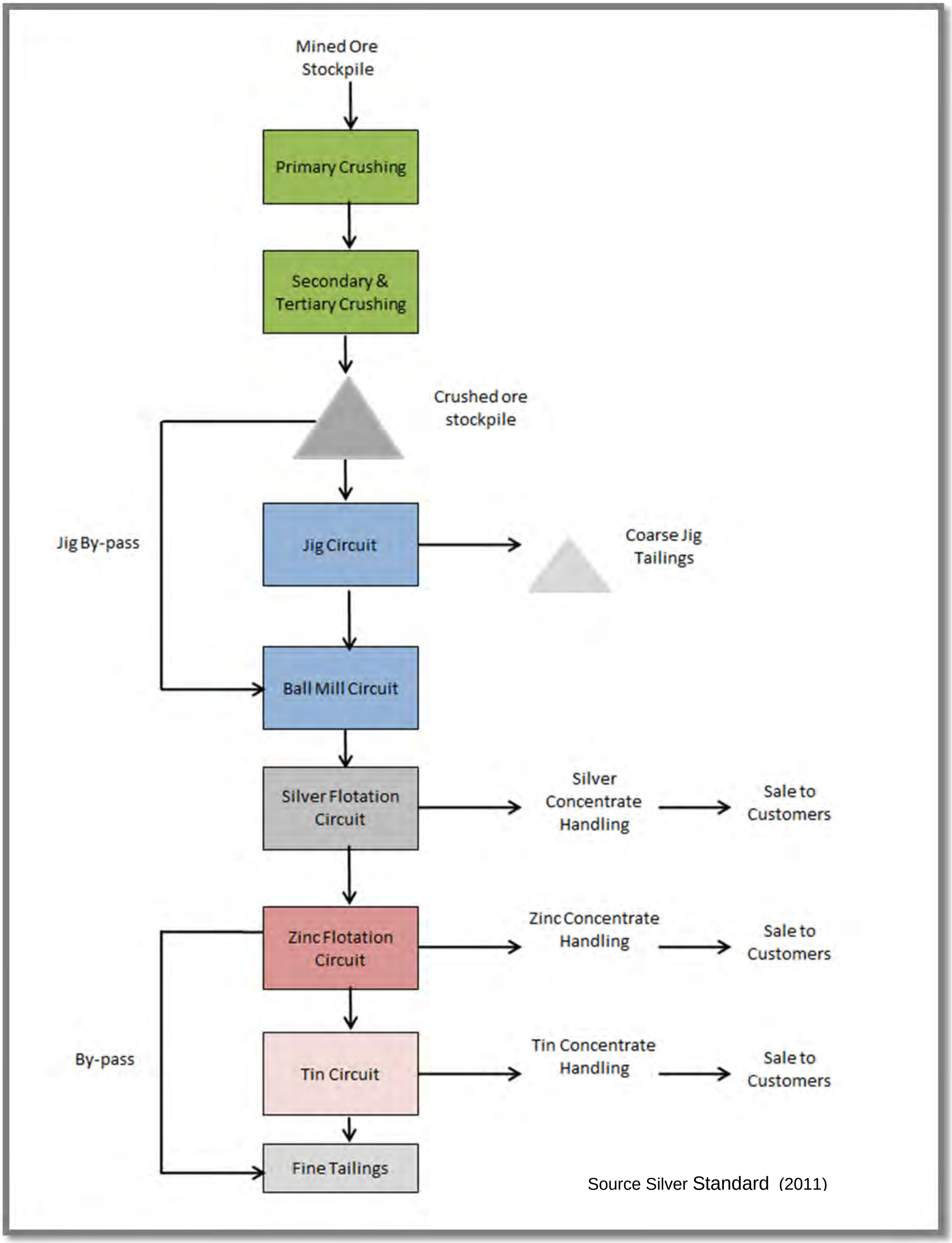


Figure 17-1 Simplified Plant Flow Sheet for the Pirquitas Mine.

17.1 Stockpiling and Crushing

The mine delivers suitable ore materials to stockpiles, including stockpiles at the primary crusher. The crusher is a jaw crusher that can be fed directly via discharge of 25-30 tonne trucks or with a front-end loader. The crusher produces a 15 cm product.

Secondary and tertiary crushing and screening operations reduce this material to a size of which 80% is less than 9 mm. This material is discharged onto a crushed ore stockpile that has four feeders located below the stockpile.

17.2 Jig Pre-concentration Plant

Ore is fed from the crushed ore stockpile into a washing screen that separates material by size and sends material to a series of jigs for pre-concentration. These jigs are capable of making a separation based on material density and can upgrade the mine ore feed by rejecting rock that has a lower density than the higher grade Ag, Zn and Sn containing material.

The ore is then sent to the ball mill while the rejects (jig plant tails) are placed in a stockpile and analyzed for metal content. The jig tails are variously distributed based on grade; they are primarily hauled to long term waste storage but can be stockpiled with other medium or low grade stockpiles if grades are justified. They can also be used for road maintenance, pit floor smoothing and blast hole stemming.

17.3 **Milling**

The milling circuit starts with wet ball milling to break all crushed and jigged ore to the optimum size for mineral separation. Wet milling is performed at a rate of approximately 4,000 tpd. Mill feed is primarily from the jig plant but the plant is equipped with a by-pass system that allows for passage of crushed ore to be fed in addition to the jig plant feed.

Mill discharge is pumped into a cyclone nest where the oversize is returned to milling operations and the fines report to flotation.

17.4 **Conditioning and Flotation of Silver and Zinc**

The conditioning of the ball mill discharge is done in a conditioning tank where appropriate pH and reagent controls are achieved to optimize recovery. Silver is floated first and the tailings from that silver flotation are pumped to the zinc conditioning tank where the pH is increased and the reagents are modified to achieve optimal zinc recovery.

The higher pH required for zinc recovery helps to ensure that the tailings facility does not become acidic.

17.5 **Metallurgical Performance Model**

The metallurgical performance of the processing plant has been improved with operating experience. For example Figure 17-2 and Figure 17-3 show the comparative metallurgical performance of the silver flotation circuit, for the months of March and September 2011.

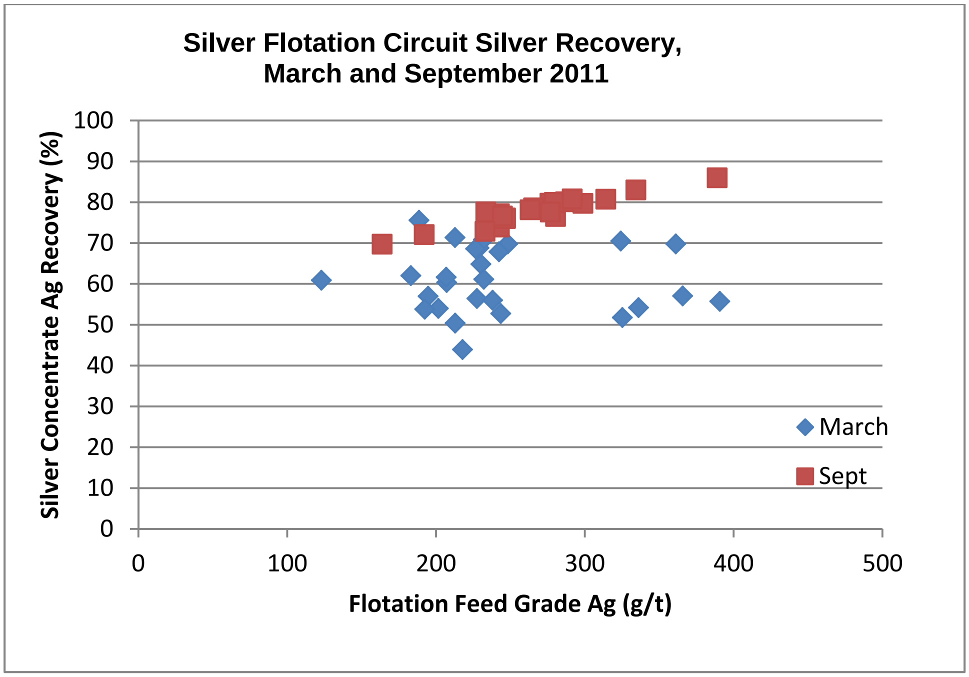


Figure 17-2 Comparison of Silver Flotation Circuit, Silver Recovery Performance for the Months of March and September 2011.

Source Silver Standard, (2011)

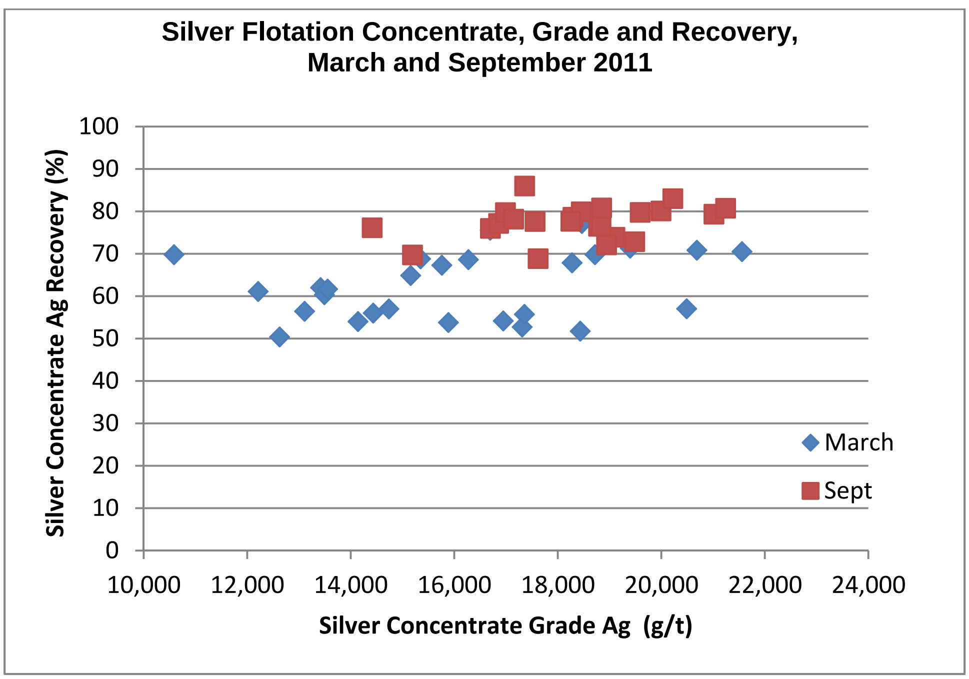


Figure 17-3 Comparison of Silver Flotation Circuit, Concentrate Grade and Recovery for the Months of March and September 2011.

Source Silver Standard, (2011).

A process plant metallurgical performance model was developed from daily plant metallurgical balances from the months of August and September 2011.

The process plant is modeled as two stages, firstly the mined ore to crushing to jig circuit to ball mill feed the schematic of which is presented in Figure 17-4 and secondly from ball mill feed to silver and zinc flotation concentrates, the schematic of which is presented as Figure 17-5.

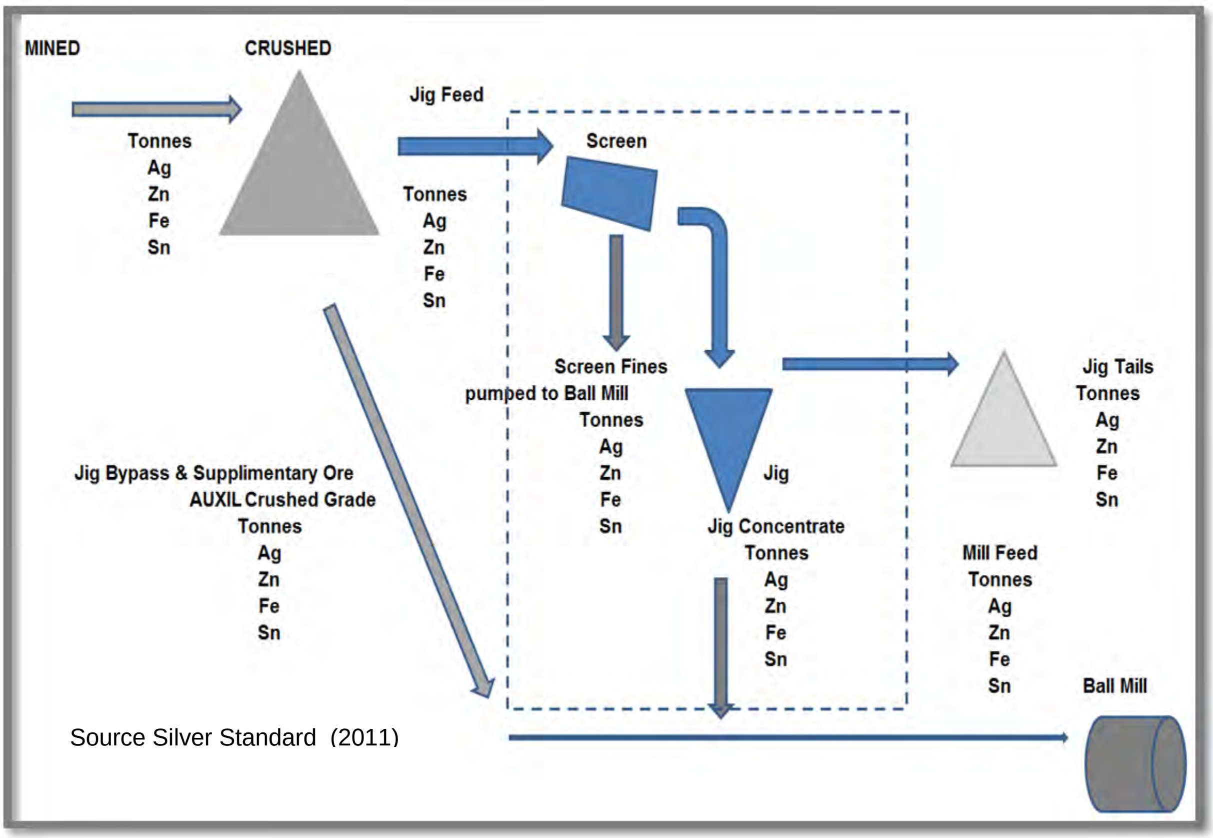


Figure 17-4 Mined Ore to Crushing and Jig Circuit to Ball Mill Feed Model.

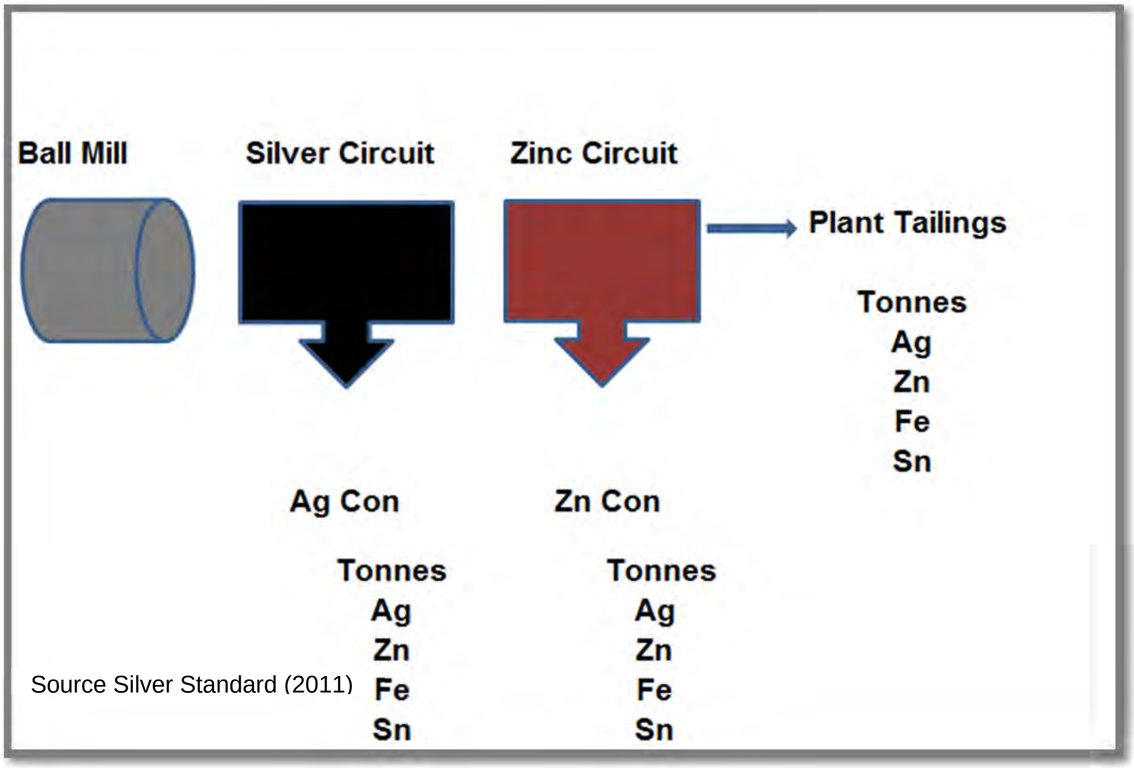


Figure 17-5 Ball Mill Feed to Flotation Concentrate Model.

17.5.1 Mined Ore to Crushing and Jig Circuit to Ball Mill Feed Model.

As shown in Figure 17-4 the mined ore to ball mill feed circuit is quite complex in terms of both tonnage and metal. The complication is due to operational bypassing of crushed (mine grade) ore around the jig upgrading circuit, the combination of these two streams becomes ball mill feed.

The jig performance can be summarized by two graphs of daily plant performance; jig circuit product mass, and jig circuit silver recovery. These graphs are presented as Figure 17-6 and Figure 17-7.

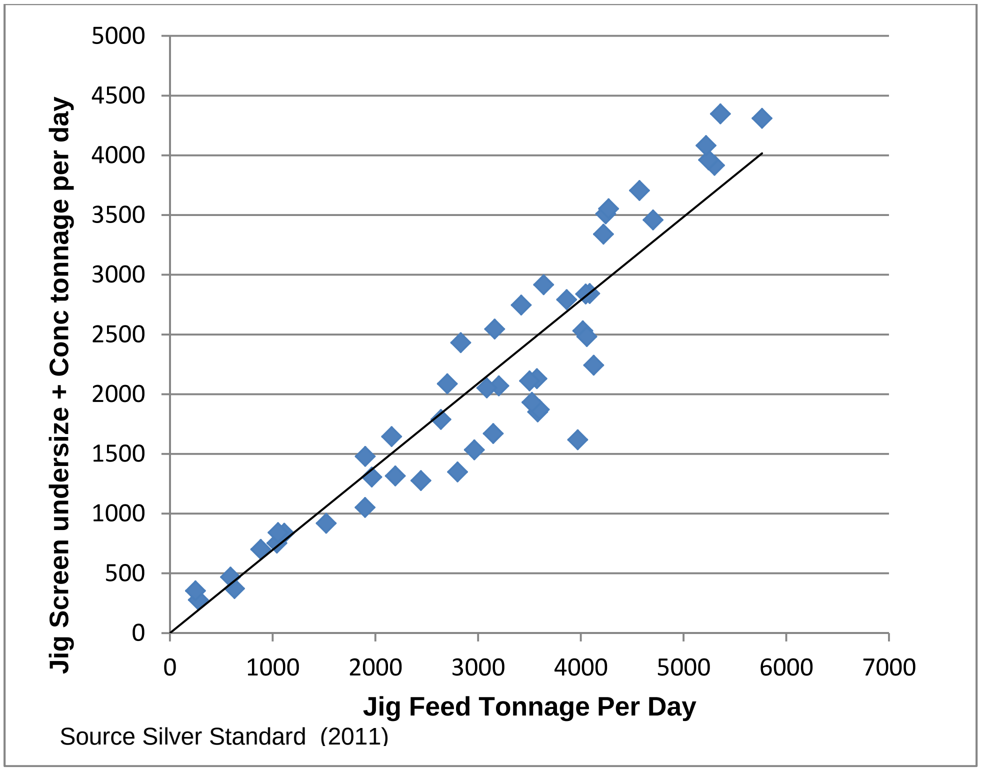


Figure 17-6 Jig Circuit Product Mass.

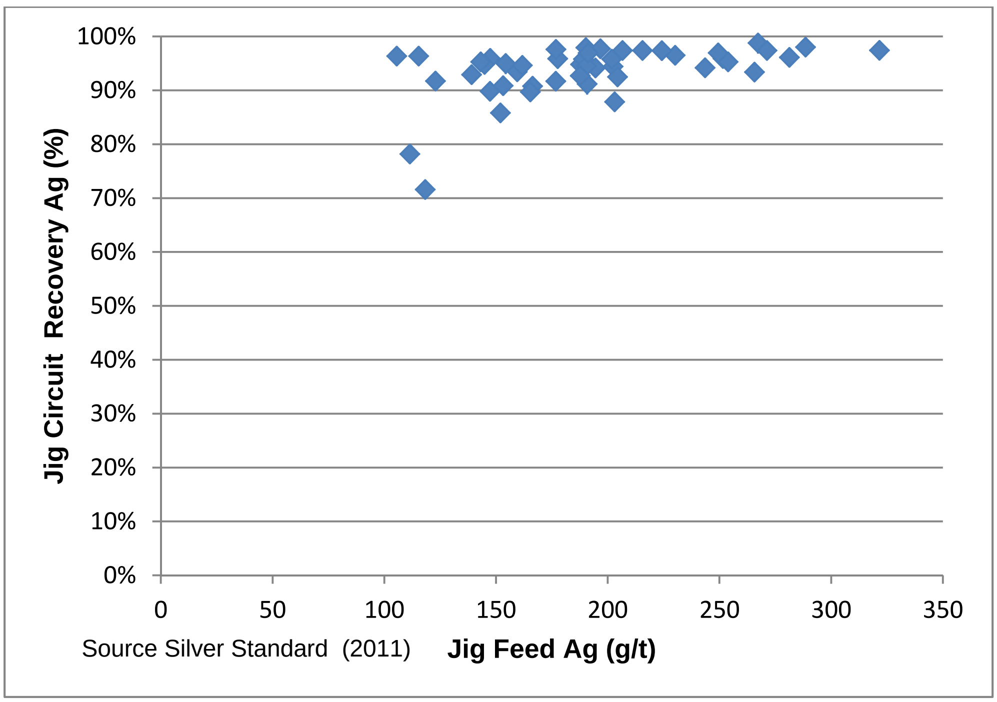


Figure 17-7 Silver Grade and Recovery of Jig Product.

17.5.2 Ball Mill Feed to Flotation Concentrate Model

The metal contents in the ball mill feed are upgraded from mined and crushed ore grades, by the jig circuit. The ball mill feed grades are the basis for the flotation circuit performance modeling.

17.5.3 Silver Flotation Circuit

The correctly-sized particles flow from the ball mill circuit to the silver flotation conditioning tank. Here flotation reagents suitable for silver minerals are added in tightly-controlled quantities.

The silver flotation circuit consists of a series of froth flotation stages, where silver minerals are recovered as froth, and progressively upgraded to a marketable silver containing concentrate.

The ball mill feed grades are the basis for the silver flotation circuit performance modeling. The performance of the silver flotation circuit for the period August to September 2011 is indicated in two graphs which are given as Figure 17-8 and Figure 17-9.

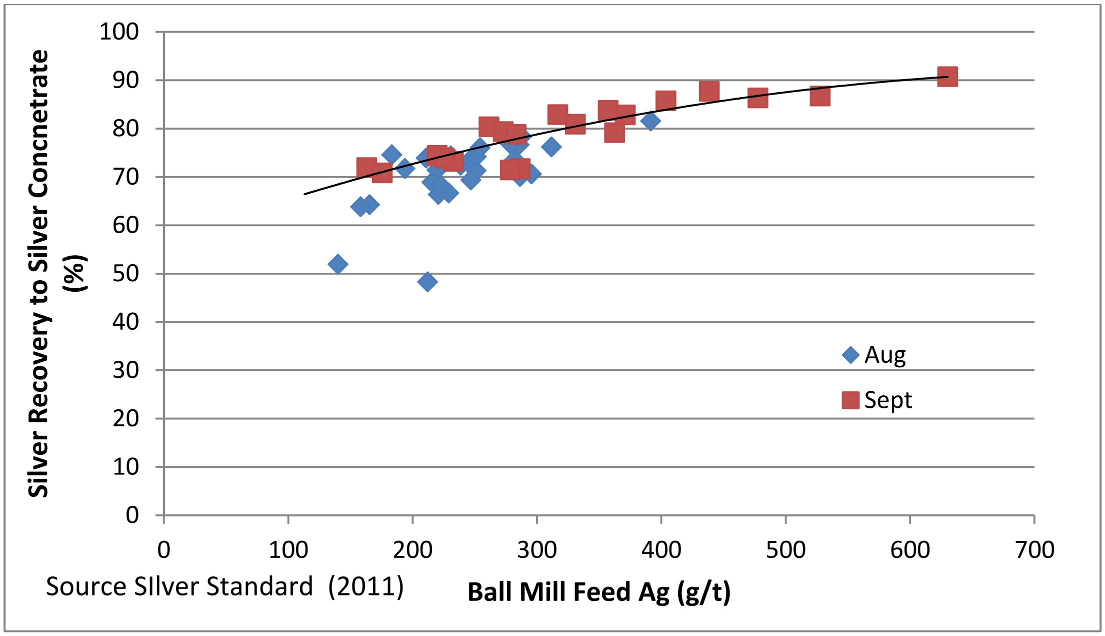


Figure 17-8 Silver Recovery from the Silver Flotation Circuit against Silver Flotation Circuit Feed Grade Ag g/t. August and September 2011.

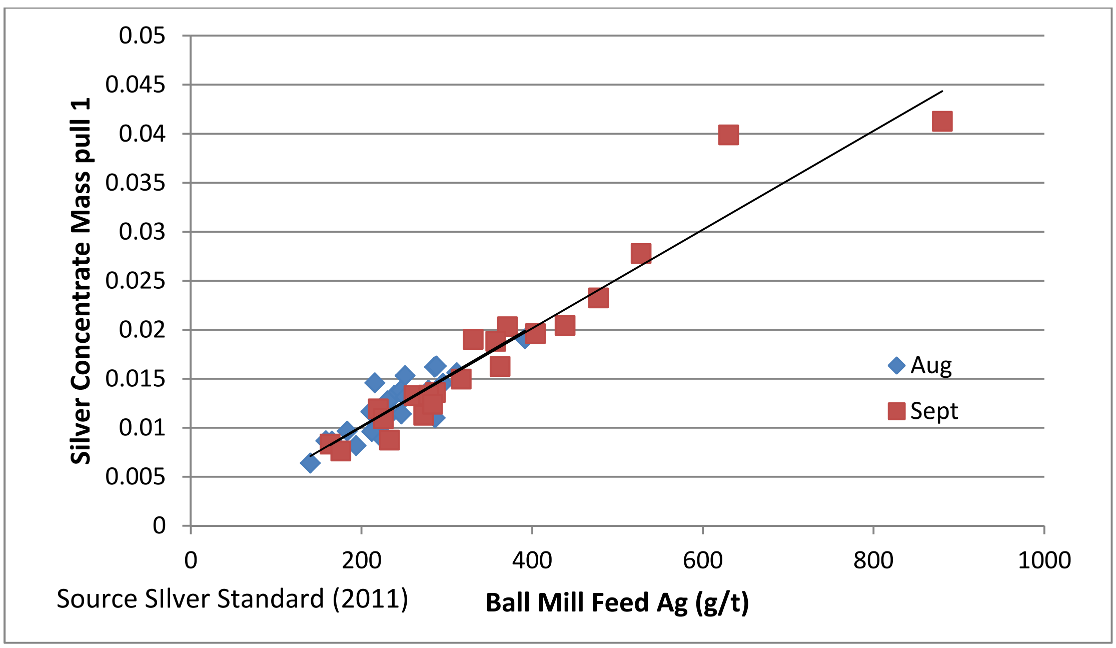


Figure 17-9 Silver Concentrate Mass Pull[1] Against Silver Flotation Circuit Feed Grade Ag g/t. August and September 2011.

[1] Mass Pull is a ratio which is equal to: <u>Mass of the Concentrate Output</u>
. Mass of the Feed Input

17.5.4 Zinc Flotation Circuit

The silver-poor silver flotation circuit tailings are pumped to the zinc circuit conditioning tank where flotation reagents suitable for zinc minerals are added.

The zinc flotation circuit consists of a series of froth flotation stages, where zinc minerals are recovered as froth, and progressively upgraded to a marketable zinc containing concentrate. Some additional silver is recovered in the zinc concentrate.

The zinc circuit feed grades (silver flotation tailings) are used as the basis for the zinc flotation circuit modeling. The performance of the zinc flotation circuit for the period August to September 2011 is indicated in two graphs which are given as Figure 17-10 and Figure 17-11.

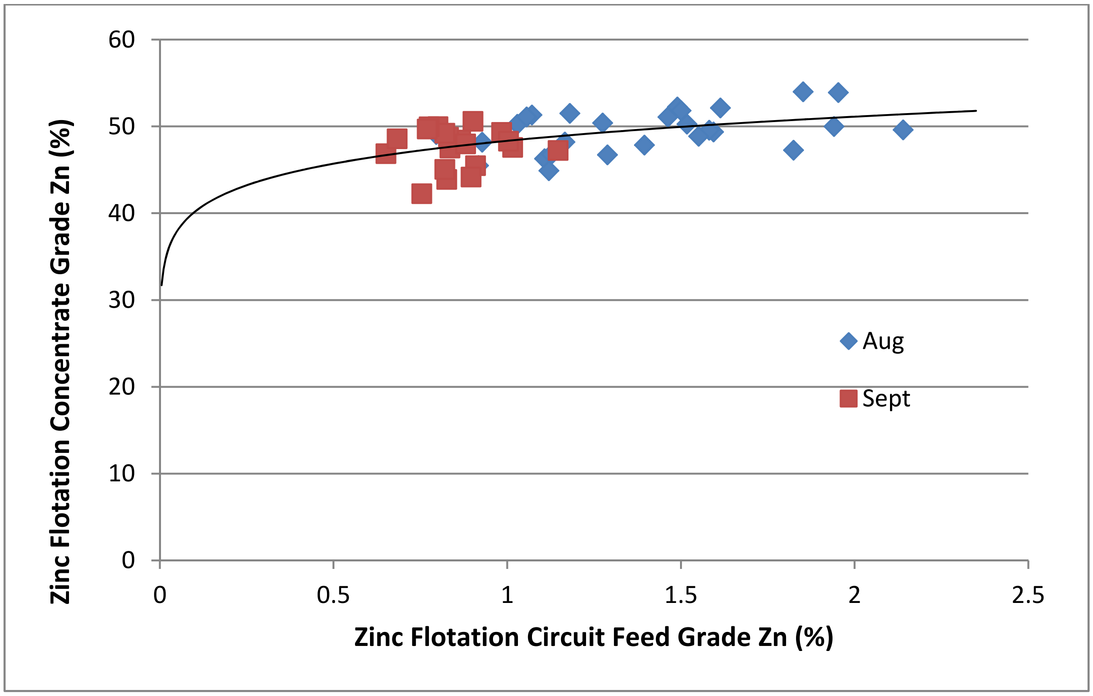


Figure 17-10 Zinc Concentrate Grade from the Zinc Flotation Circuit against Zinc Flotation Circuit feed Grade Zn %. August and September 2011.

Source Silver Standard (2011).

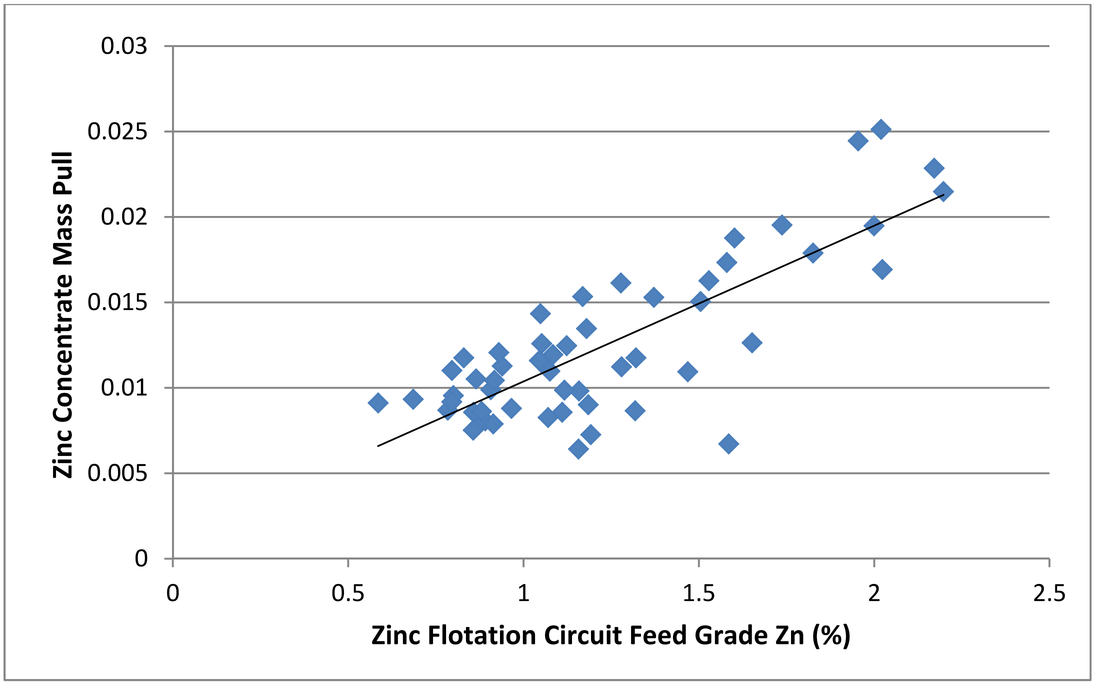


Figure 17-11 Zinc Concentrate Grade from the Zinc Flotation Circuit against Zinc Concentrate in Mass Pull [1] August and September 2011.

`Source Silver Standard (2011).

[1] Mass Pull is a ratio which is equal to: $\frac{\text{Mass of the Concentrate Output}}{\text{Mass of the Feed Input}}$
.

The zinc flotation tailings can be fed to a tin recovery circuit.

Metallurgical testwork focused on the recovery of tin is discussed in Section 13. At Pirquitas MPI produced 160 tonne of tin concentrate from mill start in July 2009 up to June 2011. The plant was shut down as product recovery and quality failed to cover plant operating costs. Additional testwork focused on economic tin recovery will be undertaken in 2012 (see Section 26). No recovery of tin has been assumed in the economic model of the current Mineral Reserve estimates presented in this Technical Report.

17.6 Concentrate Thickening and Dewatering

The silver and zinc froth flotation concentrates are thickened in dedicated thickeners, ahead of automated batch pressure filters.

The two filtering units discharge concentrate 'cake' onto conveyors. These discharge into separate storage areas. From the concentrate stockpile areas, the products are bagged for shipment off-site to Customers.

17.7 **Tailings Disposal**

Tailings are currently stored in a permitted and lined surface tailings storage facility that consists of a dam and successive lifts. The tailings dam design is performed by an engineering contractor which is currently Ausenco Vector Engineering, and they verify that the work done on site meets or exceeds the design requirements of the seismic zone and other design inputs.

At the date of this report, MPI is constructing Phase 3 of the tailings dam and is investigating the potential for dry stack tailings.

17.8 **Other**

All required energy is generated at site and there is some excess capacity and back-up generation capability. Water rights are sufficient for the existing plant capacity and are optimized to take advantage of variable pH water sources available at the site.

Process materials are available from the local market. Lime, used for pH control, is supplied from a local calcined lime provider located near Volcan, Jujuy Province. Grinding media is sourced nationally and internationally. Reagents are provided from local service representatives of international reagent suppliers.

18 Project Infrastructure

The Pirquitas Property includes significant infrastructure used to sustain operations. Infrastructure includes roads, a gas pipeline, power generation facilities located on site, water diversion systems, tailings dams, mine waste stockpiles, camp facilities, and communications systems.

18.1 Roads

Roads are discussed in Section 5.2.

18.2 Gas Pipeline

The Gas Pipeline is discussed in Section 5.3.

18.3 Power Generation Equipment

The site is equipped with an electrical power generation system that consists of 3 Wartsila and 3 Cummins generator sets. The Wartsila units are natural gas powered, each has a nominal capacity of 5 MW per hour and the Cummins units have a 1.1 MW per hour nominal capacity and are diesel-powered. Total installed generation capacity at the site is in excess of 18.3 MW per hour, with additional emergency back-up generators located at critical areas.

18.4 Water Rights and Diversion System

The mine has granted water rights of 32 lps. Currently, the mine is equipped with a water pumping system that uses a water diversion and pump station located at the San Marcos River which is located to the far east of the Pirquitas Property about 7 km from the processing plant.

18.5 Communications Systems

The mine is equipped with both cellular and desktop telephones and intranet. This equipment uses cell phone towers to communicate to Abra Pampa and is connected via a land line to the Pirquitas Mine offices and buildings.

18.6 Camp Housing and Office Buildings

The site is equipped with housing sufficient for a maximum of 673 personnel. This housing is a mix of rehabilitated housing from prior mining operations and modular housing that was installed during construction.

Food is catered by a contractor and is provided on a 7 day per week schedule.

Office buildings are a mix of rehabilitated offices from prior mining operations and modular office space installed during mine construction.

18.7 Mine Waste Stockpiles

The mine currently has two waste stockpiles as described in Section 16.

18.8 Other Infrastructure Items

The site has a permitted waste water treatment facility for treatment of liquid wastes from camp operations. This system is designed to allow for discharge of treated waste-water to national standards.

The site has a landfill for organic waste and a recycling center for plastics, wood and metal products. Most wood products are donated to the local communities and are used as fuel or for construction supplies. Scrap steel and specialty steels are recycled via local vendors.

Domestic water comes from a water diversion located in the Medano Canyon area which is approximately 300 m upstream from the Pirquitas Mine open pit. Water is pumped from that location to a site water treatment facility for filtering and chlorination and is then used within the camp site. At the date of this report, potable water is currently supplied by bottles and totes for drinking and cooking purposes.

Concentrate shipments are trucked to Susques, from Pirquitas via Route 77. These shipments are routed via Paso de Jama to Antofagasta, Chile; the silver concentrate is finally delivered to Arica some 600 km north of Antofagasta. Port facilities belonging to clients or that are rented by MPI are available in Antofagasta.

19 Markets and Contracts

19.1 Marketing

At the time of preparation of this Technical Report Silver Standard was in negotiations with smelters and traders for long term concentrate sale contracts. The concentrate sales terms are consistent with both historical terms and current discussions. Therefore no external consultants or market studies were directly relied upon to assist with concentrate sales terms used in this Technical Report. The Qualified Person for this section agrees with the assumptions and projections presented.

19.1.1 Product Specification and Selling Costs

On-site processing produces silver and zinc concentrates, which are anticipated to be sold to various smelters and traders on a spot-or long-term contract basis are presented in Table 19-1.

Table 19-1 Estimated Concentrate Sales Terms

Silver Concentrate Grade (g/t)	20,000
Payable silver in concentrate	96.75%
Metal Sales Costs ($ / oz)	$2.90
Zinc Concentrate Grade (%)	50%
Payable zinc in concentrate	84.00%
Metal Sales Costs ($ / dmt	$1,260

19.1.2 Metal prices

The metal prices used in this Technical Report are based on an internal assessment of recent market prices, long-term forward curve prices, and consensus amongst analysts regarding price estimates. Silver Standard uses a constant silver price of $25.00/oz and a constant zinc price of $1.09/lb for the Base Case economic analysis. Silver Standard considers these silver and zinc prices to be reasonable and representative of industry expectations for investment purposes. The metal prices used in the cash flow model in Section 22 are consistent with the Mineral Reserve metal prices stated above.

No external consultants or market studies were directly relied upon to assist with commodity price projections used in this Technical Report. The Qualified Person for this section agrees with the assumptions and projections presented.

19.2 Contracts

At the date of this Technical Report Silver Standard sells its silver concentrate to two global commodities traders. Silver Standard is in negotiations for long-term silver concentrate contracts with smelters and traders that include terms consistent with standard industry practices and market conditions.

Silver Standard has an ongoing commitment to sell all of its zinc concentrate to one global commodities trader. Silver Standard will revisit the terms of its zinc concentrate contract when the current contract approaches expiration. Silver Standard is of the opinion that concentrate sales contracts that may be entered into with smelters and traders are expected to be typical of and consistent with standard industry terms similar to contracts for similar concentrate quality elsewhere in the world.

MPI currently has two mining contracts for a two-year and three-year period, expiring in 2013 and 2014, respectively. These two contracts are consistent with local industry practices and terms. MPI also has one natural gas contract for five years expiring in 2013, which is consistent with local industry practices and terms.

MPI has three labour contracts of which one is for two years expiring in 2013 and two are for three years also expiring in 2013. All labour contracts have local labour rates comparable to those observed in industries with similar labour requirements. These three contracts are consistent with industry practices and terms.

20 Environmental Studies, Permitting and Social or Community Impact

The Pirquitas Mine is subject to a series of environmental and social impact studies that are similar to those requirements in Canada or the United States. In the case of the Pirquitas Mine, there was a substantial prior history of mining and development on the property that dates back into the 1920s.

20.1 Environmental Studies

Environmental studies, conducted prior to 2011, are discussed in Section 4.6.

The Pirquitas Mine is currently conducting two studies in support of the 2012 update of the Environmental Impact Study: a mine closure plan is underway by CESEL Engineering of Peru, and a Water Management Plan is being performed by SRK Consulting of Argentina.

The current requirement for reclamation is aimed primarily at post-closure water quality. There is a post-closure requirement that the site discharge water quality be the same as or better than that documented in the initial Knight Piésold (1998) baseline study.

Silver Standard is unaware of any known environmental issues that could affect the ability of MPI to extract the currently-defined Mineral Resource or Mineral Reserve.

20.1.1 Requirements and Plans of Waste and Tailings Disposal

Waste stockpiles are located to the west of the mine in the Pircas canyon and to the North of the mine in the Cortaderas canyon (see Section 16). These sites were proposed in the Knight Piésold (1998) EIR submittal and have not changed since. The mine continues to expand waste stockpiles as per its original plans. Waste stockpile monitoring is performed on site for slope stability and conformance to design.

The tailings storage facility is located immediately north of the processing plant, in the same location as initially proposed. The tailings facility has undergone several expansions with additional expansions anticipated during the life of the project. The expansions are approved by The College of Engineers (state-based professional engineering body) and the Mining Director (of the state of Jujuy) and are inspected during construction and prior to approval by the Secretary of Environment for Argentina (federal government).

20.1.2 Requirements for Site Monitoring and Water Management

The site has requirements to provide an environmental impact study update every two years. The most recent was submitted in November, 2010 BGC (2010). Site monitoring consists of routine monitoring of water samples for contaminants and acid rock drainage, dust, noise and vibrations.

The data generated is stored in on-site data-bases and is collated into reports that are submitted on a quarterly basis. The Direction of Waters; (of Jujuy state) reviews these reports and visits the mine twice a year.

20.1.3 Mine Reclamation & Closure

An allowance for the cost of reclamation and closure of the property has been included in the cash flow analysis. As of September 30, 2011 the life of mine reclamation and closure costs is estimated to be $19.6 million on an undiscounted basis. These estimates were based on an Asset Retirement Obligation (ARO) analysis prepared by MPI (2009). The ARO anticipates that some items are performed concurrently with operations while other activities occur at the end of the mine life.

The mine is conducting on-going removal of hazardous wastes and chemicals, as well as the removal of scrap steel, wood, cardboard and other non-usable items. In addition, many older buildings have either been decommissioned or repaired and re-used. Old mining equipment has been removed, and over 400,000 t of potentially acid producing material was removed from the river drainage, additional potentially acid generating materials are sampled for removal or treatment.

20.2 Permitting Requirements, Permit Status and Bonding Issues

All permits are in good standing. The government of Argentina has requested that all mining companies participate in a national environmental insurance policy. The mine has participated in this exercise with the completion of the site analysis and purchase of this insurance policy.

MPI has reserved an amount of money for reclamation activities. Analysis by the MPI environmental team anticipates that some reclamation work will be done during mine operations and that other activities will be conducted at the end of mine life. This is reported in detail in Section 20.4.

20.3 Social and Community Issues

Social and community issues are primarily addressed via a series of interactions with elected officials representing the local communities. Regular meetings are held between a MPI representative and the group of community leaders.

The mine has committed to a variety of community improvements, such as repairs and improvements to local schools, repairs to community centers and health clinics, temporary staffing of those clinics, emergency repairs to flood control structures, improvements in roads and installation of cell phone towers. Other community assistance includes the construction of water pipelines, sanitary landfill sites, and road repairs. Most employees and their families who live within the immediate vicinity of the mine use the mine’s medical center as their local clinic.

The largest social and community impact is employment of the locals. Lists of potential employees are provided by each community president and presented to the Pirquitas Mine Community Relations Department. This contact list is used by the Human Resources Department for all entry level positions and job interviews are conducted on site.

20.4 Mine Closure and Costs

As of September 30, 2011 the Pirquitas Property has an ARO for $9.3 million (on a discounted cash flow basis) and an Argentine mandated insurance policy for $4.17 million based on a recent national requirement and further verified by an independent study.

While the environmental insurance policy is based on current information regarding reclamation and costs, the mine is conducting a Mine Closure Study and updating a Water Management Plan. Both of those studies are anticipated to be available in early 2012 and are being prepared by independent consultants.

21 Capital and Operating Costs

The mining cost estimate for the Pirquitas Mine was based on 2011 year to date performance as of August 31, 2011, and adjusted for observed plant performance. This analysis includes forward estimates for sustaining capital. No inflation is included in the cost projections and exchange rates remain unchanged. Mining costs include a projection of productivity change with depth. The mine operating costs include a Human Resources (HR) component to cover camp and personnel transport, that for reasons of full cost application for staffing were distributed to mining, plant and administration components based on approximate staffing levels.

The costs included in this section were used in the pit optimization that led to the design, the cut-off grade for the Mineral Reserve estimate and the cash flow analysis estimate.

21.1 **Human Resources Distribution**

Costs calculated for administration HR year to date as of the end of August 2011, were at \$8.6 million. Administration HR costs were then distributed as 13.5% to administration, 42.0% to mining and 44.5% to milling based on approximate staffing levels. For mining, the HR distribution was applied pro-rata to all tonnes (ore and waste) mined for a cost of \$0.32/tonne mined.

For milling and administration, the costs for HR were distributed assuming that the plant would operate at 5,000 tpd crushed or 1.215 Mt per annum.

Table 21-1 HR Cost Distribution

Mining	\$0.32/tonne mined
Milling	\$3.16/tonne crushed
Administration	\$0.96/tonne crushed

21.2 **Administration Operating Cost**

Costs were calculated for administration based on 2011 year to date costs as of August 31, 2011 (without HR) at \$7.7 million. The costs for administration were then estimated assuming that the plant would operate at 5,000 tpd crushed or 1.2 Mt over the eight month period. This yielded an administration cost exclusive of HR distribution given by the formula

$$\$7.7/1.2 = \$6.4/\text{tonne}.$$

21.3 **Milling Operating Cost**

Costs were calculated for milling based on 2011 year to date costs as of August 31, 2011 (without HR) at $17.2 million. This total mill operating cost distributed over actual crusher throughput results in a cost per tonne crushed of mill operating $18.58/tonne. This time period included several months operating the tin circuit and low throughput due to completing start-up plant maintenance issues. A detailed cost analysis using the same information and considering these two issues was completed.

The final cost estimate was $17.05/tonne crushed on a 5,000 tpd basis.

21.4 **Mining Operating Cost**

Costs were calculated for mining based on 2011 year to date costs as of August 31, 2011 (without HR considerations) at $26.7 million. Distribution of costs over actual mining tonnage for the same period results in a cost per tonne of mined material of $2.35/tonne. This time period included the use of a mining contractor for ore mining and some waste mining. The long-term mining schedule includes approximately the same proportion of contractor and owner mining fleet over the remaining life of the operation. Estimates of productivity per bench were then reviewed and a cost model developed for the operation. The cost model was reconciled for actual production and the final model was:

Ore mine operating cost ($/tonne) is:

0.5*blast + 1.98 + 0.01*abs(4,230-benchtoe)

Waste mine operating cost ($/tonne) is:

0.5*blast + 1.38 + 0.01*abs(4,230-benchtoe)

Where

- blast = 0 for overburden, = 1 for all other material.
- 4,230 is the pit exit elevation at the base of the valley.
- benchtoe is any particular bench toe elevation.
- abs(4,230-benchtoe) is the absolute value of the difference of 4,230 and benchtoe. In this way it can be seen that cost for haulage always increases above and below the valley floor elevation.

21.5 **Tailings Storage Capital Cost**

The tailings storage capital cost is mainly derived from the Ausenco Vector (2011) cost estimation for a 15.1 Mt storage facility comprising an initial dam and six subsequent downstream phases (2A, 2B, 3, 4, 5 and 6). The storage facility was expected to have an overall cost of $110.4 million, including $5.9 million for closure costs. Due to the nature of the tailings storage capital cost being distributed throughout the life of the operation, this cost is considered as an operating expense for optimization and Mineral Reserve tonnage estimation.

Excluding costs expensed to September 30, 2011, and tonnage stored (2.4 Mt), a cost estimate can be calculated for the remaining capacity at $6.15/tonne. This cost assumes that the plant mills 76.6% of the crushed tonnage with the remainder being stored as jig tails oversize reject. Jig tails storage costs are included in the milling and mining costs with the mining contractor. No inflation of costs was included from the 2008 estimate that was reported by Ausenco Vector (2011).

Table 21-2 Dam Amortization Cost Estimate Source: Ausenco Vector (2011)

Data

Tailings Dam Information

	Construction Costs			**Storage Capacity (t)**	**Storage Period**	**Storage Period (# of months)**	**Wet Storage Cost ($/t)**	**Total Storage Cost ($/t)**	**Reverse Total Storage Cost ($/t)**
Initial Dam	$ 6,600,000			1,701,000	to November 2010	12	3.88	2.97	
	AFE Costs	**Costs per Vector**	**Construction Period**						
Phase									
2A	$ 4,693,000	$ 4,251,000	Apr to Nov 2010	958,500	Dec 2010 to July 2011	8	4.44	3.40	5.95
2B	$ 6,534,000	$ 6,534,000	Mar to July 2011	1,485,000	Aug 2011 to July 2012	12	4.40	3.37	6.15
3	$ 14,670,000	$ 14,670,000	Aug 11 to Jul 12	2,700,000	Aug 2012 to May 2014	22	5.43	4.16	6.53
4		$ 25,251,000	2012 to 2014	3,510,000	Jun 2014 to Oct 2016	29	7.19	5.51	7.30
5		$ 33,675,000	2015 to 2017	3,510,000	Nov 2016 to Mar 2019	29	9.59	7.35	8.60
6		$ 20,149,000	2017 to 2019	1,282,500	Apr 2019 to end of mine life (Dec 2020)	21	15.71	12.03	12.03
Closure		$ 5,889,000							
Totals	$ 25,897,000	$ 110,419,000		15,147,000	wet tonnage	133	6.95	5.32	without closure costs

Note: The highlighted cell indicates the number used in the calculation.

Total wet storage facility tonnage is 15.1 Mt. Using a storage proportion of 76.6%, and accounting for tonnage stored to September 30, 2011, the maximum Mineral Reserve remaining that can be mined is 17.3 Mt. The in-situ Mineral Reserve estimated in this report is 16.7 Mt indicating 12% spare capacity.

Table 21-3 Wet Tails Dam Storage for the Mineral Reserve Estimate September 30, 2011

Wet Tails Dam Storage for September 30, 2011 Mineral Reserve Estimate		
Stored to end Sept 2011	2.480 Mt	
In situ Reserve from Sept 30, 2011	16.700 Mt	
Wet Storage ratio	0.766	
Tails Storage Capacity	15.100 Mt	Life of Facility in terms of material milled, not crushed.
Total to Tails	15.200 Mt	Reserve in terms of tonnes milled plus what is already in dam.
Maximum Reserve	17.300 Mt	Maximum Reserve from end Sept 2011 of in-situ material.
Dam Free Capacity	12.000 %	At end of life of current reserve.

21.6 Sustaining Capital

Sustaining capital costs were applied to the optimization costs and included in the final cost analysis. Sustaining capital is based on experience with similar operations with similar mining rates and is estimated by the following formulae:

Milling

$1 millon per annum for 1.215 Mt per annum = $0.82/tonne

Administration/Infrastructure

$0.5 millon per annum for 1.215 Mt per annum = $0.41/tonne

Mining

0.14 + 0.0000021 * 40000 tpd = $0.22/tonne, IMC (2011)

21.7 Other Capital Costs

An estimate for capital costs required to complete the construction will be expensed in 2012. This is a one-off expense and will not need to be repeated in subsequent years. The list of particular items sums to $11.0 million and is included in the financial analysis.

The financial analysis includes $5.9 million for tailings dam closure costs and $9.3 million for general closure project costs in the final year after processing ceases.

21.8 Cost summary

Table 21-4 Cost Summary Pirquitas Mine

	Mill Cost $/tonne	Administration Cost $/tonne
Operating	17.05	6.37
HR Distribution	3.16	0.96
Sustaining	0.82	0.41
Tails Storage	6.15	n/a
Total	**27.18**	**7.74**

The following formulae were used in the generation of ore and waste mining operating costs, and simplified mining costs:

Mining cost

Ore Cost ($/tonne)= 0.5*blast + 1.98 + 0.32 + 0.22 + 0.01*abs(4230-benchtoe

Waste cost ($/tonne)= = 0.5*blast + 1.38 + 0.32 + 0.22 + 0.01*abs (4230-benchtoe)

Simplified Mining Cost

Ore cost ($/tonne)= = 0.5*blast + 2.52 + 0.01*abs(4230-benchtoe)

Waste cost ($/tonne)= = 0.5*blast + 1.92 + 0.01*abs(4230-benchtoe)

Incremental cost applied to ore cut-off ($/tonne)= = 0.60

22 Economic Analysis

This financial evaluation presents the current Net Present Value (NPV) for the Pirquitas Mine. Annual cash flow projections were estimated over the remaining life of the mine based on the estimates of capital expenditures, production costs and sales revenue. The sales revenue is based on the production of silver and zinc concentrate. The estimates of capital expenditures and production costs have been developed specifically for the Pirquitas Mine and have been presented in earlier sections of this report.

22.1 Mine Production Statistics

Mine production is reported as ore from the mining operation. The annual production figures were obtained from the life of mine plan; life of mine summaries are given in Table 22-1, with annual summaries provided in Table 22-8. The economic mine life begins as of January 1, 2012, and is illustrated annually. The mine plan as defined by the Mineral Reserve Estimate in Section 15 is effective as of September 30, 2011.

The mine completes earlier than the process plant. During the life of the Pirquitas operations, low grade material is stockpiled and processed after mining operations are complete. There are approximately 6.5 years of mine life from the start of 2012, followed by 2.5 years of processing stockpiles.

Table 22-1 Summary of Mine Plan: 2012 to 2018

	Tonnes (000's)	**Silver (g/t)**	**Zinc (%)**
Ore	15,019	177	0.68
Waste	55,729	-	-
Total	70,747	177	0.68

The mine production statistics do not include the current stockpile of material that are included in the plant feed.

22.2 Plant Production Statistics

Ore is processed using conventional crushing, grinding, and flotation technology to produce a silver concentrate and a zinc concentrate.

Estimated total metal recoveries over the life of the process plant for the silver and zinc concentrates are presented in Table 22-2

Table 22-2 Summary of Metal Process Recoveries: 2012 to 2020 (Life of Mine.)

	Silver (%)	**Zinc (%)**
Silver Concentrate	71.3	1.3
Zinc Concentrate	8.5	41.5
Total	79.8	42.9

Note: Values may not sum due to rounding.

Estimated life of mine silver concentrate production is 122,048 tonnes containing 64.6 Moz of Ag. The zinc concentrate production is estimated at 105,629 tonnes containing 111.4 Mlbs of Zn and 7.7 Moz of Ag.

22.3 **Smelter Return Assumptions**

Silver and zinc concentrates will be shipped from site to silver and zinc smelting and refining facilities. Smelter and refining treatment charges are negotiable at the time of agreement. A smelter may impose a penalty either expressed in higher treatment charges or in metal deductions to treat concentrates that contain higher than specified quantities of certain elements. Pirquitas silver and zinc concentrates do not contain meaningful amounts of deleterious elements.

The smelting and refining charges calculated in the financial evaluation include immediate payable silver and zinc deductions, as well as charges for smelting and refining both the silver and zinc concentrates. Also included in these charges will be the cost of transporting concentrate from the site to the smelter. Estimated off-site charges, based on current market conditions are presented in Table 22-3.

Table 22-3 Silver and Zinc Concentrate Sales Terms Used in the Cash Flow Analysis

Silver Concentrate	
Payable silver in concentrate	96.75%
Metal sales costs ($ / payable oz)[1]	$2.90
Zinc Concentrate	
Payable zinc in concentrate[2]	84.00%
Payable silver in concentrate[2]	66.00%
Metal sales costs ($ / payable dmt)[1]	$1,260

[1] Includes treatment, refining, penalty, and transportation charges.
[2] Includes minimum zinc deduction of 8.0% and minimum silver deduction of 3.0 oz / dmt.

22.4 **Capital Expenditures**

A schedule of capital cost expenditures during the production period was estimated and included in the cash flow analysis under the category of sustaining capital. The total life of mine sustaining capital is estimated to be $142.7 million. This capital will be expended during the nine year mine life as well as a subsequent year for reclamation and closure.

22.5 **Working Capital**

All working capital is recaptured at the end of the mine life. Inventory accumulated at the start of the cash flow analysis is assumed to be fully recaptured by the end of the mine life, which has a positive impact on overall working capital of $14.0 million.

22.6 **Salvage Value**

No allowance for salvage value has been included in the cash flow analysis.

22.7 **Revenue**

Annual revenue is determined by applying estimated metal prices to the annual payable metal estimated for each operating year. Metal prices have been applied to all life of mine production without escalation or hedging. Revenue is the gross value of payable metals sold before treatment charges and transportation charges. Metal prices used in the cash flow analysis are as follows:

Silver: $25.00/ ounce
Zinc: $1.09/ pound ($2,403/ tonne)

22.8 **Cash Costs**

Method #1: Per Ounce of Silver Produced

22.8.1 Direct Mining Cost

The average Direct Mining Cost over the life of the mine is estimated to be $9.11 per silver ounce produced. Direct Mining Cost includes mine operations, process plant operations, and general administrative cost. Table 22-4 shows the estimated operating cost by area per ounce of silver produced.

Table 22-4 Summary of Direct Mining Costs per Ounce of Silver Produced Life of Mine

Direct Mining Costs[1]	**$ / Oz of Silver Produced**
Mine	$2.87
Process Plant	$4.58
General Administration	$1.66
Total Direct Mining Costs	$9.11

[1] Values may not sum due to rounding.

22.8.2 Total Cash Cost

The average Total Cash Cost over the life of the mine is estimated to be $11.45 per silver ounce produced. Total Cash Cost is the Direct Mining Cost plus smelting and refining charges and shipping charges, royalties, production taxes less by-product credits.

Table 22-5 Summary of Total Cash Cost per Ounce of Silver Produced Life of Mine

Total Cash Cost[1]	**$ / Oz of Silver Produced**
Mine	$2.87
Process Plant	$4.58
General Administration	$1.66
Smelting / Refining Treatment	$3.33
Royalty and Reclamation	$0.42
Less: By-Product Credits	($1.41)
Total Cash Costs	$11.45

[1] Values may not sum due to rounding.

Method #2: Per Tonne of Ore Crushed

The average Total Cash Cost over the life of the mine is estimated to be $57.95 per tonne of ore crushed. Total Cash Cost includes mine operations, process plant operations, general administration cost, smelting and refining charges and shipping charges, and royalty and reclamation costs. Table 22-6 shows the estimated operating cost by area per tonne of ore crushed.

Table 22-6 Summary of Total Cash Cost per Tonne of Ore Crushed

Total Cash Cost	**$ / Tonne Ore Crushed**
Mine	$12.66
Process Plant	$20.21
General Administration	$7.33
Smelting / Refining Treatment	$14.69
Royalty and Reclamation	$3.06
Total Cash Costs	$57.95

22.9 Royalty

A provincial royalty payment is based on 3.0% of the “mouth of mine value”, which is based on the net recoverable value of the contained metals less certain operating costs, depreciation and depletion. The life of mine royalty payments are estimated to be $30.5 million.

The Federal Government of Argentina has proposed a retention tax on production exports by companies holding a fiscal stability agreement. Under the proposed retention tax, exports of concentrate will be taxed at 10% of the concentrate value above an agreed upon base. The legality of the retention tax is currently before the courts in Argentina and has not been included in the cash flow analysis.

22.10 Reclamation & Closure

An allowance for the cost of reclamation and closure of the property has been included in the cash flow analysis. The life of mine reclamation and closure costs on an undiscounted basis is estimated to be $19.6 million. These estimates were based on the ARO report produced by MPI and discussed in Section 20.

22.11 Depreciation

Depreciation is calculated using the units of production or straight-line methods, depending on asset classification.

22.12 Taxation

The Pirquitas Property is evaluated with a 35.0% corporate tax rate based on U.S. and Argentine tax exposures. Corporate income taxes paid is estimated to be $143.2 million for the life of the mine.

22.13 **Net Income after Tax**

Net Income after tax is $229.6 million for the life of mine.

22.14 **Net Present Value**

Base case cash flow analysis estimates a NPV (5%) of $446.7 million.

Table 22-7demonstrates the NPV (5%) sensitivity when key assumptions such as metal prices, milling costs, and mining costs are varied. This sensitivity analysis indicates that the Pirquitas mine's financial results are most sensitive to metal price changes and ore grade.

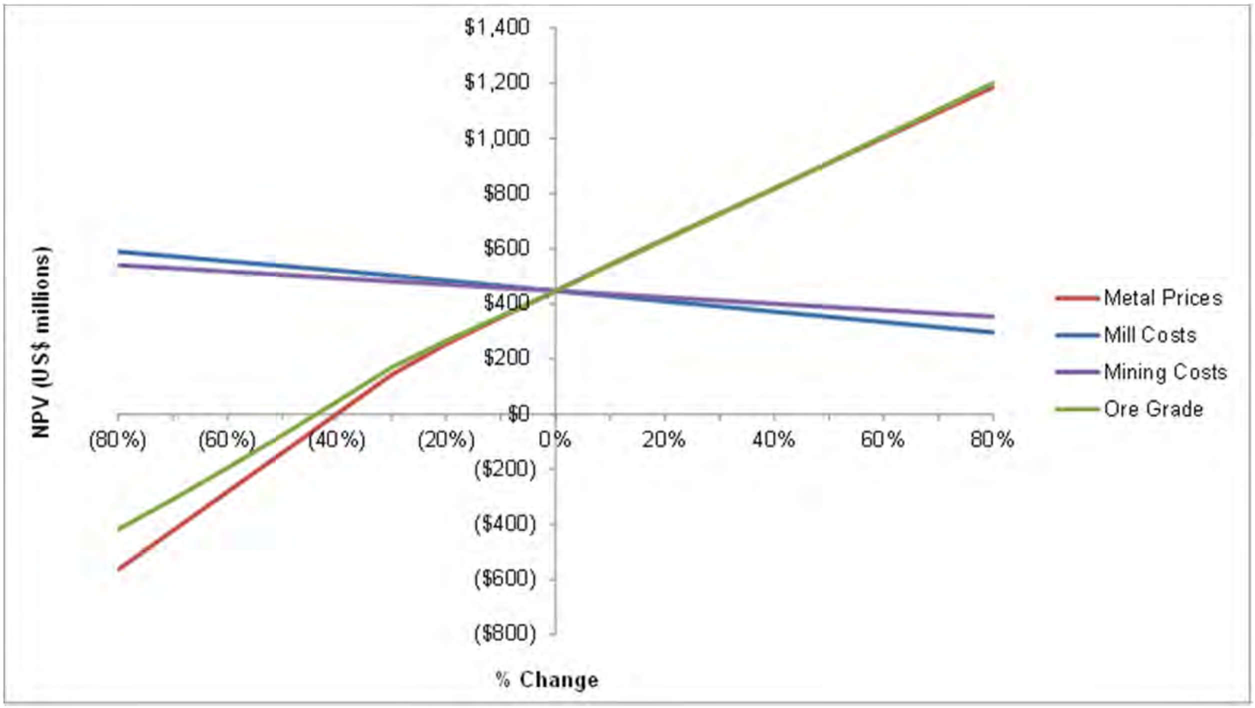


Table 22-7 Sensitivity Analysis of Base Case NPV

An IRR cannot be calculated for the Pirquitas Mine as the mine is anticipated to be cash flow positive every year under base case assumptions.

At current metal prices of $29.00 /oz for silver and $1,850/tonne for zinc, the Pirquitas Mine NPV (5%) increases to $576.9 million.

Table 22-8 Detailed Base Case Cash Flow Model

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Mining Operations												
Ore												
Beginning Inventory (kt)	15,019	15,019	13,180	11,141	8,380	5,527	2,894	847	0	0	0	0
Mined (kt)	15,019	1,839	2,039	2,761	2,853	2,633	2,047	846	-	-	-	-
Ending Inventory (kt)	0	13,180	11,141	8,380	5,527	2,894	847	0	0	0	0	0
Silver Grade (g/t)	177	191	184	164	168	171	188	198	-	-	-	-
Zinc Grade (%)	0.68%	0.62%	1.24%	1.13%	0.61%	0.40%	0.24%	0.09%	0.00%	0.00%	0.00%	0.00%
Lead Grade (%)	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%
Tin Grade (%)	0.24%	0.24%	0.18%	0.16%	0.20%	0.26%	0.35%	0.42%	0.00%	0.00%	0.00%	0.00%
Contained Silver (kozs)	85,542	11,311	12,072	14,523	15,375	14,470	12,393	5,398	-	-	-	-
Contained Zinc (klbs)	223,512	25,137	55,658	68,984	38,359	22,974	10,672	1,727	-	-	-	-
Contained Lead (klbs)	3,300	404	448	607	627	579	450	186	-	-	-	-
Contained Tin (klbs)	78,749	9,730	8,244	9,616	12,654	14,922	15,788	7,794	-	-	-	-
Waste												
Beginning Inventory(kt)	55,729	55,729	40,533	25,667	13,828	7,921	3,984	1,286	0	0	0	0
Waste Mined (kt)	55,729	15,196	14,866	11,839	5,907	3,937	2,698	1,286	-	-	-	-
Ending Inventory (kt)	0	40,533	25,667	13,828	7,921	3,984	1,286	0	0	0	0	0
Total Material Mined												
Ore Mined	15,019	1,839	2,039	2,761	2,853	2,633	2,047	846	-	-	-	-
Waste Mined	55,729	15,196	14,866	11,839	5,907	3,937	2,698	1,286	-	-	-	-
Total Material Mined (kt)	70,747	17,035	16,905	14,600	8,760	6,570	4,745	2,132	-	-	-	-
Oxide Strip Ratio (Waste : Ore)	3.71	8.26	7.29	4.29	2.07	1.49	1.32	1.52	0.00	0.00	0.00	0.00
Process Plant Operations												
Crusher Feed												
Plant Feed	16,377	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,825	1,777	-	-
Silver Grade (g/t)	172	188	206	204	211	208	209	153	89	79	-	-
Zinc Grade (%)	0.74%	0.73%	1.16%	1.14%	0.61%	0.40%	0.29%	0.56%	0.85%	0.96%	-	-
Tin Grade (%)	0.26%	0.24%	0.21%	0.18%	0.23%	0.28%	0.35%	0.32%	0.25%	0.32%	-	-
Jig Recovery	76.6%	76.6%	76.6%	76.6%	76.6%	76.6%	76.6%	76.6%	76.6%	76.6%	0.0%	0.0%
Ball Mill Feed	12,545	1,398	1,398	1,398	1,398	1,398	1,398	1,398	1,398	1,361	-	-
Silver Grade (g/t)	215	235	257	255	263	260	261	190	110	98	-	-
Zinc Grade (%)	0.84%	0.83%	1.31%	1.29%	0.69%	0.46%	0.33%	0.63%	0.97%	1.08%	0.00%	0.00%
Tin Grade (%)	0.30%	0.27%	0.24%	0.21%	0.26%	0.32%	0.40%	0.37%	0.28%	0.36%	0.00%	0.00%

Table 22-8 Detailed Base Case Cash Flow Model (Cont'd)

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Silver Concentrate												
Recovery Silver (%)	71.3%	74.8%	76.2%	76.1%	76.5%	76.3%	76.4%	72.0%	66.2%	65.2%	0.0%	0.0%
Recovery Zinc (%)	1.3%	4.5%	6.7%	6.6%	3.9%	2.7%	1.9%	3.6%	5.2%	5.7%	0.0%	0.0%
Silver Concentrate (kt)	122	15	16	16	17	16	17	12	7	6	-	-
Silver Concentrate Grade (g/t)	16,451	16,508	16,802	16,781	16,888	16,842	16,859	15,878	14,605	14,394	-	-
Zinc Grade (g/t)	4.45%	3.54%	7.53%	7.35%	2.23%	1.03%	0.54%	2.63%	10.05%	13.92%	0.00%	0.00%
Recovered Silver (kozs)	64,554	7,890	8,780	8,714	9,052	8,907	8,959	6,161	3,286	2,804	-	-
Recovered Zinc (klbs)	3,580	381	491	425	308	258	237	406	455	618	-	-
Zinc Circuit Feed												
Tonnage	12,423	1,383	1,382	1,382	1,381	1,382	1,381	1,386	1,391	1,355	-	-
Silver Grade (g/t)	55	60	62	62	62	62	62	54	38	34	-	-
Zinc Grade (%)	0.81%	0.80%	1.24%	1.22%	0.67%	0.45%	0.32%	0.62%	0.92%	1.03%	0.00%	0.00%
Zinc Concentrate												
Recovery Silver (%) - of zinc plant feed	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	35.00%	0.00%	0.00%
Recovery Zinc (%) - of zinc plant feed	49.50%	49.73%	52.70%	52.58%	48.68%	46.55%	45.01%	48.22%	50.66%	51.38%	0.00%	0.00%
Zinc Concentrate (kt)	106	12	18	18	10	6	5	9	14	15	-	-
Zinc Concentrate Silver Grade (g/t)	2,270	2,499	1,632	1,656	3,142	4,713	6,588	2,949	1,351	1,103	-	-
Zinc Concentrate Zinc Grade (%)	47.84%	47.47%	49.18%	49.12%	46.80%	45.32%	44.14%	46.49%	48.02%	48.44%	0.00%	0.00%
Recovered Silver (kozs)	7,708	929	962	960	971	966	968	840	587	523	-	-
Recovered Zinc (klbs)	111,402	12,102	19,892	19,529	9,917	6,372	4,448	9,080	14,314	15,747	-	-
Payable Metals												
Zinc Concentrate												
Payable Silver (kozs) - 66.00%	5,087	613	635	634	641	638	639	554	388	345	-	-
Payable Zinc (klbs) - 84.00%	93,578	10,166	16,710	16,404	8,330	5,353	3,736	7,627	12,024	13,228	-	-
Silver Concentrate												
Payable Silver (kozs) - 96.75%	61,464	7,634	8,341	8,279	8,599	8,461	8,511	5,853	3,122	2,664	-	-
Payable Zinc (klbs) - 0%	-	-	-	-	-	-	-	-	-	-	-	-

Table 22-8 Detailed Base Case Cash Flow Model (Cont'd)

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
(All values in $ 000's, unless otherwise stated)	Total	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Income Statement												
Metal Prices												
Silver ($/oz)		$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00
Zinc ($/t)		$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00	$ 2,403.00
Revenues												
Zinc Concentrates - Zn	$ 102,000	$ 11,080	$ 18,214	$ 17,881	$ 9,080	$ 5,835	$ 4,073	$ 8,313	$ 13,106	$ 14,418	$ -	$ -
Zinc Concentrates - Ag	$ 127,175	$ 15,333	$ 15,878	$ 15,843	$ 16,021	$ 15,946	$ 15,974	$ 13,860	$ 9,693	$ 8,628	$ -	$ -
Silver Concentrates - Zn	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Silver Concentrates - Ag	$ 1,536,601	$ 190,851	$ 208,519	$ 206,969	$ 214,986	$ 211,532	$ 212,777	$ 146,318	$ 78,050	$ 66,600	$ -	$ -
Total Revenues	$ 1,765,776	$ 217,264	$ 242,611	$ 240,692	$ 240,087	$ 233,313	$ 232,823	$ 168,491	$ 100,849	$ 89,646	$ -	$ -
Cash Production Cost												
Mining	$ 207,320	$ 45,824	$ 40,795	$ 40,685	$ 28,441	$ 23,701	$ 18,751	$ 9,122	$ -	$ -	$ -	$ -
Process Plant	$ 330,986	$ 36,883	$ 36,883	$ 36,883	$ 36,883	$ 36,883	$ 36,883	$ 36,883	$ 36,883	$ 35,920	$ -	$ -
G&A	$ 120,046	$ 13,377	$ 13,377	$ 13,377	$ 13,377	$ 13,377	$ 13,377	$ 13,377	$ 13,377	$ 13,028	$ -	$ -
Treatment & Refining Charges												
Zinc Concentrate												
Metal Sales Costs	$ 53,146	$ 5,818	$ 9,232	$ 9,075	$ 4,836	$ 3,208	$ 2,299	$ 4,457	$ 6,803	$ 7,420	$ -	$ -
Silver Concentrate												
Metal Sales Costs	$ 187,421	$ 22,923	$ 25,058	$ 24,896	$ 25,731	$ 25,372	$ 25,502	$ 18,389	$ 10,491	$ 9,058	$ -	$ -
Total Cash Operating Cost	$ 898,919	$ 124,826	$ 125,346	$ 124,917	$ 109,268	$ 102,542	$ 96,812	$ 82,229	$ 67,554	$ 65,425	$ -	$ -
Royalties, Reclamation and Other Costs												
Zinc Provincial Royalty	$ 3,521	$ 412	$ 497	$ 493	$ 405	$ 371	$ 355	$ 354	$ 320	$ 313	$ -	$ -
Silver Provincial Royalty	$ 26,984	$ 3,359	$ 3,669	$ 3,641	$ 3,785	$ 3,723	$ 3,745	$ 2,559	$ 1,351	$ 1,151	$ -	$ -
Salvage Value	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Reclamation & Closure	$ 19,648	$ 251	$ 280	$ 313	$ 350	$ 392	$ 865	$ 967	$ 1,081	$ 1,081	$ 14,067	$ -
Total Cash Production Cost	$ 949,071	$ 128,847	$ 129,793	$ 129,365	$ 113,809	$ 107,028	$ 101,777	$ 86,109	$ 70,307	$ 67,970	$ 14,067	$ -
Cash Cost per Ounce Produced												
Direct Mining Cost ($/oz)	$ 9.11	$ 10.89	$ 9.35	$ 9.40	$ 7.85	$ 7.49	$ 6.95	$ 8.48	$ 12.97	$ 14.71	$ -	$ -
Total Cash Cost ($/oz)	$ 11.45	$ 13.32	$ 11.42	$ 11.49	$ 10.41	$ 10.21	$ 9.76	$ 10.97	$ 14.49	$ 15.77	$ -	$ -
Operating Income	$ 816,705	$ 88,417	$ 112,819	$ 111,328	$ 126,278	$ 126,285	$ 131,046	$ 82,382	$ 30,542	$ 21,677	$ (14,067)	$ -
Depreciation												
Initial Capital	$ 307,095	$ 42,875	$ 42,615	$ 40,662	$ 40,919	$ 39,898	$ 37,170	$ 24,476	$ 20,368	$ 18,112	$ -	$ -
Sustaining Capital	$ 136,791	$ 3,662	$ 6,957	$ 10,099	$ 14,372	$ 19,003	$ 24,029	$ 22,720	$ 18,163	$ 17,786	$ -	$ -
Total Depreciation	$ 443,886	$ 46,536	$ 49,571	$ 50,761	$ 55,291	$ 58,901	$ 61,200	$ 47,196	$ 38,531	$ 35,898	$ -	$ -

Table 22-8 Detailed Base Case Cash Flow Model (Cont'd)

(All values in $ 000's, unless otherwise stated)	Total	2012 Year 1	2013 Year 2	2014 Year 3	2015 Year 4	2016 Year 5	2017 Year 6	2018 Year 7	2019 Year 8	2020 Year 9	2021 Year 10	2022 Year 11
Net Income after Depreciation	$ 372,819	$ 41,881	$ 63,247	$ 60,567	$ 70,987	$ 67,383	$ 69,846	$ 35,186	$ (7,989)	$ (14,222)	$ (14,067)	$ -
Tax Loss Carry-Forwards												
Initial Balance		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,989	$ 22,211	$ 36,278
Gained		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,989	$ 14,222	$ 14,067	$ -
Used		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Balance		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,989	$ 22,211	$ 36,278	$ 36,278
Income Taxes	$ 143,184	$ 14,658	$ 22,137	$ 21,198	$ 24,845	$ 23,584	$ 24,446	$ 12,315	$ -	$ -	$ -	$ -
Net Income After Taxes	$ 229,635	$ 27,223	$ 41,111	$ 39,368	$ 46,142	$ 43,799	$ 45,400	$ 22,871	$ (7,989)	$ (14,222)	$ (14,067)	$ -
Cash Flow												
Operating Income	$ 816,705	$ 88,417	$ 112,819	$ 111,328	$ 126,278	$ 126,285	$ 131,046	$ 82,382	$ 30,542	$ 21,677	$ (14,067)	$ -
Working Capital												
Account Receivable (15 days)	$ -	$ (8,929)	$ (1,042)	$ 79	$ 25	$ 278	$ 20	$ 2,644	$ 2,780	$ 460	$ 3,684	$ -
Accounts Payable (30 days)	$ -	$ 10,590	$ 78	$ (35)	$ (1,279)	$ (557)	$ (432)	$ (1,288)	$ (1,299)	$ (192)	$ (4,430)	$ (1,156)
Inventory	$ 14,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,000	$ -	$ -
Total Working Capital	$ 14,000	$ 1,661	$ (964)	$ 44	$ (1,254)	$ (279)	$ (411)	$ 1,356	$ 1,481	$ 14,268	$ (746)	$ (1,156)
Capital Expenditures												
Construction Completion Capital	$ 11,008	$ 11,008	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sustaining Capital Mine	$ 15,564	$ 3,748	$ 3,719	$ 3,212	$ 1,927	$ 1,445	$ 1,044	$ 469	$ -	$ -	$ -	$ -
Sustaining Capital Plant	$ 13,429	$ 1,497	$ 1,497	$ 1,497	$ 1,497	$ 1,497	$ 1,497	$ 1,497	$ 1,497	$ 1,457	$ -	$ -
Sustaining Capital Admin	$ 6,715	$ 748	$ 748	$ 748	$ 748	$ 748	$ 748	$ 748	$ 748	$ 729	$ -	$ -
Tailings Construction	$ 95,964	$ 13,000	$ 13,000	$ 12,251	$ 13,000	$ 13,000	$ 8,675	$ 9,000	$ 8,149	$ -	$ 5,889	$ -
Total Capital Expenditures	$ 142,680	$ 30,000	$ 18,964	$ 17,708	$ 17,172	$ 16,690	$ 11,964	$ 11,714	$ 10,394	$ 2,186	$ 5,889	$ -
Cash Flow Before Taxes	$ 688,025	$ 60,079	$ 92,891	$ 93,664	$ 107,852	$ 109,315	$ 118,670	$ 72,024	$ 21,629	$ 33,759	$ (20,702)	$ (1,156)
Cummulative Cash Flow Before Taxes		$ 60,079	$ 152,970	$ 246,633	$ 354,486	$ 463,801	$ 582,471	$ 654,496	$ 676,125	$ 709,884	$ 689,181	$ 688,025
Discounted Cash Flows	$ 566,387	$ 57,920	$ 85,289	$ 81,903	$ 89,819	$ 86,703	$ 89,640	$ 51,815	$ 14,819	$ 22,028	$ (12,865)	$ (684)
Income Taxes	$ 143,184	$ 14,658	$ 22,137	$ 21,198	$ 24,845	$ 23,584	$ 24,446	$ 12,315	$ -	$ -	$ -	$ -
Cash Flow After Taxes	$ 544,841	$ 45,420	$ 70,754	$ 72,465	$ 83,007	$ 85,731	$ 94,224	$ 59,709	$ 21,629	$ 33,759	$ (20,702)	$ (1,156)
Cummulative Cash Flow After Taxes		$ 45,420	$ 116,175	$ 188,640	$ 271,647	$ 357,378	$ 451,602	$ 511,312	$ 532,941	$ 566,700	$ 545,997	$ 544,841
Discounted Cash Flows	$ 446,671	$ 43,788	$ 64,964	$ 63,366	$ 69,128	$ 67,997	$ 71,175	$ 42,955	$ 14,819	$ 22,028	$ (12,865)	$ (684)
Economic Indicators Before Taxes												
NPV @ 0%	$ 688,025											
NPV @ 5%	$ 566,387											
Economic Indicators After Taxes												
NPV @ 0%	$ 544,841											
NPV @ 5%	$ 446,671											

23 Adjacent Properties

The northwest, west and southwest boundaries of the Pirquitas Property adjoin the Pirquitas Norte mineral property that is presently controlled by Cardero Resources Corp. and on which Davcha Resources International (DRI) has an option to acquire a 55% interest. DRI also holds a 94% interest in the Crosby mineral property which is contiguous with the Pirquitas Norte property as well as the northeastern boundary of the Pirquitas Property. Junior explorer Artha Resources Corporation (ARC) presently has an agreement with DRI that gives the company the option to acquire all of DRI's interests in the Pirquitas Norte and Crosby properties by issuing equity shares of ARC to the private-owners of DRI (Artha Resources Corp. 3rd Quarter Management Discussion & Assessment, November 30, 2011; filed on SEDAR).

Based on information provided by Artha Resources on its website as of December 2011, only early-stage mineral exploration has been conducted on the Pirquitas Norte and Crosby properties to date. Mineral deposits of real or potential economic significance are not known to exist on either of these properties and consequently neither property impacts the economics of the Pirquitas mining operation at this time. Silver Standard's Qualified Person for this section of the Technical Report has not verified the information provided on ARC's website.

24 Other Relevant Data and Information

Silver Standard considers that the current Technical Report includes all relevant data and information such that the report is not misleading.

25 Interpretation and Conclusions

An updated Mineral Resources estimate has been prepared for the Pirquitas deposit in the Jujuy Province of Argentina, following the completion of Silver Standard's recent 2011 drilling program. The Mineral Resources estimate is based on drilling and underground sampling data of acceptable quality from a series of drilling and sampling programs conducted between 1996 and 2011. A combination of non-linear (Single- and Multiple Indicator Kriging) and linear (Ordinary Kriging) estimation techniques was used to model the complex polymetallic mineralization hosted in the deposit.

The September 30, 2011 Pirquitas Mineral Resources inclusive of Mineral Reserve are estimated to contain:

- A total of 29.8 Mt of material at average grades of 148.6 g/t Ag, 0.72% Zn, and 0.22% Sn at a cut-off grade of 50 g/t Ag in the Measured+Indicated category, plus 3.0 Mt of stockpiled material at average grades of 78.5 g/t Ag, 1.50% Zn, and 0.11% Sn above a $15/t NSR cut-off grade in the Indicated category, for a total Measured+Indicated contained metal content of 150.1 Moz Ag, 571.4 Mlbs Zn, and 149.7 Mlbs Sn.
- A total of 7.0 Mt of material at average grades of 99.7 g/t Ag, 2.3% Zn, and 0.04% Sn for a contained metal content of 22.6 Moz Ag, 360.5 Mlbs Zn, and 6.5 Mlbs of Sn in the Inferred category.

This update includes all new drilling and assay information, available as of September 30, 2011. This Technical Report represents the most accurate interpretation of the Mineral Reserve available at the effective date of this report. The Mineral Resources and Mineral Reserve estimates generated from this new information are presented in Table 14-14, Table 14-15, and Table 15-1. The conversion of Mineral Resources to Mineral Reserve was made using industry-recognized methods, actual operational costs, capital costs, and plant performance data. Thus, it is considered to be representative of actual and future operational conditions. This report has been prepared with the latest information regarding environmental and closure cost requirements and has indicated that future work is in progress.

Silver Standard does not envision any significant risk or uncertainty that may be expected to affect the reliability or confidence in the Mineral Resources/Mineral Reserve estimates or projected economic outcomes.

26 Recommendations

In an ongoing commitment to Mineral Resources and Mineral Reserve development, metal production, and cost control, whilst maintaining a high standard of social benefit and environmental compliance, Silver Standard has recommended the following:

- Additional exploration and resource delineation drilling be conducted on the Pirquitas Property in 2012. Silver Standard has proposed a surface drilling program of approximately 15,000 m on exploration targets peripheral to the open pit, with an additional 3,000 m of diamond drilling from underground workings on the Oploca-Chocaya vein system. The proposed budget to cover all exploration work programs on the Pirquitas Property is estimated at $5.6 million.
- Geophysical surveys be undertaken to refine exploration drill targets. Specific geophysical programs are planned for 2012.
- A conditional simulation study be undertaken on the Pirquitas deposit to facilitate a risk assessment of Mineral Resources. Post-processing options available subsequent to such a study can greatly assist in mine planning and scheduling.
- Investigations into the reduction of mining and processing costs be commenced. Silver Standard expects that specific targets for cost control will be identified within the first half of 2012.
- Conducting a trade-off study between underground operations and an expanded open pit over the next two years.
- In addition to optimizing the existing silver and zinc recovery processes, it has been recommended that investigations be made into the recovery of tin from the Pirquitas ore.
- Investigations into the application of dry stack tailings and coincident recovery and reuse of the extracted water should continue.
- The results from the ongoing environmental studies, which are anticipated in 2012, should be incorporated into mine closure plans so as to minimize future closure costs.

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