NI 43-101 TECHNICAL REPORT
On the Advanced Project

BOLIVAR MINING OPERATIONS

ANTEQUERA, BOLIVIA

EFFECTIVE DATE – JANUARY 1, 2024
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This report entitled NI 43-101 Technical Report, Feasibility Study, Bolivar Mining Operations, effective as of January 1, 2024 was prepared and signed by the following authors:

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NOTICE

JDS Energy & Mining, Inc. prepared this National Instrument 43-101 Technical Report, in accordance with Form 43-101F1, for Santacruz Silver Mining Ltd. The quality of information, conclusions and estimates contained herein is based on: (i) information available at the time of preparation; (ii) data supplied by outside sources, and (iii) the assumptions, conditions, and qualifications set forth in this report.

Santacruz Silver Mining Ltd. filed this Technical Report with the Canadian Securities Regulatory Authorities pursuant to provincial securities legislation. Except for the purposes legislated under provincial securities law, any other use of this report by any third party is at that party's sole risk.

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1 EXECUTIVE SUMMARY

1.1 Introduction

JDS Energy & Mining Inc. (JDS) was commissioned by Santacruz Silver Mining Ltd. (Santacruz) to prepare a Technical Report in accordance with the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1, collectively referred to as National Instrument (NI) 43-101 for the Bolivar Mine (Bolivar or the Bolivar Project) located in the state of Oruro, Bolivia.

The Bolivar Mine has been active for more than 200 years under various operators producing silver, tin, lead and zinc. The current mine complex consists of an underground mine, 1,100 tonne per day (t/d) concentrator plant, maintenance workshop, shaft-winder, tailings storage facility, water treatment plants, supplies warehouse, main office, Hospital, and camp.

This report is the first declaration of resources and reserves, for the Bolivar base metals underground mining operation since its acquisition by Santacruz. The mine is fully operational at the time of this report's preparation. The effective date of both the resource and the reserve is 1 January 2023, which is approximately 18 months before the report date. Production data for the calendar year 2023 has been included in Section 24 Other Relevant Data and Information to show the depletion and typical replenishment of resources and reserves over a calendar year.

1.2 Ownership

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business.

On March 18, 2022, Santacruz completed this purchase, including Glencore's interest in the Bolivar Mine.

Santacruz thus owns 100% of the two Bolivian operating companies Illapa and Sinchi Wayra, which in turn own 45% of the Bolivar Mine, 45% of the Porco Mine, and 100% of the Caballo Blanco mining complex.

Sinchi Wayra is the operating company for all three active mining operations, including the Bolivar Mine.

1.3 Location

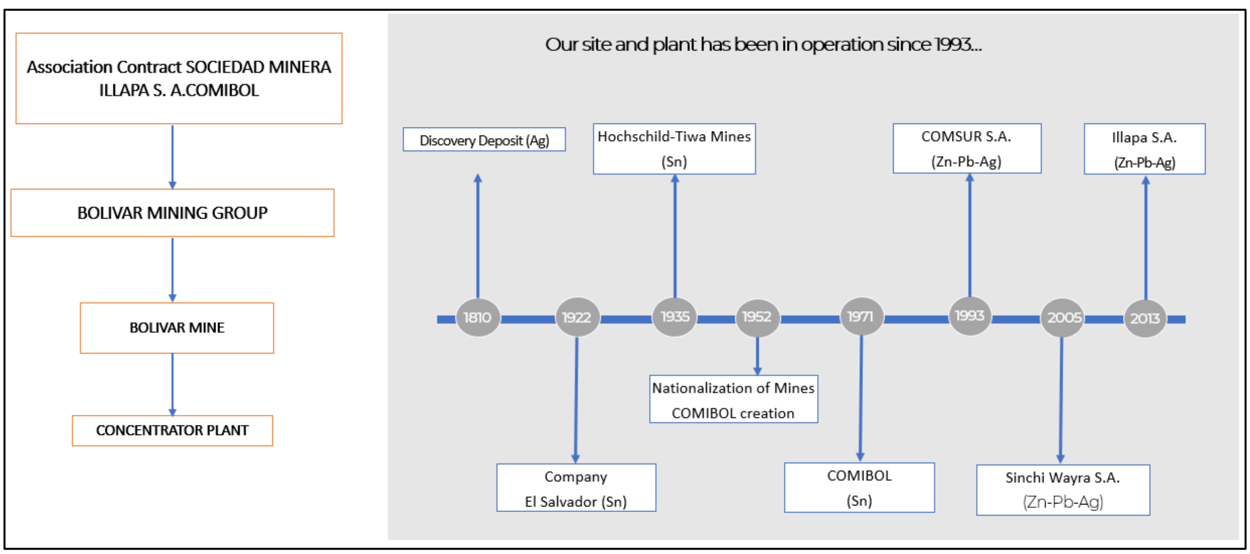
Bolívar Mine is located in the state of Oruro in Bolivia, and the municipality of Antequera. The complex has UTM WGS-84 coordinates of 727293.087E; 7959437.617N at an elevation of 4,014 masl. Paved roads connect Bolivar to Oruro City (75 km) and the concentrate warehouse and rail station at Poopó (22 km).

1.4 History

Bolivar Mine has been in operation since the early 19th century under various owners producing silver, tin, lead and zinc. After Nationalization in the 1950's tin was produced by the Bolivian State entity (COMIBOL). The current mine configuration was established in 1993. The project produces lead and zinc concentrates from a dedicated on-site process plant. Bolivar Mine is currently owned by the Bolivian government (COMIBOL) with exclusive mining held pursuant to an unincorporated joint venture (the **Illapa JV**) between private owner operator Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa). Pursuant to the Illapa JV, Illapa holds a 45% interest in the Bolivar Project, and the Bolivian Government (COMIBOL) which holds a 55% interest in the Bolivar Project. Illapa is a wholly owned indirect subsidiary of Santacruz.

Recent efforts over the last five years have been focused on improving safety and productivity standards to compare with any modern operation. Mechanization has moved the mine into less selective "bulk" methods with some increase in the flexibility and productivity of the operation.

Figure 1-1: Project History



Source: Glencore (2021)

1.5 Geology and Mineralization

The Bolivar Mine is located in the Cordillera de los Azanaques, forming the western edge of the Cordillera Oriental, which is detached from the Cordillera de los Frailes, belonging to the group of central mountain ranges. Characterized by undulating plateaus, outstanding mountains parallel to the course of the Andes, with elevations that vary between 3,400 and 4,600 masl. The area is part of the polymetallic belt of the altiplano and the Cordillera Occidental.

It is located in Cenozoic rocks of the middle to upper Silurian, constituted almost entirely by marine sediments of variable depth: from infraneritic, neuritic and bathyal environments.

The Bolivar system is a network epigenetic hydrothermal base metal type veins and faults filled mineralization hosted within a variety of lithologies from volcanic tuffs to sedimentary packages. The main mineral assemblages are composed of sphalerite, marmatite, galena, silver-rich galena and silver sulphosalts. The resources are usually based on multiple structures containing several veins. The typical dimensions of these structures ~500 m in length and ~450 m depth profile with mineralization continuing to be open at depth with vein widths of 0.2 m to 4.0 m.

The occurrence of a mineral deposit is related to two primordial aspects: a hot intrusive body generating mineralizing fluids and a pre-mineral geological structure receiving mineralization.

The non-presence of an intrusive body in close proximity to the deposit suggests that its formation is due to the influence of the Chualla Grande Stock and that the stock is the feeder. The result is higher temperature minerals such as coarse cassiterite accompanied by quartz and tourmaline in close proximity, an intermediate or transitional zone which contains Fe-Sn minerals (Buenos Aires, San Francisco, Venus veins) and an external zone where Bolívar is located with Zn-Pb-Ag-Sn minerals.

The polymetallic mineralization in the Bolivar deposit according to the mineragraphic studies concludes that it would have formed in different phases or mineralization events with a clear telescopic deposition:

- An early phase would comprise the mineral association of quartz – pyrite – sphalerite (of the marmatite type);
- Sphalerite (brown) – jamesonite – boulangerite – cassicrite (of the needle tin type) – stannine – galena – franckeite They would correspond to the intermediate phase of mineralization; and
- Finally, the carbonates (siderite) and quartz of the second generation would correspond to the late phase.

The composition and events of the mineralization indicate that the deposit was formed from hydrothermal solutions under intermediate temperature conditions of 250º - 300ºC, and that it classifies as a hydrothermal deposit of the meso- to epithermal type.

1.6 Mineral Processing and Metallurgical Testwork

The processing plant at the Bolivar Mine has been operating since 1993. The recoveries used in this report are derived from the results of the plant operation over the period of August 2020 to July 2021.

There are two concentrates produced at the Bolivar mill: a lead concentrate and a zinc concentrate. While both concentrates pay for the metal they are named for and silver, the lead concentrate does not pay for zinc contained and the zinc concentrate does not pay for lead contained, so these recoveries are not included when summarizing the total recoveries.

The results from this analysis can be found in Table 1-1.

Table 1-1: Recovery and Concentrate Grade Estimates

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Zn Recovery	%	N/A	N/A	92	86.091 + 0.3218*(Zinc Feed Grade)
Pb Recovery	%	59.56 + 17.33*(Lead Feed Grade)	32.15 + 17.69*(Lead Feed Grade)	N/A	N/A
Ag Recovery	%	36.133 + 0.0604*(Silver Feed Grade)	30	57.516 - 0.0662*(Silver Feed Grade)	36
Concentrate Grade					
Zn	%	12	11	53	44
Pb	%	32	20	0.91	1.25
Ag	g/t	5900	5500	630	775

1.7 Mineral Resource Estimate

The Bolivar Mine is an "advanced property" and has been in continuous production since 1993. Glencore and subsequently Santacruz Silver has performed exploration and resource expansion drilling of surface and underground drillholes at the Bolivar Mine since 2000 totaling 49,173.5 m. The 145 drillholes and 23,059 underground channels in the database were supplied in electronic format by Santacruz. This included collars, downhole surveys, lithology data and assay data (i.e., Ag g/t, Pb%, Zn%, Fe%, Sn%).

The geological and lithological solid domain models were supplied by Santacruz in both Datamine^{TM} and LeapFrog^{TM} which are both industry-leading software systems. The QP imported the multiple vein domains into a similar system called MineSight™ to verify solids volumes and ensure matching of the solids domains against the drillhole and sample database. Results confirmed location and extent of volumes are appropriate to resource estimation purposes.

Resource block models were supplied in Datamine™ format which is an industry recognized software system used for resource estimation. These models were then imported to MineSight™ for verification of the resource estimation. In addition, independent estimations were run using the verified sample data and vein domains employing inverse distance estimations to ensure reasonableness and verify the resources independently. Results illustrated good agreement between the original and verification models.

The mineral resources were estimated in conformity with CIM's "Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines" (December 2019) and are reported in accordance with NI 43-101 guidelines.

Mineral resources are classified under the categories of measured, indicated and inferred according to CIM guidelines. The author evaluated the resource in order to ensure that it meets the condition of "reasonable prospects of eventual economic extraction" as suggested under NI 43-101. The criteria considered were confidence, continuity and economic cut-off in addition to considering constraining the resources within an underground mining volumes.

Using a cut-off grade of 10.6% ZnEq, the Bolivar Mine resources are presented in Table 1-2.

Table 1-2: Base-Case Total Mineral Resources at 10.6% ZnEq Cut-off

Total Bolivar 2023 Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Bolivar	Measured	855	12.78	1.37	327
	Indicated	677	12.24	1.25	295
	Total M+I	**1,532**	**12.54**	**1.32**	**313**
	Inferred	**4,202**	**10.35**	**1.00**	**403**

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.;
2) All mineral resources have been estimated in accordance with Canadian Institute of Mining and Metallurgy and Petroleum (CIM) definitions, as required under National Instrument 43-101 (NI43-101);
3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD;
4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration; and
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

1.8 Mineral Reserve Estimate

The January 1, 2023 reserve estimate represents the validation of Santacruz's internally-generated mineral reserve estimate by QP Goodwin. All work on the reserve by the Santacruz mine design team and the validation exercises were done in Deswik™. The following process was used for this work:

- An NSR calculation and cut-off grade (COG) was developed by the QP using data provided by Santacruz;
- The reserve estimation methodology was reviewed, checked, and approved by the QP;
- Mine technical staff prepared a Life of Mine Plan (LOM) for the deposits using the NSR and COG provided by the QP. The LOM plan was prepared specifically for this reserve estimation and does not include inferred resources; and
- All LOM models were downloaded and reviewed by the QP for conformance to the methodology, proper application of the NSR cut-off grade, and correct application of agreed upon dilution and recovery factors.

The QP is satisfied that this exercise resulted in a valid reserve determination.

The Mineral Reserve Estimate for Bolivar Mine is shown in Table 1-3.

Table 1-3: Mineral Reserve Estimate for Bolivar Mine (January 1, 2023)

Mine	Category	Tonnes	Zn (%)	Pb (%)	Ag (g/t)
Central	Proven	653,000	11.37	1.16	311
	Probable	420,000	9.57	0.84	237
	Total	**1,073,000**	**10.66**	**1.04**	**282**
Rosario	Proven	89,000	5.40	2.34	215
	Probable	74,000	5.27	1.64	209
	Total	**164,000**	**5.34**	**2.03**	**212**
Total Bolivar	Proven	742,000	10.65	1.31	299
	Probable	495,000	8.92	0.97	233
	Total	**1,237,000**	**9.96**	**1.17**	**273**

1.9 Mining

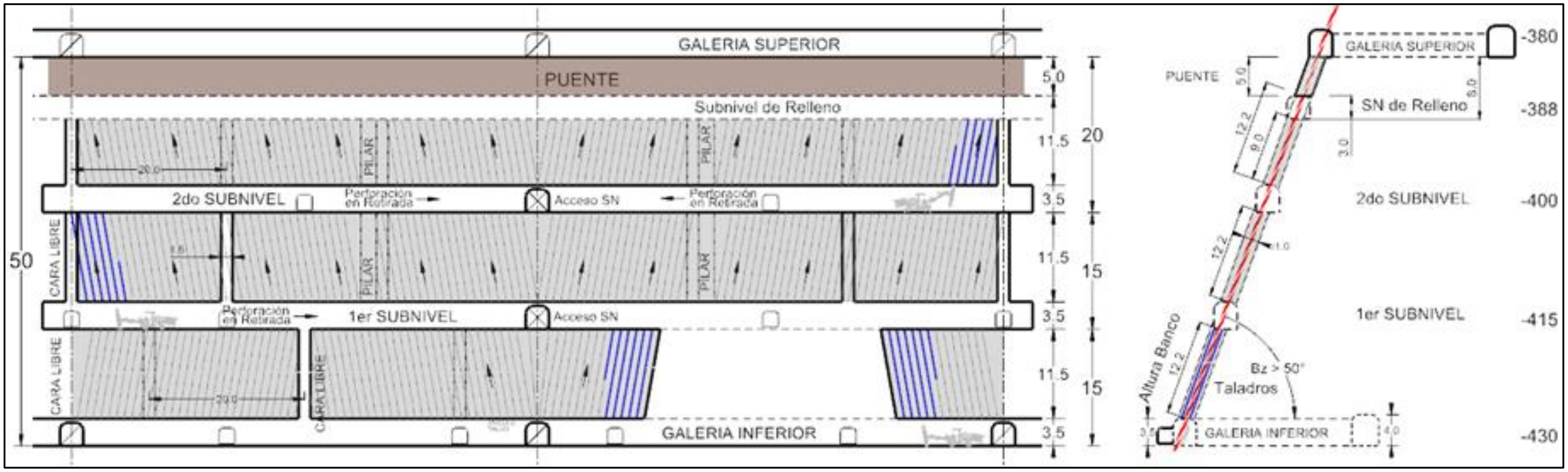
The property consists of two mining areas:

- Mina Central – is the extension of the historic mining area and extends down to the minus 430 level (430 meters (m) below primary surface access). Multiple parallel and intersecting vein structures are mined, and this area accounts for approximately 75% of the total mine production; and

- Mina Rosario – is a parallel structure recently defined which is accessed and serviced separately and accounts for approximately 25% of the total mine production.

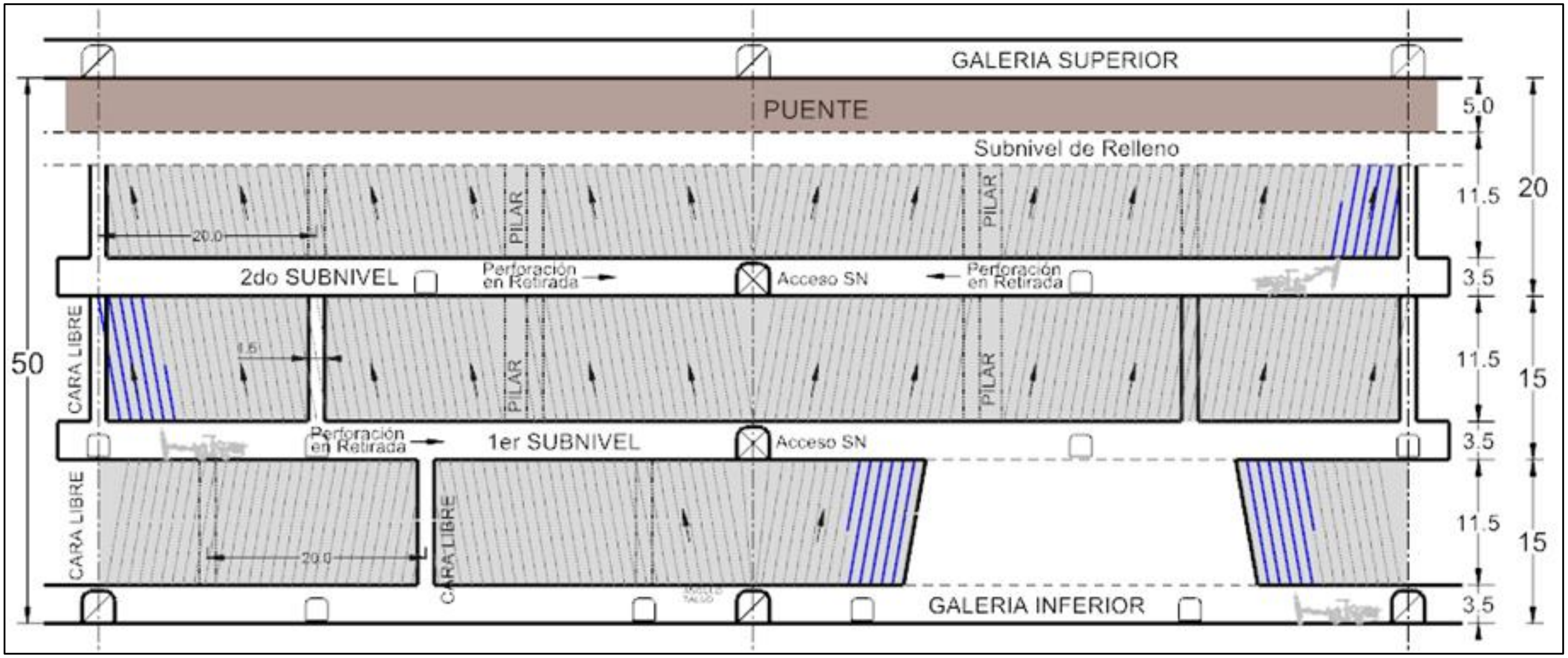
Sublevel Open Stoping is the stoping method employed at the mine with selective use of unconsolidated waste from development as backfill. Each stoping block is prepared by driving an upper and lower gallery along strike and in the vein approximately 50 m vertically apart. These main galleries are driven 4.0 m x 4.0 m in dimension. Sublevels are driven with a smaller cross section of 3.0 m x 3.5 m approximately 15 m vertically apart with a 5 m sill pillar as shown in Figure 1-2. Production drilling is with up-holes from the sublevels, and a drift is also driven right below the sill pillar for transporting backfill.

Figure 1-2: Sub Level Stoping Scheme



Source: Santacruz (2022)

Figure 1-3: Long Section of Typical Sub Level Stoping Operation



Source: Santacruz (2022)

Depending on the dip, the sublevel stoping heights are approximately 12 m, except for the second sublevel, which has a height of 9 m due to the backfill drift. Break raises are driven conventionally, and the flexibility of the method allows for vertical pillars if needed to adjust for low grade areas, or to subdivide stoping blocks to provide production flexibility.

The mine employs the following mining equipment:

- Seven Resemin Muki FF single boom jumbo rigs with a power of 75 HP that drill between 2.4 and 3.0 m long holes. They are generally used for secondary development (horizontal vein developments) to prepare sublevels whose nominal dimensions are 3.0 m x 3.5 m. Occasionally they are used in small primary development headings;

- Two Resemin Troidón XP drill Jumbos with a power of 100 HP that can drill between 3.0 and 3.5 m. These are used only for large primary development headings (3.5 m x 3.5 m or 4.0 m x 4.5 m) for mine infrastructure such as: ascending and descending ramps, cuts, counter galleries, etc.);

- Two electrohydraulic rockbolters (one each in Central and Rosario Zones) to install support with steel mesh and Hydrabolt bolts of the back and ribs of primary development headings. These units have a power of 75 HP with a drilling capacity of 3.0 m;

- Four Resemin Raptor 44 long hole drills are used for drilling long holes using the “Sub Level Stoping” method. Due to the drilling and cleaning cycles, there is generally a drilling shift during each day, with monthly drilling performance of 1,200 m;

- Eleven scooptrams ranging in size from 2.0 to 5.9 yd^3 bucket capacity; and

- Ten haulage trucks, ranging in size from 10 to 20 t.

Key production results for 2022 are shown in Table 1-4.

Table 1-4: Production 2022

	Central Zone	Rosario Zone	Total
Production (t)	231,479	37,180	268,659
Waste rock (t)			135,200
Backfill Hauled (t)			171,000
Zinc (%)	7.38	4.99	7.05
Lead (%)	0.61	0.89	0.65
Silver (g/t)	229	177	222
Primary Devt Horizontal (m)	2,947	925	3,872
Primary Devt Vertical (m)	159	69	228
Secondary Devt Horizontal (m)	2,784	643	3,427
Secondary Devt Vertical (m)	254	86	341

1.10 Recovery Methods

The Bolivar Mill has been in continuous production since 1993. The mill receives feed from two sources; the company mining operation and toll milling purchased through San Lucas. The mill processes the two types of feed separately which allows for an analysis of processing for both types of feed.

The mill uses a crushing, grinding, and flotation flowsheet to recover a lead concentrate and a separate zinc concentrate. Both concentrates are sold to Glencore via overseas shipping through Antafagasta, Chile. The mill flowsheet can be found in Figure 1-4.

The mill generally separates company and toll feed into different days, but there are a few days where the feed is processed on the same day, with a shutdown in between to separate the two feeds.

The company feed grades are determined on a daily basis by collecting and assaying samples of the process taken at the cyclone overflow, concentrates and final tailings. Each month, the production is reconciled to the measured feed tonnage using the concentrates sold and the final tailings to calculate the feed grade. The toll feed is received from San Lucas, often in 1 t to 2 t lots, where it is weighed and sampled. The material is combined on a toll feed stockpile to be fed to the mill. The toll feed is reconciled in the same method as with the company feed to determine reconciled recoveries.

The mill utilizes different reagent strategies for the toll and company feed sources, primarily due to the presence of pyrrhotite which is found in the toll feed but generally not found in the company feed.

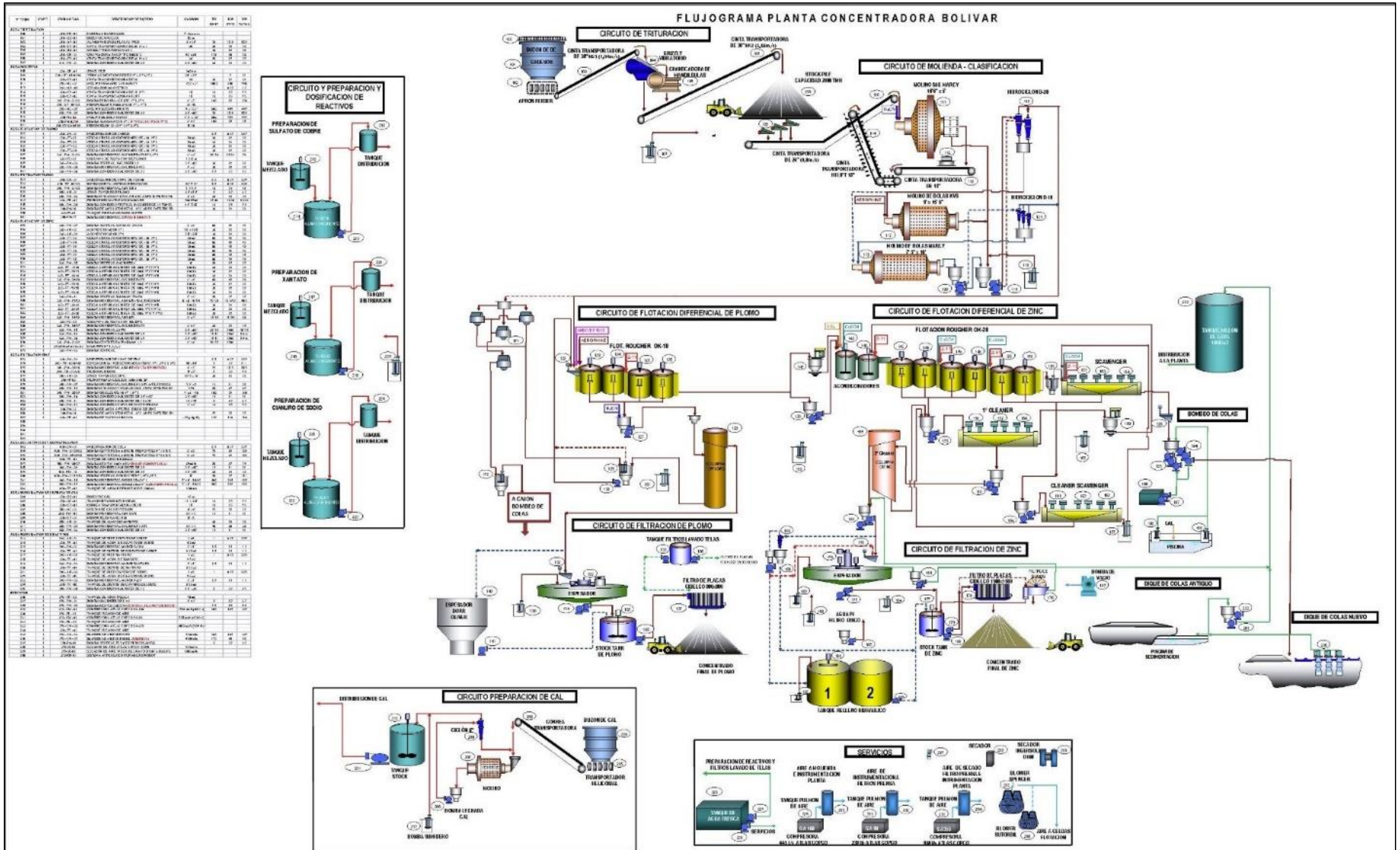
The processing plant targets 15 to 20% of the feed to be toll feed.

The plant flowsheet for the Bolivar mill is a typical sequential flotation circuit for lead and zinc (Figure 1-4). The ore is crushed in preparation for feed to the grinding circuit. The grinding circuit utilizes a SAG/Ball mill combination to produce a product size of 100 µm for the flotation circuit.

The flotation circuit starts with the lead recovery circuit. In this circuit a rougher concentrate is produced, which is then cleaned without regrinding, in a column flotation cell. The lead rougher and cleaner tails are combined and fed to the zinc circuit. The zinc circuit consists of rougher flotation and three stages of cleaning to produce a zinc concentrate. The zinc circuit tailings are deposited in the tailings pond. Both of the concentrates are filtered for shipping to the smelter. The lead concentrate is bagged for shipping, while the zinc concentrate is shipped bulk in trucks. The products are transported by truck to the train loading facility that is approximately 10 km from the mine for haulage to Antafagasta, Chile.

The expected availability for the mill is 93.8% and the utilization is 96.3% for an expected operating time of 90.3%.

Figure 1-4: Bolivar Mill Flowsheet



Source: Glencore (2021)

The metallurgical assumptions for recoveries and concentrate grades can be found in Table 1-5.

There are two tailings storage facilities at the Bolivar Mine. The original tailings storage has been decommissioned. The operational tailings dam is currently undergoing a lift to extend the capacity to 2024. Both tailings dams are inspected regularly and maintained to the standards set out by the Canadian Dam Association guidelines. Both dams are under the supervision of engineers from Wood Engineering and recently an external audit was conducted by Knight Piésold Consulting.

Table 1-5: Recovery and Concentrate Grade Estimates

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Zn Recovery	%	N/A	N/A	92	86.091 + 0.3218*(Zinc Feed Grade)
Pb Recovery	%	59.56 + 17.33*(Lead Feed Grade)	32.15 + 17.69*(Lead Feed Grade)	N/A	N/A
Ag Recovery	%	36.133 + 0.0604*(Silver Feed Grade)	30	57.516 - 0.0662*(Silver Feed Grade)	36
Concentrate Grade					
Zn	%	12	11	53	44
Pb	%	32	20	0.91	1.25
Ag	g/t	5900	5500	630	775

1.11 Infrastructure

The Bolivar operation is essentially part of a townsite, housing the workers and their families. It has two camps, numerous residences, a hospital, and a school. Workers live in the town or in nearby Antequera. As such, the mine does not provide personnel transport.

The infrastructure is depicted in the following three site plans showing:

- The Industrial Complex (Figure 1-5);
- The Industrial Complex and Townsite (Figure 1-6); and
- The General Area (Figure 1-7).

The industrial site is located on the northeastern edge of the townsite. It is fenced from the rest of the community and is guarded by security to control access. It contains the processing plant, mine offices, multiple maintenance buildings, the assay lab, mine services, multiple warehouses, and administration building. The industrial complex is located close to both mine portals to minimize the haulage distance to the crusher and processing plant.

The Santa Rita hospital is located in the south-east corner of the town, which provides services to the operation and community. This is augmented by a first aid station inside the industrial complex near the mine portal.

A dining hall is maintained for technical and administrative staff, which provides three catered meals per day year-round. Most workers eat at their own homes in town.

The site is connected to grid power supplied by the ENDE company to both the industrial complex and community.

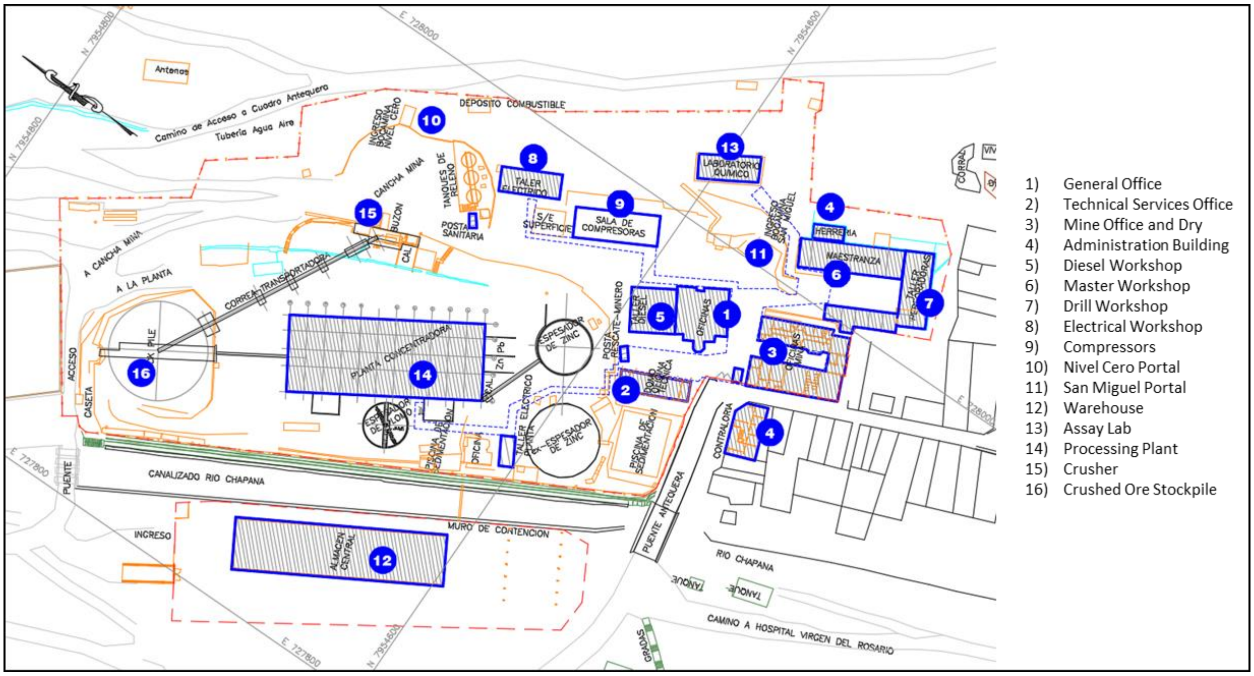
Drinking water is provided by a dammed reservoir, which is monitored and controlled by environmental staff. The water is treated and distributed to the offices and homes of the town site over a three-hour period each day. Water storage tanks are employed by all users for 24-hour access to potable water. The current reservoir is the second such structure which replaced an older dammed reservoir that is now decommissioned.

A sewage network is provided and shared by offices and homes in the community.

The industrial waste dump is located 3.2 km from the industrial site, which is also monitored by the environmental department.

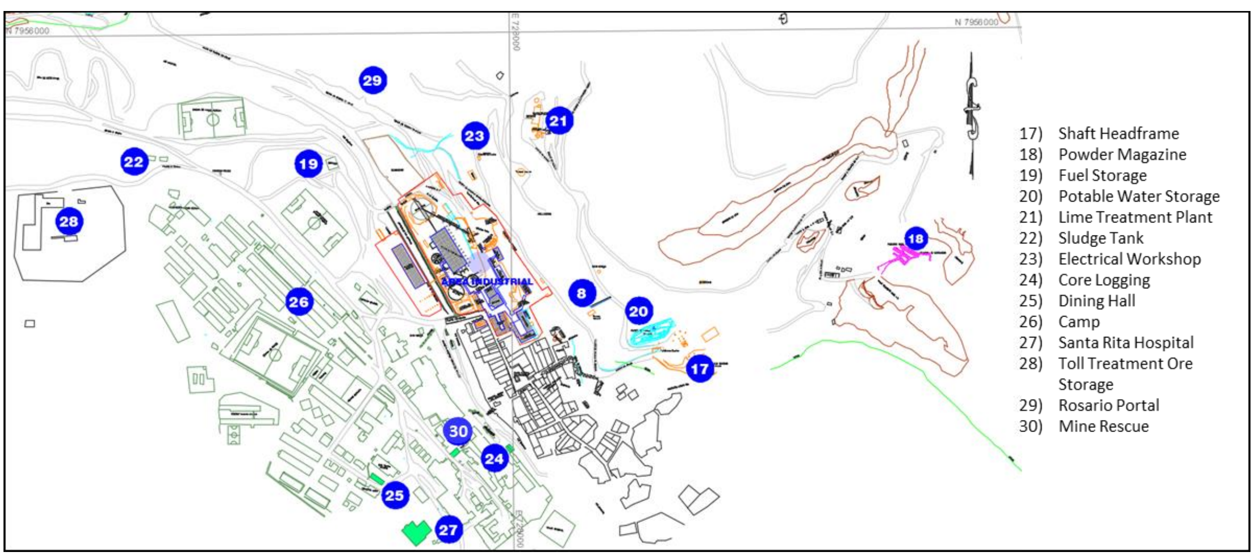
A mine rescue office is maintained in the townsite to respond to emergency situations. Firefighting and other safety equipment is located throughout the industrial complex and townsite.

Figure 1-5: Industrial Complex



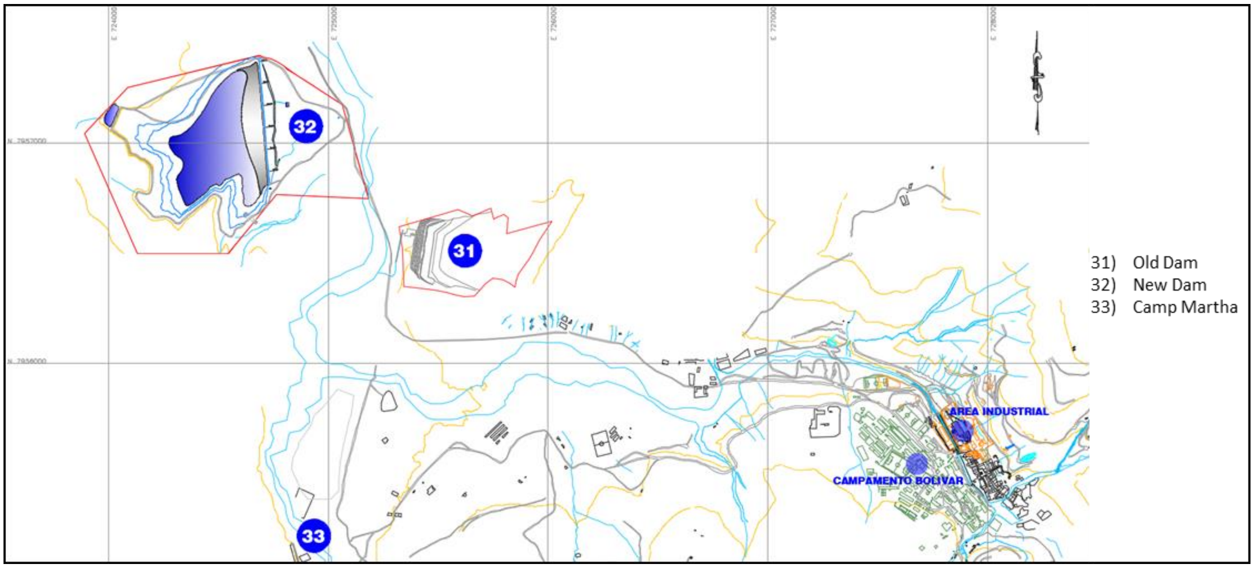
Source: Santacruz (2023)

Figure 1-6: Industrial Complex and Townsite



Source: Santacruz (2023)

Figure 1-7: General Area



Source: Santacruz (2023)

Bolivar Operations uses power for mining and processing operations. Power is supplied by the National Grid. Approximately 38 million kWh of power was consumed in 2022, representing an average draw of approximately 4.35 MW. This equates to 141 kWh/t mined or 117 kWh/t processed (including toll milling).

1.12 Environment and Permitting

1.12.1 Environmental Considerations

Responsible environmental management is a critical part of Santacruz's license to operate and our responsible, compliant operation of Bolivian assets has continued for the last 30 years. Environmental Compliance with national laws and regulations is the basis of Santacruz's environmental management system and is governed by a framework of oversight by the relevant Environmental Authority. Its environmental commitments are reported to the authorities annually in an Environmental Monitoring Report, which summarizes environmental management of its operations under applicable laws and regulations.

1.12.2 Waste and Water Management

Waste management is an important part of Santacruz's Comprehensive Environmental Management, which includes a waste management plan to classify, handle, and store waste separately for proper disposal or treatment. Waste management complies with Environmental

Law No. 1333, its Regulations on Solid Waste Management, and its supplementary regulations, focusing primarily on the sectoral requirements of the Environmental Regulation for Mining Activities for waste rock and tailings.

1.12.2.1 Solid Waste

Bolivar Mine has one active Tailing storage Facility (Queaqueani) and one inactive (Antiguo). Both are managed in compliance with the guidelines of the Canadian Dam Association (CDA) and the "Global Industry Standard on Tailings Management" issued by the UNEP (United Nations Environment Programme), ICMM (International Council on Mining and Metals), and PRI (Principles for Responsible Investment) in August 2020. This program includes third party Verification Assessments (Dam Safety Assurance Assessment). In response to findings from these assessments, and to mitigate risks of failure, risk management tools have been developed to improve management systems for the active TSF. For the inactive facility, monitoring and maintenance have been improved and follow good practice.

The "Queaqueani" tailings storage facility started operations in April 2007. This facility was designed by Canadian engineering firm AMEC and is located 3.5 km to the north of the operation. Hydraulic tails of 25-29% solids are beached along the upstream side of the dam crest and water is reclaimed from the southwest sector of the reservoir and pumped via HDPE pipelines back to the water treatment plant.

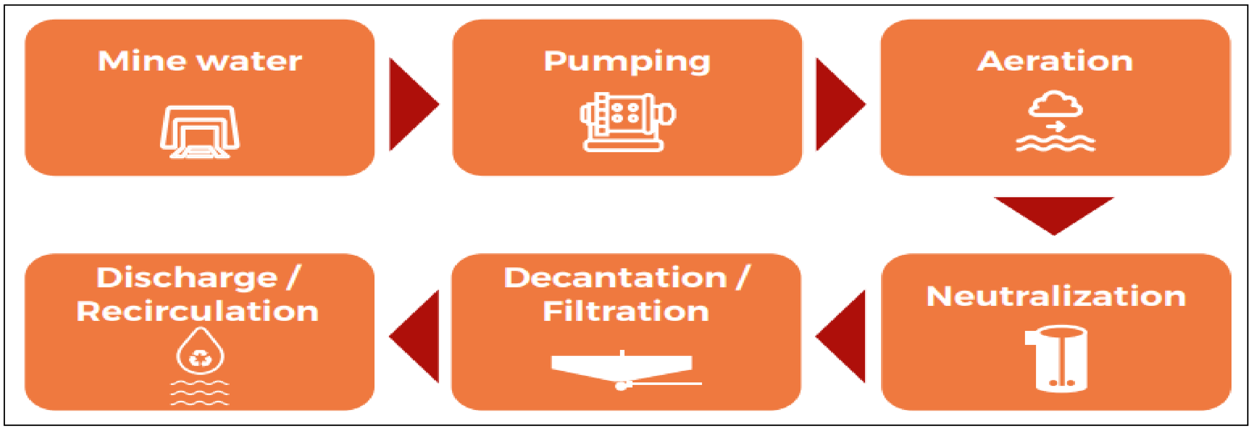
The Queaqueani Dam is a 33.5 m high, downstream-constructed dam. The current crest level is El. 3994.8 m (Stage IV-A raise was completed in December 2019). The next dam raise (Stage IV-B to El. 3997.8 m) is in progress and to be completed in 2023. There exists capacity to contain all tailings to be generated by processing the stated reserves.

1.12.2.2 Water Management

Water management has been identified as the most critical environmental area. Water is a shared resource of high social, environmental, and economic value, which is also a critical component of Santacruz's mining and metallurgical activities. Mining operations are located in the Bolivian Highlands, in areas with low precipitation, high evapotranspiration, and threats of drought.

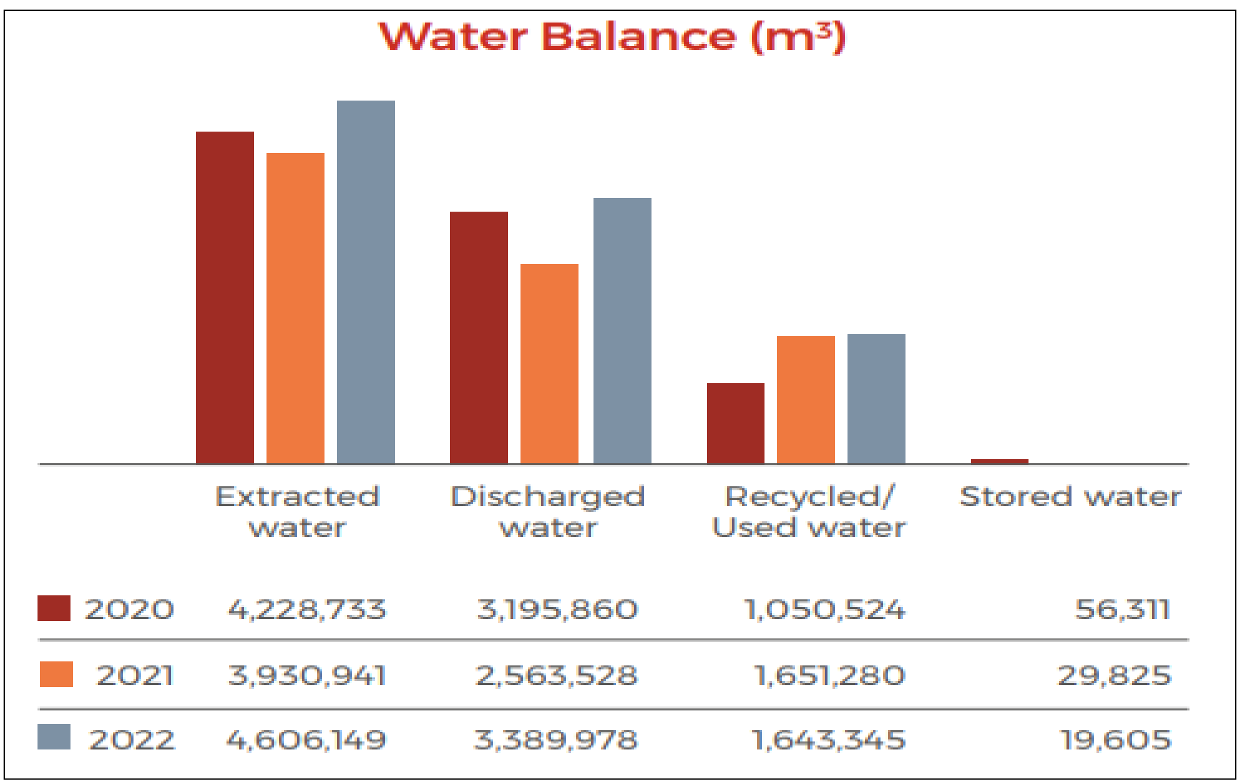
Bolivar produces an excess of water from the underground mine. A total of approximately 170 l/s is pumped from the mine and is treated in separate plants for two different uses: one for potable water at the mine and surrounding communities, the other for industrial use in the mine and makeup water for the process plant (much of the water used for processing is reclaimed from the tailing facility). The discharge parameters as set out in Water Pollution Regulations Law No. 1333, include pH, iron, zinc, lead, and suspended solids, which are typical in the water treated from the mine. The balance of water is discharged to the Pampitas River.

Figure 1-8: Water Treatment Process



Source: Sustainability Report, Sinchi Wayra (2022)

Figure 1-9: Bolivar Mine Water Balance



Source: Sustainability Report, Sinchi Wayra (2022)

1.12.3 Permitting

Santacruz Silver operates the Bolivar Mine as a joint venture with the Bolivian Government (COMIBOL) The structure of the contract with COMIBOL is a "Partnership Contract governing Bolivar and Porco Mines (CA-MBP), and its purpose is to develop and implement a mining operation for the treatment of the existing mineralogical reserves and resources in the Bolívar and Porco Mines, by the exploitation, preparation, beneficiation and sale of mineral concentrates. Contrato de Asociación Sociedad Minera Illapa S.A. is authorized as operator and responsible of executing on behalf of COMIBOL, all the operations and activities of the association contract. The shares of CA-MBP are 55% for COMIBOL and 45% for Contrato de Asociación Sociedad Minera Illapa S.A." This renewable agreement expires in 2028.

Mining Contracts that grant the right to the subsoil mining resource are granted by the Mining Administrative Jurisdictional Authority (AJAM) over the ATE mining areas, and a contract is granted for each area or contiguous group of areas. Recent changes to the laws and government personnel have pushed Santacruz contract updates into a transitionary period waiting for final signatures and approvals. Santacruz holds Special Transitory Authorizations for each contract area which are officially designated "Mining Administrative Contracts for Adaptation". As of the effective date, approximately half of the applications have been transitioned, and the remainder fall under Article 187 of Law No. 535 on Mining and Metallurgy, which states:

> *ARTICLE 187. (CONTINUITY OF MINING ACTIVITIES). Holders of Special Transitory Authorizations to be adapted or in the process of adaptation will continue their mining activities, with all the effects of their acquired or pre-constituted rights until the conclusion of the adaptation procedure.*

Santacruz has fully complied with this administrative procedure and is waiting for the Mining Administrative Authority to issue the relevant documents. It should be noted that this public entity has a considerable delay in the issuance of these documents.

Environmental Licenses have been formally granted to allow operation for all mining activity, by the Ministry of Environment and Water. The following table shows the licenses held by Santacruz:

Table 1-6: Environmental Licenses Held by Santacruz

Operation	License
Bolívar	040603-02-da-0324/14
Porco	051203-02-da-0031/14
Caballo Blanco – Colquechaquita Mine	050101-02-da-131/11
Caballo Blanco – Mina Reserva and Tres Amigos	050101-02-da-561/11
Caballo Blanco – Don Diego Concentrator Plant	050302-02-da-003/2024
Caballo Blanco – San Lorenzo Mine	050101-02-da-005/06
Comco	050101-02-da-006/09
Soracaya	050801-02-CD-C3-002/2017

Operation	License
Aroifilla Thermoelectric Plant	050101-04-da-007/2023
Yocalla Hydroelectric Plant	050103-05-da-006/2023

Source: Santacruz (2024)

1.12.4 Community Relations

Santacruz mining projects are mostly well-established operations with a long history and a developed infrastructure, which provide direct benefits to employees and supporting businesses. However, the mines are located in rural to semirural areas in which the surrounding mostly agricultural communities can benefit from each operation only indirectly or through company outreach. Santacruz supports these communities by addressing services that are lacking, and helping to create value with economic development programs, and other forms of support.

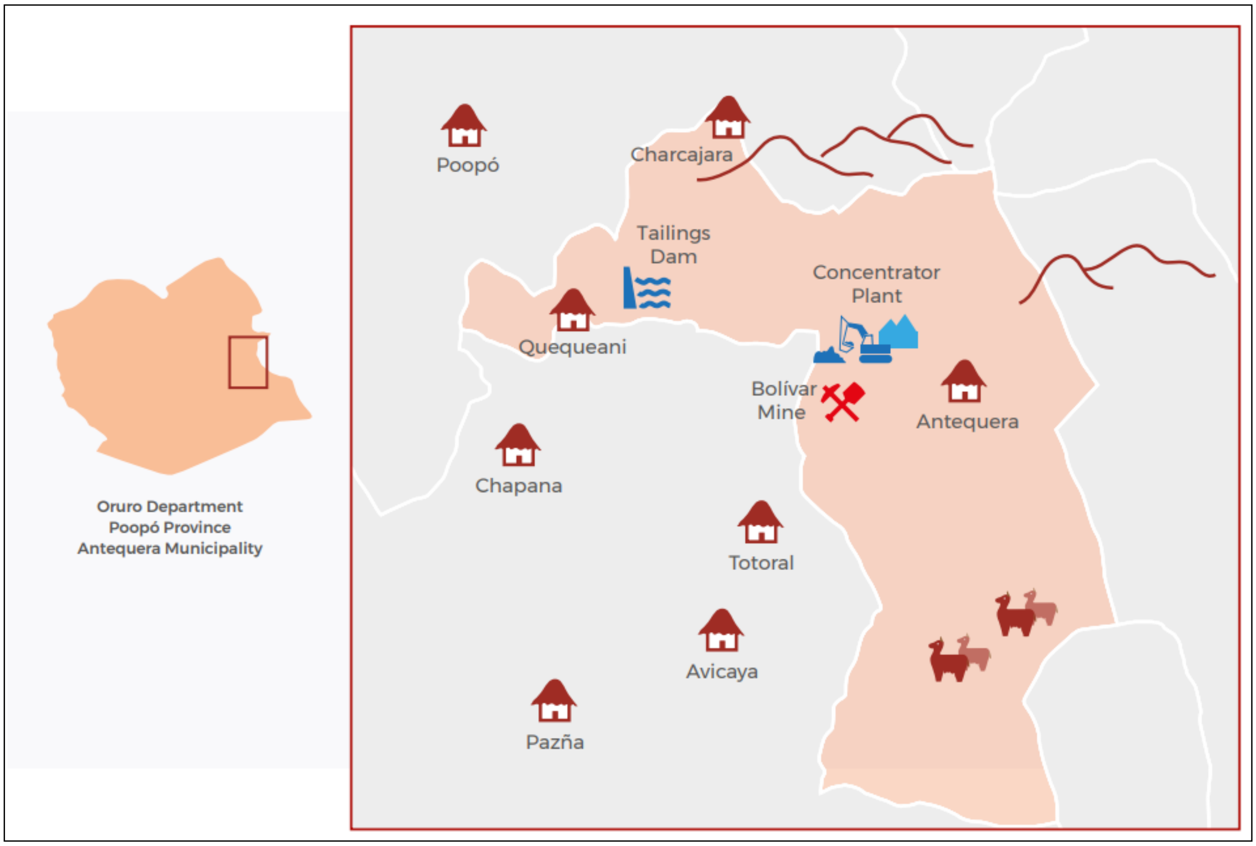
A key player connected with all Bolivian Mines and surrounding areas are the mining cooperatives which are organized independent mining entities, some quite capable and organized with their own equipment. Recognized by the government as a valid economic activity for local development, they conduct their activities in abandoned mines or expropriating active mines, which can pose risks to business. The relationship is not completely one-sided as the Cooperatives sell mineralized material to process their product, thus mechanisms are in place to face possible subjugations, protect mine employees and the communities.

More importantly, proactive solutions and agreements to avoid conflict and coexist peacefully with the different cooperatives are in place. As much as possible, with cooperatives as toll processors at Santacruz Process Plants, compliance with occupational health and safety, human rights, and good work practice is sought.

Bolívar has a formal agreement (known as Actas de Reunión) with the neighboring communities. These agreements are recognized and managed by their Ayllus and include different plans and projects to help the communities with their economic development, infrastructure, access to water, education, and health and assist the communities by sponsoring their traditional festivities and sports.

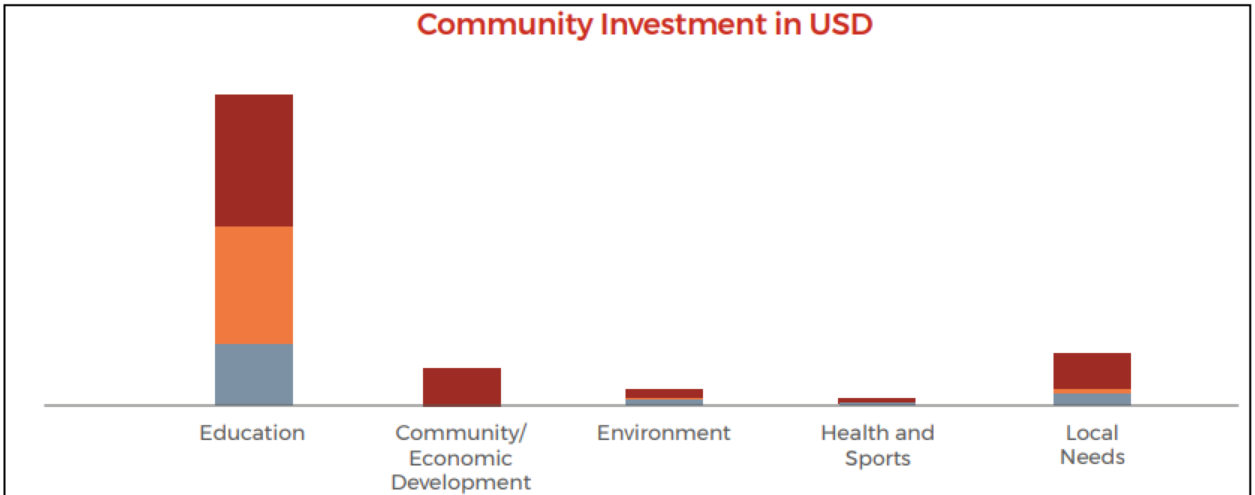
Antequera is the largest community in the area of influence and immediately adjacent to the Bolivar operation. The communities neighboring Bolívar Mine are the homes of Santacruz's workers, contractors and family members. Most of them reside in the population of Antequera, from where they establish their relationship with the operation, which is itself adjacent to town.

Figure 1-10: Bolivar Surrounding Communities



Source: Sustainability Report, Sinchi Wayra (2022)

Figure 1-11: Bolivar Community Investment



	Education	Community/ Economic Development	Environment	Health and Sports	Local Needs
2022	401,069	114,581	23,135	12,119	109,146
2021	348,742	0	10,739	1,491	19,361
2020	183,039	0	12,965	6,997	32,553

Source: Sustainability Report, Sinchi Wayra (2022)

1.12.5 Mine Closure

Closure Planning for Operations has social, economic, workforce, and environmental impacts, so conceptual closure plans are shared with communities. Santacruz's goal is to recover areas by establishing a healthy ecosystem capable of sustaining productive land use, ensuring the best possible environmental conditions, including physical, chemical, biological, and ecosystem aspects, at closure. Environmental superintendents are responsible for monitoring the environmental closure planning, and periodic reviews of these plans are conducted, including surveys of areas and activities to adjust financial provisions for closure.

Land Use and Rehabilitation - environmental challenges related to biodiversity protection, soil restoration, and land use, are addressed through dialogue with stakeholders, including local communities and relevant authorities. Our comprehensive environmental management focuses on minimizing disturbed areas. In 2022, Santacruz managed a total of 6,600 hectares of land covered by Temporary Special Authorizations (ATEs) granted by the Mining Administrative Jurisdiction Authority (AJAM), under leasing contracts with the Government through COMIBOL. However, Santacruz's processing activities, services, and related infrastructure (industrial area) currently occupy only 400.5 hectares of land, including areas of previous mining operations and other areas with environmental closure located within the properties Santacruz manage.

In 2022, Santacruz continued with the reforestation plan in the Queaqueani Dam area, in accordance with an agreement with the community of the same name, and significant progress was made in the progressive closure of the old tailings facilities at the Don Diego Concentrator Plant.

1.13 Capital and Operating Cost Estimates

1.13.1 Capital Costs

The Bolivar Mine has been in continuous operation for many years. There will be, as the reserve is expanded and developed, the need for step changes in mine access, production or haulage methods, which may require large capital outlays. These will be financially justified as needed. However, the capital needs for continued operation to exploit the remaining reserves is limited to Primary mine development, Capital equipment rebuilds and replacements, and Tailing Storage Facility expansions. Average annual capital has been and is projected to be in the 11 to 12 million USD range. It is anticipated that expansion work to the TSF will be required in 2023 ($2.5 million).

The historic total capital requirement for all the Bolivian operations is shown in Table 1-7. Bolivar's projected capital requirements for 2023 to 2027 is shown on Table 1-8.

Table 1-7: Actual Combined Capital Requirement for All Bolivian Operations, 2017 to 2022 ($M)

	2017	2018	2019	2020	2021	2022
Bolivar	8.8	13.7	13.7	6.3	11.3	10.2
Porco	3.0	8.8	8.4	3.6	5.3	3.1
Reserva	1.3	2.4	2.1	2.0	4.3	3.5
Tres Amigos	2.1	2.6	1.5	1.8	2.2	3.0
Don Diego	0.9	6.9	1.4	0.9	1.1	1.2
Colquechaquita	1.2	2.0	1.4	1.0	3.0	2.5
La Paz	3.3	0.6	0.3	0.4	0.2	0.7
Soracaya	0.5	2.1	0.2	0.1		
San Lucas	0.8	0.0	0.0	0.1	0.4	
Total	**21.8**	**39.0**	**28.5**	**16.3**	**27.8**	**24.3**

Table 1-8: Projected Capital Requirement for all Bolivar Operations, 2023 to 2027 ($M)

	2023	2024	2025	2026	2027
Engineering/Admin	0.0	0.0		0.1	
Safety/Environmental	2.8	0.2	2.6	2.6	0.4
Mobile Equipment/Maintenance	2.7	4.4	4.1	2.7	1.2
Plant	0.6	0.6	0.7	0.7	0.2
Exploration			0.3	0.3	0.4
Primary development	5.1	6.3	6.2	6.3	4.5
Corporate					
Total	**11.3**	**11.5**	**14.0**	**12.6**	**6.7**

Recurring exploration and primary development costs have been included in the COG calculations to better anticipate and account for total costs and make the COG more meaningful for reserve estimation and mine planning.

1.13.2 Operating Costs

Costs used for Cut-off Grade analysis were taken from actual costs for 2022. The actual cost of corporate G&A was allocated to each of the businesses.

Table 1-9: Unit Operating Costs ($/t)

Mine	Unit Cost, $/t
Mine Operations	36.29
Mine Maintenance	28.84
Indirect	22.32
Plant	18.28
Warehouse	0.64
G&A	13.84
Total	**120.22**

Mine operations include direct costs of mining, including labor, energy, materials, and services.

Mine Equipment Maintenance Costs includes maintenance to all equipment related to direct development, exploitation and haulage, as well as service equipment such as pumping, ventilation, winches, etc.

Indirect costs would include Site Management, Technical services, Site Administration, Environmental and Social, Safety and Security.

Plant costs include direct Beneficiation costs as well as plant maintenance, and indirect costs.

Warehouse costs refer to Concentrate handling and storage.

General and Administration includes allocated Bolivian corporate costs.

1.14 Economic Analysis

1.14.1 Result

The Reserve Estimate was generated using actual costs experienced during a stable production period following the change in management after the purchase of the mine by Santacruz Silver (2022 and beginning of 2023). Actual costs were used for mine operating, concentrate overland transport, port costs, and shipping as well as smelting fees, payment terms, and penalty charges. A simplified Cash flow model was built to model the costs and conditions used to generate the Reserve estimates stated in this report.

The Bolivar Mine is part of a multi-operation business. However, the Economic model treats it as a separate financial entity with Bolivian corporate costs allocated for the analysis. As well, the operation is subject to a partnership with the Bolivian Government (COMIBOL), but the financial modelling examines the value of the operation on a 100% basis to support the Reserve statement.

The Bolivar Mine has been in continuous operation for over 200 years and the deposit is a network of relatively narrow veins. These two aspects drive the normal exploitation process of the mine, where inferred resources are converted and exploited in the same budget year. Resources are generally proven-up by drifting and sampling instead of drilling. Therefore, normal budgeting and mine planning includes resources outside of the Reserve estimate.

For this report, only Proven and Probable reserves are included in financial evaluation, so the production schedule represents the depletion of these reserves at average grade and current production rates. The context of the production schedule exploits the Proven and Probable reserves as part of a continuous operation and as such does not include the closure activities.

Table 1-10: Production Forecast – Mining and Processing

	Unit	2023	2024	2025	2026
Mine Production					
Tonnes Mined	(DMT)	317,300	317,300	317,300	285,082
Tonnes Processed	(DMT)	317,300	317,300	317,300	285,082
Head Grades					
Zinc	(%)	9.96	9.96	9.96	9.96
Lead	(%)	1.17	1.17	1.17	1.17
Silver	g/t	273	273	273	273

Metallurgical recoveries and concentrate qualities used in the model are sourced from historic actuals for 2022 based on the head grades actually mined. Projected recoveries are thus estimated to be reasonable to conservative. These parameters will necessarily be conservative considering the higher grades in the production schedule.

Table 1-11: Production Forecast - Concentrate

	Unit	2023	2024	2025	2026
Concentrates					
Zinc (with 0.5% losses)	(DMT)	53,991	53,991	53,991	48,508
Zn Conc. Grade	(%)	53	53	53	53
Ag (in Zinc)	g/t	621	621	621	621
Zn Recovery	(%)	91	91	91	91
Ag (in Zinc)	(%)	39	39	39	39
Lead (with 0.5% losses)	(DMT)	9,559	9,559	9,559	8,588
Pb Conc. Grade	(%)	27	27	27	27
Ag (in lead)	g/t	4,599	4,599	4,599	4,599
Pb Recovery	(%)	70	70	70	70
Ag (in Lead)	(%)	51	51	51	51
Metal Recovery					
Zinc	(FMT)	29,000	29,000	29,000	26,000
Silver (in Zinc)	(FOT)	1,078,000	1,078,000	1,078,000	968,000
Lead	(FMT)	3,000	3,000	3,000	2,000

	Unit	2023	2024	2025	2026
Silver (in Lead)	(FOT)	1,413,000	1,413,000	1,413,000	1,270,000
Silver (Total)	(FOT)	2,491,000	2,491,000	2,491,000	2,238,000

Notes:
FMT = Fine Metric Tonnes; DMT = Dry Metric Tonnes; FOT = Fine Ounces Troy

That same logic applies to the net revenue generation (Table 1-12) which includes smelter charges and penalty fees.

Table 1-12: Revenue and Cost Projection ($M)

	Unit	2023	2024	2025	2026
Payable Metal Revenue					
Zinc		73	73	73	66
Metallurgical Deduction		11	11	11	10
Gross Payable Zinc		62	62	62	56
Lead		6	6	6	5
Metallurgical Deduction		1	1	1	1
Gross Payable Lead		5	5	5	5
Silver		52	52	52	47
Metallurgical Deduction in Zinc		9.2	9.2	9.2	8.2
Metallurgical Deduction in Lead		1.5	1.5	1.5	1.3
Gross Payable Silver		41.7	42	42	37
Gross Revenue (Total)		109	109	109	98
Smelter Charges and Penalties					
Treatment charges Zn	(USD/t)	277	277	277	277
Treatment charges Zn		15	15	15	14
Treatment charges Pb	(USD/t)	133	133	133	133
Treatment charges Pb		1	1	1	1
Penalties in Zn	(USD/t)	7	7	7	7
Penalties in Zn		0	0	0	0
Penalties in Lead	(USD/t)	13	13	13	13
Penalties in Lead		0	0	0	0
Refining Charges in Pb	(USD/FOZ)	1	1	1	1
Refining Charges in Pb		2	2	2	2
Smelter Fees and Penalties		18	18	18	17

	Unit	2023	2024	2025	2026
Net Revenue		90	90	90	81
Operating Costs					
Production Costs		34	34	34	30
Cost of Sales					
Rail Freight Zn		6	6	6	5
Rail Freight Pb		1	1	1	1
Port Expenses Zn		2	2	2	2
Port Expenses Pb		0	0	0	0
Rollback Fee Zn		5	5	5	4
Rollback Fee Pb		1	1	1	1
Concentrate Freight and Port Costs		14	14	14	13
Mine Royalty		6	6	6	5
Communities and Unions		2	2	2	2
Selling Costs		23	23	23	21
Total Cost of Sales		**57**	**57**	**57**	**51**

Depreciation is a product of previous operation and annual capital expenditure incurred for the exploitation of the reserve tonnage. Capital is limited to that required to support mining, processing, and tailing storage for the reserve. Corporate G&A is that part of the in-country costs allocated to the Bolivar Mine.

Table 1-13: Cashflow Projection ($M)

	2023	2024	2025	2026
Income Statement				
Net Revenue	90	90	90	81
Production Costs	(34)	(34)	(34)	(30)
Selling Costs	(23)	(23)	(23)	(21)
Depreciation	(11)	(10)	(9)	(12)
Gross Profit	**22**	**23**	**24**	**18**
Corporate G&A	(4)	(4)	(4)	(4)
Operating profit	17	19	20	14
EBIT	17	19	20	14
Income Tax Expense (CIT)	(6.5)	(7.0)	(7.4)	(5.1)
Net Gain/(Loss) for the Year	**11**	**12**	**12**	**8**

	2023	2024	2025	2026
Cashflow Statement				
Cash from Operations Activities				
Net Income	11	12	12	8
Depreciation	11	10	9	12
Subtotal	22	22	21	21
Cash from Investing Activities				
Sustaining Capital Expenditure	(11)	(12)	(13)	-
Subtotal	**(11)**	**(12)**	**(13)**	**-**
Cash Balance	(11)	(12)	(13)	-
Beginning	-	11	21	30
Change in Cash	11	10	9	21
Ending	**11**	**21**	**30**	**51**

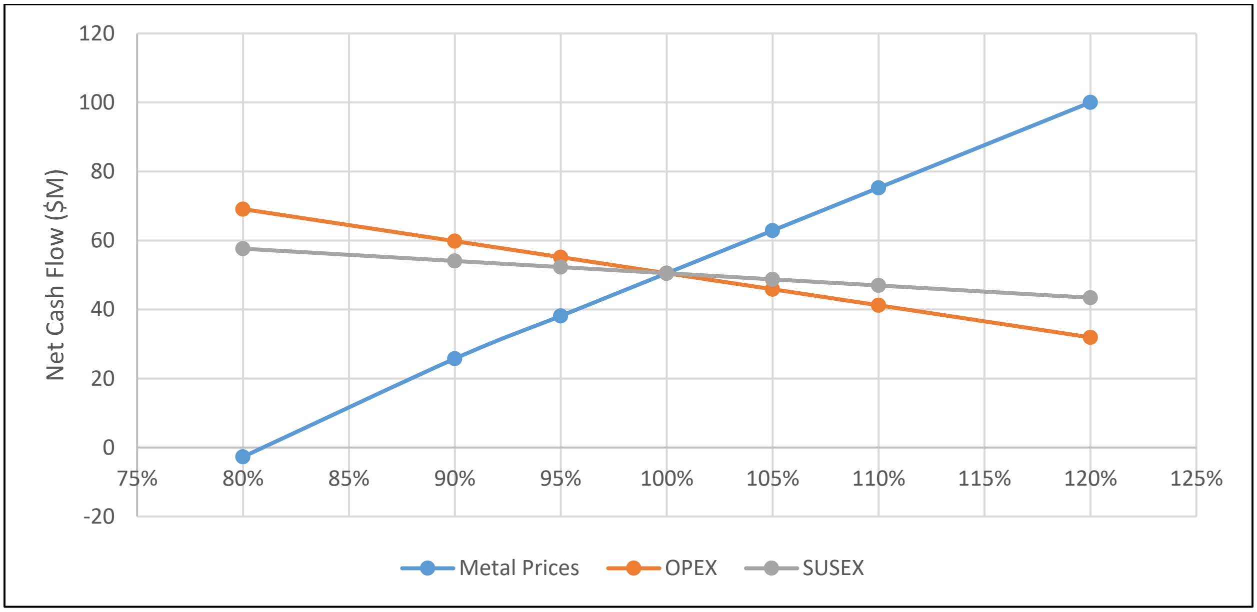
Income Tax is 37.5% of the EBIT. As seen, the operations generate a positive cash flow after tax upon exploitation of the stated reserve at the metal prices used to generate the reserve.

1.14.2 Sensitivities

A univariate sensitivity analysis was performed to examine which factors most affect the Project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -20% to +20%, although some variables may experience significantly larger or smaller percentage fluctuations over the LOM. For instance, the metal prices were evaluated at a ±20% range to the base case, while the capex and all other variables remained constant. This may not be truly representative of market scenarios, as metal prices may not fluctuate in a similar trend. The variables examined in this analysis are those commonly considered in similar studies – their selection for examination does not reflect any particular uncertainty.

Notwithstanding the above noted limitations to the sensitivity analysis, which are common to studies of this sort, the analysis revealed that the Project is most sensitive to metal pricing. The Project showed the least sensitivity to capital costs. Figure 1-12 shows the results of the sensitivity analysis.

Figure 1-12: Univariate Sensitivities



1.15 Risks, Opportunities and Recommendations

1.15.1 Risks

The Bolivar Mine is subject to all of the risks normally associated with an operating mine, and some unique to its situation. These include:

- The current political and socio-economic climate in Bolivia poses risks and uncertainties that could delay or even stop development as reported within the Fraser Institute Annual Report 2022 where Bolivia ranks very low in many non-technical metrics. Bolivia has been ranked consistently low for the past five years and ranks in the lower quartile on all metrics that gauge risk and uncertainty. It is difficult to gauge or qualify the level or extents of the risks however, all companies working in Bolivia must continue to be aware of the potential risks and develop mitigation strategies. A significant risk related to the Santacruz Bolivian mineral assets and in particular the mineral resources and mineral reserves is the significant artisanal activity that continues to exist. This activity is not only a socio-economic risk but also affects access to resources and reserves along with potential sterilization of mineral resources;

- Geological interpretations may be subjective and may result in the location and extent of some of the mineralized structure although as the Bolivar Mine is comprised of well constrained veins, this risk is minimal;

- As vein thicknesses are narrow, resources may be sensitive to dilution although the relative high grades that exist at the Bolivar Mine are successful at mitigating such risks to date;
- Varying resource classification methods and criteria may vary as more data is considered;
- There is no guarantee that further drilling will result in additional resources or increased classification;
- Lower commodity prices could change size and grade of the potential targets;
- Further work may disprove previous models and therefore result in condemnation of targets and potential negative economic outcomes;
- Ability to replace mined reserves on an annual basis; and
- Maintenance of Permits.

As the mine continues to expand to depth, the following aspects of mine operations will be challenged:

- Worker travel time (reduced time at the face);
- Dewatering inflow quantities, infrastructure and costs. The Central Mine already experiences large seasonal influxes of water, that sometimes affect production. This problem will be exacerbated by continued mining to depth;
- Ventilation system needs and costs; and
- Material handling.

As is shown on Figure 22-1, the greatest risk to the economic results in this study is from changes to metal prices.

The operation of the mining cooperatives, as described in Section 4.3.4.1, poses a risk to functionality of the Bolivar Operation. To date, Santacruz has been careful to culture a peaceful coexistence with the cooperatives and they have not operated in the core areas that Bolivar conducts mining operations. There is always a risk of this changing, and that their activities will escalate or relocate to more impactful areas.

1.15.2 Opportunities

Project opportunities include:

- A systematic exploration program could provide an excellent opportunity for successfully uncovering new discoveries;

- An increased understanding and derivation of alternative theories may result in further discovery and expansion for the Project;

- A hydrogeological study could help the operation to better characterize and understand water inflows, aiding design work and planning to reduce the impact of major seasonal inflows;

- Higher commodity prices will change size and grade of the potential targets; and

- Potential for expansion and classification upgrade of resources as mining activities progress.

The principal opportunity to the mine is to improve the grade to the mill by implementing a mine dilution control program. As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins, which must be kept at minimum to accommodate equipment widths. Often, however, veins are over-mined to ensure complete recovery of the ore. This practice significantly increases dilution due to overbreak of the hanging wall and footwall.

1.15.3 Recommendations

To advance the Bolivar Mine and further evaluate the potential additional veins and increase resources thereby displacing depletion due to ongoing mining activities, the following is recommended:

- Regional exploration for identification of new veins;

- Incorporate structural interpretations to assist regional understanding;

- Analysis of thickness and grade-thickness profiles for resource targeting and predictive dilution study;

- Investigate geo-metallurgical characteristics;

- Hydrogeological study and modelling should be done to better understand water inflows and minimize their impact on production;

- Some Surface for near surface targets along with underground drilling for resource delineation and extension; and

- Tracking of Cooperativa progress to mitigate safety and resource risk.

The operation should conduct a thorough test stoping experiment to ensure the most economic balance between incomplete recovery and excessive dilution.

Underground operations that use three x 8 hour shifts typically lose much worker productivity due to excessive travel and break time over such a short shift. The current operation has an effective time of 5.5 hours per worker on an 8-hour shift. Consideration should be given to test a longer shift, say a schedule of 4 x 10 hours per week with three days off. With the same 2.5 hours of travel and break time, the effective time would increase to 7.5 hours per shift, resulting in an increase from 68% to 75% shift effectiveness or actual working time. The workers are apt to find that the longer days are harder, but that the three days off provide more rest on the balance of the week.

These recommendations have not been costed, as they represent changes to current practices that can be funded by existing operating budgets.

2 INTRODUCTION

2.1 Terms of Reference

JDS Energy & Mining Inc. (JDS) was commissioned by Santacruz Silver Mining Ltd. (Santacruz) to prepare a Technical Report in accordance with the Canadian Securities Administrators' National Instrument 43-101 and Form 43-101F1, collectively referred to as National Instrument (NI) 43-101 for the Bolivar Project (Bolivar or the Project) located in the state of Oruro, Bolivia.

Santacruz is based in Vancouver, British Columbia and is engaged in the operation, acquisition, exploration and development of mineral properties in Latin America, with a primary focus on silver and zinc. Santacruz was incorporated on January 24, 2011 under the laws of British Columbia and is listed on the TSX Venture Exchange under the trading symbol "SCZ".

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business.

On March 18, 2022, Santacruz completed this purchase, including Glencore's interest in the Bolivar Mine.

Santacruz thus owns 100% of the two Bolivian operating companies Illapa and Sinchi Wayra, which in turn own 45% of the Bolivar Mine, 45% of the Porco Mine, and 100% of the Caballo Blanco mining complex. Sinchi Wayra is the operating company for all three active mining operations, including the Bolivar Mine.

This report is the first declaration of resources and reserves for the Bolivar base metals underground mining operation since its acquisition by Santacruz. The mine is fully operational at the time of this report's preparation. The effective date of both the resource and the reserve is 1 January 2023, which is approximately 18 months before the report date. Production data for the calendar year 2023 has been included in Section 24 Other Relevant Data and Information to show the depletion and typical replenishment of resources and reserves over a calendar year.

2.2 Qualifications and Responsibilities

The Qualified Persons (QPs) preparing this report are specialists in the fields of geology, exploration, mineral resource estimation, metallurgy and mining.

None of the QPs or any associates employed in the preparation of this report has any beneficial interest in Santacruz and neither are any insiders, associates, or affiliates. The results of this report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Santacruz and the QPs. The QPs are being paid a fee for their work in accordance with normal professional consulting practice.

The following individuals, by virtue of their education, experience and professional association, are considered QPs as defined in the NI 43-101, and are members in good standing of appropriate professional institutions / associations. The QPs are responsible for the specific report sections as listed in Table 2-1.

Table 2-1: QP Responsibilities

Qualified Person	Company	QP Responsibility / Role	Report Section(s)
Richard Goodwin, P.Eng.	JDS	Author, Mining, Project Manager	1.1 to 1.2, 1.8 to 1.9, 1.11 to 1.15, 2 to 6.1, 12.1, 12.3, 12.5, 15, 16, 18 to 26
Garth Kirkham, P.Geo.	Kirkham Geosystems Inc.	Geology, QA/QC, Data Verification, Drilling, Resource Estimate	1.3 to 1.5, 1.7, 6.2, 7 to 11, 12.2, 14, 27
Tad Crowie, P.Eng.	JDS	Metallurgy	1.6, 1.10, 12.4, 13, 17

2.3 Site Visit

In accordance with National Instrument 43-101 guidelines, site visits are summarized in Table 2-2. Sinchi Wayra staff and management were cooperative and helpful during the course of each visit. Access to all requested information and physical sites was provided voluntarily.

Table 2-2: QP Site Visits

Qualified Person	Company	Date	Description of Inspection
Richard Goodwin, P.Eng.	JDS	January 27, 2023	Bolivar Project site; including process plant, select working areas of the underground mine, Potosi professional offices, Don Diego Mill Complex, discussions with site personnel.

Qualified Person	Company	Date	Description of Inspection
Garth Kirkham, P.Geo.	Kirkham Geosystems Inc.	August 10-13, 2021 March 15-30, 2023	Bolivar Mine and Project site; including select working areas and faces underground, Potosi professional offices, Don Diego Mill Complex, sample storage facilities, La Paz company offices, discussions with site and company personnel.
Tad Crowie, P.Eng.	JDS	August 10, 2021	Bolivar Mine and Project site; including select working areas and faces underground, Potosi professional offices, Don Diego Mill Complex, sample storage facilities, La Paz company offices, discussions with site and company personnel.

2.4 Units, Currency and Rounding

The units of measure used in this report are as per the International System of Units (SI) or metric, except for Imperial units that are commonly used in industry (e.g., ounces (oz.) and pounds (lb.) for the mass of precious and base metals).

All dollar figures quoted in this report refer to United States dollars (US$ or $) unless otherwise noted.

Frequently used abbreviations and acronyms can be found in Section 28. This report includes technical information that required subsequent calculations to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the QPs do not consider them to be material.

This report may include technical information that requires subsequent calculations to derive sub-totals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, JDS does not consider them to be material.

2.5 Sources of Information

This report is based on information collected by the QPs during their site visits performed on August 10, 2021 (Kirkham and Crowie), on January 27, 2023 (Goodwin) and on March 15, 2023 (Kirkham) and on additional information provided by Santacruz, Glencore and Sinchi Wayra throughout the course of the QPs investigations. Other information was obtained from the public domain. The QPs conducted adequate verification of the information and take responsibility for the information provided by Santacruz.

2.6 List Of Previous Relevant Technical Reports

There has been one technical report published which was the subject of the Bolivar Project entitled "NI43-101 Technical Report, Bolivar Project, Oruro State, Bolivia" dated December 21, 2021. This report was produced by JDS on behalf of Santacruz and authored by Kirkham and Crowie who are also QP's for this Technical Report.

3 RELIANCE ON OTHER EXPERTS

The QP's have relied on information provided by the Issuer on claims, ownership, property agreements, royalties, environmental liabilities, and permits as described in Section 4. The information appears reasonable but has not independently verified beyond the information that is publicly available.

The QPs have relied upon a legal opinion provided by Enrique Barrios of the firm Dentons Guevara & Gutierrez S.C., located in La Paz, Bolivia, in the documents "Local Counsel Legal Opinion on the Porco Mine", "Local Counsel Legal Opinion on the Caballo Blanco Project", "Local Counsel Legal Opinion on Empresa Minera San Lucas S.A.", "Local Counsel Legal Opinion on Sociedad Minero Metalúrgica Reserva Ltda.", "Local Counsel Legal Opinion on Sociedad Minera Illapa S.A.", "Local Counsel Legal Opinion on Sinchi Wayra S.A.", and "Local Counsel Legal Opinion on the Illapa Joint Venture", all dated March 18, 2022 with regards to the Property's location, title, and environmental licenses described in Section 4 of this report.

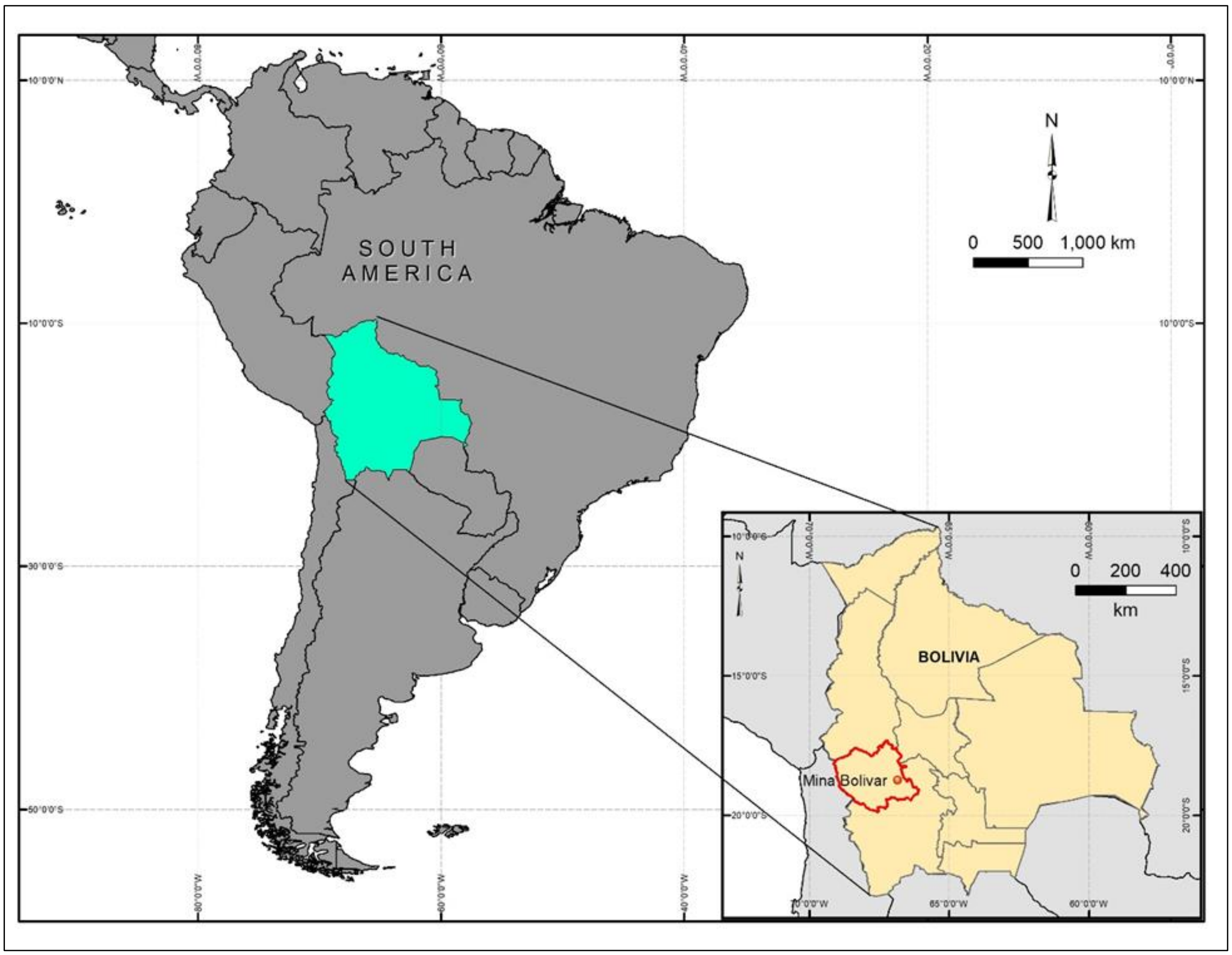
The QPs have relied on information provided by Arturo Prestamo of Santacruz for the information contained in Section 20 and for the smelter agreements used for the determination of the resources, reserves, and economic model.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

Bolívar Mine is located in the state of Oruro in Bolivia, and municipality of Antequera. The complex has UTM WGS-84 coordinates of 727293.087E; 7959437.617N at an elevation of 4014 masl. Paved roads connect Bolivar to the capital city La Paz (298 km), Oruro City (75 km) and Poopó Rail Station (22 km) which is the concentrate warehouse and dispatch.

Figure 4-1: Project Location Map



4.2 Property Description and Tenure

The Bolivar Mine has been active from more than 200 years. The current mine complex consists of an underground mine, 1,100 t/d concentrator plant, maintenance workshop, shaft-winder, tailings storage facility, water treatment plants, supplies warehouse, main office, hospital, and camp.

Two water treatment plants operate on mine water discharge; one potable treatment plant for the camp and surrounding community as well as a separate treatment plant for reuse of process water for industrial purposes. Electric power is purchased from the Bolivian Grid and available to the mine via overhead high-tension lines.

The mine stores tails in one active modern facility. There exists a historic storage facility on the site as well.

The Bolivar Mine is owned by the Bolivian Government (COMIBOL) with exclusive mining rights held pursuant to an unincorporated joint venture (the **Illapa JV**) between private owner operator Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa). Pursuant to the Illapa JV, Illapa holds a 45% interest in the Bolivar Project, and the Bolivian Government (COMIBOL) which holds a 55% interest in the Bolivar Project.

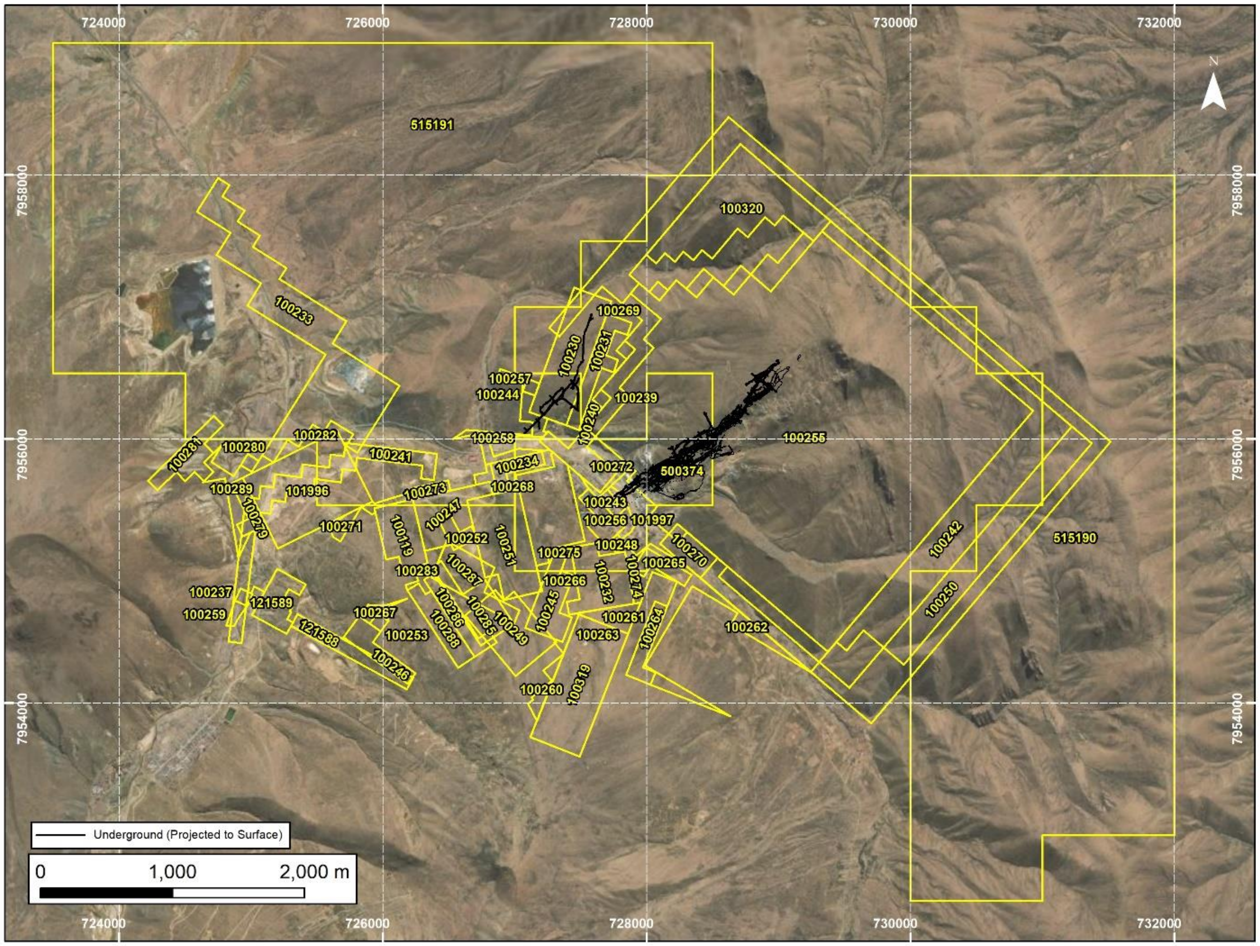
Illapa itself owns no mineral tenements in this district.

Off-take Agreements with Glencore International are in place for the Bolivar Mine production: Contract No. 180-03-10309-P and Contract No. 062-03-10276-P, including all its addendums and amendments. These Off-Take Agreements are in effect through the life of the mine.

On March 18, 2022 Santacruz acquired 100% of the shares of Illapa, as more particularly described in Section 2. There was a 1.5% NSR royalty to Glencore, provided as part of the purchase price that Santacruz paid pursuant to the Definitive Agreement, however on March 28, 2024, Santacruz and Glencore entered into a binding term sheet (the Term Sheet) which, among other terms, extinguished the 1.5% NSR royalty to Glencore. The only known existing agreements that will bind Santacruz is that of the Illapa JV. Environmental liabilities observed consist mostly of historic tailing storage facilities and mine workings. Recent audits verify environmental legal compliance and associated closure plan costing.

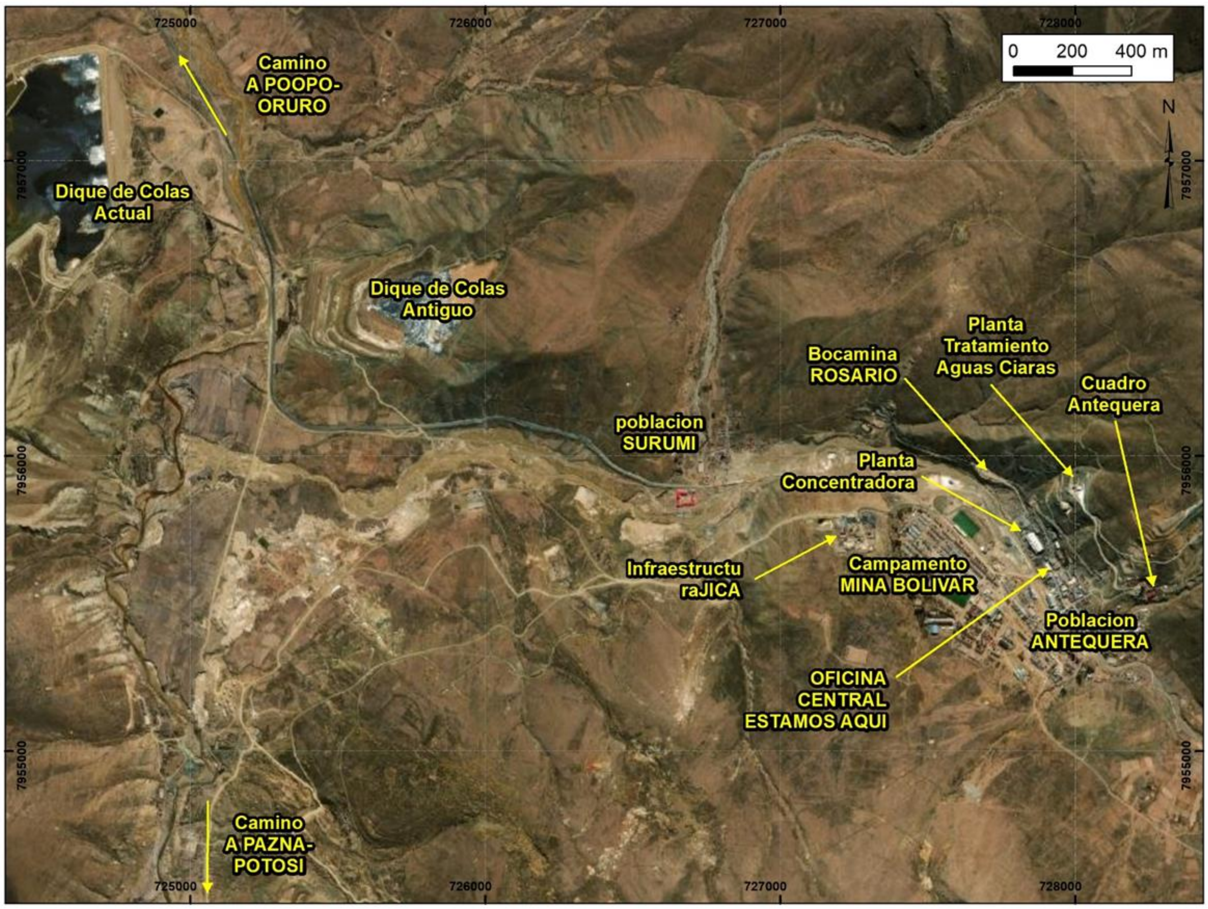
Figure 4-2 shows COMIBOL's tenements under the Illapa Joint Venture.

Figure 4-2: "COMIBOL" Mining Tenements Under Illapa JV



Bolívar Mine is located in the state of Oruro in Bolivia, and municipality of Antequera. The complex has UTM WGS-84 coordinates of 727293.087E; 7959437.617N at an elevation of 4014 masl.

Figure 4-3: Bolivar Project Site



4.3 Environmental, Permitting and Social Impacts

Santacruz Silver continues to manage its operations using a sophisticated management approach to sustainability consistent international standards. From the 2022 Sustainability Report:

> *We are: "A leading Business Group in the mining industry in Bolivia, sustainable, committed to the safety, health, and well-being of our Human Capital, and the preservation of the environment, with an entrepreneurial spirit, openness to change and innovation, and we strive to generate value and positive impact for society as a whole."*

This integrative approach is evident in the Bolivar operation. Areas addressed and monitored include:

- Employees;
- Occupational Health & Safety;
- Governance and Compliance;
- Stakeholder Engagement;
- Contributing to Community;
- Environment; and
- Product Stewardship & Material Handling.

4.3.1 Regulatory Framework

Bolivia's central statute governing environment protection is Law 1333, of 27 April 1992; specific regulations for which are set out in Regulation of Environmental Prevention and Control, December 8, 1995. Special Decree No. 24782 of 31 July 1997 sets out specific environmental requirements related to mining. Breaching environmental obligations can result in criminal liability under the Bolivian Constitution, in addition to other administrative penalties (such as a loss of mining rights).

An Environmental Impact Assessment (EIA) would be required for a project the scale of a mining and processing operation. As well, public consultation with any potentially affected indigenous communities and local populations may also be necessary. Granting of the operating permit allows the proponent to obtain the appropriate operating licenses, which must be updated with any relevant changes during the life of the operation.

Specialized environmental authorities control compliance. As required under the license, any impact on the environment must be reported to these authorities. Remediation measures and rehabilitation projects are compulsory, and financial reserve funds are maintained annually to cover closure costs. A final closing study on the effect on the environment will also be required, and restitution met.

On February 25, 2014, a Declaration of Environmental Adequacy Certificate was issued by the Ministry of Environment and Water addressing the proper license updating procedure carried out by Sinchi Wayra S.A. during the transfer of the Bolivar Mine to Contrato de Asociación Sociedad Minera Illapa S.A. In the same manner, the updating of the Porco Mine License, was addressed and approved by the Ministry of Environment and Water, on February 21, 2014, in the transfer procedure from Sinchi Wayra to Illapa.

Illapa was granted the Mining Identification Number 02-0697-04, by the SENARECOM (National Service of Control and Registration of Minerals and Metals Commercialization, for its acronym in Spanish), which expires on September 25, 2022:

a. Sinchi Wayra transferred the Bolivar Mine, which was recognized in the Declaration of Environmental Adequacy (DAA) N.° 040603-02-DAA-0324/14 dated February 25, 2014. The DAA has the nature of an environmental license; and

b. The General Direction of War Logistics and Material issued a Registration Certificate under number 0167/2021, for the use of explosives and accessories in mining activities. Expiring date: August 26, 2023.

4.3.2 Health, Safety and Economic Development

As per the Santacruz Sustainability program:

- Employees - Establishing relationships based on trust and promoting a culture of prevention and safe environments. Quality employment opportunities are offered with non-discriminatory hiring. In 2022, Bolívar employed total of 370 employees and 314 contractors, 7% of whom were women. Given the labor benefits offered, Bolívar has a low turnover rate. 71% of employees at Bolívar are unionized. Santacruz guarantees freedom of association and the right to collective bargaining;

- Occupational Health & Safety - Realizing the inherent personal risks of mining, and the incremental increase in incident rates over the last three years, emphasis continued in 2022 in program development and training in proper work practices at Bolívar;

- Health - Medical care is provided to employees through third party health insurers at Santa Rita Hospital. Regular Occupational Health examinations are given to all workers and treatment provided when prescribed. In 2022, occupational health factors at Bolívar, continue to be monitored after baseline date indicated most parameters fell within acceptable limits;

- Community - The neighboring communities house workers, contractors, and their families. Most of them reside in Antequera, which lies adjacent to the mine. In 2022, US$660,000 was invested in the development of neighboring communities, benefitting approximately 1,900 families;

- Education - One of the schools in Antequera continues to be financed by Santacruz and serves 500 students. The program includes funding of teachers', directors' and supporting personnel's wages, supplies and equipment, payment of services and school infrastructure. 29 scholarships were awarded for study abroad in the capital cities. These programs not only help the local communities, but they provide Bolivar with trained professionals. Public education is also supported through extracurricular sports and cultural activities;

- Economic Development - Bolívar offers a professional training workshop for women who live in the mining camp and that make up the Housewives' Committee. Fire extinguisher training was provided for 100 people this year and five houses were renovated as well as other help to nearly 100 families in two communities;

- Environment - Reforestation continued throughout the Queaqueani tailings dam area, and a water diversion project in Antequera focused on improving farming performance that benefited 200 people; and

- Local Needs - Cultural activities were sponsored including a safety management contest, sponsorship of trips for the Sebastián Pagador graduates, cooking courses for housewives, support for the elderly in purchasing groceries, and the anniversary celebration of Antequera

4.3.3 Environmental Management

4.3.3.1 Water Management

Bolivar produces an excess of water from the underground mine. A total of approximately 150 liters per second is pumped from the mine. This water is treated for two different uses: one for potable water at the mine and surrounding communities, the other for industrial uses in the mine and process plant. The balance of water is discharged to the Pampitas River.

4.3.3.2 Tailings Management

The stage VI lift of the Queaqueani Tailings Dam was completed in to updated design and international standards. For this Project, more than 400,000 cubic meters (m^3) of material were moved. A strict on-site Quality Control Management (CQC) and external Quality Assurance (CQA) was followed, and an enhanced monitoring program was put in place. Tailings from the process plant and sludge from the Water treatment plant is deposited in this facility.

4.3.3.3 Waste Management

Bolívar currently disposes of all waste rock underground; thus, surface management is not required. Domestic waste is collected by the municipal cleaning company of Antequera, whereas industrial waste is temporarily stored in authorized locations and is subsequently recycled by specialized companies.

4.3.4 Community Interaction

Santacruz assigns a dedicated Social Management superintendent for the Bolivar Mine. This position, which employs professionally trained individuals, has the most direct contact with the local community. A staff of approximately seven support the superintendent and implementation of social programs and projects, The Company also has a Corporate Sustainability Coordinator, who oversees the economic management of these projects and submission of Safety, Health, Environment and Communities reports to corporate management, and other interested parties, such as the United Nations Global Compact and Sustainable Development Goals (SDGs) Working Tables. All of them are under the purview of the Corporate Affairs and Sustainability Manager. Most of the social responsibility programs are implemented jointly with the environmental team, the projects and civil works team, and the labor relations team, given that most workers are union members and reside in the communities themselves.

A due diligence policy was implemented for community investments in 2019 which applies to all of Sinchi Wayra's operations and governs the Company's contributions and investments in community projects. It establishes a process that begins with the investment requests submitted by the communities involved, through the Representatives of their Ayllu (Autonomous Indigenous Government). Then, meetings are held with the communities to discuss the feasibility of the project to be financed. The community authorities exert social control on the projects that will be conducted and are part of the process.

Bolívar has a formal agreement (known as Actas de Reunión) with the neighboring communities. These agreements are recognized and managed by their Ayllus and include different plans and projects to help the communities with their economic development, infrastructure, access to water, education, and health and assist the communities by sponsoring their traditional festivities and sports. This process is verified by the Compliance Officer, who conducts a Due Diligence Process verifying the background of the beneficiaries and ensuring that the project award process complies with HSEC and conflicts of interest policies and with our Code of Conduct. If the projects meet all the requirements and have the approval of the regional compliance officers, the relevant administrative process for the project can begin.

4.3.4.1 Mining Cooperatives

A key player of Bolivar Mine and surrounding area are the mining cooperatives which are organized independent mining entities, some quite capable and organized with their own equipment. Recognized by the government as a valid economic activity for local development, they conduct their activities in abandoned mines or expropriating active mines which can pose risks to business. The relationship is not completely one-sided as the Cooperatives utilize the Bolivar plant to process their product, thus mechanisms are in place to face possible subjugations, protect mine employees and the communities.

More importantly, proactive solutions and agreements to avoid conflict and coexist peacefully with the different cooperatives are in place. As much as possible, with cooperatives as toll processors, compliance with occupational health and safety, human rights, and good work practice is sought.

To incorporate a new supplier, an assessment is required, including:

- Submission of legal documents proving that they are up to date with regard to any rules in force;
- The mineral supplier's background is verified; for this purpose, we have access to the Thomson Reuters and Info center systems, which report their background globally. This system informs us whether the supplier has any negative local or international background; in that case, the Company does not hire the services;
- Commercial visit to the supplier's operations, to directly verify the standards such as the 132 company's Code of Ethics. In particular, we analyze whether child labor is employed in the operations, and any other Human Rights violations. We also observe the use of safety equipment and personal protective equipment that guarantee the safety of the workers; and
- Machinery is assessed to ensuring that they are in good condition and that they guarantee safety. Once all these steps are completed and upon the in-situ verification of legal documents, the relationship with the cooperative is authorized.

A pilot support program was launched in 2019 to supply advisors and technical assistance on environment, human rights, occupational health & safety, and administrative management. The goal being to help mineral suppliers improve their internal systems and processes to ensure sustainability and compliance with Santacruz's sustainability standards.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

Paved roads connect Bolivar to the capital city La Paz (298 km), Oruro City (75 km) and Poopó Rail Station (22 km). Concentrates are transported by truck from Bolivar process plant to the rail station at Poopó (concentrate warehouse and dispatch) from where it is transported to a warehouse at Portezuelo outer Harbor, located 35 km from the city of Antofagasta, Chile. Once bulk shipment is arranged, the concentrates are consolidated in air-tight containers and trucked to the port of Antofagasta. Alternate ports are also accessible including Arica, Chile and Matarani, Peru.

Bolívar Mine, located within the municipality of Antequera is important to the neighboring communities of Antequera, Charcajara, Chapana and Quea Queani. The community of Antequera is immediately adjacent to the mine site and the largest community in the area of influence. The town is inhabited mainly by mine workers. Historically, it has been an area of intensive zinc, lead and tin mining so support, and service businesses have established themselves to serve the mine and its employees.

5.2 Climate and Physiography

Geographically Bolivar is part of the Cordillera de Azanaques, which in turn is part of the Cordillera Central or Meridional, located on the slopes of Cerro El Salvador (4560 masl).

The climate is arid to semi-arid and included in the “Puna” eco-region which extends south of the 18th parallel, from which aridity increases. Precipitation averages 450 mm per year with temperatures ranging from a maximum of 24°C to a minimum of -13°C. The topography of the area is moderately rugged, with mountain ranges cut by the Antequera canyon, through which the Chapana River runs.

The project lies within the Altiplano, an extensive volcanic plateau where regional flora includes dry plants such as queña, or quenua, which is a dwarf tree found at higher elevations. In addition, abundant yareta is present which is a species of moss that grows on the ubiquitous rocky surfaces.

Faura such as llamas and alpaca are the most distinctive animal populations in the area and are mostly domesticated with wild populations being fairly rare. Another similar animal, the vicuna, exists in the region however it is thought to be on the verge of extinction. In the air, condors inhabit the remote caves of the high peaks, flying over the plateaus.

5.3 Infrastructure

In addition to a network of paved roads, Bolivar also has access to rail for concentrate transport. Concentrate is hauled 22 km to the Poopó railway station in a convoy of 15 dump trucks, each with approximately 14 tonnes (t) of cargo. The trucking service is contracted from local owners to help support the economic development of neighboring communities.

Poopó also has a warehouse and storage yards. Storage is divided into 10 compartments to separate concentrate batches, and yard area is available for drying and blending if needed. Truck and rail scales are also available at the yard.

Electric power for Bolivar is supplied by the national grid (ELFEO S.A. - Managed by ENDE) from about 2 km from the Mine at Catavi substation via a 69 kV transmission line to the Bolivar step-down substation. The Bolivar electrical distribution system consists of two main feeders: one at 25 kV for the Concentrator Plant and another at 6.6 kV for the mine and the camp. A 2.8 MW diesel backup at the mine is available for the plant thickeners and mine dewatering.

Bolivar produces an excess of water from the underground mine. A total of approximately 150 l/s is pumped from the mine and is treated in separate plants for two different uses: one for potable water at the mine and surrounding communities, the other for industrial use in the mine and process plant. The balance of water is discharged to the Pampitas River.

Bolivar Mine has access to modern communications via Internet, e-mail, and communication by broadband radio and cell phone.

Bolivar Mine has one active Tailing storage Facility (Queaqueani) and one inactive (Antiguo). Both are managed in compliance with the guidelines of the Canadian Dam Association (CDA) and the “Global Industry Standard on Tailings Management” issued by the UNEP (United Nations Environment Programme), ICMM (International Council on Mining and Metals), and PRI (Principles for Responsible Investment) in August 2020. This program includes third party Verification Assessments (Dam Safety Assurance Assessment). In response to findings from these assessments, and to mitigate risks of failure, risk management tools have been developed to improve management systems for the active TSF. For the inactive facility, monitoring and maintenance have been improved and follow good practice.

The “Queaqueani” tailings storage facility started operations in April 2007. This facility was designed by Canadian engineering firm AMEC and is located 3.5 km to the north of the operation. Hydraulic tails of 25-29% solids are beached along the upstream side of the dam crest and water is reclaimed from the southwest sector of the reservoir and pumped via HDPE pipelines back to the water treatment plant.

Figure 5-1: Aerial Photography of the Queaqueani TSF

Source: Glencore (2021)

6 HISTORY

6.1 Management and Ownership

The Bolivar deposit was originally discovered in 1765 by Gonzalo de Antequera and mined primarily for silver until the late 19th century. As the world silver market began to collapse in the 1880's and early 1890's, a major shift to tin mining began to meet the increased demand of the industrialized world. Wealthy tin barons in Bolivia held much influence in national politics until they were marginalized by the nationalization of the three largest tin mining companies following the 1952 revolution. In March 1971, the government returned Bolívar Mine to the newly formed Bolivian Mining Corporation (COMIBOL), under whose management it operated until mid-1993. Bolivian miners played a critical part in the country's organized labor movement from the 1940s to the 1980s and continue to be an important stakeholder.

Bolivar Mine operates under the management of Sinchi Wayra S.A. (formerly COMSUR S.A.), under a joint venture agreement with the Bolivian government (COMIBOL) named Illapa S.A. Sinchi Wayra S.A. and (COMIBOL) entered this Joint Venture Agreement (the Illapa JV) on December 4, 2014, by virtue of Public Deed N° 1356/2014. The duration of the Illapa JV is 15 years, with the possibility of extending the term for the same duration. Under the Illapa JV, ownership is 55% COMIBOL and 45% Illapa. In the event of any disagreement, the Illapa JV has an arbitration clause with seat in La Paz, Bolivia, under UNCITRAL Rules.

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business (the Assets).

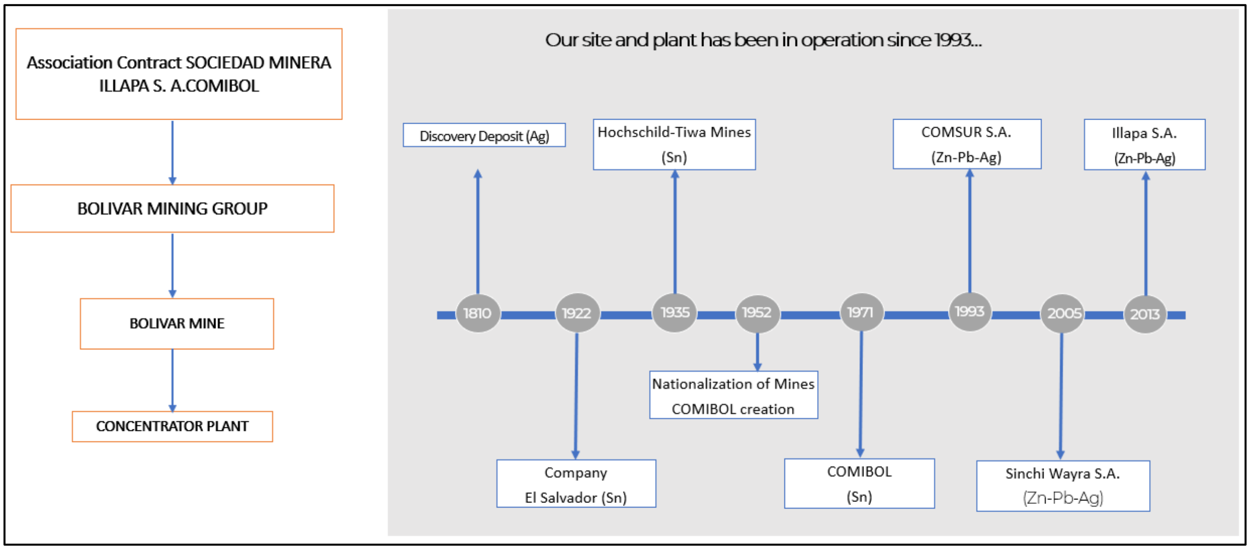
On March 18, 2022, Santacruz completed the purchase of the Assets, including Glencore's interest in the Bolivar Mine.

On May 10, 2023, Santacruz and Glencore entered into a framework agreement to amend certain terms of the transaction documents pertaining to the acquisition of the Assets. On March 28, 2024, Santacruz and Glencore entered into the binding Term Sheet which amends the terms of certain deferred consideration and ancillary documents pertaining to the acquisition of the Assets.

Santacruz thus owns 100% of the two Bolivian operating companies Illapa and Sinchi Wayra, which in turn own 45% of the Bolivar Mine, 45% of the Porco Mine, and 100% of the Caballo Blanco mining complex.

Sinchi Wayra is the operating company for all three active mining operations, including the Bolivar Mine.

Figure 6-1: Project History



Source: Glencore (2021)

6.2 Historical Resource Estimates

Glencore's Resources & Reserves report as of December 31, 2020 disclosed Bolivar, Porco and Caballo Blanco historic mineral resource statements as well as historic mineral reserve estimates as of December 31, 2020. Given the source of the estimates, Santacruz considers them reliable and relevant for the further development of the Project; and accordingly, they should be relied upon only as a historical resource and reserve estimate of Glencore, which pre-dates Santacruz's agreement to acquire the Assets however, the Company is not treating the historical estimates as current Mineral Resources or Mineral Reserves.

For all historical resources and historical mineral reserves reported within Section 6 in Table 6-1 and Table 6-2, a "Qualified Person" as per NI 43-101 has not done sufficient work to classify the historical estimate as current Mineral Resources or Mineral Reserves and Santacruz is not treating the historical estimate as current Mineral Resources or Mineral Reserves. Further drilling and resource modelling would be required to upgrade or verify these historical estimates as current mineral resources or reserves for the respective assets.

The historical resources have been reported for Bolivar as of December 31, 2020 at a Zinc Equivalent (ZnEq) cut-off grade 2% as follows in Table 6-1.

Table 6-1: Historic Mineral Resource Estimate (2020)

Category	Tonnes	Silver	Zinc	Lead
	(Mt)	(g/t)	(%)	(%)
Measured Mineral Resources	1.4	308	12.70%	1.40%
Indicated Mineral Resources	1	283	12.20%	1.30%
Inferred Mineral Resources	5.4	350	9.00%	0.90%

Notes:

1) The Mineral Resources have been calculated in accordance with definitions in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves (2014).
2) The ZnEq = (Zn% + (Pb% * 0.50) + (Ag g/t * 0.0268)).
3) The Mineral Resources have been calculated in accordance with definitions adopted by the Canadian Institute of Mining, Metallurgy and Petroleum on August 20, 2000. Employees of Glencore have prepared these calculations.
4) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution.
5) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
6) All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.
7) Reported in-situ Mineral Resources do not consider mineral availability by underground mining methods.
8) Historical Mineral Reserves and Resources are inclusive of Mineral Reserves shown at 100% ownership.

Source: Glencore (2020)

For comparison, Table 6-2 shows the Measured and Indicated Resources for 2018 and 2019, respectively which reflects mining depletion and changes in classification due to additional drilling and sampling during operations. The Indicated and Inferred Resources are reported at a 2% ZnEq cut-off grade.

Table 6-2: Historic Mineral Resource Estimate for 2018 and 2019

	Measured		Indicated		Total	
	2019	2018	2019	2018	2019	2018
Ore (Mt)	1.6	1.5	1.1	1.3	2.6	2.8
Zinc (%)	13.2	14	13	13.7	13.1	13.9
Lead (%)	1.4	1.6	1.3	1.3	1.4	1.5
Silver (g/t)	326	343	293	336	313	340

Source: Glencore (2020)

The mineral reserves have been reported for Bolivar as of December 31, 2020 at a Zinc Equivalent cut-off grade 2% as follows in Table 6-3.

Table 6-3: Historic Reserve Estimate (2020)

Category	Tonnes	Silver	Zinc	Lead
	(Mt)	(g/t)	(%)	(%)
Proved Reserves	0.8	251	9.40%	1.10%
Probable Reserves	0.7	215	8.60%	0.90%

Notes:

1) The Mineral Resources have been calculated in accordance with definitions in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code), the 2016 edition of the South African Code for Reporting of Mineral Resources and Mineral Reserves (SAMREC) and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Standards on Mineral Resources and Reserves (2014).
2) The ZnEq = (Zn% + (Pb% * 0.50) + (Ag g/t * 0.0268)).
3) The Mineral Resources have been calculated in accordance with definitions adopted by the Canadian Institute of Mining, Metallurgy and Petroleum on August 20, 2000. Employees of Glencore have prepared these calculations.
4) All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.
5) Historical Mineral Reserves are shown at 100% ownership.

Source: Glencore (2020)

6.3 2018-2022 Production

The historical production generated at the Bolivar Mine from the period 2019 to 2022 is shown in Table 6-4.

Table 6-4: Production at the Bolivar Mine, 2018 to 2022

Year	Tonnes	Zn%	Pb%	Ag g/t
2018	253,027	8.15	0.79	200
2019	219,217	7.14	0.63	172
2020	175,806	7.75	0.69	190
2021	259,192	7.53	0.69	198
2022	268,659	7.05	0.65	222

7 GEOLOGICAL SETTING AND MINERALIZATION

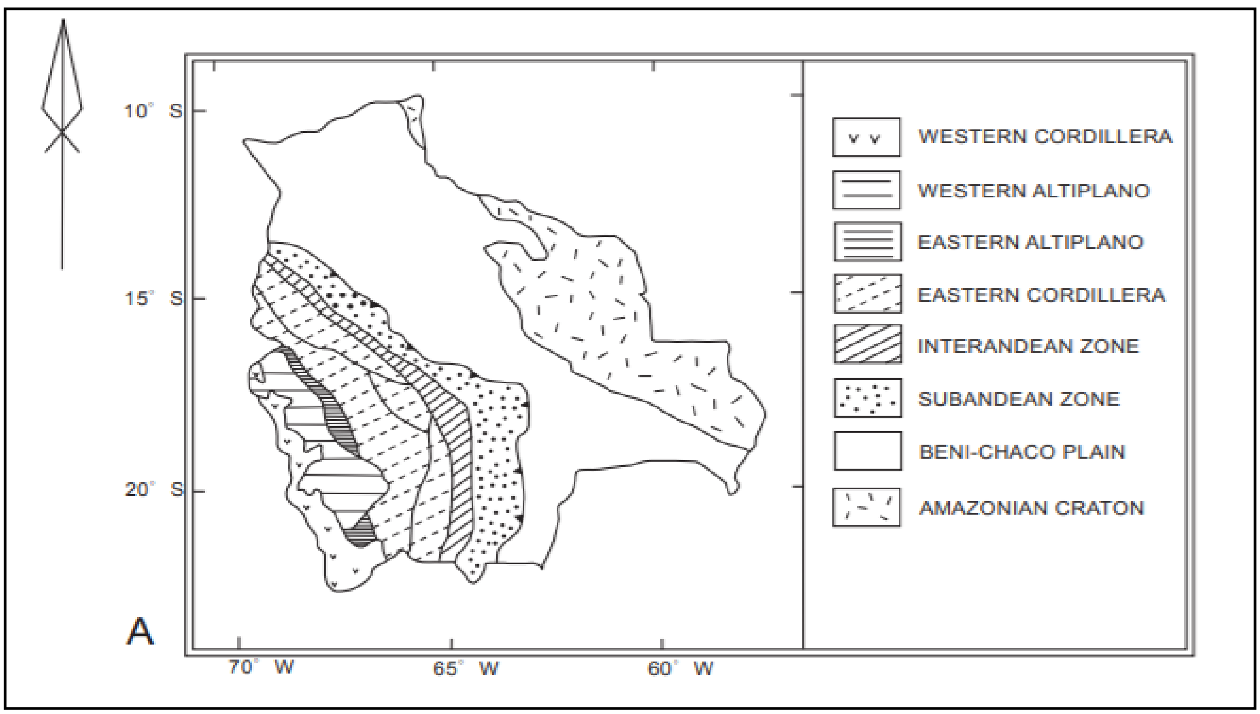
7.1 Introduction

The geological setting and framework detailed herein, is primarily referenced from the definitive publications for Bolivian geology such as Redwood (2021) and Arce-Burgoa (2009).

7.2 Geological Tectonic Framework and Regional Geology

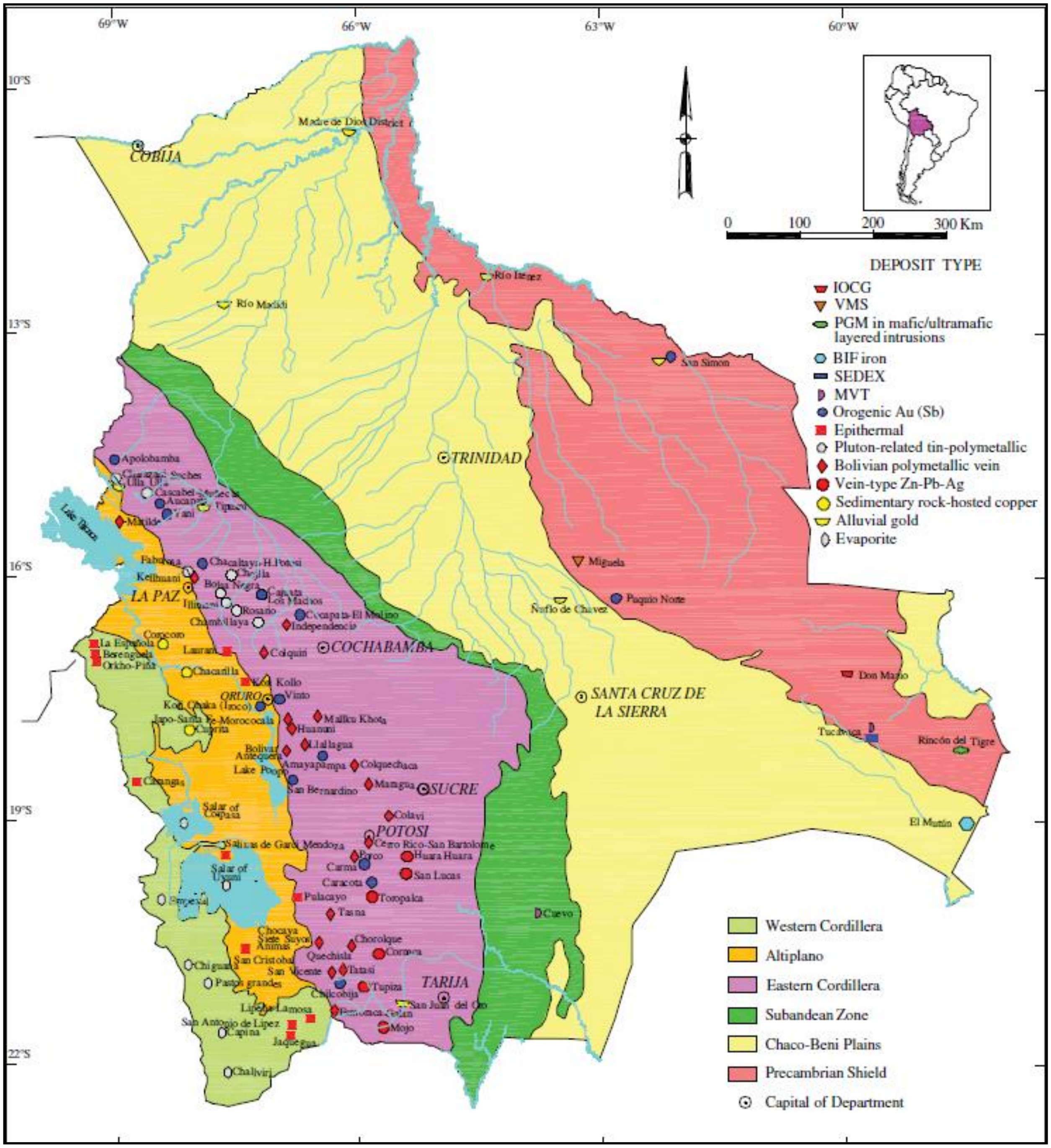
The geologic-tectonic framework of Bolivia can be divided into six physiographic provinces. From east to west (Figure 7-1), these are the Precambrian Shield, the Chaco-Beni Plains, the Sub Andean zone, the Eastern Cordillera (or Cordillera Oriental), the Altiplano, and the Western Cordillera (or Cordillera Occidental). The latter four provinces are elements of the Mesozoic-Cenozoic Andean orogen in Bolivia (Arce-Burgoa, 2002, 2007), which hosts an abundance of mineral deposits (Figure 7-2). The landward Precambrian Shield, exposed far to the east of the Andes, represents an area of great mineral potential, but has had limited exploration.

Figure 7-1: Regional Geology Setting



Source: Arce-Burgoa (2009)

Figure 7-2: Regional Geology Setting with Deposit Types



Source: Arce-Burgoa (2009)

Rocks of the Precambrian Shield in easternmost Bolivia have commonly been hypothesized to represent the southwestern part of the Amazon craton, covering an area of approximately 200,000 square kilometre (km^2), or 18% of Bolivia. The lithological units are mainly Mesoproterozoic medium and high-grade metasedimentary and meta-igneous rocks, which have been covered by Tertiary laterites and Quaternary alluvial basin deposits. Earlier studies have referred to this as the Guaporé craton, but Santos et al. (2008) proposed that are not basement rocks belonging to the craton proper but rather, that they represent the 1.45–1.10 Ga Sunsas orogen, formed along the craton margin. Major tectonic events in the orogen are dated 1465–1420, 1370–1320, and 1180–1110 Ma. The subsequent Brazilian tectonism (ca. 600–500 Ma) only had minor effects on the orogen (Litherland et al., 1986, 1989). Subsequent Brazilian tectonism (ca. 600–500 Ma) had only minor effects on the orogen (Litherland et al., 1986, 1989).

The Chaco-Beni plains, located in the central part of the country, cover 40% of Bolivia. The topography is dominated by the southwestern Amazon basin wetlands. Lying below 250 m elevation the wetlands offer little relief or outcrop. These extensive plains are part of the foreland basin of the Central Andes and include a 1 to 3 km thick sequence of Cenozoic foreland alluvial sediment in the west and much thinner accumulations atop a broad forebulge to the east (Horton and DeCelles, 1997). This sequence overlies Tertiary red-bed sediments that are >6 km thick which in turn rest unconformably on the Precambrian crystalline basement to the east and Paleozoic and Mesozoic sedimentary rocks to the west. The alluvial accumulations are products of several Neogene to Holocene episodes of post-kinematic and epeirogenetic isostatic adjustment in the Eastern Andes and its piedmont.

Rocks of the Bolivian Andean orogen include the Subandean zone, Eastern Cordillera, Altiplano, and the Western Cordillera, represent approximately 42% of Bolivia. These physiographic provinces form a series of mountain chains, isolated mountain ranges, and plains, with a north-to-south trend (Ahlfeld and Schneider-Scherbina, 1964). This part of the orogen has a length of 1,100 km, with a maximum width of 700 km, and an average crustal thickness of 70 km. The orogen displays a distinct oroclinal bend in the main fabric orientation at the Arica Elbow (18°–19°S).

The Subandean zone is the thin-skinned, inland margin of an orogen-parallel fold-and-thrust belt, which is partly covered by sediments of the western side of the active foreland basin. It is characterized by north- south- trending, narrow mountain ranges with elevations between 500 and 2,000 m. Rock types in this province include Paleozoic siliciclastic marine and Mesozoic and Tertiary continental sedimentary rocks.

The Eastern Cordillera, the uplifted interior of the Andean thrust belt, includes poly deformed Ordovician to Recent shale, siltstone, limestone, sandstone, slate, and quartzite sequences. These mainly Paleozoic clastic and metamorphic rocks have an approximate area of 280,000 km^2 and represent flysch basin sediments that were deposited along the ancient Gondwana margin and first deformed in the middle to late Paleozoic. After Permian to Jurassic rifting, they were uplifted to high elevation and folded and thrusted again during Andean compression, which may have begun as early as Late Cretaceous (McQuarrie et al., 2005).

The Altiplano is comprised of a series of intermontane, continental basins with a combined length of approximately 850 km, an average width of 130 km, and an area of approximately 110,000 km^2. The basins have been uplifted to form a high plateau at elevations between 3,600 and 4,100 m. Geomorphologically, the province consists of an extensive flat plain that is interrupted by isolated mountain ranges. Crustal shortening, rapid subsidence, and, with concurrent sedimentation accumulated a sequence thickness of as much as 15 km during the Andean orogeny (Richter et al., in USGS and GEOBOL, 1992). Basin fill was dominated by erosion of the Western Cordillera during Late Eocene-Oligocene, but Neogene shortening in the Eastern Cordillera and Subandean zone led to a subsequent dominance of younger sediments derived from the east (Horton et al., 2002).

The Western Cordillera consists of a volcanic mountain chain that is 750 km in length and 40 km in average width, with an area of about 30,000 km^2. Late Jurassic and Early Cretaceous flows and pyroclastic rocks and marine sandstone and siltstone sequences dominate the Cordillera in Peru and Chile. Lesser Late Cretaceous continental sediment was deposited above the marine rocks and, simultaneously, large granitoid plutons, many of which are associated with large porphyry orebodies, were emplaced along the coasts of adjacent Peru and Chile. In Bolivia, the province is dominated by high andesitic to dacitic strata volcanoes, erupted since ca. 28 Ma, which define the narrow, main Central Andes magmatic arc.

7.2.1 Eastern Cordillera

The Bolivar, Porco and Caballo Blanco deposits are located in the central part of the Eastern Cordillera, a thick sequence of Paleozoic marine siliciclastic and argillaceous sedimentary rocks deposited on the western margin of Gondwana and deformed in a fold-thrust belt. There were two major tectonic cycles in the Paleozoic: The Lower Paleozoic Famatinian cycle (the Tacsarian and Cordilleran cycles of Bolivia), and the Upper Paleozoic Gondwana cycle (Subandean cycle of Bolivia).

The late Precambrian supercontinent broke up with the opening of the southern Iapetus Ocean and the spreading of Laurentia away from Gondwana in the latest Precambrian or early Cambrian (Figure 7-3, Figure 7-4 and Figure 7-5). Ocean closure and collision of Laurentia and the South American segment of Gondwana during the Ordovician formed the Famatinian orogenic belt of NW Argentina (Dalla Salda et al., 1992a) which has been correlated with its probable Laurentian equivalent, the Taconic event of the Appalachian orogen (Dalla Salda et al., 1992b). The Famatinian belt records extension in the latest Precambrian with establishment of subduction during the Cambrian and closure of the ocean basin and continent-continent collision in the Ordovician (480-460 Ma) (Figure 7-6). The Pre-Cordillera Terrane carbonate platform of western Argentina, which has faunal similarities with eastern North America, may be a sliver of eastern Laurentia detached in the late Ordovician when Laurentia separated from Gondwana again (Dalla Salda et al., 1992a; b) (Figure 7-7 and Figure 7-10).

Figure 7-3: Plate Tectonic Reconstructions of the Neoproterozoic Subcontinent and the Late Precambrian Supercontinent after the Opening of the Southern Iapetus Ocean

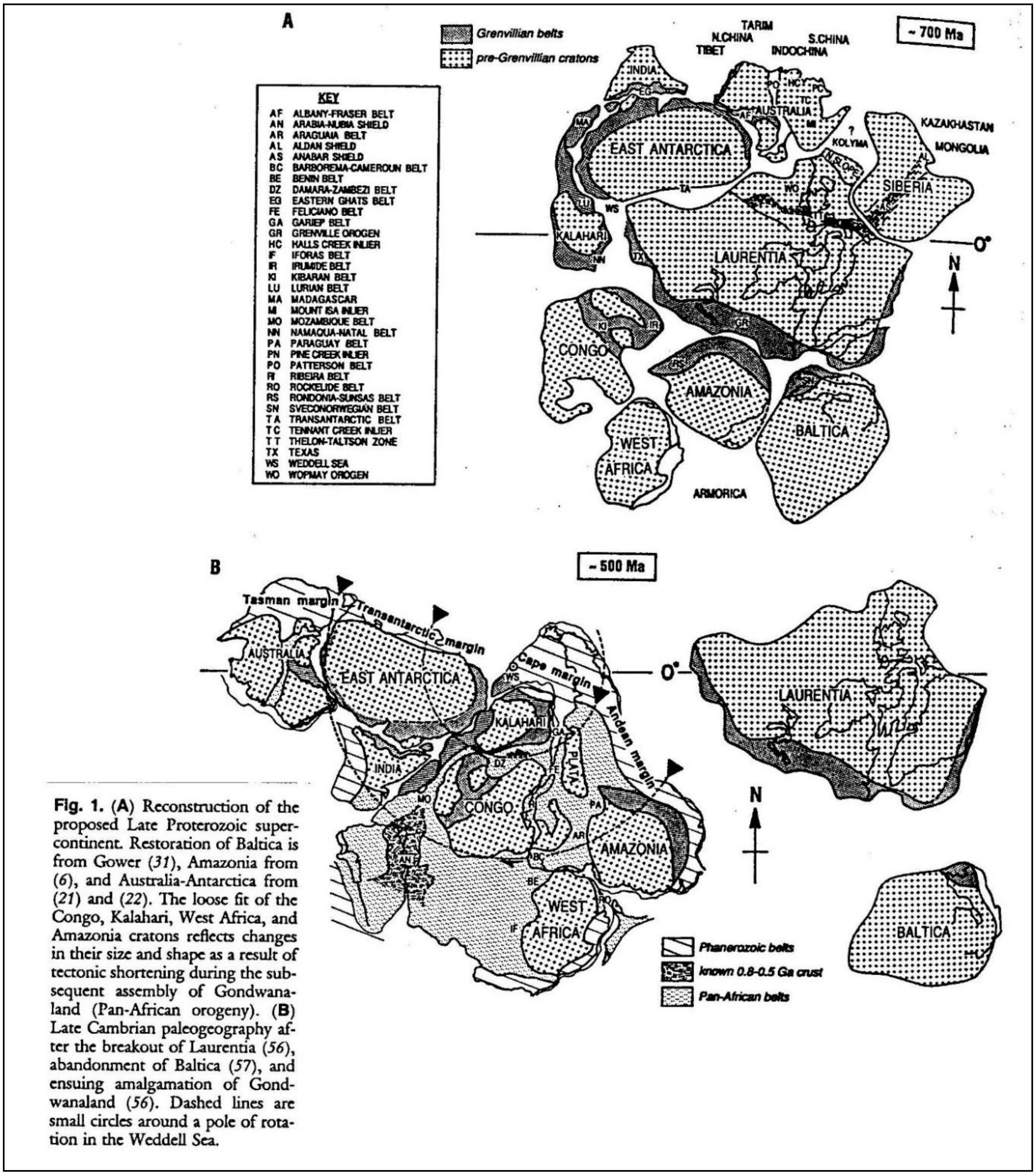


Fig. 1. (**A**) Reconstruction of the proposed Late Proterozoic supercontinent. Restoration of Baltica is from Gower (*31*), Amazonia from (*6*), and Australia-Antarctica from (*21*) and (*22*). The loose fit of the Congo, Kalahari, West Africa, and Amazonia cratons reflects changes in their size and shape as a result of tectonic shortening during the subsequent assembly of Gondwanaland (Pan-African orogeny). (**B**) Late Cambrian paleogeography after the breakout of Laurentia (*56*), abandonment of Baltica (*57*), and ensuing amalgamation of Gondwanaland (*56*). Dashed lines are small circles around a pole of rotation in the Weddell Sea.

Source: Hoffman (1991)

Figure 7-4: Plate Tectonic Reconstructions of the Neoproterozoic and Late Precambrian Subcontinents

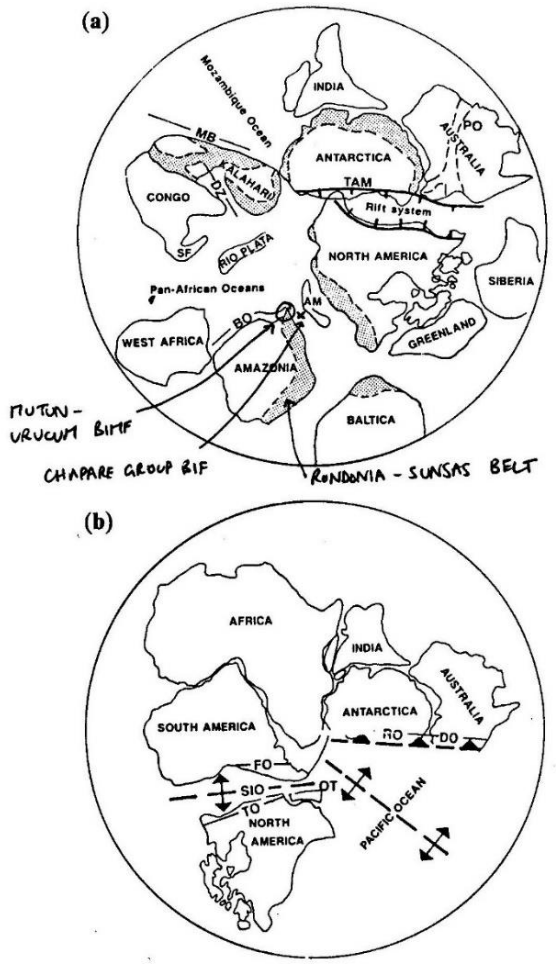
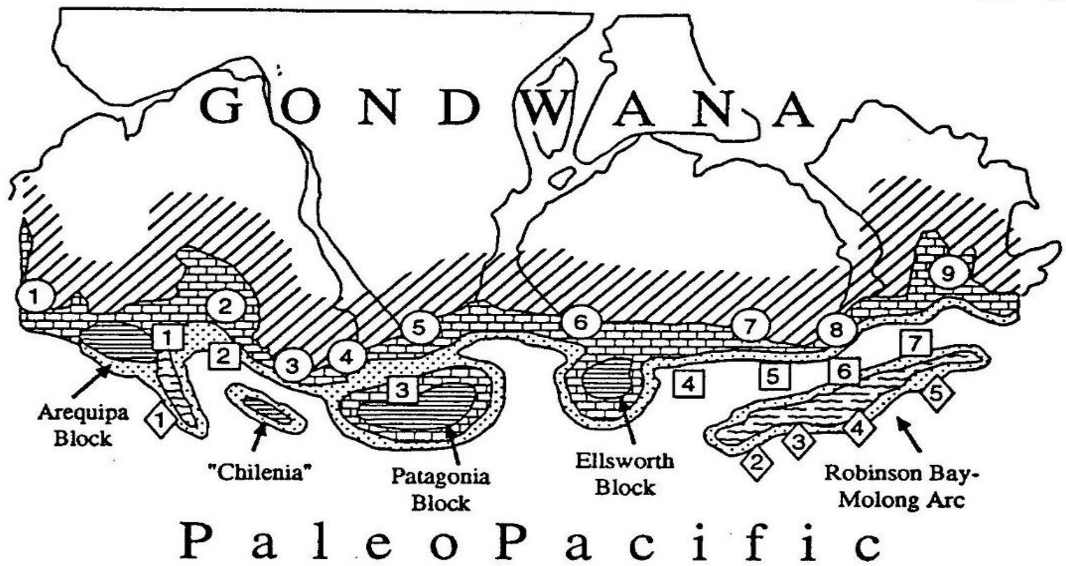


Fig. 3. (**a**) A Neoproterozoic reconstruction (*c*.750 Ma) based on the ideas of Moores (1991), Dalziel (1991, 1992*a*, *b*) and Hoffman (1991). It illustrates a single Neoproterozoic supercontinent just prior to rifting and a loose collage of African and South American cratonic blocks separated by oceanic crust. Variations in the position of the cratonic blocks can be seen in Hoffman (1991) and Dalziel (1992*a*, *b*). The supercontinent incorporates the SWEAT hypothesis of Moores (1991) linking the Transantarctic Mountains margin of East Antarctica to the western Cordilleran margin of Laurentia. The Grenville belt is shown as a stipple. AM, Arequipa Massif: BO, Brasiliano orogen; DZ, Damara -Zambezi belt; MB, Mozambique belt; PO, Patterson orogen; SF, São Francisco craton; TAM, Transantarctic Mountains. (**b**) Reconstruction of a late Precambrian to early Cambrian supercontinent following opening of the Pacific Ocean and amalgamation of Gondwana during Pan-African collisional events (Dalziel 1992), and at the time of opening of the southern Iapetus ocean (SIO) between North and South America. DO, Delamerian orogen; FO, Famatinian orogen; OT, Occidentalia terrane; RO, Ross orogen; TO, Taconic orogen.

Source: Story (1993)

Figure 7-5: Paleogeography of SW Gondwana Margin in the Early Ordovician



TECTONOSTRATIGRAPHIC UNITS

Continental Shelf

1. Fm. Hidago-Cord. Central Columbia (1)
2. Meson Group/NW Arg. (2)
3. C.-O. Carbonates/Precordillera Argentina (3)
4. La Tinta Group/Buenos Aires Prov. Arg. (4)
5. Table Mt. Gp./Cape Fold Belt (5)
6. Camb. Strata Pensacola Mt. (6)
7. Camb. Strata/S. Victoria Land Antarctica (6)
8. C.-O. Strata/Adelaide "Geosyncline" Tasman Fold Belt (7)
9. C.-O. Strata/Amadeus Basin (7)

Slope/Marginal Sea

1. Ord. Mar Clastics SE Peru/Bolivia (8)
2. Ord. A. de Perdiz Strata/N. Chile (9)
3. Port Stevens Fm. Malvinas/Fauklands (10)
4. Swanson Fm. & Fosdick Cx./M.B.L. (11)
5. Camb. Berg Gp/North Victoria Land (11)
6. Dundas "Trough" (11)
7. Wagga-Monaro "Trough" (12)

Volcanic Arc

1. S. Almeida calc-alk. suite N. Chile (13)
2. Devils River Volcanics N.W. Nelson (11)
3. Bowers Group/North Victoria Land (14)
4. Stavely volcanics (11)
5. Molong Volcanics (15)

Fig. 12. Paleogeographic model for the SW margin in Gondwana in the Early Ordovician. Brick pattern outlines the marginal shelves and the stable Proterozoic platforms of Gondwana, in stipple are slope and outer basin floor clastic deposits, in horizontal ruling, possible platform and/or microplate regions of discontinous lower Paleozoic deposition, and in v symbols, theallocthonous volcanic arc components. References are: (1) Mojica et al. [1988], (2) Turner [1970, 1972], (3) Borrello [1969], Baldis and Bordonaro [1985], (4) Baldis et al. [1985], (5) Rust [1973], Tankard and Hobday [1979], (6) Laird and Bradshaw [1982], (7) Veevers et al. [1982], (8) Martinez [1980], Acenolaza [1976], Dalmayrac et al. [1980], (9) Garcia [1976], (10) Borrello [1972], (11) Findley [1987], (12) Pachman [1987], (13) Mpodozis et al. [1983], (14) Gibson and Wright [1985], and (15) Leitch and Scheibner [1987].

Source: Forsythe et al, (1993)

Figure 7-6: The Famatinian – Taconic Orogen in the Middle Ordovician

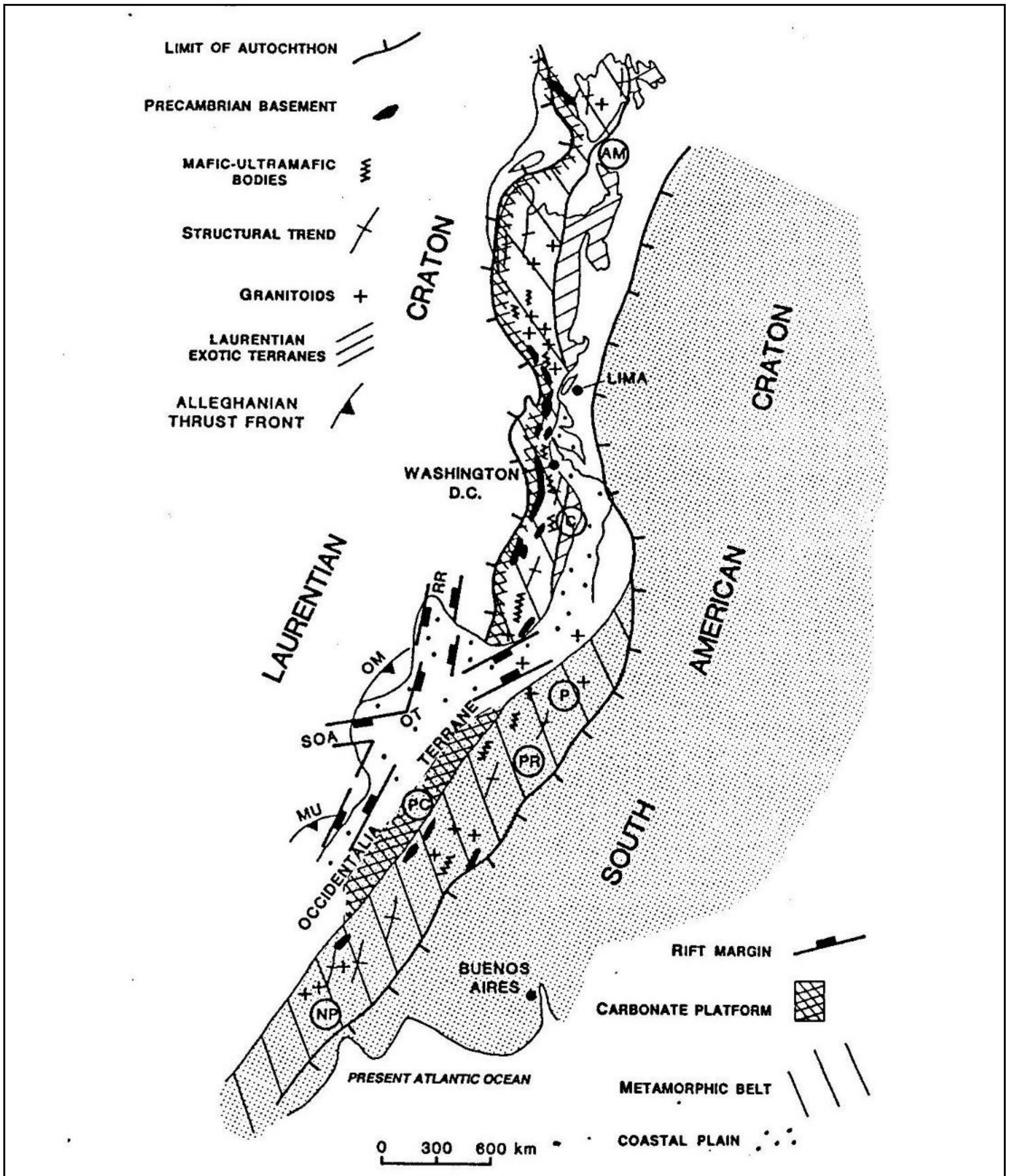


Figure 3. Reconstruction of Taconic-Famatinian orogenic belt as proposed for Middle Ordovician. Laurentia: AM—Avalon-Meguma terrane; C—Carolina terrane; MU—Marathon uplift; OM—Ouachita fold belt; OT—Ouachita trough; RR—Reelfoot rift; SOA—South Oklahoma aulacogen. South America: NP—North Patagonia massif; P—Puna; PC—Precordilleran belt; PR—Pampean Ranges.

Source: Dalla Salda et al, (1992b)

Figure 7-7: The Ordovician of the Central Andes (Cunningham et al., 1994b)

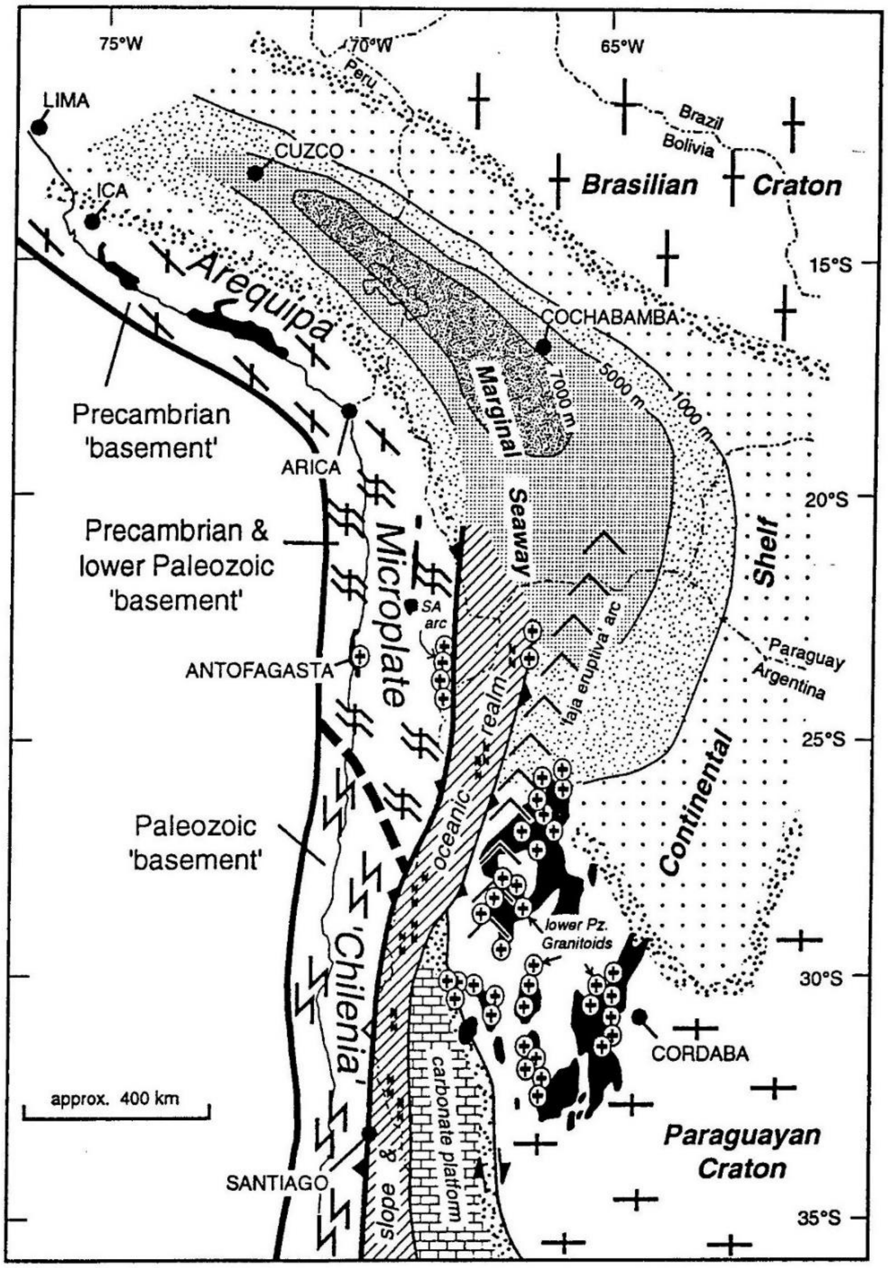


Fig. 1. Tectonostratigraphic map of the Central Andes. Modified from Delmarac et al. [1980], Martinez [1980], Dalziel and Forsythe [1985], Coira et al. [1982], and Ramos et al. [1986]. Contours indicate approximated thicknesses of Ordovician strata, and blackened areas are the principal outcrop areas of Precambrian and lower Paleozoic metamorphic basement rocks. Small pluses and inverted v symbols are lower to middle Paleozoic calcalkaline magmatic suites. Study area is the "SA arc" just to the east of Antofagasta.

Source: Forsythe et al, (1993)

7.2.2 Tacsarian Cycle (Upper Cambrian to Ordovician)

During the Upper Cambrian to Caradoc Tacsarian Cycle a broad marine back-arc rift basin existed in Bolivia-Peru with its axis in the Eastern Cordillera. There was oceanic spreading in the southern part of the basin (Figure 7-6), the Puna Straits in NW Argentina, preserved as ophiolites, with intrusions of basic dikes and sills further north in the Bolivian basin. A possible magmatic arc on the Arequipa Terrane to the west of the basin, represented by calc-alkaline plutonic and volcanic rocks dated at 487-429 Ma (Mpodozis & Ramos, 1989), separated the back arc basin from a forearc. The Arequipa microplate swung about a hinge to the NW to form the Puna Straits and Bolivia-Peru back arc basin, as a Gulf of California-type basin (Sempere, 1991) or Japan-type basin (Forsythe et al., 1993). This was bordered to the east by another subduction-related magmatic arc in western Argentina, the Puna arc, and its southward continuation, the Sierras Pampeanas magmatic arc, represented by a granitoid belt (Mpodozis & Ramos, 1989). The Ocloyic Orogeny closed the Puna Straits Ocean basin during the Llanvirn-Caradoc, as evidenced by granitic magmatism.

In SW Bolivia, the sedimentary sequence begins with shallow marine clastic sediments of the basal Tremadoc transgression, which grade upwards into open marine thick graptolitic shales intercalated with subordinate turbidites and slumps of late Cambrian – Llanvirn age. The base of this super sequence outcrops in several localities along the Cochabamba-Chapare Road (central part of the Eastern Cordillera), which were described as part of the Limbo Group and of other Cambrian formations (Castaños & Rodrigo, 1978).

The majority of the sequence consists of thick and monotonous Lower to Middle Ordovician shale beds, with subordinate siltstones and sandstones are part of the Cochabamba Group, which from base to top includes the Capinota, Anzaldo, and San Benito Formations. In the southern part of Tarija, the sequence base includes shallow marine clastic rocks. These grade upward to thick, marine graptolitic shales with subordinate Cambrian turbidites of the Condado, Torohuayco, and Sama Formations (Castaños & Rodrigo, 1978). Farther north, the sequence consists of thick graptolitic and cephalopodic shales: which have localized the main decollement zone during the Neogene, and consequently older rocks are rarely exposed in the Bolivian Andes.

In southern Bolivia the shales were affected by the Ocloyic deformation with development of folding, cleavage and schistosity. The effects of this orogeny diminished to the east and north, and are not identified north of 20°S. In the north and east, the basin developed as a marine foreland basin during deformation which was infilled with the deposition of a thick, monotonous sequence of shallowing upward, shallow marine siliciclastic interbedded sandstone and shale in the Middle to Late Ordovician (Llanvirn - Caradoc) (Sempere, 1990a, b, 1991, 1993).

7.2.3 The Cordilleran Cycle (Late Ordovician to Late Devonian)

During the Late Ordovician to Late Devonian Cordilleran Cycle (Chuquisaca Super sequence), the Bolivia-Peru basin occupied a back-arc setting, then from the late Llandovery formed a marine foreland basin. These basins lay east of the Puna arc on the Arequipa block, which continued south as the Sierra Pampeanas magmatic arc granitoid belt until the Early Carboniferous. These arcs were related to an eastward-dipping subduction regime east of the Precordillera. The cratonic Chilenia Terrane of the Cordillera Frontal collided with the continental margin in the latest Devonian to early Carboniferous, and the collision caused intense deformation in the western Precordillera. (Mpodozis & Ramos, 1989; Ramos et al., 1986; Ramos, 1988; Sempere, 1993).

The Cordilleran cycle began in Bolivia with rapid deepening of the basin as a back-arc with black pyritic-shale deposition (Tokochi Formation) followed by resedimented glacial-marine diamictites sediments in the Ashgill (Cancañiri Formation) with rare thin fossiliferous limestones. These are overlain by thickly bedded, thinning-upward turbidites (Llallagua Formation) and/or dark shales with minor turbidites (Uncía/Kirusillas Formation) from late Llandovery to Ludlow. Deposition in the basin was controlled by active normal faulting. Facies succession was induced by a major glacio-eustatic sea level low (the Ashgillian ice age) which developed between two maximum flooding episodes. The Uncía/Kirusillas Formation was the first of three main shallowing-up megasequences, which began with thick dark shales and ended with sandstone dominated units, of late Llandovery - Lochkovian, Pragian - early Giventian and late Giventian - middle Famennian ages. These were deposited in a large subsiding marine foreland basin covering the Bolivian Andes, Subandean zone and Chaco-Beni plains, reaching as far as the SW edge of the craton where they onlap the Chiquitos Supergroup (Litherland et al., 1986). This interval was a time of onlap towards the northeast and of deposition of major hydrocarbon source rocks in Bolivia. (Sempere, 1990a; b;1991; 1993).

The Cordilleran Cycle is generally considered to have been terminated by the Late Devonian to Early Carboniferous Hercynian Orogeny, which has been defined in Perú where the effects are much more evident. The presence of Hercynian orogenesis in Bolivia has been questioned however, due to Late Triassic U-Pb zircon age dates of 225 Ma (Farrar et al., 1990) for both foliated and weakly foliated facies of the Zongo-Yani granite, and by implication its wide metamorphic aureole, which was assigned an "Eohercynian" age by Bard et al. (1974).

7.2.4 Subandean (Gondwana) Cycle (Upper Paleozoic)

The Upper Paleozoic Gondwana Cycle was characterized by establishment of eastward subduction along the new Pacific margin west of Chilenia (Cordillera Frontal) and development of a broad forearc accretionary prism, which contains blue schists and ocean floor fragments. A magmatic arc lay to the east of the subduction zone. This cycle was terminated by deformation during the lower Triassic Gondwanide orogeny, the effects of which southward. (Mpodozis & Ramos, 1989; Ramos et al., 1986; Ramos, 1988).

In Bolivia, the Upper Paleozoic Subandean Cycle is characterized by the Late Devonian (Late Famennian) - Early Carboniferous (Mississippian) Villamontes Supersequence, deposited in the Subandean zone, Chaco and Titicaca basin, is mainly marine and comprises mudstone, black shale, sandstone, coal, glacial-marine sediments, diamictites and slumps, the stratigraphy of which is conflictive due to rapid facies variations (Sempere, 1993). The Eastern Cordillera was emergent. This was a period of high epeirogenic activity and synsedimentary tectonic instability coeval with the Hercynian deformation in Peru. Sempere (1993) considers the Mississippian sedimentation to have been the culmination of the Silurian - Devonian evolution.

Subsequently the Late Carboniferous (Pennsylvanian) - Early Triassic Cueva Supersequence was developed during a period of low subsidence and subtropical climate. In western Bolivia there was a shallow carbonate platform in the Titicaca Basin (Copacabana Formation) with deposition of white littoral-fluvial-eolian sands and evaporites on the eastern platform in the Subandean zone. The compressional Gondwana (Late Hercynian) deformation in the middle

Permian of the Eastern Cordillera of Peru had weak effects in the Eastern Cordillera of Bolivia. This deformation was accompanied by transgression of the marine carbonate platform to the east. Post-orogenic calc-alkaline magmatism in the Early - Middle Triassic evolved in the late Middle Triassic toward continental tholeiitic compositions, reflecting the extension which initiated the Andean Cycle (Sempere, 1990a; b; 1993; Soler & Sempere, 1993).

7.2.5 The Mesozoic to Cenozoic Andean Cycle: The Serere, Puca and Corcoro Supersequences

The Andes developed during the Mesozoic to Cenozoic Andean Orogenic Cycle. Distension in the Middle to Upper Triassic related to the initial break up of Gondwana marked the start of the Andean Cycle. In the first part of the cycle, from Triassic to mid Cretaceous, an eastward dipping subduction zone existed along the length of the Pacific margin of Peru and Chile with a magmatic arc and back-arc basin, which in some segments had oceanic crust. In Chile, the arc was superimposed on the Late Paleozoic accretionary prism and an eastward younging coastal batholith intruded. (Cobbing, 1985; Dalziel, 1986; Mpodozis & Ramos, 1989).

During the Middle Triassic - Middle Jurassic, the Andean region of Bolivia was part of a stable cratonic regime. An initial rifting process of late Middle Triassic age developed in several areas, and numerous narrow grabens were filled by fluvio-lacustrine red beds and evaporites, accompanied by tholeiitic to transitional basalts (Sempere, 1990a; 1993; Soler & Sempere, 1993). Cessation of rifting in Bolivia was probably a consequence of a regional tectonic reorganization at about 220 Ma, which probably marked the resumption of subduction along the Pacific margin. The subsequent Late Triassic - Middle? Jurassic onlapping sedimentation of fluvial and eolian sands was probably controlled by post-rift thermal subsidence. The environment was of sandy deserts on the craton, akin to the Arabian Shield (Sempere, 1990a; 1993). These deposits of the Serere Supersequence occur in the Eastern Cordillera and Subandean Zone.

Since the Late Jurassic, Bolivia has been part of the Pacific subduction regime. This was marked by a Kimmeridgian rifting event in Bolivia, the “Araucana Phase”, with extrusion of alkaline basalts which initiated the Puna Supersequence (Sempere et al., 1989; Sempere, 1993; Soler & Sempere, 1993). Bolivia was set in a back arc setting to the east of the Pacific margin arc and back-arc basin, with deposition of coarse clastic continental sediments and alkali basalts in the Potosí and Titicaca basins in a distensive regime related to a transtensional continental margin until the Aptian (Sempere et al., 1989).

The Upper Cretaceous and Cenozoic of Perú - Chile was characterized by a subduction-related continental magmatic arc with no back-arc basin. In Peru, the 110 - 60 Ma Coastal Batholith was emplaced into the Jurassic - Early Cretaceous back-arc basin volcanic pile between the Mochica and Incaic 1-fold phases (Pitcher et al., 1985). At the same time in the Central Andes the magmatic arc migrated eastwards. Large parts of the forearc zone and Mesozoic arc were removed during the Cretaceous and Tertiary, either by subduction erosion or by longitudinal strike-slip faults such as the Atacama Fault (Mpodozis & Ramos, 1989).

The mid Cretaceous compressive event inverted the Tarapacá back-arc basin of north Chile (Late Triassic - Early Cretaceous) to form the proto-Domeyko Cordillera fold-thrust belt (Mpodozis & Ramos, 1989). In Bolivia, sedimentation of the Puca Supergroup continued in a distal external foreland basin, with deposition controlled by rifting and eustatic marine transgressions from the NW. The sequence is transgressive with successively younger units covering greater areas and reaching a total thickness of up to 5,600 m in the Sevaruyo area. The strata consist of fine red-bed sediments, evaporites and alkali basalts, with marine red shales in the Aptian and marine carbonates in the Cenomanian, Campanian and Maastrichtian. (Riccardi, 1988; Sempere et al., 1989; Soler & Sempere, 1993). The end of the Puca Supersequence is marked by an important unconformity developed at the end of the Paleocene, followed by deposition of thick red beds in the Altiplano and Eastern Cordillera in an external continental foreland basin during the Eocene and Oligocene (53 - 27 Ma; Sempere 1990a).

The Cenozoic evolution of Bolivia was dominated by considerable horizontal shortening (Sempere, 1990). Cenozoic basins of the Corocoro Supersequence developed in the Cordillera and in the plains in that time are related to the uplift of the Andes. During the Lower Paleocene-Lower Oligocene, a foreland basin formed east of the Andes. A thickening of the crust enabled the accumulation of 2.5 km of red beds in the Altiplano and Eastern Cordillera (Sempere, 1995).

7.2.6 The Andean Orogeny

The first major deformation in the Andean Cycle in Bolivia occurred during the Late Oligocene to Early Miocene (27-19 Ma) when the orogenic front jumped from west of Bolivia to the Eastern Cordillera, and the Bolivian Andes started to develop as a mountain belt. Major crustal shortening by thrusting occurred in the Eastern Cordillera, and deformation of the Subandean Zone also began. Since the Late Oligocene, the Altiplano has functioned as an intermontane foreland basin with deposition of thick continental sediments, with smaller intermontane basins in the Eastern Cordillera.

The external foreland basin moved east to the Subandean - Llanura (Beni-Chaco) Basin. The second major period of thrusting occurred between 11-5 Ma. Thrusting is mainly eastward-verging towards the foreland, with an important west-verging back-thrust belt in the eastern Altiplano and western side of the Eastern Cordillera.

7.2.7 Mesozoic to Cenozoic Magmatism

Extension-related granites were intruded in the Cordillera Real in the Triassic–Jurassic (227-180 Ma) (Everden et al., 1977; McBride, 1977; Grant et al., 1979; Farrar et al., 1990).

Alkaline volcanic activity was initiated in the Late Oligocene (28-21 Ma) in the Western Cordillera and western Altiplano, coincident with the first major period of deformation. At the same time granitoid plutons intruded in the southern part of the Cordillera Real (Illimani, Quimsa Chata, Santa Vera Cruz) with related tin-tungsten-silver-lead-zinc-polymetallic mineralization (28-20 Ma). Similar deposits also developed to the south as far as Potosi, such as Colquiri and Chicote Grande. These deposits are hosted by Paleozoic sediments and related to buried plutons of this age. The main period of magmatism was the Middle Miocene (17-12 Ma) with an eastward "breakout" of magmatism in an unusually broad arc across the Western Cordillera, Altiplano and Eastern Cordillera, generally forming small extrusive (domes) and intrusive (stocks, sills) bodies. Further magmatism occurred across this wide arc during the Late Miocene (10-5 Ma) during the second main period of crustal shortening. This was characterized by stratovolcanoes, ash-flow calderas, and major ignimbrite shields such as Los Frailes and Morococala in the Eastern Cordillera. (Baker, 1981; Baker & Francis, 1978; Evernden et al., 1977; Grant et al., 1979;

McBride et al., 1983; Redwood, 1987; Redwood & Macintyre, 1989; Soler & Jimenez, 1993; Thorpe et al., 1982).

7.3 Local Geology

The Bolivar Mine is located in the Cordillera de los Azanaques, forming the western edge of the Cordillera Oriental, which is detached from the Cordillera de los Frailes, belonging to the group of central mountain ranges. Characterized by the essence of undulating plateaus, outstanding mountains parallel to the course of the Andes, with elevations that vary between 3,400 and 4,600 masl. The area is part of the polymetallic belt of the altiplano and the Cordillera Occidental.

It is in Cenozoic rocks of the middle to upper Silurian, constituted almost entirely by marine sediments of variable depth: from infraneritic, neuritic and bathyal environments.

Stratigraphically, during the Silurian (Lower Silurian) Middle began the deposition, with the formation of sediments of glacial-marine origin, which in Bolivian territory reaches the central part, being so that in areas surrounding the Bolívar mine it is documented by the presence of the Cancañiri Formation (Figure 7-8 and Figure 7-9). Likewise, the sequence of deposition continued with the formation of sandy and clay materials giving rise to the sandstones and shales corresponding to the members of the Lallagua and Uncía Formation.

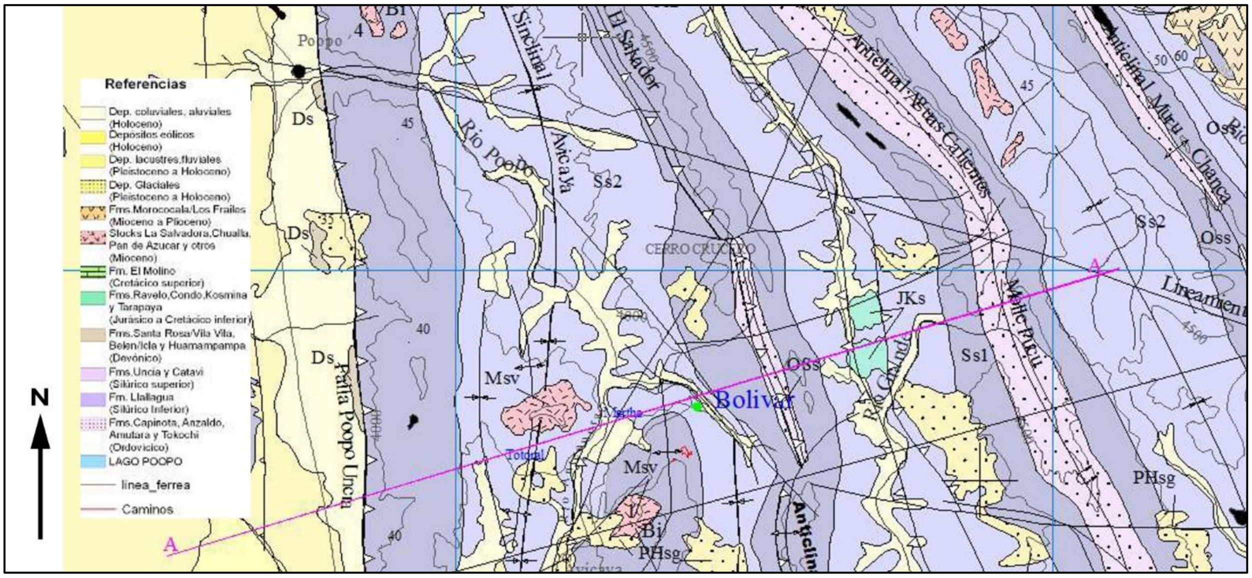
These stratigraphic sequences have a considerable thickness forming the Silurian formations, it is made up of fine materials with sands and conglomerates (Uncía case) with leads to have an idea of the behavior of the sea during the deposition of these materials, which correspond to stages of regressive and transgressive character.

Following the formation of the Silurian rocks, the sediments of the region were folded regionally during the Upper Paleozoic by compressive dominant tectonics (Hercynic Orogeny) and at the end of the Cretaceous and/or Lower Tertiary by the Andean Orogeny. In the Bolivar area, this Orogenic cycle ended with an intense Pliocenaean folding and tectonics of the region, giving rise to the presence of folds with very inclined dips.

The magmatic activity observed regionally, represented by the stocks of Sugar Loaf, China Chualla, Chualla Grande, etc., called "Andean Andesitic Inter-Andean Volcanism", plays an important role in the geological history as it constitutes the different Miocene-Pliocene age intrusions.

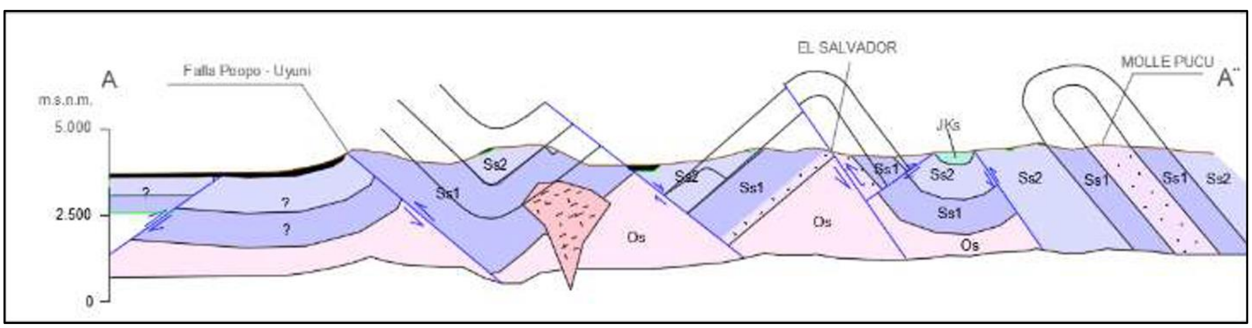
The geomorphological features presented by the study area are conditioned by the climatic events that occurred during the Pleistocene, in which glacial activity models the landscape, where glacial cirque and moraine can be observed and fluted surfaces. The presence of large alluvial plains and terraces that are observed in the western part of the area, are related to the existence of "Minchin Lake", of contemporary age to the Pleistocene glaciation. Recent Quaternary sediments were deposited in a discordant form on the folded and failed Silurian rocks.

Figure 7-8: Property Geology of Bolivar (Section A-A’)



Source: Glencore (2020)

Figure 7-9: Section A-A’ Property Geology of Bolivar



Source: Glencore (2020)

The Bolivar deposit is located in the Cañadón Antequera or Avicaya-Bolivar district about 85 km southeast of Oruro, together with the Martha, Totoral, and Avicaya deposits (Figure 7-10).

The district is underlain by the Silurian Llallagua and Uncía Formations that consist of thickly bedded turbidites and black shales, respectively. These are folded into the NW-striking El Salvador anticline and there are NW-trending thrust faults and NE-trending strike-slip faults. The felsic porphyry stocks of China Chualla, Chualla Grande, Pan de Azúcar, Pepito, and Chuallani. were intruded in the Miocene. These have narrow contact metamorphic aureoles, with tourmaline-rich hornfels and quartzites. There are also several porphyritic cupola-like bodies and dikes present in the tourmaline- and quartz-rich zones near the Chualla Grande stock. The stocks have not been dated but sericite from a vein selvedge at Avicaya was dated by K-Ar at: 20.5 ± 1.0 Ma, while fine grained, supergene alunite from Avicaya was dated at 6.7 ± 0.7 Ma, and fine-grained supergene jarosite from Bolivar was dated at 3.9 ± 0.7 Ma. Sugaki et al. (2003)

A 7 km x 2 km zone of mineralization extends northeast from the Chualla Grande stock with sericite-silica-tourmaline alteration and is terminated by a N- to NW-striking reverse fault system. Within this there is a well-developed metal zonation from proximal tin veins at Avicaya, Totoral and Martha (with coarse cassiterite, quartz, tourmaline, pyrrhotite, pyrite, and arsenopyrite); medial zinc-silver veins at Bolivar (with sphalerite, microscopic cassiterite, pyrite, jamesonite); and distal lead-antimony veins (with galena, stibnite, pyrite, sphalerite, arsenopyrite) (Sugaki et al., 1981b). The zoning is Sn to Zn-Ag to Pb-Sb. It is interpreted to be the result of lateral fluid flow from the porphyry stock from south to north, together with a thermal gradient from high to low temperature.

The Bolivar zinc-silver-tin deposit is located in a polymetallic zone, approximately 7 km northeast of the Chualla Grande porphyritic stock. A series of predominantly east-west and northeast trending veins up to 2,000 m long are hosted by Silurian shales, sandstones and quartzites. The veins vary in width between 0.40 m and 4.50 m. The Bolívar vein, which is one of the main veins, has an average width of 1.25m, with a dip of 50º to 75º with a strike of 30º to 50º and is Zn-Ag-Pb rich. The Pomabamba vein, which towards the SW shows a degeneration of zinc and lead and a considerable increase in silver due to the presence of silver sulphides, has approximate widths of 3.0 m to 5.00 m with a dip of 35º to 60º and a general heading from 60º to 70º. The Nané vein, which has an average width of between 0.50 m to 2.50 m, with a dip of 40º to 60º and strike of 50º, has significant Zn-Ag-Pb mineralization, although silver is reduced towards the NE. The veins have a length of up to 1,800 m for the combined Pomabamba, Nané and Bolívar composite vein. In addition, they are mined up to Level 400 (3,600 masl) and over a vertical distance of >600 m and are delineated by drilling to Level 620 (3,400 masl) for more than 1,000 m of vertical extent.

The mineralogy of the deposit is sphalerite, galena, cassiterite, jamesonite, pyrite, arsenopyrite and marcasite in a gangue of quartz. The Bolivar paragenesis is an early, low sulfidation mesothermal Zn assemblage of quartz-pyrite-Fe-rich sphalerite, with a later intermediate sulfidation epithermal Zn-Sn-Ag-Pb-Sb assemblage of sulfides and sulfosalts including low Fe sphalerite, microscopic cassiterite, and Pb-Sb sulfosalts along with jamesonite, frankeite, teallite, tetrahedrite, and late-stage galena-siderite-quartz.

The fluids from the mineralizing events generated physical-chemical exchange and reactions during mineral deposition. Alteration halos are observed mainly at the contact between the mineralized structures and the surrounding lithologies. With the silicification present mainly in the mineral structures or in the immediate caisson rock, while argillite and chlorite are abundant adjacent to the mineralized structures.

This district is typical of the Bolivian polymetallic vein-type deposits including a genetic relationship with a Miocene felsic intrusion, even though the deposit is sediment-hosted, fault control of the veins, zoned hydrothermal alteration, and a multiphase, zoned, polymetallic, and telescoped mineral paragenesis.

Figure 7-10: Geological Sketch Map of the Avicaya-Bolivar District

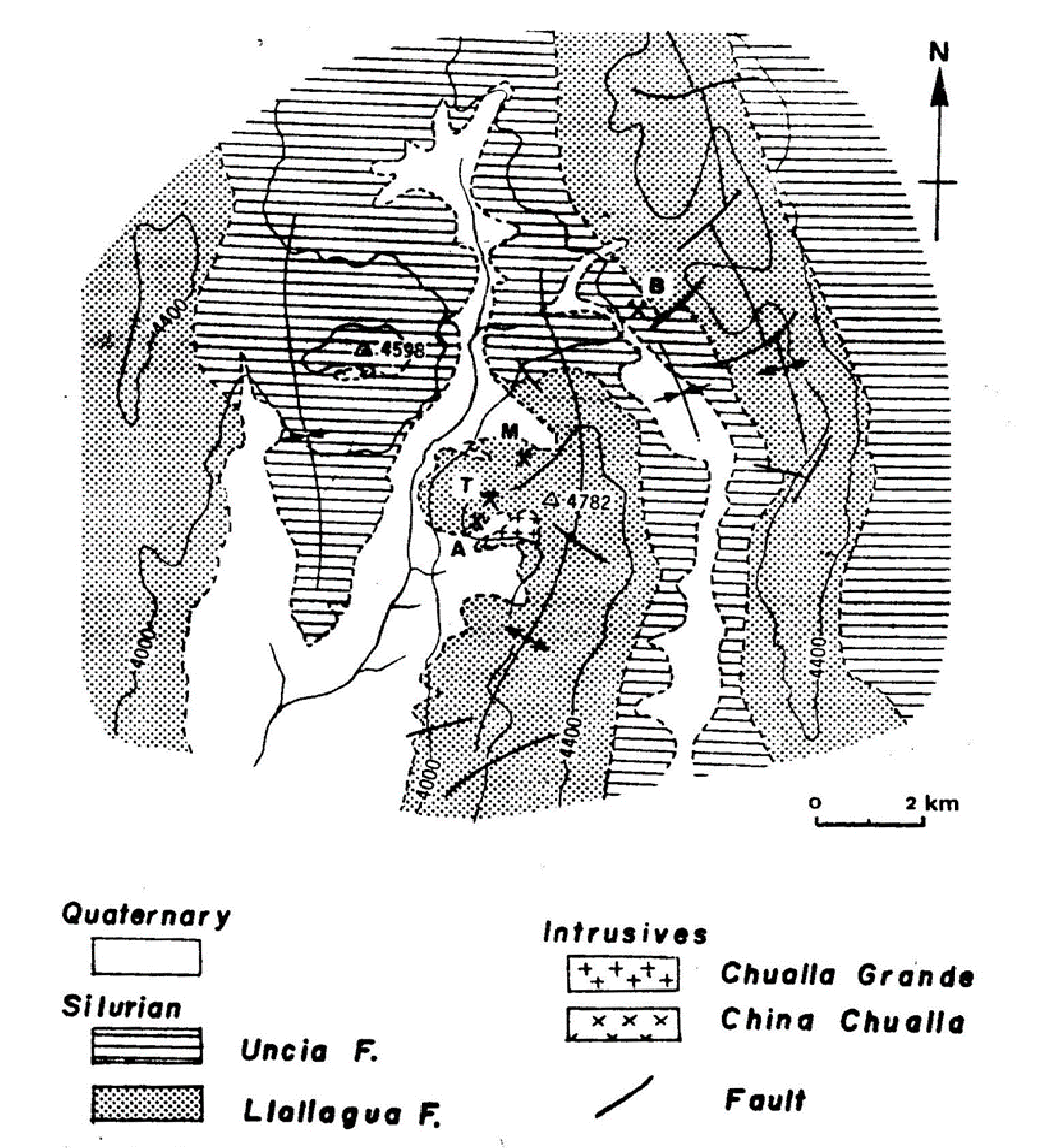
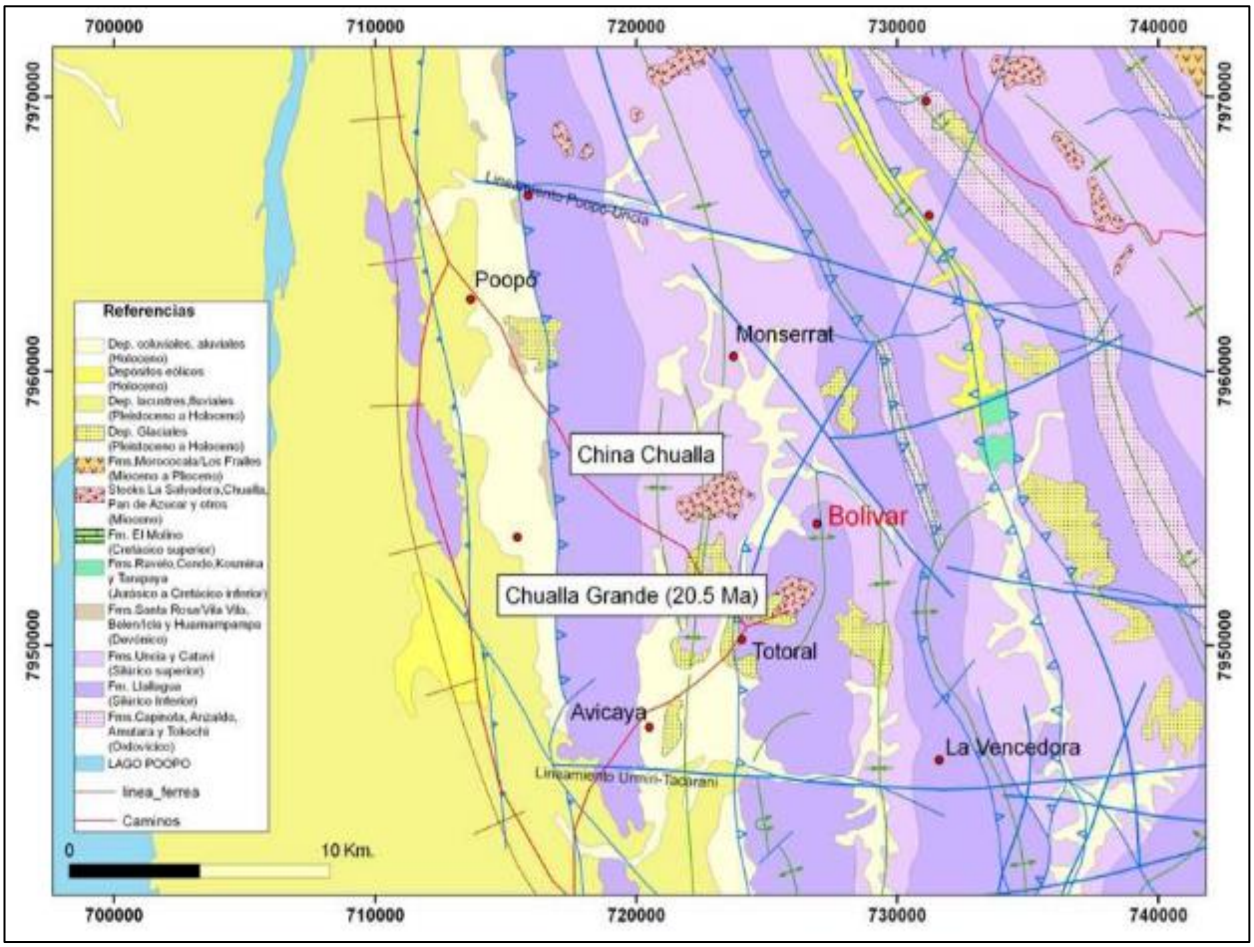


FIG. 1. GEOLOGICAL MAP OF THE AVICAYA AND BOLIVAR DISTRICT. (B) Bolivar mine, (M) Martha mine, (T) Totral mine, (A) Avicaya mine.

Source: Sugaki et al., (1981b)

Structurally this region is characterized by the presence of a series of subparallel folds of general course N 15 degrees W with anticlines and sinclines dislocated by the intrusions of the Chualla Stocks Grande and China Chualla, located 5 km SW and 6 km to the W of Bolivar respectively and by transverse faults (Figure 7-11). The deposit is located in the northern part of the Pazña – Antequera mineralized zone, where there are numerous mineral deposits related to the Chualla Grande and China stocks.

Figure 7-11: Structural Features and Local Geology



Source: Glencore (2020)

7.4 Mineralization

The Bolivar system is a network epigenetic hydrothermal base metal type veins and faults filled mineralization hosted within a variety of lithologies from volcanic tuffs to sedimentary packages. The main mineral assemblages are composed of sphalerite, marmatite, galena, silver-rich galena and silver sulfosalts. The resources are usually based on multiple structures containing several veins. The typical dimensions of these structures are ~500 m in length and ~450 m in depth with mineralization continuing to be open at depth with vein widths of between 0.2 m - 4.0 m.

The occurrence of a mineral deposit is related to two primordial aspects: 1) a hot intrusive body generating mineralizing fluids and 2) a pre-mineral geological structure receiving mineralization. The non-presence of an intrusive body very close to the deposit, makes one conclude that its formation is due to the influence of the Chualla Grande Stock, with minerals of higher temperature in its vicinity such as: 1) coarse cassiterite accompanied by quartz and tourmaline (at Totoral and Avicaya); 2) an intermediate or transitional zone with minerals of Fe-Sn (Buenos Aires, San Francisco, Venus) and; 3) an external zone where Bolívar is located with minerals of Zn-Pb-Ag-Sn.

The Pomabamba mineralization corridor has a simplified mineral paragenesis of sphalerite – pyrite – sulfosalt type of Ag-Pb-Sn that differs from the Rosario mineralization corridor whose paragenesis is sphalerite – galena – pyrite – siderite. This allows one to conclude that there is a lateral zone in the mineralization that corresponds to the central part of the deposit termed the Pomabamba corridor.

The Pomabamba vein has its own characteristics longitudinally, with a predominance of marmatite-pyrite mineralization in its northern sector and abundant pyrite in the south. Vertically and at depth the pyrite becomes more dominant and the marmatite subordinate. A remarkable aspect is that pyrite is associated or is intergrown with Ag minerals mainly to the south. Another aspect to note is that, at higher levels, there is a band of brown sphalerite that can be distinguished within the marmatite-pyrite association, whose longitudinal inlay had no preferential location.

The mineralogical characteristics of the Nané vein differ from that of Pomabamba, with predominant brown sphalerite, and galena sulfosalts in smaller proportions and generally as much sphalerite and pyrite with subordinate marmatite at depth.

The Bolivar vein, which is an extension in the north direction of the Nané, presents as sphalerite (brown), sulfosalts of Pb-Sb-Ag-Sn, marmatite and pyrite, which is enriched in Ag content as a result, characteristic of its south and center sector. However, in the north, the pyrite becomes predominant and the sphalerite-sulfosalts subordinate.

The polymetallic mineralization in the Bolivar deposit according to the paragenesis (Figure 7-12) concludes that it would have formed in different phases or mineralization events with a clear telescopic deposition:

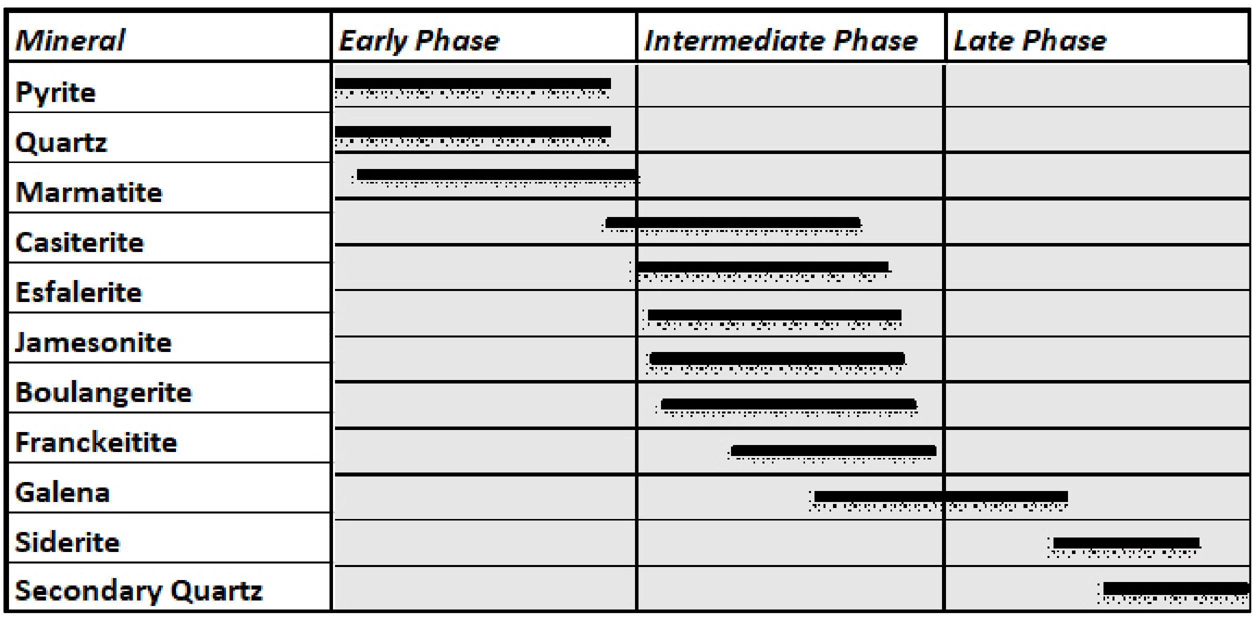
- An early phase would comprise the mineral association of quartz – pyrite – sphalerite (of the marmatite type);

- Sphalerite (brown) – jamesonite – boulangerite – needle-type cassiterite – galena – franckeitite would correspond to the intermediate phase of mineralization; and

- Finally, the second-generation carbonates and quartz corresponding to the late phase mineralization.

The composition and events of the mineralization illustrate that the deposit was formed from hydrothermal solutions under intermediate temperature conditions of 250º - 300ºC, and that it classifies as a meso- to epithermal hydrothermal deposit.

Figure 7-12: Paragenesis Bolivar Site

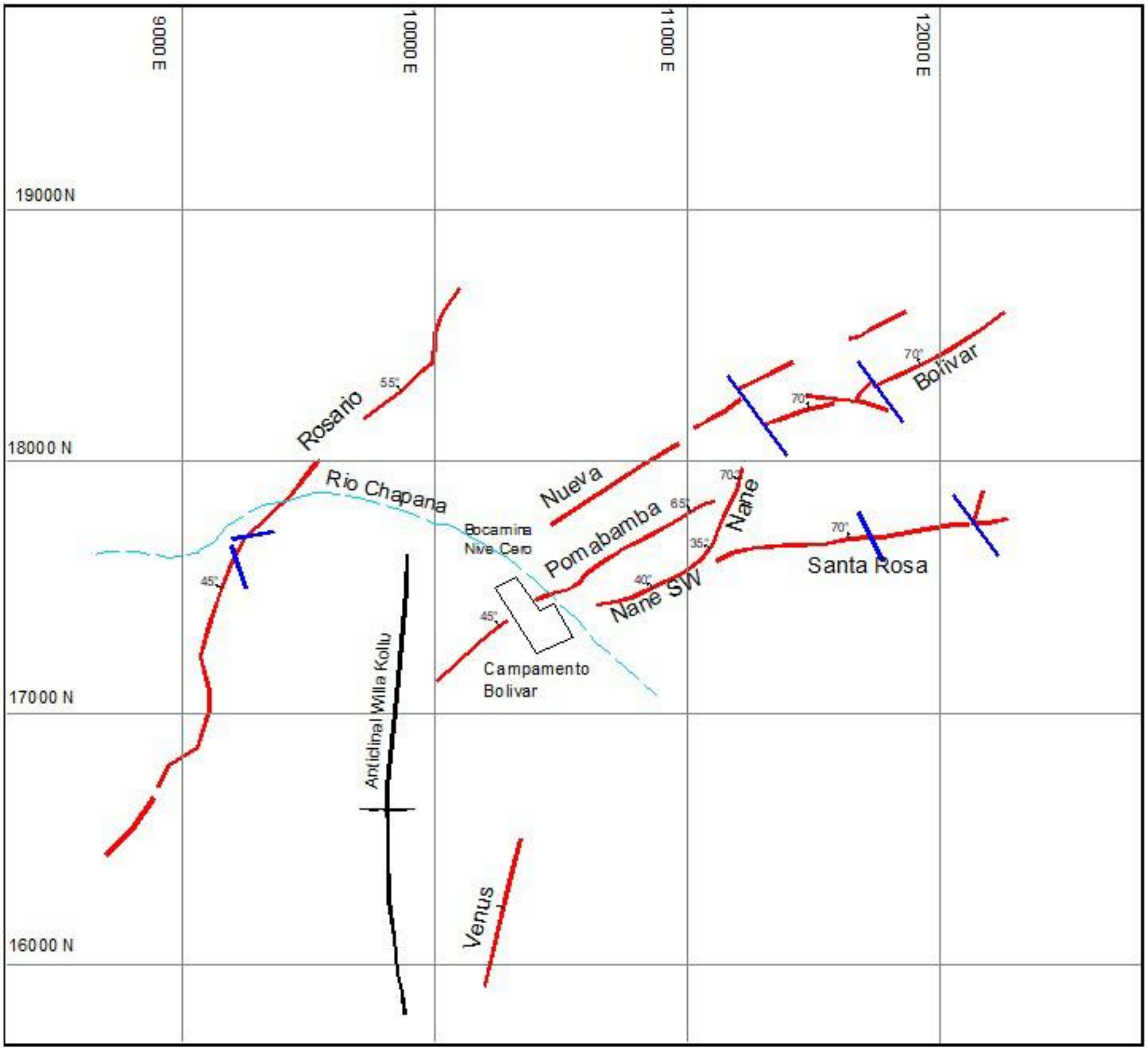


Source: Glencore (2020)

7.5 Bolivar Veins

The Bolivar Deposit is currently composed of seventeen (17) mineralized structures (Figure 7-13) with varying geometric, structural and mineralogical characteristics. These veins have been identified and developed for more than 590 m at Levels 0 and -380.

Figure 7-13: Bolivar Veins



Source: Glencore (2020)

7.5.1 3000 Veta Pomabamba (PBA)

The Pomabamba vein has been identified and developed for 590 m at Level 0 and Level -380. Diamond drilling confirms the vertical extension of the Veta Pomabamba up to 3,432 masl (200 m below Level -340), having a total vertical extension of 650 m. This mineral structure has a general strike of N 60°-70° E, with dips ranging from 35° to 60° NW in the extreme southern part. The average width of this structure varies between 0.50 m to 3.00 m, although at higher levels it exceeds 5.00 m in thickness.

This vein is a well-defined structure in upper levels (-300 upwards) but is more irregular in the lower levels. It has a tabular geometry and has fairly regular mineralization containing abundant dark sphalerite (marmatite) but predominant pyrite. In addition, the vein is filled with clear sphalerite, lead sulfosalts, antimony, which has likely been deposited in a later phase of mineralization, in abundance at levels above -300. The presence of silver sulfosalts causes a significant increase in silver towards the southwest. Historic documentation mentions the presence of cassiterite and others at the upper levels. Zinc mineralization is significant in the upper levels while there is a marked decrease towards the lower levels and also from north to south. Silver and lead show a correlation to zinc, illustrating vertical decrease concentrations. Horizontally from south to north, this characteristic is not consistent.

7.5.2 3010 Veta Nané (NAN)

Veta Nané has length of between 200 m to 400 m from Level 0 to Level -580. It is located between the Veins Pomabamba to the southwest and Bolívar to the northeast. It is located in an area of intense fracturing near the joint with Veta Pomabamba with the mineralization being irregularly distributed consisting of sphalerite, marmatite, stannite, cassiterite, jamesonite, zinckenite, boulangerite, pyrite, quartz and frankeite. The presence of tin minerals is restricted to the upper levels.

The overall strike of this structure is N 40°-60° E and its average dip of 50° to the northwest. The vein has an average width that varies from 0.50 m to 2.50 m and diamond drilling confirms the vertical extension of the Nané Vein to 3,415 masl (273 m below the Sublevel -330), having a total vertical extension of approximately 700 m.

7.5.3 3020 Veta Bolivar (BOL)

Veta Bolívar extends horizontally for approximately 1,000 m of development in the upper levels and identified with drilling for up to 120 m below the last Level -340. The general strike of this structure is N 40° E, with dips that vary between 60 and 75 to the northwest, the widths vary between 0.50 and 2.00 m which thins significantly to the north. The vertical development of this structure up to the current development level is 650 m.

The mineralogy of the Bolivar vein is variable according to the area, but in general it occurs with dark sphalerite (marmatite), light sphalerite accompanied by cassiterite, galena, boulangerite, jamesonite, pyrite, quartz, arsenopyrite and siderite. In the southwest it is strongly mineralized with frankeite and jamesonite with high silver values. Cassiterite is preferentially associated with quartz and sphalerite, as individual crystals form as 15 µm needles. Silver and lead concentrations are regularly distributed both horizontally and vertically in the southern section of the vein, while they are reduced toward the northern section of the vein.

This structure is dislocated transversely by two faults called Rica and Salvadora with offsets not exceeding 25 m.

7.5.4 3030 Veta Ramo Bolivar

The Veta Ramo Bolivar vein is recognized from levels -140 to -300 as a splay that is detached from the main Bolivar vein joining it at about 15 m below the last recognized level. Its width can vary from 0.60 to 3.00 m.

Mineralogically it is predominantly sphalerite accompanied by significant sulfosalts, which results in high concentration of silver particularly toward the northeast.

7.5.5 3031 Veta Ramo Bolívar Central (RBC)

The Veta Ramo Bolivar Central is located between the Nané and Bolivar SW veins, in an area of intense fracturing near the joint with Bolivar vein. The mineralization is irregularly distributed in the developed levels and is composed of sphalerite, marmatite, pyrite, and quartz. The thickness ranges from 0. 2 to 1.2 m.

7.5.6 3032 Veta Rama (RMA)

The Veta Rama has irregular width and is located on the western flank of the Ramo Bolivar vein as a splay, it has been identified on levels -215 to -260 extending approximately 120 m. It is mineralogically comprised of marmatite, pyrite along with minor sulfosalts.

7.5.7 3033 Veta Regina (REG)

Veta Regina developed on levels -260 and -270, is located on the roof of the Bolivar vein, has a high zinc and silver content, has thicknesses varying from 0.20 to 3.0 m and extends horizontally for approximately 90 m. The Regina vein is composed of sphalerite and sulfosalts such as jamesonite, frankeite resulting in high silver values.

7.5.8 3034 Veta Branch One (UBI)

The Veta Branch One has been developed on levels -230 and -245 extending approximately 50 m and is composed mineralogically of sphalerite and trace sulfosalts. It has widths ranging from 0.50 to 1.10 m and is located on the roof of the Bolivar vein between Bolivar and the Ramo Bolívar.

7.5.9 3040 Veta Bolivar SW Ramo Nané (BSW RNA)

The Veta Bolivar SW Ramo Nané has a general strike of N 45° E and dips of 55° – 65° NW. It has a length of 350 m of development at level -125 and extends 375 m to Level -380 (3,635 masl). The average width of this vein is approximately 1.50 m.

Its mineralogy is characterized by the presence of sphalerite, marmatite, sulfosalts such as jamesonite, pyrite and quartz.

This vein has a tabular geometry in sections where it separates from the Nané vein and joins to the north with Bolívar vein. It brecciated in some areas while being massive in others. In the south it joins again to the Nané vein, where it has been named Bolivar SW beyond this point.

7.5.10 3050 Veta Nueva (NUE)

Veta Nueva is a mineralized structure that is located on the roof of the Veta Pomabamba having development of 180 m on level -170 and sub level -185. It has been recognized at depth through diamond drilling extending for 500 m in length and vertically for 300 m from level -170. It has a variable width from 0.30 m to 1.20 m. The overall strike is N 40°E and dipping 55° – 60° NW.

This ore-filled fault structure is mineralogically made up of marmatite, pyrite, sphalerite, siderite, quartz, galena, argentite and alunite. The presence of mylonite is present up to 0.20 m in both the ceiling and floor.

7.5.11 3060 Veta Nané Southwest (NSW)

The general strike of the Veta Nané Southwest is approximately N 60° E with dips ranging from 35° to 55° NW. The average width of the structure is 2.40 m. At Level 0 it extends 550 m however the length decreases to depth to the point at which it joins with the Pomabamaba vein (Sublevel -330) where it reduces to 60 m.

The mineral distribution is irregular and is a brecciated structure with massive sections, which has bands of sulfosalts. Mineralogically it is composed of sphalerite, marmatite (near the Pomabamba vein), sulfosalts (jamesonite, zinckenite and boulangerite), pyrite and quartz.

7.5.12 3090 Veta Rosario (ROS)

Veta Rosario is located 1 km to the west of Mina Bolívar, in the vicinity of the town of Surumi, in the sectors called Hope and Abundance. This structure has a variable general direction, from N 20° E to N 0° E in the northeast sector, with dips ranging between 45° – 60° NW. The average width of the vein varies from 0.50 m to 2.50 m.

The structure, in surface emerges 2.2 km, and in Level 0 is recognized for 750 m to the north and 200 m to the south, while drilling has identified it horizontally for over 1,500 m. The vertical continuity of this structure is up to 3,770 m above sea level (250 m below Level 0). Currently, there is development of the Veta Rosario at Level -125 (3,866 masl) with an extension of approximately 350 m.

Mineralogically, it consists of a brecciated structure with marmatite, pyrite, quartz, galena, sphalerite, siderite and traces of sulfosalts. The distribution of mineralization along the vein is irregular, with higher zinc and silver in the central part and higher concentrations of silver and lead towards the northeast, while towards the southwest the presence of zinc is predominant.

7.5.13 3230 Veta Negrita (NEG)

The Veta Negrita is the most recently defined structure in the deposit being discovered in 2010. It is a very irregular structure both in strike and thickness and dipping is also irregular changing direction in several sections.

This structure is recognized from Level -125 with extending 67 m towards the southwest. It also has been developed at Sublevels -140, -155 and-170, for lengths of up to 120 m. Continuity has not yet been determined. Striking N80°E to S80°W, with dips that oscillate between 60°-70° NW, varying to the SE. This structure is brecciated throughout its length and is located in shales with intercalations of thin sandstone beds. Mineralogy includes marmatite, sphalerite, silver sulfosalts, pyrite, with scarce galena and quartz.

The width of the structure is very variable from 0.30 to 1.30 m to as high as 3.00 m. It should be noted that is characterized by significantly high zinc, making this an important structure despite the irregular character both horizontal and vertically.

7.5.14 3101 Veta Santa Rosa 3 (SR3)

Veta Santa Rosa 3 has irregular mineralization, general strike N 60° E, average dip of 70° NW, and average width of 1.00 m to 2.00 m. The developed length is 100 m in all levels worked, and its northern extension is defined by this structure and less mineralization. It extends 300 m defined by drilling.

Santa Rosa 3 mineralogically is composed of fine-grained sphalerite, wurtzite, cassiterite, sulfosalts (jamesonite, zinkenite and boulangerite) and quartz.

7.5.15 3102 Veta Santa Rosa 4 (SR4)

The average width of this structure varies from 0.50 m to 1.10 m, the average strike is N 80° E and the average dip of 68°NE, it has been recognized in a length of less than 150 m.

As with Santa Rosa 3 it is mineralogically composed of fine-grained sphalerite, wurtzite, cassiterite, sulfosalts (jamesonite, zinkenite and boulangerite) and quartz.

7.5.16 3070 Veta Nané Extension (EXN)

This vein has a general E-W heading, an inclination that varies from 55° to 75°NW. It is bounded by the Pomabamba vein and Nané to the SW and Nané SW to the NE.

The mineralization is regular is made up mostly of sphalerite, wurtzite, stannine, cassiterite, jamesonite, zinckenite, boulangerite, pyrite, quartz, chalcopyrite and siderite. The average width of this structure is 1.90 m.

Towards the Level -300 is defined the vertical joint with Pomabamba and Nané SW veins delimiting it.

7.5.17 3041 Veta Karen (KRN)

The Karen Vein is located to the southwest of the Bolivar SW vein, in an area of intense fracturing with faults that cause displacements of the vein of up to 10.00m. The mineralization is irregularly distributed in the developed levels (Level -380, Sublevel -388, Sublevel -400 and Sublevel -408) and is composed of sphalerite, marmatite, pyrite and quartz.

The thickness varying between 0.30 and 2.50 m. Developed length of up to 70 m recognized.

8 DEPOSIT TYPES

The most important ore deposits of the Eastern Cordillera are polymetallic hydrothermal deposits mined principally for Sn, W, Ag and Zn, with sub-product Pb, Cu, Bi, Au and Sb. They are related to stocks, domes and volcanic rocks of Middle and Late Miocene age (22 to 4 Ma). Mineralization occurs in veins, fracture swarms, disseminations and breccias. The deposits of the Eastern Cordillera are epithermal vein and disseminated systems of Au, Ag, Pb, Sb, as that have been telescoped on to higher temperature mesothermal Sn-W veins and, in some cases, porphyry Sn deposits. The "telescoping" is a characteristic of these deposits and is the product of the collapse of a hydrothermal system, whereby younger lower temperature fluids overprint the alteration and mineralization developed by older higher temperature fluids. The systems show a fluid evolution from a high temperature, low sulfidation state to intermediate sulfidation epithermal and high sulfidation epithermal.

A typical example is the Cerro Rico where high temperature veins at depth, with a low sulfidation assemblage of cassiterite, wolframite, pyrite, arsenopyrite, bismuthinite and minor pyrrhotite (the main tin-tungsten ore stage), are overprinted at higher levels by an intermediate sulfidation epithermal assemblage of Ag-Pb-Sb sulfosalts (the main silver ore stage), with disseminated high sulfidation epithermal silver mineralization in the upper part of the system (a major silver resource).

These polymetallic deposits have been described as Bolivian Polymetallic Vein Deposits by the U.S. Geological Survey with the following characteristics (Ludington et al., 1992; Redwood, 1993; Sillitoe et al., 1975):

1. Lithological Control. Paleozoic, Mesozoic and Cenozoic sedimentary rocks and metasediments;

2. Structural Control. Hinge zones of regional anticlines;

3. Subvolcanic Intrusions. Spatially and genetically related to stocks and volcanic rocks with 60-70 % SiO_2, clusters of dikes and/or porphyritic domes of rhyolite, dacite, rhyodacite, or quartz latitite composition with alkaline tendencies. The mineralization can occur within the stocks and domes, in volcanic rocks (e.g., Porco, Caballo Blanco), or in sedimentary rocks distal to stocks (e.g., Bolivar) or inferred to be related to buried stocks (e.g., Huanuni);

4. Style of Mineralization. Disseminated, parallel veins, veinlets, fracture swarms, breccias;

5. Ore Minerals. Pyrite, marcasite, pyrrhotite, sphalerite, galena, cassiterite, arsenopyrite, chalcopyrite, stibnite, stannite, teallite, tetrahedrite, tennantite, wolframite, bismuth, bismuthinite, argentite, gold, and Ag-Sb-sulphosalts (freibergite, andorite), Pb-Sb-sulfosalts (zinkenite, boulangerite, jamesonite), Pb-Sn-Sb-sulfosalts (franckeite, cylindrite), and Bi sulfosalts. Telescoping of intermediate sulphidation epithermal mineralization of Au, Ag, Pb, Sb, As, etc. on to higher temperature mesothermal, low sulphidation Sn-W mineralization is characteristic;

6. Gangue Minerals. Quartz, barite, and Mn carbonate. There is a transition upward from massive sulfides, to quartz, quartz-barite, and barite-chalcedony towards the upper parts of the deposits; and

7. Hydrothermal Alteration. Sericitic (sericite-quartz-pyrite) often with tourmaline in the central part and zoned outward to argillic and propylitic alteration. The upper zones have advanced argillic lithocaps with alunite, residual vuggy silica and silicification. Breccias are common.

The Bolivar deposit is considered a “Bolivian-type” polymetallic deposit which has the primary reference and quoted as described in Arce-Burgao (2009). The Bolivian vein deposits can be identified into three subgroups:

1. Deposits associated with tin porphyries;

2. Deposits associated with volcanic domes and sub volcanic stocks; and

3. Deposits associated with sedimentary rocks. This classification is based mainly on host rock lithology.

One of the most common types of mineralization in the country, the Bolivar-type is the product of widespread hydrothermal activity between 22 Ma and 4 Ma. The deposits are characterized by a polymetallic signature which is usually telescoped coexistence of low and high temperature minerals and are spatially related to epi-zonal and meso-zonal intrusions. Early stages of mineralization are high temperature, high salinity, and high pressure, indicative of great formations depths. Several overlapping stages of lower temperature events, due to later igneous events and supergene process is during evolution of the Andes, occurred between 11 and 4 Ma. Several of these deposits are classified as giant, such as Sierra Rico de Potosi and Llallagua or “world class” such as Oruro and Huanumi.

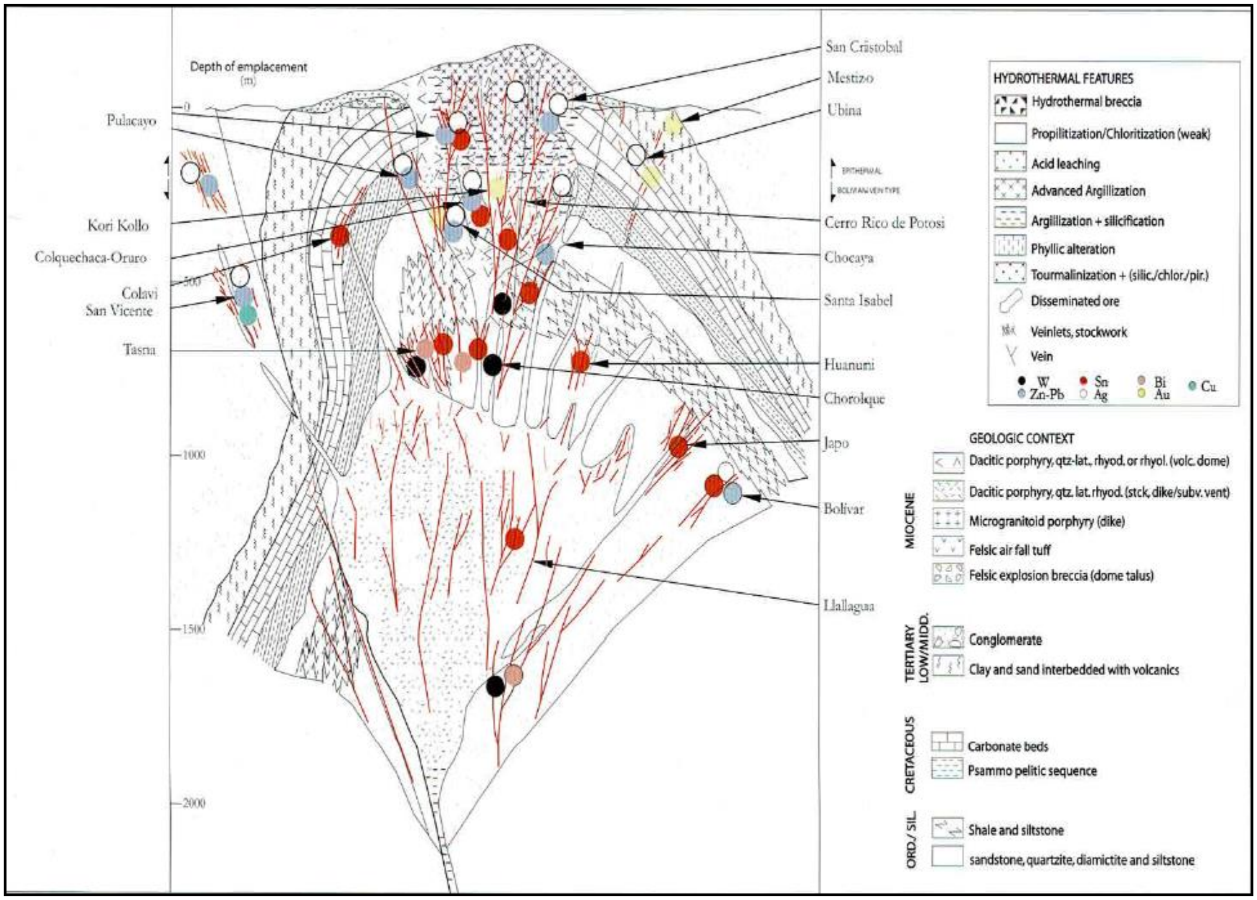
On a district scale, deposits from the different subgroups may sometimes be spatially and or genetically associated. The style of mineralization includes groups of veins, subsidiary vane swarms, veinlets, stockwork, and dissemination mineralization. The veins are hosted in a variety of host rocks that include Paleozoic sedimentary and metasedimentary rocks, meso-zonal and epi-zonal stocks, and syn-kinematic flows, dikes and volcanic domes that are generally of rhyolitic, dacitic, and acidic compositions. In general, the deposits have similar origins although they differ with respect to metal signatures and/or fluid geochemistry.

The main metallic minerals, although not necessarily present in every deposit, are cassiterite, sphalerite, galena, pyrite, pyrrhotite, arsenopyrite, chalcopyrite, stibnite, stannite, tetrahedrite, wolframite, native bismuth, bismuthinite, argentite, native gold, and complex sulphosalts such as teallite, franckeite, and cylindiite. The main economical exploitable minerals are tin and silver, with less important tungsten, bismuth, an antimony.

The temperatures of homogenization and the salinities obtained from fluid inclusions in quartz and in sphalerite, and less commonly in cassiderite and barite, average 300 degrees C and 20% weight equivalent NaCl, respectively. Turneaure (1970), identified an early boiling during mineral deposition examining fluid inclusions, which was confirmed by later studies that showed boiling occurred intermittently during all stages of mineral deposition. (Arce Burgoa and Nambu 1989).

The Bolivar zinc-tin deposit is located 90 km southeast of Oruro, in the Canadon Antequera district (Figure 8-1). Mineralogy of the deposit includes sphalerite, galena, cassiterite, jamesonite, pyrite, arsenopyrite and marcasite in a dominant gangue of quartz.

Figure 8-1: Conceptual Model of Bolivian Polymetallic Vein Type Deposits (modif. From Heuschmidt, 2000)



Source: Heuschmidt (2000)

9 EXPLORATION

There has not been any exploration performed on behalf of Santacruz.

10 DRILLING

10.1 Drilling Summary

The Bolivar Mine is an “advanced property” and has been in continuous production since 1993. Glencore and subsequently Santacruz Silver has performed exploration and resource expansion drilling of 146 surface and underground drillholes at the Bolivar Mine since 2000 totalling 49,173.5 m.

As of January 2023, Santacruz had drilled approximately 8 holes for a total of 5,410 m at the Bolivar Mine since the acquisition from Glencore. Table 10-1 summarizes the historical drilling on the property with the Santacruz drilling highlighted in **blue**.

Table 10-1: Bolivar Drilling Programs from 2000 through 2021

Phase	Year	Hole ID	Total (m)	Core Size	Target	Total Program Budget ($US)
I	2000	DDH_AB_12s - DDH_AB_20s, DDH_ES_01s - DDH_ES_11s	4,705	HQ/NQ/BQ	vn Rosario	447,013
II	2001	DDH_AB_21s - DDH_AB_28s	3,491	NQ/BQ	vn Rosario	331,636
III	2005	DDH_N_60s - DDH_N_62s, DDH_PB_30s - DDH_PB_57s, DDH_R_29s - DDH_R_48s, DDH_SR_45i - DDH_SR_60i	9,948	HQ/NQ/BQ	vn: Nané, Rosario, Santa Rosa	1,243,475
IV	2006-2007	DDH_B_66i - DDH_B_88i, DDH_N_63s - DDH_N_68s, DDH_Nu_70s - DDH_Nu_91s, DDH_PB_77s - DDH_PB_92s, DDH_SR_64i	13,372	HQ/NQ/BQ	vn: Bolivar, Nané, Nueva, Pomabamba, Santa rosa	1,671,531
V	2011	DDH_BLV_NU_01s - DDH_BLV_NU_03s, DDH_BLV_PBA_01s - DDH:BLV_PBA_04s	2,814	HQ/NQ	vn: Nueva, Pomabamba	382,643
VI	2012	DDH_BLV_PBA_05s- DDH:BLV_PBA_10s	2,349	HQ/NQ	vn: Pomabamba	317,102

Phase	Year	Hole ID	Total (m)	Core Size	Target	Total Program Budget ($US)
VII	2014	DDH_BLV_BOL_11i - DDH_BLV_BOL_19i, DDH-BLV_ROS_12s - DDH_BLV_ROS_33s	4,689	HQ/NQ	vn: Bolivar, Rosario	609,570
VIII	2017	DDH_BLV_NU_34s - DDH_BLV_NU_37s	1,519	HQ/NQ	vn: Nueva	226,991
IX	2018	DDH_BLV_BOL_20i - DDH_BLV_BOL_23i, DDH-BLV_NU_38i - DDH_BLV_NU_39i	877	HQ/NQ	vn: Bolivar, Nueva	736,170
X	**2021**	**DDH_BLV_BOL_23s-DDH_BLV_BOL_26s, DDH-BLV_NAN_69s-DDH_BLV_NAN_72s**	**5,410**	**HQ/NQ**	**vn: Bolivar, Nané**	**661,172**
Total			**49,173.5**			**6,627,303**

The drilling has been primarily focused upon the extension of the veins to depth particularly for definition and delineation of inferred resources. Figure 10-1 shows a plan view of drillhole locations along with the underground channel sample data. Figure 10-2 and Figure 10-3 shows representative section views of the drilling along with channel sample data and topography.

Figure 10-1: Plan View of Drillhole Locations at the Central Area

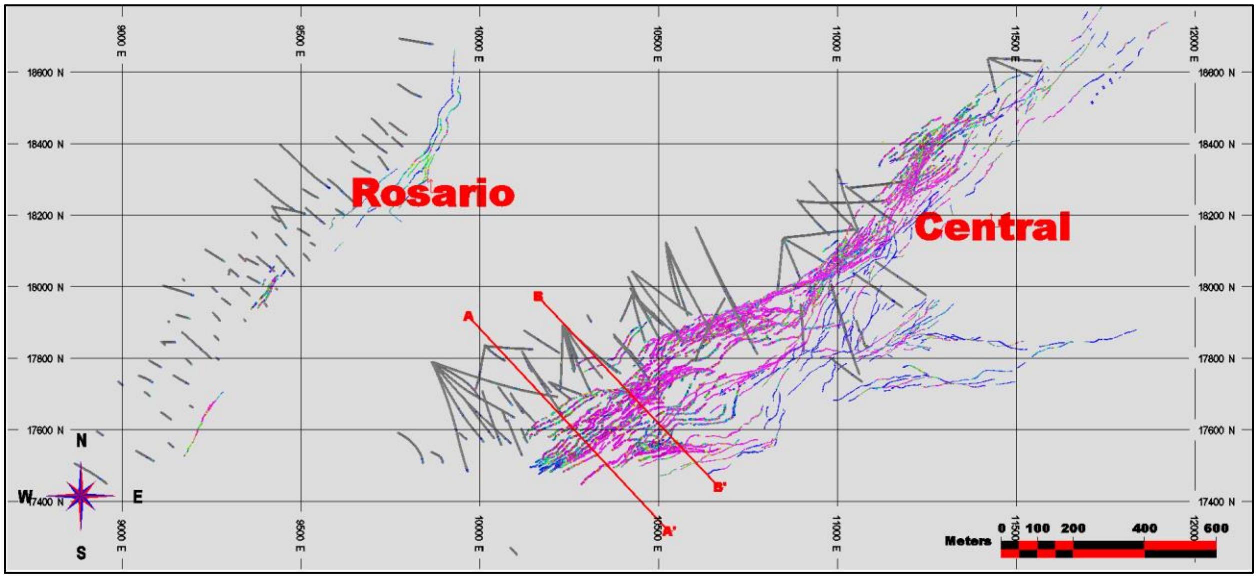


Figure 10-2: Section View A-A' (azimuth 230°)

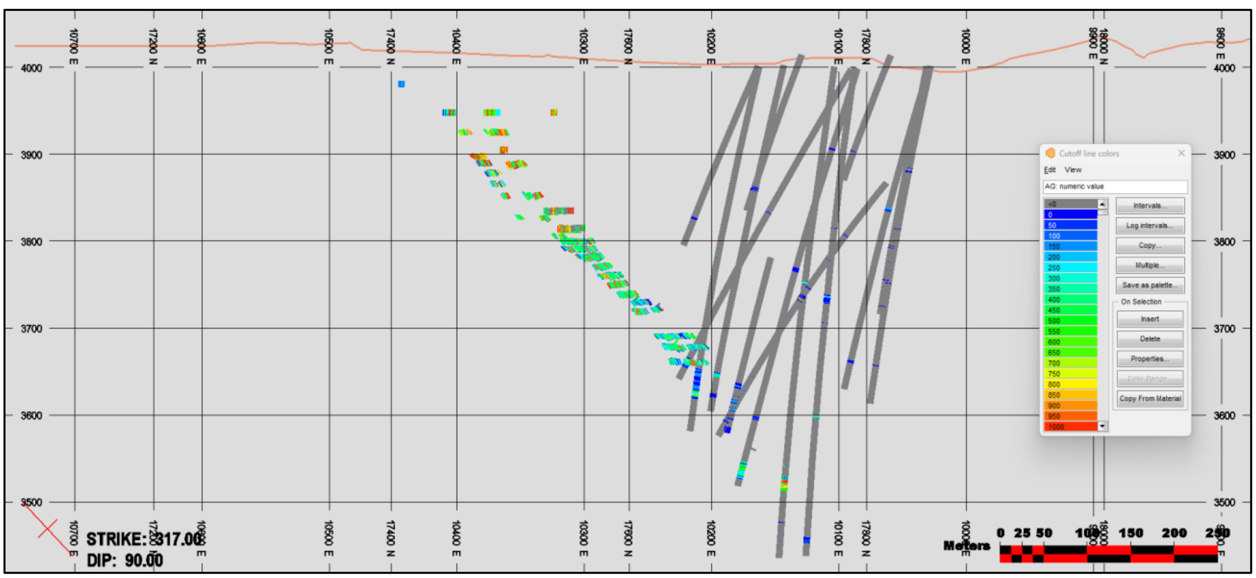
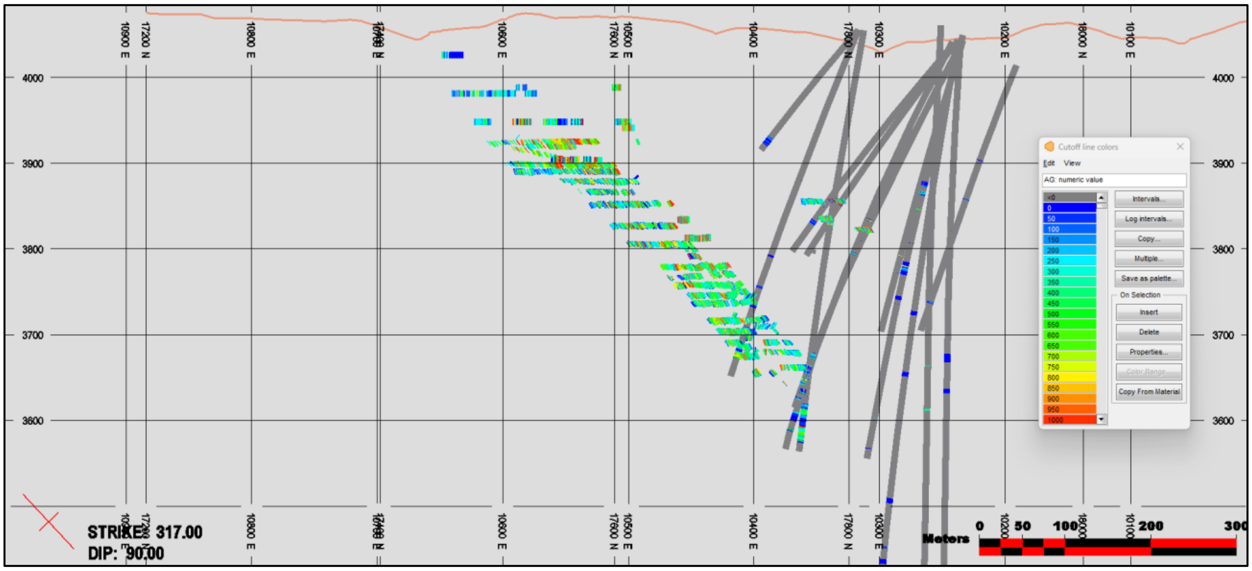


Figure 10-3: Section View B-B' (azimuth 230°)



10.2 Drilling Programs

Drills were operated by Maldonado Exploraciones of La Paz, Bolivia and Geodrill S.A. of La Serena, Chile. The surface and underground drilling was performed by drilling larger diameter HQ core at the early stage of the hole and reduced to NQ size and BQ size if drilling conditions became difficult.

Drillhole collar surveys were completed using a differential GPS (UTM WGS-84) and the collars of the underground holes are surveyed in using total station by company survey staff. Downhole surveys were derived using either Tropary, Flexit or Reflex depending on the year and the drilling contractor. Early drilling between 2000-2007 in Phases I – IV performed by Maldonado Exploraciones utilized Tropary instrumentation while subsequent drilling by the same contractor in Phases VII – X transitioned to using Reflex EZ-Shot. The drilling performed by Geodrill in 2011 – 2012 in Phases V-VI used Flexit downhole survey equipment.

The details for the surface and underground drilling program for the Bolivar Mine from 2000 to 2023 are summarized in Table 10-2.

Table 10-2: Bolivar Drilling Details from 2000 through January 2023

Contractor/Company	Phase	Holes Drilled	Meters Drilled	Downhole Survey Instrument
Surface				
Maldonado Exploraciones	I	20	4,705.4	Trópary
Maldonado Exploraciones	II	8	3,490.9	Trópary
Maldonado Exploraciones	III	27	8,346.85	Trópary
Maldonado Exploraciones	IV	25	10,984.1	Trópary
Geodrill S.A.	V	7	2,813.55	Flexit
Geodrill S.A.	VI	6	2,348.9	Flexit
Maldonado Exploraciones	VII	19	3,620	Reflex
Maldonado Exploraciones	VIII	4	1,519	Reflex
Maldonado Exploraciones	X	8	5,409.7	Reflex
Underground				
Maldonado Exploraciones	III	7	1,600.95	Trópary
Maldonado Exploraciones	IV	5	2,388.15	Trópary
Maldonado Exploraciones	VII	4	1,069	Reflex
Maldonado Exploraciones	IX	6	877	Reflex

Prior to 2010, downhole survey measurements were taken every 50 m however since then, based on recommendations, the frequency was increased every 25 m. Survey results were corrected for magnetic declination, however, the existence of pyrrhotite occasionally causes downhole survey anomalies that require mitigation. These are identified by the geologist during the survey measurement process and corrected by taking another survey measurement above or below the point giving the faulty readings.

Prior to commencement of drilling, the exploration geology supervisor set out the number of runs needed to reach total depth using steel bars and the blocks to be inserted by the driller into the core boxes at the appropriate depth delineated using permanent marker. Unless issues are encountered, the standard drill run length is 3 m. Then the exploration geology supervisor verifies this process by counting the number of steel bars introduced in the hole against the remaining steel bars left to complete total length of hole. Completed core is placed in wooden core boxes which are covered by wooden lids and secured with metal nails prior to being transported by mine staff from drill site to core logging facility.

For underground drillholes, orientations are marked before drill enters to drill site area, with the locations being measured using total station. The orientation of the drillhole is painted on both walls of the drift by the exploration geologist to insure correct alignment and positioning of the drill. Once the equipment mobilized and installed, the drill is leveled, and the direction is set. Finally, the dip is checked with a clinometer or compass.

Core recoveries were high, and by utilizing several drill core sizes, Glencore and Santacruz were able to ensure drillhole target completion. The majority of drillholes were drilled perpendicular to the strike and dip of the veining and therefore significantly represent true thickness of the veining.

There are no known drilling or core recovery factors that could materially impact the accuracy of these results.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Drillhole and Sub-Surface Sampling and Security

As reported in Section 10 Drilling, the surface and sub-surface diamond drilling was performed primarily by Maldonado Exploraciones and with GeoDrill S.A. performing drilling services in 2011-2012. The surface diamond drilling is utilized primarily for resource expansion and delineation identify extensions of structures and specifically to define inferred resources. However, the sub-surface drift and slope development sampling is the primary and significant data source for defining and estimating resources which is performed by Santacruz geological staff at the Bolivar Mine.

Sampling methods and procedures are consistent including drill core handling, sample collection, chain-of-custody and security in addition to assay preparation, assay analysis and QA/QC procedures are consistent for Bolivar, Caballo Balance and Porco.

The secure, sealed core and channel samples are delivered by Santacruz mine staff for analysis to the ISO Certified (**NB/ISO/IEC 17025: 2018**) Don Diego assay laboratory which is located within the Don Diego mill and processing complex. The Don Diego Complex including the assay laboratory is owned and operated by the Issuer, Santacruz Silver. All samples undergo both assay preparation and assaying at the Don Diego laboratory which also employs industry accepted QA/QC programs.

All analytical results are entered and reside upon the centralized database called LIMS Laboratory Information Management System which is the responsibility and under the supervision of the Don Deigo laboratory staff. The assay information is provided to geological staff via live, non-read-write access for import into the industry recognized geological modelling and estimation software systems such as LeapFrog™ and Datamine™.

Sample rejects and remaining half-core is stored in a secure location and labelled for access and retrieval. These facilities are fully controlled by perimeter fencing and security on the property.

11.1.1 Drill Core Logging, Photography, Sampling and Security

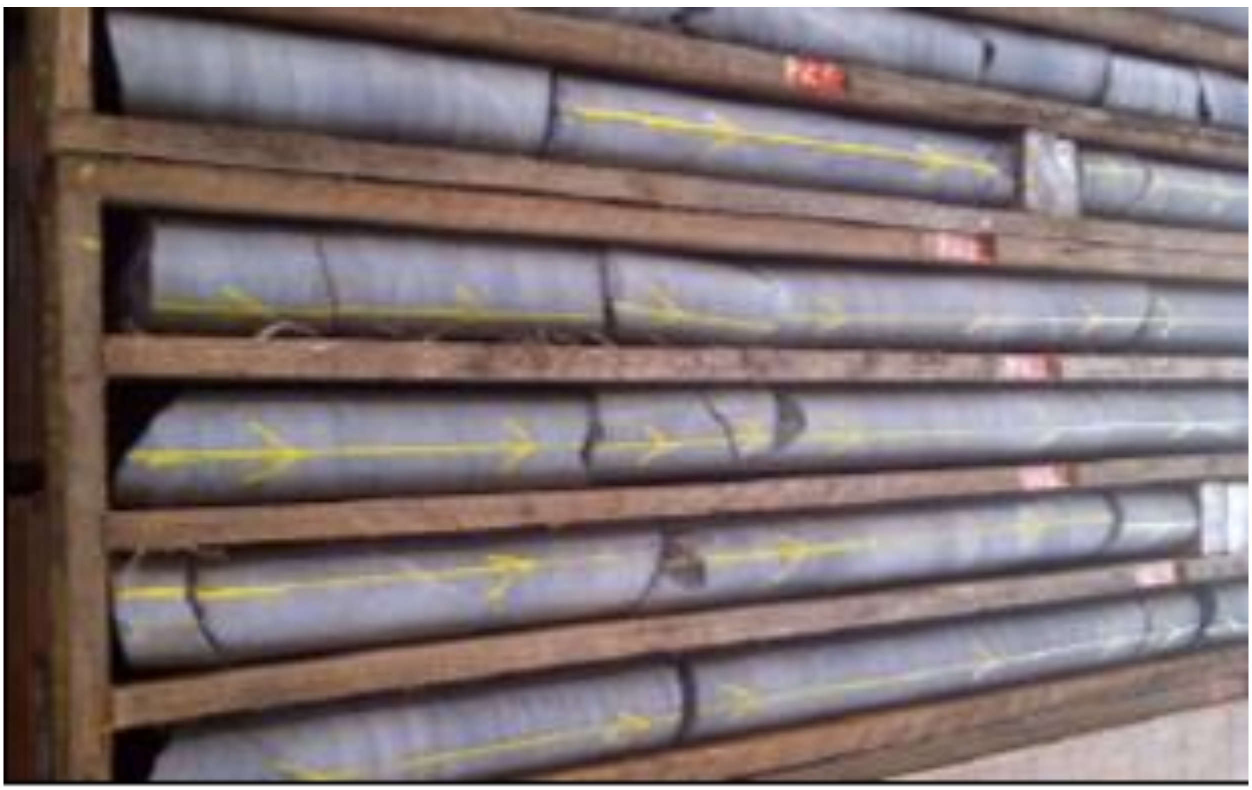
Drill core from surface and underground was stored in wooden labelled boxes, from the drill and transported from the drill to the core logging facility. Before core splitting and logging commences, drill core is systematically photographed using tripod-mounted camera in high resolution and digitally archived for reference as part of the drill and sample database.

Logging and sampling were undertaken on site by company personnel under a QA/QC protocol developed by Glencore. Technicians first prepared the core boxes by reviewing drillhole depth tags, re-assembling broken sections, and mis-placed or mis-aligned core. Core is then washed and cleaned, then marked every meter using permanent marker. Core logging is performed to identify lithology, alteration, RQD, structure, mineralization and sampling selection for core sawing was completed by technicians under the direction of the geologist.

A digital photographic record was performed on each core box, with each photo containing two to a maximum of three boxes. These photos are taken with natural light and each box are marked with their general description, such as project, sample name, box number, and start and end depths.

The exploration geologist is responsible for marking core interval depending on interest structure in mineralization zones, from one to two meters. The typical sample lengths are 1.0 to 1.5 m with a minimum sample width of 1m and maximum lengths of approximately 2.0 m; sample lengths were based on the lithology and alteration. The geologist also marks the saw line along the core, with each side containing roughly an equivalent amount of mineralization, and also marks the start and end of each sample interval as shown in Figure 11-1. The technician records the core intervals entering then into an Excel™ spreadsheet.

Figure 11-1: Example of Core Marked for Splitting



Technicians secure the sample boxes while they are transported to the dedicated enclosure for cutting. Samples cutting is performed by trained, specialized personnel equipped with appropriate personal protective equipment (PPE) operating a Target Portasaw™ brand diamond disc cutting machine as shown in Figure 11-2. This type of cutting machine is used because it allows the operator to safely split the core longitudinally with precision. It is also possible to make perpendicular cuts and to cut segments greater than 45 centimeters (cm) can be split.

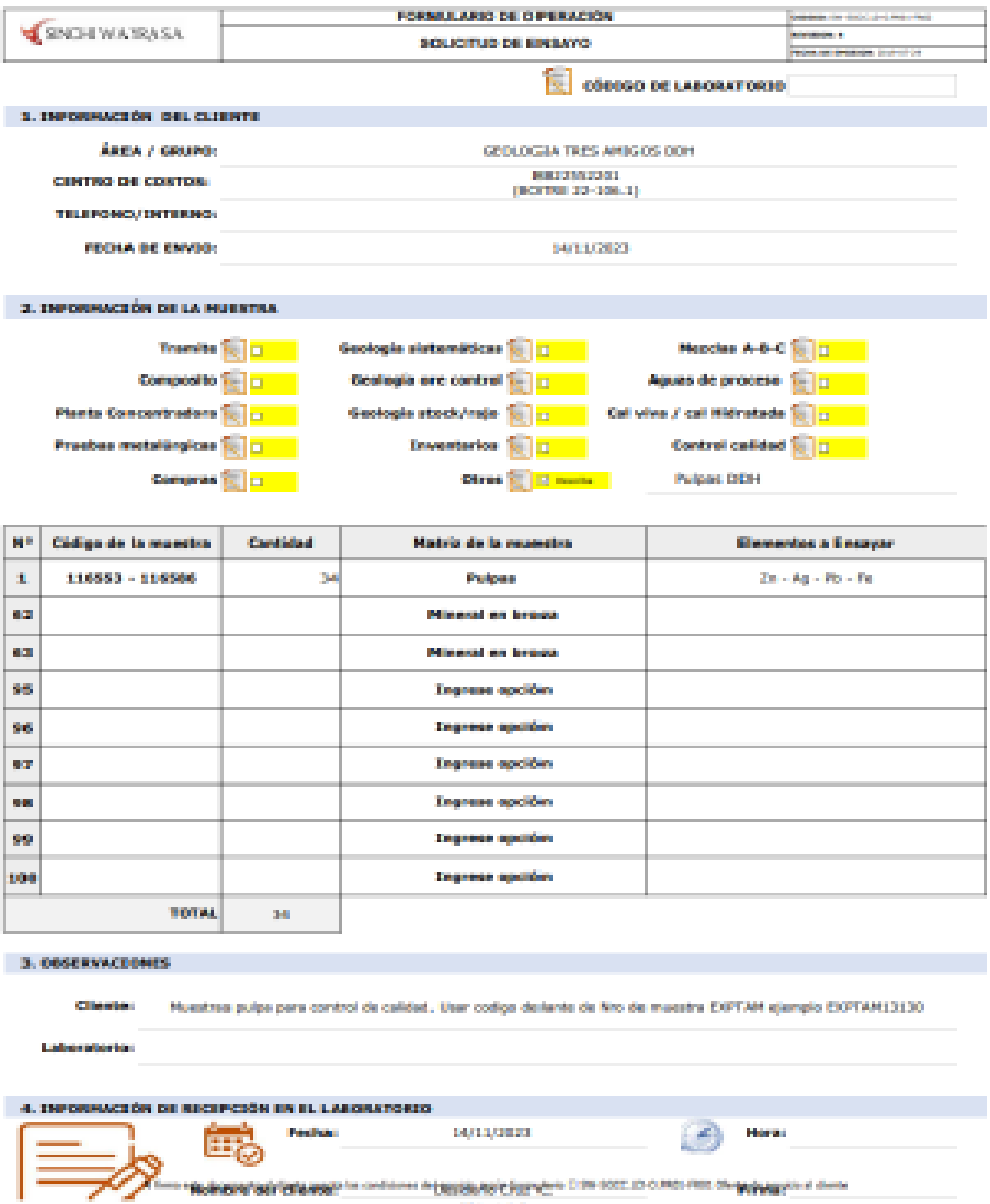
Figure 11-2: Core Splitting Facilities

Once the core is cut, half of the drill core is inserted into sample bags along with a sample ticket, tied with plastic straps and then placed in consecutive order according to sequential coding. Then, seven to ten samples are placed in rice bags, based on weight and not exceeding 25 kilograms. Then the rice sacks are grouped into batches and order maintaining as shown Figure 11-3.

Figure 11-3: Samples Prepared for Analysis Transport

The samples are then delivered to the laboratory through an analysis request form which lists the required elements for reporting. The form also includes details about the quantity of samples sent, how many sacks they are transported in, and indicate if they are special samples as shown in Figure 11-4.

Figure 11-4: Sample Submission Form


SINCHI WAYRA S.A.

FORMULARIO DE OPERACIÓN

SOLICITUD DE ENSAYO

CÓDIGO DE LABORATORIO

1. INFORMACIÓN DEL CLIENTE

ÁREA / GRUPO: GEOLOGIA TRES AMIGOS DDH

CENTRO DE COSTOS:

TELEFONO/INTERNO:

FECHA DE ENVIO: 14/11/2023

2. INFORMACIÓN DE LA MUESTRA

Tramite · Geologia sistemáticas · Mezclas A-B-C

Composito · Geologia ore control · Aguas de proceso

Planta Concentradora · Geologia stock/rajo · Cal viva / cal Hidratada

Pruebas metalúrgicas · Inventarios · Control calidad

Compras · Otros · Pulpas DDH

N°	Código de la muestra	Cantidad	Matriz de la muestra	Elementos a Ensayar
1	116553 - 116586	34	Pulpas	Zn - Ag - Pb - Fe
62			Mineral en broza	
63			Mineral en broza	
95			Ingrese opción	
96			Ingrese opción	
97			Ingrese opción	
98			Ingrese opción	
99			Ingrese opción	
100			Ingrese opción	
TOTAL		34		

3. OBSERVACIONES

Cliente: Muestras pulpa para control de calidad. Usar codigo delante de Nro de muestra EXPTAM ejemplo EXPTAM13130

Laboratorio:

4. INFORMACIÓN DE RECEPCIÓN EN EL LABORATORIO

Fecha: 14/11/2023 **Hora:**

Nombre del cliente: **Firma:**

All core boxes that have completed the entire logging and sampling process are stored in the logging area sequentially. They are then transported to the permanent secured core storage facilities and then stored on covered metal shelves as shown in Figure 11-5. Each core box is labelled and coded for easy identification and access.

Figure 11-5: Drill Core Storage Facilities

11.1.2 Sub-Surface Sampling and Logging

The sub-surface sampling is primarily performed within horizontal drift development in addition to face and stope development. Prior to entering the designated underground sampling areas, inspection is performed to ensure or establish adequate ventilation and to perform scaling to eliminate hazards. The structure is washed by pressure hose prior to sampling and the faces marked with white spray paint to delineate length and orientation of sampling transverses. Then a ladder is secured if samples are being taken from the back or at heights up the drift walls to insure safe access. Samples are the taken using a hammer and chisel, collected into an un-used sample bag. Alternatively, samples are collected onto a cleaned and washed tarp, or a specialized tarp lined sample collection pocket for transfer into sample bags. Samples are collected from a 10 cm wide and at least 2 cm depth channel using the hammer and chisel by following the white painted markings. The sampling is performed as two person teams with one operating the hammer and chisel, and the other collected the rock and mineralized fragments. A new sample bag or freshly cleaned tarp is used for each sample. In the case where the sample width is greater than approximately 1 m then more than one sample must be taken. For stope sampling, systematic samples are taken every 4 m. These samples are split depending upon the structure being sampled and the character of the mineralization encountered as shown in Table 11-1. Samples are then introduced to a polyethylene bag with its sample number labeled, sample tag inserted and gathered for transport to the surface for delivery to the analytical laboratory by Santacruz staff of analysis.

Table 11-1: Underground Sample Mineralization Codes

Code	Description
BM	Mineralized Breccia
CM	Mineralization Stock
VM	Massive Vein
VB	Brecciated Vein
F	Fault
CM	Wall, back, floor, shoulder waste
FM	Mineralized Fault

11.2 Sample Preparation and Analysis

Samples were transported to the Don Diego laboratory, which has NB/ISO/IEC 17025: 2018 certification, for sample preparation and analysis where they are documented and entered to the Laboratory Information Management System (LIMS) for tracking and secure reporting of data and results. It is important to note that the Don Diego Laboratory is owned and operated by the Issuer, Santacruz, and was previously owned and operated by Glencore prior to the purchase of all of the Sinchi Wayra operations.

Once received the samples are laid out for sample preparation which entails crushing and pulverizing the drill core down to 95% passing -140 microns. The resulting pulps are weighed and individually packaged into envelopes and loaded onto carts for assaying. The resulted prepared samples are then assayed for silver, lead, zinc, and iron using an Atomic Absorption Spectroscopy (AAS) for silver, lead, zinc and iron followed by a Gravimetric finish for silver samples > 2100 g/t and Volumetric for lead > 16% and zinc > 20% as shown in Figure 11-6.

Figure 11-6: Assay Methods Employed at the Bolivar Mine

1. LIMITES DE CUANTIFICACION:

Ag: <7 g/t; Zn: <0.11%; Pb: <0.04%

2. TRATAMIENTO DE LA MUESTRA:

Presecado, cuarteo y pulverizado a malla -140 p95

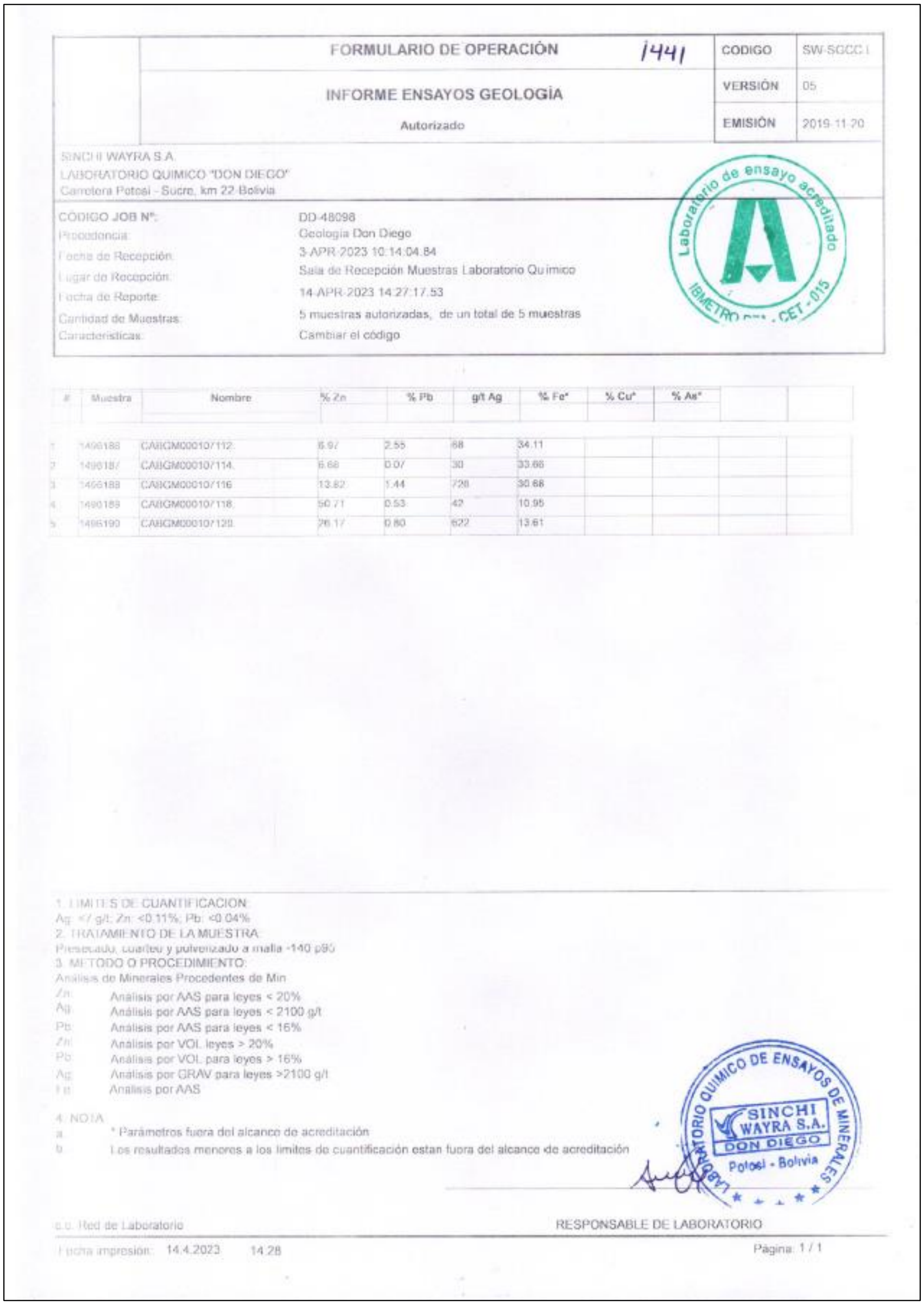
3. METODO O PROCEDIMIENTO:

Análisis de Minerales Procedentes de Min

Zn:	Análisis por AAS para leyes < 20%
Ag:	Análisis por AAS para leyes < 2100 g/t
Pb:	Análisis por AAS para leyes < 16%
Zn:	Análisis por VOL leyes > 20%
Pb:	Análisis por VOL para leyes > 16%
Ag:	Análisis por GRAV para leyes >2100 g/t
Fe:	Análisis por AAS

Analytical results are provided via secure servers and pdf formatted assay certificates as shown in Figure 11-7.

Figure 11-7: Example of Don Diego Laboratory Assay Certificate



FORMULARIO DE OPERACIÓN 1441

INFORME ENSAYOS GEOLOGÍA

Autorizado

CODIGO	SW-SGCC-I
VERSIÓN	05
EMISIÓN	2019-11-20

SINCHI WAYRA S.A.
LABORATORIO QUIMICO "DON DIEGO"
Carretera Potosi - Sucre, km 22 Bolivia

CÓDIGO JOB N°:	DD-48098
Procedencia:	Geologia Don Diego
Fecha de Recepción:	3-APR-2023 10:14:04.84
Lugar de Recepción:	Sala de Recepción Muestras Laboratorio Quimico
Fecha de Reporte:	14-APR-2023 14:27:17.53
Cantidad de Muestras:	5 muestras autorizadas, de un total de 5 muestras
Caracteristicas:	Cambiar el código

#	Muestra	Nombre	% Zn	% Pb	g/t Ag	% Fe*	% Cu*	% As*		
1	1496186	CABGM00010/112	6.97	2.55	68	34.11				
2	1496187	CABGM00010/114	6.68	0.07	30	33.66				
3	1496188	CABGM00010/116	13.82	1.44	728	30.68				
4	1496189	CABGM00010/118	50.71	0.53	42	10.95				
5	1496190	CABGM00010/120	26.17	0.80	622	13.61				

1. LIMITES DE CUANTIFICACION:
Ag: <7 g/t; Zn: <0.11%; Pb: <0.04%
2. TRATAMIENTO DE LA MUESTRA:
Presecado, cuarteo y pulverizado a malla -140 p95
3. METODO O PROCEDIMIENTO:
Analisis de Minerales Procedentes de Min

Zn	Análisis por AAS para leyes < 20%
Ag	Análisis por AAS para leyes < 2100 g/t
Pb	Análisis por AAS para leyes < 16%
Zn	Análisis por VOL leyes > 20%
Pb	Análisis por VOL para leyes > 16%
Ag	Análisis por GRAV para leyes >2100 g/t
Fe	Analisis por AAS

4. NOTA
a. * Parámetros fuera del alcance de acreditación
b. Los resultados menores a los limites de cuantificación estan fuera del alcance de acreditación

c.c. Red de Laboratorio

RESPONSABLE DE LABORATORIO

Fecha impresión: 14.4.2023 14:28

Página: 1 / 1

Santacruz database files are stored and managed in Access and Excel formats before being transferred to LeapFrog™ and Datamine™ software.

All half-core is stored at a dedicated core storage facility that is locked and is within a fully controlled perimeter wall and fencing with security on the property.

11.3 QA/QC Procedures and Discussion of Results

The purpose of Quality Assurance and Quality Control (QA/QC) is to ensure that the laboratory procedures may be relied upon by guarding against sample contamination and test whether the equipment used to prepare the samples has been sufficiently cleaned between sequential assays. In addition, it is standard and highly recommended practice to insert additional "control" samples to continually test the precision and accuracy of the resulting analyses.

Since 2000, Sinchi Wayra has implemented QA/QC programs to varying degrees which employ industry standards and accepted practices for drillcore and channel sampling. This includes the regular insertion of blanks and standards randomly into the sample stream along with performing duplicate analysis of pulps and coarse rejects to assess analytical precision and accuracy. Additionally, beginning in 2012, the practice of including coarse and pulp duplicate QA/QC samples was employed.

Field blanks are non-mineralized material sourced locally and inserted into the sample series one every 20 samples (5%). Field blanks are inserted to test for any potential carry-over contamination which might occur in the crushing phase of sample preparation, because of laboratory poor cleaning practices.

Duplicate analysis of pulps and quarter-core are used to evaluate analytical precision and to determine if any biases exist between laboratories. Duplicate analysis of coarse rejects is used to analyze preparation error. Table 11-2 details the QA/QC sample insertion rate.

Table 11-2: QA/QC Sample Insertion Rates

Sample Type	Notes
Blanks	Usually inserted at the end of mineralized runs to measure carry-over
Coarse Blanks	Inserted according to estimated grade of mineralization before, within or immediately after a mineralized interval. Insertion at regular intervals avoided
Pulp Blanks	Usually inserted at the end of mineralized runs to measure carry-over
Pulp Duplicates	Undertaken at second laboratory with same analytical technique. High- and low-grade mineralized samples are usually chosen
Coarse Duplicates	Normally choose mineralized samples, used to measure laboratory sample preparation

In 2022, a total of 531 control samples as shown in Table 11-3 were assigned for QA/QC purposes and accounted for approximately 20% of total samples taken during the program.

Table 11-3: Quantity of Control Samples by Type

Control Type	#
Blanks	150
Field Blanks	130
Coarse Duplicates	124
Pulp Duplicates	127
Total	531

Contamination and determining whether adequate cleaning practices are being performed at the laboratory is evaluated through the direct incorporation of sample blanks. Blank samples are do typically have some level of very low grade, background values depending upon where they are sourced from so the results should be at that value or within acceptable error (±) thresholds. The placement of blanks within the sample stream is typically in the middle of an identified mineralized structure or immediately at the end of the section or sample run. Figure 11-8 through Figure 11-10 show results show 3 failures or 2% for silver and lead blanks while there were two failures for zinc or 1.3%.

Figure 11-8: Plot of Ag g/t Values for Field Blanks

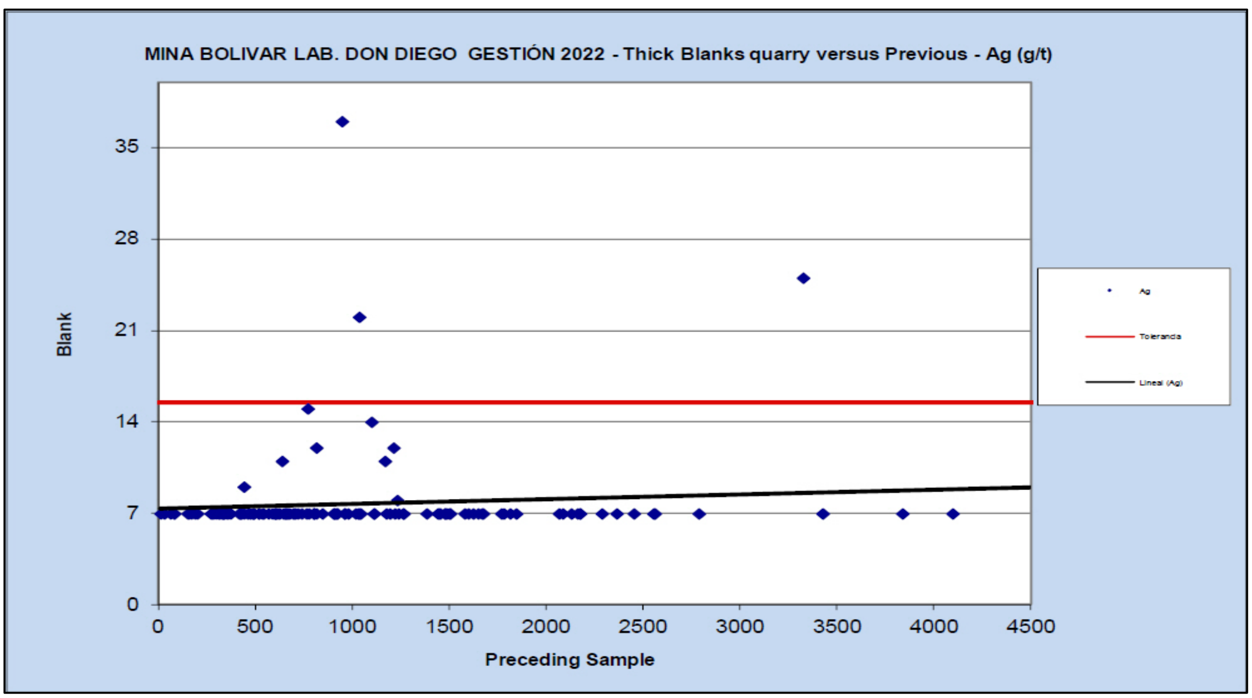


Figure 11-9: Plot of Pb% Vaues for Field Blanks

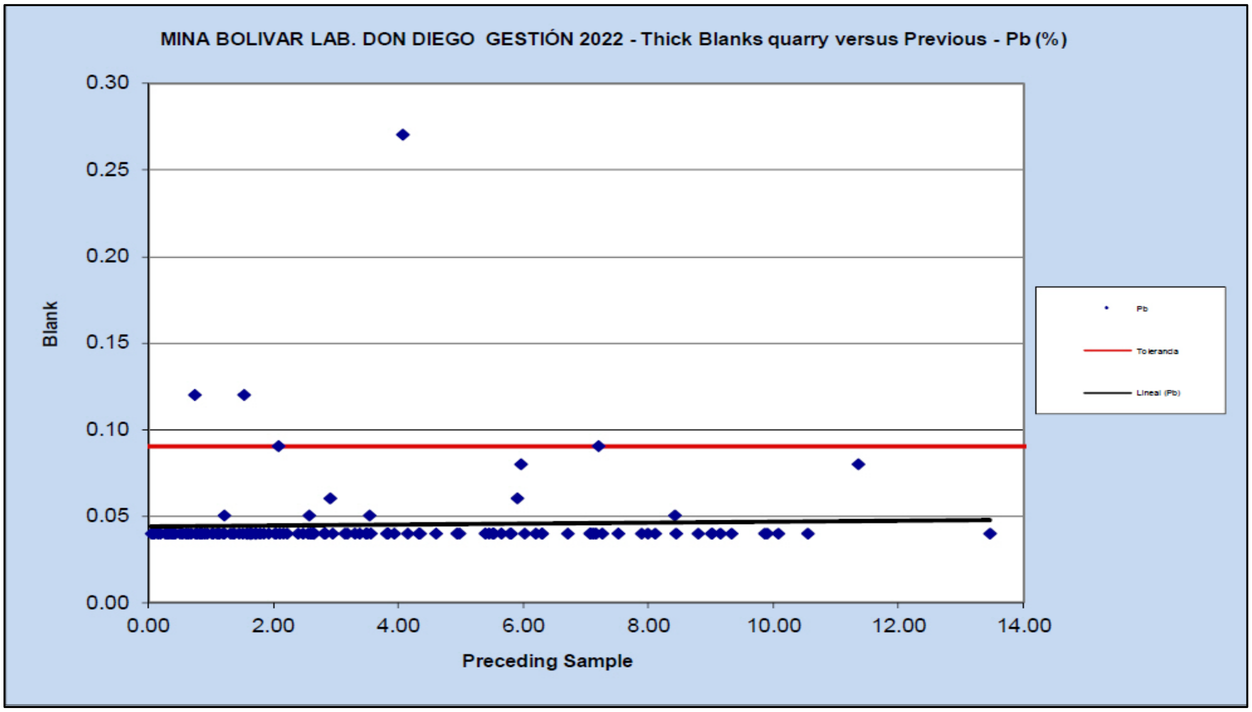
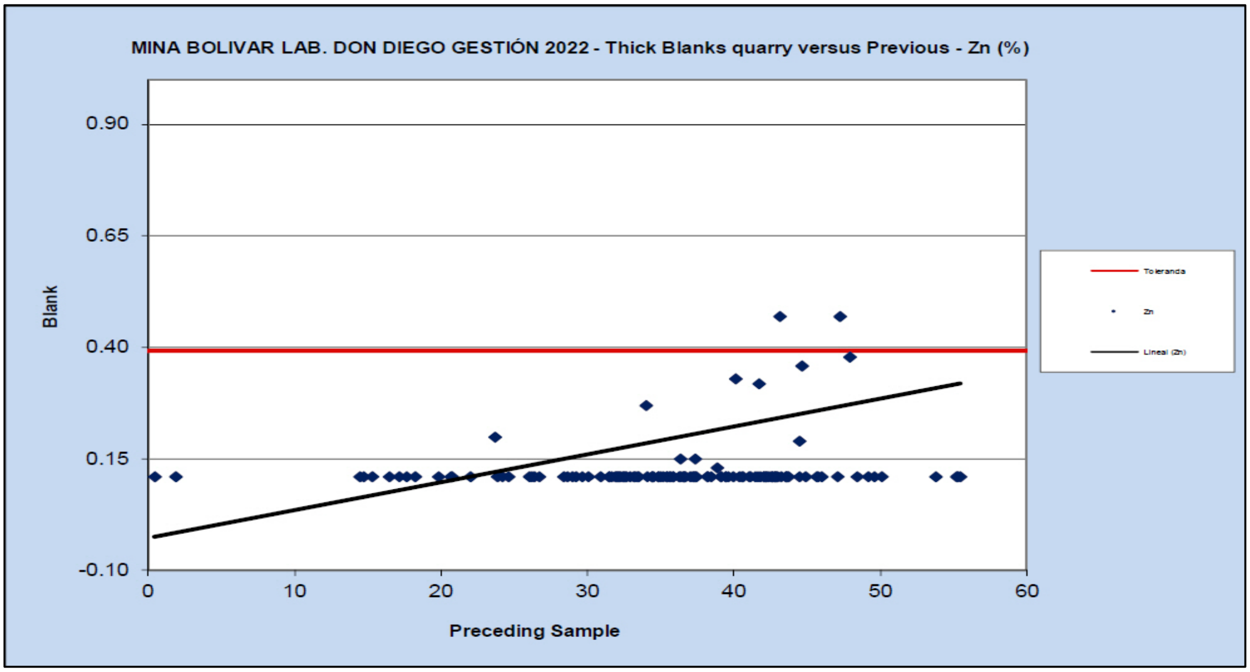


Figure 11-10: Plot of Zn% Vaues for Field Blanks



Precision is a measure of reproducibility which is measured by introducing duplicate samples randomly into the sample stream. At the Bolivar Mine, both coarse and pulp duplicates are performed in order to ensure appropriate levels of precision are being attained at the Don Diego laboratory facilities. Coarse duplicates entail taking a physical split of the sample at the sample collection stage and then including that duplicate blindly into the sample stream. Pulp duplicates entail taking a physical split of the sample at the culmination of the sample preparation stage at the laboratory and re-inserted into the sample stream.

Figure 11-11 through Figure 11-13 shows the comparative results for the original versus duplicate grades for silver, lead and zinc, respectively. Note that a ±10% relative difference threshold is denoted as a **red line**. Of the 127 coarse duplicate analyses, the results for silver show good results with two significant failures and four warnings for a failure rate of 1.5% as shown in Figure 11-11. Figure 11-12 shows the results for lead where there are six failures and nine warnings for a failure rate of 5%. Although the failure rate for lead is not particularly high, where a high failure rate would be greater than 10%, it is recommended that the sampling practices be reviewed to determine whether there may be a reason for potential cross-contamination at the sampling stage. Figure 11-13 shows only one failure and no warnings for the zinc coarse duplicates for a failure rate of 0.7%.

Figure 11-11: Plot of Coarse Reject Duplicates – Ag g/t

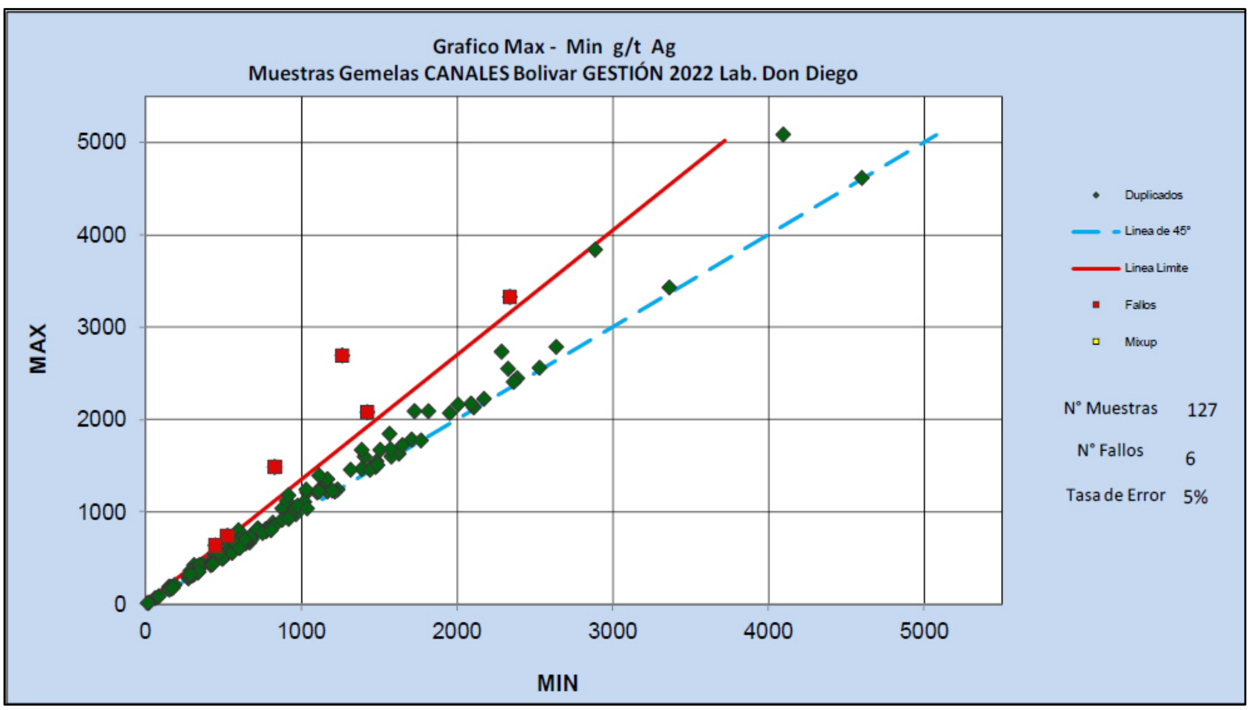


Figure 11-12: Plot of Coarse Reject Duplicates – Pb%

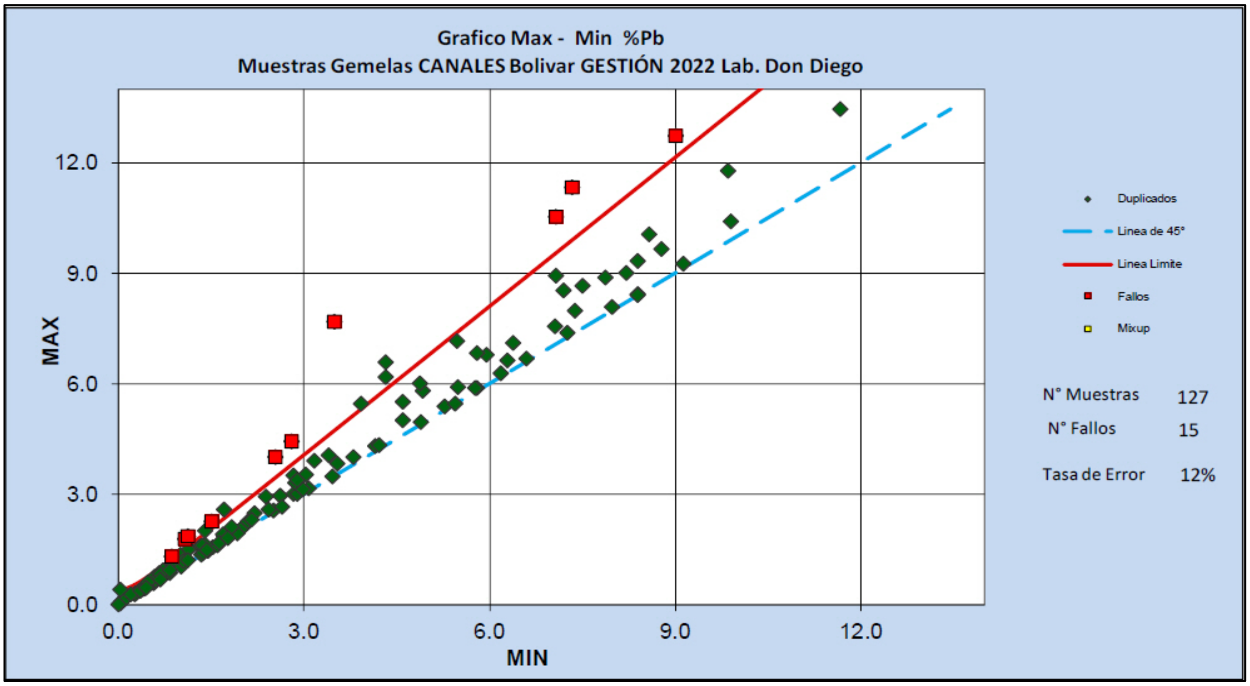


Figure 11-13: Plot of Coarse Reject Duplicates – Zn%

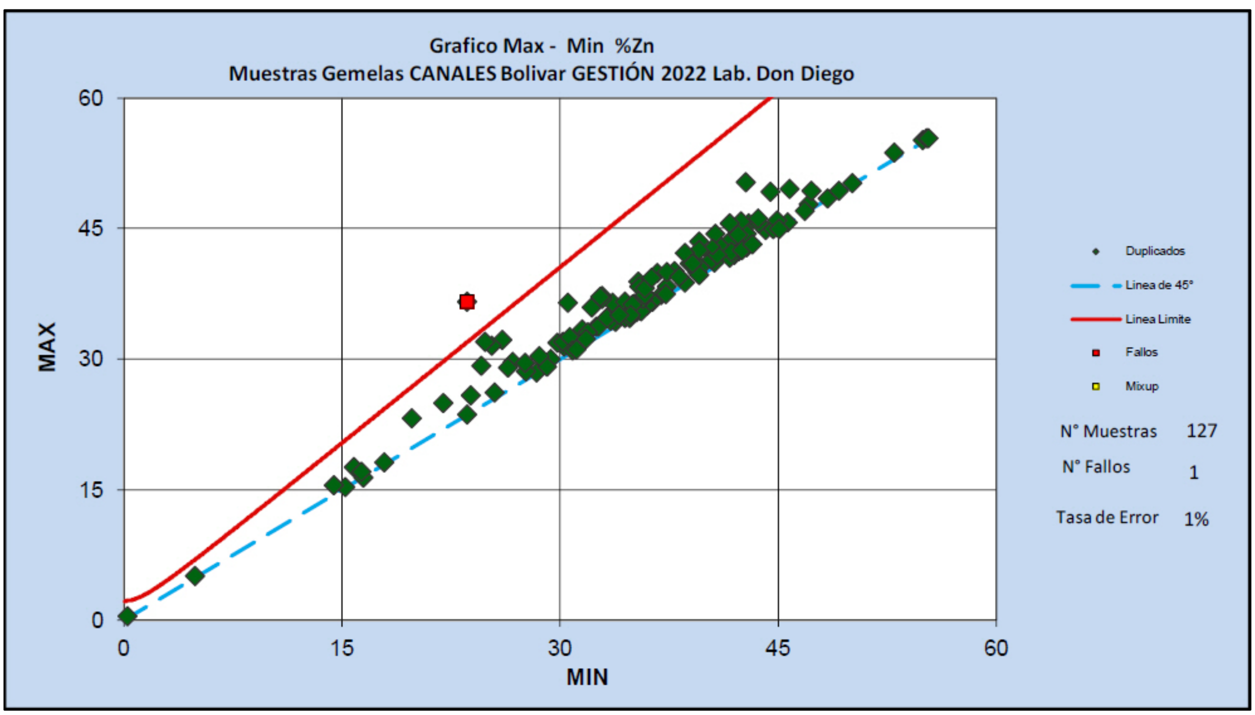


Figure 11-14 through Figure 11-16 shows the comparative results for the original versus duplicate grades for silver, lead and zinc pulp duplicates, respectively. Again, note that a ±10% relative difference threshold is denoted as a **red line**. Of the 124 pulp duplicate analyses, the results show good results with no failures and one warning for a failure rate of 0.7% as shown in Figure 11-14. Figure 11-15 and Figure 11-16 shows excellent results for lead and zinc where there are no failures and no warnings for a failure rate of 0%.

Figure 11-14: Plot of Pulp Duplicates – Ag g/t

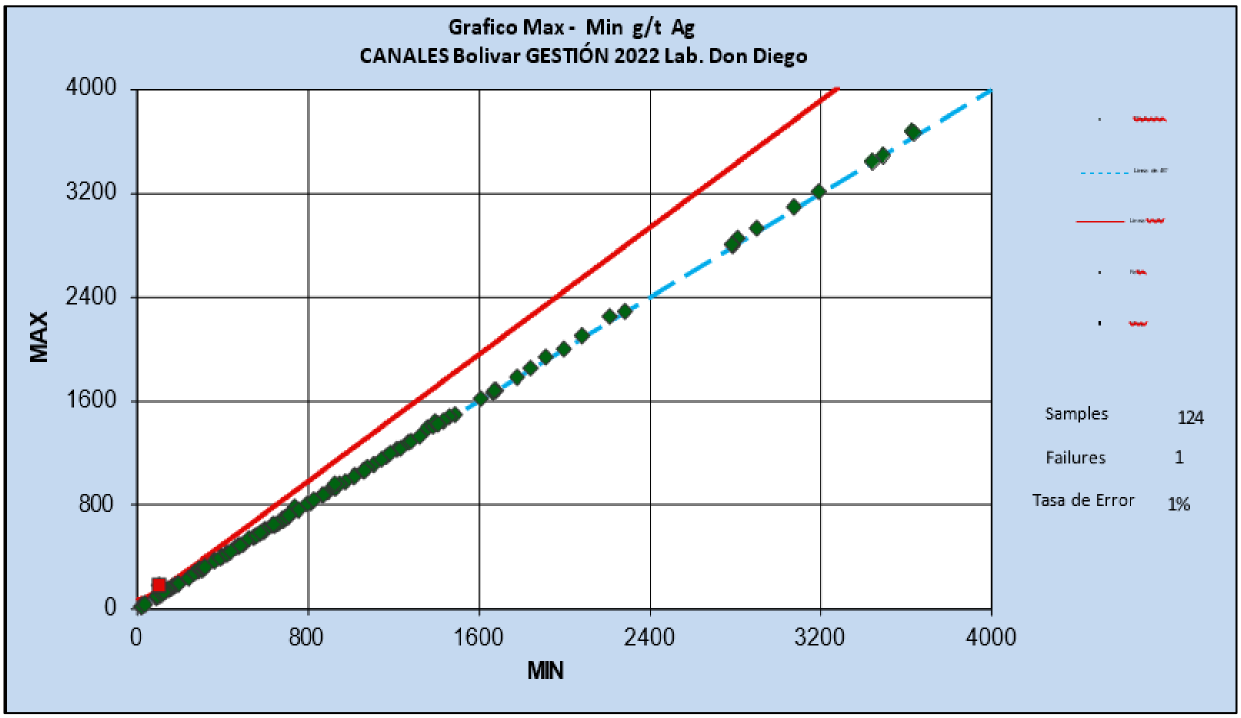


Figure 11-15: Plot of Pulp Duplicates – Pb%

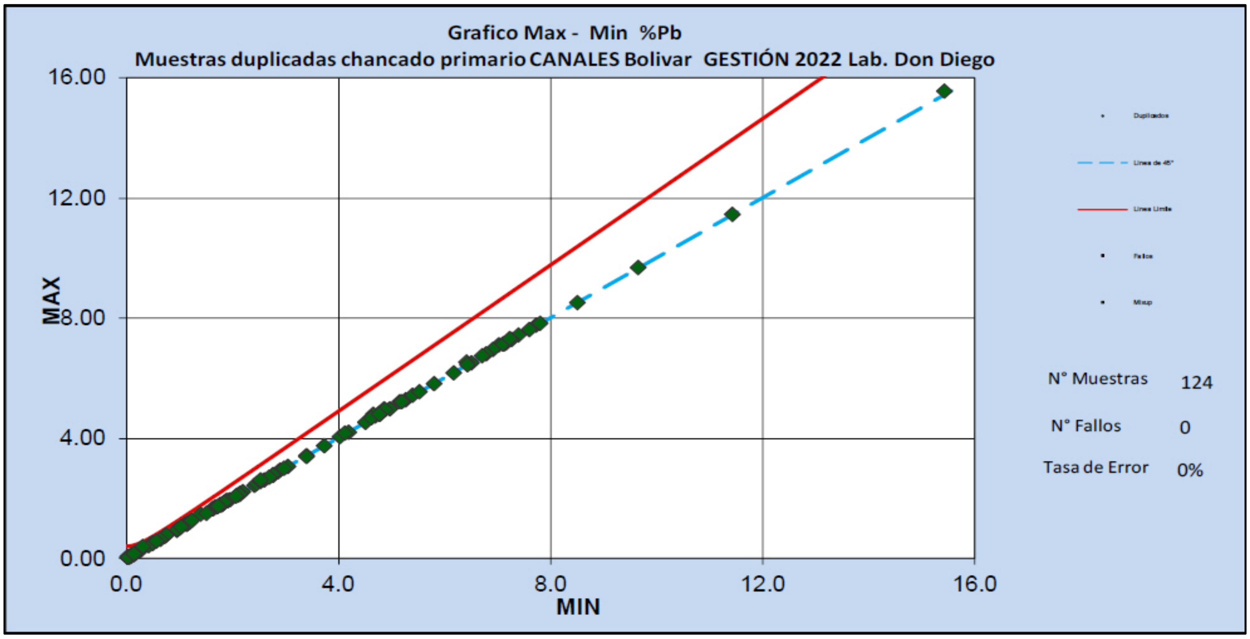
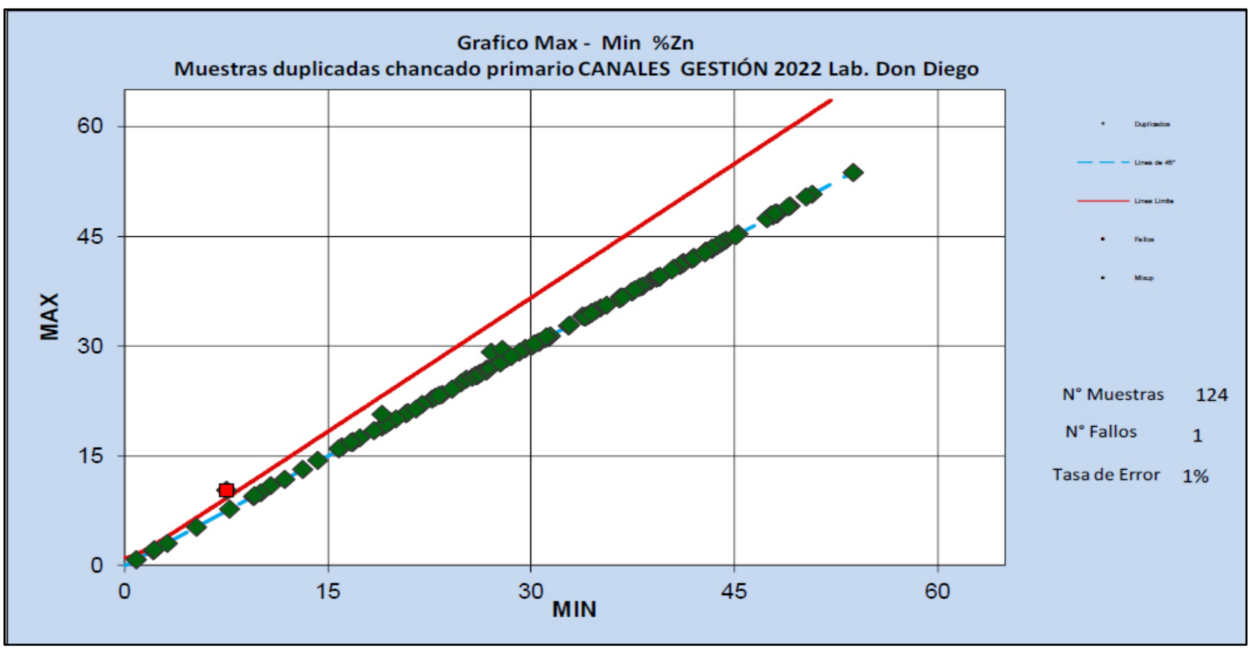


Figure 11-16: Plot of Pulp Duplicates – Zn%



In summary, the quality assurance and quality practices and methods employed are reasonable and produce good results. Recommendations with respect to the QA/QC sample selections that the company should investigate obtaining Certified Reference Material form an outside accredited source for blanks, particularly barren blanks, and for specific Ag, Pb, Zn standards.

The LIMS system is widely used and accepted at the laboratory while interfaces to users are automated and trusted. The system is also highly secure which is critical in ensuring that data is not tampered with or prone to inadvertent error however, this also makes it difficult to access, review and report data externally. In addition, reporting functions are relatively dated and system upgrades should be investigated, and some additional customization would also be desirable.

11.4 QP Statement

It is the opinion of the QP, Garth Kirkham, P.Geo., that the sampling preparation, security, analytical procedures and quality control protocols used by Santacruz are consistent with generally accepted industry best practices and therefore reliable for the purpose of resource estimation.

12 DATA VERIFICATION

12.1 Verifications by the Authors of this Technical Report

The following details the data verification performed by the Qualified Persons for the completion of this Technical Report.

Multiple site visits were conducted by the QPs, as detailed in Section 2.3 (Table 2-2). The purpose of these visits was to fulfill the requirements specified under NI 43-101 and to familiarize with the property. These site visits consisted of underground tours of mineralized and non-mineralized development headings, sampling review, storage areas and existing infrastructure.

No limitations or failures to conduct data verification were identified by the QPs in the preparation of this Technical Report.

12.2 Geology and Resources

12.2.1 Site Visit & Verification

The purpose of these visits is to fulfill the requirements specified under NI 43-101, to gain familiarization with the property, to validate the existence, location, extent and the mineralization and deposits. In addition, the site visits are an important component for verification of all information and data being submitted by the company for inclusion into the NI43-101 technical report including sample data, geology, QA/QA procedures and mineral resource models and results. These site visits consisted of underground tours of non-mineralized development headings, sampling, storage areas and existing infrastructure. In addition to gathering on-site data and reports, performing interviews, walking through procedures, and investigating areas of discrepancy, the identification and collection of independent verification data such as samples are all critical activities that make up a site visit.

Prior to the site visits, the author reviewed all collected data sources and reports. The primary sources of data for inspection were the drillhole and underground channel sample data, related assay data, QA/QC data and analyses, assay certificates and LIMS databases. In addition, internal company reports and demonstrations were provided detailing the methods and procedures for sample collection, handling and chain-of-custody, QA/QC procedures and results, and resource estimation methods and reporting.

The QP, Garth Kirkham, P.Geo., visited the property between August 10 through August 13, 2021 and March 15 through March 30, 2023. The site visit included an inspection of the property, offices, underground operations, core storage facilities, and tours of major centres and surrounding villages most likely to be affected by any potential mining operation.

The August 2021 site visit performed by the QP to support the Technical Report dated December 17, 2021 included a tour of the offices, core logging, and storage facilities which showed clean, well-organized, professional environments. Santacruz geological staff and on-site personnel led the QP through the chain of custody and methods used at each stage of the logging and sampling process. All methods and processes are to common industry standards and common best practices, and no issues were identified. The 2021 site visit also entailed attending all operations including the Boliva miner, Porco mine and the Caballo Blanco complex which included separate attendance to the Tres Amigos, Colquechaquita and Reserva mines. Visits to the underground operations showed extensive, on-going mining operations. In addition, the tour included tours through the Don Diego Milling and Processing Complex along with the sample storage facilities.

The tour of the property showed a clean, well-organized, professional environment. On-site staff led the author through the methods used at each stage of the resource estimation process. All methods and processes are up to industry standards and reflect leading practices, and no issues were identified.

12.2.2 Sample Database Verification

Verification of the Bolivar drillhole and underground sample assay database was primarily focused on silver, lead and zinc in addition to iron, arsenic, sulphur and tin. Sample databases were supplied in Excel™ format and in LeapFrog™. Checks against source data and assay certificates showed agreement. Statistical analyses used to investigate and identify errors were performed and resulted in minor issues. These have been corrected and it is recommended that a continued program of random "spot checking" the database against assay certificates be employed.

12.2.3 Independent Sampling

No verification samples were taken during the 2021 site visit due to severe limitations on transport of materials due to COVID at that time. In addition, the 2021 site visit was performed in support of the Technical Report which did not include a resource estimate and was performed prior to transfer of ownership of all properties from Glencore and Santacruz.

The 2023 site visit included a visit of the Don Diego mill complex which included a tour of the Don Diego laboratory which included an extensive review of the methods and procedures along with gathering appropriate documentation for reporting.

Also, during the 2023 site visit, an extensive independent sampling verification plan was implemented with a total of 80 samples collected across from the Bolivar, Porco and Caballo Blanco operations. The Don Diego laboratory is an NB/ISO/IEC 17025:2018 accredited laboratory which performs all assay analyses for the mining and processing operations for Sinchi Wayra including Bolivar.

In order to ensure reliability of results particularly as the data is being used for resource estimation purposes with this Technical Report, independent verification duplicate samples are sent to an accredited external umpire laboratory. These verification samples were secured and transported to SGS Peru for analysis and comparison. SGS Peru is a well-established certified assay laboratory that possess and maintains ISO 14000 accreditation. Individual samples were placed in plastic bags with a uniquely numbered tag, after which all samples were collectively placed in a larger bag and delivered by independent transport to the SGS laboratory in Lima Peru for analysis. The selection was a combination of acid digestion and Induced Coupled-Plasma Atomic

Emission Spectroscopy (ICP) along with screening and hydroxide precipitation for overlimit values.

A total of 20 samples which were comprised of 5 coarse duplicated and 15 pulp duplicates were sent for independent analysis as shown in Table 12-1.

Table 12-1: Bolivar Independent Verification Sampling

Sample	Ag	Fe	Pb	Pb	Zn	Zn
BLVGM00805702	235	12.53	1001	0.10	>10000	40.81
BLVGM00805704	169	11.22	638	0.06	>10000	38.19
BLVGM00805706	690	13.1	1101	0.11	>10000	13.95
BLVGM00805708	401	>15	>10000	2.05	>10000	13.18
BLVGM00805710	136	>15	1512	0.15	>10000	21.69
804783	12.7	12.94	518	0.05	8936.4	0.89
804784	59.5	9.85	465	0.05	>10000	8.46
804785	108	15	2153	0.22	>10000	12.40
804786	187	6.17	394	0.04	>10000	10.89
804787	43	3.4	138	0.01	>10000	4.45
804788	615	9.95	>10000	2.49	>10000	11.47
804789	595	9.68	>10000	2.48	>10000	11.53
804790	35.5	9.28	788	0.08	>10000	1.91
804791	118	10.06	6368	0.64	>10000	3.18
804792	737	8.9	>10000	2.26	>10000	10.32

Results of the verification samples are presented in Figure 12-1 through Figure 12-4 for silver, lead, zinc and iron, respectively. In all cases, the correlation between the original source Don Diego assay data and that of the duplicate SGS umpire analyses, are perfect as evidenced by the respective R^2 being 1. R^2 is a measure of the goodness of fit of a model. In regression, the R^2 coefficient of determination is a statistical measure of how well the regression predictions approximate the real data points. An R^2 of 1 indicates that the regression predictions perfectly fit the data.

Although, these results are not a complete audit of the laboratory, they do verify that the assay results are suitable for resource estimation purposes.

Figure 12-1: Results of Independent Verification Sampling for Ag g/t

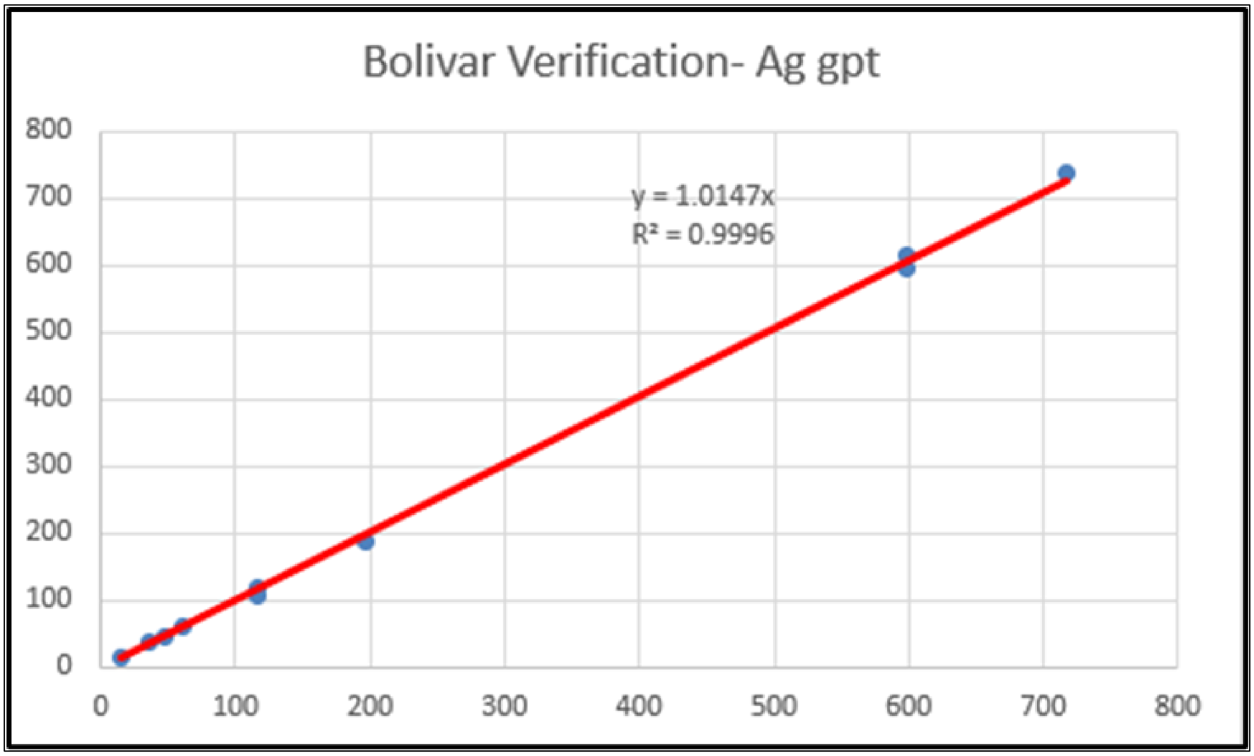


Figure 12-2: Results of Independent Verification Sampling for Pb%

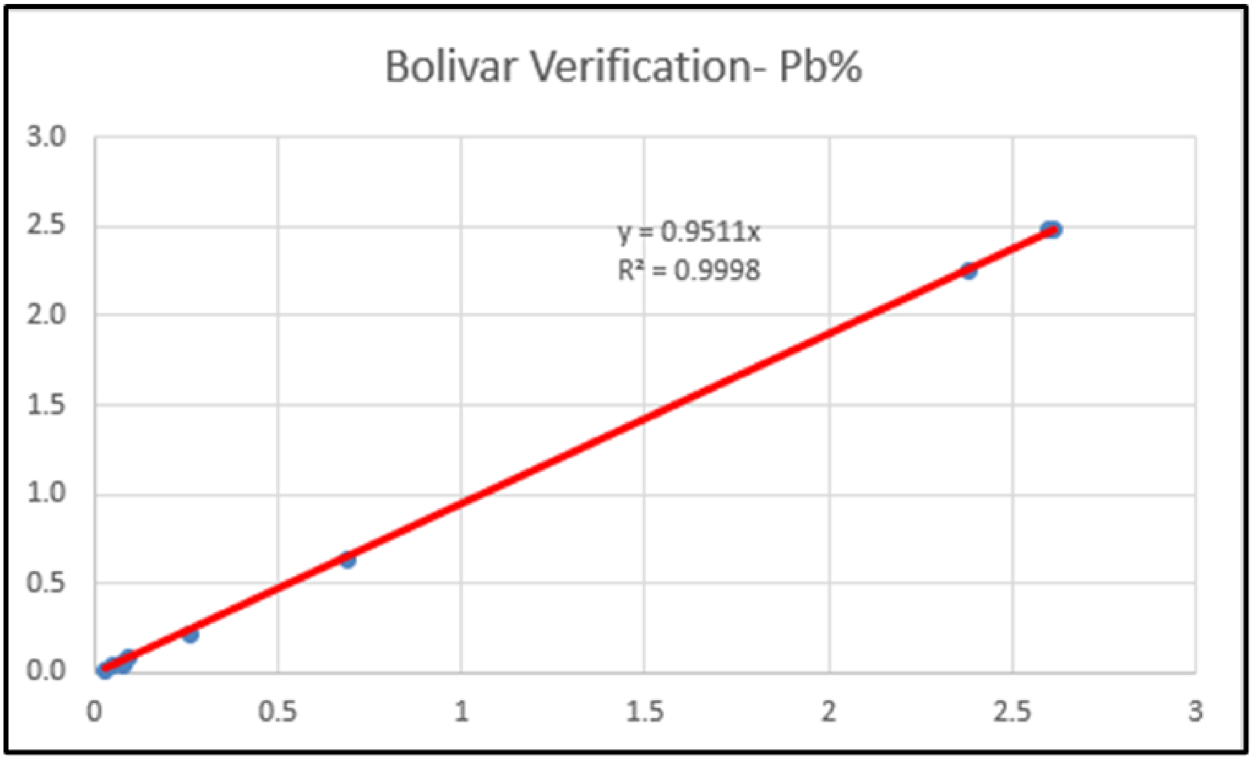


Figure 12-3: Results of Independent Verification Sampling for Zn%

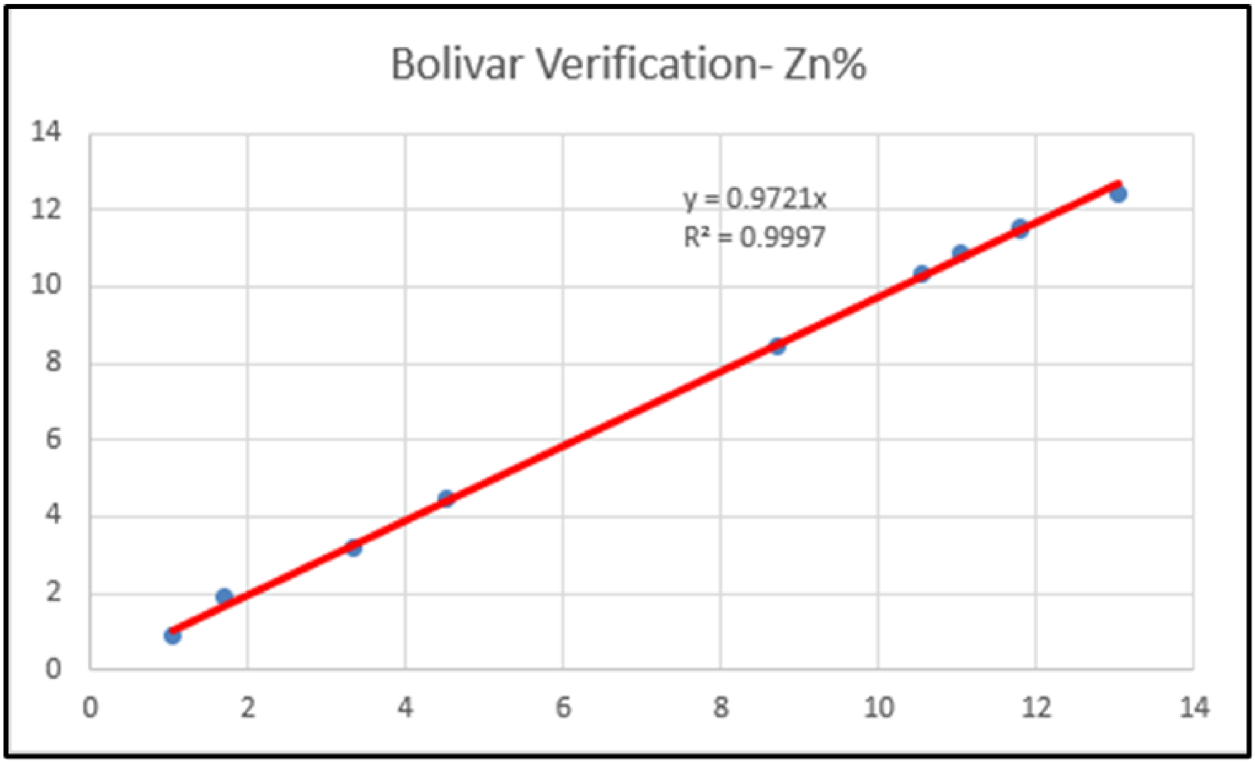
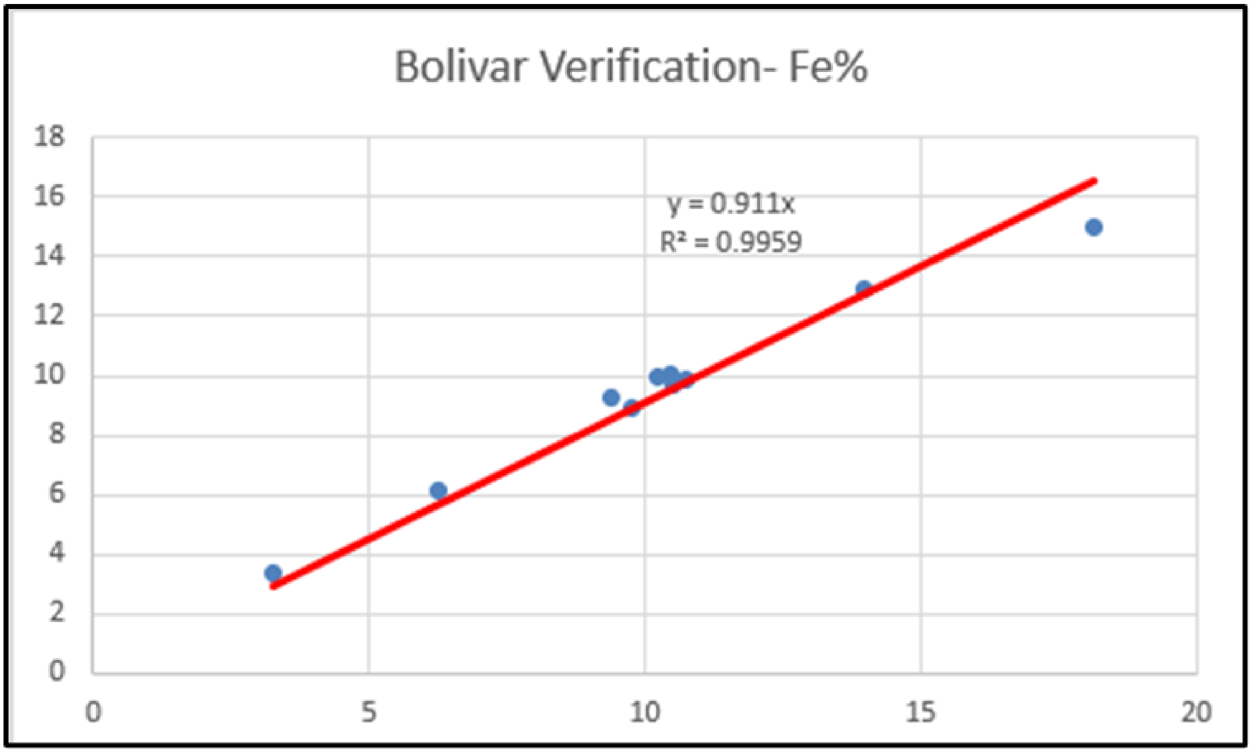


Figure 12-4: Results of Independent Verification Sampling for Fe%



12.2.4 Geological Model Verification

The geological and lithological solid domain models were supplied by Santacruz in both Datamine™ and LeapFrog™ which are both industry-leading software systems. The QP imported the multiple vein domains into a similar system called MineSight™ to verify solids volumes and ensure matching of the solids domains against the drillhole and sample database. Results confirmed location and extent of volumes are appropriate to resource estimation purposes.

12.2.5 Resource Estimation Verification

Resource block models were supplied in Datamine™ format which is an industry recognized software system used for resource estimation. These models were then imported to MineSight™ for verification of the resource estimation. In addition, independent estimations were run using the verified sample data and vein domains employing inverse distance estimations to ensure reasonableness and verify the resources independently. Results illustrated good agreement between the original and verification models.

Verification of the SG regression analysis was also performed by comparing measured versus calculated density values.

12.2.6 Conclusions

The QP is confident that the data and results are valid based on the site visits and inspection of all aspects of the Project, including the methods and procedures used. It is the opinion of the QP that all work, procedures, and results have adhered to best practices and industry standards as required by NI 43-101.

12.3 Mining Reserve

The reserves and schedule were received in Deswik. The QP verified that the correct dilution and recovery factors were applied to the stope shapes according to mining methods.

Stope shapes were then queried within Deswik and reported to excel. Calculations were manually checked and verified. Tonnages and metal content of the shapes were checked and verified for each deposit.

The equipment performance rates assumed in the schedule were reviewed. These were based on historic performance and were found to be reasonable by industry standards for each deposit.

Stope productivities by mining method and unit activity were reviewed and found to be and within the expected ranges.

The schedule sequence was reviewed for each deposit. The mining sequence was found to be robust for each mine. There are multiple production zones in each deposit allowing flexibility in the mine plan and sustainable production rates.

On the basis of this QA/QC review, the QP is satisfied that the data provided is adequate for the estimation of the reserves.

12.4 Metallurgy

The metallurgical data used in this report is taken from historical operating information. The reconciled data was compared to the daily sampling data, which was used for this report, to check that the daily data is within a reasonable range compared to the reconciled data.

The reconciled data is based on the sale of concentrates to a smelter. The concentrates are weighed and sampled by a third party whose function is to act without bias to determine the metal received at the smelter in order to determine the correct payment for the concentrates.

12.5 Site Visit for Mining, Infrastructure and Environment & Permitting

The description of mining processes, methods and production rates used in this report is based on mine surface and underground visits to representative work areas on August 11, 2021 (by QPs Kirkham and Crowie) and January 27, 2023 (by QP Goodwin), and production reports subsequently provided by Sinchi Wayra. The author's analysis and reconciliation of the data shows that it accurately describes the operation at the time of the visit. Mine and plant Infrastructure, including tailing facilities and water treatment plants was also observed to be as described in provided information as described herein.

Technical software and methods are modern and professionally applied. The authors are confident that the property is described accurately to the level of detail required for this stage of report.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

The Bolivar Mill has been in continuous production since 1993. The mill receives feed from 2 sources; the company mining operation at the Bolivar Mine and toll feed milling purchased through San Lucas ore sourcing, which is predominantly mined from the same deposit, but in different mineralization zones. The mill processes the two types of feed separately which allows for an analysis of processing for both types of feed.

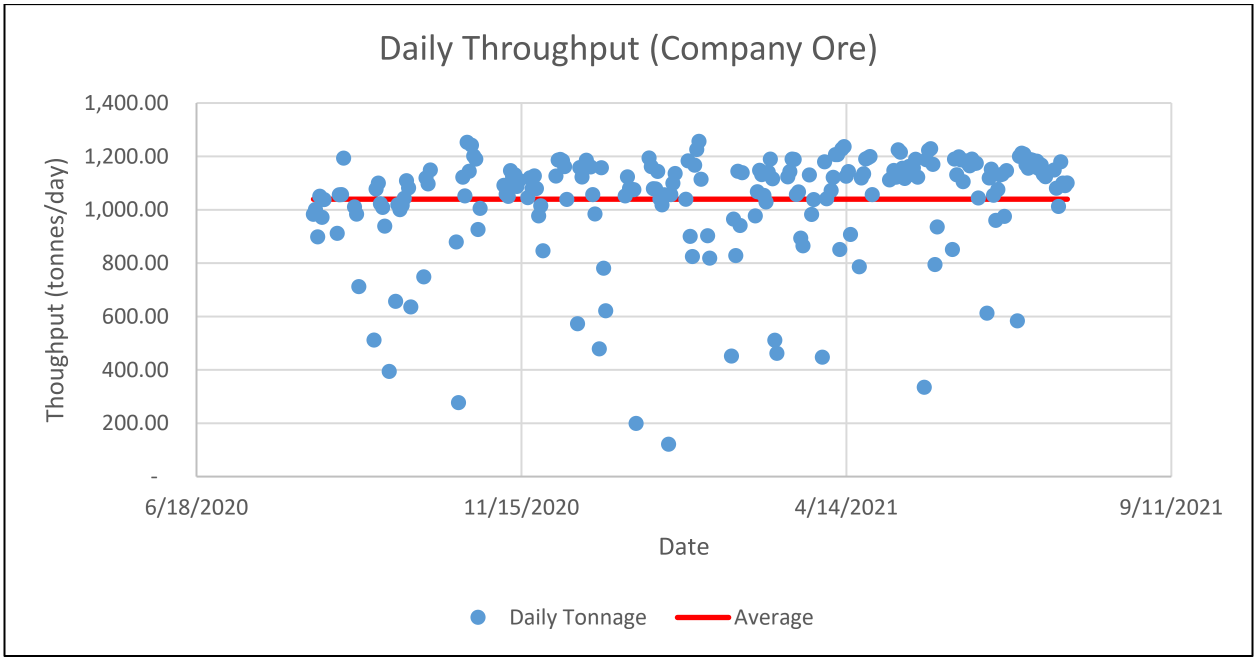
13.1 Company Feed Processing

Data from August 2020 to July 2021 was used to develop the expected metallurgical performance of the Bolivar mill. This data was used to determine throughput, recovery and concentrate grade relationships. The results will be discussed in the upcoming sections.

13.1.1 Mill Throughput

The expected availability for the mill is 93.8% and the utilization is 96.3% for an expected operating time of 90.3%. The actual throughput from August 2020 to July 2021 can be found in Figure 13-1.

Figure 13-1: Bolivar Mill Company Feed Throughput 2020/2021



The throughput of company feed through the Bolivar mill during the analyzed period was a little lower than the stated target, with the average of the days it operated being 1,040 t/d. During the analyzed period, the mill ran company feed over 219 whole or partial days and processed 227,671 t of feed. The data suggests that the feed rate is not achieving the target throughput for company feed.

The target grind for the Bolivar plant is a product size P_{80} of 100 µm.

13.1.2 Feed Grades

For the period examined, the unreconciled feed grades for the company feed were 7.86% zinc, 0.74% lead, and 201 g/t silver. The feed was somewhat variable with standard deviations of 1.52, 0.22, and 61.85 for zinc, lead, and silver respectively. These values fall within the expected ranges for Bolivar feed. The unreconciled feed grades can be seen in Figure 13-2 through Figure 13-4.

Figure 13-2: Zinc Feed Grade 2020/2021

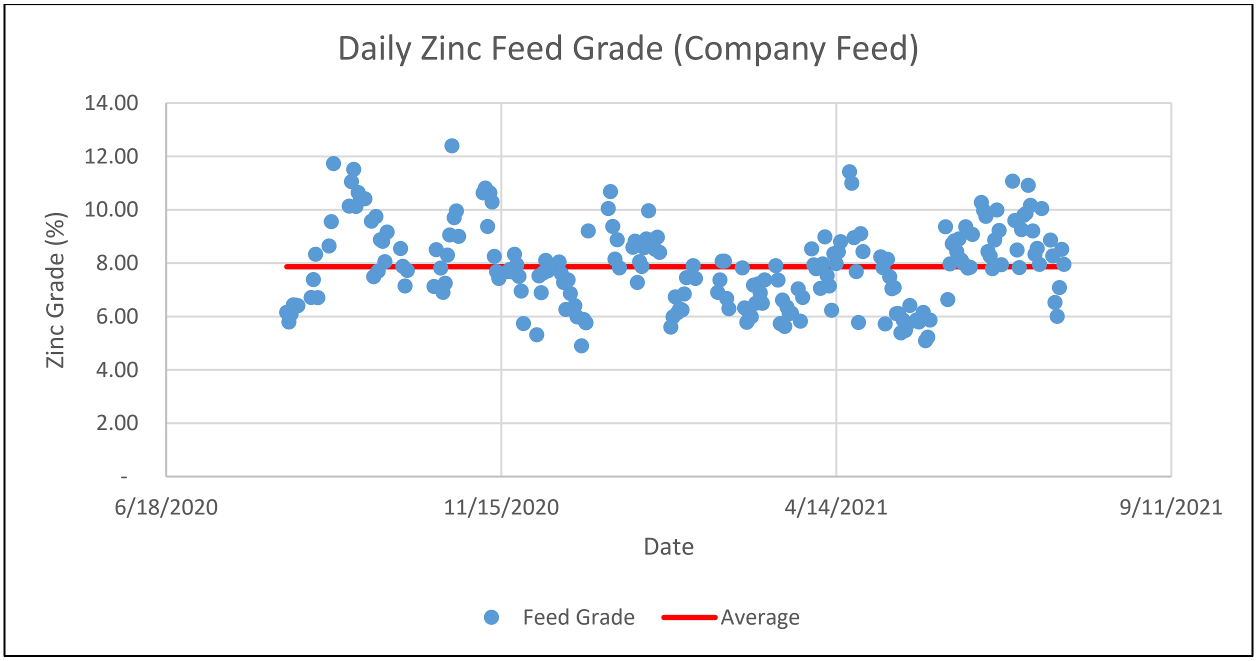


Figure 13-3: Lead Feed Grade 2020/2021

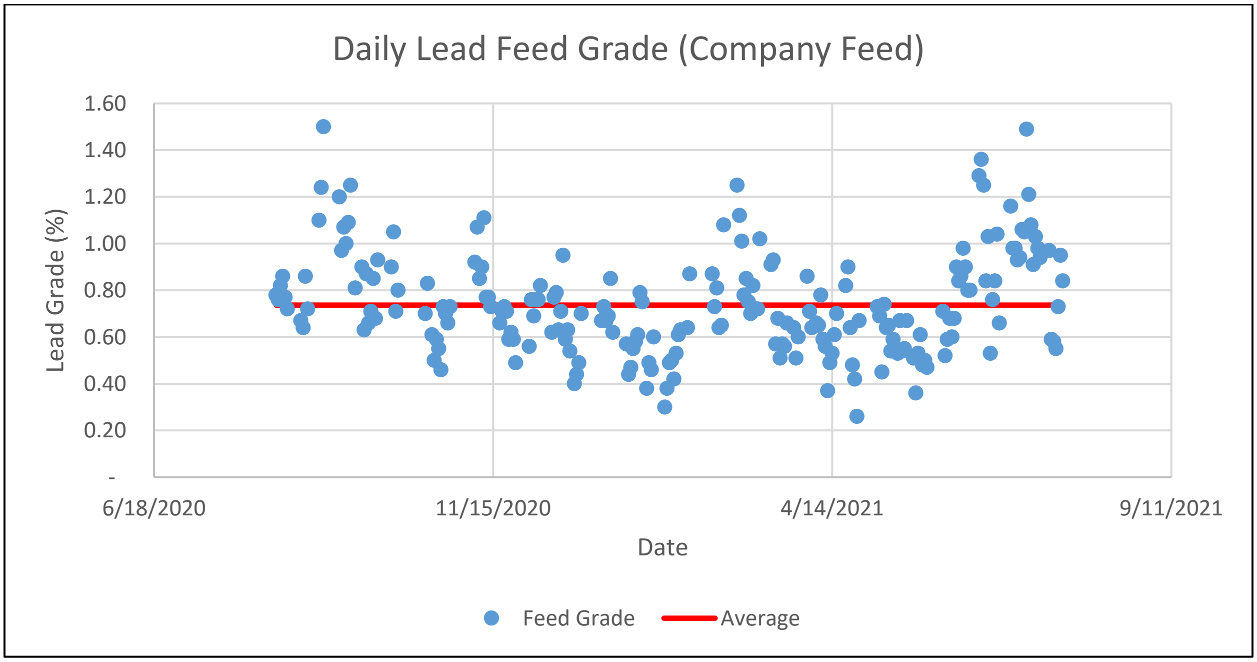
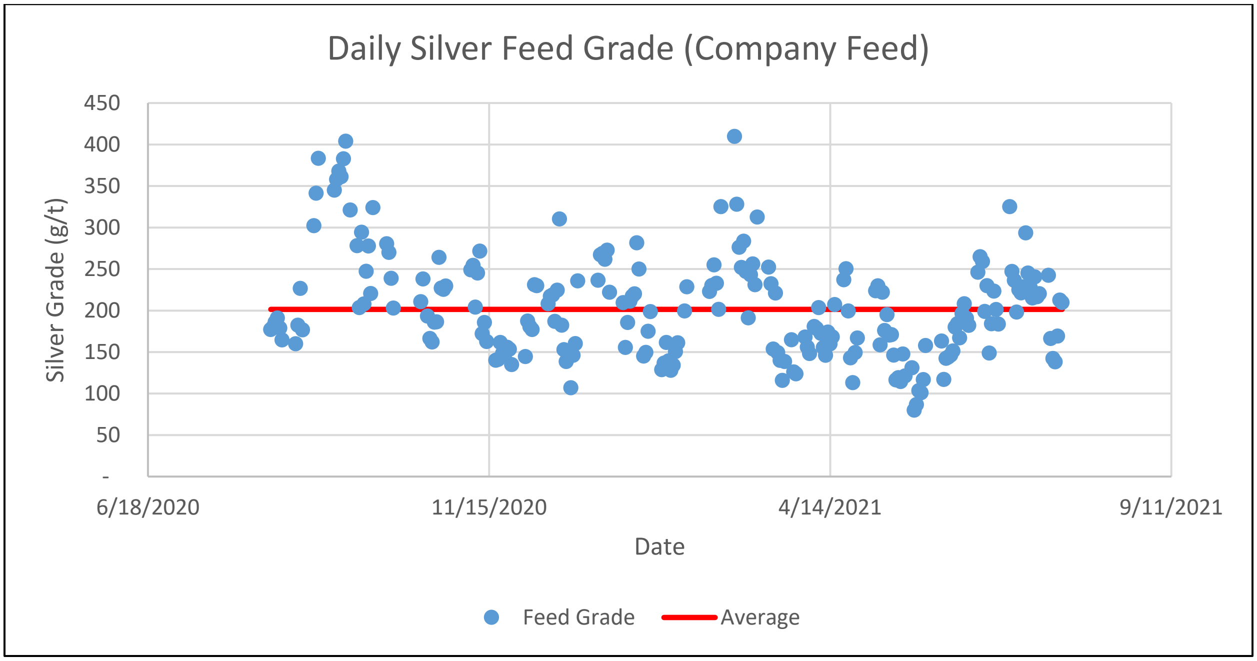


Figure 13-4: Silver Feed Grade 2020/2021



The mill feed grades are measured at the lead circuit flotation feed.

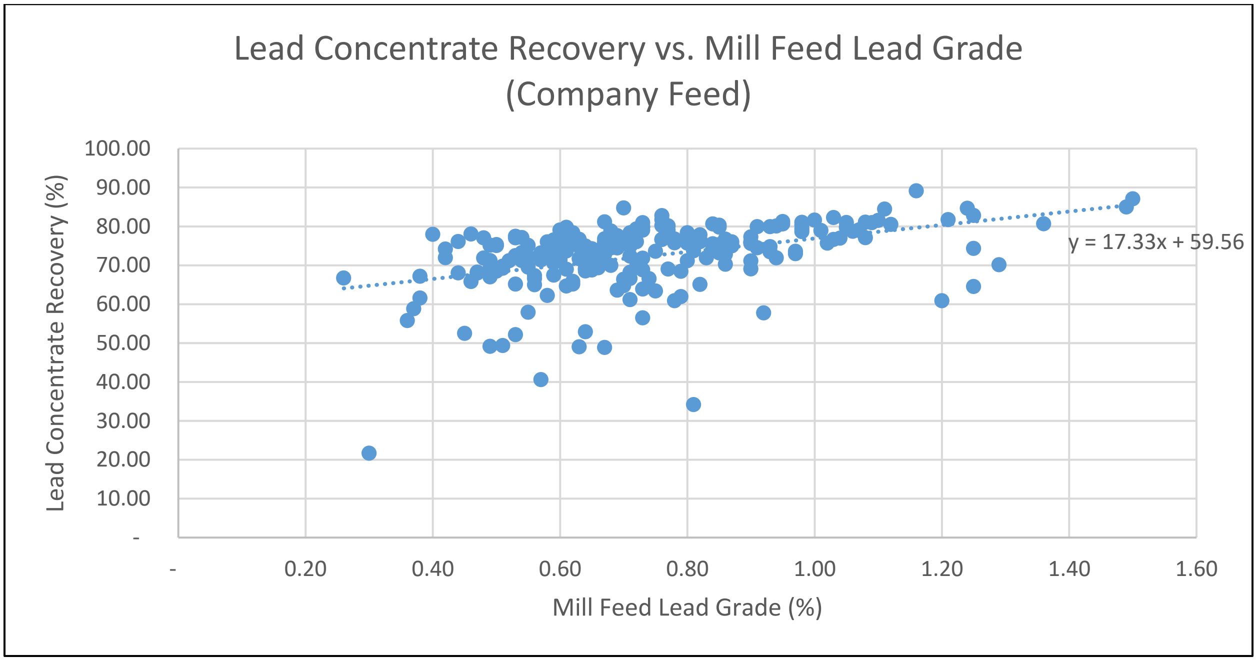
13.1.3 Lead Production

The grinding circuit product reports to the lead flotation circuit where Aerophene 3418A and a frother are added to float the lead and associated silver. In this circuit, cyanide is used as a zinc depressant, which is added to the cleaner circuit. The lead concentrate produced during evaluated period measured 3,850 t which represents 1.69% of the feed to the plant.

The average grade of the lead concentrate was 32.16% lead, 12.18% zinc, and 5,912 g/t silver. The recoveries to the lead concentrate were 72.68%, 48.43%, and 2.59% for lead, silver, and zinc respectively.

The relationship between the lead feed grade and the lead recovery to the lead concentrate can be seen in Figure 13-5. While there is some variability, especially in the lower lead feed grades, a clear relationship can be seen between lead feed grade and recovery to the lead concentrate.

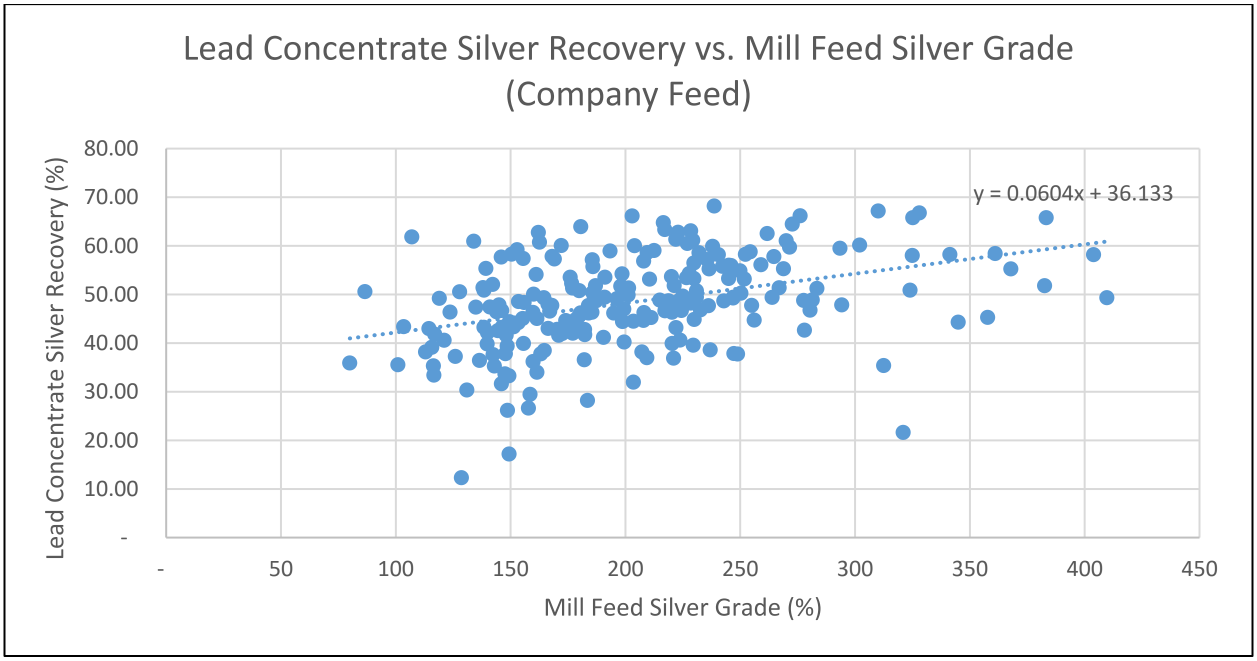
Figure 13-5: Mill Lead Concentrate Recovery vs. Lead Feed Grade



From the above analysis, the recovery relationship for lead to the lead concentrate will be considered: 17.33*(Lead feed grade %) + 59.56.

The silver recovery to both the lead and zinc concentrates is a byproduct of the flotation process; the silver is associated with the lead and zinc minerals and follows them into the concentrates. The recovery of silver to the lead concentrate can be seen in Figure 13-6. In this case, the silver recovery appears to follow a reasonable trend to the silver grade in the feed and, therefore, the relationship of 0.0604*(Silver feed grade %) + 36.133 will be used for this report.

Figure 13-6: Silver Recovery to the Lead Concentrate vs. Mill Feed Silver Grade



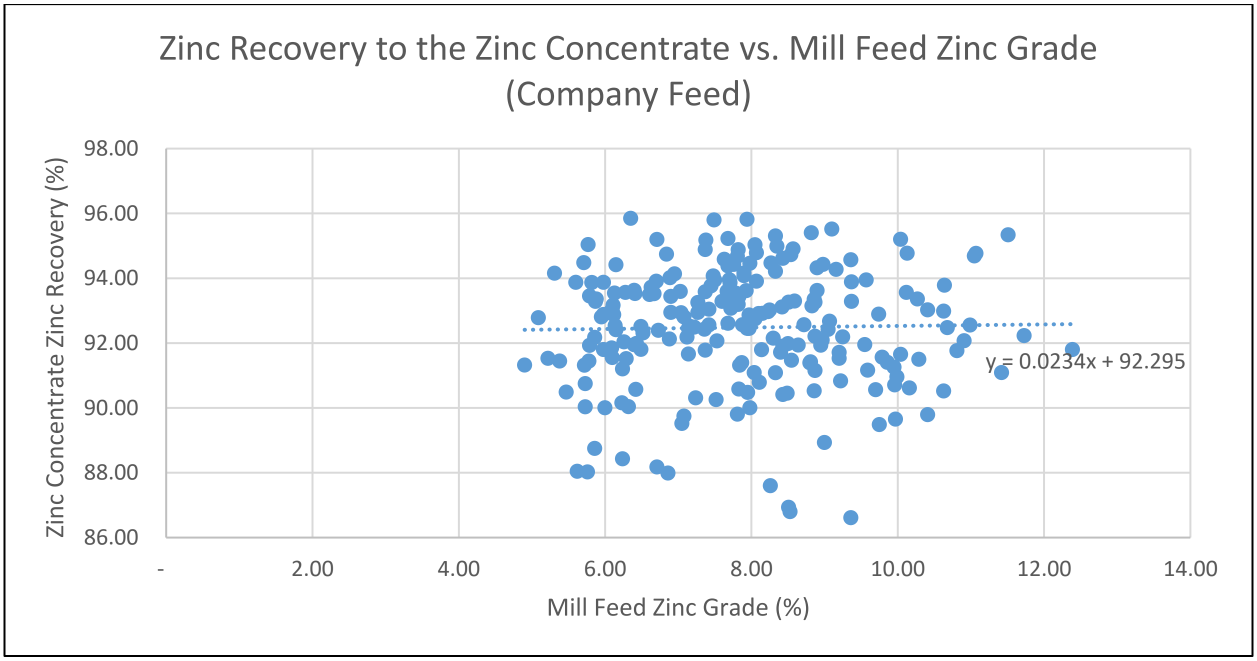
13.1.4 Zinc Production

The lead rougher and cleaner tailings report to the zinc circuit conditioning tanks where copper sulphate and additional collector and frother are added to float a zinc concentrate, with silver. The zinc concentrate accounts for approximately 13.7% of the feed mass.

Over the period analyzed, the unreconciled zinc concentrate production was 31,207 t with average grades of 53.06% zinc, 0.91% lead, and 626 g/t silver. The recoveries to the zinc concentrate were 92.48, 43.89, and 17.61 for zinc, silver, and lead respectively.

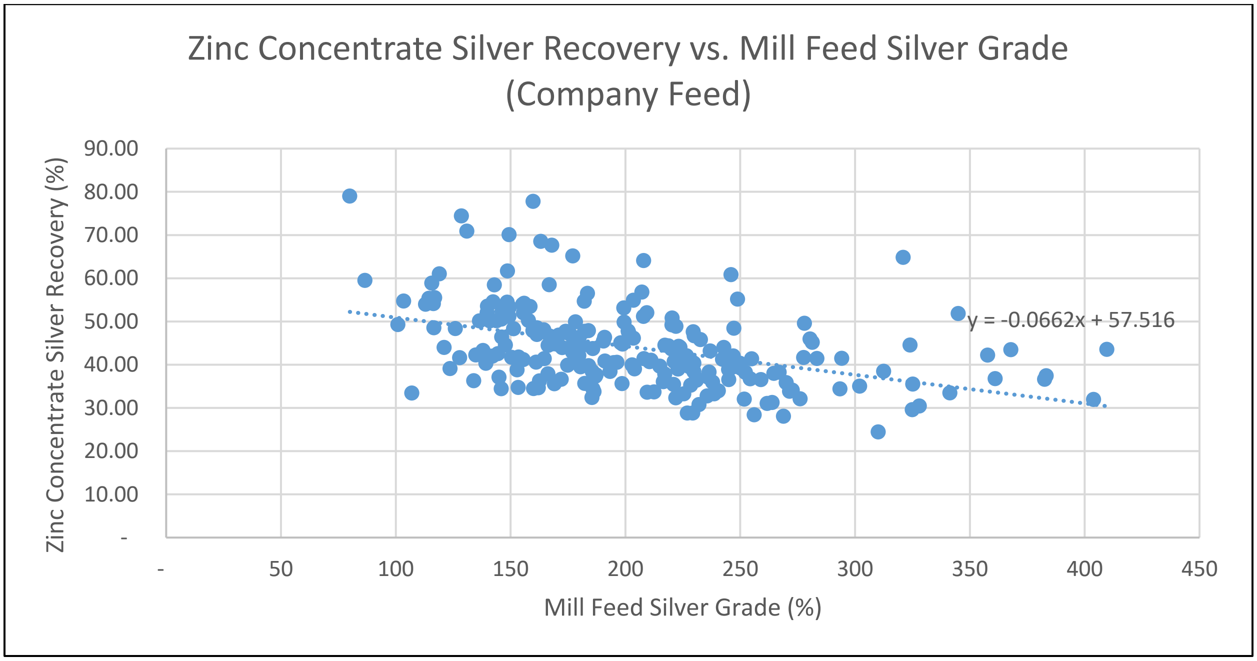
The zinc recovery as a function of the feed grade was examined and found to be a poor relationship (as is indicated by the R^2 value of 0.0004) for determining expected zinc recovery to the zinc concentrate as can be seen in Figure 13-7. It was determined in this case that the best option was to assign a zinc recovery to the zinc concentrate of 92%, which is the average value over the period examined.

Figure 13-7: Zinc Recovery to the Zinc Concentrate vs. Mill Feed Zinc Grade



The silver recovery to the zinc concentrate can be seen in Figure 13-8. In this case, the recovery has a negative relationship to the feed grade, most likely due to the positive relationship that the silver grade has with the silver recovery to the lead concentrate. The relationship for the silver recovery to the zinc concentrate will be taken as -0.0662 x (Silver Feed Grade) + 57.516.

Figure 13-8: Silver Concentrate to the Zinc Recovery vs. Mill Feed Silver Grade



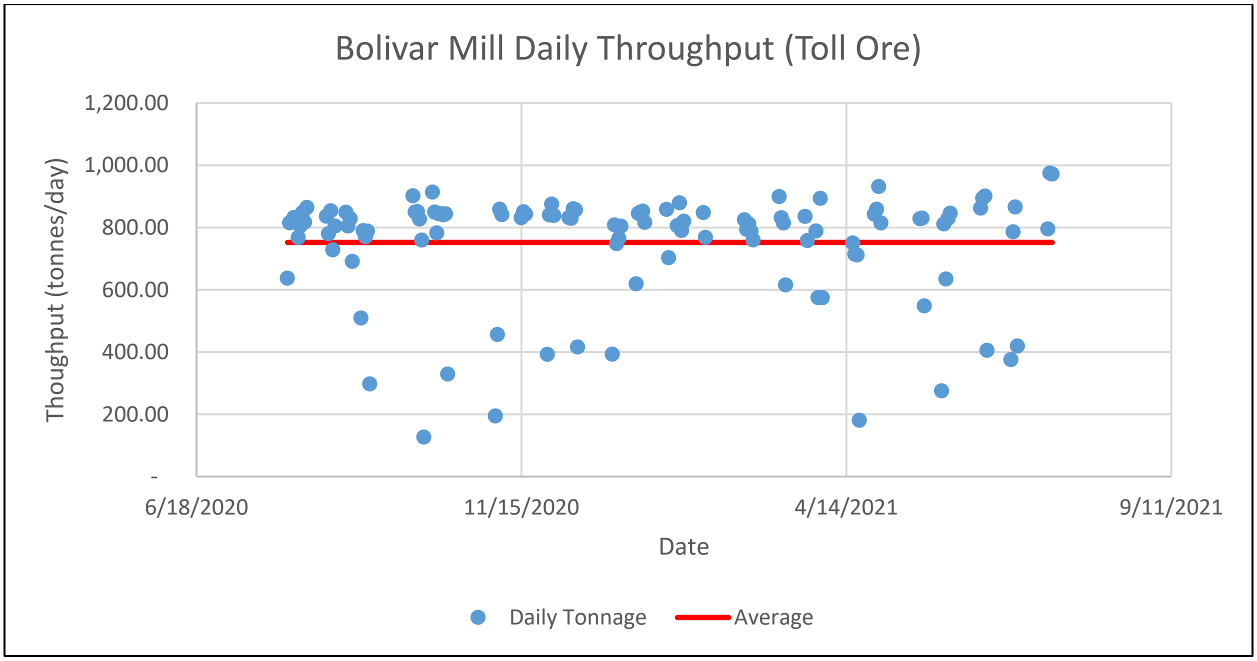
13.2 Toll Feed Processing

Data from the same time period, August 2020 to July 2021, was used to develop the expected metallurgical performance of the Bolivar mill on toll feed. As was the case for the company feed, the data was used to determine throughput, recovery and concentrate grade relationships.

13.2.1 Mill Throughput

As with the company feed, the expected availability for the mill is 93.8% and the utilization is 96.3% for an expected operating time of 90.3% for the toll feed. A summary of the throughput from August 2020 to July 2021 can be found in Figure 13-9.

Figure 13-9: Bolivar Mill Toll Feed Throughput 2020/2021



The throughput of company feed through the Bolivar mill during the analyzed period was a little higher than the stated target, with the average of the days it operated being 752 t/d. During the analyzed period, the mill ran company feed over 114 whole or partial days and processed 85,738 t of feed. The data suggests that the feed rate is not achieving the target throughput for company feed.

The target grind for the Bolivar plant toll feed has a P_{80} of 100 µm.

13.2.2 Feed Grades

For the period examined, the unreconciled feed grades for the company feed were 7.70% zinc, 0.76% lead, and 306 g/t silver. The feed was somewhat variable with standard deviations of 1.45, 0.32, and 111.32 for zinc, lead, and silver respectively. These values fall within the expected ranges for Bolivar toll feed. The unreconciled feed grades can be seen in Figure 13-10 through Figure 13-12.

Figure 13-10: Toll Feed Zinc Grade 2020/2021

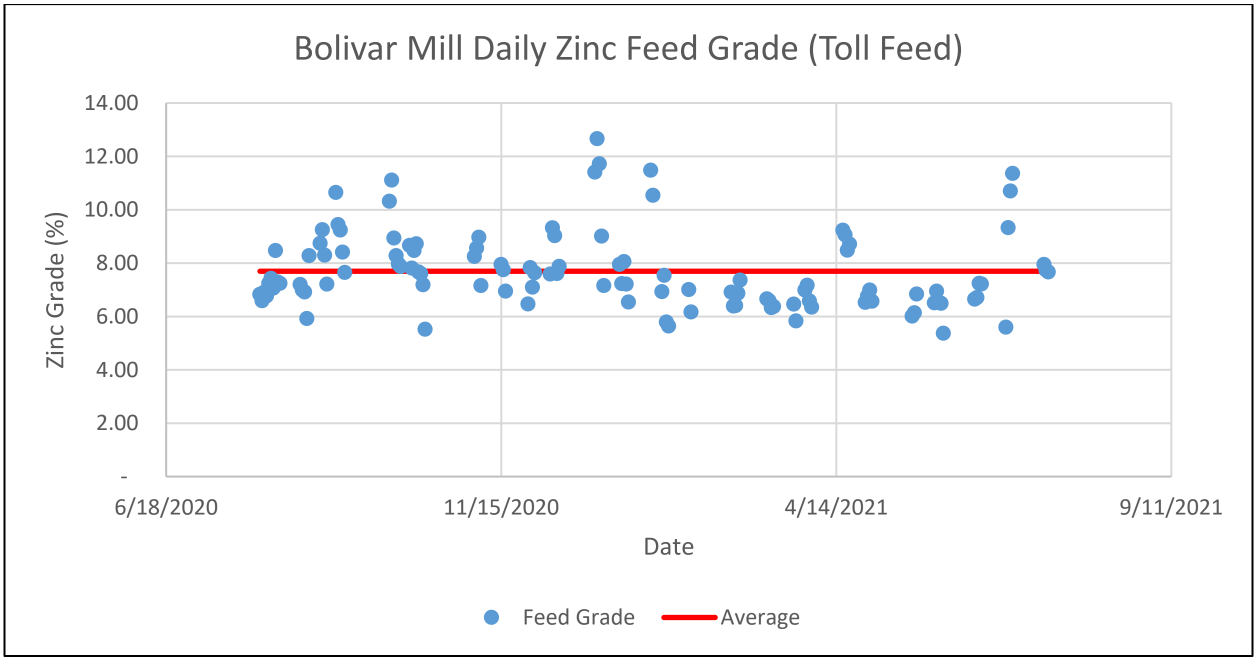


Figure 13-11: Toll Feed Lead Grade 2020/2021

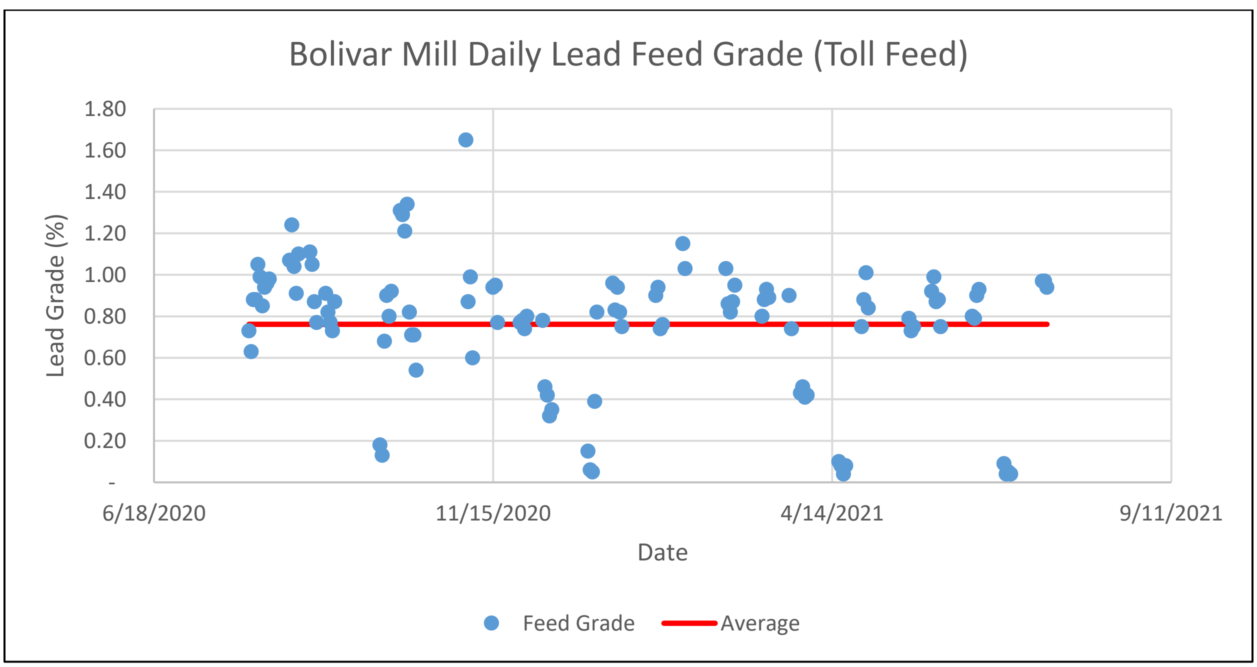
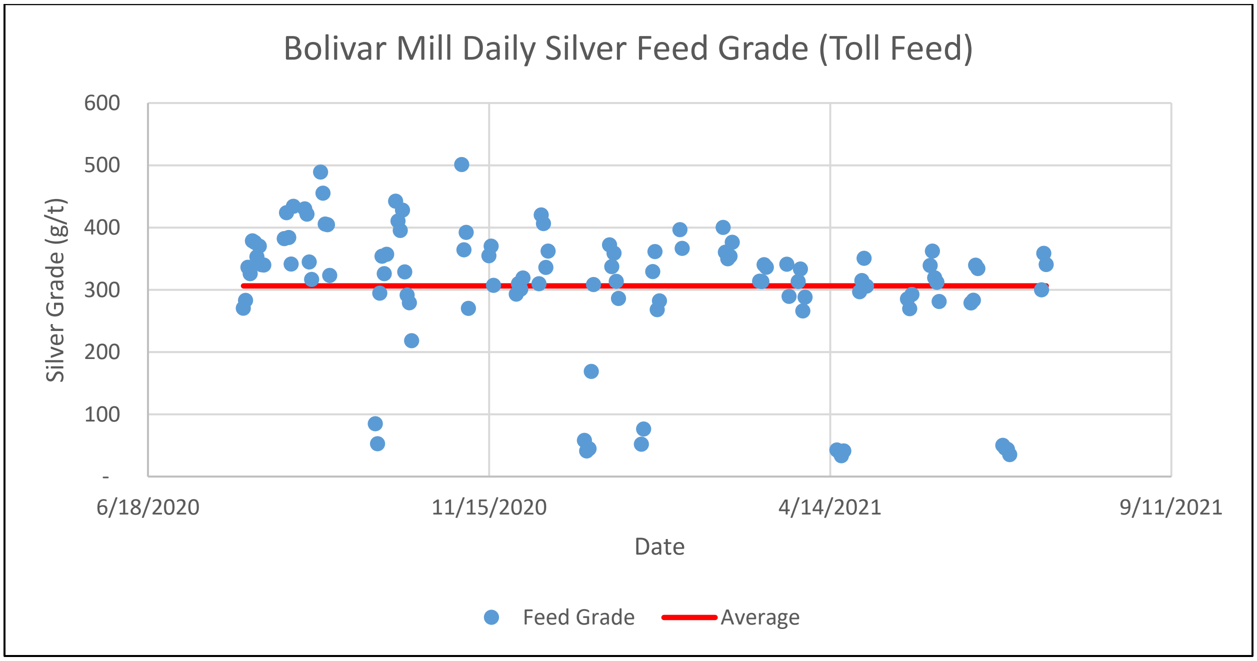


Figure 13-12: Toll Feed Silver Grade 2020/2021



The toll feed head grades were measured in the same location as the company feed.

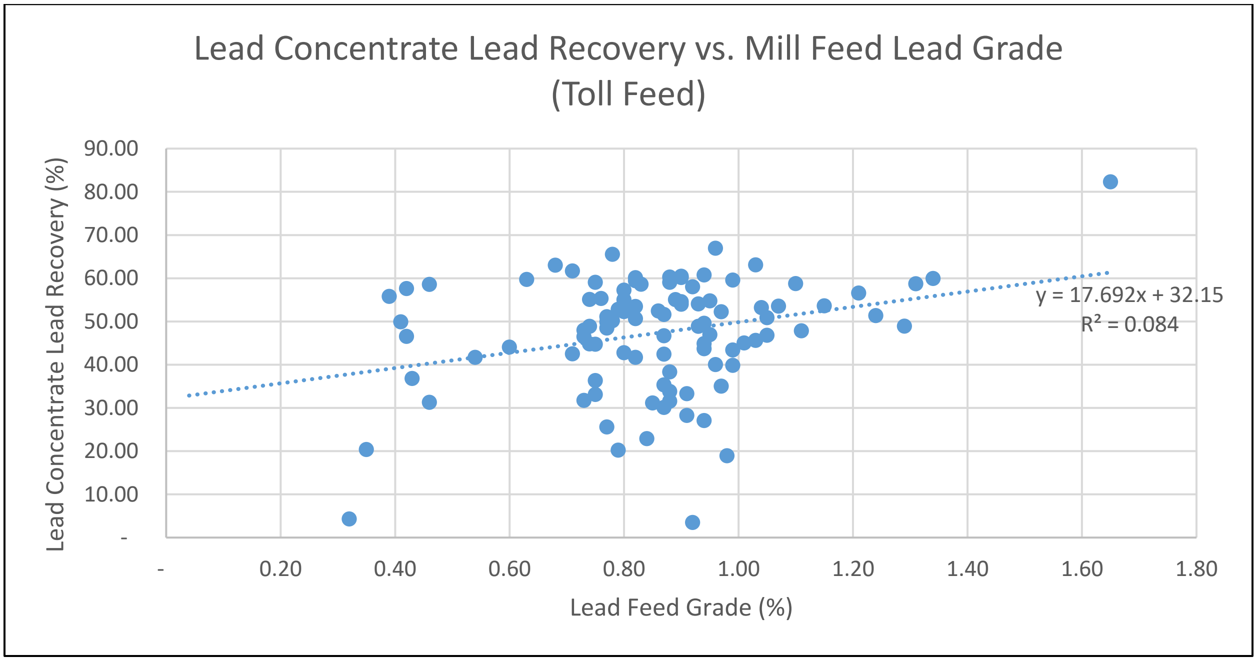
13.2.3 Lead Production

The toll feed utilizes the same reagents as the company feed, but in different dosages due to the pyrrhotite that is present in the toll feed but not the company feed. The lead concentrate produced during evaluated period measured 1,569 t which represents 1.83% of the feed to the plant.

The average grade of the lead concentrate was 19.80% lead, 11.07% zinc, and 5,472 g/t silver. Due to the low lead grades, the lead concentrate from the toll feed must be blended with the concentrate from the company feed to produce an acceptable concentrate grade for the smelter. The recoveries to the lead concentrate were 41.84%, 29.42%, and 2.78% for lead, silver, and zinc respectively.

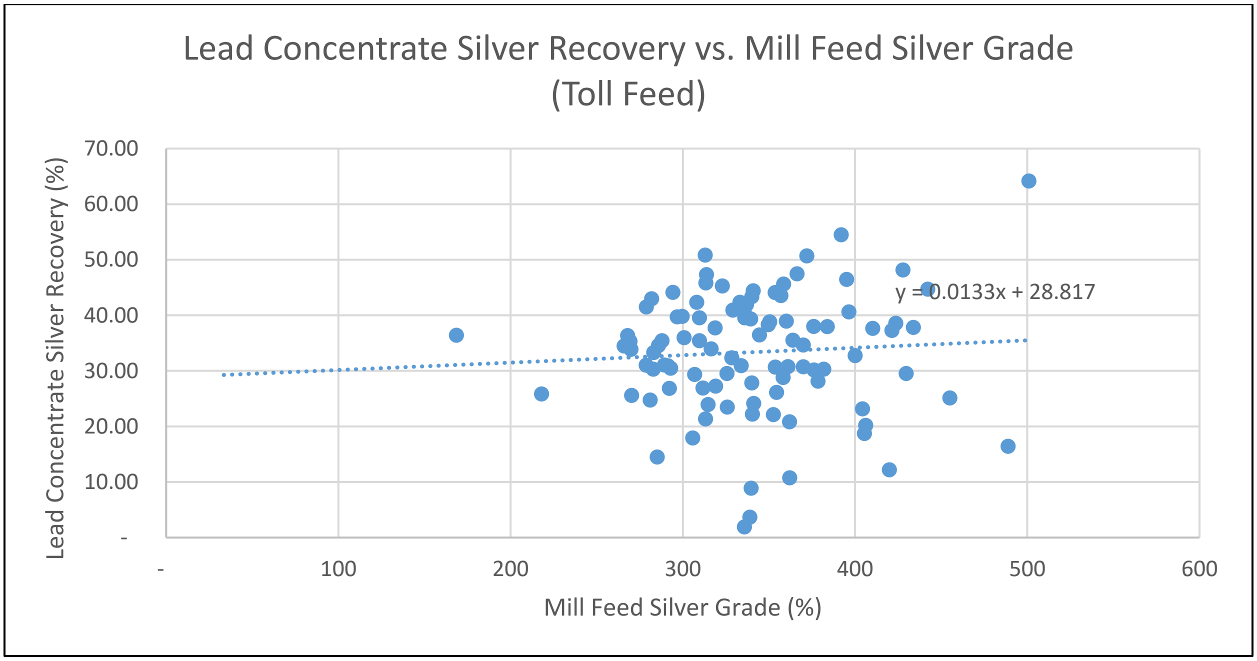
The relationship between the lead feed grade and the lead recovery to the lead concentrate can be seen in Figure 13-13. Although the relationship between lead feed grade and lead recovered to the lead concentrate does not have a high R^2 value, the graph does demonstrate that there is a relationship that can be used to loosely predict recovery. The recovery relationship for lead to the lead concentrate was determined to be: 17.69 x (Lead feed grade %) + 32.15.

Figure 13-13: Mill Lead Concentrate Recovery vs. Lead Feed Grade



The silver recovery to both the lead and zinc concentrates is a byproduct of the flotation process; the silver is associated with the lead and zinc minerals and follows them into the concentrates. The recovery of silver to the lead concentrate can be seen in Figure 13-14, In this case the silver recovery appears to be uncorrelated to the silver grade in the toll feed and therefore a silver recovery of 30, which is the average of the toll feed silver recovery to the lead concentrate, will be used.

Figure 13-14: Silver Recovery to the Lead Concentrate vs. Mill Feed Silver Grade

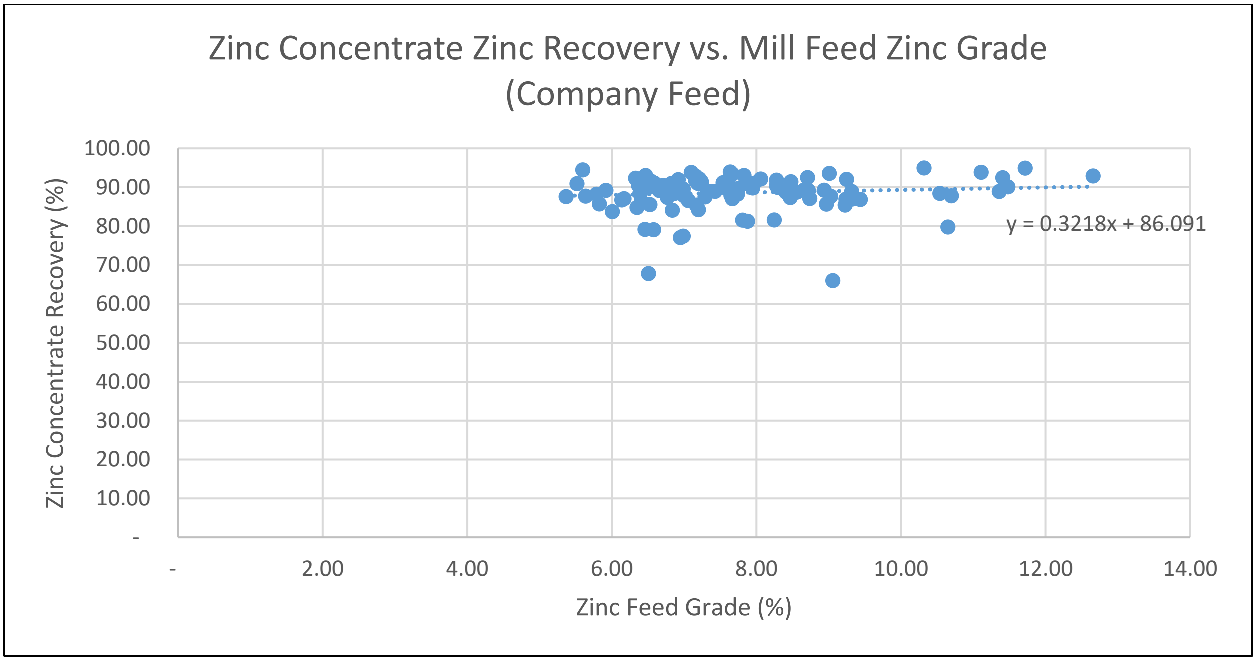


13.2.4 Zinc Production

Over the period analyzed, the unreconciled zinc concentrate production was 13,434 t with average grades of 43.63% zinc, 1.25% lead, and 773 g/t silver. The recoveries to the zinc concentrate were 88.74%, 36.23%, and 31.27% for zinc, silver, and lead respectively. The higher lead in the zinc concentrate is due to the low recovery of lead to the lead concentrate.

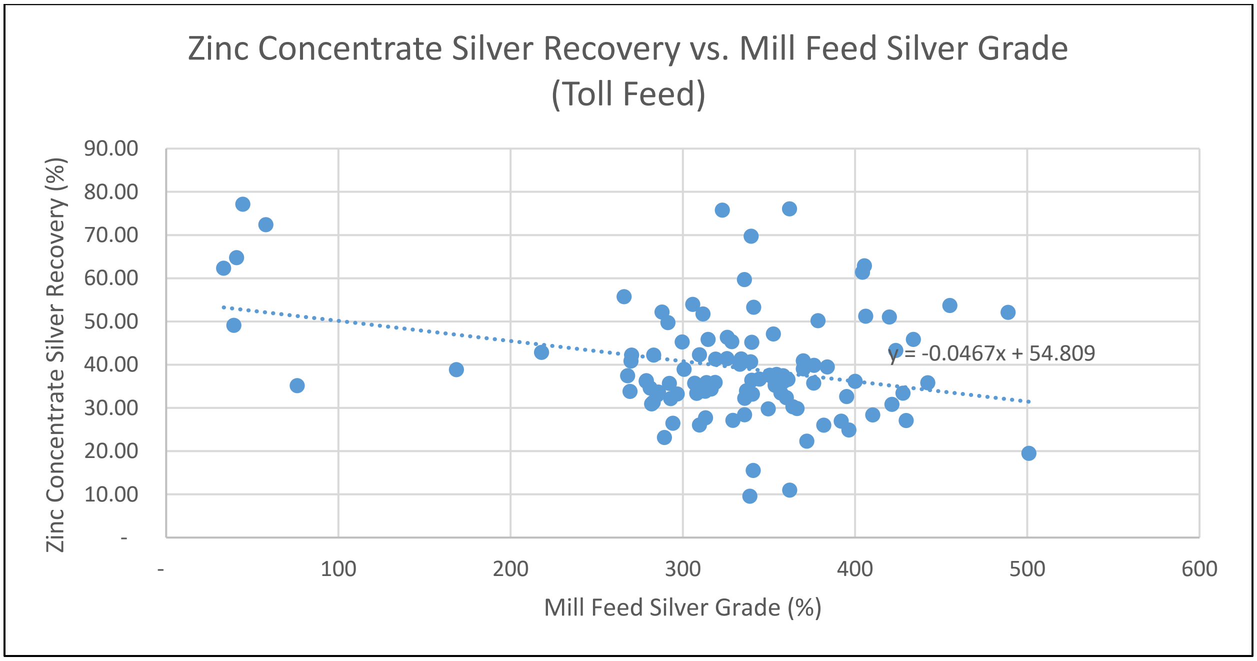
The zinc recovery as a function of the feed grade was examined and found to be a much better relationship for determining expected zinc recovery to the zinc concentrate than for the company feed. This relationship can be seen in Figure 13-15. The relationship used for the purposes of this report for the zinc recovery to the zinc concentrate is 0.3218 x (toll feed zinc grade) + 86.091.

Figure 13-15: Zinc Recovery to the Zinc Concentrate vs. Mill Feed Zinc Grade



The unreconciled silver recoveries to the zinc concentrate, for the toll feed, as reported had a few instances of values that were impossible (>100%). In order to determine a silver recovery to the zinc concentrate, any values that were greater than 80% were removed to produce the average recovery of 36.23%. The recovery of silver to the zinc concentrate, with the stated adjustments, can be seen in Figure 13-16, As with the lead concentrate, the silver recovery to the zinc concentrate appears to have a poor correlation to the silver grade in the toll feed. A silver recovery of 36% to the zinc concentrate, which was the average for the data, was chosen for this report.

Figure 13-16: Silver Recovery to the Zinc Concentrate vs. Mill Feed Silver Grade



13.3 Metallurgical Assumptions

The metallurgical assumptions for recoveries and concentrate grades can be found in Table 13-1.

While both the lead and the zinc concentrates pay for the metal they are named for and for silver, a lead concentrate does not pay for zinc contained and the zinc concentrate does not pay for lead contained. The recoveries included in this report only include recovery to concentrates in which they can be paid.

Table 13-1: Recovery and Concentrate Grade Estimates

Parameter	Unit	Concentrates			
		Lead Concentrate		Zinc Concentrate	
		Company Feed	Toll Feed	Company Feed	Toll Feed
Zn Recovery	%	N/A	N/A	92	86.091 + 0.3218*(Zinc Feed Grade)
Pb Recovery	%	59.56 + 17.33*(Lead Feed Grade)	32.15 + 17.69*(Lead Feed Grade)	N/A	N/A
Ag Recovery	%	36.133 + 0.0604*(Silver Feed Grade)	30	57.516 - 0.0662*(Silver Feed Grade)	36
Concentrate Grade					
Zn	%	12	11	53	44
Pb	%	32	20	0.91	1.25
Ag	g/t	5900	5500	630	775

14 MINERAL RESOURCE ESTIMATE

14.1 Introduction

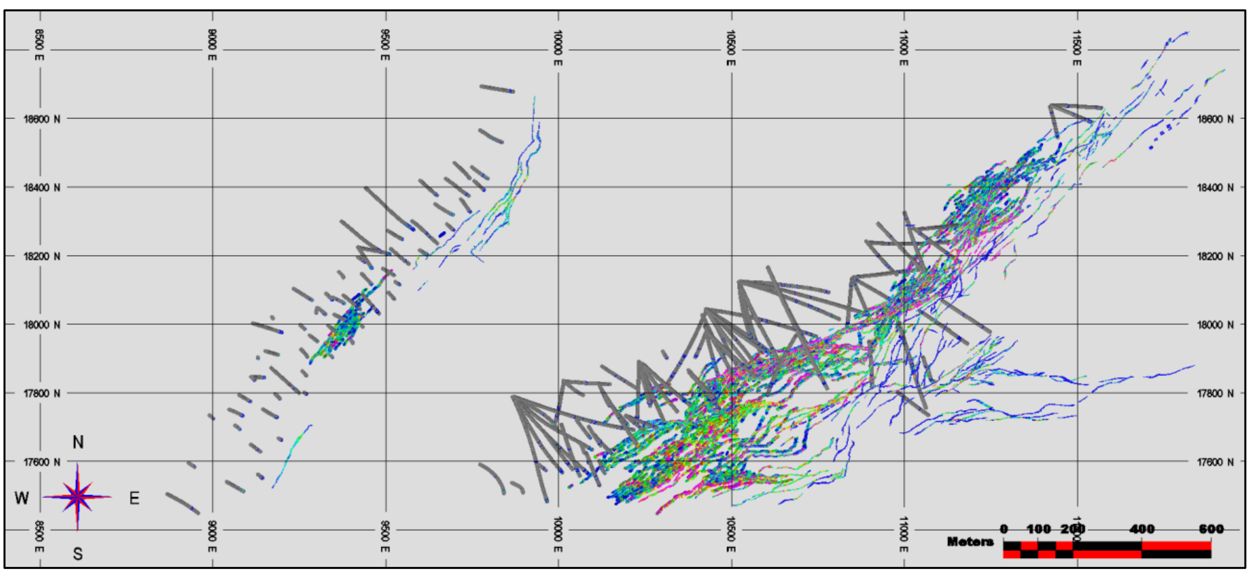
The purpose of this report is to document the resource estimations for the Bolivar deposit. This section describes the work undertaken by Kirkham Geosystems, including key assumptions and parameters used to prepare the mineral resource models for Bolivar which herein to be reporting using ZnEq cut-offs based upon updated commodity pricing and actual operating costs.

In addition, this Technical Report serves as a first-time disclosure for mineral resources for the Bolivar deposit, together with appropriate commentary regarding the merits and possible limitations of such assumptions.

14.2 Data

The 145 drillholes and 23,059 underground channels in the database were supplied in electronic format by Santacruz. This included collars, downhole surveys, lithology data and assay data (i.e., Ag g/t, Pb%, Zn%, Fe%, Sn%). Validation and verification checks were performed during importation of data to ensure there were no overlapping intervals, typographic errors or anomalous entries. Anomalies and errors were validated and corrected. Figure 14-1 shows a plan view of the supplied drillholes and underground channel samples.

Figure 14-1: Plan View of Bolivar Drillholes



14.3 Geology Model

Solid models (Figure 14-2 through Figure 14-4) were created from sections and based on a combination of lithology, grades and site knowledge. It is important to note that the Bolivar Mine has been producing for many years which means that a great deal is known about the mineralized structures such that there is a high level of confidence in the location, orientation and dimensions of the modelled geological domains.

Figure 14-2: Plan View of Bolivar Mineralized Zones and Drillholes

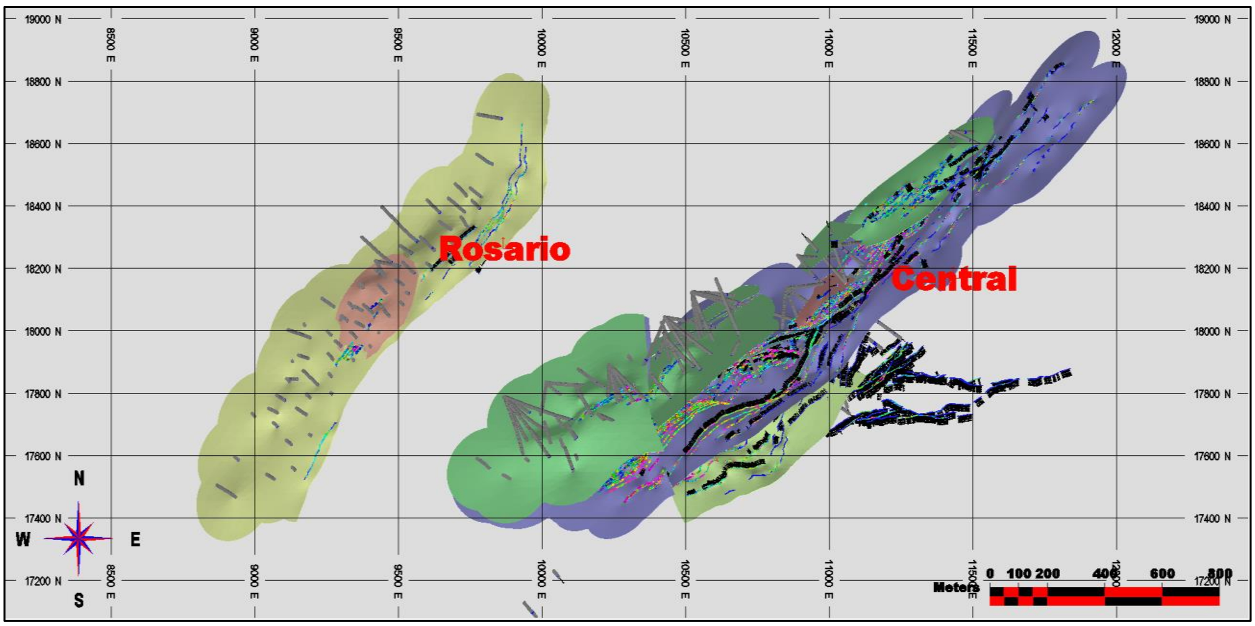


Figure 14-3: Section View of Bolivar Mineralized Zones and Drillholes Looking North

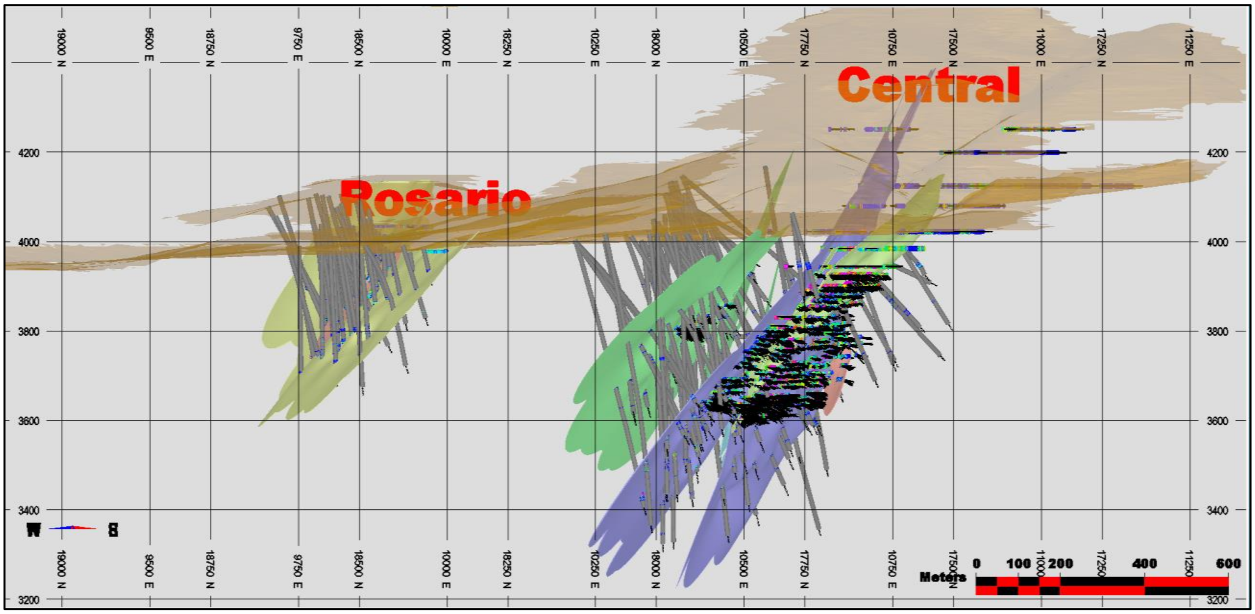
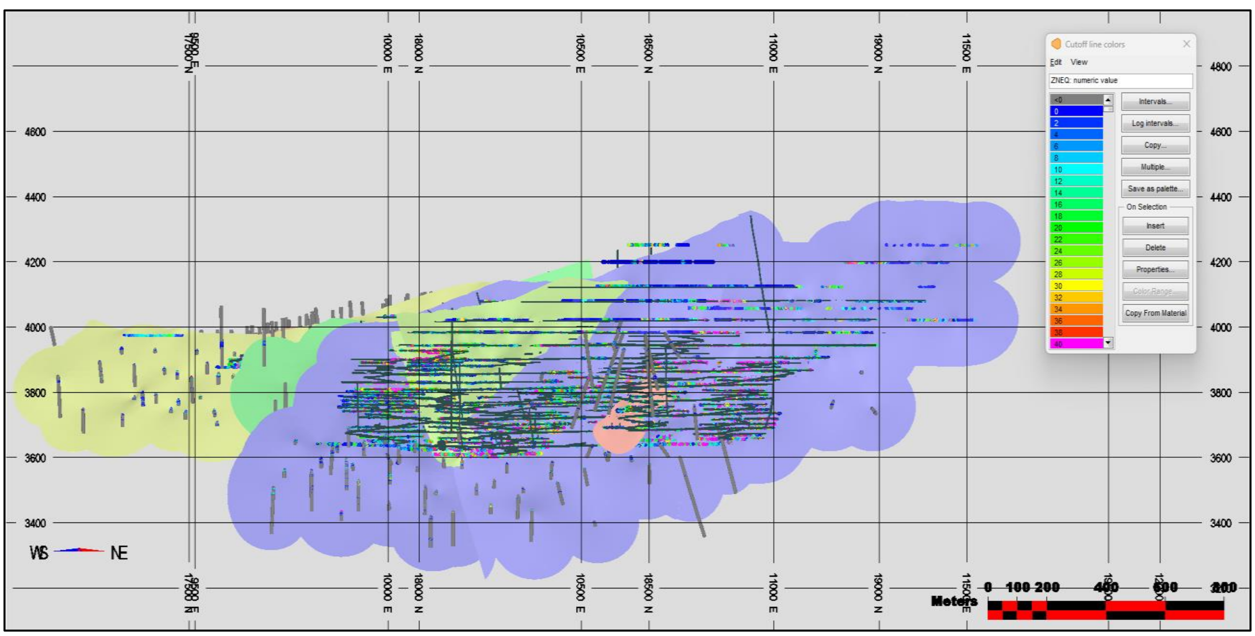


Figure 14-4: Long Section View of Bolivar Mineralized Zones and Drillholes Looking South East



All zones were modelled based on current drilling and assay data using LeapFrog™ and then imported into MineSight™ for interpretation and refinement. Every intersection was inspected, and the solid was then manually adjusted to match the drill intercepts. Once the solid model was created, it was used to code the drillhole assays and composites for subsequent statistical and geostatistical analysis. The solid zones were used to constrain the block model by matching assays to those within the zones. The orientation and ranges (distances) used for search ellipsoids in the estimation process were derived from strike and dip of the mineralized zone, site knowledge and on-site observations by Santacruz geological staff.

14.4 Data Analysis

Each of the veins within the Bolivar deposit is identified and individually coded as shown in Table 14-1.

Table 14-1: Vein Codes and Descriptions for the Bolivar Deposit

Vein #	Vein Code	Vein Name
3020	BOL-PBA-NAN	Pomabamba-Bolívar-Nané
3032	RMA	Ramo A
3040	BSW - RNA	Bolívar SW - Ramo Nané
3041	KRN	Karen
3050	NUE	Nueva
3060	NSW	Nané SW
3090	ROS	Rosario
3091	RRO	Ramo Rosario
3092	PAM	Pamela
3240	ALK	Alimak
3250	RBE	Ramo Bolívar Este

The database was then numerically coded using these individual mineralized solids. The database was then inspected and manually adjusted, drillhole by drillhole, to ensure accuracy of zonal intercepts. Table 14-2 shows the statistics for the silver, lead and zinc assays.

Note that all of the vein domains possess a relatively low degree of variability which is evidenced by the low Coefficient of Variation (CV) which is a unit independent quantitative measure of variability. With CV's being quite low at values of <2 with 3092 having only one lead assay and 3250 having one silver assay with a CV >2. However, the Bolivar deposit is extremely high grade and although not demonstrating high levels of variability, with grades up to 60.8% zinc, 61.6% lead and 17,446 g/t silver, it is prudent to ensure that extremely high grades do not unduly over-influence the resource as a whole. The goal of compositing and grade cutting will be to temper the effect of extreme grades so as not to spread or smear beyond reasonable distances.

Table 14-2: Statistics Silver, Lead and Zinc for the Bolivar Deposit by Vein

	Vein#	#	Length (m)	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
Zn	**3020**	17,212	13,934.95	0.02	57.02	16.15	7.20	14.59	23.35	11.00	120.94	0.7
	3032	335	241.8	0.34	38.46	8.20	3.60	6.66	11.19	6.43	41.38	0.8
	3040	5,847	3,956.27	0.01	59.88	20.97	8.71	20.16	32.31	13.50	182.15	0.6
	3041	233	139.45	0.11	47.74	18.06	5.20	15.64	29.93	13.90	193.09	0.8
	3050	2,128	1,400.67	0.04	60.76	10.60	2.96	6.96	14.78	10.43	108.78	1.0
	3060	4,198	3,493.62	0.1	53.80	15.00	6.28	13.68	21.97	10.35	107.04	0.7
	3090	1,877	1,559.18	0.04	50.64	7.36	2.43	5.41	9.93	6.98	48.67	0.9
	3091	70	101.27	0.84	21.30	6.91	4.97	7.10	8.38	2.94	8.66	0.4
	3092	105	71.28	0.04	26.24	4.44	0.44	2.06	5.85	5.79	33.54	1.3
	3240	268	130.1	0.12	46.05	11.82	2.66	7.88	17.34	11.21	125.76	0.9
	3250	342	228.25	0.11	49.86	11.28	2.88	8.17	15.41	10.45	109.14	0.9
	Total	32,615	25,256.84	0.01	**60.76**	15.69	6.01	13.49	23.38	11.58	134.08	**0.7**
	All	46,062	34,275.87	0	60.76	14.79	4.91	12.34	22.33	11.67	136.13	0.8
Pb	**3020**	16,492	13,491.46	0	41.96	1.61	0.30	0.83	2.00	2.19	4.79	1.4
	3032	335	241.8	0.1	15.37	1.07	0.19	0.41	1.28	1.73	2.99	1.6
	3040	5,824	3,945.46	0.01	28.65	1.90	0.37	0.93	2.47	2.46	6.04	1.3
	3041	233	139.45	0.04	12.23	1.65	0.46	0.85	1.99	1.98	3.92	1.2
	3050	2,127	1,400.22	0	45.21	1.33	0.22	0.56	1.43	2.38	5.65	1.8
	3060	4,182	3,477.95	0.01	31.54	1.20	0.25	0.71	1.65	1.51	2.29	1.3
	3090	1,867	1,552.48	0	61.10	2.00	0.08	0.44	1.80	4.27	18.22	2.1
	3091	70	101.27	0.2	11.36	2.16	0.76	1.28	2.36	2.45	6.03	1.1
	3092	105	71.28	0	13.35	0.88	0.04	0.14	0.56	2.15	4.62	**2.5**
	3240	268	130.1	0.01	9.75	0.89	0.13	0.30	0.82	1.43	2.03	1.6
	3250	342	228.25	0.04	13.24	0.74	0.12	0.27	0.70	1.49	2.22	2.0
	Total	31,845	24,779.72	0	**61.10**	1.59	0.27	0.77	1.93	2.35	5.54	**1.5**
	All	44,332	33,325.45	0	61.89	1.53	0.23	0.70	1.86	2.32	5.38	1.5
Ag	**3020**	17,194	13,921.51	1	17,446	493	117	276	611	650	422,256	1.3
	3032	335	241.8	8	4,297	241	45	90	256	415	172,629	1.7
	3040	5,835	3,949.71	1	9,398	423	125	288	525	507	256,711	1.2
	3041	233	139.45	7	1,927	233	78	196	325	235	55,021	1.0
	3050	2,127	1,400.22	0	6,564	237	39	111	268	407	165,667	1.7
	3060	4,180	3,478.62	2	11,470	555	122	308	713	733	537,660	1.3
	3090	1,932	1,601.73	0	5,653	223	50	124	277	299	89,417	1.3
	3091	70	101.27	33	898	212	149	176	250	119	14,210	0.6
	3092	105	71.28	3	1,689	110	12	43	112	211	44,502	1.9

	Vein#	#	Length (m)	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
	3240	268	130.1	1	2,713	175	20	66	179	322	103,733	1.8
	3250	342	228.25	7	4,039	176	26	77	177	409	166,938	**2.3**
	Total	32,621	25,263.94	0	**17,446**	**449**	99	250	554	614	376,623	**1.4**
	All	45,964	34,232.64	0	17,446	419	78	218	510	610	371,966	1.5

Additionally, tin and iron statistics show relatively elevated values particularly for tin within the 3020, 3040, 3060 and 3090 veins. The tin and iron assay data is very variable as evidenced by the very high to extreme CV's ranging from 2 – 4 and up to >17. Although the tin and iron ae not considered economic contributors at this time, they may prove important in the future in addition to needing monitoring from a geo-metallurgical perspective.

Table 14-3: Statistics Tin and Iron for the Bolivar Deposit by Vein

	Vein#	#	Length (m)	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
SN	**3020**	17,885	14,409.63	0	**30.40**	**0.54**	0.00	0.00	0.59	1.16	1.35	2.1
	3032											
	3040	5,872	3,972.12	0	**16.47**	**0.18**	0.00	0.00	0.00	0.75	0.56	4.1
	3041											
	3050	2,132	1,401.97	0	1.85	0.00	0.00	0.00	0.00	0.06	0.00	17.4
	3060	4,351	3,641.90	0	**18.50**	**0.60**	0.00	0.00	0.80	1.10	1.21	1.8
	3090	1,971	1,642.23	0	**11.21**	**0.12**	0.00	0.00	0.00	0.55	0.30	4.6
	3091	70	101.27	0	1.50	0.04	0.00	0.00	0.00	0.18	0.03	4.1
	3092	105	71.28	0	1.16	0.03	0.00	0.00	0.00	0.14	0.02	4.5
	3240											
	3250											
	Total	33,564	25,980.00	0	**30.40**	0.42	0.00	0.00	0.35	1.03	1.07	**2.5**
	All	48,826	36,117.22	0	30.40	0.46	0.00	0.00	0.40	1.11	1.23	2.4
FE	**3020**	17,885	14,409.63	0	45.86	1.87	0.00	0.00	0.00	5.39	29.07	2.9
	3032											
	3040	5,872	3,972.12	0	36.53	1.83	0.00	0.00	0.00	5.29	28.00	2.9
	3041	233	139.45	0	30.91	9.78	4.71	9.48	15.19	7.05	49.69	0.7
	3050	2,132	1,401.97	0	38.05	2.19	0.00	0.00	0.00	5.79	33.52	2.6
	3060	4,351	3,641.90	0	34.24	1.13	0.00	0.00	0.00	4.37	19.11	3.9
	3090	1,971	1,642.23	0	40.69	3.13	0.00	0.00	5.66	5.44	29.62	1.7
	3091											

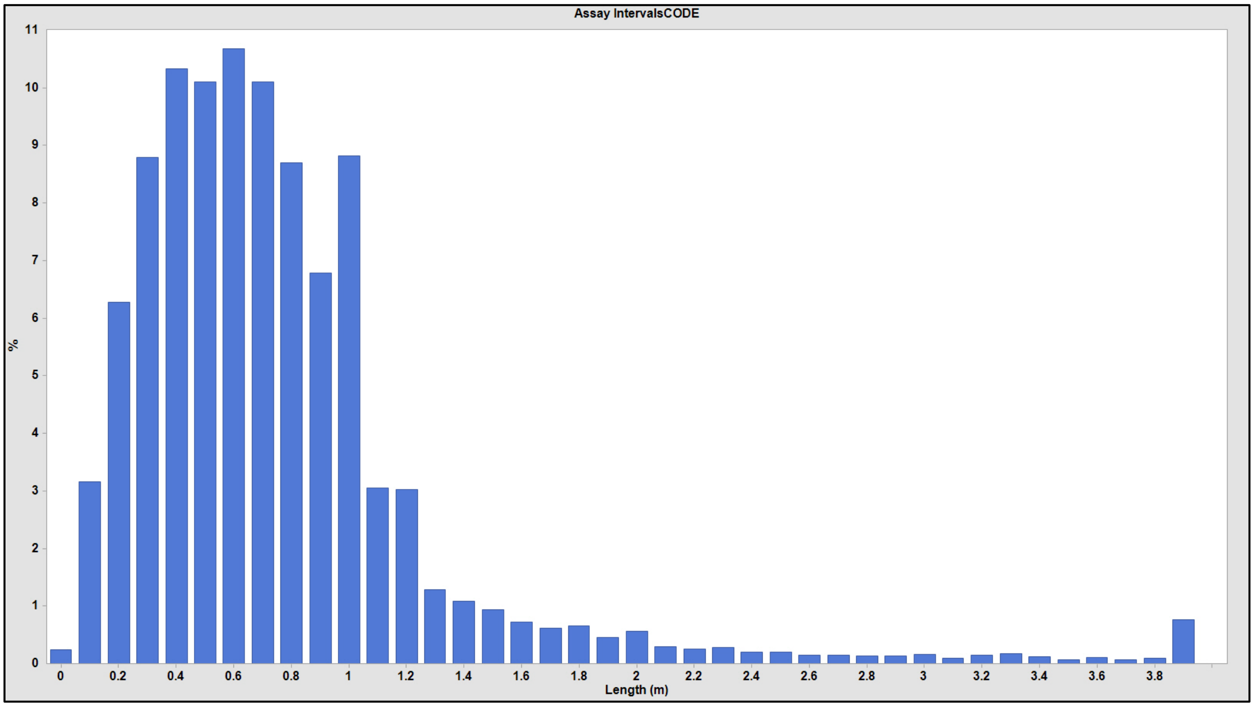
	Vein#	#	Length (m)	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
	3092	105	71.28	0	19.36	3.09	0.00	0.00	6.34	4.28	18.28	1.4
	3240	268	130.1	0	10.21	0.09	0.00	0.00	0.00	0.77	0.60	8.7
	3250											
	Total	33,564	25,980.00	0	45.86	1.85	0.00	0.00	0.00	5.26	27.70	2.8
	All	48,826	36,117.22	0	45.86	1.58	0.00	0.00	0.00	4.89	23.93	3.1

Table 14-4 shows the statistical analysis of assay interval lengths shows that the average sample length is 0.83 m with the median (or the value where 50% of the data is above and below) being 0.7 m. Therefore, the data is negatively skewed meaning that there is a preponderance of small sample lengths in comparison to greater thicknesses. Figure 14-5 also illustrates this negative skewness and also illustrates that the assay lengths are predominately <1 m in length with 20% of all vein samples being >1 m.

Table 14-4: Statistics Assay Interval Lengths for the Bolivar Deposit by Vein

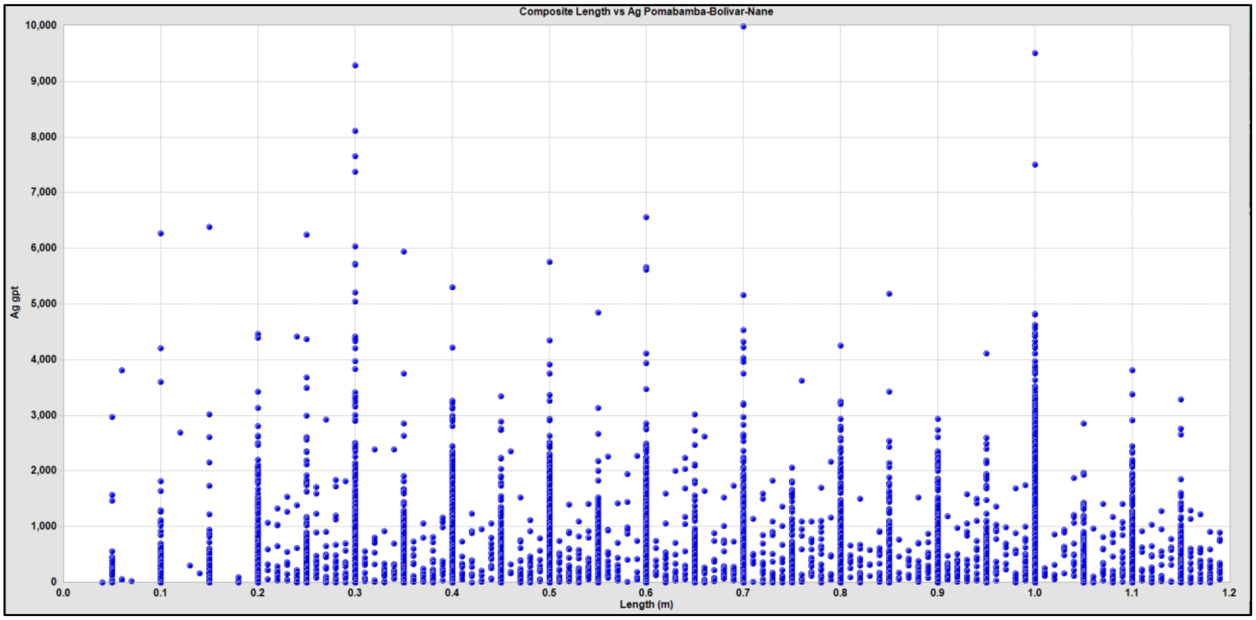
	Vein#	#	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
	3020	17,937	0.04	77.09	**0.84**	0.40	0.70	1.00	1.20	1.44	1.4
	3032	335	0.1	1.80	**0.72**	0.50	0.70	1.00	0.30	0.09	0.4
	3040	5,878	0.1	69.88	**0.70**	0.40	0.60	0.90	1.24	1.53	1.8
	3041	234	0.15	4.02	**0.61**	0.39	0.56	0.78	0.35	0.12	0.6
	3050	2,192	0.04	111.70	**1.04**	0.40	0.65	0.90	4.29	18.42	4.1
	3060	4,353	0.01	15.57	**0.84**	0.45	0.70	1.00	0.70	0.49	0.8
Al	**3090**	2,018	0.03	54.90	**0.96**	0.48	0.70	1.00	1.80	3.24	1.9
	3091	70	0.6	2.80	**1.45**	0.90	1.50	1.82	0.60	0.36	0.4
	3092	123	0.02	76.61	**1.82**	0.48	0.68	0.95	7.64	58.38	4.2
	3240	269	0.1	3.75	**0.50**	0.30	0.40	0.60	0.34	0.11	0.7
	3250	342	0.1	2.00	**0.67**	0.40	0.60	1.00	0.34	0.12	0.5
	Total	33,751	0.01	111.70	**0.83**	0.40	0.70	0.98	1.65	2.71	2.0
	All	54,018	0.01	175.86	**1.56**	0.40	0.70	1.00	5.55	30.79	3.6

Figure 14-5: Assay Interval Lengths



A significant concern related to having very small sample widths is the potential for bias due to selectively sampled or high grading. Figure 14-6 shows the distribution of silver values compared with sample lengths where there are a large number of very high grades that coincide with small intervals although the distribution is not overly biased. However, compositing to larger intervals will understandably smooth out or dilute the effect of these very high grades, it is also clear that an outlier strategy that reduces the extreme effects is also warranted even though variabilities remain low.

Figure 14-6: Assay Interval Lengths vs Silver Grades



14.5 Composites

It was determined that a 1.0 m composite length offered the best balance between supplying common support for samples and minimizing the smoothing of the grades with ~80% of the samples within the mineralized zones being <1 m in length. The 1.0 m sample length also was consistent with the distribution of sample lengths within the mineralized domains as shown in the histogram of assay lengths.

Table 14-5 shows the basic statistics for the 1.0 m zinc, lead and silver composite grades within the mineralized vein domains. It should be noted that although 1.0 m is the composite length, any residual composites of lengths greater than 0.5 m were retained to represent a composite, while any composite residuals less than 0.5 m were combined with the previous composite. Note that the composite data was not declustered however analysis shows that there are small variations in the mean grades between native and declustered composites. Due to the high degree of reliance on underground sample data for the estimation process, consideration should always include review of declustering to ensure appropriate data support.

Table 14-5: Composite Statistics for the Bolivar Deposit by Vein

	Vein#	#	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
Zn	**3020**	17,212	0.02	57.02	16.15	7.20	14.59	23.35	11.00	120.94	0.7
	3032	335	0.34	38.46	8.20	3.60	6.66	11.19	6.43	41.38	0.8
	3040	5,847	0.01	59.88	20.97	8.71	20.16	32.31	13.50	182.15	0.6
	3041	233	0.11	47.74	18.06	5.20	15.64	29.93	13.90	193.09	0.8
	3050	2,128	0.04	60.76	10.60	2.96	6.96	14.78	10.43	108.78	1.0
	3060	4,198	0.1	53.8	15.00	6.28	13.68	21.97	10.35	107.04	0.7
	3090	1,877	0.04	50.64	7.36	2.43	5.41	9.93	6.98	48.67	0.9
	3091	70	0.84	21.3	6.91	4.97	7.10	8.38	2.94	8.66	0.4
	3092	105	0.04	26.24	4.44	0.44	2.06	5.85	5.79	33.54	1.3
	3240	268	0.12	46.05	11.82	2.66	7.88	17.34	11.21	125.76	0.9
	3250	342	0.11	49.86	11.28	2.88	8.17	15.41	10.45	109.14	0.9
	Total	32,615	0.01	60.76	15.69	6.01	13.49	23.38	11.58	134.08	0.7
	All	46,062	0	60.76	14.79	4.91	12.34	22.33	11.67	136.13	0.8
Pb	**3020**	16,492	0	41.96	1.61	0.30	0.83	2.00	2.19	4.79	1.4
	3032	335	0.1	15.37	1.07	0.19	0.41	1.28	1.73	2.99	1.6
	3040	5,824	0.01	28.65	1.90	0.37	0.93	2.47	2.46	6.04	1.3
	3041	233	0.04	12.23	1.65	0.46	0.85	1.99	1.98	3.92	1.2
	3050	2,127	0	45.21	1.33	0.22	0.56	1.43	2.38	5.65	1.8
	3060	4,182	0.01	31.54	1.20	0.25	0.71	1.65	1.51	2.29	1.3
	3090	1,867	0	61.1	2.00	0.08	0.44	1.80	4.27	18.22	2.1
	3091	70	0.2	11.36	2.16	0.76	1.28	2.36	2.45	6.03	1.1
	3092	105	0	13.35	0.88	0.04	0.14	0.56	2.15	4.62	2.5
	3240	268	0.01	9.75	0.89	0.13	0.30	0.82	1.43	2.03	1.6
	3250	342	0.04	13.24	0.74	0.12	0.27	0.70	1.49	2.22	2.0
	Total	31,845	0	61.1	1.59	0.27	0.77	1.93	2.35	5.54	1.5
	All	44,332	0	61.89	1.53	0.23	0.70	1.86	2.32	5.38	1.5
Ag	**3020**	17,194	1	17,446	493	117	276	611	650	422,256	1.3
	3032	335	8	4,297	241	45	90	256	415	172,629	1.7
	3040	5,835	1	9,398	423	125	288	525	507	256,711	1.2
	3041	233	7	1,927	233	78	196	325	235	55,021	1.0
	3050	2,127	0	6,564	237	39	111	268	407	165,667	1.7
	3060	4,180	2	11,470	555	122	308	713	733	537,660	1.3
	3090	1,932	0	5,653	223	50	124	277	299	89,417	1.3

	Vein#	#	Min	Max	Mean	1st Q	Median	3rd Q	SD	Var	CV
	3091	70	33	898	212	149	176	250	119	14,210	0.6
	3092	105	3	1,689	110	12	43	112	211	44,502	1.9
	3240	268	1	2,713	175	20	66	179	322	103,733	1.8
	3250	342	7	4,039	176	26	77	177	409	166,938	2.3
	Total	32,621	0	17,446	449	99	250	554	614	376,623	1.4
	All	45,964	0	17,446	419	78	218	510	610	371,966	1.5

The box plots for the zinc, lead and silver, composites shown in Figure 14-7 through Figure 14-9 illustrate that each of the individual vein domains have differing statistical characteristics and grade distributions. Therefore, there is not a case for combining any or all of the vein domains for estimation and as such, they are treated independently utilizing hard boundaries.

Figure 14-7: Box Plot of Zn Composites for the Bolivar Deposit

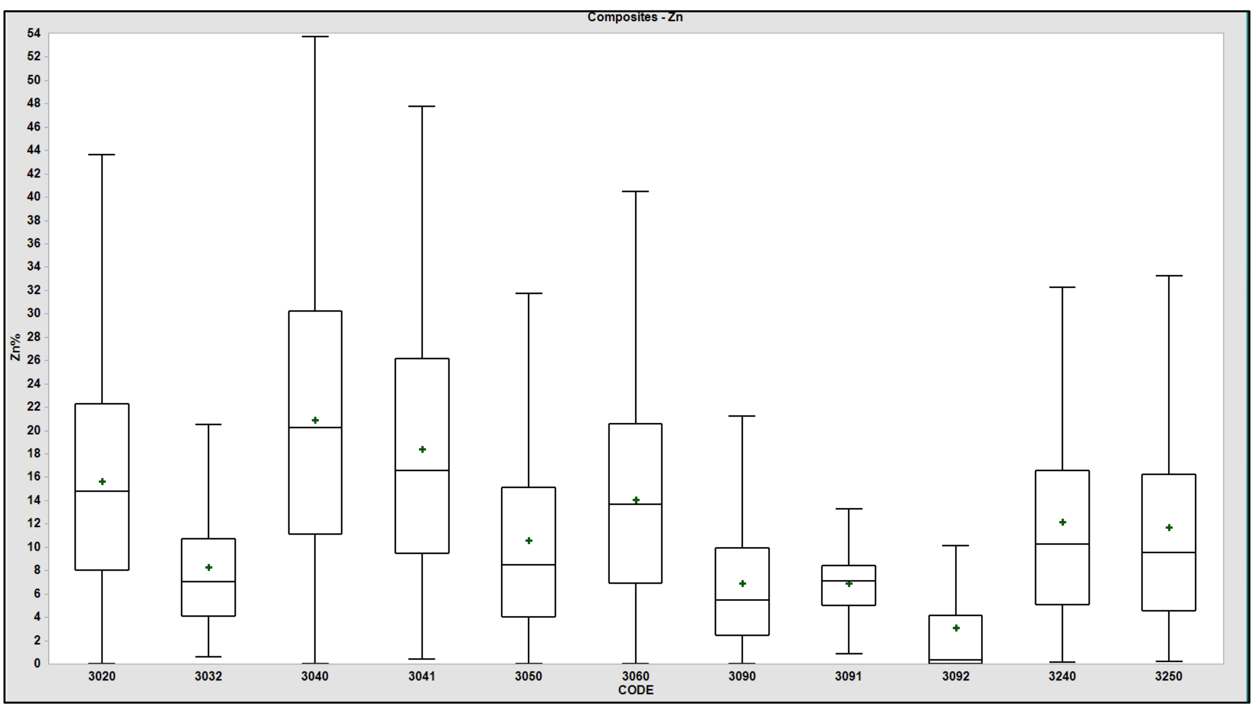


Figure 14-8: Box Plot of Pb Composites for the Bolivar Deposit

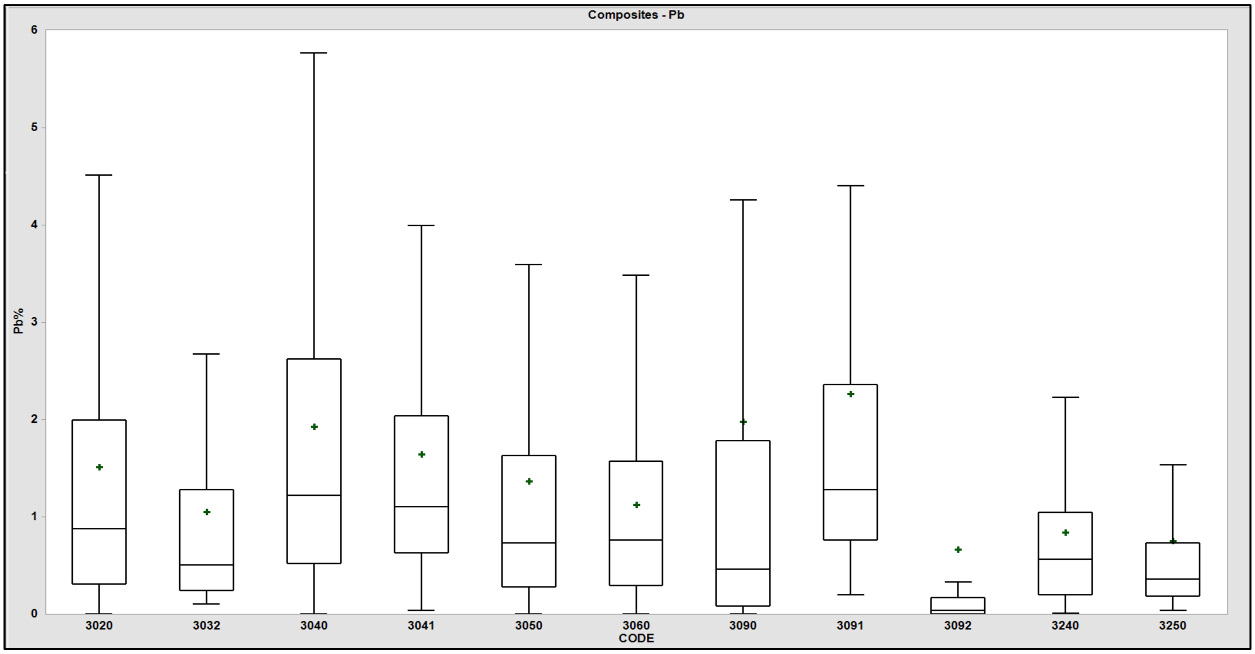
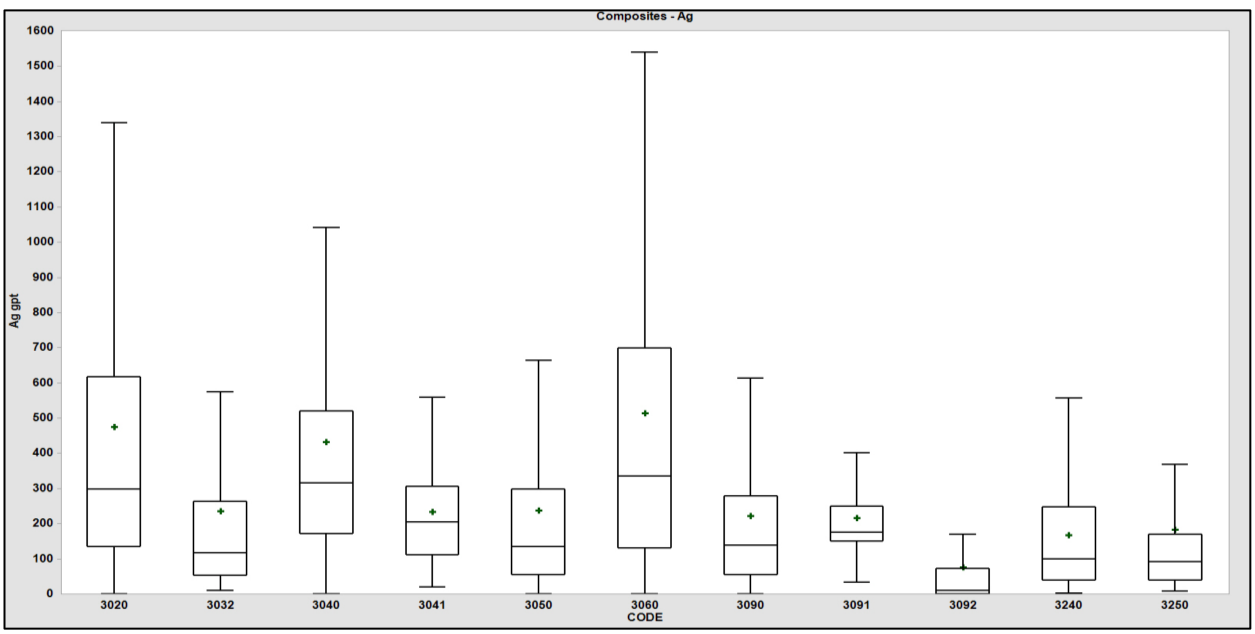


Figure 14-9: Box Plot of Ag Composites for the Bolivar Deposit



14.6 Evaluation of Outlier Assay Values

An evaluation of the probability plots suggests that there may be outlier assay values that could result in an overestimation of resources as previously discussed. Although it is believed that this risk is relatively low, it was considered prudent to cut the silver, lead and zinc composites to varying thresholds for each mineralized vein to reduce the effects of outliers.

As previously discussed, the CV's, which are a unit independent measure of variability, were relatively low for the assay data. This may be mitigated or resolved by 1) compositing and 2) cutting or grade limiting.

An evaluation of the probability plots suggests that there may be outlier values or populations that could result in an overestimation or smearing of grade. Figure 14-10 through Figure 14-12 shows examples of probability plots for the Pomabamba-Bolivar-Nané vein for the lead, zinc and silver, respectively which demonstrate "breaks" or shift at the 99-percentile that indicate an outlier population. Therefore, for composites above those "breaks" or thresholds, the composites are limited or capped. Table 14-6 lists the cut thresholds applied to the composite data for each individual vein for zinc, silver and lead, respectively.

Figure 14-10: Cumulative Probability Plot of Zn Composites for the Bolivar Deposit

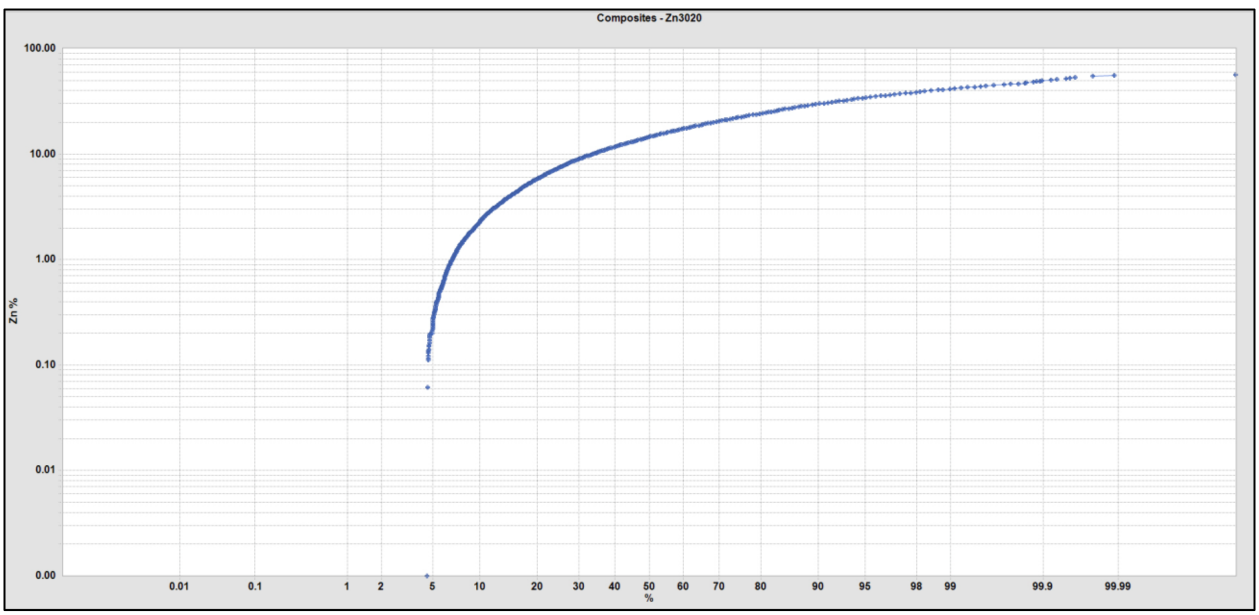


Figure 14-11: Cumulative Probability of Pb Composites for the Bolivar Deposit

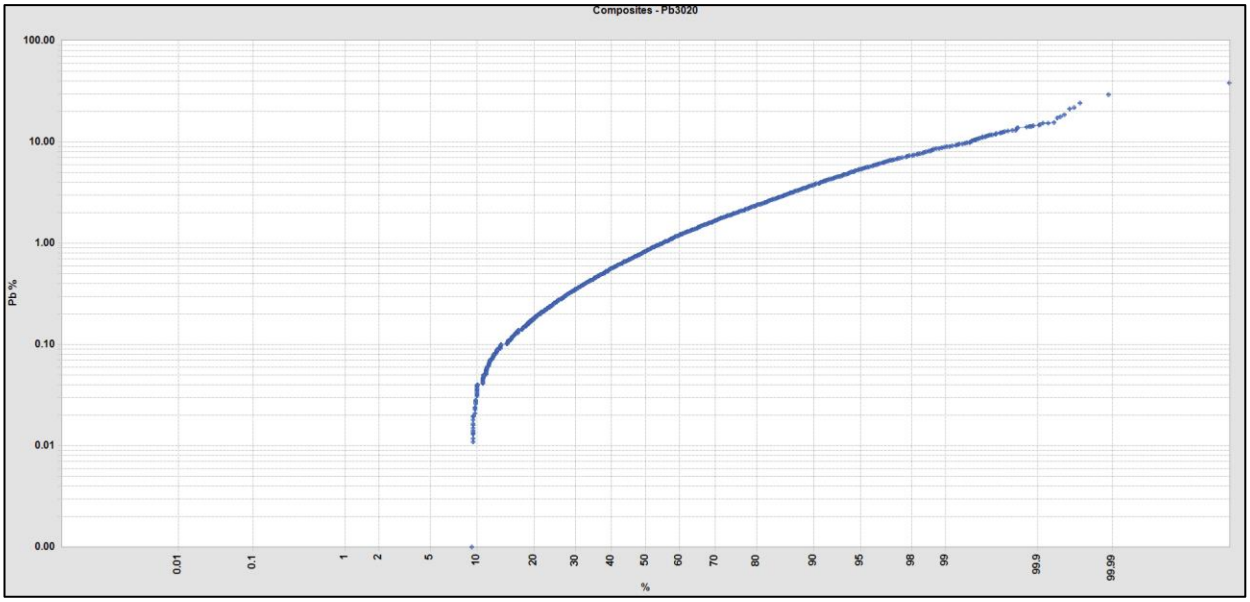


Figure 14-12: Cumulative Probability of Pb Composites for the Bolivar Deposit

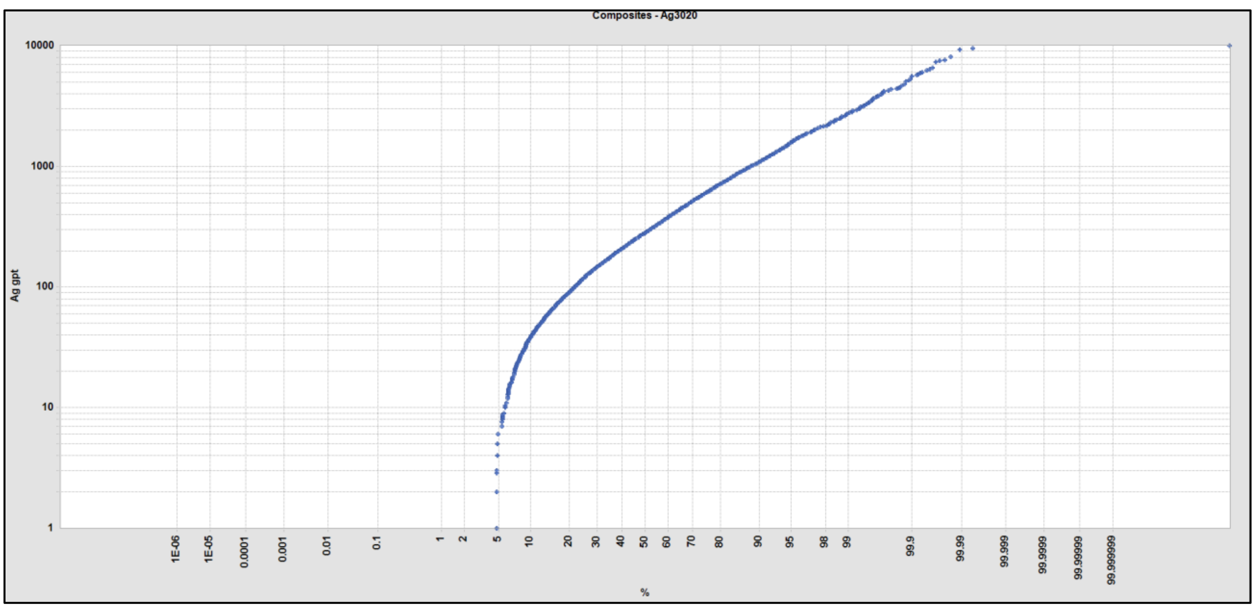


Table 14-6: Outlier Cutting Analysis for the Bolivar Deposit

Vein #	Vein Code	Vein Name	Zn %	Ag g/t	Pb %
3020	BOL-PBA-NAN	Pomabamba-Bolívar-Nané	49.7	6120	18.4
3032	RMA	Ramo A	27.5	1400	4.2
3040	BSW - RNA	Bolívar SW - Ramo Nané	49.5	5069	18.4
3041	KRN	Karen	43.3	704	9.2
3050	NUE	Nueva	47.4	2567	16
3060	NSW	Nané SW	47.1	5250	11
3090	ROS	Rosario	32.6	1460	25.5
3091	RRO	Ramo Rosario	13.9	452	9.8
3092	PAM	Pamela	20.7	710	9.5
3240	ALK	Alimak	40.6	1539	4.4
3250	RBE	Ramo Bolívar Este	38.1	1190	6.9

Table 14-7 illustrates the effect of each process from assay data, composites and cut composites along with the reduction in average grade and corresponding CV. Throughout, the results show a modest reduction of metal as illustrated by the reductions of the mean grades from assay versus cut composites as shown as **red bold**. In addition, variability is modestly to significantly reduced as illustrated by the reduction in the CV's.

Table 14-7: Outlier Cutting Analysis for the Bolivar Deposit

		Assays			Comp			Cut Grades			Comps vs Cut			Assays vs Cut		
	Vein#	Max	Mean	CV	Max	Mean	CV	Max	Mean	CV	Max	Mean	CV	Max	Mean	CV
Zn	3020	57.02	16.15	0.7	56.6	15.70	0.6	49.7	15.70	0.6	-12%	0%	0%	-13%	-3%	-7%
	3032	38.46	8.20	0.8	30.36	8.20	0.7	27.5	8.19	0.7	-9%	0%	-1%	-28%	0%	-14%
	3040	59.88	20.97	0.6	53.74	20.89	0.6	49.5	20.89	0.6	-8%	0%	0%	-17%	0%	-13%
	3041	47.74	18.06	0.8	47.74	18.16	0.6	43.3	18.09	0.6	-9%	0%	-1%	-9%	0%	-20%
	3050	60.76	10.60	1.0	55.32	10.61	0.8	47.4	10.61	0.8	-14%	0%	0%	-22%	0%	-19%
	3060	53.80	15.00	0.7	53.8	14.38	0.6	47.1	14.37	0.6	-12%	0%	0%	-12%	-4%	-7%
	3090	50.64	7.36	0.9	48.02	7.00	0.9	32.6	6.98	0.9	-32%	0%	-1%	-36%	-5%	-7%
	3091	21.30	6.91	0.4	21.3	6.91	0.4	13.9	6.83	0.4	-35%	-1%	-9%	-35%	-1%	-9%
	3092	26.24	4.44	1.3	18.77	2.86	1.6	18.77	2.86	1.6	0%	0%	0%	-28%	-36%	21%
	3240	46.05	11.82	0.9	41.28	11.77	0.7	40.6	11.76	0.7	-2%	0%	0%	-12%	0%	-23%
	3250	49.86	11.28	0.9	49.86	11.28	0.8	38.1	11.18	0.8	-24%	-1%	-3%	-24%	-1%	-19%
	Total	60.76	15.69	0.7	56.6	15.32	0.7	49.7	15.31	0.7	-12%	0%	0%	-18%	-2%	-8%
	All	60.76	14.79	0.8	59.2	11.62	1.0	59.2	11.62	1.0	0%	0%	0%	-3%	-21%	21%
Pb	3020	41.96	1.61	1.4	38.06	1.51	1.3	18.4	1.51	1.2	-52%	0%	-3%	-56%	-6%	-10%
	3032	15.37	1.07	1.6	15.37	1.07	1.5	4.2	0.94	1.1	-73%	**-12%**	**-25%**	-73%	-12%	-31%
	3040	28.65	1.90	1.3	28.65	1.89	1.1	18.4	1.89	1.0	-36%	**0%**	**-1%**	-36%	-1%	-19%
	3041	12.23	1.65	1.2	10.95	1.65	1.0	10.95	1.65	1.0	0%	**0%**	**0%**	-10%	0%	-20%
	3050	45.21	1.33	1.8	32.879	1.34	1.5	16	1.33	1.4	-51%	**-1%**	**-5%**	-65%	0%	-21%
	3060	31.54	1.20	1.3	15.1	1.15	1.1	11.03	1.15	1.1	-27%	**0%**	**-1%**	-65%	-5%	-12%
	3090	61.10	2.00	2.1	61.1	1.96	2.1	25.5	1.90	1.9	-58%	**-3%**	**-11%**	-58%	-5%	-10%

		Assays			Comp			Cut Grades			Comps vs Cut			Assays vs Cut		
	Vein#	Max	Mean	CV	Max	Mean	CV	Max	Mean	CV	Max	Mean	CV	Max	Mean	CV
	3091	11.36	2.16	1.1	11.36	2.16	1.1	11.36	2.16	1.1	0%	0%	0%	0%	0%	0%
	3092	13.35	0.88	2.5	7.3975	0.63	2.5	7.40	0.63	2.5	0%	0%	0%	-45%	-28%	2%
	3240	9.75	0.89	1.6	5.7	0.87	1.2	4.4	0.86	1.1	-23%	-1%	-3%	-55%	-3%	-30%
	3250	13.24	0.74	2.0	13.24	0.74	1.7	6.9	0.71	1.5	-48%	-3%	-12%	-48%	-3%	-26%
	Total	61.10	1.59	1.5	61.1	1.52	1.4	25.5	1.51	1.3	-58%	-1%	-5%	-58%	-5%	-12%
	All	61.89	1.53	1.5	61.1	1.17	1.6	25.5	1.16	1.6	-58%	-1%	-4%	-59%	-24%	4%
	3020	17,446	493	1.3	9,994	478	1.2	6,120	477	1.2	-39%	0%	-1%	-65%	-3%	-12%
	3032	4,297	241	1.7	4,297	241	1.6	1,400	223	1.3	-67%	-7%	-18%	-67%	-7%	-24%
	3040	9,398	423	1.2	5,625	421	1.0	5,069	421	1.0	-10%	0%	0%	-46%	-1%	-18%
	3041	1,927	233	1.0	1,804	234	0.8	704	224	0.6	-61%	-4%	-24%	-63%	-3%	-37%
	3050	6,564	237	1.7	4,229	238	1.4	2,567	236	1.3	-39%	-1%	-5%	-61%	-1%	-23%
	3060	11,470	555	1.3	11,092	531	1.2	5,250	528	1.2	-53%	0%	-4%	-54%	-5%	-13%
Ag	3090	5,653	223	1.3	3,188	224	1.2	1,460	220	1.1	-54%	-2%	-6%	-74%	-1%	-15%
	3091	898	212	0.6	898	212	0.6	452	205	0.4	-50%	-3%	-21%	-50%	-3%	-21%
	3092	1,689	110	1.9	1,185	74	2.2	710	68	1.9	-40%	-7%	-13%	-58%	-38%	0%
	3240	2,713	175	1.8	1,675	176	1.2	1,539	176	1.2	-8%	0%	-1%	-43%	1%	-37%
	3250	4,039	176	2.3	3,747	176	1.9	1,190	157	1.4	-68%	-11%	-29%	-71%	-11%	-42%
	Total	17,446	449	1.4	11,092	438	1.2	6,120	436	1.2	-45%	0%	-2%	-65%	-3%	-13%
	All	17,446	419	1.5	11,092	329	1.5	7,027	328	1.5	-37%	0%	-1%	-60%	-22%	3%

14.7 Specific Gravity Estimation

Bulk densities were based on a total of 1,032 individual measurements taken by Company field personnel throughout the Bolivar deposit. These density values ranged om 1.07 tonne per cubic meter (t/m^3) to 8.68 t/m^3 and average to 3.28 t/m^3. However, based on the metal content as for two samples with densities of 1.07 t/m^3 and 1.77 t/m^3, it appears that these may be outliers or more likely errors.

A multiple-element linear regression formula was used to determine the density, which includes weighted factors for the zinc, lead and iron. Figure 14-13 through Figure 14-15 shows the scatterplots which illustrates comparable relationships for density versus zinc, lead and iron, respectively. It is important to note that silver has not been considered due to the low correlatability with density as shown in Figure 14-16.

Figure 14-13: Scatterplot of Zinc vs Density

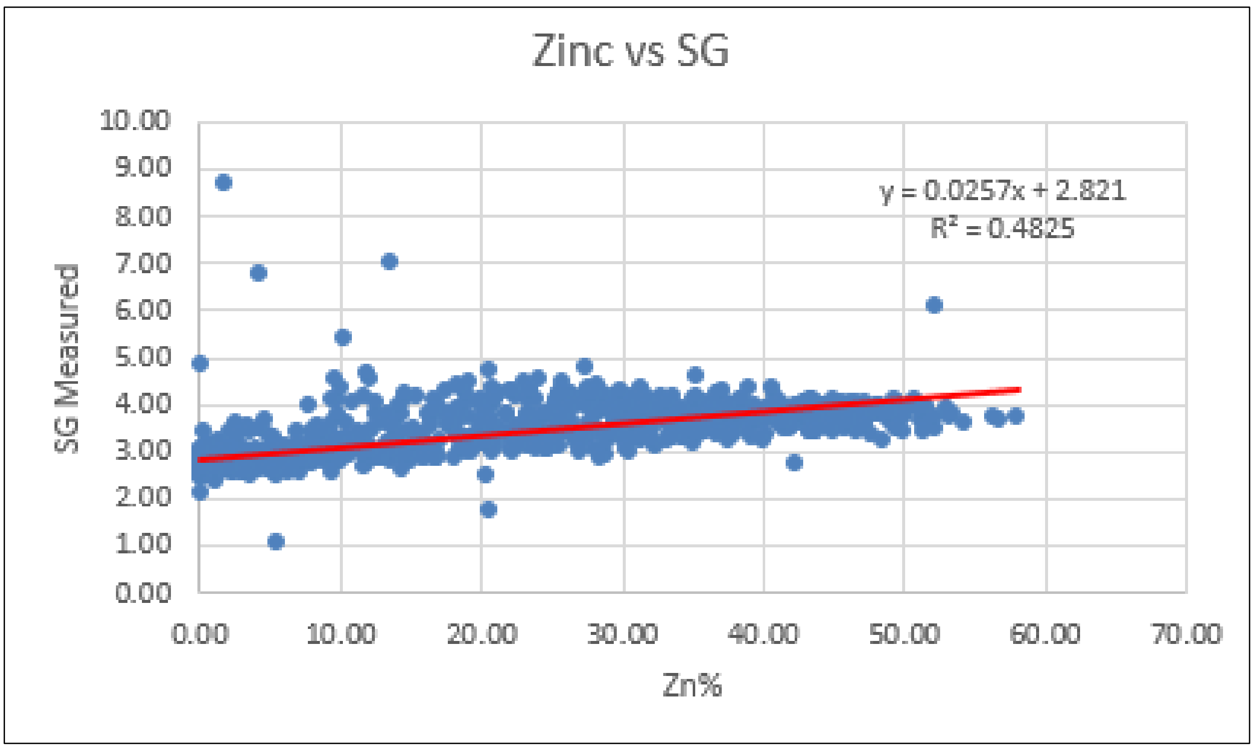


Figure 14-14: Scatterplot of Lead vs Density

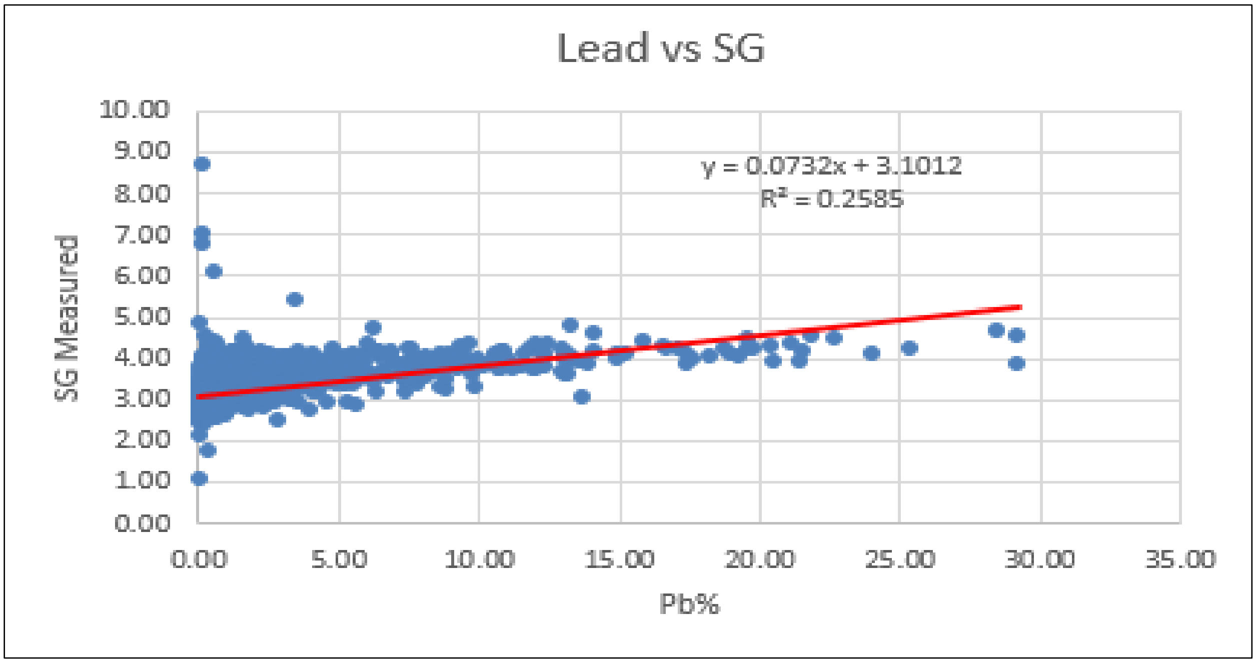


Figure 14-15: Scatterplot of Iron vs Density

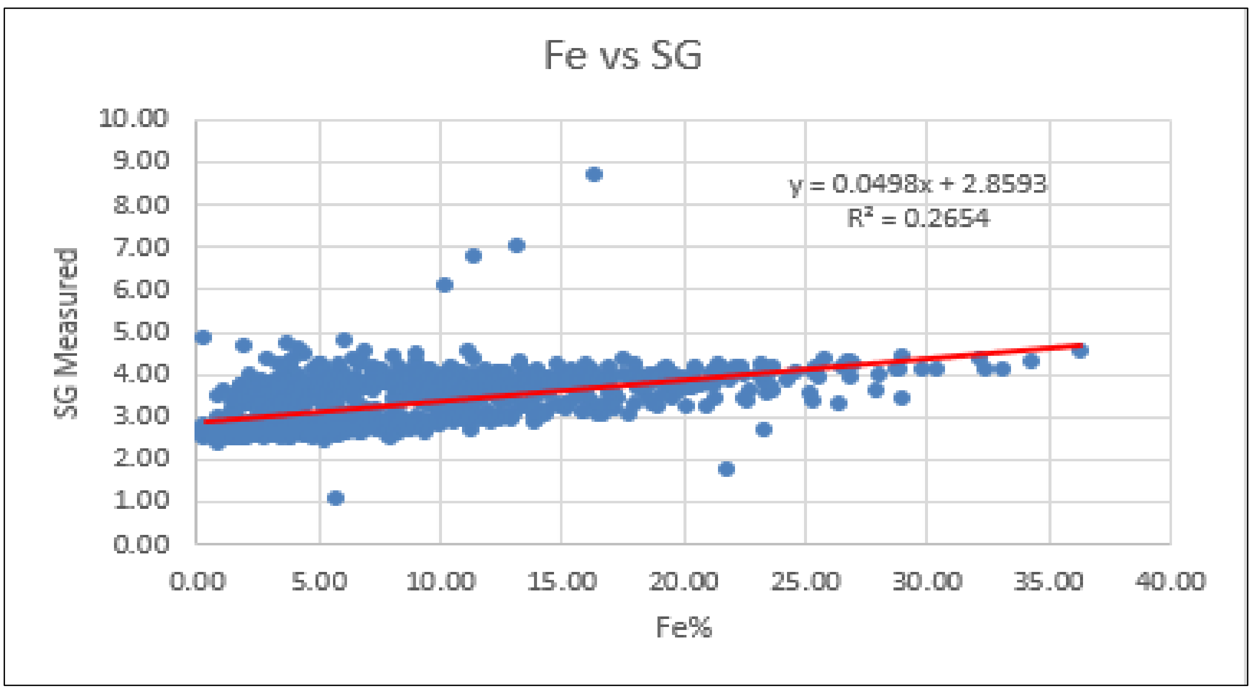
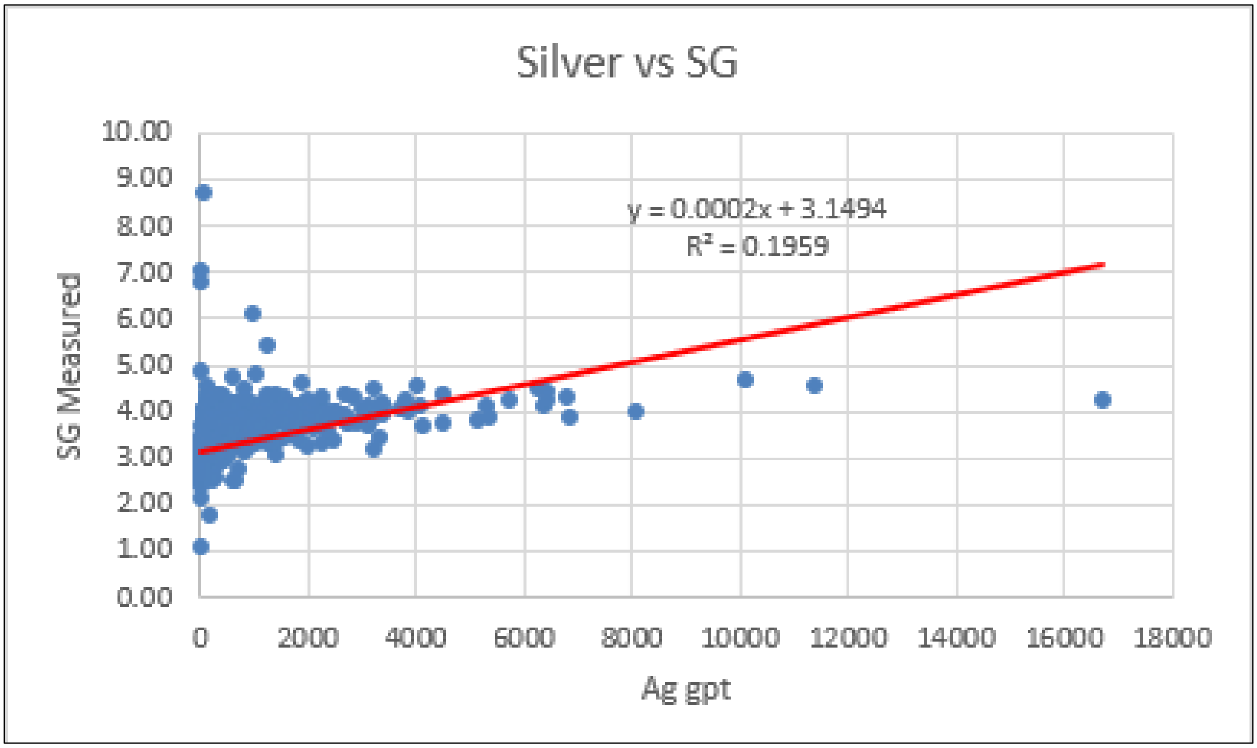


Figure 14-16: Scatterplot of Silver vs Density



The multiple-element linear regression formula was calculated with the use of a Python script based on the 1,032 density samples analyzed locally which has been consistent 2021. No new samples were added to the database however it recommended that going forward additional samples be collected and measured to re-test the regression formula.

Due to the fact that not all of the dataset has Fe analysis, two formulas have been established for the calculation of density, the first utilizing Zn, Pb and Fe whilst the second considers only Zn and Pb. There the Multiple Linear Regression Formula is in the form of SGcalculated = Intersection + Coefficient * Assay Value as follows:

- If the Fe analysis is available:

$$Density = 2.53757+0.0176*Zn+0.05611*Pb+0.04176*Fe$$

- If the Fe analysis is not available:

$$Density = 2.83179+0.02252*Zn+0.04516*Pb$$

Figure 14-17 and Figure 14-18 shows the scatterplot of measured versus calculated density for each case, with and without iron. Th correlation for the formula with iron is good (R^2=0.72) however a handful of outliers are causing a less than ideal result however upon removal of the four outliers the correlation is excellent (R^2=0.88). Therefore, going forward is recommended to continue to gather density data in addition to ensuring that iron is included in the analysis.

Specific gravities assigned on a block-by-block basis using the calculated values. A default density of 3.1 t/m^3 was assigned to any blocks that were not assigned a calculated value.

Figure 14-17: Scatterplot of Measured Density vs Calculated Density with Iron

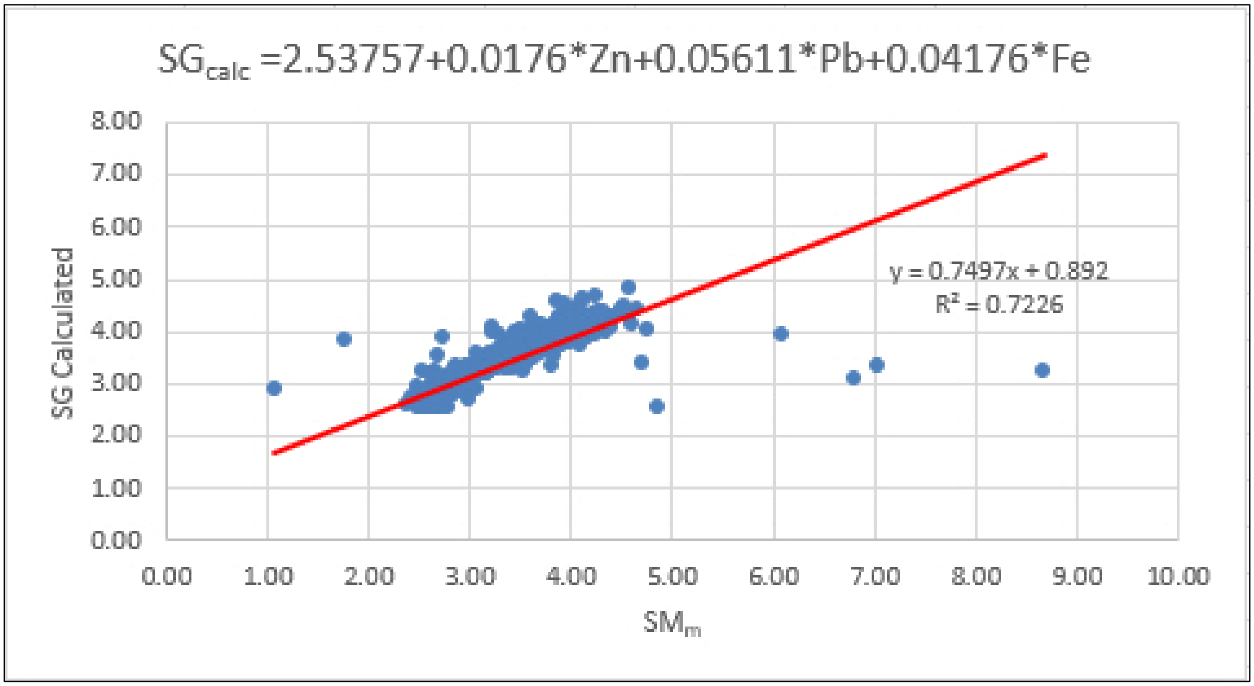
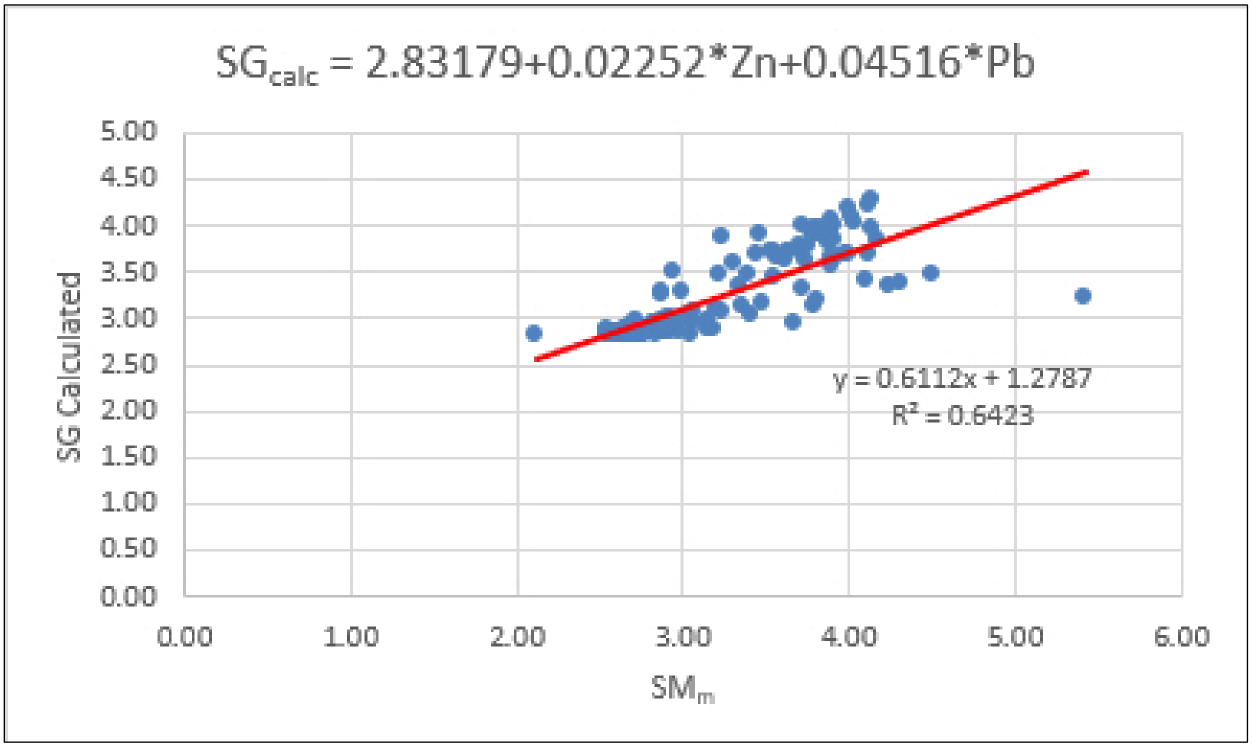


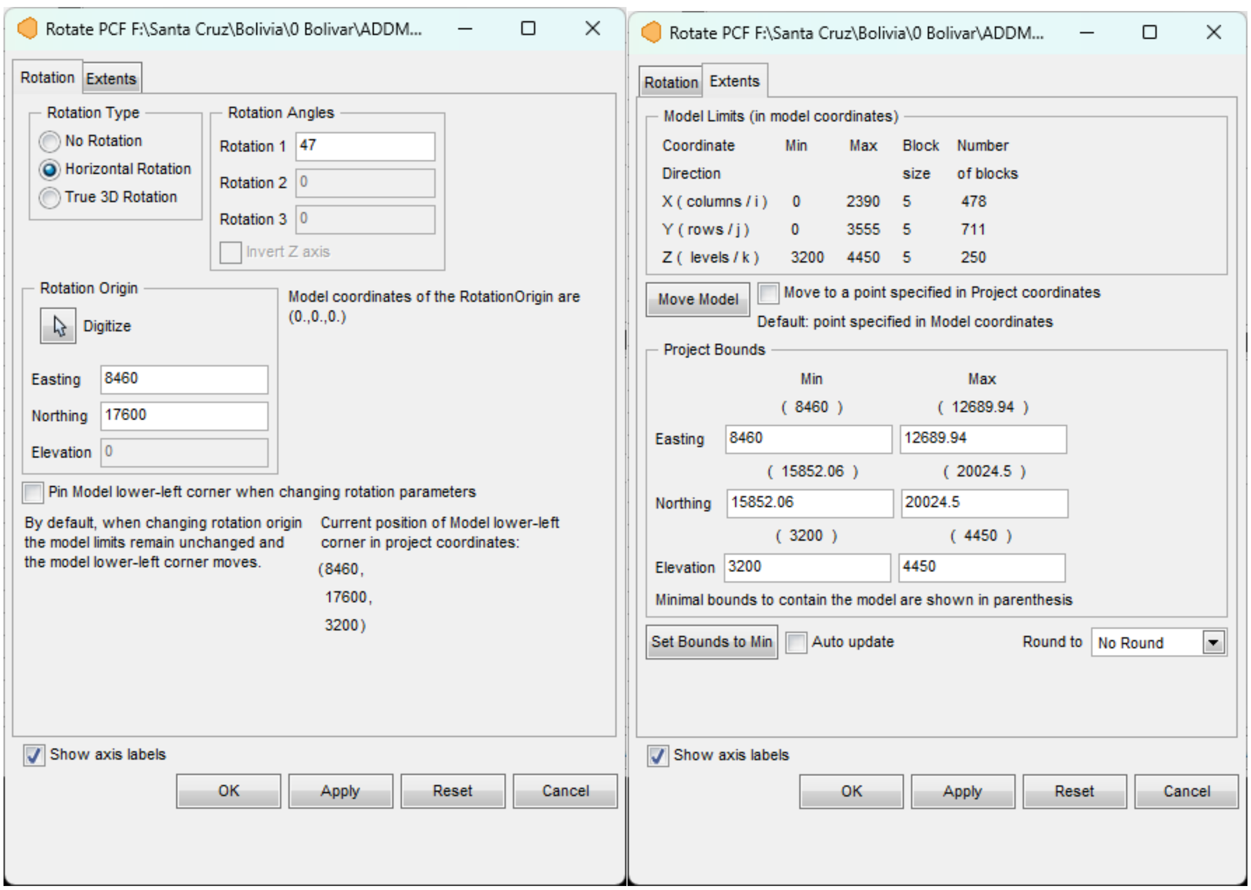
Figure 14-18: Scatterplot of Measured Density vs Calculated Density without Iron



14.8 Block Model Definition

The block model used to estimate the resources was defined according to the limits specified in Figure 14-19. The block model is orthogonal and rotated 47 degrees, reflecting the orientation of the deposit. The chosen block size was 5 m by 5 m by 5 m and subsequently sub-blocked to 1 m x 0.1 m x 1 m to facilitate underground mine planning and scheduling. Note that MineSight^{TM} uses the centroid of the blocks as the origin.

Figure 14-19: Dimensions, Origin and Orientation for the Bolivar Block Model



14.9 Resource Estimation Methodology

Experimental variograms and variogram models in the form of correlograms were generated for silver, lead and zinc grades which were utilized for the estimation via ordinary kriging. However, Veta Karen (3041), Veta Ramo Rosario (3091) Veta Pamela (3092) and Veta Ramo Bolivar Este (3250) do not have sufficient data to generate meaningful variogram results. For this reason, it was decided at this time to use inverse distance to the second power for these veins as the interpolator.

The resource estimation plan includes the following items:

- Mineralized zone code of modelled mineralization in each block;
- Estimated block silver, lead, and zinc grades by ordinary kriging with the exception of inverse distance to the second power being employed for Veta Karen (3041), Veta Ramo Rosario (3091) Veta Pamela (3092) and Veta Ramo Bolivar Este (3250);

- Three-pass estimation strategy for each mineralized vein domain as detailed in Table 14-8. The three passes enable better estimation of local metal grades and infill of interpreted solids and to facilitate classification;
- Interpolation of iron and tin using inverse distance to the second power; and
- Assignment on pillars, sterilized and mined out areas coded into the block model for exclusion.

Table 14-8 summarizes the search ellipse dimensions for the two estimation passes for each zone.

Table 14-8: Search Ellipse Parameters for the Bolivar Deposit

Vein	Pass	Range 1 (m)	Range 2 (m)	Range 3 (m)	Min # Composites	Max # Composites	Octant Search
3020	1	60	37	6	5	25	yes
	2	90	55	6	5	25	yes
	3	180	110	12	3	25	no
3032	1	19	35	10	5	25	no
	2	37	71	20	4	25	no
	3	74	142	30	2	25	no
3040	1	48	62	13	5	25	yes
	2	73	94	20	4	25	no
	3	146	188	40	4	25	no
3041	1	28	26	17	5	25	yes
	2	42	40	25	4	25	no
	3	84	80	50	4	25	no
3050	1	31	33	5	5	20	yes
	2	47	50	7	4	20	no
	3	94	100	14	2	20	no
3060	1	22	48	5	5	25	no
	2	34	73	7	4	25	no
	3	68	146	14	3	25	no
3090	1	38	38	26	15	25	no
	2	58	59	50	17	30	no
	3	116	118	100	2	25	no
3091	1	26	26	24	5	20	yes
	2	40	40	37	4	20	yes
	3	80	80	74	3	20	no

Vein	Pass	Range 1 (m)	Range 2 (m)	Range 3 (m)	Min # Composites	Max # Composites	Octant Search
3092	1	47	47	47	5	20	yes
	2	70	70	70	4	20	yes
	3	140	140	140	3	20	no
3240	1	33	28	3	5	25	yes
	2	50	42	4	4	25	no
	3	100	84	8	3	25	no
3250	1	17	32	26	5	25	no
	2	26	48	40	4	25	no
	3	52	96	80	3	25	no

14.10 Mineral Resource Classification

Mineral resources were estimated in conformity with generally accepted CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (2019). Mineral resources are not mineral reserves and do not have demonstrated economic viability.

The mineral resources may be impacted by further infill and exploration drilling that may result in an increase or decrease in future resource evaluations. The mineral resources may also be affected by subsequent assessment of mining, environmental, processing, permitting, taxation, socio-economic and other factors. There is insufficient information in this early stage of study to assess the extent to which the mineral resources will be affected by factors such as these that are more suitably assessed in a scoping or conceptual study.

Mineral resources for the Bolivar deposit were classified according to the CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) as approved by Garth Kirkham, P.Geo., an “independent qualified person” as defined by National Instrument 43-101.

Drillhole spacing in the Bolivar deposit is sufficient for preliminary geostatistical analysis and evaluating spatial grade variability. Kirkham Geosystems is, therefore, of the opinion that the amount of sample data is adequate to demonstrate very good confidence in the grade estimates for the deposit.

The estimated blocks were classified according to the following:

- Confidence in interpretation of the mineralized zones;
- Number of data used to estimate a block;
- Number of composites allowed per drillhole; and
- Distance to nearest composite used to estimate a block.

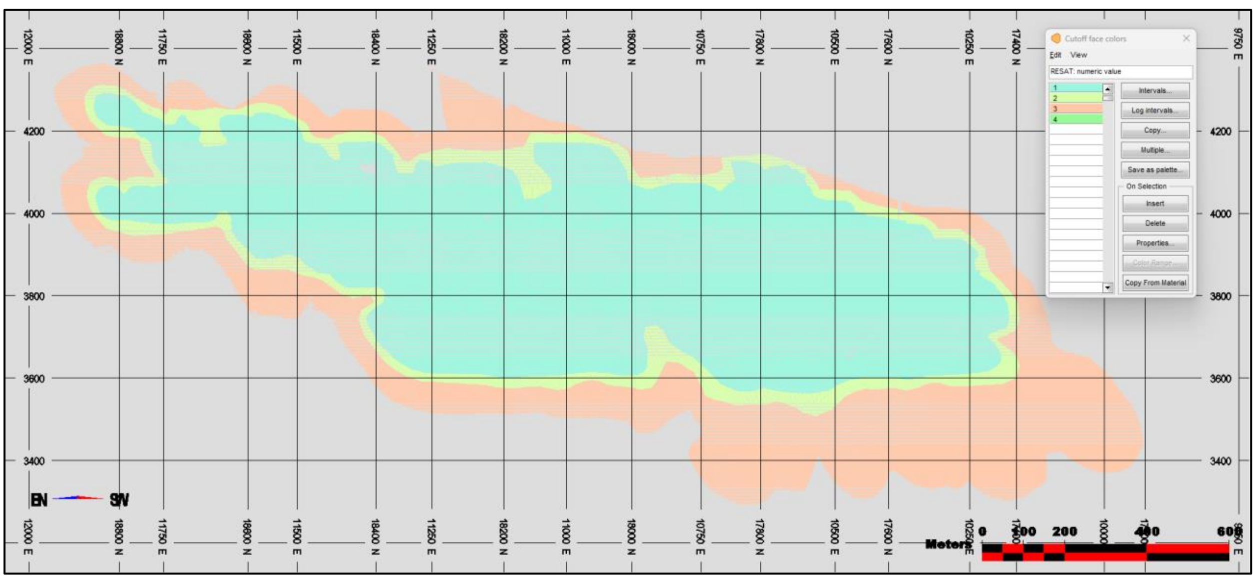
The classification of resources was based primarily on distance to the nearest composite; however, all of the quantitative measures, as listed here, were inspected and taken into consideration. In addition, the classification of resources for each zone was considered individually by virtue of their relative depth from surface and the ability to derive meaningful geostatistical results.

The estimation plan entailed a multiple pass strategy where each pass utilized increasingly restrictive search distances and parameters. Each individual vein employs differing search distances and parameters as listed in Table 14-8. Therefore, blocks that are estimated within the first pass are assigned as measured, those estimated within the second pass are assigned indicated and those estimated in the third pass are assigned as inferred.

Furthermore, an interpreted boundary was created for the indicated and inferred threshold in order to exclude orphans and reduce “spotted dog” effect. The remaining blocks may be unclassified and may be considered as geologic potential for further exploration.

Furthermore, in consideration for the requirement for resources to possess a “reasonable prospect of eventual economic extraction” (RP3E), underground mineable shapes were created that displayed continuity based on cut-off grades and classification. Additionally, these RP3E shapes also took into account must-take material that may fall below cut-off grade but will be extracted by mining in the event that adjacent economic material is extracted making below cut-off material by virtue of the mining costs being paid for.

Figure 14-20: Long Section View of the Bolivar Deposit Showing Resource Block by Classification



14.11 ZnEq and NSR Calculation

The mineral resources reported herein are reporting based on zinc equivalent or ZnEq. The parameters that were considered for the ZnEq and NSR calculation are listed in Table 14-9.

Cut-off criteria was developed based on a ZnEq formula as follows:

$$ZnEq = Zn\% + 0.7 \times Pb\% + 0.046 \times Ag\ (g/t)$$

Table 14-9: ZnEq and NSR Calculation Parameters

Metal Prices	
Ag	25.20 $/oz
Pb	1.20 $/lb
Zn	1.38 $/lb
Lead Concentrate	
Pb recovery	70%
Pb grade	27%
Ag recovery	51%
Pb Payable	89%
Ag Payable	95%
Pb Royalty	5%
Ag Royalty	6%
Treatment Charges	133 $/t
Transportation	158 $/t
Zinc Concentrate	
Zn recovery	91%
Zn grade	53%
Ag recovery	39%
Zn Payable	85%
Ag Payable	61%
Zn Royalty	5%
Ag Royalty	6%
Treatment Charges	277 $/t
Transportation	180 $/t
Port Fees	40 $/t

14.12 Mined Out and Sterilized Areas

Due to the fact that the Bolivar Mine has been and continues to be in production for a significant number of years, it is extremely important to identify and exclude areas that are no longer available for future mining. This includes areas that have development and ramping, areas that have been mined out, areas that have been sterilized by mining operations or other reasons and pillars that have been left behind but not accessible. Figure 14-21 shows a plan view of the existing underground development, pillars, mined out areas along with areas sterilized be mining or geotechnical hazards. Figure 14-22 illustrates the classified resources with the classified block model for the Pomabamba-Bolivar-Nané vein (3000, 3010, 3020) with the development, pillars, mined out and sterilized material colour coded in blue.

Figure 14-21: Plan View of Development, Pillars, Mined Out and Sterilized

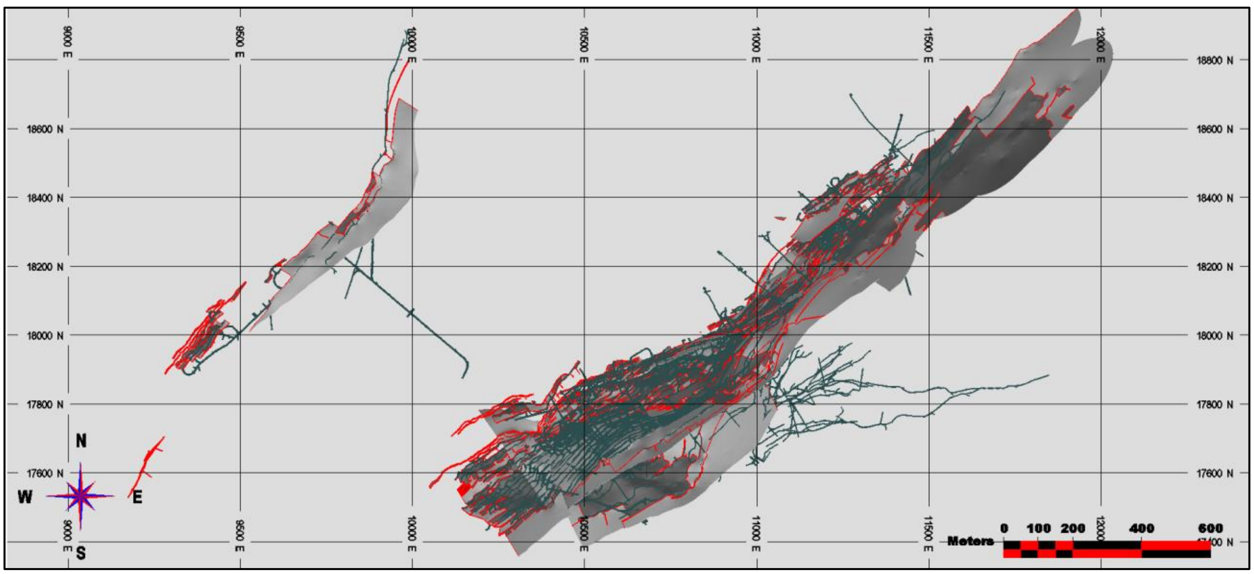
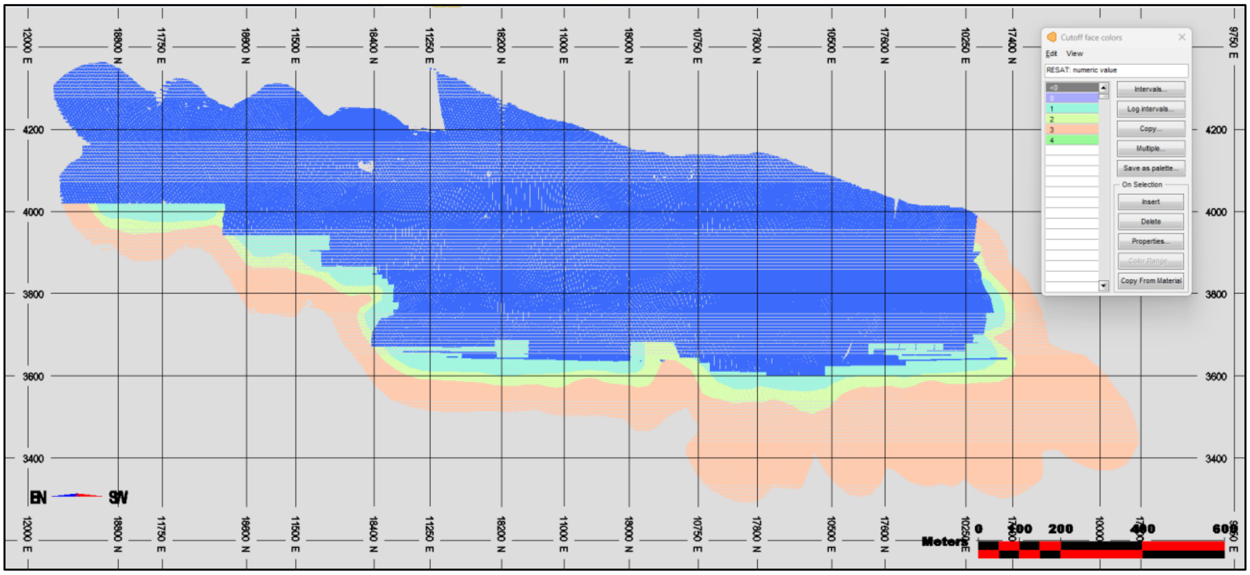


Figure 14-22: Classified Resources with Pillars, Mined Out and Sterilized Areas (Blue)



14.13 Resource Validation

A graphical validation was completed on the block model. This type of validation serves the following purposes:

- Checks the reasonableness of the estimated grades based on the estimation plan and the nearby composites;
- Checks that the general drift and the local grade trends compare to the drift and local grade trends of the composites;
- Ensures that all blocks in the core of the deposit have been estimated;
- Checks that topography has been properly accounted for;
- Checks against manual approximate estimates of tonnages to determine reasonableness; and
- Inspects for and explains potentially high-grade block estimates in the neighbourhood of the extremely high assays.

A full set of cross sections, long sections and plans were used to digitally check the block model; these showed the block grades and composites. There was no indication that a block was wrongly estimated, and it appears that every block grade could be explained as a function of the surrounding composites and the applied estimation plan.

The validation techniques included the following:

- Visual inspections on a section-by-section and plan-by-plan basis;
- Use of grade-tonnage curves;
- Swath plots comparing kriged estimated block grades with inverse distance and nearest neighbour estimates; and
- Inspection of histograms showing distance from first composite to nearest block, and average distance to blocks for all composites which gives a quantitative measure of confidence that blocks are adequately informed in addition to assisting in the classification of resources.

Figure 14-23: Long Section View of Bolivar Block Model with ZnEq Cut-off Grades

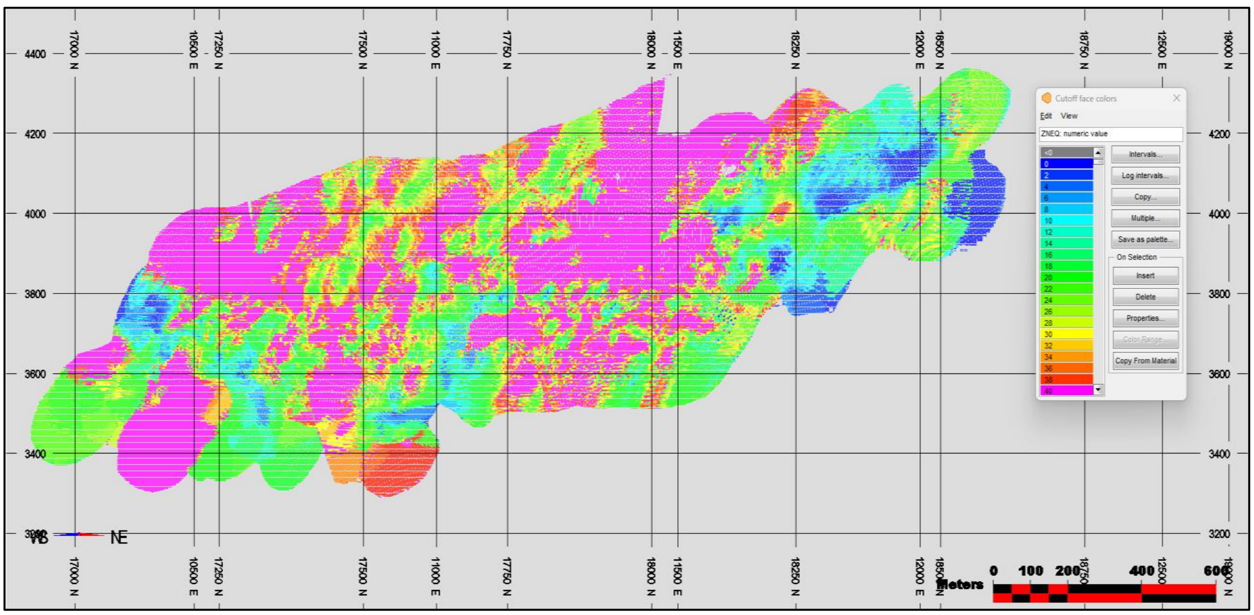


Figure 14-24: Long Section View of Measured, Indicated and Inferred Blocks with ZnEq Cut-off Grades along with Mined Out and Sterilized Areas

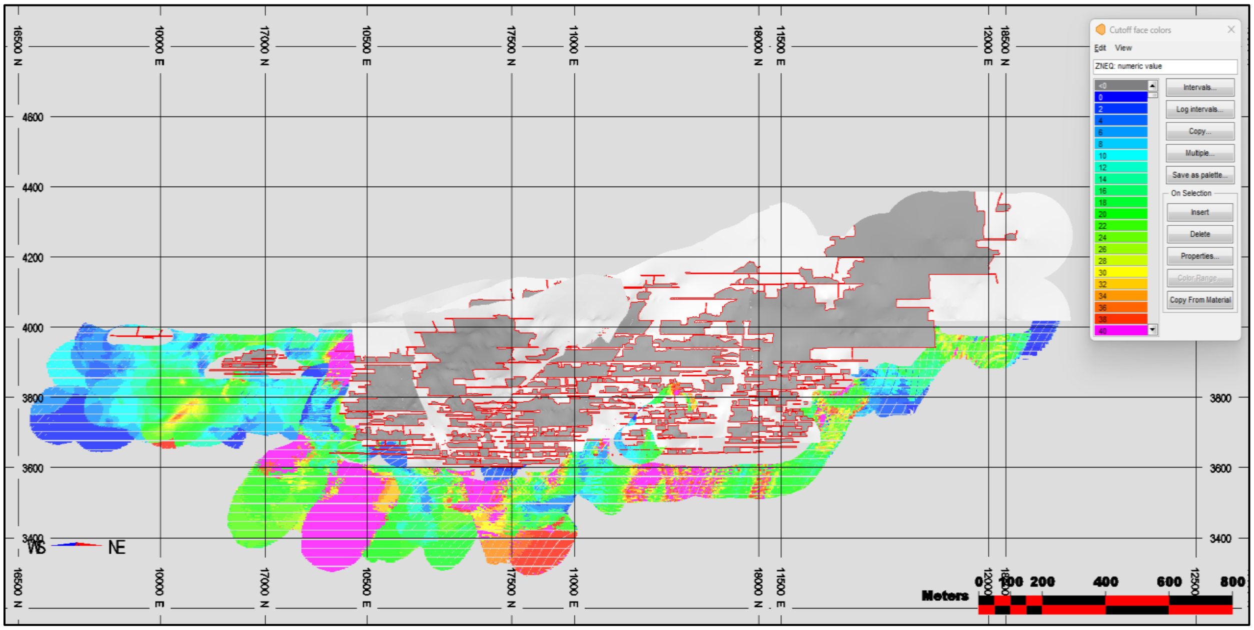


Figure 14-25: Long Section View of Measured and Indicated Blocks with ZnEq Cut-off Grades along with Mined Out and Sterilized Areas

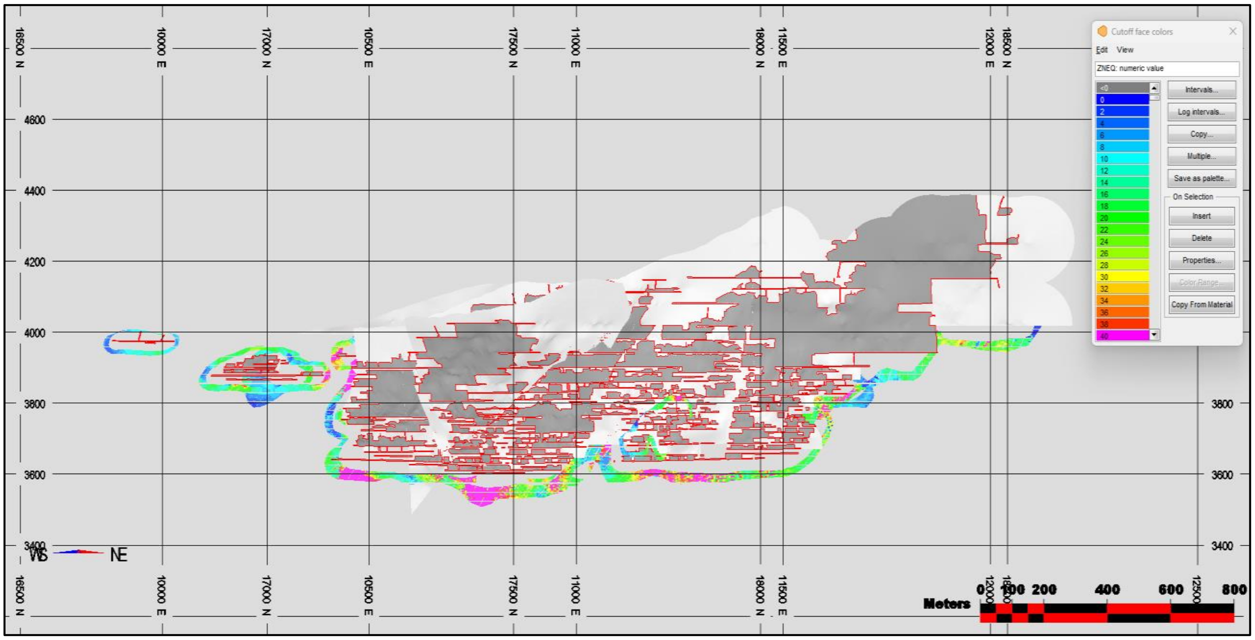
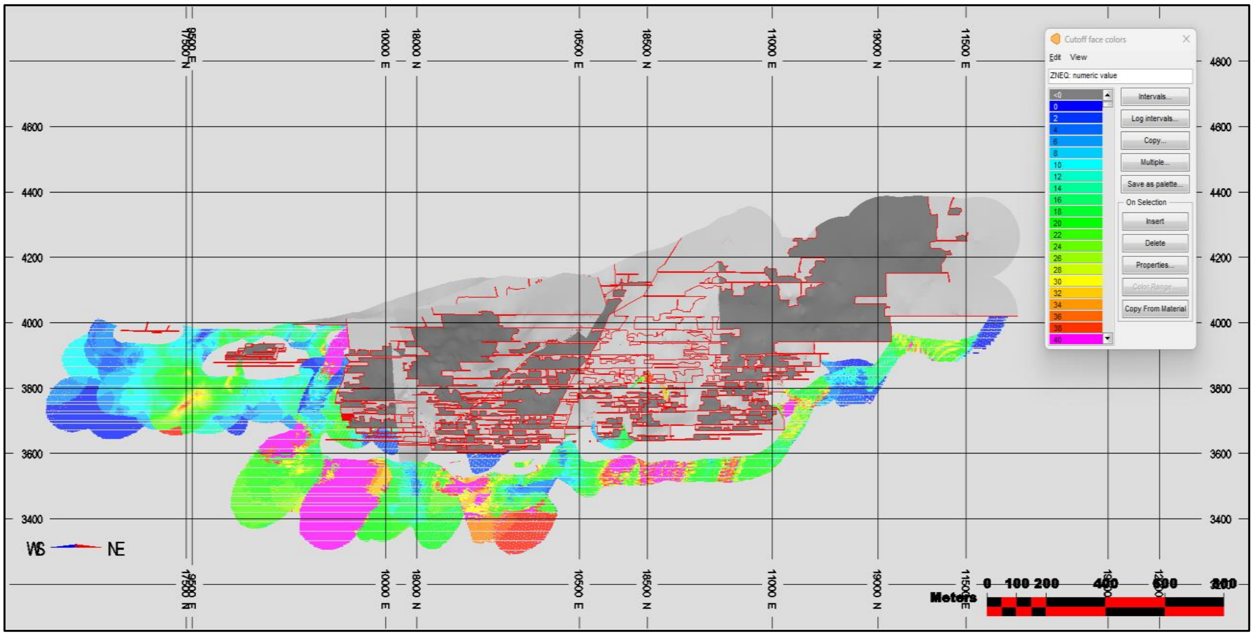


Figure 14-26: Long Section View of Inferred Blocks with ZnEq Cut-off Grades along with Mined Out and Sterilized Areas



14.14 Sensitivity of the Block Model to Selection Cut-off Grade

The mineral resources are not particularly sensitive to the selection of cut-off grade. Table 14-10 shows the total resources for all metals at varying ZnEq cut-off grades. The reader is cautioned that these values should not be misconstrued as a mineral reserve. The reported quantities and grades are only presented as a sensitivity of the resource model to the selection of cut-off grades.

Note that the base case cut-off grades presented in Table 14-10 are based on potentially underground, mineable resources at the base case of 10.6% zinc equivalent.

Table 14-10: Sensitivity Analyses at Various ZnEq Cut-off Grades for Measured, Indicated and Inferred Resources

Classification	Cut-off	Tonnes	ZnEq	Sg	Thickness	Zn	Ag	Pb
Measured	>=14	720,000	31.90	3.21	1.69	13.91	368.17	1.51
	>=12	802,000	29.97	3.19	1.68	13.21	342.53	1.42
	>=10.6	**855,000**	**28.80**	**3.18**	**1.67**	**12.78**	**327.39**	**1.37**
	>=10	874,000	28.40	3.17	1.66	12.63	322.15	1.36

Classification	Cut-off	Tonnes	ZnEq	Sg	Thickness	Zn	Ag	Pb
	>=8	929,000	27.27	3.16	1.65	12.19	307.84	1.31
	>=6	966,000	26.49	3.15	1.63	11.86	298.45	1.28
	>=4	983,000	26.12	3.15	1.62	11.70	294.29	1.26
	>=2	994,000	25.86	3.14	1.62	11.58	291.25	1.25
Indicated	>=14	560,000	29.72	3.19	1.40	13.28	336.45	1.38
	>=12	624,000	28.00	3.17	1.40	12.69	312.92	1.30
	>=10.6	**677,000**	**26.70**	**3.16**	**1.40**	**12.24**	**295.37**	**1.25**
	>=10	696,000	26.24	3.15	1.40	12.09	289.07	1.22
	>=8	773,000	24.53	3.14	1.39	11.50	265.84	1.14
	>=6	820,000	23.54	3.13	1.37	11.10	253.73	1.10
	>=4	837,000	23.18	3.12	1.37	10.93	249.74	1.08
	>=2	842,000	23.06	3.12	1.36	10.88	248.38	1.08
Inferred	>=14	3,603,000	32.45	3.12	1.91	10.76	455.45	1.07
	>=12	3,951,000	30.74	3.11	1.87	10.54	423.54	1.03
	>=10.6	**4,203,000**	**29.58**	**3.11**	**1.85**	**10.35**	**402.91**	**1.00**
	>=10	4,319,000	29.06	3.11	1.85	10.26	393.68	0.98
	>=8	4,622,000	27.75	3.10	1.82	9.98	371.92	0.95
	>=6	5,058,000	25.98	3.08	1.83	9.44	345.75	0.90
	>=4	5,221,000	25.32	3.08	1.82	9.24	336.19	0.88
	>=2	5,535,000	24.04	3.07	1.79	8.82	318.12	0.84

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.;
2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI 43-101;
3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD;
4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration; and
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

14.15 Mineral Resource Statement

Table 14-11 shows the Mineral Resource Statement for the Bolivar deposit.

The Qualified Person evaluated the resource in order to ensure that it meets the condition of "reasonable prospects of eventual economic extraction" as suggested under NI 43-101. The criteria considered were confidence, continuity and economic cut-off. The resource listed below is considered to have "reasonable prospects of eventual economic extraction".

The Mineral Resource Estimate which updates the previously reported estimate, incorporates data from new drilling conducted in 2020-2021 that successfully delineated a major new deposit on the Project and significantly increased the resource base in both the Indicated and Inferred Resource categories.

Table 14-11: Base-Case Total Mineral Resources at 10.6% ZnEq Cut-off

Total Bolivar 2023 Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Bolivar	Measured	855	12.78	1.37	327
	Indicated	677	12.24	1.25	295
	Total M+I	**1,532**	**12.54**	**1.32**	**313**
	Inferred	**4,202**	**10.35**	**1.00**	**403**

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.;
2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI 43-101;
3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD;
4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration; and
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

Table 14-12: Base-Case Total Mineral Resources at 10.6% ZnEq Cut-off Split by Area

Bolivar Mineral Resources (January 1, 2023)					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Central	Measured	661	14.15	1.39	363.40
	Indicated	523	13.40	1.25	324.87
	Total M+I	**1,184**	**13.82**	**1.33**	**346.38**
	Inferred	**2,731**	**11.14**	**0.87**	**527.21**
Rosario	Measured	194	8.12	1.31	204.74
	Indicated	154	8.30	1.22	194.92
	Total M+I	**348**	**8.20**	**1.27**	**200.40**
	Inferred	**1,471**	**8.87**	**1.24**	**172.20**
Total Bolivar	Measured	855	12.78	1.37	327.39
	Indicated	677	12.24	1.25	295.37
	Total M+I	**1,532**	**12.54**	**1.32**	**313.24**
	Inferred	**4,202**	**10.35**	**1.00**	**402.93**

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.;
2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI 43-101;
3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD;
4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration; and
5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

14.16 Discussion with Respect to Potential Material Risks to the Resources

The current political and socio-economic climate in Bolivia poses risks and uncertainties that could delay or even stop development as reported within the Fraser Institute Annual Report 2022 where Bolivia ranks very low in many non-technical metrics. Bolivia has been ranked consistently low for the past five years and ranks in the lower quartile on all metrics that gauge risk and uncertainty. It is difficult to gauge or qualify the level or extents of the risks however, all companies working in Bolivia must continue to be aware of the potential risks and develop mitigation strategies. A significant risk related to the Santacruz Bolivian mineral assets and in particular the mineral resources and mineral reserves is the significant artisanal activity that continues to exist.

This activity is not only a socio-economic risk but also affects access to resources and reserves along with potential sterilization of mineral resources.

Apart from political and socio-economic risks there are no other known environmental, permitting, legal, taxation, title or other relevant factors that materially affect the resources apart from commodity price fluctuations particularly on the downside.

The Bolivar deposit consists of very many high-grade thin veins. These types of deposits are very sensitive to grade as the size and geometry must be economically viable as they must support selective mining methods and be able to withstand high levels of dilutive material.

15 MINERAL RESERVE ESTIMATE

15.1 Summary

The January 1, 2023 reserve estimate represents the validation of Santacruz's internally-generated mineral reserve estimate by QP Goodwin. All work on the reserve by the Santacruz mine design team and the validation exercises were done in Deswik™. The following process was used for this work:

- An NSR calculation and cut-off grade (COG) was developed by the QP using data provided by Santacruz;
- The reserve estimation methodology was reviewed, checked, and approved by the QP;
- Mine technical staff prepared a Life of Mine Plan (LOM) for the deposits using the NSR and COG provided by the QP. The LOM plan was prepared specifically for this reserve estimation, as the annual budget includes mining in inferred resources; and
- All LOM models were downloaded and reviewed by the QP for conformance to the methodology, proper application of the NSR cut-off grade, and correct application of agreed upon dilution and recovery factors.

The QP is satisfied that this exercise resulted in a valid reserve determination.

15.2 Definitions

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. This Feasibility Study includes adequate information and considerations on mining, processing, metallurgical, infrastructure, economic, marketing, environmental and other relevant factors that demonstrate, at the time of reporting, that economic extraction could reasonably be justified.

Mineral Reserves are those parts of Mineral Resources which, after the application of all mining factors, result in an estimated tonnage, and grade which, in the opinion of the Qualified Person(s) making the estimates, is the basis of an economically viable Project after taking account of all relevant Modifying Factors. Mineral Reserves are inclusive of diluting material that will be mined in conjunction with the Mineral Reserves and delivered to the treatment plant or equivalent facility. The term "Mineral Reserve" need not necessarily signify that extraction facilities are in place or operative or that all governmental approvals have been received. It does signify that there are reasonable expectations of such approvals.

Mineral Reserves are subdivided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

The reserve classifications used in this report conform to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) classification of NI 43-101 resource and reserve definitions and Companion Policy 43-101CP. These are listed below.

A “Proven Mineral Reserve” is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect potential economic viability of the deposit. Proven Mineral Reserve estimates must be demonstrated to be economic, at the time of reporting, by at least a Pre-Feasibility Study. Within the CIM Definition standards the term Proved Mineral Reserve is an equivalent term to a Proven Mineral Reserve.

A “Probable Mineral Reserve” is the economically mineable part of an Indicated Mineral Resource, and in some circumstances a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

15.3 NSR and COG Determinations

15.3.1 Operating Costs

Operating costs for the reserve estimation were based on actual costs derived from 2022 operations, as summarized in Table 15-1.

Table 15-1: Actual Operating Costs for 2022 by Category

Category	$/t
Mining	87.46
Processing	18.28
G&A	14.48
Total	**120.22**

15.3.2 Metal Prices

The metal prices used to determine the 2023 Mining Reserve are as follows:

- Lead $1.00 /lb;

- Zinc $1.15 /lb; and
- Silver $21.00 /oz.

The derivation and rationale for these price selections is discussed in discussed in Section 19.

15.3.3 Metallurgical Recoveries

The metallurgical recoveries of payable metals were based on 2022 mill operating performance as follows:

Lead: 70.0% to the lead concentrate

Zinc: 69.0% to the zinc concentrate

Silver: A total of 89.7% recovery; 51.0% to the lead concentrate and 38.7% to the zinc concentrate.

15.3.4 Smelter Terms

There are two concentrates that are produced and sent to Antofagasta in Chile for shipment overseas. Both concentrates are sold to Glencore. Smelter terms were based on actual invoicing. These include typical payment terms for all payable metals (Pb, Zn, Ag) and deductions for deleterious elements (Sb and Bi in the zinc concentrate and SiO_2 in the lead concentrate. Off-site costs for freight, port fees, sampling, and silver refining are included in the analysis at the actual rates.

15.3.5 Net Smelter Return and Cut-off Criteria

The combination of all factors discussed in this section results in the following NSR formula for the 2023 Mining Reserve:

NSR = $9.56 x Zn% + 6.7 x Pb% + 0.44 x Ag (g/t)

Cut-off criteria was developed based on a ZnEq formula as follows:

ZnEq = Zn% + 0.7 x Pb% + 0.046 x Ag (g/t)

A cut-off grade of 12.7% ZnEq was applied to the reserve estimation based on this equation.

15.4 Estimation Methodology

The reserves were estimated in Deswik. The NSR formula and ZnEq were applied to the block model. Stope optimization was then performed to the resource to generate stope shapes for evaluation.

The following factors were set for the stope optimization exercise: minimum stope width (1.2 m for 3050, 3090, 3091, and 3092 veins; and 1.5 m for all other veins), maximum stope width (15 m), minimum pillar width (5 m), minimum slope of the stope (35°), minimum stope height (10 m), and maximum stope height (13 m).

Dilution and recovery factors were applied as follows:

- Development: 95% recovery without dilution applied; and
- Sublevel Open Stoping mining method: 85% recovery and 12.5% dilution.

Once generated, solids below the COG of 12.7% ZnEq were then eliminated as well as any inferred resources.

A development layout was then prepared for each stope to determine access requirements. A development and production schedule were then prepared in Deswik.

15.5 Mineral Reserve Estimate

The Mineral Reserve Estimate for Bolivar Mine is shown in Table 15-2.

Table 15-2: Mineral Reserve Estimate for Bolivar Mine (January 1, 2023)

Mine	Category	Tonnes	Zn (%)	Pb (%)	Ag (g/t)
Central	Proven	653,000	11.37	1.16	311
	Probable	420,000	9.57	0.84	237
	Total	**1,073,000**	**10.66**	**1.04**	**282**
Rosario	Proven	89,000	5.40	2.34	215
	Probable	74,000	5.27	1.64	209
	Total	**164,000**	**5.34**	**2.03**	**212**
Total Bolivar	Proven	742,000	10.65	1.31	299
	Probable	495,000	8.92	0.97	233
	Total	**1,237,000**	**9.96**	**1.17**	**273**

These reserves could be impacted by changes to mine operating costs, metallurgical recoveries, changes to permitting status, and the availability of tailings storage. No significant variations from current assumptions for these aspects are currently anticipated.

16 MINING METHODS

16.1 Introduction

The Bolivar Mine has been in continuous operation for 200 years through various operators. The application of mining methods has thus been an adaptation of mining equipment technologies, evaluation and monitoring tools to the specific mineralized zones. The last decade of operations, under the guidance of Glencore, the mine has seen a move to more mechanized methods to improve safety performance and mine productivity.

The steeply dipping and relatively wide mineralized zones were intuitively adaptable to mechanization, however, the geotechnical evaluation also supports using more productive methods. In addition to historical and empirical knowledge about the deposit, a systematic evaluation included such other deposit qualities as:

- Safety aspects, Environmental risks, Social impacts;
- Shape, geometry, consistency, and volume;
- Both mineralization and wall rock quality (strength, Fracture characterizations, in-situ strength, regional stress);
- Stability, and Support requirements;
- Grades, NSR Value, potential extraction rate;
- Mechanization/automation, use of gravity, flexibility and adaptability; and
- Unit costs, time to production, dilution, development requirements.

Based on continuously evaluated performance of the selected mining system, improvements are always being considered based on the aforementioned criteria and economic performance.

The mine currently operates at a production rate of approximately 870 t/d with a current LOM of four years based on the current reserve.

16.2 Geotech Analysis & Recon

Analysis of structural domains using the rock mass (RMR) classification system, show variation in the rock mass with the mineralized domain being relatively weaker than the Hanging and footwalls.

The geomechanical characterization is shown in Table 16-1.

Table 16-1: Geomechanical Characterization

Structural Domain	RMR	Type	Quality	Max Openings (m)	Self-Sustainability Time (1m)	Excavation Length (m)	Observations (respect to AR 1.15m)
Hangingwall	41 a 55	R III-B	Regular B	3.3 a 6.2	2 months to 2 years	1.5 a 3.0	Stable Zone
On the Vein	30 a 45	R IV-A	Bad A	2.0 a 3.9	1 day to 2 months	1.0 a 2.3	Potentially Unstable Zone
Footwall	41 a 55	R III-B	Regular B	3.3 a 6.2	2 months to 2 years	1.5 a 3.0	Stable Zone

Source: Santacruz (2022)

The flexibility and adaptability of the sub-level stoping method meets all selection criteria as well as geological and geotechnical characteristics of the rock mass. This method is used for all mineralized vein structures with widths greater than 1.0 m and dipping greater than 50°.

Table 16-2: Geomechanical Stability Analysis

Case: Stability Status Summary									
Stability Status	Stope Design Dimensions								
	Hangingwall (Regular Quality III-B			On the Vein (Bad Quality IV-A)			Footwall (Regular Quality III-B)		
	17 x 40 m	15 x 40 m	15 x 20 m	17 x 40 m	15 x 40 m	15 x 20 m	17 x 40 m	15 x 40 m	15 x 20 m
Stable without Support									X
Transition	X	X	X			X	X	X	
Stable with Support				X	X				

Case: Isoprobability Stability Contours									
Stability Status	Stope Design Dimensions								
	Hangingwall (Regular Quality III-B			On the Vein (Bad Quality IV-A)			Footwall (Regular Quality III-B)		
	17 x 40 m	15 x 40 m	15 x 20 m	17 x 40 m	15 x 40 m	15 x 20 m	17 x 40 m	15 x 40 m	15 x 20 m
Stable without Support									63%
Transition	25%	33%	52%			18%	38%	48%	
Stable with Support				7%	9%				

Source: Santacruz (2022)

16.3 Mining Methods

The adaptation of the Sub-level stoping system to the Bolivar Mine is described below.

16.3.1 Mine Design

The Property consists of two mining areas:

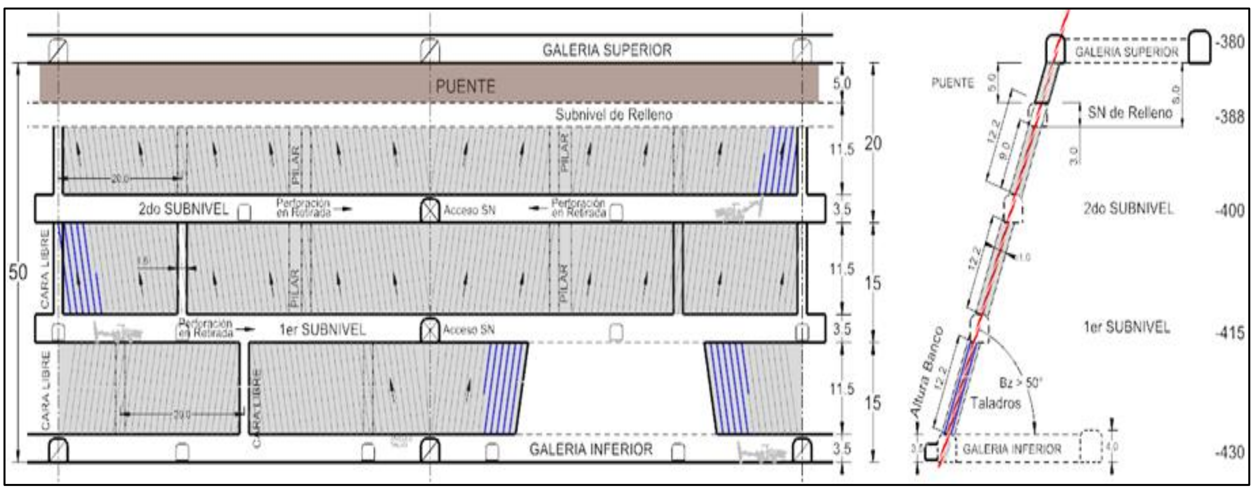
- Mina Central – is the extension of the historic mining area and extends down to the minus 430 level (430 m below primary surface access). Multiple parallel and intersecting vein structures are mined, and this area accounts for approximately 75% of the total mine production; and

- Mina Rosario – is a parallel structure recently defined which is accessed and serviced separately and account for approximately 25% of the total mine production.

16.3.2 Stoping

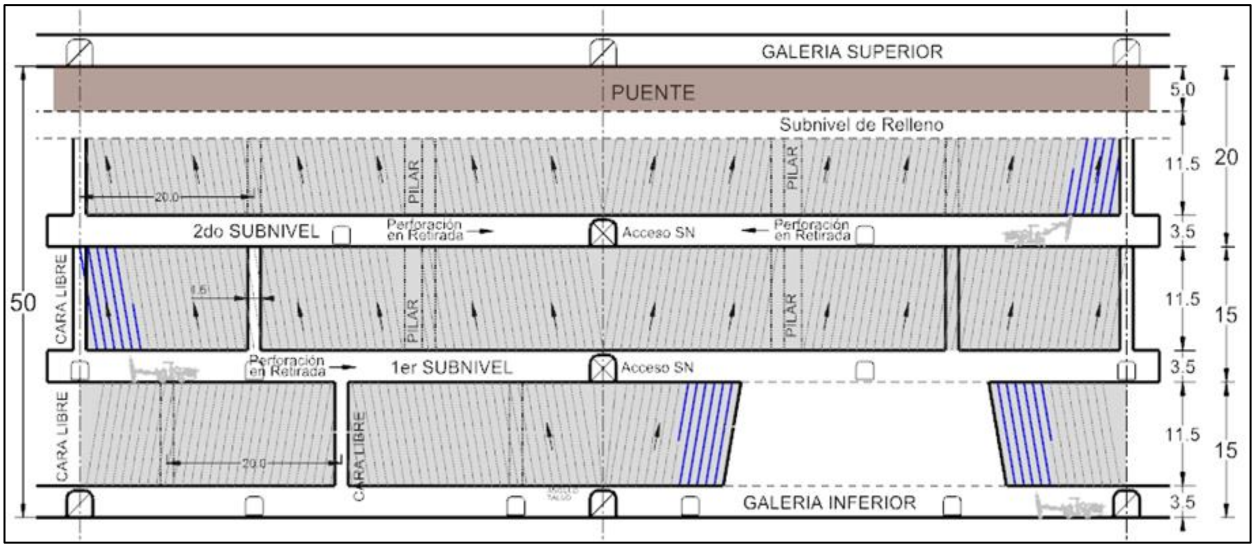
Each stoping block is prepared by driving an upper and lower Gallery along strike and in the vein approximately 50 m vertically apart. These main galleries are driven 4.0 m x 4.0 m. Sublevels are driven with a smaller cross section of 3.0 x 3.5 m approximately 15 m vertically apart with a 5 m sill pillar as shown in Figure 16-1. Production drilling is with up-holes from the sublevels, and a drift is also driven right below the sill pillar for transporting backfill.

Figure 16-1: Sub Level Stoping Scheme



Source: Santacruz (2022)

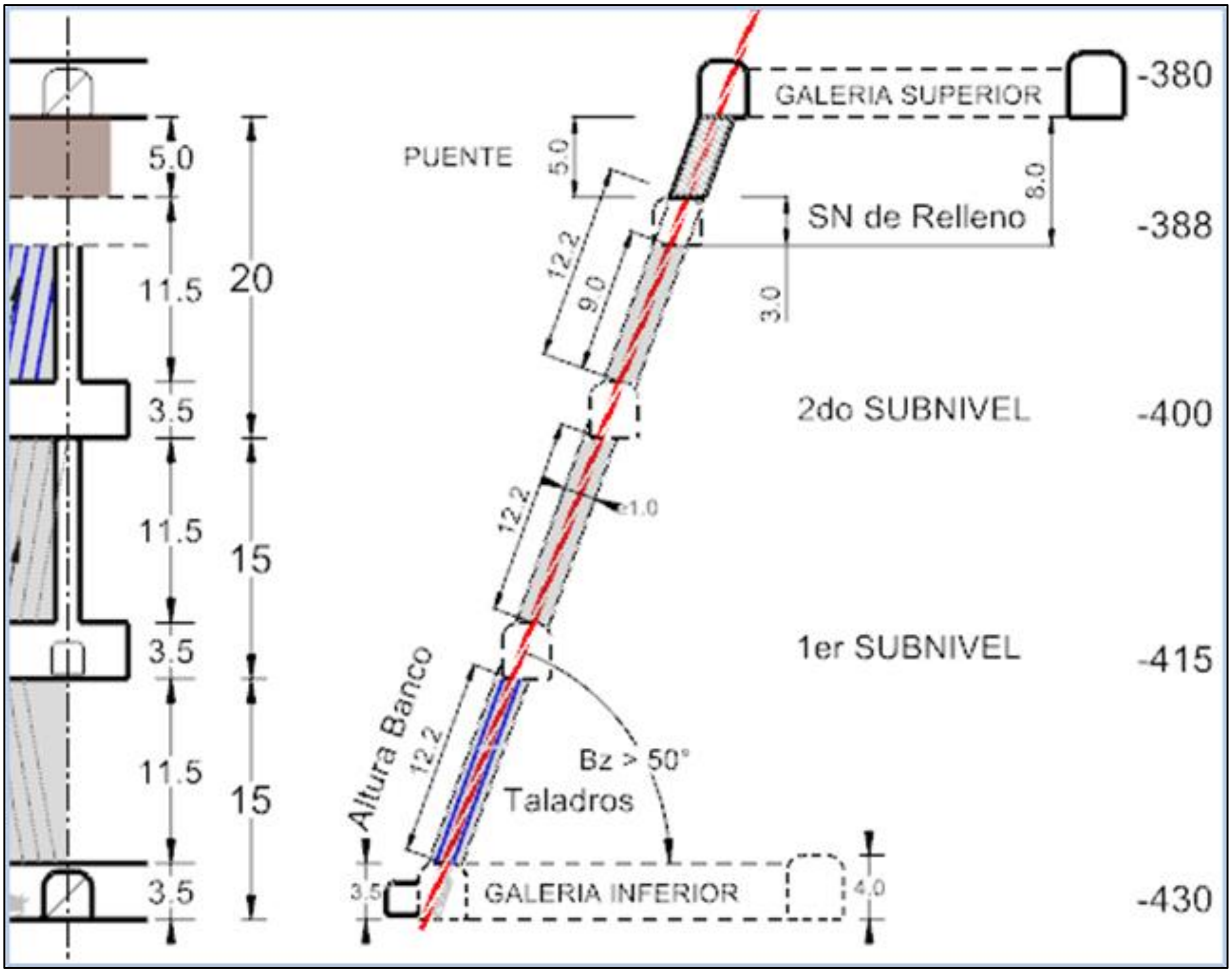
Figure 16-2: Long Section of Typical Sub Level Stoping Operation



Source: Santacruz (2022)

Depending on the dip, the sublevel stoping heights are approximately 12 m, except for the 2nd sublevel, which has a height of 9 m due to the backfill drift. Break raises are driven conventionally, and the flexibility of the method allows for vertical pillars if needed to adjust for low grade areas, or to subdivide stoping blocks to provide production flexibility.

Figure 16-3: Cross Section of Typical Sub Level Stoping Operation



Source: Santacruz (2022)

Stoping progresses from bottom to top in each block and backfill of each panel is sourced from development within the mine. The contribution of the Sub-Level stope production represents approximately 70% of the total production of Mina Bolivar, the other 30% originating from secondary development.

The mechanization of the Sub Level Stoping method has improved the safety of the operation by minimizing direct exposure to the face by the miners, as opposed to the conventional shrinkage and Cut and Fill methods with jackleg drills that was previously used.

The method also allows the operation to increase production and flexibility to facilitate blending from different stoping areas to control grade and metallurgical criteria.

Benefits experienced include:

- Greater safety performance due to mechanization;
- Higher production;
- Allows regulating the grades for the rapid disposal of mineral;
- The preparation, exploitation and transportation process are continuous and independent;
- No stoping ground support is required prior to backfilling; and
- Lower cost per tonne compared to a conventional exploitation method.

The disadvantages of the method are:

- Selectivity is compromised, and dilution is a risk if drilling and blasting factors are not controlled;
- There is a 95% recovery; and
- Variable fragmentation from stopes.

16.3.3 Development

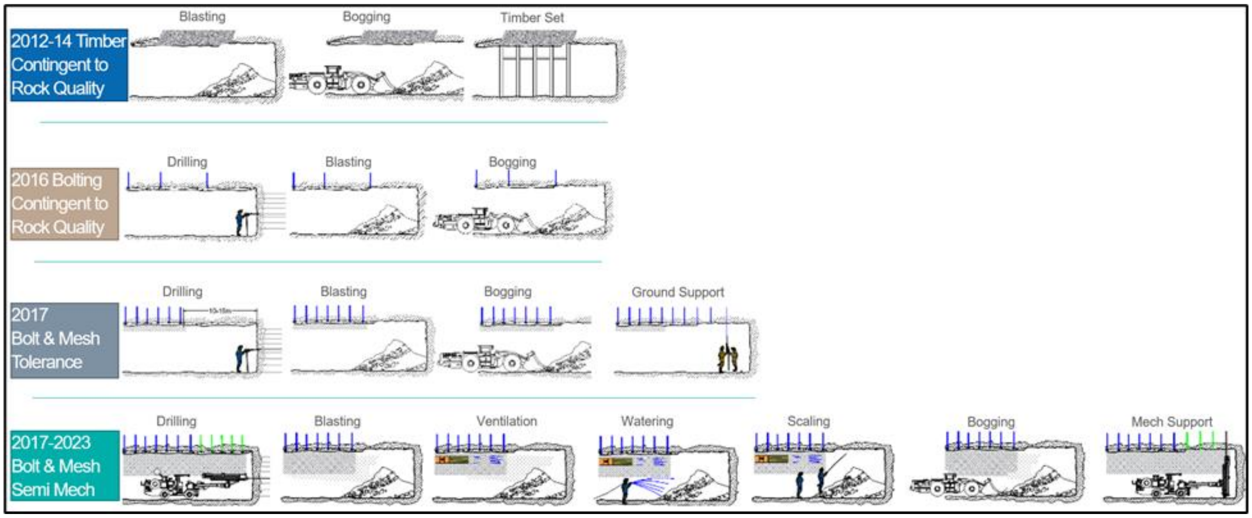
Mine Access is trackless via ramps which access the deepest levels of each mining area from the surface. Existing shafts are still used to transport Mineralized material to surface, but all access for men and materials utilize the main ramp.

The methods for driving development openings have evolved over the past decade or so in response to a period of high accident frequency rates where it was determined that the main cause of severe injuries was related to rock falls. A systematic and progressive program was established to implement controls and methods to mitigate exposure to this danger.

Until 2014, support was only carried out with timber in the worst sectors according to informal evaluations of the rock conditions. Subsequently, the specific installation of support bolts (Split set or Hydrabolt) was implemented in the back of the drifts according to the evaluation of the rock mass. Currently the primary developments (ramps, counter galleries, cutouts, entrances, etc.) have support in the back and ribs with steel mesh and hydrabolts bolts.

The galleries of the secondary developments (levels, sublevels, etc.) are supported in the back and ribs with electro-welded mesh and Split Set bolts. Figure 16-4 illustrates the progression of methodology.

Figure 16-4: Evolution of the Rock Mass Support System



Source: Glencore (2021)

In 2017, the installation of bolts (Split set or Hydrabolt) and electro-welded mesh on the back of the drift was standardized with a tolerance margin of 10 to 15 m without support on the advance front according to the quality assessment of the rock mass.

Currently, the support standard consists of the installation of bolts and electro-welded mesh on the roof and sides of the gallery (up to the gradient) to the advance front using electro-hydraulic equipment applying the 2 golden rules:

- Meter advanced equals meter supported; and
- Drilled hole, bolt installed.

The use of Jacklegs for horizontal development is minimized. Currently, the only “conventional” development being done is short raises which are driven with jacklegs and timber.

16.4 Mine Services

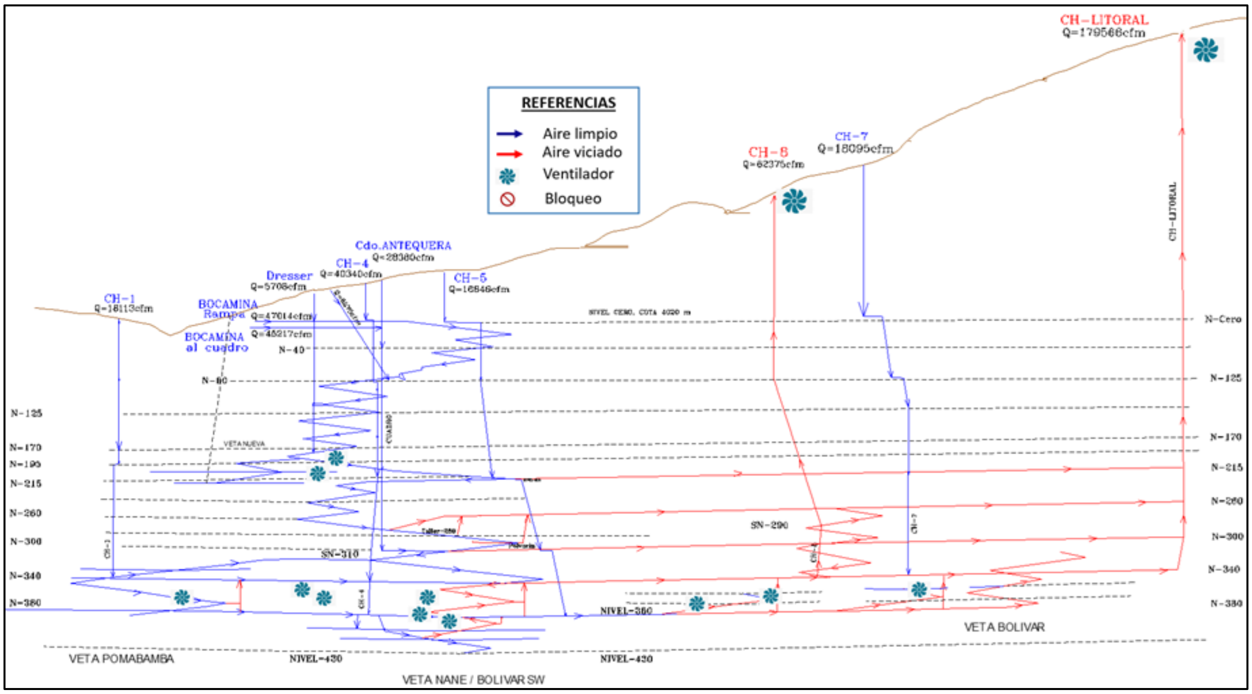
16.4.1 Ventilation

The ventilation system is independent for both the Central and Rosario Zones. Ventsim software is used to model and simulate each ventilation system, which facilitates the monitoring, evaluation and design of the ventilation system.

16.4.2 Ventilation System – Central Zone

In this area, the ventilation system consists of 7 fresh air inlets (from left to right: CH-1, Dresser, CH-4, Box, Ramp, CH-5 and CH-7) and 2 exhaust outlets (CH- 8 and CH-Litoral).

Figure 16-5: Ventilation Scheme – Central Zone

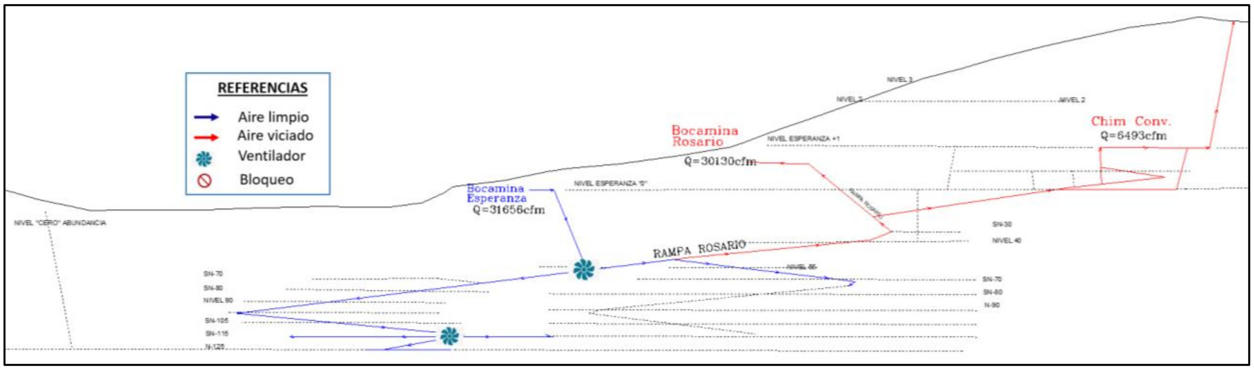


For the system to be dynamic, "main fans" are located in the exhaust side with ratings of between 200 HP and 600 HP.

16.4.3 Ventilation System – Rosario Zone

This area is in the development stage and requires less airflow than Central Zone. Total inflow is approximately 30,000 CFM.

Figure 16-6: Ventilation Scheme – Rosario Zone

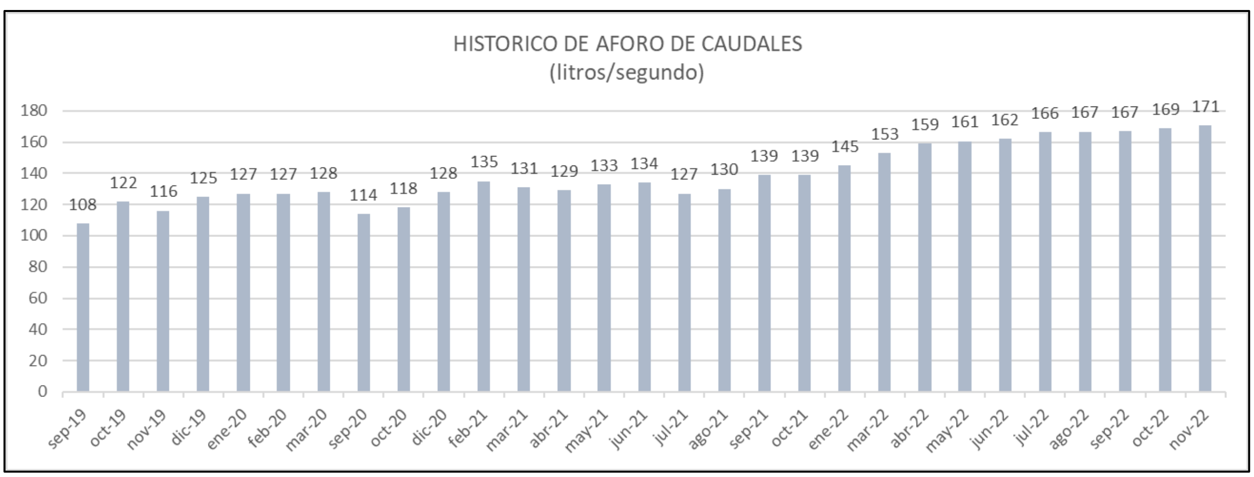


The ventilation system consists of a main inlet of fresh air through the Esperanza Level 0 raise and 2 exhaust air outlets; the Rosario Ramp and the conventional raise from Esperanza Level 1 to the surface.

16.4.4 Dewatering

The Central Zone has an appreciable quantity of groundwater inflow conducted via the mineralized veins. Most originates from surface sources so historically, the quantity varies according to season and surface rainfall, however as the mine progresses deeper, the seasonality effect is muted, and the quantity has stabilized at approximately 170 l/s.

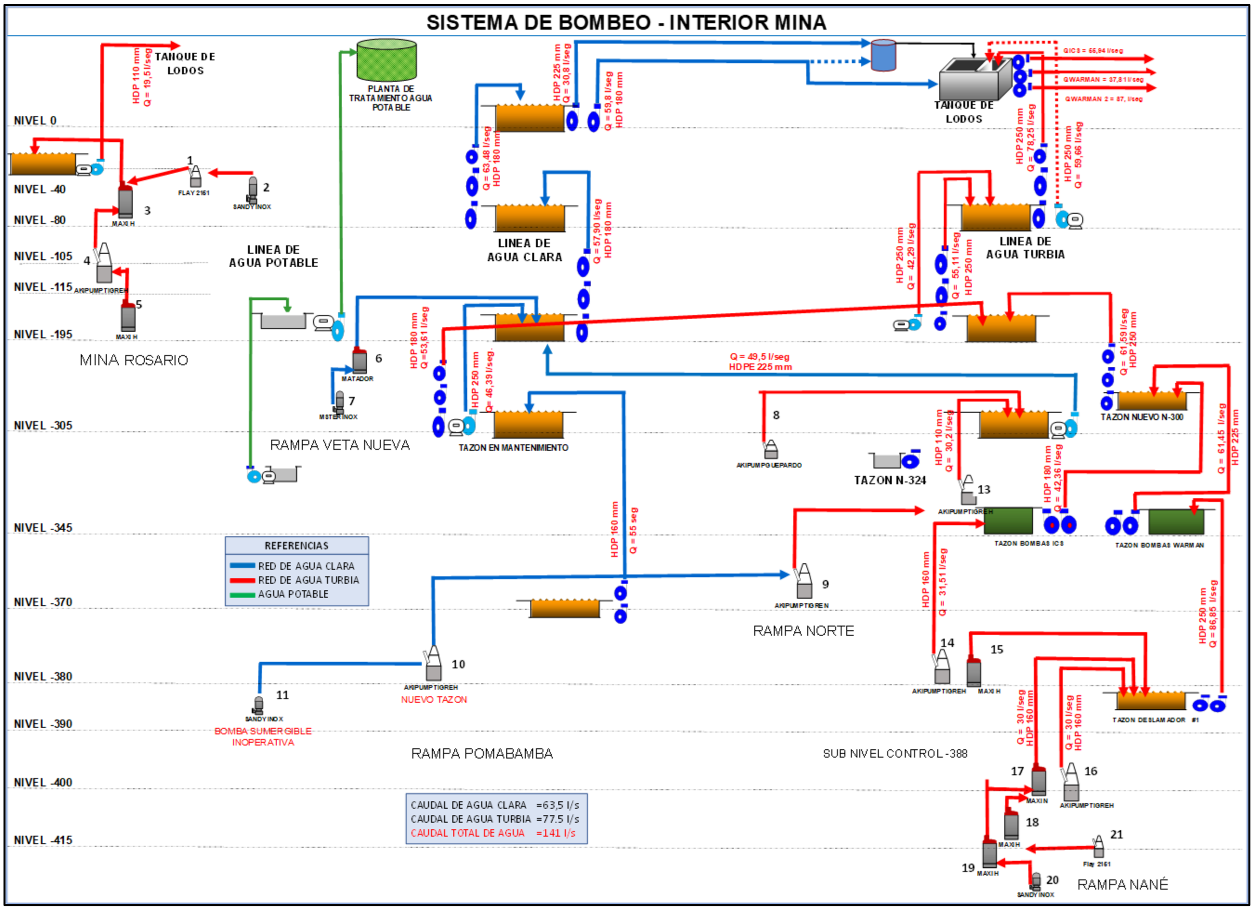
Figure 16-7: Flow Record for the Pumping System



Source: Santacruz (2023)

The pumping system uses submersible pumps to collect water from the deepest production and development areas and transfers the water to the central dewatering infrastructure. At the main sump, a series of stationary pumps remove the water from the mine as described and shown in the pumping system diagram.

Figure 16-8: Pumping Scheme – Central Zone



Source: Santacruz (2023)

16.5 Unit Operations

Stoping is sequenced in ascending order from the Lower Gallery to the Fill Sublevel according to the following sequence.

Drilling is done using a Raptor 44 longhole drill, which is capable of radial drilling at angles from 0° to 360°:

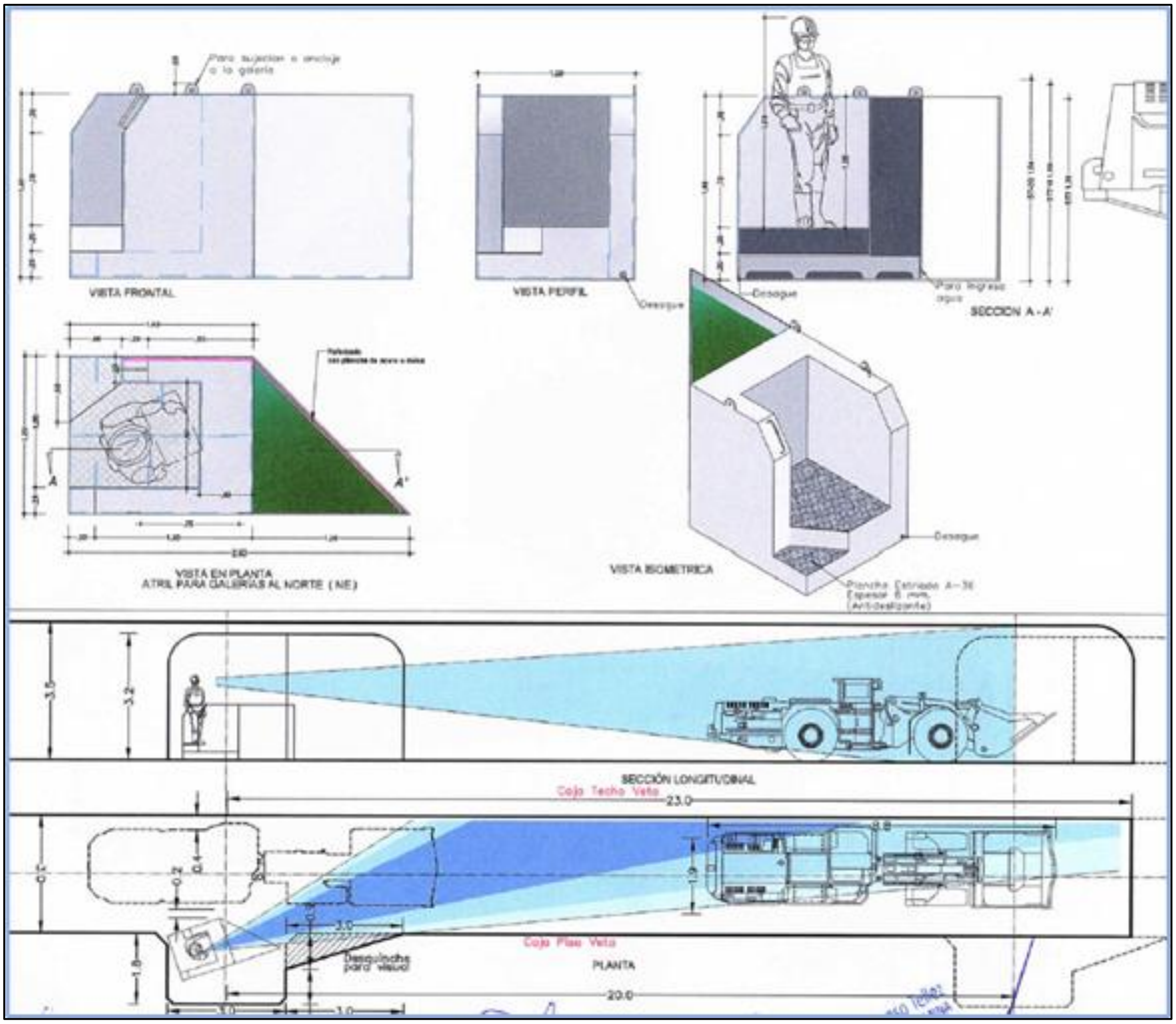
- Burden = 1.0 m and spacing = 1.20 m;
- Longitudinal angle of 80°;
- Hole diameter of 64 mm;
- Drill steel 1.20 m coupled; and
- Casing of the drilled holes with PVC.

Blasting: is carried out using a "V" relief sequence using long period delays. This sequence allows control of the hanging and footwalls, avoiding fracturing and instability.

Cleaning and extraction: the broken mineral is cleaned from the stopes (Lower Gallery) using a remote controlled Scooptram operated at a relevant safety distance where there is a shelter with a solid structure for the operator (bunker). Haulage is carried out using DUX dump trucks which transport the mineral to the shaft for hoisting (Antequera Shaft).

Filling: not until the cleaning stage is completed, are the voids filled with waste rock delivered via the upper sublevel (1st Subn Level) to generate a solid floor in the 1st Subn Level.

Figure 16-9: Remote Mucking Platform and Placement

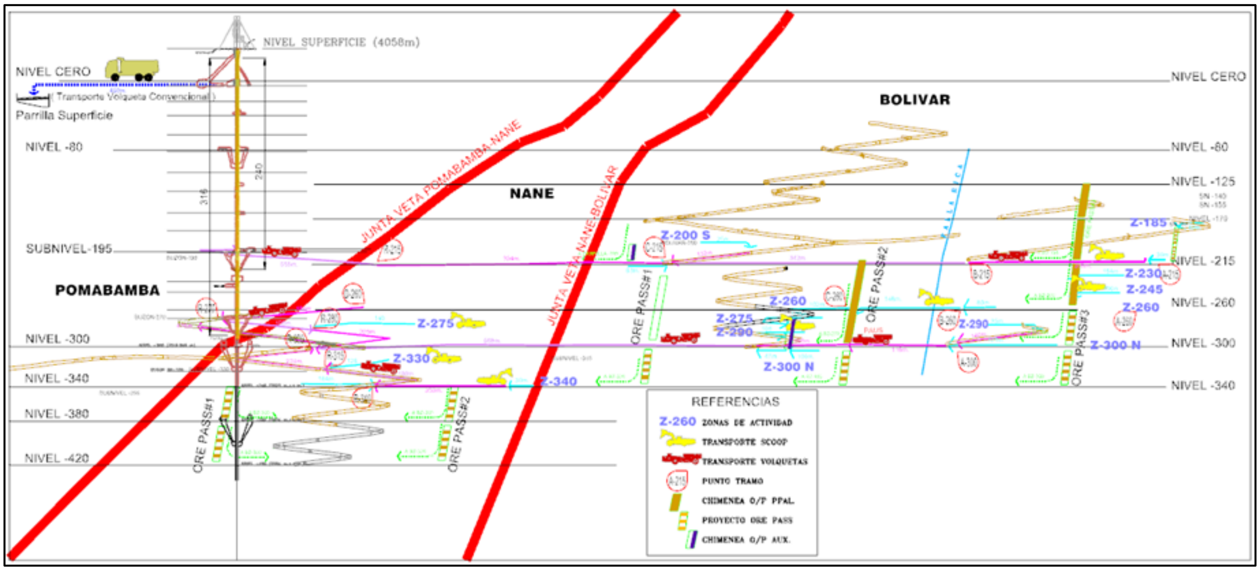


16.5.1 Extraction and Transport System

In the deposit there are 2 main production zones: Central Zone and Rosario Zone with individual extraction systems that are described in the following points.

The greatest contribution in production and mineral quality comes from the Central Zone with the mineral contribution from the veins: Bolivar, Nané, Bolivar SW, Pomabamba and Nueva as the main contributors, with other veins of lesser importance that contribute to production.

Figure 16-10: Extraction System Diagram



The extraction system consists of cleaning the advance headings or producing stopes with scooptrams directly to collection points and then loading the low-profile dump trucks that haul mineral to a central ore pass which is fitted with a chute at a main haulage level. From here the mineral is transported by trucks to the closest dump at the shaft where the mineral is hoisted to level 0. Another stage of truck haulage using conventional surface trucks takes the mineralized material to the concentrator plant.

From Rosario Zone the extraction system consists of cleaning the headings with scooptrams and transporting the mineral directly to the truck loading sites for extraction to the surface and subsequent transfer to concentrator plant.

16.6 Mine Equipment

The fleet of equipment for the Central and Rosario Zones performs the following tasks:

- Mine infrastructure (primary development): ramps, counter galleries, cuts, entrances, loading stations, shelters, collection chambers, pumping sumps, etc. and everything related to waste rock infrastructure;
- To carry out these tasks, electrohydraulic drilling jumbos are used, such as: Troidón and Muki, which are used depending on the size of the heading;
- Preparation drifts (secondary development on vein): main levels, sublevels and shelters;
- Muki electrohydraulic drilling jumbos are used;

- Installation of ground support in drifts: this activity is carried out in the primary and secondary development drifts for the stability of the back and ribs;
- Electrohydraulic equipment such as: Small Bolter and Muki;
- Cleaning: this activity is carried out at the advance fronts and stope headings;
- Scooptrams with different capacities depending on the size of the heading;
- Extraction and transportation: transport of mineral and waste rock; and
- DUX dump trucks.

16.6.1 Drilling Equipment – Drill Jumbo

There are seven Resemin Muki FF single boom jumbo rigs with a power of 75 HP that drill between 2.4 and 3.0 m long holes. They are generally used for secondary development (horizontal vein developments) to prepare sublevels whose nominal dimensions are 3.0 m x 3.5 m. Occasionally they are used in small primary development headings.

Table 16-3: Inventory of Drill Jumbo Electrohydraulic Equipment

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Capacity Range (M)	Hp	Availability (%)	Utilization (%)
1	Jumbo Drills	Central	MK-01	MUKI FF	RESEMIN	3,00	75	82	25
2		Central	MK-02	MUKI FF	RESEMIN	3,00	75	84	37
3		Central	MK-03	MUKI FF	RESEMIN	3,00	75	83	20
4		Central	MK-04	MUKI FF	RESEMIN	3,00	75	79	32
5		Central	MK-05	MUKI FF	RESEMIN	3,00	75	78	34
6		Central	MK-06	MUKI FF	RESEMIN	3,00	75	83	36
7		Central	TD-02	TROIDON XP	RESEMIN	3,50	100	89	42
8		Rosario	MK-07	MUKI FF	RESEMIN	3,00	75	83	20
9		Rosario	TD-01	TROIDON XP	RESEMIN	3,50	100	85	32

Source: Santacruz (2023)

There are also two Resemin Troidón XP drill Jumbos with a power of 100 HP that can drill between 3.0 m and 3.5 m. These are used only for large primary development headings (3.5 m x 3.5 m or 4.0 m x 4.5 m) for mine infrastructure such as: ascending and descending ramps, cuts, counter galleries, etc.).

16.6.2 Equipment for Support

There are two electrohydraulic jumbos (1 each in Central and Rosario Zones) to install support with steel mesh and Hydrabolt bolts of the back and ribs of primary development headings. These jumbos have a power of 75 HP with a drilling capacity of 3.0 m.

Table 16-4: Inventory of Electrohydraulic Support Equipment

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Capacity Range (M)	Hp	Availability (%)	Utilization (%)
1	Rock Bolters	Central	JE-02	SMALL BOLTER R99	RESEMIN	3	75	88	54
2		Rosario	JE-03	SMALL BOLTER R99	RESEMIN	3	75	95	41

Source: Santacruz (2023)

Production Equipment – Long hole drills are used for drilling long holes using the "Sub Level Stoping" exploitation method. Due to the drilling and cleaning cycles, there is generally a drilling shift during each day, with monthly drilling performance of 1,200 m.

Table 16-5: Inventory of Electrohydraulic Equipment for SLS Drilling

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Capacity Range (m)	Hp	Availability (%)	Utilization (%)
1	Longhole Drills	Central	RP-02	RAPTOR 44	RESEMIN	20	100	87	16
2		Central	RP-03	RAPTOR 44	RESEMIN	20	100	87	10
3		Central	RP-04	RAPTOR 44	RESEMIN	20	100	89	18
4		Rosario	RP-05	RAPTOR 44	RESEMIN	20	100	93	21

Source: Santacruz (2023)

Mucking –Table 16-6 shows the distribution of equipment by area to clean mineralized material and waste rock. Depending on the type of work and the heading size, the appropriate equipment is used for cleaning, stockpiling and loading trucks.

Table 16-6: Equipment Inventory – Scooptram

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Capacity Range (yd^3)	Hp	Availability (%)	Utilization (%)
1	Scooptrams	Central	ST-21	ST2G	EPIROC	2	146	90	30
2		Central	ST-26	R1300G	CATERPILLAR	3.5	165	59	6
3		Central	ST-27	ST7	EPIROC	3.5	160	84	50
4		Central	ST-28	ST7	EPIROC	3.5	160	90	40
5		Central	ST-30	ST2G	EPIROC	2	110	58	40
6		Central	ST-31	ST7	EPIROC	3.5	160	77	42
7		Central	ST-32	ST2G	EPIROC	2	160	77	56
8		Central	ST-33	ST1030	EPIROC	5.9	250	81	58
9		Central	ST-34	ST7	EPIROC	3.5	160	92	71
10		Central	ST-36	ST1030	EPIROC	5.9	250	95	80
11		Rosario	ST-35	ST7	EPIROC	3.5	160	94	82

Source: Santacruz (2023)

Haulage Equipment – Like the scoops, the dump trucks are distributed by zones to cover the movement of mineralized and waste rock material. Depending on the size of the gallery, the appropriate equipment is used according to the size.

Table 16-7: Equipment Inventory - Dump Trucks

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Capacity Range (tonnes)	Hp	Availability (%)	Utilization (%)
1	Trucks	Central	MT-12	DT12	DUX	10	146	78	26
2		Central	MT-18	DT12	DUX	10	146	71	24
3		Central	MT-21	DT12	DUX	10	146	87	57
4		Central	MT-23	DT12	DUX	10	146	80	51
5		Central	MT-07	DT22N	DUX	20	300	85	49
6		Central	MT-19	MT2010	EPIROC	20	300	72	35
7		Central	MT-20	TH315	SANDVIK	20	160	73	23

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Capacity Range (tonnes)	Hp	Availability (%)	Utilization (%)
8		Central	MT-22	DT22N	DUX	20	375	85	48
9		Rosario	MT-24	DT22N	DUX	20	375	88	57
10		Rosario	MT-25	DT22N	DUX	20	375	94	46

Source: Santacruz (2023)

Auxiliary Equipment - Auxiliary equipment is used for the transportation of equipment, personnel, and supplies, as well as maintenance of haulage and access ways. Additionally, there is auxiliary equipment through the provision of services by contracting companies for the transportation of personnel and materials.

Table 16-8: Inventory of Company Owned Service and Transportation Equipment

Item	Category	Mine / Zone	Equipment Code	Model	Brand	Hp	Availability (%)	Utilization (%)
1	Auxiliary Equipment	Central	TR-04	D4G	CATERPILLAR	45	85	30
2		Central	TR-03	D4G	CATERPILLAR	45	85	30
3		Central		LAND CRUISIER	TOYOTA	40	85	20

Source: Santacruz (2023)

16.6.3 Availability and Utilization Factors

As can be seen in the above tables, the equipment is in good operating condition, as is reflected in the high average availability numbers of between 81% and 86% and low utilization factors:

- Drill Equipment 29%
- Scooptrams 51%
- Trucks 42%

As expected, the ore haulage equipment has the highest utilization, but these numbers still suggest an ample provision of equipment for mining operations.

16.7 Mine Personnel

Total Manpower at the mine site including Mine, Plant, Maintenance, Services, and General and administrative in 2022 totaled 652 people consisting of 354 direct employees and 298 contractors. In the breakout table below, the contractors fill mostly the services roles.

Table 16-9: Mine Personnel

Mine	**200**
Plant	48
Engineering and Maintenance	70
General & Administrative	36
Contractors	298
Total	**652**

16.8 Production

Key production results for 2022 are shown in Table 16-10.

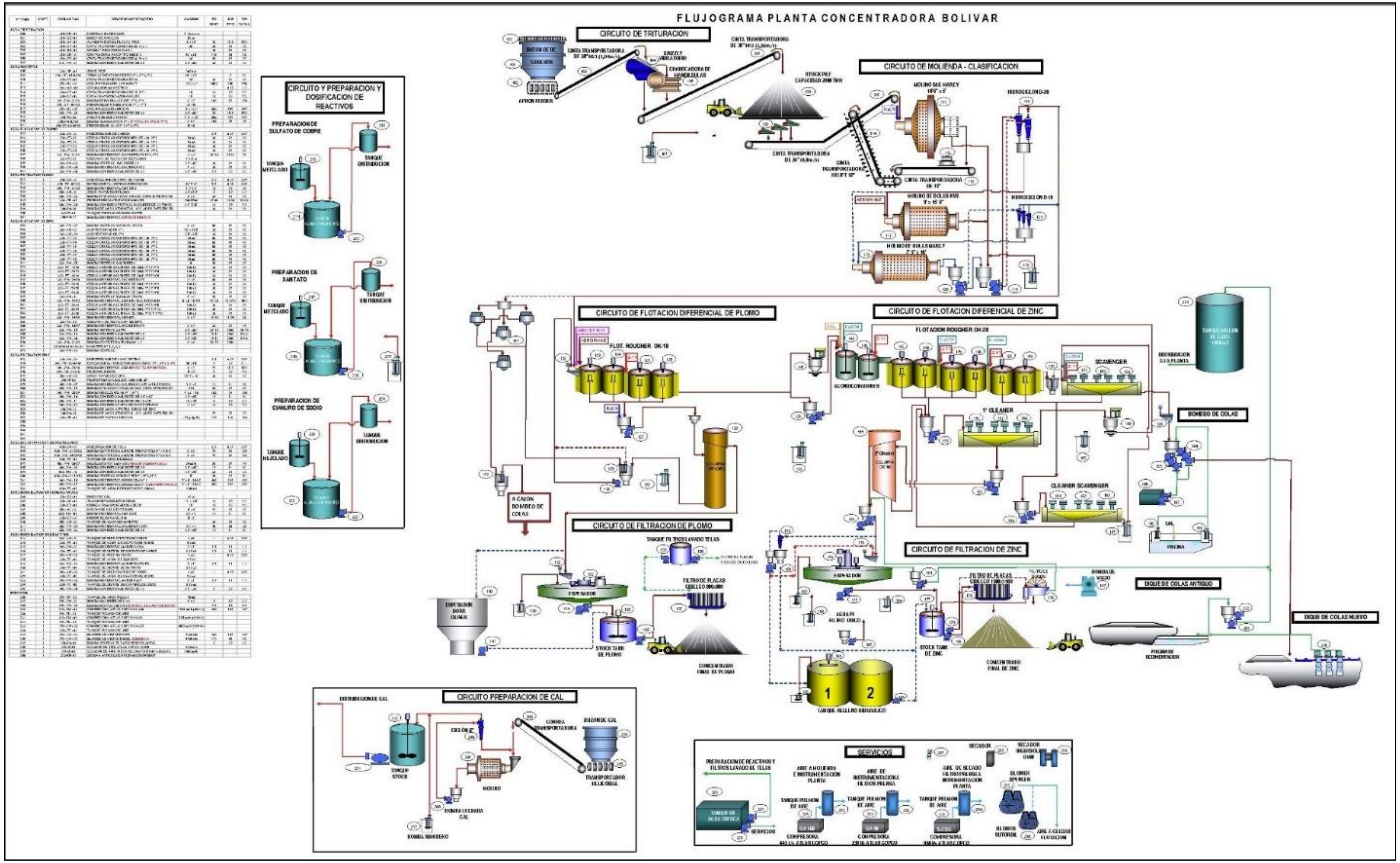
Table 16-10: Production 2022

	Central Zone	Rosario Zone	Total
Production (t)	231,479	37,180	268,659
Waste rock (t)			135,200
Backfill Hauled (t)			171,000
Zinc (%)	7.38	4.99	7.05
Lead (%)	0.61	0.89	0.65
Silver (g/t)	229	177	222
Primary Devt Horizontal (m)	2947	925	3,872
Primary Devt Vertical (m)	159	69	228
Secondary Devt Horizontal (m)	2784	643	3,427
Secondary Devt Vertical (m)	254	86	341

17 PROCESS DESCRIPTION / RECOVERY METHODS

The Bolivar mill was built and commissioned in 1993 and has been in continuous operation since. The mill uses a flowsheet that is comprised of crushing, grinding, and differential flotation to recover lead and zinc in to two separate concentrates. Both the lead and zinc concentrates are sold to Glencore, shipped overseas via Antafagasta, Chile. The mill flowsheet can be found in Figure 17-1.

Figure 17-1: Bolivar Mill Flowsheet



Source: Glencore (2021)

The mill receives feed from two sources: company mined feed and toll feed, which are processed separately. The two feeds are typically processed on different days, but there are times when they are processed on the same day, with a shutdown in between in order to ensure that the two feed sources can be measured independent of each other.

The company feed grades are determined on a daily basis by collecting and assaying samples of the process taken at the cyclone overflow, concentrates and final tailings. Each month, the production is reconciled to the measured feed tonnage using the concentrates sold and the final tailings to calculate the feed grade.

The toll feed is purchased from independent miners by San Lucas, a wholly owned company of Santacruz Silver. The lot sizes are often 1 or 2 t increments. San Lucas weighs and samples each lot to determine the metal content purchased from the independent miners. The individual lots are combined on a toll feed stockpile to be fed to the mill. The toll feed is reconciled in the same method as with the company feed to determine reconciled recoveries.

The mill utilizes different reagent dosage strategies for the toll and company feed sources, primarily due to the presence of pyrrhotite in the toll feed (which is generally not found in the company feed).

The processing plant targets a split of 80% to 85% of the feed being company mined and 15 – 20% of the feed to be toll feed.

17.1 Process Plant Description

The processing plant is designed to process 1,150 t/d of company feed or 800 t/d of toll feed. The plant produces two concentrates; a lead concentrate and zinc concentrate, both of which are high in silver.

17.1.1 Crushing

The plant feed is brought to the surface via haul truck and dumped into the crushing feed bin. The mineralized material is fed to a 40” x 30” jaw crusher via vibrating grizzly feeder. The jaw crusher discharge is placed on the mill feed stockpile.

17.1.2 Grinding

The coarse ore stockpile is reclaimed by underground vibratory feeder to a 15.5’ dia. x 6’ EGL SAG mill. The SAG mill has a trommel screen to return oversize material to the SAG mill. The fine particles are pumped to a cyclone pack for size classification. The undersize is split between 2 ball mills: an 11’ dia. X 15.5’ EGL ball mill and a 7’5” dia. X 16’ EGL ball mill. The cyclones used for classification are CAVEX 400 mm cyclones.

17.1.3 Flotation

The flotation circuit at the Bolivar mill utilizes a sequential flotation strategy. After the grinding circuit, the feed is directed to a lead flotation rougher circuit, which recovers lead and silver to be further cleaned. The tailings from the lead rougher circuit are conditioned with zinc activation reagents and then floated to make a zinc rougher concentrate.

17.1.3.1 Lead Flotation Circuit

The grinding circuit product is directed to the lead rougher flotation conditioning tanks where Aerophine 3418A, Aero 3477, and lime are added. The feed continues to the rougher flotation circuit which consists of four 10 m^3 flotation tank cells. Sodium Isopropyl Xanthate (Z-11) is added halfway down the lead rougher flotation bank (after the first 2 rougher flotation cells) to help with flotation of lead and silver.

A zinc cyanide solution is added to the rougher concentrate and the slurry is pumped to a 1.5 m diameter x 8 m high flotation cleaner column. The lead concentrate is upgraded to a concentrate grade that is above 20% lead.

The lead cleaner column tailings reports to the final tailings pump box to be pumped to the tailings pond. The lead rougher tailings reports to the zinc flotation circuit conditioning tanks.

17.1.3.2 Zinc Flotation Circuit

The lead rougher tailings report to a pair of conditioning tanks where lime and copper sulphate are added in encourage flotation of sphalerite. Once again, Z-11 is added as a collector. The zinc rougher circuit consists of six 20 m^3 Outotec flotation tank cells. The zinc rougher circuit tailings is scavenged in a bank of six 200 ft^3 (a total of 34 m^3) Denver style flotation cells.

The concentrate from the final two zinc rougher flotation cells and the scavenger flotation cells is directed to a cleaner scavenger flotation circuit, which consists of six 100 ft^3 (a total of 17 m^3) Denver style flotation cells.

The concentrate from the first four zinc rougher cells and the concentrate from the cleaner scavenger flotation cells is fed to the zinc 1st cleaner which consists of a bank of six 100 ft^3 (a total of 17 m^3) Denver style flotation cells. The tailings from the zinc 1st cleaner flotation cells is returned to the zinc circuit feed.

The concentrate from the zinc 1st cleaner flotation cells is pumped to 2 m diameter x 8 m high zinc 2nd cleaner column. The concentrate from this column is pumped to the zinc concentrate thickener. The tailings from the zinc 2nd cleaner column is pumped to the feed of the 1st cleaner.

17.1.4 Concentrate Dewatering

The concentrate dewatering circuit consists of two circuits, the lead concentrate dewatering circuit and the zinc concentrate dewatering circuit.

The concentrates produced at the Bolivar Mine are sold to Glencore via overseas shipping through Antafagasta, Chile. The zinc concentrate is shipped as a bulk product. The lead concentrate, due to local laws, is bagged prior to shipping. The products are transported by truck to the train loading facility that is approximately 10 km from the mine.

17.1.4.1 Lead Concentrate Dewatering

The lead dewatering circuit consists of a 40 ft diameter lead concentrate thickener. The thickener overflow returns to the process water tank. The thickener underflow is pumped to a lead concentrate stock tank. The lead concentrate is then filtered in a 1 m x 1 m x 24 plate pressure filter.

Filtered lead concentrate is bagged for transport to the smelter, as is required by Bolivian law.

17.1.4.2 Zinc Concentrate Dewatering

The zinc dewatering circuit consists of a 60 ft diameter zinc concentrate thickener. The thickener overflow returns to the process water tank. The thickener underflow is pumped to a zinc concentrate stock tank. The zinc concentrate is then filtered in either a 1.5 m x 1.5 m x 44 plate pressure filter or a 6 ft diameter x 6 disc filter.

17.1.5 Tailings

There are two tailings storage facilities at the Bolivar Mine. The original tailings storage has been decommissioned. The operational tailings dam is currently undergoing a lift to extend the capacity to 2024. Both tailings dams are inspected regularly and maintained to the standards set out by the Canadian Dam Association guidelines. Both dams are under the supervision of engineers from AMEC (now Wood Engineering) and recently an external audit was conducted by Knight Piésold Consulting.

18 PROJECT INFRASTRUCTURE AND SERVICES

The Bolivar operation is essentially part of a townsite, housing the workers and their families. It has two camps, numerous residences, a hospital, and a school. Workers live in the town or in nearby Antequera. As such, there is no need for personnel transport.

The infrastructure is depicted in the following three site plans showing:

- The Industrial Complex (Figure 18-1);
- The Industrial Complex and Townsite (Figure 18-2); and
- The General Area (Figure 18-3).

The industrial site is located on the northeastern edge of the townsite. All the infrastructure of the industrial area is close to the mine entrances of equipment and personnel and ore extraction to minimize transportation of ore from the mine to the concentrator plant and worker travel. It is fenced from the rest of the community and is guarded by security to control access. It contains the processing plant, mine offices, multiple maintenance buildings, the assay lab, mine services, multiple warehouses, and administration building. The industrial complex is located close to both mine portals to minimize the haulage distance to the crusher and processing plant.

The Santa Rita hospital is located in the south-east corner of the town, which provides services to the operation and community. This is augmented by a first aid station inside the industrial complex near the mine portal.

A dining hall is maintained for technical and administrative staff, which provides three catered meals per day year-round. Most workers eat at their own homes in town.

The site is connected to grid power supplied by the ENDE company to both the industrial complex and community.

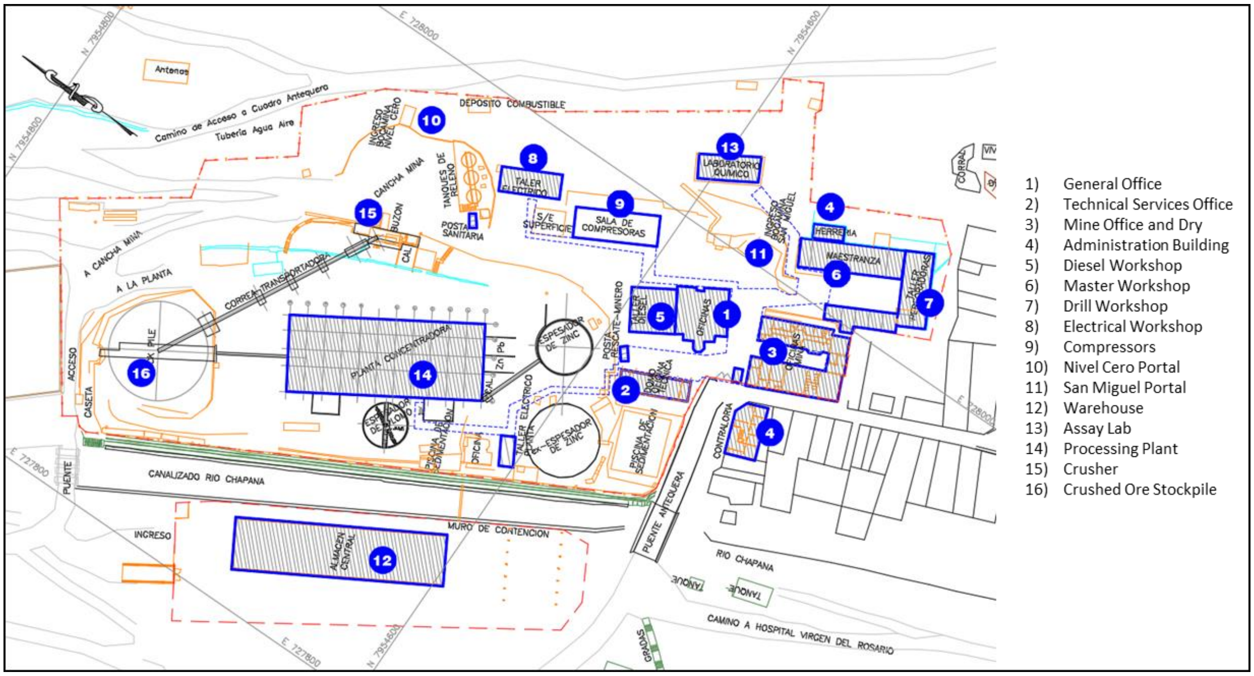
Drinking water is provided by a dammed reservoir, which is monitored and controlled by environmental staff. The water is treated and distributed to the offices and homes of the town site over a three-hour period each day. Water storage tanks are employed by all users for 24-hour access to potable water. The current reservoir is the second such structure which replaced an older dammed reservoir that is now decommissioned.

A sewage network is provided and shared by offices and homes in the community.

The current dike and the former dike are located 3.5 km from the industrial area and the solid waste dump 3.2 km away, which are managed by the Department of the Environment, where monitoring and control for their proper functioning is carried out on a daily basis.

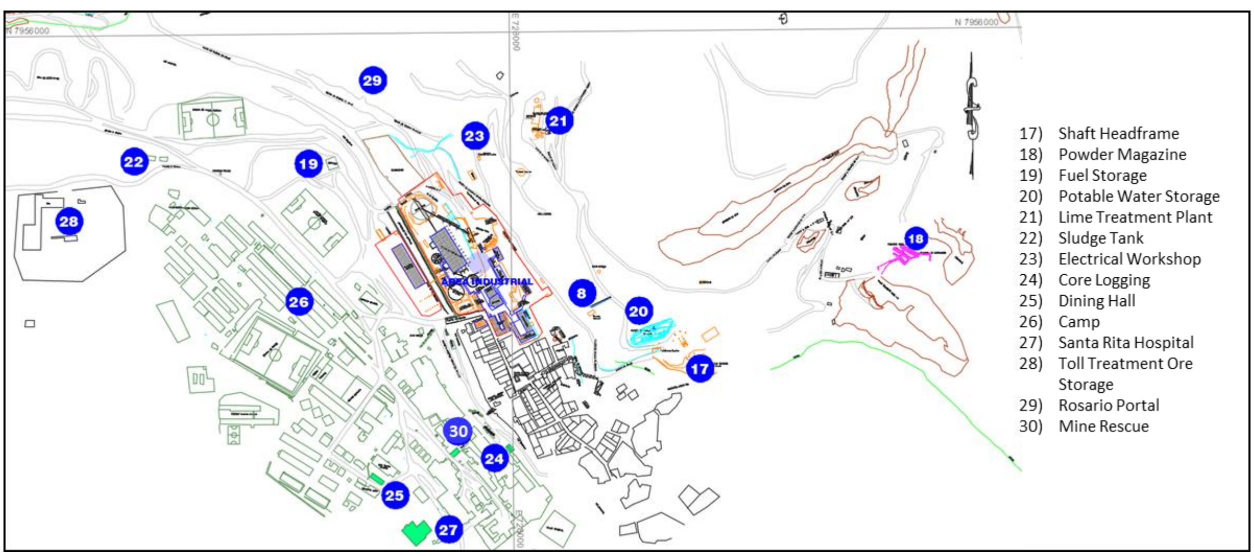
A mine rescue office is maintained in the townsite to respond to emergency situations. Firefighting and other safety equipment is located throughout the industrial complex and townsite.

Figure 18-1: Industrial Complex



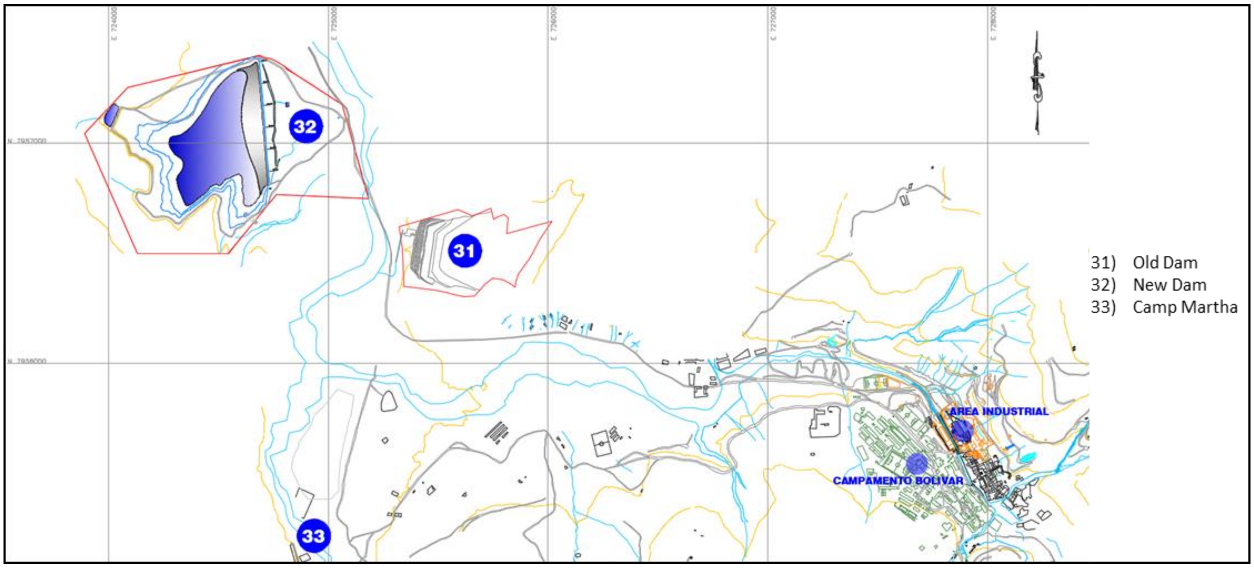
Source: Santacruz (2023)

Figure 18-2: Industrial Complex and Townsite



Source: Santacruz (2023)

Figure 18-3: General Area



Source: Santacruz (2023)

Bolivar Operations uses power for mining and processing operations. Power is supplied by the National Grid. Approximately 38 million kWh of power was consumed in 2022, representing an average draw of approximately 4.35 MW. This equates to 141 kWh/t mined or 117 kWh/t processed (including toll milling).

19 MARKET STUDIES AND CONTRACTS

19.1 Contracts

19.1.1 Illapa JV

Bolivar Mine operates under the management of Sinchi Wayra S.A. (formerly COMSUR S.A.), under a joint venture agreement with the Bolivian government (COMIBOL) named Illapa S.A. Sinchi Wayra S.A. and (COMIBOL) entered this Joint Venture Agreement (the Illapa JV) on December 4, 2014, by virtue of Public Deed N° 1356/2014. The duration of the Illapa JV is 15 years, with the possibility of extending the term for the same duration. Under the Illapa JV, ownership is 55% COMIBOL and 45% Illapa. In the event of any disagreement, the Illapa JV has an arbitration clause with seat in La Paz, Bolivia, under UNCITRAL Rules.

On October 11, 2021, Santacruz entered into the Definitive Agreement with Glencore whereby Santacruz agreed to acquire a portfolio of Bolivian silver assets from Glencore, including the following: (a) a 45% interest in the Bolivar Mine and the Porco Mine, held through an unincorporated joint venture between Glencore's wholly-owned subsidiary Contrato de Asociación Sociedad Minera Illapa S.A. (Illapa) and COMIBOL, a Bolivian state-owned entity; (b) a 100% interest in the Sinchi Wayra S.A. (Sinchi Wayra) business, which includes the producing Caballo Blanco mining complex; (c) the Soracaya exploration project; and (d) the San Lucas ore sourcing and trading business (the Assets).

On March 18, 2022, Santacruz completed the purchase of the Assets, including Glencore's interest in the Bolivar Mine.

On May 10, 2023, Santacruz and Glencore entered into a framework agreement to amend certain terms of the transaction documents pertaining to the acquisition of the Assets. On March 28, 2024, Santacruz and Glencore entered into the binding Term Sheet which amends the terms of certain deferred consideration and ancillary documents pertaining to the acquisition of the Assets.

19.1.2 Glencore Offtake Agreement

Off-take Agreements with Glencore International are in place for the Bolivar Mine production: Contract No. 180-03-10309-P and Contract No. 062-03-10276-P, including all its addendums and amendments. These Off-Take Agreements are in effect through the life of the mine.

19.2 Market Studies

No market studies have been completed for the Project at this time. All commodities produced by the mine are regularly sold on vast international markets and the operation has an arrangement with a smelter to ensure continued product sales.

19.3 Smelting

The mine produces two saleable concentrates: lead, and zinc. Both are sent to Antafagasta, Chile for shipment overseas. Both are sold to Glencore. These include typical payment terms for all payable metals (Pb, Zn, Ag) and deductions for deleterious elements, which potentially include Sb, Bi, and As in the lead concentrate; and SiO_2, Sn, Cd, Sb, and Fe in the zinc concentrate.

The approximate percentage net revenue by concentrate is ranked as follows:

- Zn Concentrate: 59%
- Pb Concentrate: 41%

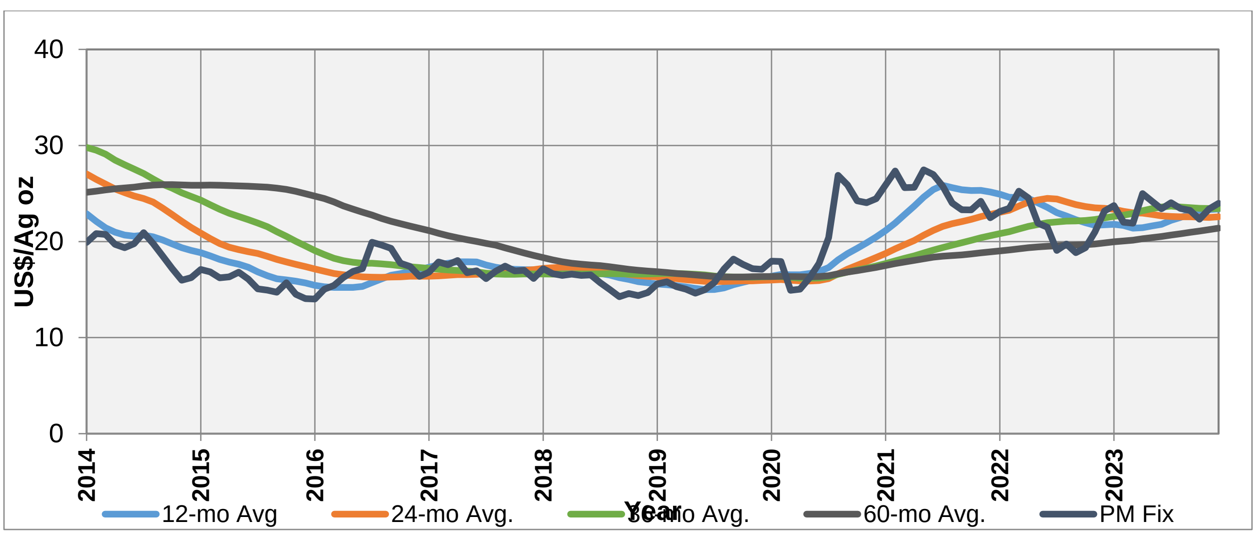
The approximate percentage revenue by metal is ranked as follows:

- Ag: 58%
- Zn: 39%
- Pb: 3%

19.4 Metal Prices

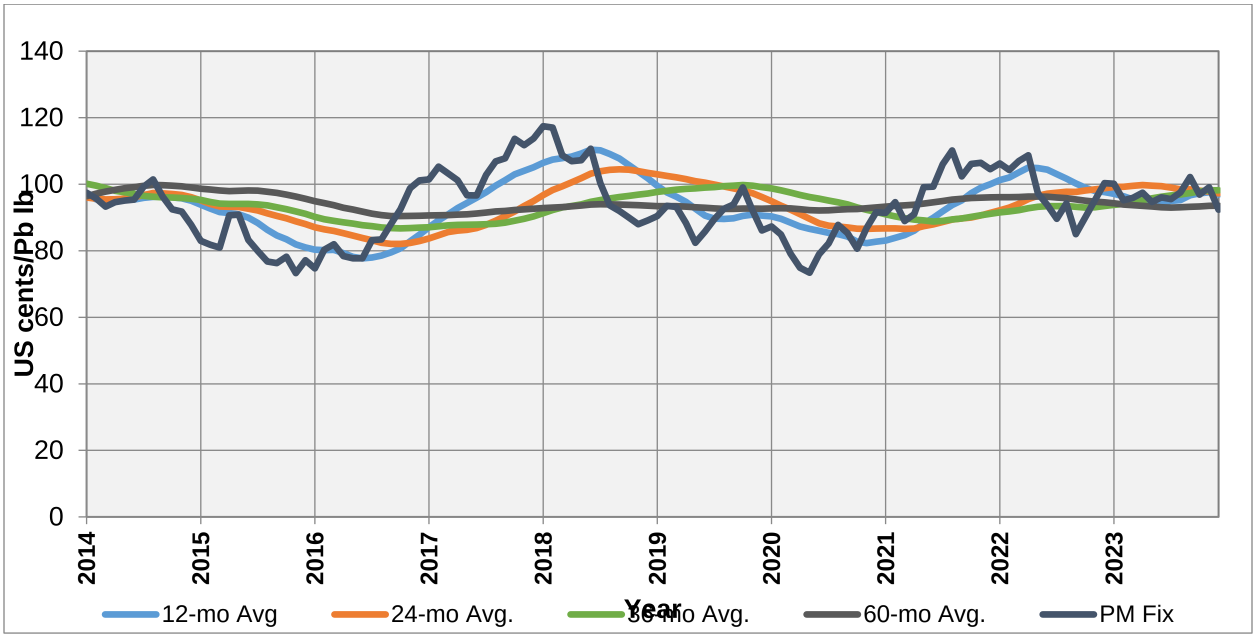
Historical silver, lead, and zinc prices are shown in Figure 19-1 through Figure 19-3.

Figure 19-1: Historical Silver Price



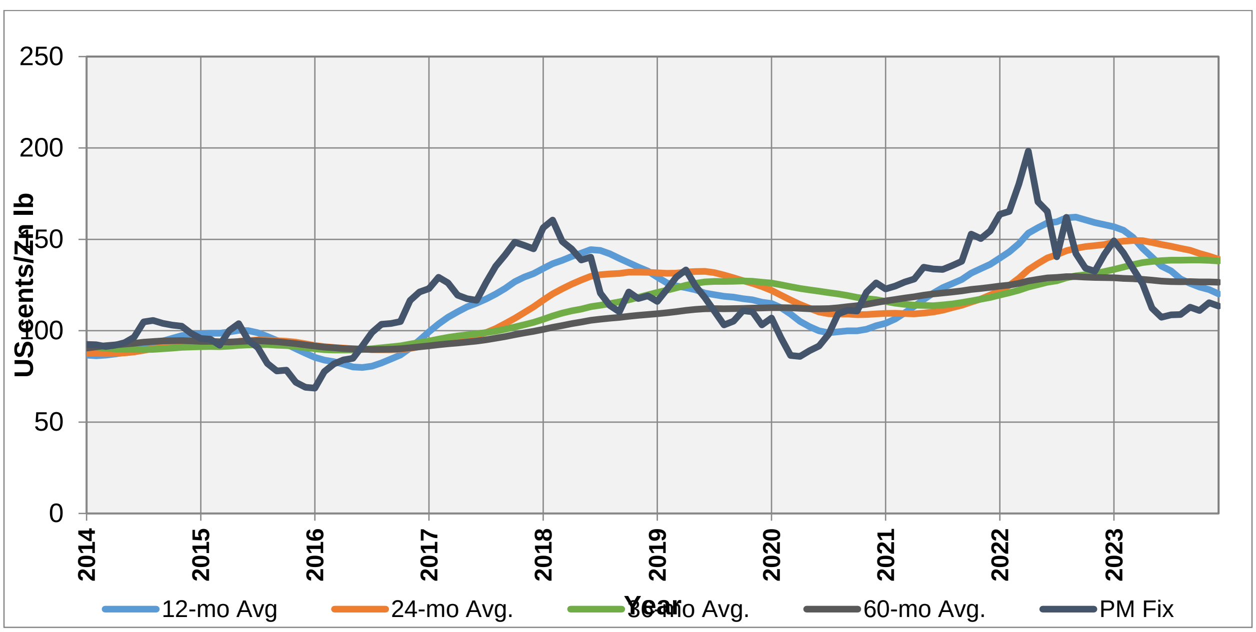
Source: London Metals Exchange (2023)

Figure 19-2: Historical Lead Price



Source: London Metals Exchange (2023)

Figure 19-3: Historical Zinc Price



Source: London Metal Exchange (2023

The zinc, silver and lead prices used in this Technical Report were selected based on the average of three years past and forward projections by CIBC and Consensus Economics, as shown in Table 19-1. These parameters are in line with other recently released comparable Technical Reports. These prices were used as the basis for the resource estimate, reserve estimate, and economic model.

Table 19-1: Metal Price and Exchange Rate

Metal	Three Year Average	CIBC (Long Term)	Consensus Economics Forecast (Log Term)	Assumed Value
Silver	23.39	22.96	20.48	21.00
Zinc	1.20	1.27	1.14	1.15
Lead	0.97	0.94	0.88	1.00

It must be noted that metal prices are highly variable and are driven by complex market forces and are difficult to predict.

Current (May 3, 2024) spot prices are as follows:

- Ag: $26.50/oz
- Zn: $1.32/lb
- Pb: $1.00/lb

The QPs do not consider the difference between metal current prices and those assumed in this study to be material with regard to the estimation of the mineral resources, reserves, or financial model.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACTS

20.1 Environmental Considerations

Responsible environmental management is a critical part of Santacruz's license to operate and our responsible, compliant operation of Bolivian assets has continued for the last 30 years. Control of potential environmental impacts that can affect Santacruz's performance and the interests of internal and external stakeholders is paramount. Santacruz' environmental management approach is divided into three major areas; Water Management, Tailings Management, and Climate Change. However, other environmental issues are addressed as needed outside of these major management areas such as Waste Management, Land Use, Environmental Closure, and Biodiversity.

Environmental Compliance with national laws and regulations is the basis of Santacruz's environmental management system and is governed by a framework of oversight by the relevant Environmental Authority. However, the company's environmental management system allows it to identify and assess all effects of its operations in order to establish controls and improvement targets guided by best environmental practices and its responsibility to the communities in which it operates. Its environmental commitments are reported to the authorities annually in an Environmental Monitoring Report, which summarizes environmental management of its operations under applicable laws and regulations.

Santacruz is part of the Environmental Working Table within the Bolivia Network of the United Nations Global Compact, where it supports initiatives for raising awareness and environmental care, while also sharing experience from the field.

Based on comparison to the Baseline Environmental Audit Studies (ALBAs), mining activities in Santacruz's operations have not had a significant impact on the area's biodiversity. However, Santacruz actively manage risks related to land use by analyzing impacts on water resources and agriculture, adhering to national regulatory requirements, and applying relevant best practices from the ICMM for environmental closure. In the context of continuous improvement, Santacruz carried out partial remediation and rehabilitation tasks in industrial areas in accordance with the Progressive Closure Plan, in compliance with the Environmental Regulation for Mining Activities (RAAM) of Law No. 1333. None of Santacruz's mining operations are in direct proximity to a sensitive biodiversity area, and no species listed on the IUCN Red List or national conservation lists are identified as threatened by Santacruz's activities. However, Reserva Mine in Caballo Blanco is located near a Municipal protected area.

20.1.1 Climate Change

The impacts and costs of addressing climate change is driven by global commitments, such as the Paris Agreement in 2015, which was signed by 193 countries, including Bolivia. The Agreement proposes, through international action, the reduction of global emissions to prevent the increase of 2° C in the planet's temperature. In this regard, the Bolivian government, through Law No. 835 of 2016, committed to preserving the integrity of Mother Earth, and private industry is expected to join global initiatives on climate change. Climate change has been identified as a material topic due to its potential negative impacts in the medium and long term, particularly in terms of water use and the energy limitations that the mining sector must face. This has been evaluated in Santacruz's corporate risk matrix, and Santacruz is taking actions to address this risk. Santacruz recognize the importance of the required actions in response to Climate Change and strive to ensure mining operations with the least possible environmental impact. focus its efforts mainly on efficient water management and energy efficiency. The cost of energy is one of the largest components of Santacruz's operating expenditures. Ninety percent of the electricity consumed in Santacruz's operations is purchased from the national power grid which relies mostly on fossil fuels (73%).One of Santacruz's direct actions is the management of two power plants that supply electricity to Colquechaquita Mine (Caballo Blanco):

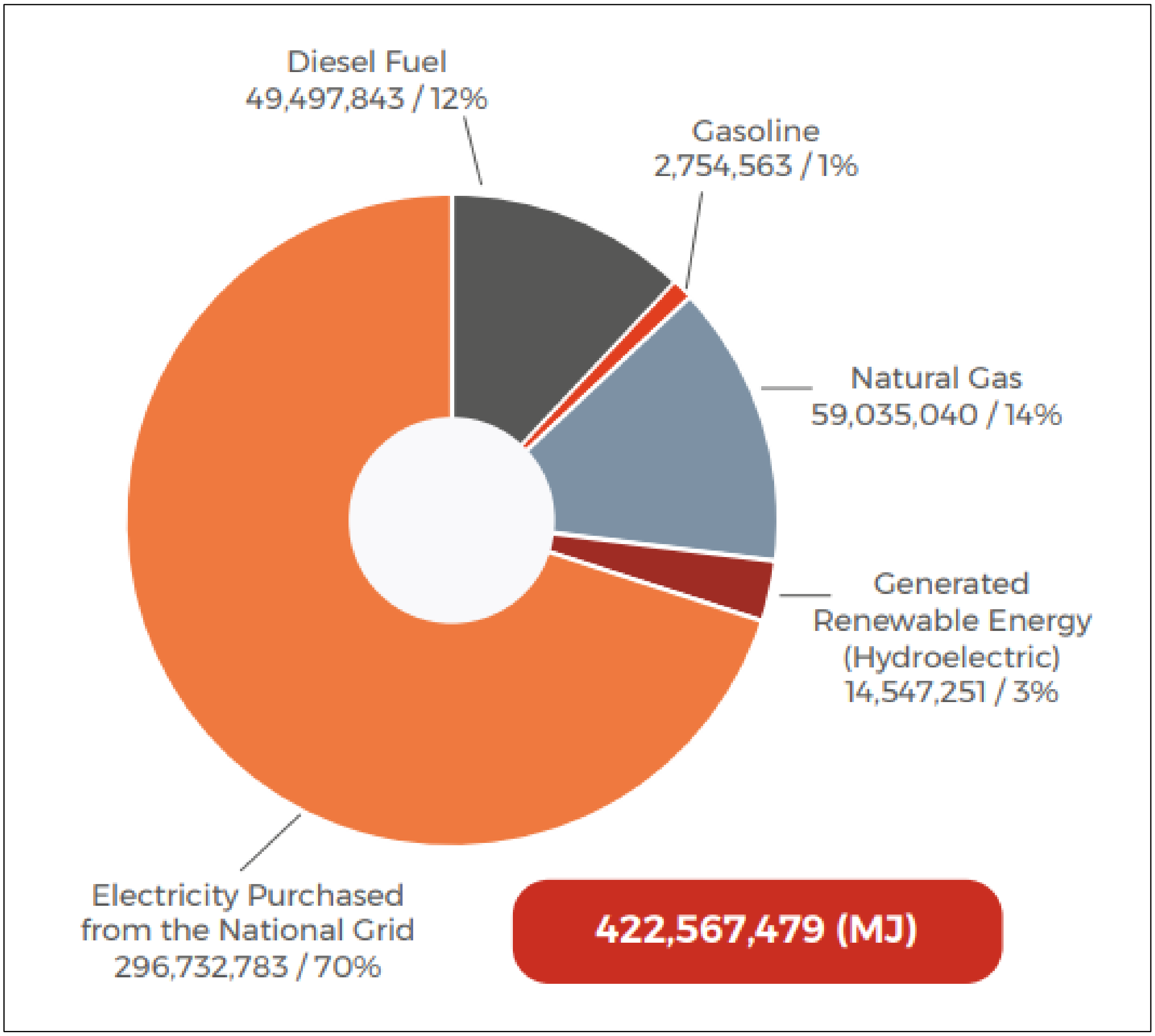
- Hydropower Plant - Renewable energy from Yocalla, which generates 870 CVA s a generation facility that converts the potential energy from falling water into electricity, with a generation capacity of 870 CV; and

- Aroifilla Thermoelectric Plant, which operates on natural gas and has a generation capacity of 200 KW.

Santacruz's operations consumed a total of 91,500 M Watt-hours from the national grid and Santacruz's own power plants, representing a 3% increase compared with the previous year's consumption against a 7% growth in production. 90% of the electricity consumed is purchased from the National Grid, while the remaining electricity is generated by Santacruz's Aroifilla thermoelectric power plant (5%) and Yocalla Renewable hydroelectric power plant (4%).

Electric energy and natural gas are measured via dedicated meters installed for this purpose. Gasoline and diesel fuel consumption is tracked through the records of outgoing supplies managed by warehouses, which are solely for the company's equipment and vehicles. Energy intensity can then be calculated to allow monitoring of overall energy efficiency. In 2022, Santacruz's energy intensity per tonne of concentrate was 2,544 MJ/t, a 10% reduction compared with the previous year, and 30.5% decrease since 2018. This reduction is attributed to more efficient production processes and increases in production that allow energy to be used more effectively.

Figure 20-1: Santacruz Bolivia Operations Energy Consumption



Source: Sustainability Report, Sinchi Wayra (2022)

Atmospheric Emissions are associated with the transportation of materials and personnel to and between the mines, resulting from dust and particulate matter generated by truck transport on unpaved roads. To prevent dust and particulate material dispersion in the air, Santacruz has implemented controls, such as frequent watering of gravel roads. In 2022, Santacruz continued to perform ambient air quality monitoring at specific points designated in Santacruz's environmental permits. These monitoring activities assess the levels of PM-10 and metallic contents in the air, and the results are well below the permissible limits. Santacruz also reports the emissions of SOx and NOx resulting from the combustion of natural gas in Santacruz's

Aroifilla thermoelectric plant in Potosí. These emissions are also below the permissible limits established by law. The calculation of these emissions is based on measurements conducted by an independent certified environmental laboratory.

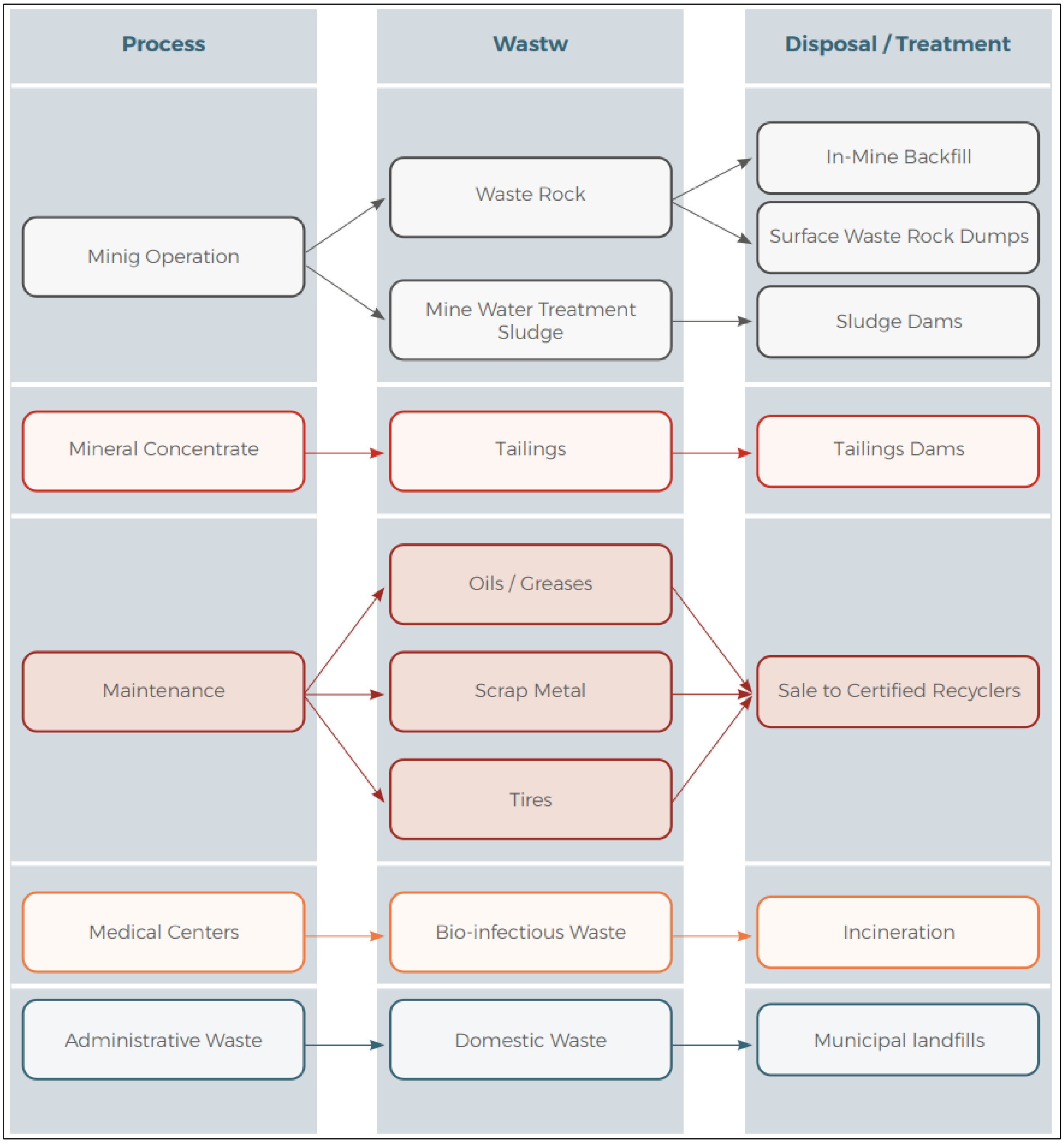
20.2 Waste and Water Management

Waste management is an important part of Santacruz's Comprehensive Environmental Management, which includes a waste management plan to classify, handle, and store waste separately for proper disposal or treatment. Waste management complies with Environmental Law No. 1333, its Regulations on Solid Waste Management, and its supplementary regulations, focusing primarily on the sectoral requirements of the Environmental Regulation for Mining Activities for waste rock and tailings.

Waste management extends beyond Santacruz's production operations and includes administrative activities and healthcare facilities managed by Santacruz. Santacruz has begun initiatives for recycling and reuse of domestic waste at several of Santacruz's operations, including plastic recycling campaigns, paper reuse, and compost generation from food waste. Industrial wastes such as oils, greases, scrap, and tires, are sold to recognized recyclers. It ensures that these recyclers are regulated and certified by the environmental authorities to ensure compliant reuse and recycling.

Santacruz classifies waste based on its source of generation. Waste Management then addresses separation by kind of waste, collection, temporary storage and final disposal.

Figure 20-2: Waste Classification by Process Source



Source: Sustainability Report, Sinchi Wayra (2022)

Table 20-1: Total Waste Quantification and Treatment/Disposal

Classification	Subclassification	Type of Waste	Description of Measures and Risks	Treatment / Disposal	2022
Hazardous Waste	Mineral Waste	Waste Sterile Rock or Wall Rock (Tn.)	Excavated material resulting from mining operations. Our environmental and safety management ensures that this waste is confined to fill blasted galleries, maintaining the stability of the deposit. The excess sterile rock is transported to the surface and stored in Waste Rock Deposits with all the necessary environmental measures to prevent pollution. Its hazard level is high due to the potential for Acid Rock Drainage (ARD) generation, which is why we have a drainage system that collects and redirects rainwater to avoid contact with the sterile material accumulations.	Transport to a Landfill On-site	17,266
		Tailings (Tn.)	Tailings are the residues generated from the metallurgical concentration process, and they are confined in constructed tailings dams specifically designed for this purpose. They are transported through a pipeline system from the Concentrator Plants. Due to their high content of metals and chemicals, their hazard level is high. The tailings dams are equipped with a drainage system that captures and diverts rainwater, as well as another system to capture infiltrations.	Transport to a Landfill On-site	851,725
	Non-Mineral Waste	Bio-infectious Waste (Tn.)	This waste is generated by our health centers in the operations. It undergoes incineration treatment in Bolívar and Porco, while in Caballo Blanco, it is transported to Potosí for disposal by the specialized municipal service. Its hazardous nature is based on the potential for disease transmission and infection, including transmission of Covid-19.	Disposal by Incineration (without energy recovery) On-site (Bolívar and Porco) / Off-site (Caballo Blanco)	0.7
Non-Hazardous Waste	Mineral Waste	Sludge (Tn.)	Sludge is the waste generated by the Treatment of Water. It is composed mainly of Calcium Hydroxide and solids decanted from the mine water. Sludge is stored in pools specifically designed for this purpose or in the Tailings Dams.	Transport to a Landfill On-site	18,597
	Non-Mineral Waste	Domestic and Industrial Waste	Non-hazardous non-mining waste is common waste that is collected separately, including domestic garbage, paper and cardboard, and plastic. In the operational area, oils, greases, worn-out tires, and scrap materials are separated. These waste items are temporarily stored and, as part of circularity measures, sold to specialized external companies for their respective reuse, recycling, or proper disposal. As a prerequisite for verifying these companies, their environmental license for handling this waste is requested. Contracts and shipping documents are also available and validated by the Environmental Authority.	Disposal - Transfer to Municipal Landfill (domestic waste) Off-site Industrial Waste - Transfer for Recycling/Reuse (Not disposed of) Off-site	1,318

Source: Sustainability Report, Sinchi Wayra (2022)

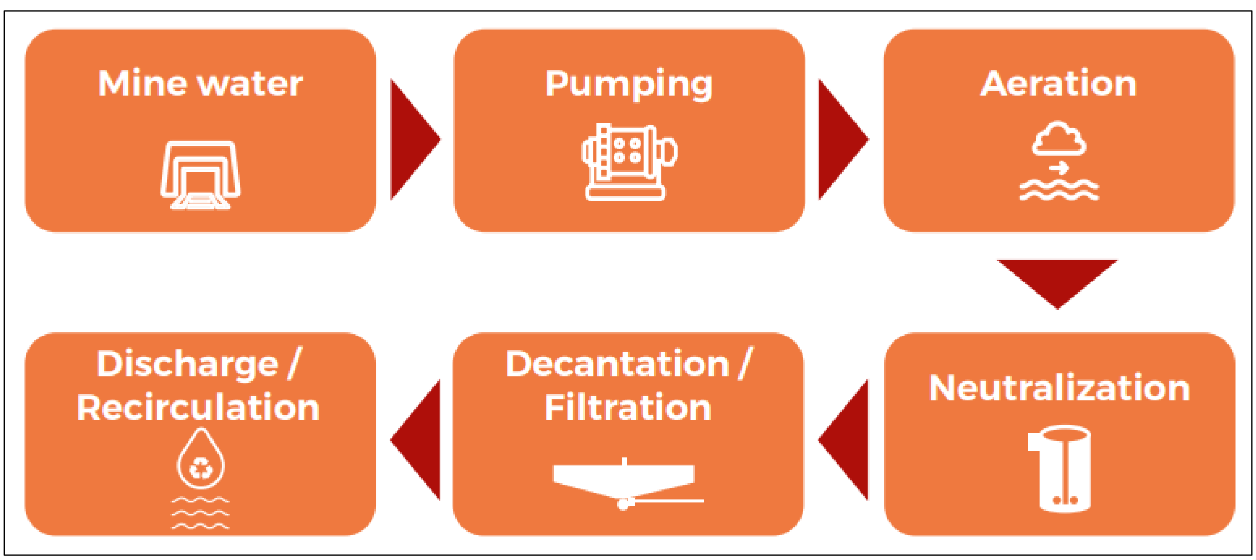
Water management has been identified as the most critical environmental area. Water is a shared resource of high social, environmental, and economic value, which is also a critical component of Santacruz's mining and metallurgical activities. Mining operations are located in the Bolivian Highlands, in areas with low precipitation, high evapotranspiration, and threats of drought.

According to data presented in the "Ecological Threat Register", which ranks countries and watersheds worldwide based on their exposure to water-related risks, Bolivia has a low country risk (10- 20%) of water vulnerability and is not considered a water-stressed country. However, in accordance with the "Aqueduct Water Risk Atlas" by the World Resources Institute, the highland areas where Santacruz operates are considered as Medium Risk (Bolívar) and High Risk (Caballo Blanco and Porco). According to these recognized international public tools, Santacruz deems the care and preservation of water critical aspects of Santacruz's management system and strives to ensure access to water for communities and operational needs.

During the mining production process, water comes into contact with heavy metals, so it must be treated before being use or discharge. Monitoring water quality and quantity and the use of water balance monitoring, Santacruz is able to comply with the criteria required by the Regulations on Water Pollution (RMCH) of Environmental Law No. 1333. Santacruz is also subject to periodic inspections by applicable environmental authorities and community representatives. Water balances for each operation are verified using flow meters and reservoir level bathymetry to ensure accurate and validated information for assessing, proposing, and identifying opportunities for improving water management.

Water Treatment - The underground mining activities produce an excess of water which must be pumped from the mine. This water may contain suspended solids and chemical contaminants (such as pyrite and heavy metals), which would require treatment for reuse of discharge. Water treatment includes the following steps:

Figure 20-3: Water Treatment Process



Source: Sustainability Report, Sinchi Wayra (2022)

Table 20-2: Santacruz Bolivia Water Volumes

Water Sources	Description	2022
Underground Water (m³)	Given the nature of mining operations, the required deposits are located adjacent to underground water sources that are pumped to the surface for mining development and treatment, as it contains high levels of metals and solids. (Produced water)	118,960
Fresh Surface Water (m³)	Fresh surface water is obtained from rivers or springs in the area. We minimize the need for fresh surface or springs. It is used to supply drinking water to the camps or to supplement the operational needs of the concentrating plants.	7,003,987
Rainwater (m³)	Rainwater is the water collected in our tailings ponds, and it is calculated based on rainfall data and the surface area of the pond. This water is added to the water that goes through recirculation.	298,055
Other Sources of Water (m³)	These include small amounts of potable water (third parties) supplied by local municipal operators.	9,032
	Total Extracted Water	**6,697,431**

Notes:

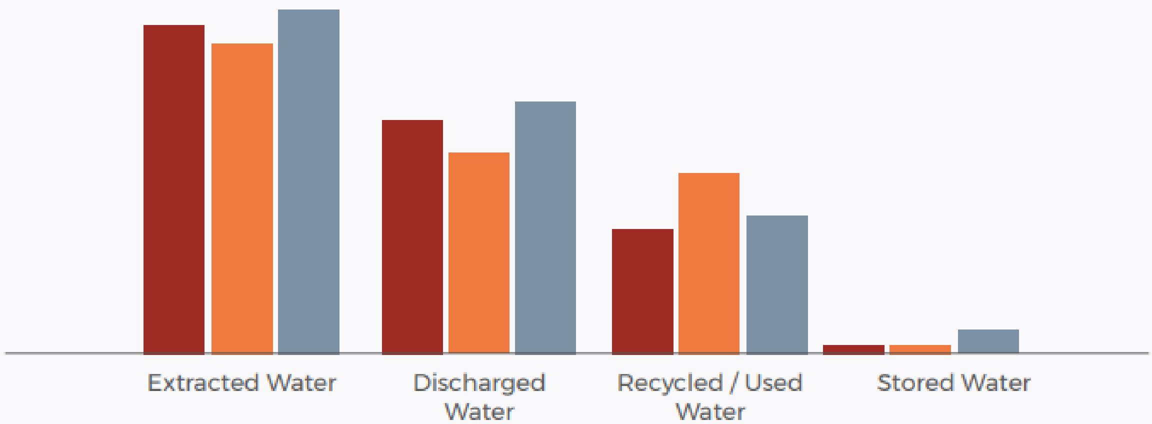
1. Marine water sources are not considered as the country is landlocked.
2. The underground water sources refer to the extraction of produced water, and there is no extraction from other natural underground sources.
3. All extracted waters [fresh surface water, rainwater, other sources water, and even underground (produced) water] are considered freshwater (total dissolved solids ≤ 1000 mg/l).
4. This data is consolidated from all our operations. For detailed information on each operation and water stress zones, please refer to the operation-specific information.

Source: Sustainability Report, Sinchi Wayra (2022)

Operational consumption is used for drilling, mine services, irrigation, and process water sourced by reclaim from the Tailings Dam. The actual water consumption is the difference between "extracted" water and "discharged water", resulting in 1.9 million m³ consumed in 2022 for all mines.

Santacruz treats excess water to meet applicable required standards and discharge it to surface water at authorized points specified in Santacruz's environmental permits. The discharge parameters as set out in Water Pollution Regulations Law No. 1333, include pH, iron, zinc, lead, and suspended solids, which are typical in the water treated from the mine.

Figure 20-4: Santacruz Bolivia Water Balance



	Extracted Water	Discharged Water	Recycled / Used Water	Stored Water
2020	7,178,981	5,131,719	2,701,583	214,464
2021	6,697,431	4,412,548	3,873,349	232,526
2022	7,494,504	5,505,821	3,023,718	530,463

Source: Sustainability Report, Sinchi Wayra (2022)

20.2.1 Solid Waste - Bolivar

Bolivar Mine has one active Tailing storage Facility (Queaqueani) and one inactive (Antiguo). Both are managed in compliance with the guidelines of the Canadian Dam Association (CDA) and the "Global Industry Standard on Tailings Management" issued by the UNEP (United Nations Environment Programme), ICMM (International Council on Mining and Metals), and PRI (Principles for Responsible Investment) in August 2020. This program includes third party Verification Assessments (Dam Safety Assurance Assessment). In response to findings from these assessments, and to mitigate risks of failure, risk management tools have been developed to improve management systems for the active TSF. For the inactive facility, monitoring and maintenance have been improved and follow good practice.

The "Queaqueani" tailings storage facility started operations in April 2007. This facility was designed by Canadian engineering firm AMEC and is located 3.5 km to the north of the operation. Hydraulic tails of 25-29% solids are beached along the upstream side of the dam crest and water is reclaimed from the southwest sector of the reservoir and pumped via HDPE pipelines back to the water treatment plant.

The Queaqueani Dam is a 33.5 m high, downstream-constructed dam. The current crest level is El. 3994.8 m (Stage IV-A raise was completed in December 2019). The next dam raise (Stage IV-B to El. 3997.8 m) is in progress and to be completed in 2023. There exists capacity to contain all tailings to be generated by processing the stated reserves.

Figure 20-5: Volume profile of the Queaqueari Dam by Stage Height

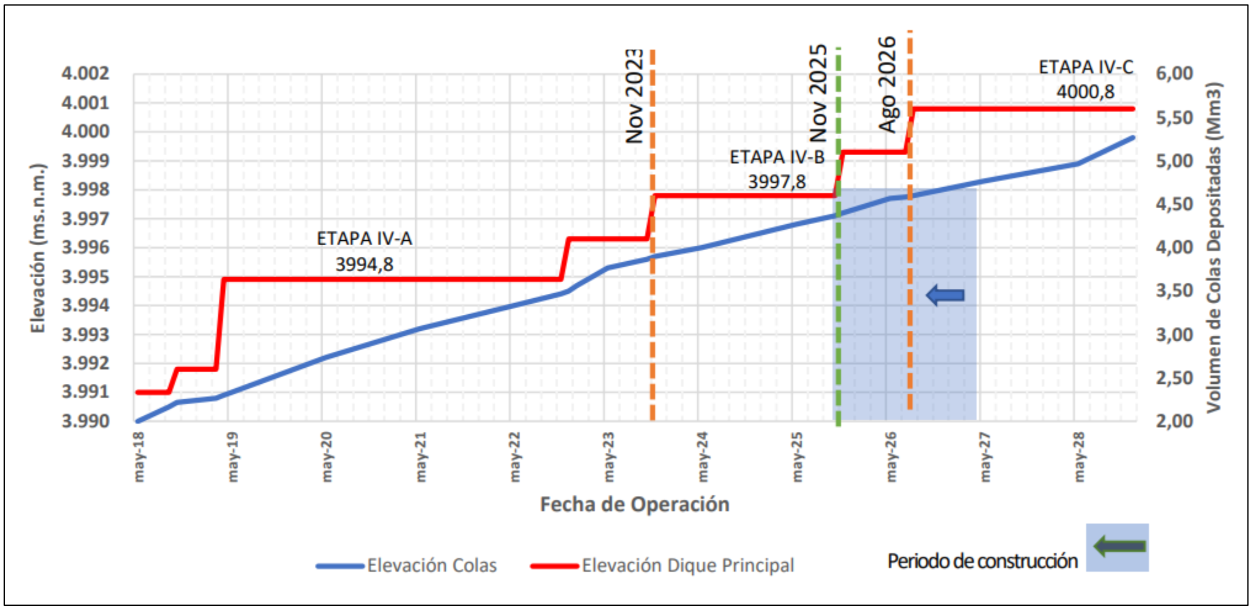


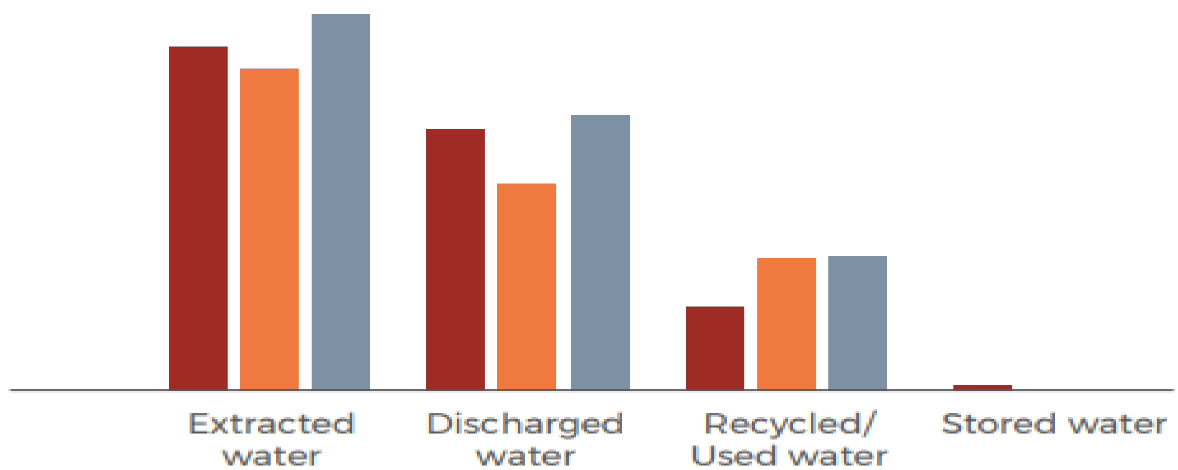
Figure 20-6: Aerial Photography of the Queaqueani TSF

Source: Glencore (2021)

20.2.2 Water Management - Bolivar

Bolivar produces an excess of water from the underground mine. A total of approximately 170 l/s is pumped from the mine and is treated in separate plants for two different uses: one for potable water at the mine and surrounding communities, the other for industrial use in the mine and makeup water for the process plant (much of the water used for processing is reclaimed from the tailing facility). The balance of water is discharged to the Pampitas River.

Figure 20-7: Bolivar Mine Water Balance



	Extracted water	Discharged water	Recycled/ Used water	Stored water
2020	4,228,733	3,195,860	1,050,524	56,311
2021	3,930,941	2,563,528	1,651,280	29,825
2022	4,606,149	3,389,978	1,643,345	19,605

Source: Sustainability Report, Sinchi Wayra (2022)

20.3 Permitting

Santacruz Silver operates the Bolivar Mine as a joint venture with the Bolivian Government (COMIBOL) The structure of the contract with COMIBOL is a "Partnership Contract governing Bolivar and Porco Mines (CA-MBP), and its purpose is to develop and implement a mining operation for the treatment of the existing mineralogical reserves and resources in the Bolívar and Porco Mines, by the exploitation, preparation, beneficiation and sale of mineral concentrates. Contrato de Asociación Sociedad Minera Illapa S.A. is authorized as operator and responsible of executing on behalf of COMIBOL, all the operations and activities of the association contract.

The shares of CA-MBP are 55% for COMIBOL and 45% for Contrato de Asociación Sociedad Minera Illapa S.A." This renewable agreement expires in 2028.

Mining Contracts that grant the right to the subsoil mining resource, is granted by the Mining Administrative Jurisdictional Authority (AJAM) over the ATE mining areas, and a contract is granted for each area or contiguous group of areas. Recent changes to the laws and government personnel have pushed Santacruz contract updates into a transitionary period waiting for final signatures and approvals. Santacruz holds Special Transitory Authorizations for each contract area which are officially designated "Mining Administrative Contracts for Adaptation". As of the effective date, approximately half of the applications have been transitioned, and the remainder fall under Article 187 of Law No. 535 on Mining and Metallurgy, which states:

> *ARTICLE 187. (CONTINUITY OF MINING ACTIVITIES). Holders of Special Transitory Authorizations to be adapted or in the process of adaptation will continue their mining activities, with all the effects of their acquired or pre-constituted rights until the conclusion of the adaptation procedure.*

Santacruz has fully complied with this administrative procedure and is waiting for the Mining Administrative Authority to issue the relevant documents. It should be noted that this public entity has a considerable delay in the issuance of these documents.

Environmental Licenses have been formally granted to allow operation for all mining activity, by the Ministry of Environment and Water. The following table shows the licenses held by Santacruz:

Table 20-3: Environmental Licenses Held by Santacruz

Operation	License
Bolívar	040603-02-da-0324/14
Porco	051203-02-da-0031/14
Caballo Blanco – Colquechaquita Mine	050101-02-da-131/11
Caballo Blanco – Mina Reserva and Tres Amigos	050101-02-da-561/11
Caballo Blanco – Don Diego Concentrator Plant	050302-02-da-003/2024
Caballo Blanco – San Lorenzo Mine	050101-02-da-005/06
Comco	050101-02-da-006/09
Soracaya	050801-02-CD-C3-002/2017
Aroifilla Thermoelectric Plant	050101-04-da-007/2023
Yocalla Hydroelectric Plant	050103-05-da-006/2023

20.4 Community Relations

Santacruz mining projects are mostly well-established operations with a long history and a developed infrastructure, which provide direct benefits to employees and supporting businesses.

However, the mines are located in rural to semirural areas in which the surrounding mostly agricultural communities can benefit from each operation only indirectly or through company outreach. Santacruz supports these communities by addressing services that are lacking, and helping to create value with economic development programs, and other forms of support.

Mining represents a significant portion of the Bolivian economy and is especially critical to local economies through employment, tax revenue and local procurement or supply. The high dependency on mining of areas influenced by Santacruz operations obliges responsible action and support for the health of these communities, as well as its employees and their families. Santacruz is interested in fostering an environment of social peace, respect, and mutual progress. The Social Management team for each operations consists of a dedicated Superintendent along with supporting personnel who ensure the fulfillment of its commitment to the communities.

To be most effective local Social Management groups have established communication channels to learn about the perceptions, concerns, requests, or complaints from within stakeholder communities. The communities can communicate their inquiries, complaints, concerns, and issues through letters addressed to the company, formal meetings, or the Santacruz “Ethics Hotline” channel. The local Social Management team routinely conducts community and area visits inspections and, in the case of a complaint, conducts the necessary verifications. The main channel of communication is through in-person meetings involving community leaders where minutes are recorded. As such, all parties can move cooperatively forward with acceptable initiatives and mitigations.

Prior to action, Santacruz must take into consideration social challenges faced by the country and the communities, as well as each initiative’s possible impacts on the life of people. Its actions are aimed at identifying vulnerable groups and obtaining their participation. It identifies impacts and assess risks associated with each initiative, as well as changes in Santacruz’s operations that may have repercussions on the community.

Table 20-4: Communities and Population Proximal to Santacruz Operations

Operation	Communities	Approximate number of people
Bolívar	9	4,440
Porco	10	15,810
Caballo Blanco	13	5,120

Source: Santacruz (2023)

Common concerns addressed during the meetings with community leaders focus on job opportunities within the company and monitoring medium- to long-term commitments. The change of shareholders that occurred with the Santacruz purchase in March 2022 generated uncertainty in several communities, and a process of communication and meetings was necessary to assure and demonstrate that the company will maintain normal operations and fulfill its commitments to the fullest extent. The major concerns of the proximal communities put forth in 2022 are outlined in Table 20-5.

Table 20-5: Concerns Put Forth by Proximal Communities in 2022

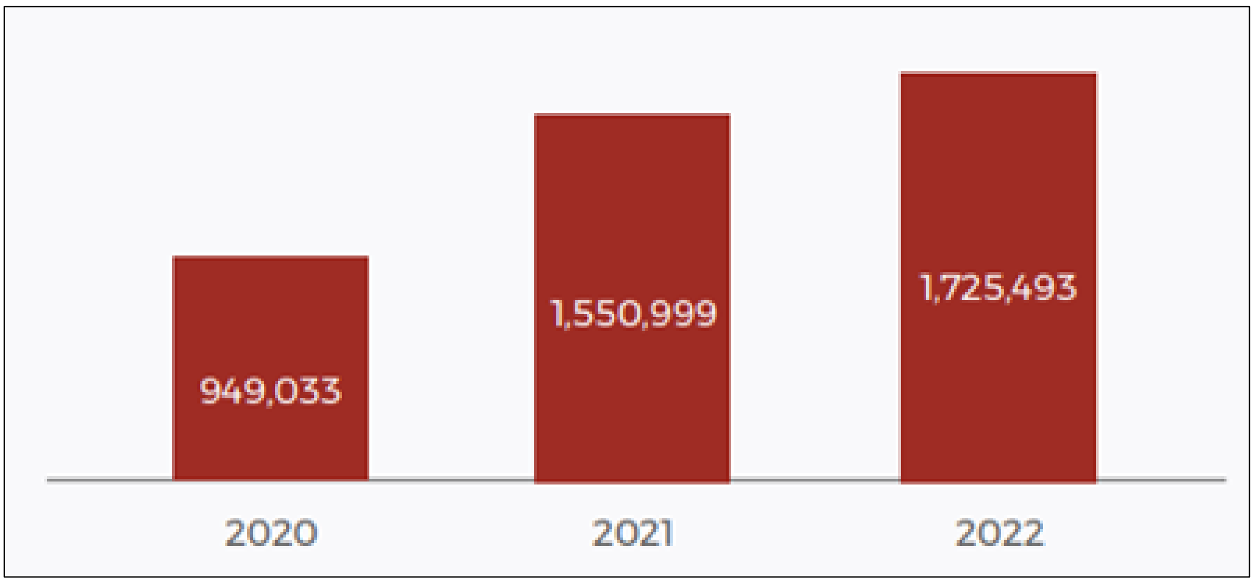
Operation / Month	Community	Concern	Description and Approach to the solution
Porco – September/2022	Porco	Concern about the visual appearance of stagnant rainwater in areas adjacent to the tailings dam	Description and Approach to the solution Diversion works were carried out to prevent the stagnation of rainwater. This action was verified by the indigenous authorities.
Bolívar May/2022	Queaqueani Grande	Community demands for new hires, issues related to water and the environment	Despite several attempts at dialogue initiated by the company, the community carried out a road blockade demanding the closure of the tailings dam in order to draw the attention of regional and national authorities to negotiate community issues with the company. With the mediation of the Governor of Oruro, several meetings were held, which concluded with the signing of an agreement with the community. To this date, direct dialogue has been reestablished with the community to address their demands.
Bolívar April/2022	Charcajara	Concerns regarding the maintenance and replacement of pipelines passing through the community. Request for new job positions and environmental issues.	After nearly 6 months of negotiations, an agreement was signed with the community, establishing a land lease for the passage of the pipelines. A separate agreement was included to address the remaining demands of the community.
Bolívar May/2022	Antequera	Uncertainty regarding the continuity of pending commitments.	Meetings were held with the community to reaffirm the fulfillment of pending commitments, which are currently being carried out. Additionally, a negotiation process was initiated to install an alternative pipeline route that bypasses the community of Charcajara.

Source: Sustainability Report, Sinchi Wayra (2022)

Santacruz's investments focus on donation of assets, goods, products, and in-kind services, minimizing cash disbursements to directly benefit the communities. As part of Santacruz's support, Santacruz has invested over $300,000 in infrastructure, including housing, pedestrian bridges, electrification, water diversion systems for irrigation, and basic sanitation, among other infrastructure projects. As a company, Santacruz encourages the communities to manage and prioritize long-term projects with a greater impact. At all times, and particularly during implementation, the communities are heavily involved in each project.

A rigorous company due diligence policy governs the contributions and investments made to community projects, so that they are made in accordance with the company's values and ethics codes. The process begins with the requests proposed by the communities through their leaders, followed by meetings held between the Community leaders and the company during which, formal agreements are executed, which approve mutually accepted projects to be implemented.

Figure 20-8: Total Investment in Communities



Source: Sustainability Report, Sinchi Wayra (2022)

A key player connected with all Bolivian Mines and surrounding areas are the mining cooperatives which are organized independent mining entities, some quite capable and organized with their own equipment. Recognized by the government as a valid economic activity for local development, they conduct their activities in abandoned mines or expropriating active mines, which can pose risks to business. The relationship is not completely one-sided as the Cooperatives sell mineralized material to process their product, thus mechanisms are in place to face possible subjugations, protect mine employees and the communities.

More importantly, proactive solutions and agreements to avoid conflict and coexist peacefully with the different cooperatives are in place. As much as possible, with cooperatives as toll processors at Santacruz Process Plants, compliance with occupational health and safety, human rights, and good work practice is sought.

To incorporate a new supplier, an assessment is required, including:

- Submission of legal documents proving that they are up to date with regard to any rules in force;
- The mineral supplier's background is verified; for this purpose, we have access to the Thomson Reuters and Info center systems, which report their background globally. This system informs us whether the supplier has any negative local or international background; in that case, Santacruz would not deal with them;
- Commercial visit to the supplier's operations, to directly verify the standards such as the 132 company's Code of Ethics; In particular, whether or not child labor is employed in the operations, and any other Human Rights violations, and observations of the use of safety equipment and personal protective equipment; and
- Machinery is assessed to ensure good condition safe operation.

Once all these steps are completed and upon the in-situ verification of legal documents, the relationship with the cooperative is authorized. A pilot support program was launched in 2019 to supply advisors and technical assistance on environment, human rights, occupational health & safety, and administrative management. The goal being to help mineral suppliers improve their internal systems and processes to ensure sustainability and compliance with Santacruz sustainability standards.

Bolívar has a formal agreement (known as Actas de Reunión) with the neighboring communities. These agreements are recognized and managed by their Ayllus and include different plans and projects to help the communities with their economic development, infrastructure, access to water, education, and health and assist the communities by sponsoring their traditional festivities and sports.

Santacruz's community investment programs are aimed mostly at communities directly influenced by the operations. Community investments are designed to maximize positive impact, recognizing that each community has unique requirements and living conditions; therefore, Santacruz prioritizes based on number of beneficiaries, vulnerability, long-term sustainability, and urgency of need.

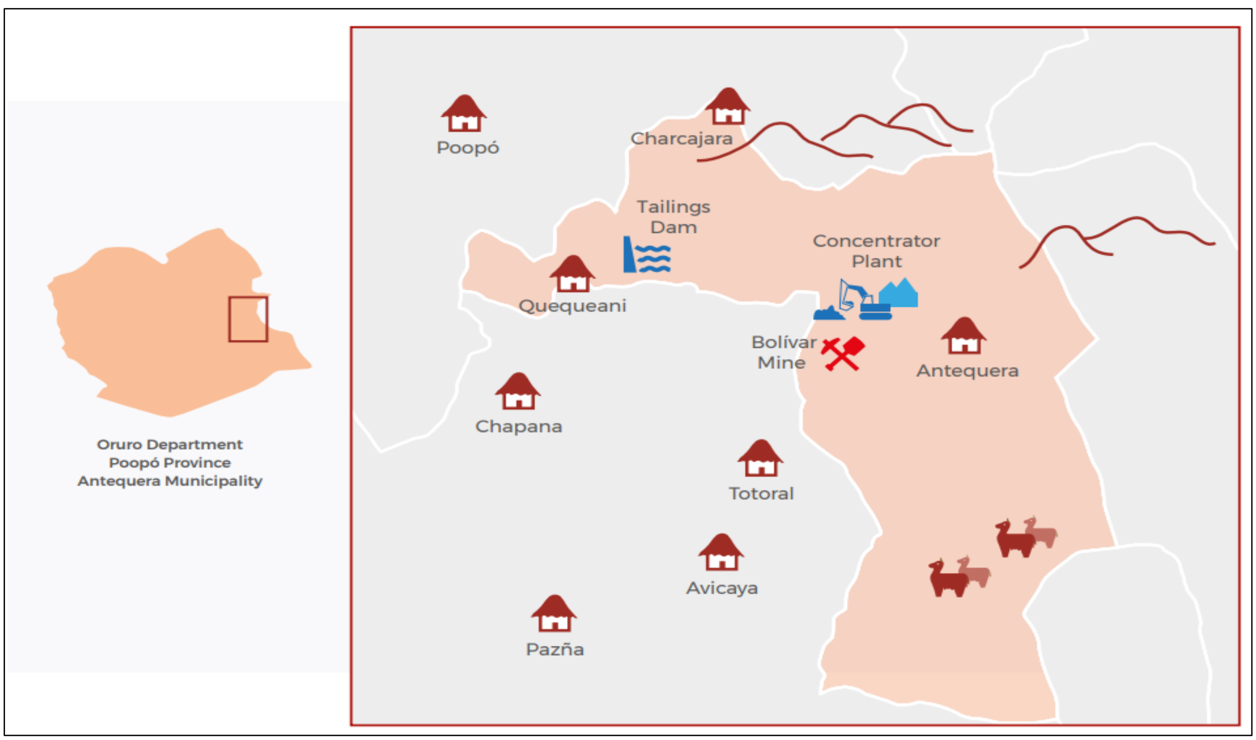
Antequera is the largest community in the area of influence and immediately adjacent to the Bolivar operation. The communities neighboring Bolívar Mine are the homes of Santacruz's workers, contractors and family members. Most of them reside in the population of Antequera, from where they establish their relationship with the operation, which is itself adjacent to town.

Table 20-6: Bolivar Local Populations

Communities	People
Antequera	1,045
Charcajara	96
Queaqueani Grande	184
Totoral Grande	864
Aviacaya	820
Pazña	120
Totoral Chico	100
Poopó	1,100
Chapana	112
Bolívar Total	**4,441**

Source: Sustainability Report, Sinchi Wayra (2022)

Figure 20-9: Bolivar Surrounding Communities



Source: Sustainability Report, Sinchi Wayra (2022)

20.4.1 Education

Santacruz has engaged in the following activities to support education in the region:

- Santacruz continued to manage the Antequera School, dedicated to the education of 456 children and teenagers. This includes the wages of 28 teachers, 1 director, and supporting janitorial and cleaning staff. Santacruz also provide support with materials and equipment, breakfast, payment of utilities, infrastructure maintenance, and sponsorship of socio-cultural and sports activities; and

- Santacruz has established a scholarship program for outstanding students that graduate from its school, supporting their education at universities in the capital cities, covering expenses for meals, accommodation, and participation in activities. One of the purposes is to provide professionals to the community and to the company, as well. In 2022, Santacruz granted 29 scholarships.

20.4.2 Community and Economic Development

Santacruz has encouraged community and economic development in the region following ways:

- Together with families, Santacruz conducted fire extinguisher training courses for 100 people;

- According to our commitment, Santacruz sponsors basic services by renovating 5 houses and providing additional assistance to nearly a hundred families in two communities; and

- Santacruz sponsored productive development by repairing the roofs of five houses and additional assistance to 55 additional families in the community.

20.4.3 Environmental Initiatives

Santacruz has undertaken several environmental initiatives, including the following:

- Santacruz continued with the reforestation program in the vicinity of the Queaqueani tailings dam; and

- Santacruz supported the Water Diversion Project with Antequera, focused on a farming recovery that benefits 200 people.

20.4.4 Local Needs

Santacruz has responded to local needs in several ways including the following:

- Santacruz sponsored various sports and cultural activities in the community, including: a safety management contest, sponsorship of trips for the Sebastián Pagador graduates, cooking courses for housewives, support for the elderly in purchasing groceries, and the anniversary celebration of Antequera.

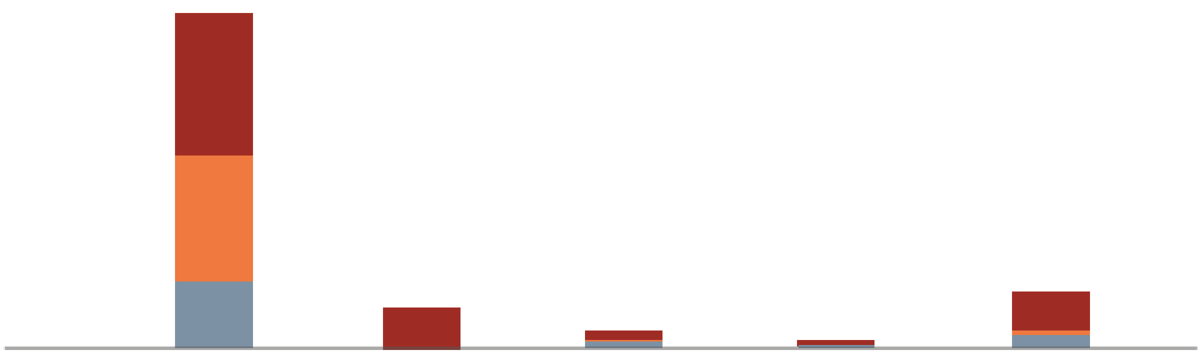
20.4.5 Health and Sports

Santacruz has supported health and sports for the local communities in several ways including:

- Santacruz supported the soccer school by covering the coach's salary and providing transportation for the team to Oruro during championship weekends. The school has 140 students; and

- The fumigation and pest control works were continued in Antequera and the workers campsite.

Figure 20-10: Bolivar Community Investment



	Education	Community/ Economic Development	Environment	Health and Sports	Local Needs
2022	401,069	114,581	23,135	12,119	109,146
2021	348,742	0	10,739	1,491	19,361
2020	183,039	0	12,965	6,997	32,553

Source: Sustainability Report, Sinchi Wayra (2022)

20.5 Mine Closure

Closure Planning for Operations has social, economic, workforce, and environmental impacts, so conceptual closure plans are shared with communities. Santacruz's goal is to recover areas by establishing a healthy ecosystem capable of sustaining productive land use, ensuring the best possible environmental conditions, including physical, chemical, biological, and ecosystem aspects, at closure. Environmental superintendents are responsible for monitoring the environmental closure planning, and periodic reviews of these plans are conducted, including surveys of areas and activities to adjust financial provisions for closure.

Land Use and Rehabilitation - environmental challenges related to biodiversity protection, soil restoration, and land use, are addressed through dialogue with stakeholders, including local communities and relevant authorities. Our comprehensive environmental management focuses on minimizing disturbed areas. In 2022, Santacruz managed a total of 6,600 hectares of land covered by Temporary Special Authorizations (ATEs) granted by the Mining Administrative Jurisdiction Authority (AJAM), under leasing contracts with the Government through COMIBOL. However, Santacruz's processing activities, services, and related infrastructure (industrial area) currently occupy only 400.5 hectares of land, including areas of previous mining operations and other areas with environmental closure located within the properties Santacruz manage.

In 2022, Santacruz continued with the reforestation plan in the Queaqueani Dam area, in accordance with an agreement with the community of the same name, and significant progress was made in the progressive closure of the old tailings facilities at the Don Diego Concentrator Plant.

21 CAPITAL AND OPERATING COSTS

21.1 Capital Costs

The Bolivar Mine has been in continuous operation for many years. There will be, as the reserve is expanded and developed, the need for step changes in mine access, production or haulage methods, which may require large capital outlays. These will be financially justified as needed. However, the capital needs for continued operation to exploit the remaining reserves is limited to Primary mine development, equipment rebuilds and replacements, and Tailing Storage Facility expansions. Average annual capital has been and is projected to be in the 11 to 12 million USD range. It is anticipated that expansion work to the TSF will be required in 2023 (2.5 million).

The historic total capital requirement for all the Bolivian operations is shown in Table 21-1. Bolivar's projected capital requirements for 2023 to 2027 is shown in Table 21-2.

Table 21-1: Actual Combined Capital Requirement for All Bolivian Operations, 2017 to 2022 ($M)

	2017	2018	2019	2020	2021	2022
Bolivar	**8.8**	**13.7**	**13.7**	**6.3**	**11.3**	**10.2**
Porco	3.0	8.8	8.4	3.6	5.3	3.1
Reserva	1.3	2.4	2.1	2.0	4.3	3.5
Tres Amigos	2.1	2.6	1.5	1.8	2.2	3.0
Don Diego	0.9	6.9	1.4	0.9	1.1	1.2
Colquechaquita	1.2	2.0	1.4	1.0	3.0	2.5
La Paz	3.3	0.6	0.3	0.4	0.2	0.7
Soracaya	0.5	2.1	0.2	0.1		
San Lucas	0.8	0.0	0.0	0.1	0.4	
Total	**21.8**	**39.0**	**28.5**	**16.3**	**27.8**	**24.3**

Table 21-2: Projected Capital Requirement for Bolivar Operations, 2023 to 2027 ($M)

	2023	2024	2025	2026	2027
Engineering/Admin	0.0	0.0		0.1	
Safety/Environmental	2.8	0.2	2.6	2.6	0.4
Mobile Equipment/Maintenance	2.7	4.4	4.1	2.7	1.2
Plant	0.6	0.6	0.7	0.7	0.2
Exploration			0.3	0.3	0.4
Primary development	5.1	6.3	6.2	6.3	4.5
Corporate					
Total	**11.3**	**11.5**	**14.0**	**12.6**	**6.7**

Recurring exploration and primary development costs have been included in the COG calculations to better anticipate and account for total costs and make the COG more meaningful for reserve estimation and mine planning.

21.2 Operating Cost Estimate

Costs used for Cut-off Grade analysis were taken from actual costs from 2022.

The actual cost of corporate G&A was allocated to each of the businesses.

Table 21-3: Unit Operating Costs ($/t)

Mine	Unit Cost, $/t
Mine Operations	36.29
Mine Maintenance	28.84
Indirect	22.32
Plant	18.28
Warehouse	0.64
G&A	13.84
Total	**120.22**

Mine operations include direct costs of mining, including labor, energy, materials, and services.

Mine Equipment Maintenance Costs includes maintenance to all equipment related to direct development, exploitation and haulage, as well as service equipment such as pumping, ventilation, winches, etc.

Indirect costs would include Site Management, Technical services, Site Administration, Environmental and Social, Safety and Security.

Plant costs include direct Beneficiation costs as well as plant maintenance, and indirect costs.

Warehouse costs refer to Concentrate handling and storage.

General and Administration includes allocated Bolivian corporate costs.

22 ECONOMIC ANALYSIS

22.1 Result

The Reserve Estimate was generated using actual costs from 2022, including mine operating, concentrate overland transport, port costs, and shipping as well as smelting fees, payment terms, and penalty charges in effect during that period. A simplified Cash flow model was built to model the costs and conditions used to generate the Reserve estimates stated in this report.

The Bolivar Mine is part of a multi-operation business. However, the Economic model treats it as a separate financial entity with Bolivian corporate costs allocated for the analysis. As well, the operation is subject to a partnership with the Bolivian Government (COMIBOL), but the financial modelling examines the value of the operation on a 100% basis to support the Reserve statement.

The Bolivar Mine has been in continuous operation for over 200 years and the deposit is a network of relatively narrow veins. These two aspects drive the normal exploitation process of the mine, where inferred resources are converted and exploited in the same budget year. Resources are generally proven-up by drifting and sampling instead of drilling. Therefor normal budgeting and mine planning includes resources outside of the Reserve estimate.

For the current exercise in this report, only Proven and Probable reserves are included in financial evaluation, so the production schedule represents the depletion of these reserves at average grade and current production rates. The context of the production schedule exploits the Proven and Probable reserves as part of a continuous operation and as such does not include the closure activities.

Table 22-1: Production Forecast – Mining and Processing

	Unit	2023	2024	2025	2026
Mine Production					
Tonnes Mined	(DMT)	317,300	317,300	317,300	285,082
Tonnes Processed	(DMT)	317,300	317,300	317,300	285,082
Head Grades					
Zinc	(%)	9.96	9.96	9.96	9.96
Lead	(%)	1.17	1.17	1.17	1.17
Silver	g/t	273	273	273	273

Metallurgical recoveries and concentrate qualities used in the model are sourced from historic actuals for 2022 based on the head grades actually mined. Projected recoveries are thus estimated to be reasonable, to conservative These parameters will necessarily be conservative considering the higher grades in the production schedule. Metallurgical recoveries and concentrate qualities are actuals based on the head grades actually mined. These parameters will necessarily be conservative considering the higher grades in the production schedule.

Table 22-2: Production Forecast - Concentrate

	Unit	2023	2024	2025	2026
Concentrates					
Zinc (with 0.5% losses)	(DMT)	53,991	53,991	53,991	48,508
Zn Conc. Grade	(%)	53	53	53	53
Ag (in Zinc)	g/t	621	621	621	621
Zn Recovery	(%)	91	91	91	91
Ag (in Zinc)	(%)	39	39	39	39
Lead (with 0.5% losses)	(DMT)	9,559	9,559	9,559	8,588
Pb Conc. Grade	(%)	27	27	27	27
Ag (in lead)	g/t	4,599	4,599	4,599	4,599
Pb Recovery	(%)	70	70	70	70
Ag (in Lead)	(%)	51	51	51	51
Metal Recovery					
Zinc	(FMT)	29,000	29,000	29,000	26,000
Silver (in Zinc)	(FOT)	1,078,000	1,078,000	1,078,000	968,000
Lead	(FMT)	3,000	3,000	3,000	2,000
Silver (in Lead)	(FOT)	1,413,000	1,413,000	1,413,000	1,270,000
Silver (Total)	(FOT)	2,491,000	2,491,000	2,491,000	2,238,000

Notes:
FMT = Fine Metric Tonnes
DMT = Dry Metric Tonnes
FOT = Fine Ounces Troy

That same logic follows to the net revenue generation (Table 22-3) which includes smelter charges and penalty fees.

Table 22-3: Revenue and Cost Projection ($M)

	Unit	2023	2024	2025	2026
Payable Metal Revenue					
Zinc		73	73	73	66
Metallurgical Deduction		11	11	11	10
Gross Payable Zinc		62	62	62	56
Lead		6	6	6	5
Metallurgical Deduction		1	1	1	1
Gross Payable Lead		5	5	5	5
Silver		52	52	52	47
Metallurgical Deduction in Zinc		9.2	9.2	9.2	8.2
Metallurgical Deduction in Lead		1.5	1.5	1.5	1.3
Gross Payable Silver		41.7	42	42	37
Gross Revenue (Total)		109	109	109	98
Smelter Charges and Penalties					
Treatment charges Zn	(USD/t)	277	277	277	277
Treatment charges Zn		15	15	15	14
Treatment charges Pb	(USD/t)	133	133	133	133
Treatment charges Pb		1	1	1	1
Penalties in Zn	(USD/t)	7	7	7	7
Penalties in Zn		0	0	0	0
Penalties in Lead	(USD/t)	13	13	13	13
Penalties in Lead		0	0	0	0
Refining Charges in Pb	(USD/FOZ)	1	1	1	1
Refining Charges in Pb		2	2	2	2
Smelter Fees and Penalties		18	18	18	17
Net Revenue		90	90	90	81
Operating Costs					
Production Costs		34	34	34	30
Cost of Sales					
Rail Freight Zn		6	6	6	5
Rail Freight Pb		1	1	1	1
Port Expenses Zn		2	2	2	2
Port Expenses Pb		0	0	0	0
Rollback Fee Zn		5	5	5	4
Rollback Fee Pb		1	1	1	1
Concentrate Freight and Port Costs		14	14	14	13
Mine Royalty		6	6	6	5

	Unit	2023	2024	2025	2026
Communities and Unions		2	2	2	2
Selling Costs		23	23	23	21
Total Cost of Sales		**57**	**57**	**57**	**51**

The mine royalty shown in Table 22-3 is paid to the state government, comprising 6% for precious metals (silver and gold) and 5% for base metals (zinc and lead).

Depreciation is a product of previous operation and annual capital expenditure incurred for the exploitation of the reserve tonnage. Capital is limited to that required to support mining, processing, and tailing storage for the reserve. Corporate G&A is that part of the in-country costs allocated to the Bolivar Mine.

Table 22-4: Cashflow Projection ($M)

	2023	2024	2025	2026
Income Statement				
Net Revenue	90	90	90	81
Production Costs	(34)	(34)	(34)	(30)
Selling Costs	(23)	(23)	(23)	(21)
Depreciation	(11)	(10)	(9)	(12)
Gross Profit	22	23	24	18
Corporate G&A	(4)	(4)	(4)	(4)
Operating profit	17	19	20	14
EBIT	17	19	20	14
Income Tax Expense (CIT)	(6.5)	(7.0)	(7.4)	(5.1)
Net Gain/(Loss) for the Year	11	12	12	8
Cashflow Statement				
Cash from Operations Activities				
Net Income	11	12	12	8
Depreciation	11	10	9	12
Subtotal	22	22	21	21
Cash from Investing Activities				
Sustaining Capital Expenditure	$(11)	$(12)	$(13)	$-
Subtotal	$(11)	$(12)	$(13)	$-
Cash Balance	(11)	(12)	(13)	-
Beginning	$-	$11	$21	$30

	2023	2024	2025	2026
Change in Cash	$11	$10	$9	$21
Ending	**$11**	**$21**	**$30**	**$51**

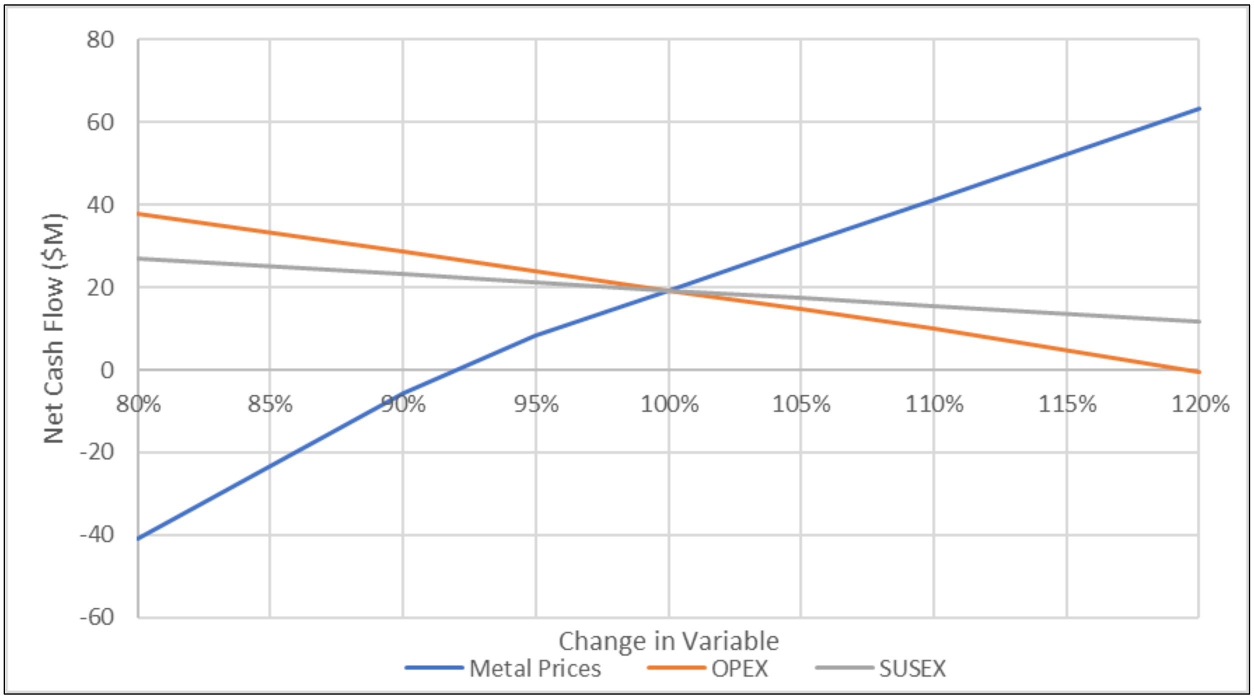
Income Tax is 37.5% of the EBIT. As seen, the operations generate a positive cash flow after tax upon exploitation of the stated reserve at the metal prices used to generate the reserve.

22.2 Sensitivities

A univariate sensitivity analysis was performed to examine which factors most affect the Project economics when acting independently of all other cost and revenue factors. Each variable evaluated was tested using the same percentage range of variation, from -20% to +20%, although some variables may experience significantly larger or smaller percentage fluctuations over the LOM. For instance, the metal prices were evaluated at a ±20% range to the base case, while the capex and all other variables remained constant. This may not be truly representative of market scenarios, as metal prices may not fluctuate in a similar trend. The variables examined in this analysis are those commonly considered in similar studies – their selection for examination does not reflect any particular uncertainty.

Notwithstanding the above noted limitations to the sensitivity analysis, which are common to studies of this sort, the analysis revealed that the Project is most sensitive to metal pricing. The Project showed the least sensitivity to capital costs. Figure 22-1 shows the results of the sensitivity analysis.

Figure 22-1: Univariate Sensitivities



23 ADJACENT PROPERTIES

There are no relevant adjacent properties to the Bolivar Project.

24 OTHER RELEVANT DATA AND INFORMATION

Mining has been ongoing since the effective date of this report through 2023 and into 2024. Total mining in 2023 was 293,083 t at a grade of 228 g/t Ag, 0.68% Pb, and 6.60% Zn, resulting in the production of 1.97 Moz of Ag, 1,461 t of Pb, and 17,523 t of Zn. This production cannot simply be subtracted from the January 1, 2023, resource or reserve estimates contained in this report, however. As described previously, reserves and resources are adjusted as the mining progresses based on development along vein and associated sampling. These adjustments can be significant, and the geologic block model is updated to account for this new information. The operations team at Bolivar uses the considerable modelling tools and methods at their disposal to incorporate these operational updates to guide their mine planning.

The January 1, 2023 Reserves statement is based on a fixed model. However, block model updates are generated for annual budgeting and forecasting. These updates incorporate projected operating costs, updated block grades and NSR factors as applicable.

A significant amount of the 2023 production came from blocks that were not included in the stated January 1, 2023 reserves. The most significant differences were from veins: Pomabamba, Nane, Bolivar, Nueve and Rosario where development and sampling increased the value of previously uneconomic blocks.

However, actual dilution in 2023 for Sub level Stoping was 29.4% vs. 12.5% estimated in the January 1, 2023.

This ongoing estimation process provides a good mine planning guide as well as an accurate empirical tool for reconciliation. A direct reconciliation with the January 1, 2023 Reserve and Resource blocks stated in this report, shows that:

- 49% of the mined mineralized production for 2023 originated from the Proven and Probable reserves;
- 40% of mined mineralized production for 2023 originated from Measured, Indicated, and inferred Resources outside of the reserve base, which were converted into reserves as mining progressed; and
- 11% of mined mineralized production for 2023 originated from stope design dilution, development dilution, and unplanned stope dilution.

This analysis provides a good indication of the reserve drawdown and continuous level of replenishment resulting from normal operations in identified and active mineralized veins.

Details of the 2023 production and economic results are included in Santacruz's MD&A filing.

25 INTERPRETATIONS AND CONCLUSIONS

25.1 Observations

The Bolivar, Porco and Caballo Blanco deposits are located in the central part of the Eastern Cordillera, a thick sequence of Paleozoic marine siliciclastic and argillaceous rocks deposited on the western margin of Gondwana and deformed in a fold-thrust belt. There were two major tectonic cycles in the Paleozoic: The Lower Paleozoic Famatinian cycle (the Tacsarian and Cordilleran cycles of Bolivia), and the Upper Paleozoic Gondwana cycle (Subandean cycle of Bolivia).

The most important ore deposits of the Eastern Cordillera are polymetallic hydrothermal deposits mined principally for Sn, W, Ag and Zn, with sub-product Pb, Cu, Bi, Au and Sb. They are related to stocks, domes and volcanic rocks of Middle and Late Miocene age (22 to 4 Ma). Mineralization occurs in veins, fracture swarms, disseminations and breccias. The deposits of the Eastern Cordillera are epithermal vein and disseminated systems of Au, Ag, Pb, Sb, as that have been telescoped on to higher temperature mesothermal Sn-W veins and, in some cases, porphyry Sn deposits. The telescoping is a characteristic of these deposits and is the result of collapse of the hydrothermal systems, with lower temperature fluids overprinting higher temperature mineralization. The systems show a fluid evolution from a high temperature, low sulphidation state to intermediate sulphidation epithermal and high sulphidation epithermal.

The Bolivar system is a network epigenetic hydrothermal base metal type veins and faults filled mineralization hosted within a variety of lithologies from volcanic tuffs to sedimentary packages. The main mineral assemblages are composed of sphalerite, marmatite, galena, silver-rich galena and silver sulphosalts. The resources are usually based on multiple structures containing several veins. The typical dimensions of these structures are ~500 m in length and ~450 m in depth with mineralization continuing to be open at depth with vein widths of between 0.2 m - 4.0 m.

The Bolivar Mine is an “advanced property” and has been in continuous production since 1993. Glencore and subsequently Santacruz Silver has performed exploration and resource expansion drilling of surface and underground drillholes at the Bolivar Mine since 2000 totalling 49,173.5 m. The 145 drillholes and 23,059 underground channels in the database were supplied in electronic format by Santacruz. This included collars, downhole surveys, lithology data and assay data (i.e., Ag g/t, Pb%, Zn%, Fe%, Sn%).

Verification of the Bolivar drillhole and underground sample assay database was primarily focused on silver, lead and zinc in addition to iron, arsenic, sulphur and tin. Sample databases were supplied in Excel™ format and in LeapFrog™. Checks against source data and assay certificates showed agreement. Statistical analyses used to investigate and identify errors were performed and resulted in minor issues. These have been corrected and it is recommended that a continued program of random “spot checking” the database against assay certificates be employed.

During the 2023 site visit, an extensive independent sampling verification plan was implemented with a total of 80 samples collected across from the Bolivar, Porco and Caballo Blanco operations. The Don Diego laboratory is an NB/ISO/IEC 17025:2018 accredited laboratory which performs all assay analyses for the mining and processing operations for Sinchi Wayra including Bolivar. The Don Diego laboratory in owned and operated by the Issuer, Santacruz.

Results of the verification samples indicates that the regression predictions perfectly fit the data meaning that the check sampling program successfully verified and validated the data and although, these results are not a complete audit of the laboratory, they do verify that the assay results are suitable for resource estimation purposes.

The geological and lithological solid domain models were supplied by Santacruz in both Datamine™ and LeapFrog™ which are both industry-leading software systems. The QP imported the multiple vein domains into a similar system called MineSight™ to verify solids volumes and ensure matching of the solids domains against the drillhole and sample database. Results confirmed location and extent of volumes are appropriate to resource estimation purposes.

Resource block models were supplied in Datamine™ format which is an industry recognized software system used for resource estimation. These models were then imported to MineSight™ for verification of the resource estimation. In addition, independent estimations were run using the verified sample data and vein domains employing inverse distance estimations to ensure reasonableness and verify the resources independently. Results illustrated good agreement between the original and verification models. Verification of the SG regression analysis was also performed by comparing measured versus calculated density values.

The mineral resources were estimated in conformity with CIM's "Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines" (December 2019) and are reported in accordance with NI 43-101 guidelines.

Using a cut-off grade of 10.6% ZnEq, the Bolivar Mine resources are presented in Table 25-1.

Table 25-1: Base-Case Total Mineral Resources at 10.6% ZnEq Cut-off

Total Bolivar 2023 Mineral Resources					
Mine	**Category**	**Tonnes ('000)**	**Zn (%)**	**Pb (%)**	**Ag (g/t)**
Bolivar	Measured	855	12.78	1.37	327
	Indicated	677	12.24	1.25	295
	Total M+I	**1,532**	**12.54**	**1.32**	**313**
	Inferred	**4,202**	**10.35**	**1.00**	**403**

Notes:

1) The current Resource Estimate was prepared by Garth Kirkham, P.Geo., of Kirkham Geosystems Ltd.;

2) All mineral resources have been estimated in accordance with CIM definitions, as required under NI 43-101;

3) The Mineral Resource Estimate was prepared using a 10.6% zinc equivalent cut-off grade. Cut-off grades were derived from $25.20/oz silver, $1.38/lb zinc and $1.20/lb lead, and process recoveries of 91% for zinc, 70% for lead, and 89.7% for silver. This cut-off grade was based on current smelter agreements and total OPEX costs of $120.22/t based on 2022 actual costs plus capital costs of $48.68/t, with process recoveries of 91.0% for zinc, 70.0% for lead, and 89.7% for silver. All prices are stated in $USD;

4) An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration; and

5) Mineral resources are not mineral reserves until they have demonstrated economic viability. Mineral resource estimates do not account for a resource's mineability, selectivity, mining loss, or dilution. All figures are rounded to reflect the relative accuracy of the estimate and therefore numbers may not appear to add precisely.

The QPs found that Bolivar is a well-managed operation that should be capable of sustaining profitable operations for many years to come in the same fashion as it has operated for the past several years.

The reserves were found to be estimated correctly using industry-standard techniques and procedures and industry-standard software by diligent and competent professionals.

The mine has an ample provision of skilled workers and reasonably good quality mining equipment. Typical and reasonable ore control systems were in place, but it is possible that the results could be improved with a closer attention to appropriate mining widths, minimizing them wherever possible to minimize dilution.

The mill facility at the Bolivar Mine is well run and the feed and mill operation are well understood by the technical group. The mill equipment appeared to be well maintained during the site visit in 2021.

25.2 Risks

The Bolivar Mine is subject to all of the risks normally associated with an operating mine, and some unique to its situation. These include:

- The current political and socio-economic climate in Bolivia poses risks and uncertainties that could delay or even stop development as reported within the Fraser Institute Annual Report 2022 where Bolivia ranks very low in many non-technical metrics. Bolivia has been ranked consistently low for the past five years and ranks in the lower quartile on all metrics that gauge risk and uncertainty. It is difficult to gauge or qualify the level or extents of the risks however, all companies working in Bolivia must continue to be aware of the potential risks and develop mitigation strategies. A significant risk related to the Santacruz Bolivian mineral assets and in particular the mineral resources and mineral reserves is the significant artisanal activity that continues to exist. This activity is not only a socio-economic risk but also affects access to resources and reserves along with potential sterilization of mineral resources;

- Geological interpretations may be subjective and may result in the location and extent of some of the mineralized structure although as the Bolivar Mine is comprised of well constrained veins, this risk is minimal;

- As vein thicknesses are narrow, resources may be sensitive to dilution although the relative high grades that exist at the Bolivar Mine are successful at mitigating such risks to date;

- Varying resource classification methods and criteria may vary as more data is considered;

- There is no guarantee that further drilling will result in additional resources or increased classification;

- Lower commodity prices could change size and grade of the potential targets;
- Further work may disprove previous models and therefore result in condemnation of targets and potential negative economic outcomes;
- Ability to replace mined reserves on an annual basis; and
- Maintenance of permits.

As the mines continues to expand to depth, the following aspects of mine operations will be challenged:

- Worker travel time (reduced time at the face);
- Dewatering inflow quantities, infrastructure and costs. The Central Mine already experiences large seasonal influxes of water, that sometimes affect production. This problem will be exacerbated by continued mining to depth;
- Ventilation system needs and costs; and
- Materials handling.

As is shown on Figure 22-1, the greatest risk to the economic results in this study is from changes to metal prices.

The operation of the mining cooperatives poses a risk to functionality of the Bolivar Operation. To date, Santacruz has been careful to culture a peaceful coexistence with the cooperatives and they have not operated in the core areas that Bolivar conducts it mining operations. There is always a risk of this changing, and that their activities will escalate or relocate to more impactful areas.

25.3 Opportunities

Project opportunities include:

- A systematic exploration program could provide an excellent opportunity for successfully uncovering new discoveries;
- An increased understanding and derivation of alternative theories may result in further discovery and expansion for the Project;
- A hydrogeological study could help the operation to better characterize and understand water inflows, aiding design work and planning to reduce the impact of major seasonal inflows;
- Higher commodity prices will change size and grade of the potential targets; and
- Potential for expansion and classification upgrade of resources as mining activities progress.

The primary opportunity to the mine is to improve the grade to the mill by incorporating a mine dilution control program. As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins, which must be kept at minimum to accommodate equipment widths. Often, however, veins are over-mined to ensure complete recovery of the ore. This practice significantly increases dilution due to overbreak of the hangingwall and footwall.

26 RECOMMENDATIONS

To advance the Bolivar Mine and further evaluate the potential additional veins and increase resources thereby displacing depletion due to ongoing mining activities, the following is recommended:

- Regional exploration for identification of new veins;
- Incorporate structural interpretations to assist regional understanding;
- QA/QC program review and improvement;
- Investigate source of anomalous lead values experienced with the field blanks;
- Incorporation of externally certified blanks and standards into the QA/QC program;
- Insertion of QA/QC samples throughout at a rate of 1 in 20 for blanks, standards and duplicates;
- Analysis of thickness and grade-thickness profiles for resource targeting and predictive dilution study;
- Investigate geo-metallurgical characteristics;
- Hydrogeological study and modelling should be done to better understand water inflows and minimize their impact on production;
- Extensive surface drilling for near surface targets along with underground drilling for resource delineation and extension; and
- Tracking of Cooperativa progress to mitigate safety and resource risk.

As is typical with all narrow width mining, dilution is very sensitive to the mined widths of veins. Often veins are over-mined to ensure complete recovery, but this practice comes with significantly increased dilution due to overbreak of the hangingwall and footwall. The operation should conduct a thorough test stoping experiment to ensure the most economic balance between incomplete recovery and excessive dilution.

Underground operations that use three x 8 hour shifts typically lose much worker productivity due to excessive travel and break time over such a short shift. The current operation has an effective time of 5.5 hours per worker on an 8-hour shift. Consideration should be given to testing a longer shift, say a schedule of 4 x 10 hours per week with three days off. With the same 2.5 hours of travel and break time, the effective time would increase to 7.5 hours per shift, resulting in an increase from 68% to 75% shift effectiveness or actual working time. The workers are apt to find that the longer days are harder, but that the three days off provide more rest on the balance of the week.

The mill facility at Bolivar receives two significantly different types of feed (company mined feed and toll feed) from the same deposit. The toll feed has a lower concentrate grade due to higher amounts of pyrrhotite in the feed. A geometallurgical testwork program should be run to determine if there are any additional domains that have not been recognized and to determine recoveries associated with those domains. This will improve overall recoveries as well as provide more information to the mining group when determining the value of mineralized blocks to be mined.

These recommendations have not been costed, as they represent changes to current practices that can be funded by existing operating budgets.

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28 UNITS OF MEASURE, ABBREVIATIONS, ACRONYMS, AND GLOSSARY OF SPANISH TERMS

Symbol / Abbreviation	Description
°	degree
$	United States Dollars
$M	One Million United States Dollars
°C	degrees Celsius
µm	micrometres
3D	three-dimensions
a	annum (year)
ACAD	AutoCAD™, a commercially produced design software by Autodesk
Ag	silver
amsl	above mean sea level
Au	gold
Bi	bismuth
Ca	calcium
CAPEX	Capital expense
cfm	cubic feet per minute
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
CIBC	Canadian Imperial Bank of Commerce
CIT	Corporate income tax
COMIBOL	Bolivian Government owned mining company; joint venture partner to Santacruz through the Illapa JV
CQA	Quality Assurance (for tailings disposal)
CQC	Quality control management (for tailings disposal)
Cu	copper
CV	Coefficient of Variation
DAA	Declaration of Environmental Adequacy
DMT	Dry metric tonnes
E	East
EBIT	Earnings before interest and taxes
EIA	Environmental Impact Assessment
ENDE	National Electricity Company (Bolivia)

Symbol / Abbreviation	Description
ft^3	cubic foot
g	gram
G&A	general and administrative
g/t	grams per tonne
hp	horsepower
HSEC	health, safety, environment and community
IDW	Inverse distance weighting
JDS	JDS Energy & Mining Inc.
JORC	Australasian Joint Ore Reserves Committee
JV	Joint venture
kg	kilogram
km	kilometre
km/h	kilometres per hour
kPa	kilopascal
kt	kilotonne
kV	kilovolt
kVA	kilovolt-ampere
kW	kilowatt
L	litre
L/min	litres per minute
L/s	litres per second
LOM	life of mine
m	metre
M	million
Ma	million years
masl	metres above sea level
mm	millimetre
Mm^3	Millions of cubic metres
MPa	megapascal
Mt	million metric tonnes
MW	megawatt
N	north
NI 43-101	National Instrument 43-101
NSR	net smelter return
OPEX	Operating cost
oz	troy ounce
OK	Ordinary kriging

Symbol / Abbreviation	Description
P.Eng.	Professional engineer (a Canadian designation)
P.Geo.	Professional Geologist (a Canadian designation)
Pb	lead
ppm	parts per million
PVC	Polymerization of vinyl chloride (a plastic)
QA/QC	quality assurance/quality control
QP	qualified person
RMR	rock mass rating
S	South
SAG	Semi-autogenous grinding
SAMREC	South African Code for the Reporting of Exploration Results
Sb	Antimony
SDG	Sustainable development goals
SG	specific gravity
Sn	selenium
t	metric tonne
t/d	tonnes per day
t/m^3	Tonnes per cubic metre
TSF	tailings storage facility
UTM	universal transverse mercator
V	volt
W	west
Zn	zinc
ZnEq	Zinc equivalent (other payable metal values have been converted to the same value of zinc metal)

Glossary	
Spanish Term	**English Translation**
1er	primary
2do	secondary
Acceso	Sublevel access
Aire limpio	Fresh air
Aire viciado	Exhaust
Altura de banco	Bench height
Ancho	Width

Glossary	
Spanish Term	**English Translation**
Ángulo	Dip
Bomba estacionaria	Stationary pump
Bomba sumergible	Submersible pump
Bombeo	pumping
Buzon	Ore bin
Cara libre	Free face
Chimenea	Raise
Chimenea de ventilacion	Ventilation raise
Circuito	circuit
Desarollos	Development
Dique de colas	TSF
Direccion de tumbe	Ore mining direction
Etapa	Stage
Exploración	Exploration
Filtracion	filtration
Flotacion	flotation
Flujograma	Flowsheet
Galería	Drift (gallery), classified as Superior (main) and Inferior (secondary)
Ingeniera	Engineering
Ingreso rampa	Portal
Mantenimiento	Maintenance
Media ambiente	environment
Mina	mine
Nivel	Level
Perforación	drilling
Planta Concentradora	Processing Plant
Plomo	lead
Puente	Pillar
Red de bombeo	Pumping system
Relleno	Backfill
Seccion longitudinal	Long section
Seccion transversal	Cross section
Seguridad	Security
Sistema	System

Glossary	
Spanish Term	**English Translation**
Subnivel	Sublevel
Subnivel de relleno	Backfill drift
Taladros	Drillholes
Taza de bombeo	Water storage pond
Ventilador	Fan
Veta	Vein
Zonas explotadas	Mined zones