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Preliminary Economic Assessment

Proyecto Riotinto | Riotinto District
Huelva Province, Spain

EFFECTIVE DATE: October 31, 2022
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ACRONYMS/ABBREVIATIONS

Acronym/Abbreviation	Definition
µm	Micron
3D	Three dimensional
cm	Centimeter
G	Gram
g/t	Grams/tonne
h	Hour
ha	Hectare
IDP	Inverse distance power
in	Inch
IRR	Internal rate of return
kg	Kilogram
km	Kilometer
kt	Thousand tonnes
KV	Kilovolt
KW	Kilowatt
kWh	Kilowatt-hour
LOM	Life of mine
lb	Pounds
m	Meter
M	Million
mm	Millimeters
mRL	Meters reduced level
Mt	Million tonnes
Mtpa	Million tonnes per year
MW	Megawatt
NN	Nearest neighbor
PRT	Proyecto Riotinto (the Riotinto Project)
NPV	Net present value
NSR	Net smelter return
PEA	Preliminary Economic Assessment
PRT	Proyecto Riotinto
QA/QC	Quality assurance/quality control
QP	Qualified Person
ROM	Run of mine
t/m^3	Tonnes per cubic meter
t	Tonnes
VMS	Volcanic Massive Sulfide

1. SUMMARY

Tetra Tech was retained by Atalaya Mining Plc (Atalaya) to develop a Preliminary Economic Assessment (PEA) of the Cerro Colorado, San Dionisio, and San Antonio Deposits, collectively known as Proyecto Riotinto (PRT or the Project), in Huelva Province, Spain. Tetra Tech has prepared this report using the Canadian National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101) guidelines. This report is prepared by Tetra Tech for Atalaya dated February 21, 2023, with effective date of October 31, 2022.

This PEA incorporates project information developed by Atalaya and their consultants.

1.1 Location and Property Description

The Riotinto Copper Project (Proyecto Riotinto or PRT) is located approximately 65 km northwest of Seville and 70 km northeast of the Huelva port between the municipalities of Minas de Riotinto, Nerva, and El Campillo in the Huelva Province of Spain. The Riotinto Copper Project's coordinates using the UTM ETRS89 coordinate system are 708,000 to 718,000 East and 416,900 to 417,900 North, as shown in **Figure 1-1**.

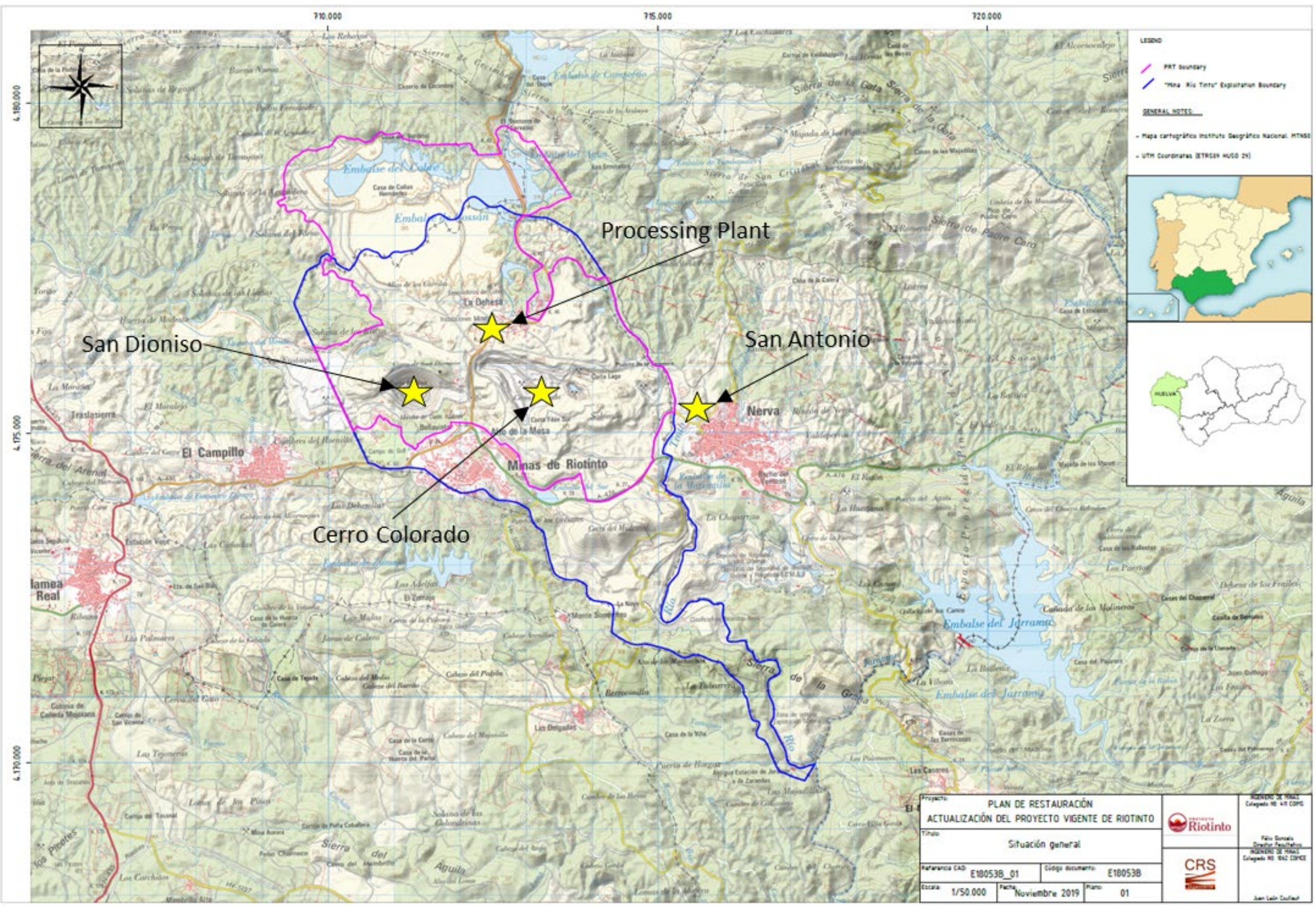


Figure 1-1: Location and overview of the Riotinto Copper Project (modified from CRS Ingeniería 2019)

1.2 Geology and Mineralization

Mineralization is typical of the VMS deposits and occurs as three different types of mineralization: sulfide stockworks in the volcanic rocks, massive sulfide orebodies, generally, on top of the stockwork zones and/or intercalated with rocks of the transition series, and weathering products of the mentioned primary mineralization types which are represented by gossans and secondary enrichment zones.

1.3 Exploration, Sampling, and QA/QC

Exploration at the project includes Geological mapping and exploration drilling. A combined 2,649 holes have been drilled at the Project to date.

Current sample preparation, analyses, and security procedures followed by Atalaya staff meet industry best practice standards and are sufficient to support the estimation of Resources for a study of this level. Previous quality control procedures and results have been reviewed by previous authors it was concluded the data was sufficient to support estimation of Resources for a study of this level. Classification of the Resources considers the confidence in the historical data.

1.4 Mineral Processing and Metallurgical Testing

Historic information from 1995 to 2001 were used to generate information to develop the design criteria and startup plan for the current operation. Metallurgical testwork results and current plant performance indicate that Riotinto mineralized material is amenable to conventional crushing, grinding, froth flotation, dewatering, and filtering processes. The mineralized material for the current operation is mined from 5 different zones with different but acceptable metallurgical performance variability when processing it with conventional flotation machines and Isopropyl Ethyl thiocarbamate (IPETC)-based chemistry at basic pH of over 10.5. The optimum target P_{80} in the flotation feed has been set to 175-200 microns as a compromise between copper recovery and throughput.

Mineralized material from future Resources will contain polymetallics, primarily lead and zinc, as well as copper. Historical and recent preliminary polymetallic testwork has focused on maximizing both the metal recovery and concentrate grade. These data indicate that a finer liberation size as well as selective flotation techniques are required to achieve economic recoveries.

1.5 Mineral Resource Estimation

Resource estimations were estimated for Proyecto Riotinto. Block models were created for the Cerro Colorado, San Dionisio, and San Antonio deposits in Datamine Studio software by Alan C. Noble, P.E. of Ore Reserves Engineering, Lakewood, CO USA, and by Mónica Barrero Bouza, EurGeol, and verified by Tetra Tech's Qualified persons for this PEA. Estimation of the block models was done using Inverse Distance methods, with nearest neighbor methods being used for refinement of populations determinations and verification of the models. **Table** 1-1**, Table 1-2, Table 1-3,** and **Table 1-4** show the Resource estimates for each deposit at the Project.

Table 1-1: Mineral Resource Estimate for the Cerro Colorado Open Pit

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	0.14	132,699	0.36	0.15	0.03	1,053,170	438,821	87,764
Indicated	0.14	43,203	0.38	0.14	0.03	361,930	133,343	28,573
Measured + Indicated	0.14	175,901	0.37	0.15	0.03	1,434,831	581,688	116,338
Inferred	0.14	4,074	0.4	0.15	0.03	35,924	13,472	2,694

Resource estimate effective December 2020, with mined material removed through October 31, 2022

Table 1-2: Mineral Resource Estimate for San Dionisio for Open Pit

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
STOCKWORK RESOURCE								
Measured	0.14	28,118	0.76	0.27	0.06	471,116	167,370	37,193
Indicated	0.14	2,115	0.63	0.18	0.04	29,375	8,393	1,865
Measured + Indicated	0.14	30,233	0.75	0.27	0.06	499,888	179,960	39,991
Inferred	0.14	443	0.91	0.19	0.03	8,887	1,856	293
POLYMETALLIC RESOURCE								
Measured	0.14	22,699	1.12	2.11	0.40	560,473	1,055,891	200,169
Indicated	0.14	4,461	0.73	1.85	0.49	71,793	181,942	48,190
Measured + Indicated	0.14	27,161	1.06	2.07	0.41	634,719	1,239,498	245,504
Inferred	0.14	429	0.62	0.91	0.43	5,864	8,607	4,067
TOTAL RESOURCE								
Measured	0.14	50,817	0.92	1.09	0.21	1,030,687	1,221,140	235,265
Indicated	0.14	6,576	0.70	1.31	0.35	101,482	189,917	50,741
Measured + Indicated	0.14	57,393	0.89	1.12	0.23	1,126,105	1,417,120	291,016
Inferred	0.14	872	0.77	0.54	0.23	14,803	10,038	4,422

Table 1-3: Mineral Resource Estimate for San Dionisio for Underground

Classification	Cutoff $/tonne	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	35	0	0			0	0	0
Indicated	35	0	0			0	0	0
Measured + Indicated	35	0	0			0	0	0
Inferred	35	12,388	1.01	2.54	0.62	275,837	693,689	169,326

Table 1-4: Mineral Resource Estimate for San Antonio Underground

Classification	Cutoff $/tonne	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	35	0	0			0	0	0
Indicated	35	0	0			0	0	0
Measured + Indicated	35	0	0			0	0	0
Inferred	35	11,776	1.32	1.79	0.99	342,690	464,709	257,018

1.6 Mining Methods

Mining has historically been completed through open pit and underground methods. The Cerro Colorado deposit will continue to be mined using open pit methods. The historic open pit for San Dionisio will be expanded, before continuing underground. Mining at the San Antonio deposit has been completed through underground methods in the past and will continue to be mined with underground methods. Underground mining is planned to be completed by underground sublevel stoping methods, with delayed backfill.

1.7 Recovery Methods

The Riotinto concentrator processes copper sulfide mineralized material using conventional froth flotation to produce a copper concentrate. The plant employs a combination of existing equipment associated with the historical operations as well as expanded and upgraded facilities.

Relatively coarse primary and secondary grinding, at a P_{80} of approximately 160–220 µm, is used to float the minerals containing chalcopyrite and pyrite to produce a rougher concentrate. This concentrate must then be re-ground to a relatively fine grain size of around 40 to 20 µm to increase the concentrate grade.

Since refurbishment and re-commissioning in June 2015 (Phase 1), the process was upgraded and successfully expanded to 9.5 Mtpa (Phase 2) and is currently operating at above 15 Mtpa.

1.8 Infrastructure

The Project is currently operating and has established infrastructure. The property is well connected for road transportation via a high-quality national road system that was recently renovated. The site is located 75 km from the port and the industrial port city of Huelva, and 88 km from the regional capital, Seville.

The main incoming electrical substation has a 132 kV capacity on the incoming high-voltage side and 6.3 kV and 20 kV on the outgoing low-voltage side. The substation was fully reconditioned and updated as part of previous development programs. A 50 MW solar farm is currently under construction at the site and is planned to provide approximately 22% of the site’s electricity needs.

Process water is supplied from Gossan Dam and from Aguzadera. Freshwater is supplied from the Campofrío, Aguas Limpias, and Odiel reservoirs.

1.9 Market Studies and Contracts

Detailed market studies for the concentrates produced from San Dionisio and San Antonio have not been undertaken. Atalaya is currently selling copper concentrates from the nearby Cerro Colorado mine on the open market as well as to other companies according to market standard offtake agreements. It is expected that similar agreements will be negotiated for the sale of the zinc and lead concentrates produced from the polymetallic mineralized material at San Dionisio and San Antonio.

1.10 Environmental Permitting

Atalaya is committed to conducting its mining operation on a sustainable basis, with maximum prevention of any negative environmental, social, or cultural impact, which is reflected in the Environmental Policy approved for Proyecto Riotinto. The principles of this Policy include compliance with applicable environmental legislation and regulations, as well as other environmental commitments to which the Company subscribes. The policy was updated in 2021 to include a commitment to fight climate change and integrate resilience and adaptation as part of continuous improvement.

1.11 Capital and Operating Costs

Capital cost expenditures for the LOM are estimated to be $566 million as shown in **Table 1-5**. A contingency of 15% has been applied to all capital costs.

Table 1-5: Proyecto Riotinto Capital Cost Summary ($000s)

Capital Costs	LOM Total ($M)
Mine Equipment	0
Mine Development	204
Process Plant	92
Closure	32
Sustaining Capital	71
Other Surface Infrastructure	93
Contingency	74
Total	**566**

Operating costs will average $17.88/tonne-milled over the LOM as shown in **Table 1-6**. A contingency of 5% has been applied to all operating costs.

Table 1-6: Proyecto Riotinto Operating Cost Summary

Item	Total LOM ($000s)	Unit Cost ($/t-milled)
Mining Costs	1,875	7.77
Processing Costs	1,962	8.12
G&A	275	1.14
Contingency	206	0.85
Total	**4,318**	**17.88**

1.12 Economic Analysis

Results of the economic model are presented in **Table 1-7** below. Over the LOM, the Project is projected to return an after-tax $NPV_{10\%}$ of $915M.

Table 1-7: Economic Analysis Summary

Item	Units	Value
Stockwork Tonnes Processed	kt	195,890
Grade Cu	%	0.42
Polymetallic Tonnes Processed	kt	45,601
Grade Cu	%	0.98
Grade Zn	%	1.69
Grade Pb	%	0.45
Cu Recovered to Concentrate	Mlbs	2,213
Zn Recovered to Concentrate	Mlbs	1,267
Pb Recovered to Concentrate	Mlbs	168
Average Recovery - Cu	%	79.0
Average Recovery - Zn	%	74.7
Average Recovery - Pb	%	37.0
Cu Produced - Payable	Mlbs	2,118
Zn Produced - Payable	Mlbs	1,077
Pb Produced - Payable	Mlbs	160
Gross Revenues	**US$ M**	**8,855**
TCs, RCs, and Freight	US$ M	(1,361)
Net Revenue	**US$ M**	**7,494**
Operating Costs		
Mining Costs	US$ M	(1,875)
Processing Costs	US$ M	(1,962)
G&A	US$ M	(275)
Contingency	US$ M	(206)
Total Operating Costs	**US$ M**	**(4,318)**
EBITDTA	**US$ M**	**3,176**
Change in Working Capital	US$ M	(50)
Cash Costs		
Cash Costs[1]	US$/lb-Cu	2.00
Cash Costs + Sustaining[1]	US$/lb-Cu	2.03

Item	Units	Value
Capital Costs		
Mine Equipment	US$ M	-
Mine Development	US$ M	(204)
Plant Capital	US$ M	(92)
Other Capex	US$ M	-
Closure	US$ M	(32)
Sustaining Capital	US$ M	(71)
Surface Infrastructure	US$ M	(93)
Contingency	US$ M	(74)
Total Capital Costs	**US$ M**	**(566)**
Pre-tax Cash Flow	**US$ M**	**2,561**
Income Tax	**US$ M**	**(408)**
After-tax Cash Flow	**US$ M**	**2,152**
Pre-tax $NPV_{10\%}$	**US$ M**	**1,105**
After-tax $NPV_{10\%}$	**US$ M**	**915**

[1] *Cash costs and cash costs plus sustaining capital per pound of payable Cu net of by-product credits from revenues attributable to Zn and Pb*

Sensitivity studies were conducted on metal prices, capital costs, operating costs, and metallurgical recoveries of the polymetallic mineralized material. The sensitivities show that the Project is highly sensitive to copper price and operating costs.

1.13 Interpretations and Conclusions

1.13.1 Geology and Resource

Tetra Tech has reviewed the Resource models for the Riotinto Project. The inputs, parameters, and estimation results are within industry best practices for a study of this level and a mine with historic data.

1.13.2 Mining

Pit designs for the San Dionisio pit were based on a generalized set of pit design parameters. While Tetra Tech considers these designs adequate for use in this PEA, detailed design work and validation with known areas of geotechnical instability was not completed. Underground scheduling was performed using simplified assumptions for stopes and crown pillars. Due to historical production experience at both underground mines, it is expected that resumption of underground mining in the two deposits using similar methods is feasible; however, detailed underground mine design and scheduling was not performed for this PEA due to the uncertainty of the Mineral Resource estimate for both deposits.

1.13.3 Metallurgy and Processing

Metallurgical testwork results and current plant performance indicate that Riotinto mineralized material is amenable to conventional crushing, grinding, froth flotation, dewatering, and filtering processes. The mineralized material for the current operation is mined from five different zones (CCW, Isla, Salomon, Lago and QUEB), with different but acceptable metallurgical performance variability when processing it with conventional flotation machines and Isopropyl Ethyl thiocarbamate (IPETC)-based chemistry at basic pH of over 10.5. The optimum target P_{80} in the flotation feed has been set to 175-200 microns as a compromise between copper recovery and throughput.

Mineralized material from future Resources will contain polymetallic minerals, primarily lead and zinc, as well as copper. Historical data developed by Riotinto and various metallurgical laboratories prior to 1986 and recent preliminary polymetallic testwork commissioned by Atalaya has focused on maximizing both the metal recovery and concentrate grade. The historical data clearly se data indicate that a finer liberation size as well as selective flotation techniques are required to achieve economic recoveries. Regrinding cleaner concentrates below 20 microns typically yields higher metal recoveries and grades.

1.13.4 Environmental and Permitting

Tetra Tech has reviewed the available information on permits, agreements, and environmental aspects. Based on this information, Tetra Tech is unaware of any outstanding issues not discussed in this report on this regard that will affect the current operations or mine life.

1.13.5 Economic Analysis

An economic analysis was performed for the expected 15.6-year LOM of the Project. The economic analysis is based on Mineral Resources that are not Mineral Reserves and do not have demonstrated economic viability. Mineral Reserves have not been estimated for this PEA, and Cerro Colorado pit inventories were considered as Mineral Resources in accordance with CIM best practice. As there has been no modifications to Cerro Colorado's mineral inventory, mining method, or recovery assumptions used in the declaration of the Cerro Colorado Mineral Reserves, Tetra Tech considers that the Mineral Reserves declared in the September 2022 technical report can be considered current and valid. The after-tax NPV of the Project is $915M at a discount rate of 10%, indicating that the Project is potentially economically viable; however, there is no guarantee of economic performance. The Project is sensitive to the copper price and operating costs. Diligence in operating cost management and the identification of potential areas for operating cost reduction could improve the potential economic performance of the Project as metal price factors are outside the control of Atalaya.

1.13.6 Significant Risk Factors

Risks identified for this study include:

- If one of the mines is not advanced to production or experiences other operational delays, the results of this PEA will be affected
- Changes to metallurgical recovery parameters may impact the economic performance of the Project
- Processing of the polymetallic mineralized material
- Geotechnical information of the San Dionisio open pit and underground mines
- Waste rock and tailings storage capacity
- Delays in permitting and road relocation that would affect the mine schedule

1.14 Recommendations

Tetra Tech recommends completing a study of a higher confidence level, such as a pre-feasibility or feasibility study.

1.14.1 Geology and Resource

Tetra Tech recommends the following work be performed to increase confidence in the Mineral Resources at PRT:

- Assay for silver as additional exploration is completed and estimate silver values into the block model to gain an understanding of the silver content that could be saleable.
- Confirm historical drilling data with new drilling and the corresponding QA/QC data. This could upgrade the current Inferred Resource to a higher classification confidence.
- Sample recovery (drill core) issues and the possible correlation with high lead and zinc values discussed in historical reports should be clarified with new drilling core recovery data. Diamond drill core is recommended for future confirmation and infill drilling programs.

1.14.2 Mining

Recommendations for improving the confidence in mine designs and scheduling are:

- Determination of appropriate design angles and catch bench widths for future pit designs at San Dionisio using updated geotechnical analysis of shales, oxides, and fill materials.
- Perform detailed pit designs on the San Dionisio pit as Resource confidence increases, ensuring compliance with geotechnical considerations as part of the Project's advancement into a pre-feasibility or feasibility stage.
- Perform updated and/or confirmatory geotechnical studies of potential underground workings.
- It is critical to perform a high-level evaluation of the geometry of the potentially minable underground Resources if confidence of the Resources is increased through additional exploration work. Once this evaluation has been completed, higher levels of study can be performed with more detailed engineering design for the underground mines.
- The development of a fully blended mine plan with stockpiling and cutoff grade optimization is recommended as part of any future studies on the Project.

1.14.3 Metallurgy and Processing

Recommendations for additional work surrounding metallurgy and processing are:

- Additional and more advanced metallurgical testwork will be required to properly design the polymetallic flowsheet. The existing Riotinto concentrator infrastructure would be utilized to support the additional equipment required to process the polymetallic material. A program should evaluate fine grinding (< 20 microns) vs. metal recovery and concentrate grade for each of the various deposits. The use of selective flotation reagents and pyrite depressants, combined with the finer grind should be studied to optimize polymetallic recoveries. A metallurgical model can then be developed to create the appropriate blending formula that maximizes metal recovery and cash flow.
- Test work and studies to define the feasibility and cost of the E-LIX™ processing technology should be continued to see if it can be used as the processing option for the Project in the future. E-LIX™ has the potential to substantially influence the metallurgical performance of Atalaya mineralized material.

1.14.4 Tailings and Waste Rock Storage

Tetra Tech recommends additional studies to define capacity for tailings and waste rock storage on the surface and underground.

2. INTRODUCTION

Tetra Tech was retained by Atalaya Mining Plc (Atalaya) to develop a Preliminary Economic Assessment (PEA) of the Cerro Colorado, San Dionisio, and San Antonio Deposits, collectively known as Proyecto Riotinto (PRT), in Huelva Province, Spain. Tetra Tech has prepared this report using the Canadian National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101) guidelines.

This report contains subtotal, total, and weighted average calculations, which by their nature involve a degree of rounding. Tetra Tech does not consider any margins of error resulting from these calculations to be material to the interpretations and conclusions presented in this report.

This PEA is preliminary in nature and includes Inferred Mineral Resources that are too speculative in nature to be classified as Mineral Reserves. There is no certainty that the economic results presented in this PEA will be realized. Mineral Resources are not Mineral Reserves and therefore do not have demonstrated economic viability.

2.1 Statement of Impact on Existing Reserves

This PEA provides a preliminary economic evaluation of a production scenario that considers the development and extraction of the satellite San Dionisio and San Antonio deposits, alongside the currently operating Cerro Colorado open pit. Cerro Colorado is an operating mine with declared Mineral Reserves as described in the NI 43-101 report entitled *Technical Report on the Riotinto Copper Project* prepared by Ore Reserves Engineering and dated September 2022. The results of this PEA may impact the declared Mineral Reserves by extending Cerro Colorado's life of mine due to the reduced production rates required to accommodate the processing of mineralized material from San Dionisio and San Antonio. As there will be no modifications to Cerro Colorado's mineral inventory, mining method, or recovery assumptions used in the declaration of the Cerro Colorado Mineral Reserves, Tetra Tech considers that the Mineral Reserves declared in the September 2022 technical report can be considered current and valid.

Per CIM definitions, the mineral inventory of Cerro Colorado is included in this PEA as Mineral Resources.

2.2 Sources of Information

Background information in Sections 2 through 8 and 18 through 20 has been reproduced or summarized from the NI 43-101 report entitled *Technical Report on the Riotinto Copper Project* prepared by Ore Reserves Engineering and dated September 2022.

Additional data for this report pertaining to the San Dionisio and San Antonio deposits has been compiled by Atalaya and submitted to Tetra Tech for review. Sources of information are referenced in **Section 27.**

Technical data provided by Atalaya has been reviewed by Tetra Tech and has been found suitable for a study of this type. This includes data pertaining to:

- Drillhole database
- Geological interpretation and 3-D modeling of the veins
- Capital and operating costs
- Metal prices
- Mineral processing data, including process flow sheets and metallurgical recoveries
- Infrastructure

Tetra Tech does not have concerns that information used to prepare this report has been misrepresented or is otherwise invalid.

2.3 Property Inspection

Dr. Guillermo Dante Ramírez-Rodríguez and Ms. Kira Johnson visited the property on November 7–9, 2022. Dr. Ramírez-Rodríguez and Ms. Johnson are Qualified Persons as defined under NI 43-101. Mr. Jaye Pickarts' most recent property visit was July 2021.

2.4 Units of Measure

Metric units are used throughout this report unless otherwise specified. All currency is in United States Dollars ($). All tonnages are in tonnes (1,000 kilograms). Base metal grades are presented in percent (%), and metal content is presented in pounds (lb).

3. RELIANCE ON OTHER EXPERTS

Tetra Tech is relying upon the following information provided by Atalaya personnel regarding legal, political, environmental, and tax matters relevant to the Project:

- The legal status of the mineral and surface rights (**Section 4.2**)
- The required permits pertaining to the Project and their status (**Sections 4.5** and **20.3**)
- Social considerations (**Section 20.4**)
- Tax and royalty terms (**Sections 4.3** and **22**)

4. PROPERTY DESCRIPTION AND LOCATION

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

4.1 Location

The Riotinto Copper Project (Proyecto Riotinto or PRT) is located approximately 65 km northwest of Seville, and 70 km northeast of the Huelva port between the municipalities of Minas de Riotinto, Nerva, and El Campillo in the Huelva Province of Spain. The Riotinto Copper Project's coordinates using the UTM ETRS89 coordinate system are 708,000 to 718,000 East and 416,900 to 417,900 North, as shown in **Figure 4-1.**

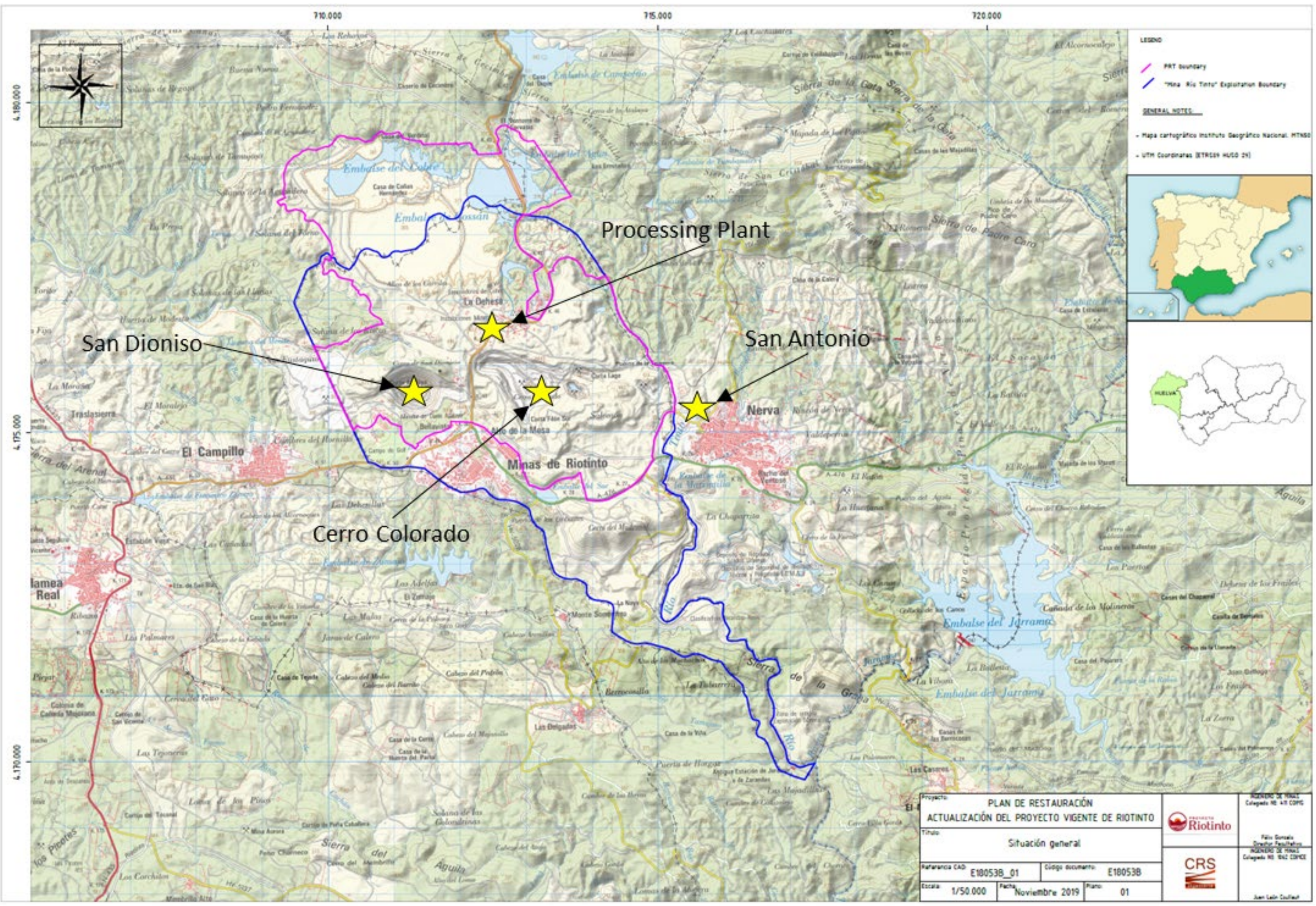


Figure 4-1: Location and overview of the Riotinto Copper Project (modified from CRS Ingeniería S.L. 2019)

PRT includes the operational Cerro Colorado open pit mine, several present-day and historical waste dumps, tailings, and water facilities, the beneficiation plant, laboratories and offices, other maintenance facilities, and general infrastructure. Also present are the San Dionisio deposit, consisting of the non-producing Atalaya open pit and underground Resource, and the San Antonio deposit.

4.2 Mineral Tenure

The PRT is owned and operated by Atalaya Mining Plc through the wholly owned Spanish subsidiary Atalaya Riotinto Minera SLU. The Cerro Colorado pit and the San Dionisio deposit area are located within the Minas de Rio Tinto Exploitation Concession, number 843, granted to Atalaya in April 2014. The concession has a total area of 1,992.39 ha and is valid for 90 years. The tenure of the mineral rights within the concession is 100% held by Atalaya.

Atalaya holds surface rights for 2,070.51 ha of land that comprises the operational areas of the concession as well as tailings ponds and other infrastructure. The exploitation concession and surface rights are shown in **Figure 4-1** in blue and pink lines, respectively.

A portion of the San Antonio deposit lies outside the current mining permit within a set of mining concessions called Grupo Riotinto, itself a part of a larger group of concessions collectively known as the Concesiones Agrupadas. The Concesiones Agrupadas were acquired by Atalaya under a contract of sale, and the transfer of ownership is pending approval of the relevant authorities. The location of the San Antonio deposit relative to the current exploitation permit and the Concesiones Agrupadas is shown in **Figure 4-2**.

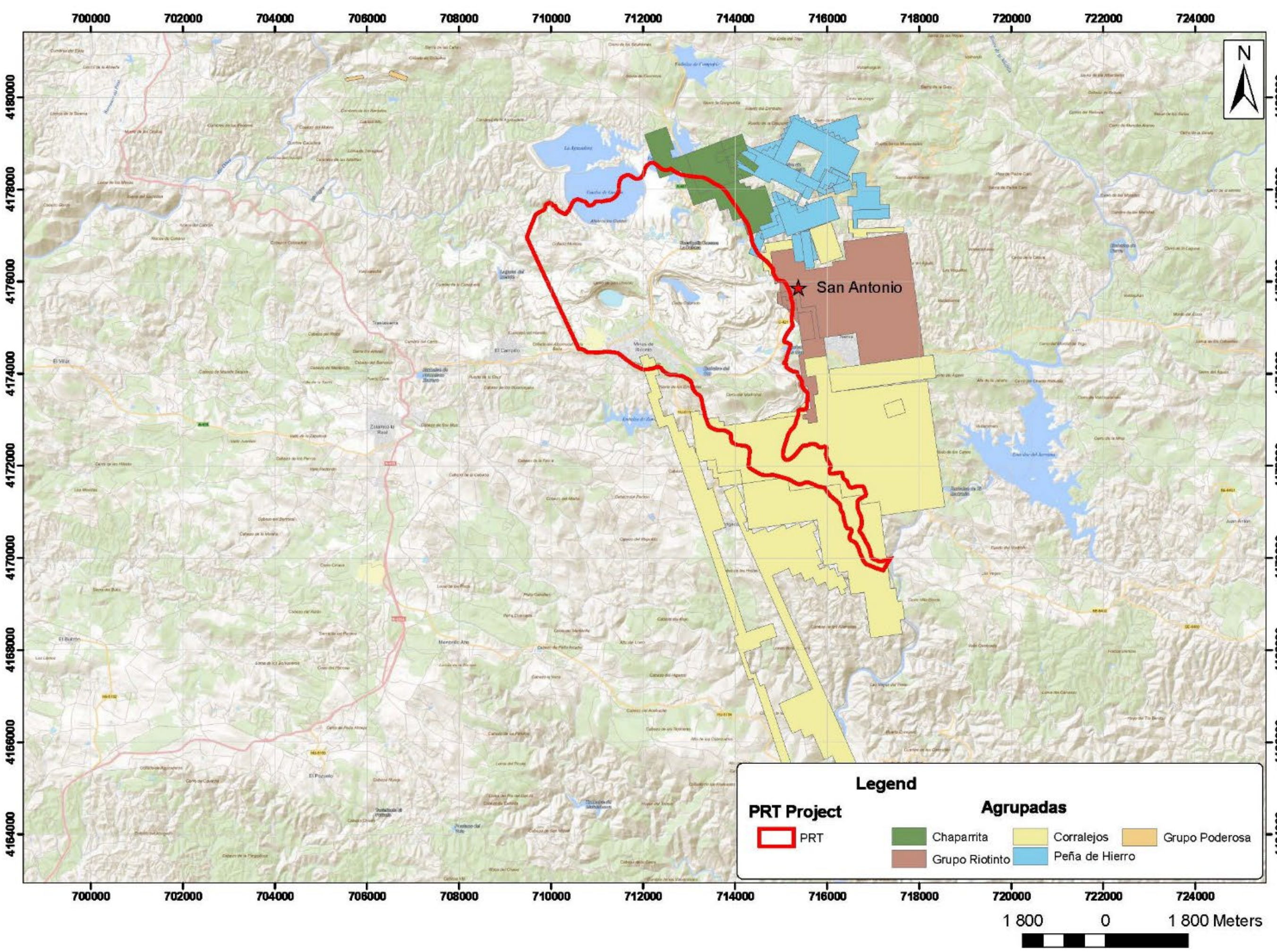


Figure 4-2: Limits of current Minas de Rio Tinto concession and the Concesiones Agrupadas

4.3 Royalties

There are no known royalties to which minerals extracted from PRT are subject. Tetra Tech is unaware of any other encumbrances to which the project is subject.

4.4 Environmental Liabilities

Primary environmental liabilities at the PRT are waste dumps, tailings storage facilities, pit slopes, and shafts and other underground openings. These liabilities are addressed by a Unified Environmental Authorization (Autorización Ambiental Unificada [AAU]), which stipulates requirements for environmental management to avoid, prevent, and minimize project impacts to the environment and cultural heritage. Failure to comply with the conditions in the AAU could result in a withdrawal of the approvals and permits required to continue operations at the PRT.

4.5 Permitting

The main regulatory framework for exploration and mining in Spain are Spanish Mining Act 22 of 21 July 1973 and Royal Decree 2857 of 25 August 1978. The regulatory authorities governing mineral exploration and extraction in the country are the Directorate General for Energy Policy and Mines within the Ministry for the Ecological Transition and the Demographic Challenge, and the Departments of Industry, Environment, Culture, and Public Works of each of the 17 Autonomous Regions of Spain.

Under the Spanish Mining Act mineral deposits and geological resources are classified into three sections, and metals and industrial minerals belong to Section C. Three types of licenses apply to Section C projects:

1. Exploration Permit: Provides the right to carry out studies and preliminary reconnaissance works of regional scope, using all types of techniques except those which might alter the surface of the land. Permits are granted for one year, which can be extended to one more.
2. Investigation Permit: Provides the right to carry out all types of research required to define the existence of resources of Section C so that a mining concession can be obtained later. Investigation Permit: Provides the right to carry out all types of research required to define the existence of resources of Section C, so that a mining concession can be obtained later. The permit can last for a maximum of three years and can be extended for another three, and exceptionally for additional periods.
3. Exploitation Concession: Provides the right to exploit resources of Section C, except those which have been previously reserved by the State and applying all mining techniques available. The concession (mining permit) is granted for 30 years and can be extended up to a maximum of 90 years.

The above permits do not guarantee surface rights, which must be purchased or secured through agreements with the landowner to begin work. In the case that an agreement cannot be reached, holders of permits and concessions for Section C minerals are empowered by Spanish law to secure surface rights through an expropriation procedure. The expropriation requires a payment from the permit holder to the landowner the amount of which is determined by a public technical committee.

To retain the rights granted under a Section C Exploitation Concession, the holder must comply with approved annual work plans, pay any required fees, and apply for any extensions and renewals on time.

As discussed in **Section 4.2**, Atalaya has secured an Exploitation Concession for the PRT property. Additional discussion on the required permits and their status for exploitation of San Dionisio and San Antonio is provided in **Section 20.3**.

4.6 Other Significant Risks

For some of the mining concessions located within the Concesiones Agrupadas, no previous exploration work has been undertaken. An investigative campaign must be carried out to secure these mineral rights and avoid a cancelation of rights due to inactivity.

Tetra Tech is unaware of any other significant risk factors that may affect access, title, or the right or ability to perform work on the property.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

5.1 Topography, Elevation, and Vegetation

The area of PRT consists of low, sparsely wooded, east-west trending ridges separated by wide valleys. The topographic relief is about 500 m from the bottom of the valley to the top of the highest ridge. The approximate elevation at the processing plant is 434 meters above sea level.

Vegetation in the vicinity of PRT is residual, and due to the area's history of mining, there is an absence of native soils. Where native soils are present, they are classified as leptosols, which are shallow soils having hard rock within 30 cm of the soil surface.

Due to the history of mining in the area dating back to Tartessian and Roman times, the Minas de Pirita de Riotinto, which encompasses the current PRT mining concession, has been included in the Inventory of Andalusian Georesources, a catalog of locations of significant geological heritage in the region.

5.2 Accessibility

Proyecto Riotinto is in the Huelva Province of the Autonomous Community of Andalucía in southern Spain, approximately 500 km south of Madrid, 65 km northwest of Seville, and 70 km northeast of the port of Huelva.

Several paved roads and highways connect PRT to Seville, Huelva, and Aracena. International airports in the provincial cities of Seville and Malaga provide service to the Spanish capital city of Madrid as well as other destinations in Europe and North America. High-speed rail service is also available between Seville and Madrid.

5.3 Climate

Climate around PRT is defined as Continental Mediterranean, with hot, dry summers and mild winters. The dry season is typically observed between the months of May and September. Average annual temperature is 17.7°C, with daytime temperatures averaging 3°C in January to 40°C in July and August. Average annual rainfall is 765.7 mm, with most of the precipitation observed in autumn and winter. The climate is suitable for year-round operations.

5.4 Local Resources and Infrastructure

5.4.1 Sufficiency of Surface Rights

Atalaya owns the surface rights for the existing operations at PRT, covering an area of 2,070.51 ha. These surface rights contain all the current operation's infrastructure including the operating Cerro Colorado pit, the processing plant, waste and tailings storage facility, and other supporting infrastructure. The San Dionisio deposit also lies entirely within the surface area held by Atalaya. Expansions to waste rock dumps required to support the operations are expected to remain within the currently held surface rights, while tailings storage facility expansions may require additional land acquisitions.

A section of the surface rights pertaining to the San Antonio deposit lie outside the currently held boundary. Atalaya reports that it will have secured the required surface rights to perform work on the San Antonio deposit through agreements with the current surface rights holders or through the expropriation process. Additionally, access to the underground workings at San Dionisio could be achieved from land currently held by Atalaya.

5.4.2 Power, Water, and Labor

Power is supplied to PRT via the La Dehesa substation (ENDESA independent power supplier) using three outgoing lines on three main transformers. The distribution system at the property has undergone upgrades to support current production rates and an additional expansion of the power distribution system is ongoing, which will support the desired production rate of 15.5 Mtpa. This electric system will be supported by a 50 MW solar farm that is currently under construction at PRT and is expected to be commissioned in 2023.

PRT has been granted a public water concession for 4.93 hm^3/year, of which 2.5 hm^3/year is sourced from the Odiel, Campofrío, and Aguas Limpias reservoirs, and 2.43 hm^3/year is sourced from rainwater. Similarly, PRT has obtained a new temporary permit for an additional 4.1 hm^3/yr of fresh water supply for a total of 6.6 hm^3/year. Currently, water concession is 9.03 hm^3/year (6.6 hm^3/year of freshwater + 2.43 hm^3/year rainwater). PRT prioritizes the reuse and recirculation of water, by relying on supply from an external source only when necessary. As result, water consumption is greatly reduced with the percentage of fresh water being around 10–20% of the total. Water consumption by source for 2021 is tabulated in **Table 5-1**.

Table 5-1: 2021 Water Consumption by Source

Source	Volume	Percent of Use
Fresh water	6.5 hm^3	20.53%
Water recycled	24.05 hm^3	76.03%
Rainwater	1.09 hm^3	3.44%
Total	31.63 hm^3	100%

PRT is currently operating a zero liquid discharge process to prevent discharging water into the environment. The Project holds a valid discharge permit as well, should it be required.

Labor for the current operations at PRT has been sourced from the communities surrounding the Project, although some specialty roles have been sourced from other areas within Spain. Mining operations are currently conducted by contractors, and it is expected that contract mining will continue to be used for the San Dionisio and San Antonio mines.

It is expected that the sources of power, water, and labor will be sufficient for the development and operation of the San Dionisio and San Antonio deposits.

5.4.3 Tailings and Waste Storage

Proyecto Riotinto has permitted and operational tailings and waste storage facilities within the existing mining concession. Atalaya is currently pursuing permit modifications to increase tailings storage, and an expansion of the current waste dumps will be included in the permit modification for the San Dionisio open pit. Additional tailings storage capacity will be required in 2032 and studies for this future expansion are ongoing.

5.4.4 Processing Plant Site

Mineralized material from the San Dionisio and San Antonio deposits will be processed at the existing, operating processing plant at PRT. The plant is fully permitted and is operating at a throughput of above 15 Mtpa.

6. HISTORY

Content in this section has been summarized from Ore Resources Engineering (2022) with minor additions and edits as necessary.

6.1 History of Riotinto

Historic workings at Riotinto date back to at least 1000 BCE when the Tartessians and Phoenicians mined for gold and silver up to the 6th century BCE. Following the defeat of Carthago Nova in 209 BCE by Escipion, the Romans occupied the south sector of the Iberian Peninsula. There is evidence of Roman mining at Riotinto for over 600 years, where they mined for gold, silver, and copper. Following abandonment of the property by the Romans in 425 (Ortiz Mateo, 2003), there was a long period of inactivity until its rediscovery in 1556 by a royal search party commissioned to investigate Roman workings that were reported in the province of Seville. Despite a positive report by the investigation team, there was no significant mining until the property was sold to Matheson & Co in 1873, leading to the formation of the Rio Tinto Company Limited (RTCL). Prior to the acquisition by RTCL, extraction at Riotinto was focused at Filón Sur and Filón Norte, and at a later stage around 1839, at Planes.

The Rio Tinto Company led by Scottish banker Hugh Matheson poured significant capital into the project, constructing modern (for the time) mine and plant facilities, a railway from the mine to the port, and a pier for deep-water ships. The company then commenced open pit mining on the Filón Sur deposit. Despite this work being largely manual, with digging and loading by shovels and baskets, it provided significant cost and productivity advantages over the underground pillar and stall mining practices. Over time, mining practices were improved in both underground and open-pit operations, leading to cut-and-fill mining at Filón Sur, Planes, and San Dionisio, and shovel and train open pit mining at Filón Sur and Atalaya. RTCL mining activity lasted until 1954, with 108 Mt of ore extracted.

In 1954, RTCL transferred two-thirds of the property to a Spanish private equity company and the company became Compañía Española de Minas de Río Tinto S.A. (CEMRT). At that time, the only active mining at the property was at the Atalaya open pit and Pozo Alfredo underground mines at San Dionisio.

In 1966, CEMRT started a new joint venture with two companies, the Patiño Mining Corporation and Rio Tinto Zinc (RTZ), the latter formed by a merger between RTCL and Zinc Corporation. The name of the new company was Rio Tinto Patiño (RTP), with 55% owned by CEMRT, 40% by Patiño Mining Corporation, and 5% by RTZ. The new company's mission was to investigate and mine the Cerro Colorado copper deposit. Thus, mining at the property was conducted by two companies, with PRT managing the copper mining and CEMRT managing the mining of pyrite (Arenas Posadas 2017). Copper ore extraction at the Cerro Colorado open pit began in 1967, and the copper concentrate plant entered production with a design capacity of 3 Mtpa, then expanded in a later stage to 10 Mtpa.

In 1970, CEMRT merged with Unión Española de Explosivos S. A. (UEE), and became Explosivos Rio Tinto (ERT). During this time, RTP reduced its activity to copper exploration and plant construction.

In 1970, Corta Atalaya was expanded to extract pyrite, and deep exploration at Pozo Alfredo resulted in the beginning of the *cloritas* copper ore extraction (a total of 14 Mt). The introduction of underground loaders and conveyor systems led to an important reduction of the workforce in this period. Shortly after 1970, intensive gossan mining began at Cerro Colorado to extract gold and silver. The ore was treated in a new gold leaching plant using cyanidation, filtering, and precipitation at a designed throughput of 1.5 Mtpa of oxidized (gossan) ores and was later expanded to reach an operating capacity of 6.0 Mtpa. The gold leach plant still exists but is not operational.

In 1976, after the fall of commodity prices, RTP sold its interest in the Riotinto property to ERT. In 1978, the reunified company took the name of Rio Tinto Minera S.A. (RTM), where ERT held 75% of the property and RTZ 25%. Soon after, the RTZ interest increased to 49% because of a capital increase to upgrade mining equipment, develop and execute new exploration plans, and implement plant expansions.

Between 1980 and 1987 the pyrite, gold, and silver production continued, but it represented a small proportion of the RTM business; the main mining activity was the copper ore of Cerro Colorado. RTM subsequently accumulated significant losses, mainly due to unceasing debt growth, declining commodity prices, and a slowdown of worldwide demand coupled with increasing mining costs due to lower than expected copper grades at Cerro Colorado. RTM experienced economic difficulties and attempted to reduce costs and improve performance with the aim of reducing the financial charges; however, in 1987 copper production ceased (Arenas Posadas 2017).

Meanwhile, ERT was acquired by Ercros in 1987, selling 65% of its interests in RTM to Freeport-McMoRan Copper & Gold, Inc. (Freeport) in 1993 (trading as Atlantic Copper in Spain). Freeport's only interest in Proyecto Riotinto was to acquire the Huelva smelter.

Mining at Pozo Alfredo ended in 1991 and at the Atalaya pit in 1992. Gossan extraction at Cerro Colorado continued until 1996.

After the acquisition of RTM, Freeport tried to reduce the Riotinto workforce with a reallocation and redundancy plan but met with opposition from the trade unions and the effort failed. The unions submitted a plan to restart the mining activity at Riotinto (Plan Esquila) through a purchase or transfer of the property to the mineworkers. In 1995 Freeport sold the company to the workers, who founded Minas de Río Tinto S.A.L. (MRT), as a workers' cooperative comprising former senior management and unions, with Freeport committing to buy the copper concentrate produced by the new company.

Between 1995 and 2001 MRT mined 25 Mt of ore at an average grade of 0.57% Cu. During this period an annual production of 7.3 Mt was achieved in 1997 and a peak annual throughput of 9 Mtpa was achieved in 1998. Due to declining copper prices, MRT declared suspended payments at the end of 1998 and ceased operations at the Cerro Colorado operation in 2001.

After a period of negotiations with the local and Spanish Governments and multiple protests and strikes, the mine was closed in 2003.

In 2004, the mineral rights and properties were acquired at a public tender by Mantenimiento General del Sur, Mantesur Andevalo S.L. (MSA), the management of which included former managers of MRT. MSA commenced restoration of the primary crushing and ore feed systems in anticipation of a restart, but the group failed to secure the necessary approvals and the mine remained on care and maintenance. Work focused on monitoring the tailings dams, filing statutory reports, and maintaining pumping to avoid effluent discharges and to protect the recent capital works from deterioration.

In November 2006, two Australian companies, Oxiana Limited and Minotaur Exploration, entered a memorandum of understanding with MSA to invest in MRT. Both companies withdrew from the project in December 2006 and the project was then introduced to EMED Mining Public Ltd. of which Oxiana is a founding shareholder. In May 2007 EMED Mining Public Ltd. was granted an option to acquire the Rio Tinto Copper Mine known as Proyecto Riotinto (PRT).

In October 2008, EMED Mining Public Ltd. announced that it had acquired 100% of the Rio Tinto Copper Project through its wholly owned Spanish subsidiary EMED Tartesus S.L.U. EMED Mining Public Ltd. received the approved Unified Environmental Authorization (AAU) for the Riotinto Copper Project and the transfer of the Riotinto mining rights in 2014. The mining permit and restoration plan approval was received in January 2015 and construction and refurbishment operations commenced. In October 2015, the shareholders approved the name change to Atalaya Mining Plc.

6.2 Cerro Colorado

The latest mining operations were focused on the Cerro Colorado open pit located near the treatment plant. The Cerro Colorado deposit contained one of the largest known concentrations of sulfides in the world. It has been estimated that there were originally about 500 Mt of massive sulfides (pyrite), of which about 20% were leached to form gossans. Cerro Colorado has the potential to increase in size by investigation of the adjacent ancient workings at Filón Sur, Filón Norte (Lago), Cerro Salomon, Planes/San-Antonio, and Quebrantahuesos.

In the Cerro Colorado pit, altered, grey, felsic volcanics host a major pyrite-chalcopyrite stockwork, part of which extends below the felsic volcanics into mafic volcanics. Alteration closest to the stockworks is chloritic passing to sericitic and silicic further away.

Cerro Colorado was opened in 1967 to extract copper, gold, and silver from the gossans and stockwork for treatment through the concentrator's two separate copper and gold/silver recovery circuits. The mine was developed as an open pit, with a planned production potential of 39 Mt at 0.8% Cu and 18 Mt of gossan (oxide) ore averaging 2.4 g/t Au and 42 g/t Ag that formed the top of Cerro Colorado. The pit was 1,560 m long, 850 m wide, and 230 m deep, and covered an area of about 200 ha. The benches were 10 m high and the ramps 20 m wide. Production was 13 Mtpa, of which 3 Mt was copper ore, 1.5 Mt was gold-silver ore, and 8.5 Mt was waste-rock and marginal ore with < 0.28% Cu. The Cerro Colorado ore was treated in a copper concentration plant with a capacity of 10,000 t/day (3 Mtpa) and a gold-silver concentration plant with a capacity of 4,500 t/day (1.5 Mtpa). Ore from the gossan was crushed in the same plant as the copper ore, in similar units, but separately.

When MRT took over the mine in 1995, they elected to restart copper extraction from Cerro Colorado, starting at 4.5 Mtpa, and the gossans were processed at a rate of 2 Mtpa. Mining of the gossan ore ceased in 1998. Between 1995 and 2001, 23.9 Mt at 0.54% Cu was processed. Some 19 Mt was mined from Cerro Colorado West, with the remainder coming from Salomon (now known as Cerro Colorado East).

6.3 San Dionisio

Underground mining (Alfredo Mine) in the San Dionisio orebody, the biggest known mass of pyrite in the Iberian Peninsula (**Figure 6-1**), started in 1881 with 22,090 t of ore produced. In 1909, open-pit mining of San Dionisio commenced (Atalaya open pit), and production continued both by open pit and underground methods.

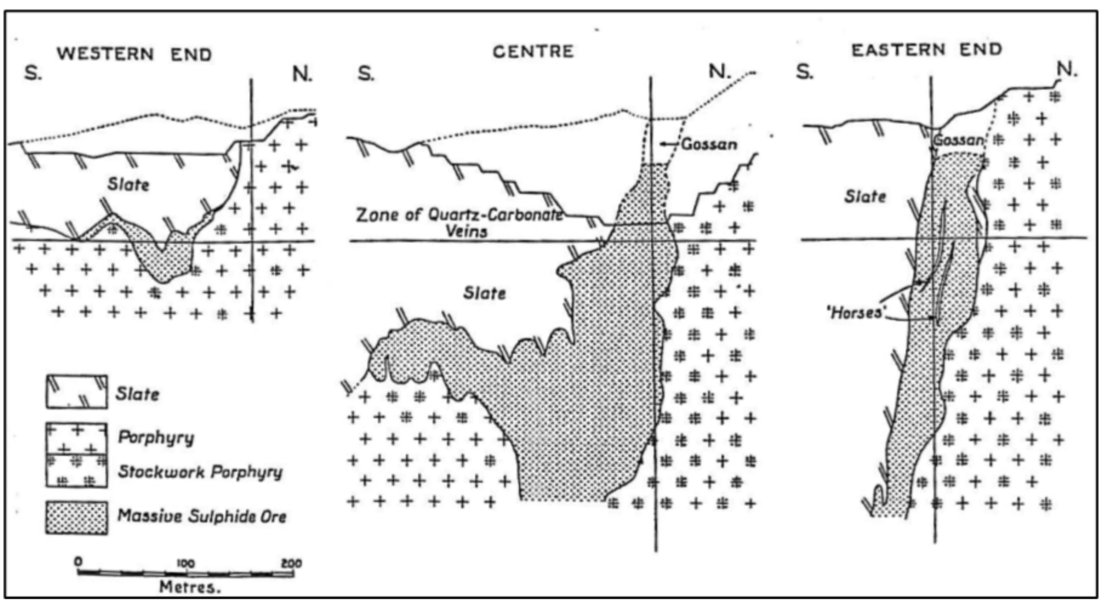


Figure 6-1: Cross Section through the San Dionisio Deposit (D. Williams 1934)

A room-and-pillar method mining system was applied to Alfredo mine until the 1930s when mining switched to a horizontal cut-and-fill method *bottom slicing and filling with roof settlement* to increase ore recovery and maintain output (**Figure 6-2)**. At San Dionisio, this mining system progressed up to the 26th level until the 1970s, when modern machinery was brought into the 31st and 33rd mine levels using the room and pillar method, which ended in 1979. The total pyrites extracted from San Dionisio up to 1954 was 26.8 Mt at Alfredo underground and 11.3 Mt at the Atalaya opencast.

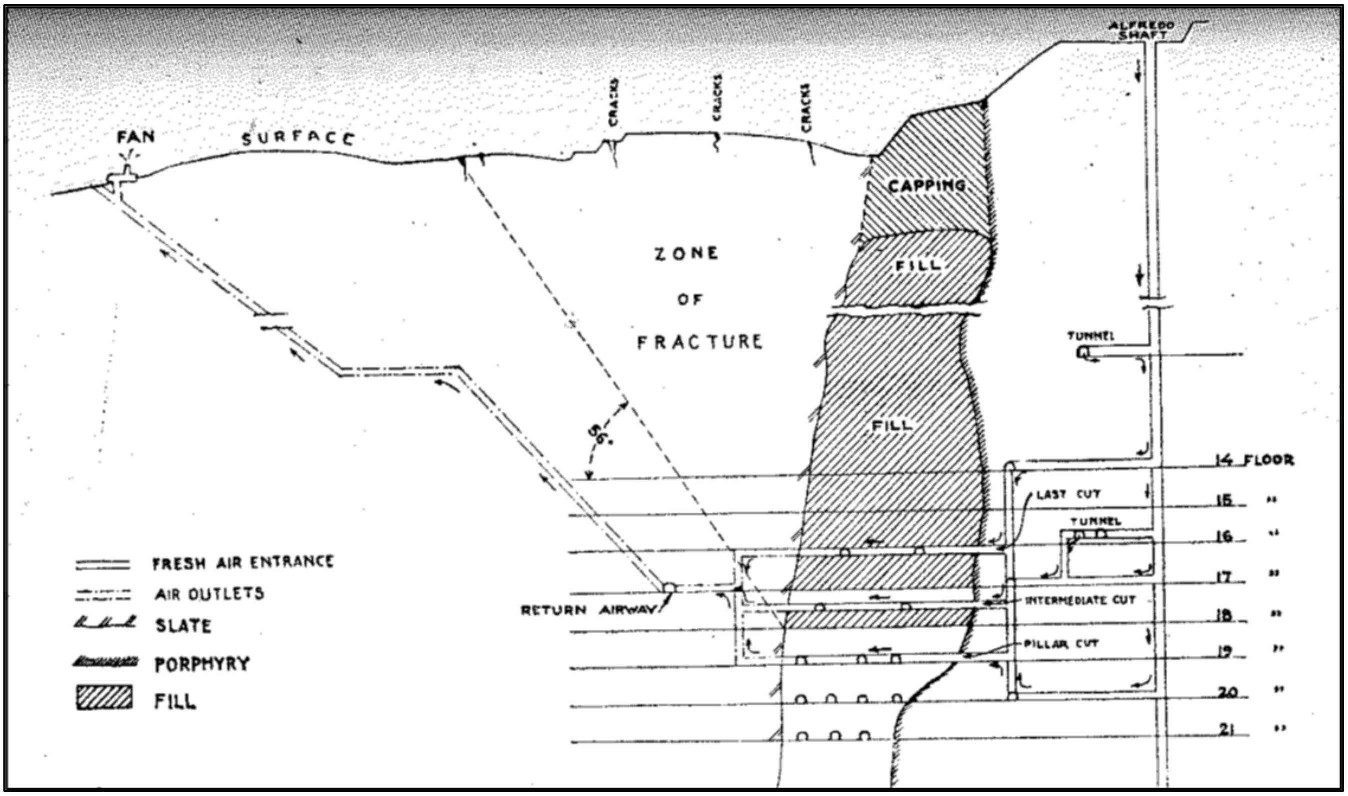


Figure 6-2: Sketch cross-section of the mining system at Alfredo Mine (Julian 1939-1940)

In 1964 stockwork *cloritas* orebody extraction started at Alfredo underground mine by sublevel benching between the 17th and the 23rd levels, ending in 1972 with the extraction of one stope. Between 1972 and 1979, *cloritas* mining was carried out using a cut-and-fill system between levels 32 and 30 (Botin y Singh 1981)

The last extraction period of *cloritas* started in 1981 and ended at the beginning of 1987, with blast hole stoping with hydraulic backfill between the 33rd and the 45th levels to reduce dilution. Open stopes were 20 m width, 50 m average length, and 70 m height. The total production of the open stopes was 3.2 Mt at an average grade of 1.85% Cu.

The extraction of San Dionisio polymetallic ore was evaluated in 1986 by JS Redpath Mining Consultants Limited. The evaluation comprised a mining study and metallurgical test work to recover copper and zinc concentrates and a sealable pyrite product from a blend of Cerro Colorado and Alfredo ores. A geotechnical study was carried out by P. Croney and P. Gash and included excavation of an experimental opening in the massive sulfide orebody on the 39th floor (stope 10), which was completed successfully (Croney y Gash 1986). In 1987, the Company decided to suspend production at the project due to low metal prices.

According to the compiled historical data presented previously, mining was mostly focused on the massive sulfide ore, but there is still unmined massive sulfide mineralization at depth. In addition, there is significant unmined mineralization hosted in the chlorite-altered copper stockwork zone located on the northern flank of the deposit outside the stoping area as shown in **Figure 6-3**.

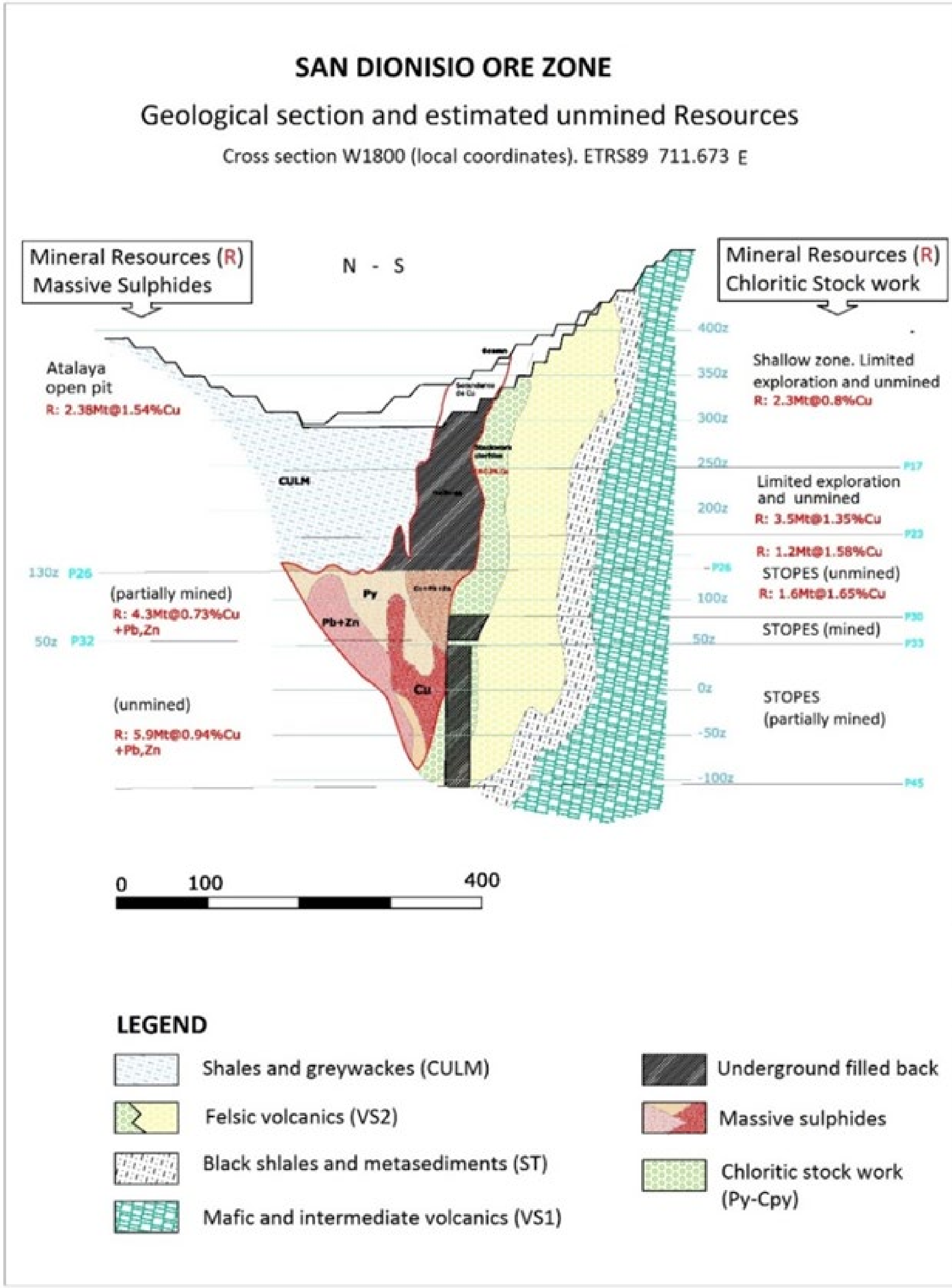


Figure 6-3: N-S vertical section through the San Dionisio deposit showing the unmined portion of the orebody (Atalaya 2018)

6.4 San Antonio

Underground mining at the Planes orebody, located to the west of Nerva village, commenced in 1922 with a production rate of up to 50,000 tonnes per year. The Planes mine ended in 1954 with a total production of 2.1 Mt of high-sulfur and low-copper ore and the depletion of the orebody (Gil Varon 1984). Between 1956 and

1963, the mine was allowed to flood to recover copper by dissolution in the acidic water, also called cementation or precipitation process (Unthank Salkield 1987).

The sub-horizontal shape of the Planes deposit favored the formation of a thick alteration zone (gossan) on the hanging wall of the mineralization. The action of the meteoric water generated an enrichment zone with secondary sulfides, usually chalcocite and covellite with traces of gold, which has also been mined in the past by open-pit methods.

In 1962, the San Antonio orebody was discovered during a gravimetric and electromagnetic investigation over the Rio Tinto concession. This orebody represents the eastward extension of the Planes bedded pyrite and is a polymetallic (Pb-Zn-Cu) high-sulfur and high-copper pyritic stratiform sheet, as shown in **Figure 6-4**. After its discovery in 1962, the orebody was defined by surface and underground holes, and the underground workings between the 1st and 14th levels were completed, including two vertical shafts. The deposit dips approximately 25° to the east, occurring at depths between 120 m to 200 m.

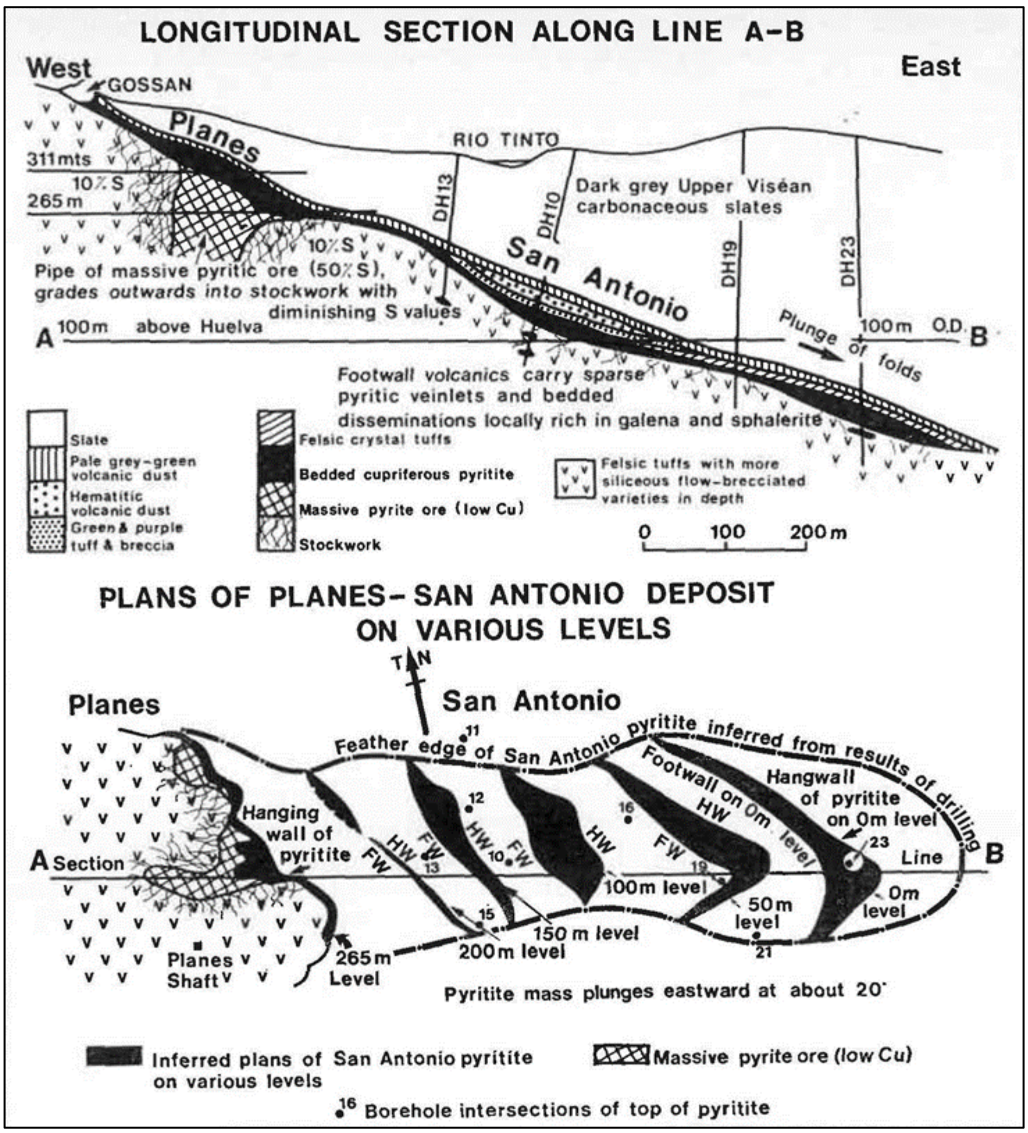


Figure 6-4: Plan and longitudinal cross-section of the Planes-San Antonio deposit (Williams, Stanton y Rambaud 1975)

Between 1973-1977 the San Antonio deposit was evaluated externally and internally. In 1974 a mining study including a conceptual mine design, scheduling, and metallurgical test work of the massive pyrite and complex mineralized material was carried out by RTZ Consultants. The total estimated mineable Resources in the study were 9.5 Mt of mineralized material at an average grade of 1.6 % Cu, 1.05% Pb, and 1.74% Zn (RTZ Consultants Limited 1974). Production at San Antonio never resumed, and it is currently flooded.

The western part of the San Antonio deposit is within the Riotinto Concession owned by Atalaya, and the eastern part is in the Tejonera Concession, which belongs to the *Grupo Riotinto* set of concessions, as shown in **Figure 6-5**. *Grupo Riotinto* is part of the *Concesiones Agrupadas* or *Grouped Concessions*. The Grouped Concessions were acquired by Atalaya under a contract of sale, transfer of the permit ownership to Atalaya is pending approval of the mining authorities. The boundary between the mining concessions is the Riotinto River.

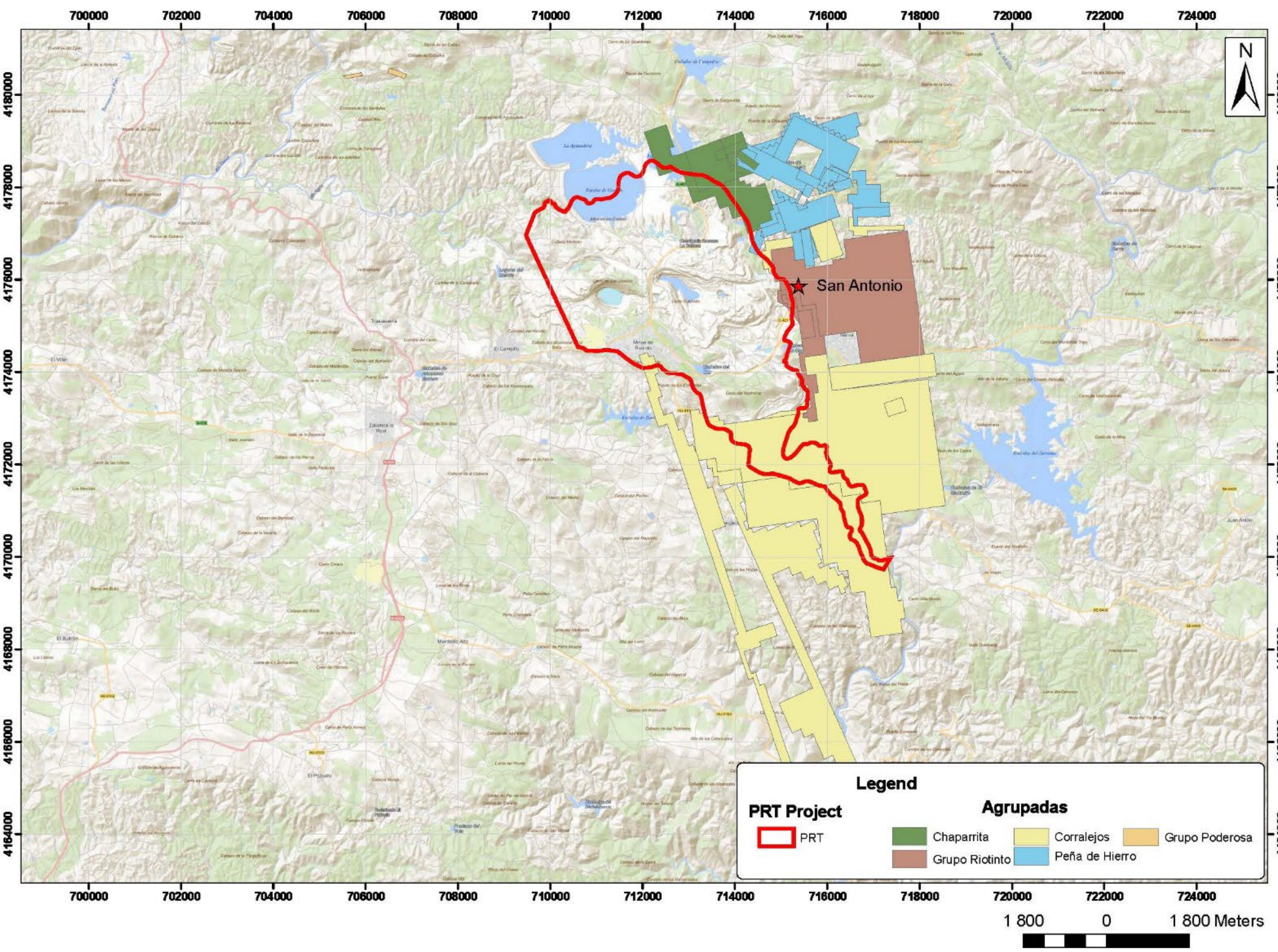


Figure 6-5: Plan map with the location of the San Antonio deposit within the Grupo Riotinto Exploitation Concession (Atalaya 2022)

7. GEOLOGICAL SETTING AND MINERALIZATION

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

7.1 Regional Geology

The Rio Tinto massive sulfide deposit occurs on the Spanish side of the Iberian Pyrite Belt (IPB), which is part of the South Portuguese Zone (SPZ) of the Iberian Massif. The Iberian Massif resulted from the collision of three continental blocks that originated from the fragmentation of a Late Proterozoic mega-continent (Murphy y Nance 1991) into a series of plates: the SPZ, the Ossa Morena Zone (OMZ), and the ensemble of the Central Iberian Zone (CIZ), West Asturian–Leonese (WALZ) and Cantabrian (CZ) zones as shown in **Figure 7-1**.

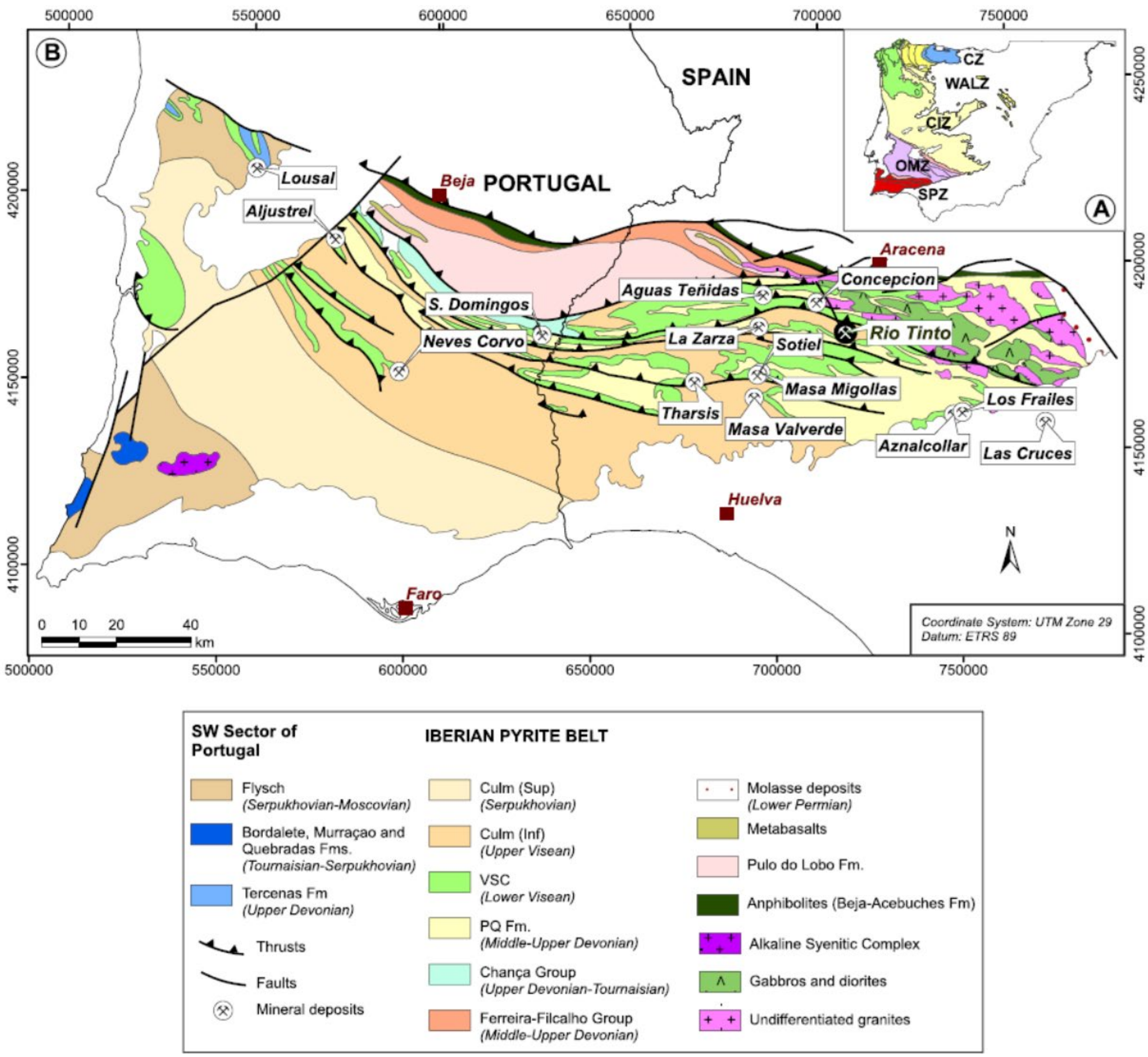


Figure 7-1: Zones of the Iberian Massif (Martin-Izard, A. et al 2015)

The IPB was formed as a series of marine basins that developed during the left-lateral transcurrent faulting that was generated by the subduction and collision of Laurentia with Gondwana during the Variscan orogeny (Late Devonian−early Carboniferous (Silva, Oliveira y Ribeiro 1990). These basins were formed within the passive margin of Laurentia, now represented by the SPZ and adjacent to the collision suture (Martin-Izard, A. et al 2015).

The oldest rocks in the IPB are a sequence of quartzite and shales (the Phyllite–Quartzite Group, also called PQ) of Devonian age, which are overlain by a thick sequence of volcano-sedimentary rocks (the Volcanic Sedimentary Complex, VSC) that host most of the mineralization of the IPB. The VSC is a highly variable unit, up to 1300 m thick of uppermost Devonian to Lower Carboniferous (ca. 356–349 Ma).

The VSC is formed by dacitic–rhyolitic dome complexes, basaltic lava flows, mafic sills, thick pumice, and crystal-rich felsic volcanoclastic units interbedded with detrital sedimentary rocks, mostly mudstone with some greywacke and sandstone. The depositional environment appears to be dominated by submarine mass-flow tuffs as indicated by (Schermerhorn 1971).

The earliest Carboniferous (about 360 to 350 Ma) was a transitional period characterized by extension forming different submarine basins and abundant bimodal volcanism that caused the development of Volcanogenic Massive Sulfide (VMS) deposits that were mainly hosted along the fracture zones limiting the basins (Silva, Oliveira y Ribeiro 1990). Some of these basin-forming faults were reactivated as thrusts during later Variscan shortening (Gumiel, P. et al. 2010).

The IPB contains over 100 massive sulfide and stockwork VMS deposits. Over 10 extensive VMS deposits, with more than 50 Mt of ore, are hosted by volcanic rocks or associated shales and were formed as exhalative ores in brine pools on the sea floor or as filled veins and replacement style mineralization (Tornos 2006). Riotinto is the largest deposit in the IPB and has been estimated to have held more than 500 Mt of massive pyrite, complex, and stockwork deposit types (D. Williams 1934).

7.2 Property Geology

The geology of the property is described in the sections below.

7.2.1 Stratigraphy

The Rio Tinto deposit occurs on the Volcano-Sedimentary Complex (VSC) of the IPB, which regionally is formed by a lower mafic volcanic unit composed of basaltic and spilitic pillow lavas and dolerite sills intercalated with bands of slate and chert of Lower Carboniferous and an overlying felsic volcanic unit composed by rhyodacite lavas and pyroclastic rocks (**Figure 7-2**).

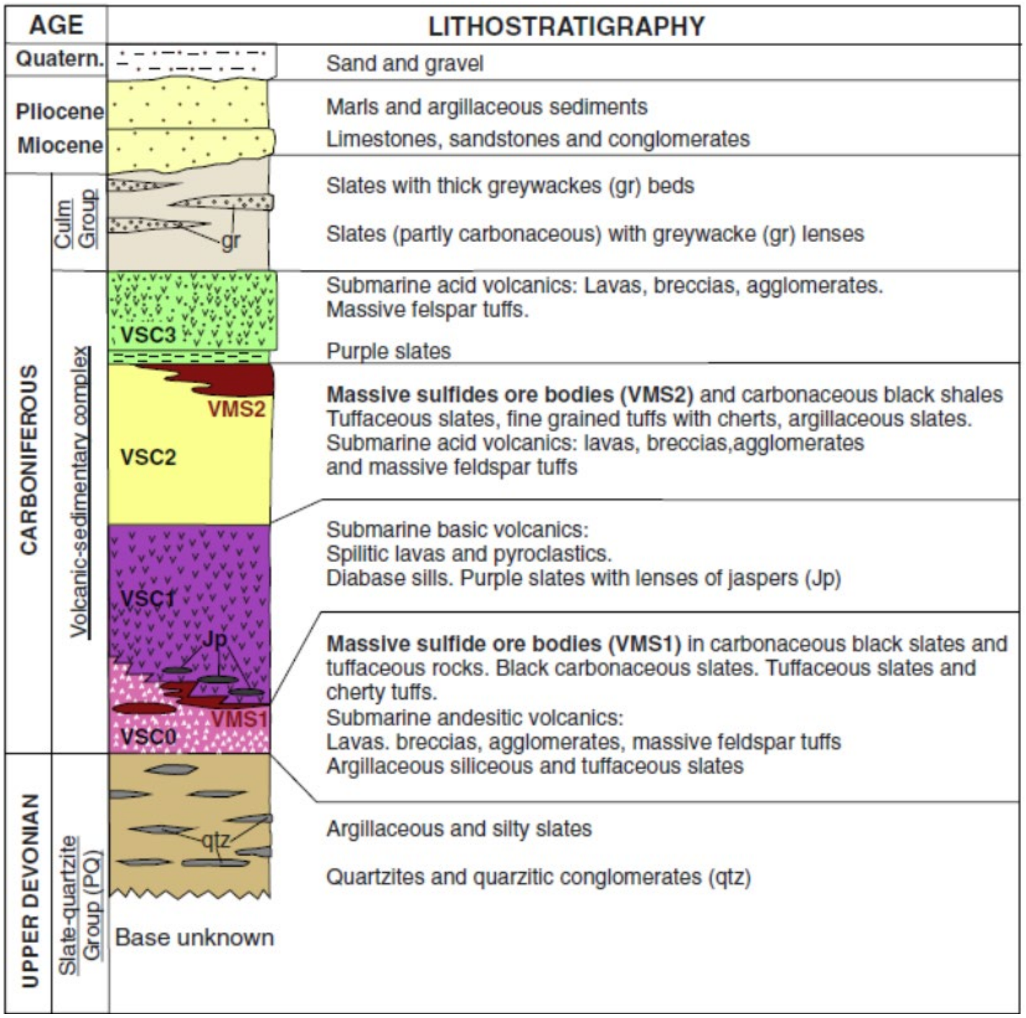


Figure 7-2: The lithostratigraphic sequence of the IPB (Martin-Izard, A. et al. 2016)

Based on historical drilling at Riotinto and on available drill-core logs compiled, the Exploration Department of Atalaya Mining has identified eight main litho-stratigraphic units from the Volcano-Sedimentary Complex -VSC. In chrono-stratigraphic order from top to bottom, these units are as described in **Table 7-1**.

Table 7-1: Rio Tinto Deposit Lithostratigraphic Units (Atalaya, 2018)

CULM	A sequence of shales, slates and fine greywackes with turbiditic features (syn-orogenic flysh sequence which covers the volcano-sedimentary complex). The Culm Group ranges in age from Late Visean to Middle-Late Pennsylvanian.. The sequence is very thick. Drilling at Rio Tinto indicated thickness of about 400m in the southern limb, and more that 800m in the northern limb, at Dehesa.
VS3	Felsic and intermediate volcanic cinerites, tuffites and domes that represent the last volcanic event of the IPB.
PJ	Purple shale, cinerites and jaspers. A volcano sedimentary unit formed by purple shales (Fe-Mn rich) with interbedded lenses of jaspers, which represents the lateral extension of the latest volcanism VS3.
VS	Volcano sedimentary unit consisting of green shales and tuffaceous shales. This unit represents the zones most distal from the volcanic centers where deposition of sediments dominates. Laterally they grade to the felsic unit (VS2). Thickness is highly variable, depending on distance from the feeders.
Massive sulfides	The Massive sulfide bodies are located at the top of the volcanic sequence- VS2 . They occur as dismembered lenses underlying stockworks and the felsic volcanic domes and pyroclastic rocks. Although at present most of the massive sulfides have been mined, the largest lenses are located in Cerro Colorado area, Filón Sur Lode, San Dionisio, and Planes-San Antonio areas.
Stockwork	Hosted in volcanic rocks from the VS1 and VS2. It consists of irregular veins, fractures and fissures filled with quartz and sulfides (mainly pyrite and chalcopyrite).
VS2	Felsic Volcanic Unit. Rhyolitic lavas, rhyodacites and felsic volcanic pyroclastic and epiclastic rocks. At Cerro Colorado and the eastern prospects rhyodacitic domes and lavas from the pyroclastic tuffs are dominant, whereas the western zones are mostly pyroclastic. Thickness is very variable, from some 75 m at western Corta Atalaya, up to 400 m in Cerro Colorado close to the northern fault.
TS	Transition Series. Mostly a sedimentary unit formed by black shales, slates with radiolarian, conglomerates and mafic pyroclastic. Approximate thickness is 50m.
VS1	Lower Mafic Volcanic Unit. Mostly formed by basaltic rocks and pillow lavas with some interbedded black slates and tuffaceous shales. Estimated thickness is over 250m.

The Rio Tinto deposits lie in the upper Paleozoic unit containing volcanics (VS2, andesites, and rhyolites) at the base of the Carboniferous. Within this unit, there are several sulfide deposits that are associated spatially and genetically. A geological map of the Rio Tinto district is presented in **Figure 7-3.**

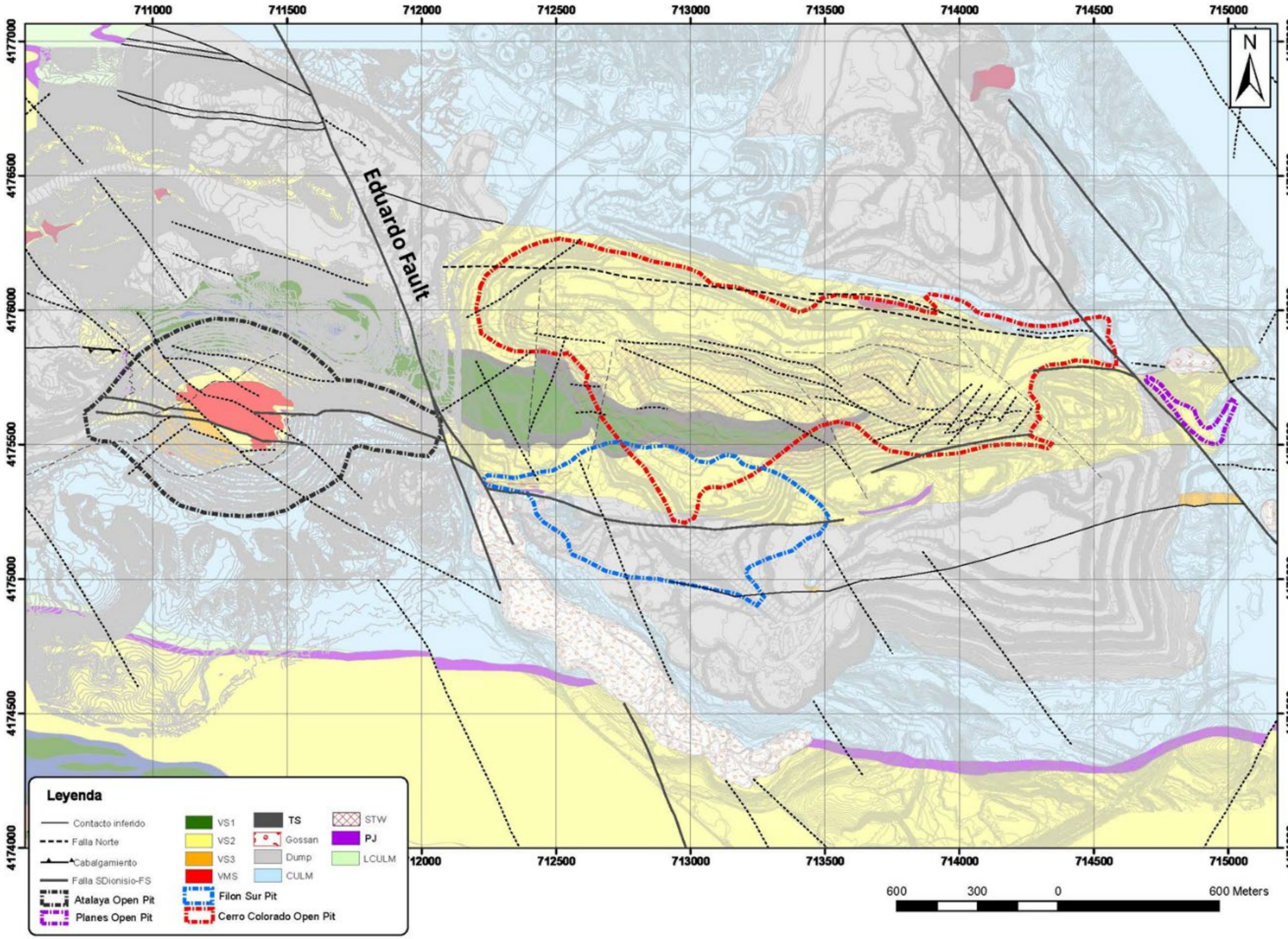


Figure 7-3: Geologic map of PRT

7.2.2 Structure

The Rio Tinto deposit was formed in an extensional tectonic setting associated with volcanism that took place in the late Devonian-earlier Carboniferous period in an oceanic seafloor environment. After the extensional period, a compressional event took over during the Variscan-Hercynian orogeny that formed the Iberian Massif.

Rio Tinto is characterized by having a high intensity of Variscan deformation that generated S to SSW vergence folding structures. The Rio Tinto deposit forms an E-W trending anticline, with the northern flank dipping approximately 50 degrees to the north and the southern flank near vertical. Another E-W syncline fold occurs next to the anticline to the south.

The anticline is crosscut by the NW-SE trending Eduardo Fault zone, which dissects the whole body into two sectors. To the east: the Cerro Colorado and Filón Sur areas. To the west: San Dionisio (Alfredo Mine and Atalaya open pit). The Planes-San Antonio orebodies occur at the eastern end of the anticline, to the East of Cerro Colorado.

Cerro Colorado is bounded on the North by the E-W trending North Fault, which represents a sharp contact between mineralized and non-mineralized volcanics. Cerro Colorado is bounded on the south by a synclinal fold that places Culm in contact with Filón Sur.

7.2.2.1 NW Fault

During a detailed review of blasthole grade distributions on bench plan maps a NW-trending structure that is the dividing line between high arsenic grades to the east and lower arsenic grades to the west was observed. This structure has not been previously reported or mapped in geologic reports but is clearly visible on the pit floor and pit walls in addition to blasthole grades. This fault has been confirmed by the authors of this report based on blasthole grade patterns and subsequent observation in the pit. The NW Fault has been surveyed by the mine surveying department and subsequently modeled to provide a well-defined 3D surface for Resource modeling. While the NW Fault is a strong control for arsenic mineralization, it also may be a weaker control for copper and zinc mineralization.

7.2.3 Metamorphism

The metamorphic grade in Rio Tinto is mostly very-low-grade, prehnite-pumpellyite facies. However, in the northern part of the IPB and near thrusts, deformation is more intense, and the rocks are recrystallized within the greenschist facies.

7.3 Mineralization

In the Rio Tinto area, mineralization occurs in five separate zones along the anticline: San Dionisio, Cerro Colorado - Filón Sur - Filón Norte, and Planes-San Antonio. Mineralization is typical of the VMS deposits and occurs as three different types of mineralization: sulfide stockworks in the volcanic rocks, massive sulfide orebodies, generally, on top of the stockwork zones and/or intercalated with rocks of the transition series, and weathering products of the mentioned primary mineralization types which are represented by gossans and secondary enrichment zones. The latter are restricted to within 70 m of the surface (Palomero 1990).

7.3.1 Sulfide Stockwork

The stockworks occur as irregular veins, fractures, and fissures filled with quartz and sulfides (pyrite, chalcopyrite, galena, sphalerite), magnetite, quartz, chlorite, calcite, and barite cutting the volcanic host rocks. The top of the stockwork marks the base of the massive sulfides. The veins become thicker towards the surface. Close to the massive sulfides, most stockworks are made up of veins with lesser amounts of strongly replaced volcanic rocks. The stockworks can extend up to 400 m downwards from the contact with the massive sulfides down to the basic volcanic unit.

There is a spatial zonation within the stockwork where three types of stockwork can be distinguished:

- Pyritic stockwork zones, also referred to as pyrite chimneys or pyrite feeder zones, consisting of intense pyrite mineralization and local chalcopyrite (e.g., Planes). Average sulfur content of this type of stockwork is 20%.
- The cupriferous stockwork (average 2% Cu content and 30% S). This is a vein-type mineralization with a high concentration of chalcopyrite and is usually adjacent to and parallel to the contact with the massive sulfides. This copper envelope is locally referred to as *cloritas* (Botin y Singh 1981). The *cloritas* stockwork is highly developed at the base of the San Dionisio massive sulfide body, where veining is parallel to the contact with the massive sulfides. It is also found below the Filón Sur and Filón Norte deposits.
- The lower stockwork zone consisting of a sericitic envelope restricted to the acid volcanic rocks contiguous to the *cloritas* cupriferous stockwork. Copper and sulfide contents are much lower than in the previously described stockwork types. The lower stockwork is the main mineralization of Cerro Colorado. Zone 2a described at the footwall of the *cloritas* of the Alfredo underground mine is also a stockwork of this type.

The Planes-San Antonio deposit has a poorly developed stockwork of reduced size compared with San Dionisio. A semi-massive pyrite zone without base metals is located at the base of the Planes deposit.

7.3.2 Massive Sulfide

Massive sulfide mineralization consists of lenses of massive pyrite overlaying the felsic volcanic and the stockworks, usually with greater lateral extent than the stockwork zones. The sulfide minerals are frequently recrystallized with relicts of primary textures within the pyrite.

The primary sulfide mineralization consists mostly of pyrite, with minor chalcopyrite, sphalerite, galena, tetrahedrite, and sulfosalts of Sb and As in intergranular spaces or in microfractures. Chalcopyrite is the dominant copper mineral and mostly occurs within small fractures in the pyrite; on a lesser extent it occurs in isolation.

The massive sulfide deposits are present as dismembered lenses along the axis and the flanks of the anticline and are overlain by shales of the Culm series. Currently, massive sulfides remain only at San Dionisio and San Antonio. At Filón Sur, Filón Norte, and Planes the massive sulfides have almost entirely been removed by mining. In the core of the anticline at Cerro Colorado-Salomón open pit, it is believed that the deposits originally formed an almost continuous lens of massive sulfides of about 5 km long, 750 m wide, and 40 m thick, containing more than 500 Mt of sulfide mineralization.

The San Dionisio sulfide body is the largest deposit at Rio Tinto. It is a homogeneous pyritic body containing sphalerite and chalcopyrite with minor amounts of galena, arsenopyrite, and tetrahedrite. While the distribution of Pb-Zn is not regular, the copper content increases toward the contact with *cloritas*, and maximum copper grade is found at the contact between the massive sulfides and *cloritas*. This footwall contact is gradational to locally abrupt. The upper contact is usually sharp and mineralization in the hanging wall rocks is very rare. The San Dionisio deposit has been described in the literature as a stratiform massive sulfide orebody with a syncline shape derived from folding. An extensive study of the geology and the mineralogy of the San Dionisio sulfide body by R.A. Read in 1967 strongly indicates that the deposition of sulfides is a replacement of a favorable folded volcanic horizon.

San Dionisio Massive sulfides have been extensively mined at the Atalaya pit and the Alfredo underground mine, down to approximately the 135 m elevation.

At the Planes-San Antonio deposit, the massive sulfides are planar and are represented by two orebodies. The first is the Planes deposit, which is overlying the pyrite stockwork and is completely mined out; and the second is the San Antonio deposit, which occurs outside the limits of the stockwork and is intercalated with pyroclastic volcanic rocks. The San Antonio deposit is a pyritic stratiform sheet, apparently formed as a chemical sediment on the sea floor (Williams, Stanton y Rambaud 1975). The San Antonio massive sulfide mineralization contains more than 40% S, is enriched in Cu, Pb, and Zn, and has a maximum thickness of 38 m. Laterally, the massive orebody splits in several bands separated by barren tuffs.

7.3.3 Gossan

Gossans and secondary mineralization have formed in places over the stockwork and sulfide mineralization. Leaching and oxidation of an important volume of sulfides in Cerro Colorado and minor amounts in the Atalaya open pit developed extensive gossans, which were previously mined for gold and silver. Gossans and supergene enrichment zones are characterized by the occurrence of secondary minerals goethite-limonite and chalcocite-covellite respectively. Gossan has also been mined at Planes 50 m west of the Planes shaft (Williams, Stanton y Rambaud 1975). Gossans and secondary mineralization have been mined out and are no longer a significant Resource.

8. DEPOSIT TYPES

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

Riotinto is a Volcanogenic Massive Sulfide (VMS) deposit located in the Iberian Pyrite Belt (IPB), which forms part of the Hercynian orogenic belt.

VMS deposits form in or near the seafloor where circulating hydrothermal fluids are formed in extensional tectonic settings of oceanic seafloor (including mid-ocean ridges, volcanic arcs, back-arc basins, rifted continental margins, and pull-apart basins), driven by magmatic heat and quenched through mixing with bottom waters or porewaters in near-seafloor lithologies. They are generally stratiform and may occur as multiple lenses. The volcanic-hosted massive sulfide mineralization derives from a single genetic process, but shows different morphological forms (stockworks, stratiform massive sulfides, disseminations) that may occur in a close spatial relationship or be isolated.

At Riotinto there are several deposits genetically related, with different morphologies and lithological relationships between the sulfides and the host rocks.

Filón Sur and San Dionisio are massive sulfide bodies closely associated with black slate, with local incorporation of slate in the massive sulfide and local impregnations of sulfide in the slate.

Filón Norte covers several deposits: Salomón, Quebrantahuesos, Dehesa, Lago, Mal Año and Argamasilla. Sub-seafloor replacement of the country-rock by massive pyrite has been described as the process responsible for the genesis of Salomón and Quebrantahuesos bodies. Remnants of stockwork-type mineralization within chloritic felsic lithologies near Dehesa and the presence of sericitic volcanic rocks in the hanging wall side suggest a replacement genesis for the Filón Norte deposit.

Sub-seafloor replacement of pelitic units has been described by several authors as the most efficient mechanism of deposition at Filón Sur and San Dionisio, but an extensive study of the geology and the mineralogy of the San Dionisio sulfide body strongly indicates that the deposition of sulfides is the replacement of a favorable previously folded volcanic horizon.

The best development of copper or cupriferous stockwork underlies the massive sulfide body of San Dionisio and is characterized by intense pyritic veining in sericitic and chloritic felsic volcanic rocks (*cloritas*) but is also locally observed at Filón Sur and Filón Norte. Lower copper grade stockwork is extensively developed at Cerro Colorado and extends over a surface area around 3 km^2.

Planes–San Antonio represents the transition from a proximal massive sulfide zone replacing felsic tuffs (Planes) into a distal sedimentary association with massive sulfide interlayered with volcaniclastic lithologies (San Antonio), suggesting formation by exhalative processes in the sea bottom.

The sulfide deposits are dominantly pyrite, with minor chalcopyrite, sphalerite, and galena in various proportions depending on the location. Chalcopyrite is the dominant sulfide at Cerro Colorado, where Pb and Zn are important components of the San Dionisio and San Antonio deposits. The relationships between the orebodies and country rocks suggest that the Riotinto deposits display a spectrum of ore types from massive sulfide deposited by subsurface replacement of the volcanic host rocks, through deposition at or close to the rock/seawater interface in close association with black shales, into typical sedimentary exhalative deposition at some distance from the source of the hydrothermal fluids.

According to Atalaya Mining and based on the environment of formation, and the spatial association with felsic volcanics, the Riotinto volcanic-hosted pyrite-chalcopyrite (Pb-Zn) deposit could be classified as felsic siliciclastic VMS of Kuroko type.

9. EXPLORATION

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

Since 2014, Atalaya has completed exploration, Resource, and development drilling programs in the Riotinto mining area. Exploration activities, including exploration drilling, had been carried out in selected prospect areas within the PRT and outside the current mining area to find new Resources and/or to confirm Resources exposed by historical reports.

Previous exploration activities such as historical data compilation and exploration drilling at San Dionisio and Filón Sur had evolved to Resource drilling.

No further exploration activities have been carried out in or around the known mineralized areas of Cerro Colorado, San Dionisio, and San Antonio after the last update of the Technical Report in 2018, except for the continuous update of the geological mapping of the current pits and surrounding areas.

10. DRILLING

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

10.1 Drill Programs

Historical drilling at Proyecto Riotinto has been done from 1892 until 1996 by the companies who owned the project. The historical drilling data was compiled and validated by EMED between 2008 and 2011. Further drillhole data validation has been done by Atalaya and, more recently, by Alan Noble and Mónica Barrero Bouza for the San Dionisio and San Antonio drilling data.

Atalaya exploration and resource drilling started in April 2014 and continues to present. A brief description of the historical drilling data and Atalaya drilling programs for the different deposits is given below, and a summary of the drilling programs completed at the Project is shown in **Table 10-1**.

Table 10-1: Description of the drilling programs undertaken at PRT

Drilling Program/Series	Number of Holes	Total Drilling (m)
Cerro Colorado		
Legacy	682	142,355
CCR	12	1,480
ETR and RT	361	28,659
RTD 2017	28	5,437
FS (Filón Sur)	43	10,255
Geotech	6	1,170
ARD	3	769
Geotech 2018	11	1,061
Special (PZ and SA)	5	167
RT 2018	41	8,557
RT Penalty 2019	54	11,180
RT Penalty 2020	164	18,880
RT 2021	43	6,800
Total	**1,453**	**236,770**
San Dionisio		
Legacy	949	65,611
1996 holes	9	1,033
Atalaya	45	16,911
Total	**1,003**	**83,554**
Planes		
Atalaya 206	8	918
Total	**8**	**918**

Drilling Program/Series	Number of Holes	Total Drilling (m)
San Antonio		
Legacy UG	157	9,963
Legacy Surface	20	6,838
Atalaya 2015	8	1,504
Total	**185**	**18,305**

10.1.1 Cerro Colorado

Atalaya's drilling programs completed since 2014 are:

- 2014-2015 Cerro Colorado drilling program: Consisted of expansion and infill drilling, mainly RC drilling, in areas of known mineralization within the Cerro Colorado pit. The purpose of this program was to better define the shallow mineralization, to provide more detailed information to optimize the mine production during the initial mining phases in 2015, and to define Resources containing penalty elements, such as Sb and As, that might need special metallurgical treatment.
- 2016-2018 RT-Resource drilling program: RC and Diamond infill drilling in the Cerro Colorado open pit area to convert Inferred Resources to Indicated and Measured. The program also includes deep drilling at Filón Sur, up to 800 m depth, to define the massive sulfide at depth and its eastern extents.
- 2019-2021 RT-Resource drilling program: RC and diamond drilling in the Cerro Colorado open pit for infill drilling and penalty element evaluation.

The location of the RC and diamond drillholes completed during historical and Atalaya drilling programs are shown in **Figure 10-1**.

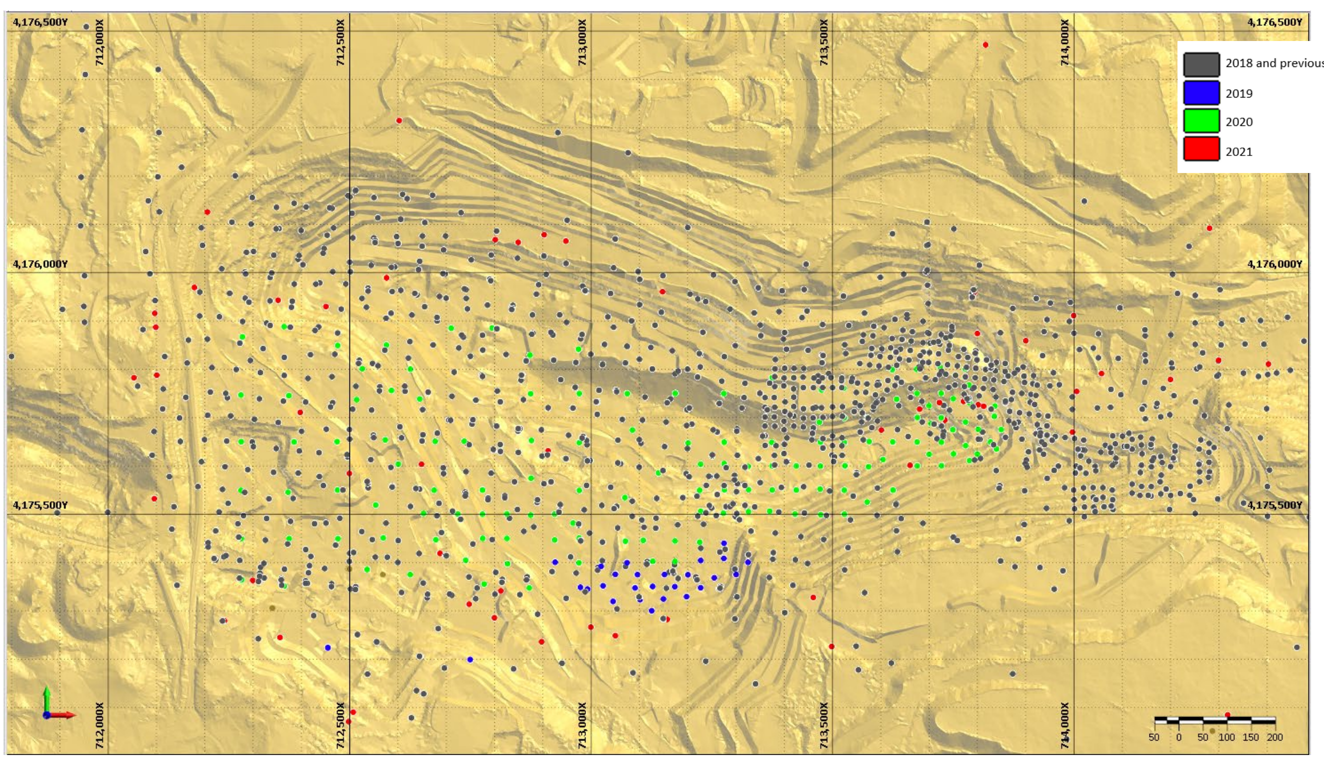


Figure 10-1: Drilling at Cerro Colorado

Since the last Mineral Resource and Reserves update in 2018, Resource drilling included a total of 302 holes with a total of 45,417.10 m; 164 of the 302 infill holes were targeted to define the shape and size of the Sb and As enriched zones.

10.1.2 San Dionisio

In 2021, the historical EMED drillhole database was reviews and checked against the available hard-copy data consisting of geological drillhole logs, laboratory certificates, drillhole sections, and several reports. A total of 949 historical holes were validated (65,610.70 m of drilling).

Atalaya Resource drilling started in April 2015 to confirm and evaluate the shallow stockwork Resources located at the northern flank of the deposit and to gain confidence for Resource evaluation of the unmined portion of the deposit. A total of 45 surface holes (16,911 m) have been completed by Atalaya at San Dionisio from 2015 to the present. These holes have been reviewed and validated in 2021.

A plan view of the different drilling programs at San Dionisio is shown in **Figure 10-2**.

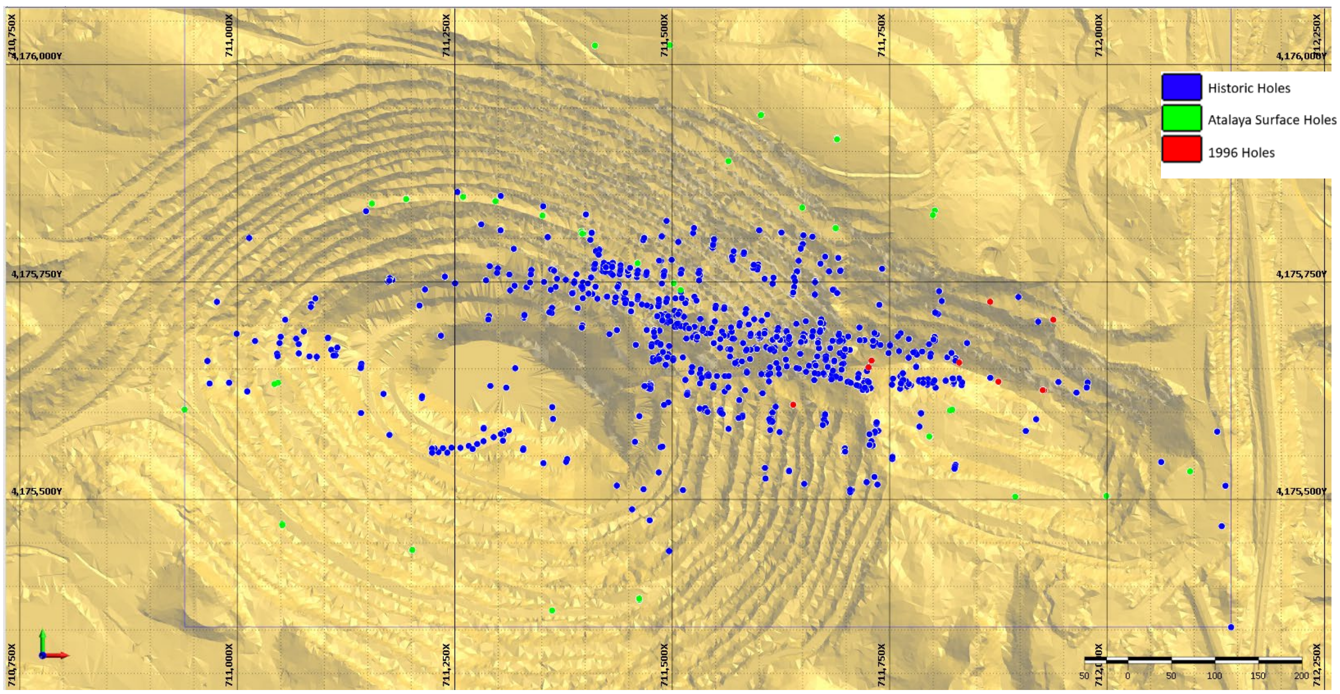


Figure 10-2: Drilling at San Dionisio

10.1.3 San Antonio

During 2021, the historical EMED drillhole database was reviewed and checked against the available hard data, which included geological drillhole logs, laboratory certificates, drillhole sections, and several reports. The core for the historical holes is not available for inspection. A total of 177 historical holes have been validated, including 157 underground holes (9,962.67 m of drilling) and 20 surface holes (6,838.17 m of drilling).

In 2015, Atalaya performed limited drilling program in the western part of the deposit, with the aim of confirming grades and intercepts. Drilling included 8 diamond drillholes for 1,504.2 m of drilling. The orebody was intersected by most of the holes; however, grades were slightly lower than expected.

A plan view of the different drilling programs accomplished at the San Antonio deposits is shown in **Figure 10-3.**

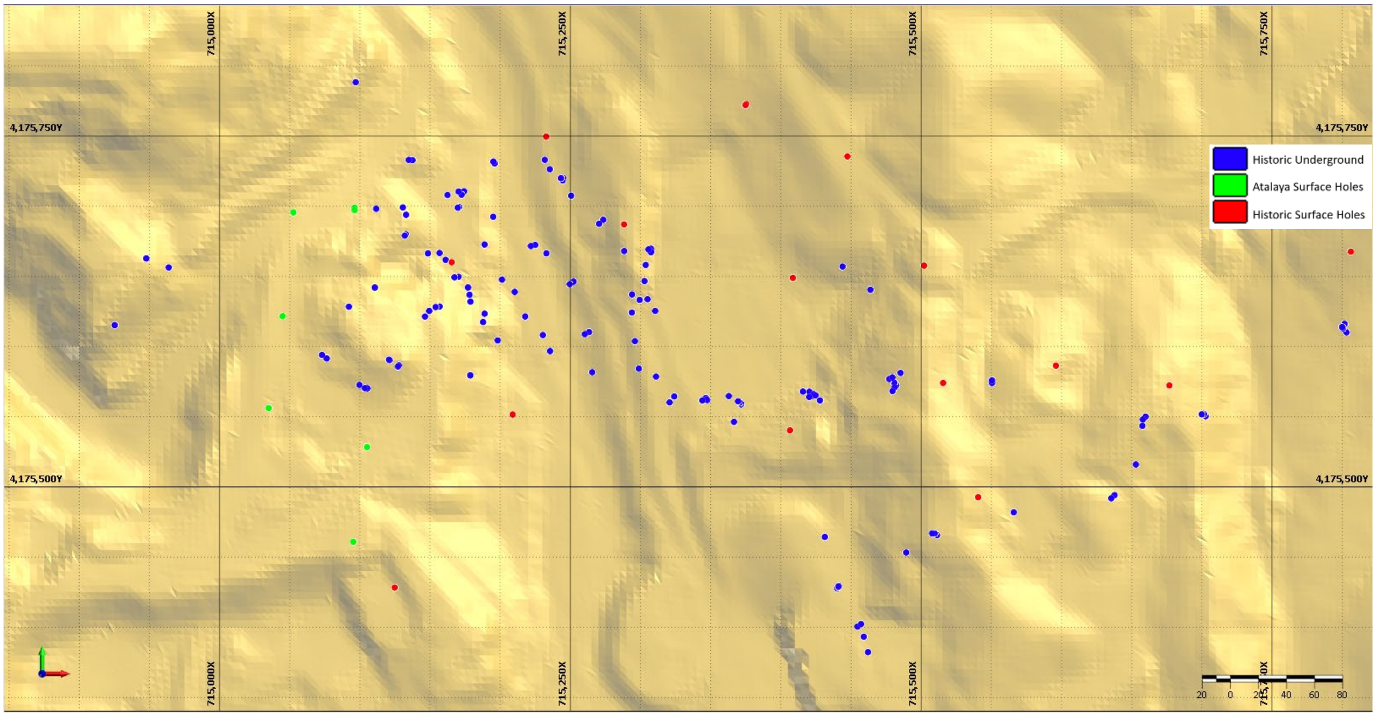


Figure 10-3: Drilling at San Antonio

10.1.4 Planes

In 2016 Atalaya performed a short drilling program to explore the stockwork below the mined massive sulfides and to assess the remaining mineralized and unmined areas. The program consisted of 8 drillholes for 918.2 m of drilling, both reverse-circulation, and diamond drilling. The mineralized intercepts were considered to be limited, and the program was concluded. This drilling was not considered for the Resource estimation.

10.2 Drilling and Sampling Procedures

The main objectives of Atalaya drilling programs are to confirm or gain confidence and expand the historical Resource of the project through confirmation, infill, and exploration drilling. Drilling programs are planned and monitored by the Exploration Department of Atalaya.

Atalaya began its drilling programs in 2014, completing several drilling programs within Proyecto Riotinto. Reverse Circulation (RC) has been the main drilling method, although diamond (DDH), and mixed RC-DDH drillholes have also been drilled when necessary. The main drilling operator for Atalaya Mining is SPI (Sondeos y Perforaciones Industriales del Bierzo S.A.)

The Atalaya's Exploration Department has well established procedures that comply with international industry standards for drilling management, chip and core logging, sampling and sample preparation, and sampling and assaying QA/QC.

11. SAMPLE PREPARATION, ANALYSES AND SECURITY

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

11.1 Summary

The Project drillhole database includes sample data from reverse circulation and core drilling, both surface and underground. Drilling has been performed from 1892 until present by a variety of operators.

Little documentation is available on diamond core drilling, sampling procedures, and security methods employed by Riotinto Company and RTZ, Freeport-McMoRan, and MRT. However, drilling was conducted by companies experienced in exploration and production and is considered reliable. At that time, Riotinto had its own company standards, which were followed throughout exploration projects and operations in Spain and elsewhere.

Drilling, sampling, assaying, and security procedures employed by Atalaya are described and documented in this report and are considered to have been performed to industry standards and are sufficient to support Resource estimation.

11.2 Sample Storage and Security

There is no information on sample storage or sample security or core from the historical holes.

Security of Atalaya samples is based on procedures designed by the company and sample collection and transport, sample handling, and sample preparation are completed by company personnel and using company vehicles. Samples are always attended or locked at the company facilities.

Samples collected at drillholes are initially transported and delivered to the main logging shed for logging purposes (**Figure 11-1**). Once the logging and sampling have been performed, core samples are transferred to the permanent core shed, shown in **Figure 11-2**. Both facilities are locked and secure.

Figure 11-1: Core boxes prepared for logging and sampling at the logging shed

Figure 11-2: Outside and inside views of the permanent storage core shed

Coarse rejects from reverse circulation (RC) drilling are stored on site in plastic drums to prevent moisture, and in a fenced and secure yard, as shown in **Figure 11-3**.

Figure 11-3: Storage Yard for RC Cuttings rejects

11.3 Sample Handling and Preparation

No information is available on the sampling and sampling preparation procedures employed historically at Proyecto Riotinto, but the mine had its own sample preparation facility and an in-house laboratory. There are no details available for the sampling methodology and whether it met current industry standards, but the company had its own company standards at that time.

Since the project has been owned by Atalaya, RC and core samples are prepared and assayed at the Atalaya laboratory using the sample collection and preparation flow charts shown in **Figure 11-4** and **Figure 11-5**.

Before delivery to the Atalaya laboratory, the samples are sorted, and the control samples are inserted into the batch of samples by the project geologist (standards, blanks, and duplicates) for QC purposes. For RC samples, the QC procedures also include the insertion of 2 individual samples of 1 m drill interval per hole, to check the representativeness of the 2 m sampling interval.

A submission order is generated when the batches are submitted to the Atalaya laboratory facility located at Minas de Riotinto for further sample preparation and assaying.

The RC and core samples are reduced through splitting, crushing, pulverizing, and quartering to get a final pulp sample of approximately 125 g that is assayed at the Atalaya's laboratory onsite.

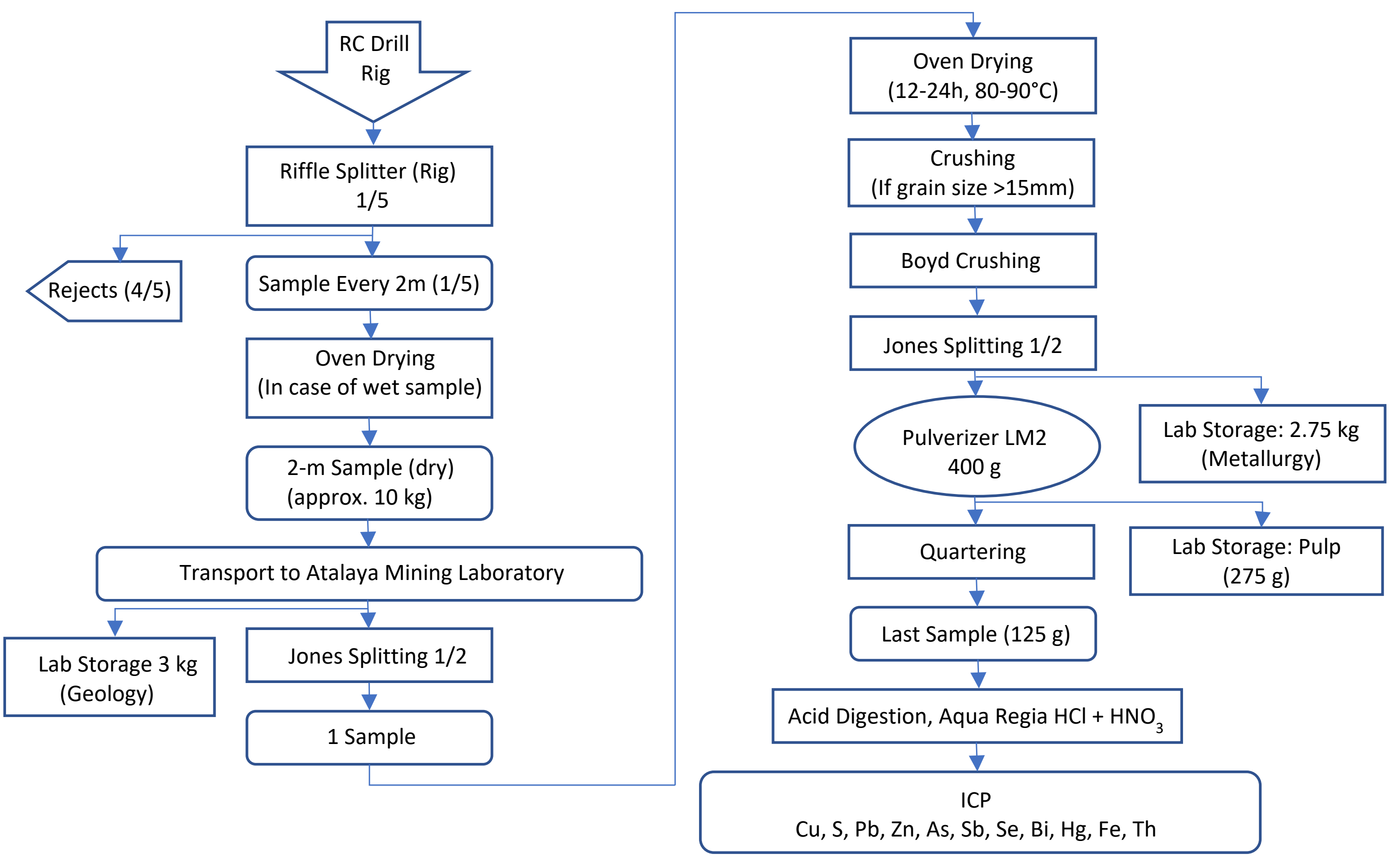


Figure 11-4: Sample Collection and Preparation Flow Chart for RC samples

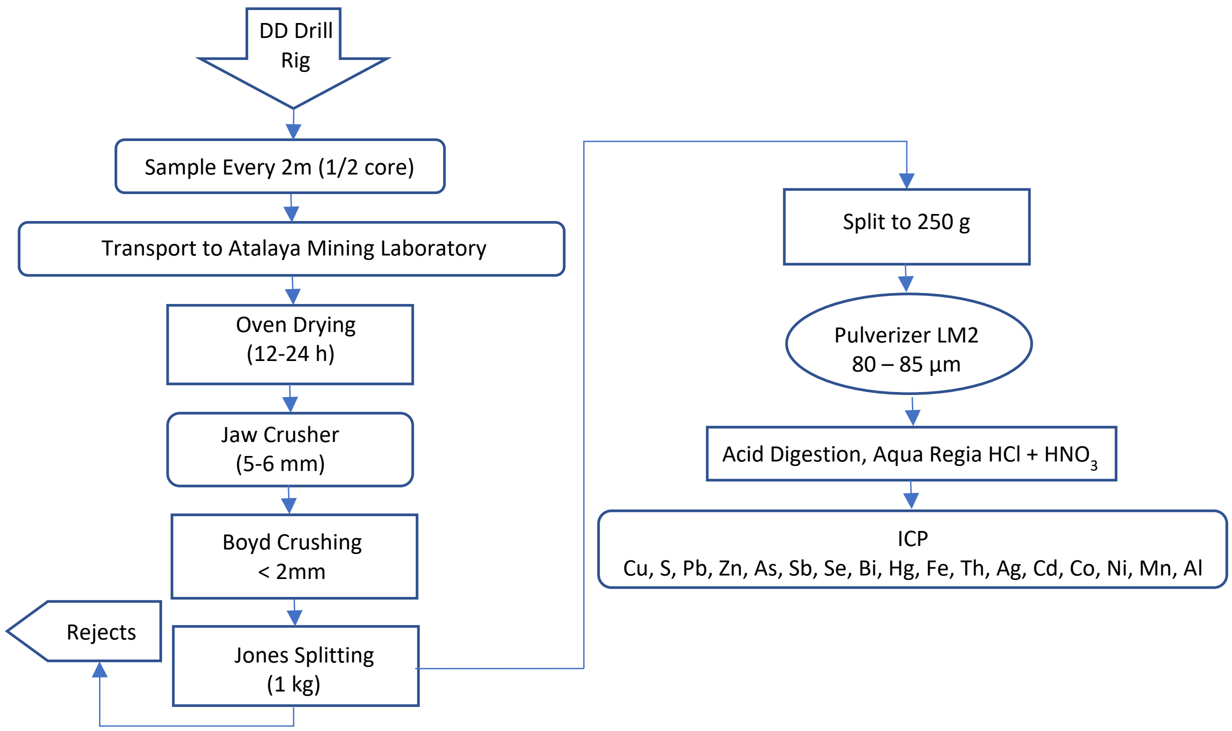


Figure 11-5: Sample Collection and Preparation Flow Chart for drill core samples

11.3.1 Reverse Circulation

The sample is collected from a splitter that is directly connected to the cyclone of the RC rig. The splitter divides the bulk sample into $^{1}/_{5}$ and $^{4}/_{5}$ portions. The two portions are weighed (bulk weight) and dried, and the data is recorded in a spreadsheet for further recovery estimation. The $^{1}/_{5}$ portion is further split before being delivered to the sample preparation laboratory, and the $^{4}/_{5}$ portion is rejected. The $^{1}/_{5}$ portion sample represents a 1 m length sample.

After the 1 m samples are taken, Atalaya's rig operators prepare a composite sample every 2 m for assay. The procedure includes a further split of the two 1 m samples, mixing and homogenizing the sample, and further splitting before the sample is prepared for assaying.

Depending on recovery, the weight of the final $^{1}/_{5}$ dried sample varies between 6 and 10 kg.

11.3.2 Diamond Drilling

Diamond core is collected at the drill rig by a trusted driller who is directly contracted by Atalaya. The core is placed by the driller in core boxes. Markers are placed in the core boxes clearly indicating the drill depth at the end of each drill run. Each box is identified using a permanent marker, with a box number and from-to depths.

The core is transported to the secure core shed by two workers from the Atalaya exploration department using a pickup truck, where a digital photograph is taken of each core box. The core is inspected and logged by the Atalaya project geologists. The typical sampling length used for the Resource drilling program is 2 m but can vary according to lithological variations and program requirements. The drill core samples are split into two halves using commercial diamond saws, with one half placed in a new plastic bag along with a sample tag and the other half is placed back into the core box. The sample bags containing the selected half-core are submitted to the Atalaya laboratory for sample preparation.

11.3.3 Density Determination

There are historical records, mainly in technical and internal reports, with density data of the mineralized and unmineralized core intervals. There is no evidence of which method was used for density determination.

Atalaya performs density determinations on core samples of 15-20 cm length using the water immersion method, consisting of weighing the wet core samples in air and then weighing the core sample submerged in water. Weight readings are performed with a calibrated high-precision scale. The density determination is obtained by dividing the weight of the core sample in air by the apparent weight of the sample submerged in water.

The samples for density determinations are selected by the Project Geologist. The density determination is performed by a senior field assistant under the supervision of the Project Geologist.

Density measurements were completed using raw core samples; samples are not coated or sealed in plastic prior to immersion. Where there is significant porosity in the samples, measuring density without coating or sealing the samples results in density measurements that are biased high. While porosity appears to be minimal, it should be considered whether coating or sealing is justified for future density measurements.

11.3.3.1 Bulk Density

Bulk density formulas have been calculated for each mine area, using an adjustment for the sulfur content, as detailed in the following sections.

Cerro Colorado

Bulk density is estimated using a formula correlating density and sulfur grade. Data for the correlation were sulfur assays and specific gravity measurements that were done on blasthole cuttings. The samples were taken from the Cerro Colorado (low sulfur) and Salomon (high sulfur) areas of the mine, primarily during 2000. These measurements, shown in **Figure 11-6**, demonstrate increasing density with increasing sulfur. While this correlation is significant, the correlation coefficient is only 0.629, so there is still considerable variability around the trend.

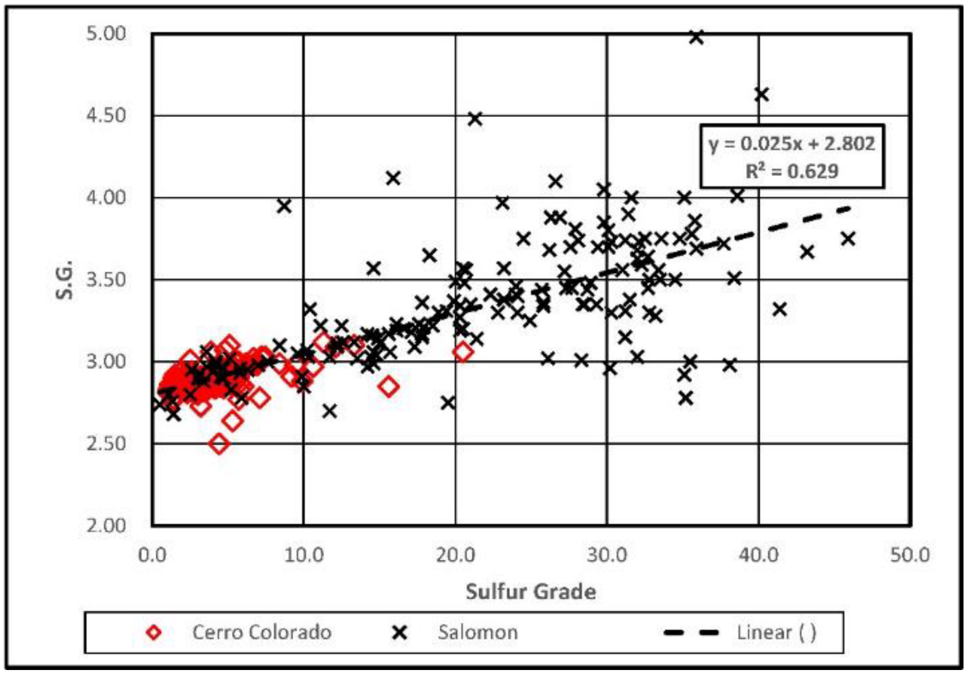


Figure 11-6: Correlation between Specific Gravity and Sulfur Grade – 2000 Data (Ore Reserves Engineering 2022)

A second investigation of the correlation between specific gravity and sulfur grade was conducted in 2010 as part of a comparison between ALS check assays and historical Rio Tinto Mining assays. The results of this study, shown in **Figure 11-7**, show an excellent correlation between the ALS sulfur assays and the ALS measured specific gravity. These data also show an increasing relationship between S.G. and sulfur grade, but with much less scatter around the regression line and a much higher correlation coefficient of 0.845. The correlation is improved because the S.G. is measured on larger pieces of core compared to small pieces of blast hole cuttings in the 2000 study. Outliers shown as orange points on the chart were reported to be porous, weathered rock that is not representative of the copper Resource.

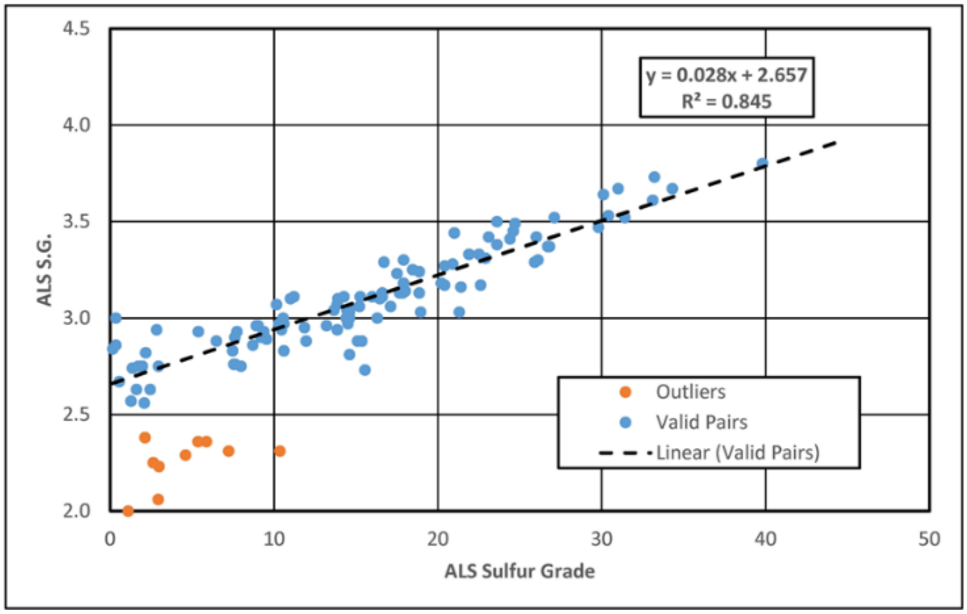


Figure 11-7: Correlation between Specific Gravity and Sulfur Grade – 2010 Data (Ore Reserves Engineering 2022)

The Cerro Colorado density formula is based on the year 2000 data with a slight discount on the constant from 2.8 to 2.7 to account for void space and fracturing in the in-situ rock.

$$\text{Density} = 2.7 + (0.025 \text{ x } \%\text{S})$$

The 2010 work suggests that the constant may be lower than indicated by the Resource formula, but the slope of the line may be steeper than the slope of the Resource formula. Thus, low-sulfur rock may be lighter than suggested by the Riotinto formula, and high-sulfur rock may be heavier. These differences are minor, however, and the effect on Resources is negligible.

San Dionisio

Bulk density is estimated using a formula correlating density and sulfur grade. Data used for the correlation were sulfur assays and specific gravity measurements that were done on 20 drill core samples of Atalaya drillholes. The samples were taken from the San Dionisio low sulfur stockwork, chlorites and massive sulfides cores during 2021. Density determination was performed on site using the water immersion method. The results of this study demonstrate an excellent correlation between sulfur grades and measured density, as shown in **Figure 11-8**. The estimated density formula agrees with historical density data for high sulfur zones above 45% S.

The San Dionisio density formula when estimated sulfur is above 17% is:

$$\text{Density} = 2.39 + (0.0431 \text{ x } \%\text{S})$$

The regression line shows a crossover with Cerro Colorado density regression at 17.1% S. Below this sulfur content, density estimated by the San Dionisio formula is lower than the density estimated using Cerro Colorado formula, for this reason, below 17% the Cerro Colorado formula is used.

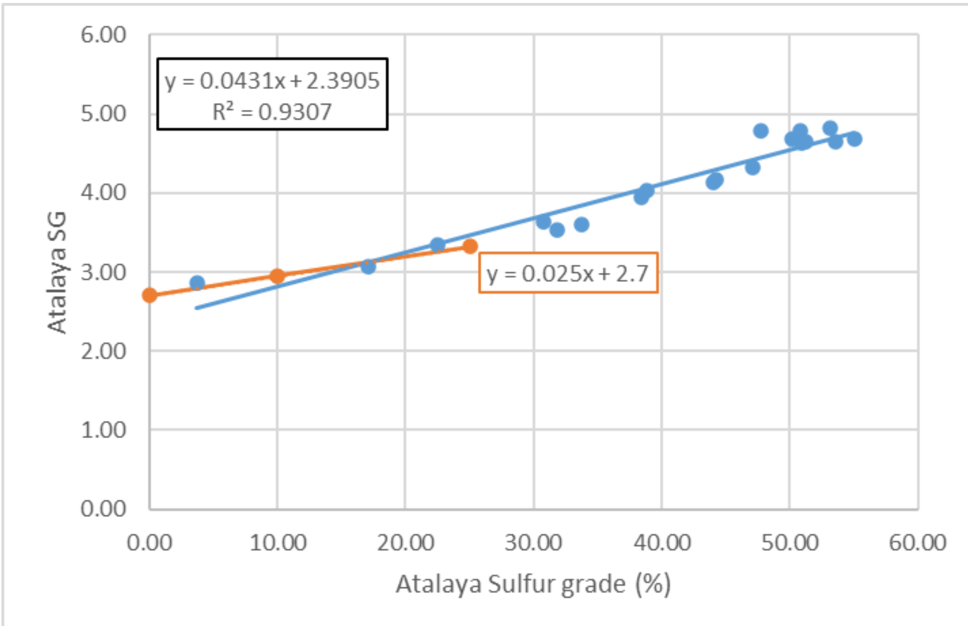


Figure 11-8: Correlation between Specific Gravity and Sulfur Grade – San Dionisio 2021 Data (blue) and Cerro Colorado 210 Data (orange), (Noble 2022)

San Antonio

Bulk density is estimated using a formula correlating density with sulfur and zinc grades. Data for the correlation were historical sulfur and zinc assays and specific gravity measurements that were done on drill core samples (RTZ Consultants Limited 1974). The samples were taken from drill cores of the San Antonio 8, 9, and 11 levels. The density determination method is unknown.

The results of this study demonstrate a good correlation between combined sulfur and zinc grades and measured density (one outlier excluded), as shown in **Figure 11-9**.

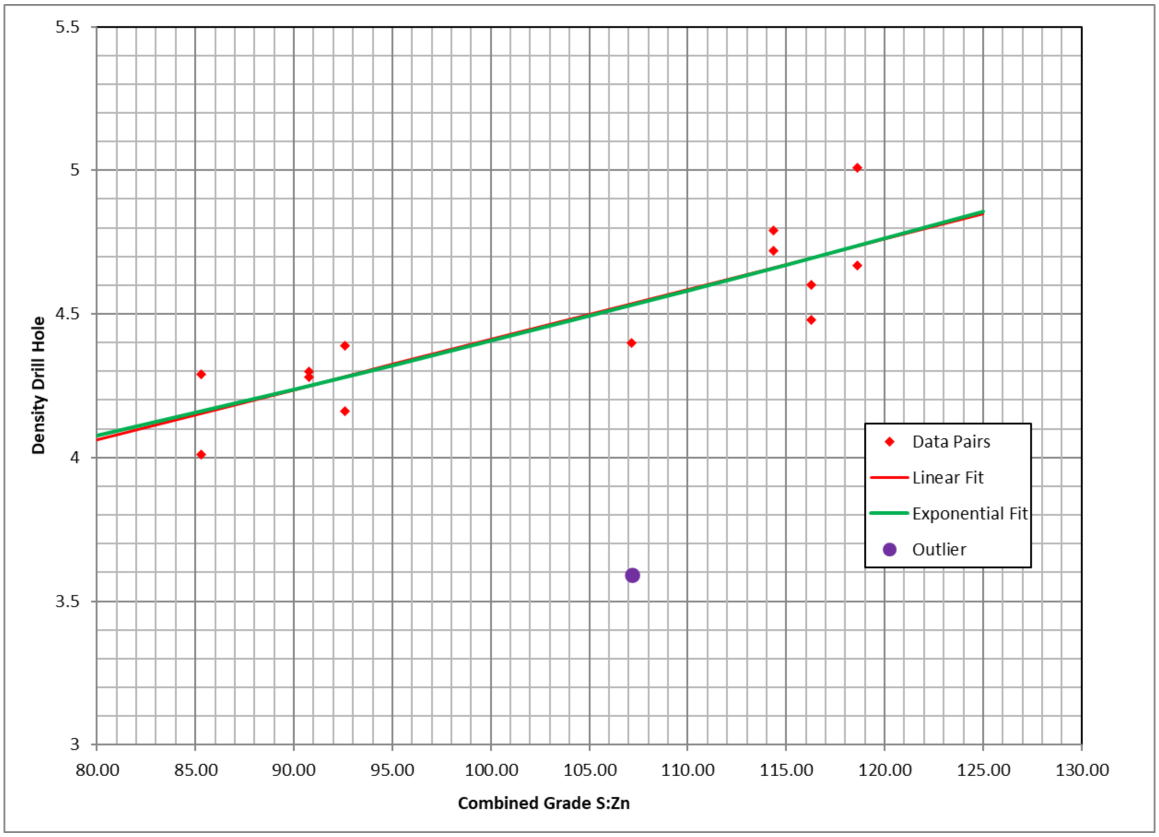


Figure 11-9: Correlation between Specific Gravity and Sulfur& Zinc Grades – San Antonio 1974 Data (Noble 2022)

The San Antonio density formula is:

Density = 2.6654 + (0.0175 * (2.427*% S_IDP+1.543*% Zn_IDP))

In those cases where the estimated zinc grade is absent, the density formula used only considers the estimated sulfur grade:

Density = 3.5695 + (0.0241 * % S_IDP)

11.4 Historic Data Confirmation

Historic data confirmation was carried out by the previous author's and has been reviewed by Tetra Tech.

11.4.1 San Dionisio Historical QC Data

The copper, sulfur, lead, and zinc assay data of half- and quarter-core check assays dated in 1986 were extracted from laboratory certificates from the in-house laboratory of RTM and double-checked in historical Laboratory Books. These check assays are from only three holes and are a very small sample of the total drilling. In addition, it is very difficult to make a quarter-core split from a previous one-half core split without introducing sampling bias. Thus, these results must be viewed with caution. The results of half-core splits compared with quarter-core splits are presented in **Table 11-1**.

The comparison of results shows that the quarter-core copper assays are 12% lower than half-core assays, and that the differences are statistically significant.

The quarter-core sulfur assays are 2% lower, and the differences are also statistically significant.

The lead is 11% lower on average, but the differences are not statistically significant.

The core assay checks are inconclusive for zinc. The quarter-core assays are 11% lower, but the differences are not statistically significant above 0.5% Zn; thus, the zinc assays are believed to be acceptable. When the data pairs of zinc assays are compared graphically, it is noted that there is a group of assays which do not align around the 1:1 line (**Figure 11-11**); this is likely due to a transcription error on the decimal point of the original assays.

While the above differences are significant on both a practical and statistical basis, it is quite possible that they are related to sampling biases when splitting the quarter-core samples.

Table 11-1: San Dionisio Historical: comparison of half and quarter core splits

Grade Range		Number of Pairs	½ Core		¼ Core		Difference			Relative difference (%)	Ratio (x/y)
Min	Max		Avg	Std Dev	Avg	Std Dev	Avg	Std Dev	t-dist (%)		
Copper											
0	10	78	1.203	0.994	1.063	0.871	0.140	0.183	0	11.6	1.132
0.5	10	50	1.706	0.905	1.494	0.808	0.213	0.187	0	12.5	1.142
1	10	35	2.085	0.820	1.831	0.737	0.254	0.196	0	12.2	1.139
Sulfur											
0	100	78	47.227	9.218	46.202	9.237	1.024	2.190	0.01	2.2	1.022
20	100	75	49.040	1.279	47.991	2.101	1.049	2.228	0.01	2.1	1.022
45	100	74	49.059	1.277	48.080	1.968	0.980	2.160	0.02	2.0	1.020
Lead											
0	10	78	0.671	0.991	0.596	0.850	0.075	0.376	8.25	11.2	1.126
0.1	10	49	1.023	1.111	0.900	0.951	0.123	0.469	7.29	12.0	1.137
0.2	10	29	1.636	1.077	1.431	0.912	0.204	0.599	7.70	12.5	1.143
Zinc											
0	10	78	1.476	1.950	1.252	1.845	0.223	0.623	0.2	15.1	1.178
0.5	10	42	2.465	2.218	2.204	2.092	0.261	0.831	4.8	10.6	1.118
1	10	25	3.548	2.303	3.318	2.066	0.230	1.036	27.8	6.5	1.069

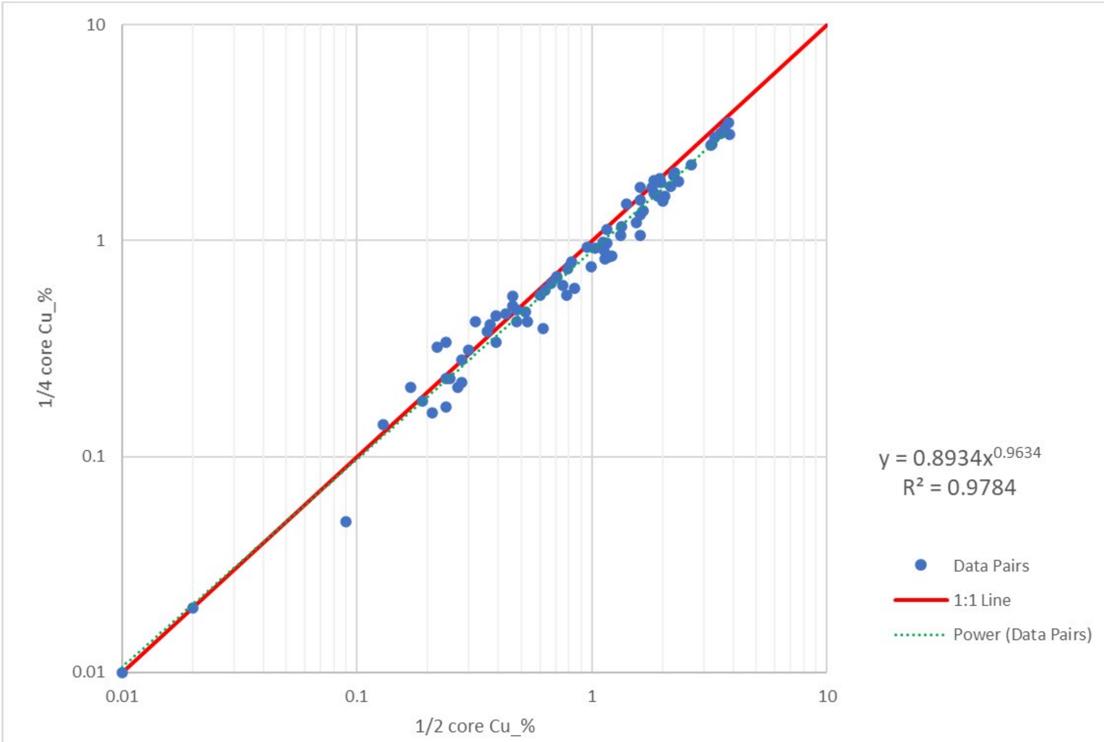


Figure 11-10: Logarithmic plot comparing the copper assays of half and quarter core splits (Ore Reserves Engineering 2022)

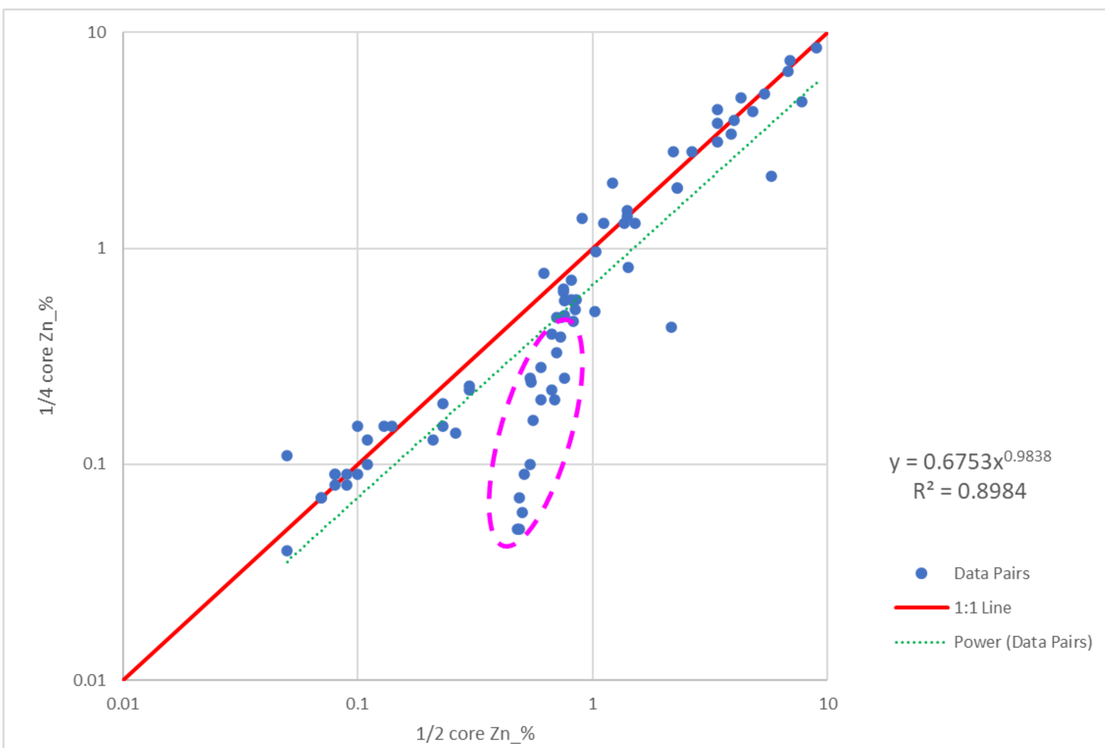


Figure 11-11 Logarithmic plot comparing the zinc assays of half and quarter core splits (Ore Reserves Engineering 2022)

11.4.2 San Antonio Historic QC Data

QC measures on historical core samples of San Antonio drilling have been extracted from legacy reports (RTZ Consultants Limited 1974). The statistics of copper and sulfur assays of the crushed duplicate pairs show no statistically significant bias between the pairs, as summarized in **Table 11-2**.

Table 11-2: Historical crushed duplicates from San Antonio, RTZ 1974 (Ore Reserves Engineering 2022)

Primary	Duplicate	Count	Average Primary	Average Duplicate	Difference	Std Deviation	Relative Difference	t-dist (%)
Cu_P	Cu_D	9	2.006	2.053	-0.0478	0.276	-2.4%	62%
S_P	S_D	9	39.580	38.567	1.0133	1.532	2.6	8.8%

A t-dist. value less than 5% indicates the difference is statistically significant from zero.

Check sampling was carried out on core splits to determine if there was a significant difference between the two halves of the core. The data pairs do not show a statistically significant difference, as summarized in **Table 11-3**.

Table 11-3: Historical San Antonio check assays on core splits from RTZ 1974

Grade Range		Number of Pairs	Cu_% (ERT)		Cu_% (RTZC)		Difference			Relative difference (%)	Ratio (x/y)
Min	Max		Avg	Std Dev	Avg	Std Dev	Avg	Std Dev	t-dist (%)		
0	10	7	2.61	1.57	2.54	1.49	0.07	0.27	52	2.63	1.03
0	2	4	1.44	0.31	1.49	0.55	-0.03	0.33	87	-2.09	0.98
2	10	3	4.17	0.91	0.55	0.93	0.20	0.09	15	4.80	1.05

11.4.3 Results of Internal Duplicate Samples

The geology department prepares duplicate samples of RC cuttings as an independent QA/QC procedure from the internal QA/QC done at the Atalaya laboratory. The duplicate pairs for the Cerro Colorado drilling assay data between 2018 and 2021 show no statistically significant bias between the pairs, either on an overall basis or within grade ranges, except for the assays below 0.1% Cu, as summarized in **Table 11-4**.

Table 11-4: Statistical Summary of Duplicate Samples Prepared by Geology Department (Ore Reserves Engineering 2022)

Grade Range		Number of Pairs	Primary Cu%		Duplicate Cu%		Difference			Relative difference (%)
Min	Max		Avg	Std Dev	Avg	Std Dev	Avg	Std Dev	t-dist (%)	
0	0.10	100	0.033	0.025	0.030	0.022	0.003	0.011	2	8.4
0.10	0.20	24	0.149	0.034	0.154	0.047	-0.005	0.028	41	3.3
0.20	0.50	36	0.328	0.071	0.325	0.106	0.003	0.089	85	0.9
0.50	100	62	1.488	1.353	1.376	1.191	0.112	0.475	6.9	7.5
0	100	222	0.499	0.947	0.467	0.852	0.032	0.257	6.2	6.5
0.10	100	122	0.882	1.145	0.825	1.019	0.057	0.345	7.3	6.4

The results are shown graphically in **Figure 11-12**. Three outliers are observed and are likely the result of a misplaced decimal point or bad coding. It is recommended that Atalaya re-assay the entire batch that included these samples to resolve the question.

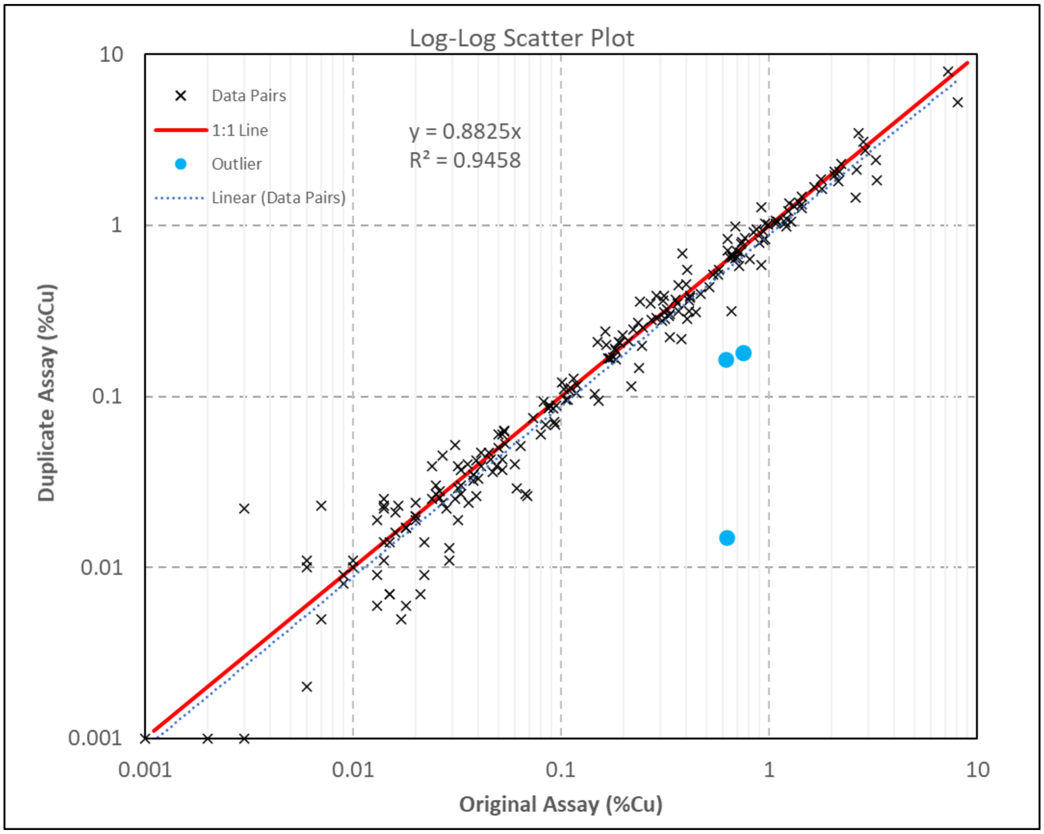


Figure 11-12: Internal duplicate assays (Ore Reserves Engineering 2022)

11.4.4 Results of Certified Reference Materials (CRMs) and Blanks

Five CRMs prepared by Geostats Pty Ltd, of O'Connor, WA, Australia were used by the Exploration Department of Atalaya to routinely monitor assay quality control of the in-house laboratory. The results of the 2018-2021 reference assays, as summarized in **Table 11-5**, suggest that the Atalaya laboratory copper grades average slightly lower than the reference assays. Although the differences are statistically significant for three of the five standards, the relative differences are small and do not have practical significance for Resource estimation.

Although reference assays are not available for the blanks, all assays are very low grade, with an average of 0.011% Cu in 419 assays.

Table 11-5: Summary of Certified Reference Sample Results from the Atalaya Riotinto Laboratory (Ore Reserves Engineering 2022).

Certified Control Values (Geostats Pty)				Atalaya On Site Lab			Difference			
Sample	Number of Assays	Grade Cu (ppm)	Std Dev	Number of Assays	Grade Cu (ppm)	Std Dev	Diff	Std Dev of Diff	t-test (%)	% Rel Diff
GBM316-10	78	0.4554	0.0146	343	0.445	0.014	-0.011	0.002	0	-2.4
GBM906-10	66	0.1916	0.0081	157	0.191	0.010	-0.001	0.001	62.32	-0.3
GBM910-5	89	0.7952	0.0089	137	0.767	0.023	-0.028	0.002	0	-3.5
GBM910-6	87	0.0309	0.0309	103	0.970	0.025	-0.038	0.004	0	-3.8
GBM914-5	148	0.0501	0.0501	45	1.307	0.048	0.015	0.008	7.52	1.2

11.4.5 Results of External Duplicate Samples

Starting in December 2016, duplicate samples are submitted periodically to ALS (Omac) laboratory in Ireland. AGQ laboratory in Sevilla, Spain, and the Alex Stewart International laboratory in Bilbao were used as umpire laboratories in the past. Since 2018, ALS is the main external umpire laboratory.

Since August 2018, a total record of 800 duplicate samples is available in eight lots. Paired statistics for the samples are summarized in **Table 11-6**. The results are shown graphically in **Figure 11-13**. These statistics show all lots are within acceptable tolerances for Resource estimation.

Table 11-6: Summary of External Sample Results by lot and by grade range (Ore Reserves Engineering 2022)

Sample	Number of Pairs	External Lab Cu (%)		Riotinto Lab Cu (%)		Difference			% Rel Diff
		Avg	Std Dev	Avg	Std Dev	Avg	Std Dev	t-test (%)	
ALS Aug 2018	100	0.346	0.498	0.344	0.488	0.003	0.044	56.6	0.7
ALS Dec 2018	100	0.354	0.535	0.370	0.562	-0.016	0.047	0.1	-4.5
ALS Oct 2019	100	0.416	0.527	0.399	0.509	0.016	0.041	0	3.9
ALS Feb 2020	101	0.268	0.424	0.269	0.410	-0.001	0.022	70.7	-0.3
ALS June 2020	100	0.332	0.399	0.335	0.406	-0.003	0.021	10.5	-1.0
ALS Sept 2020	100	0.312	0.517	0.311	0.526	0.001	0.050	79.7	0.4
ALS Dec 2020	99	0.258	0.385	0.244	0.368	0.014	0.022	0	5.4
ALS April 2021	100	0.217	0.387	0.212	0.377	0.004	0.015	0.5	2.0
All	800		0.463	0.311	0.463	0.002	0.036	8.7	0.7

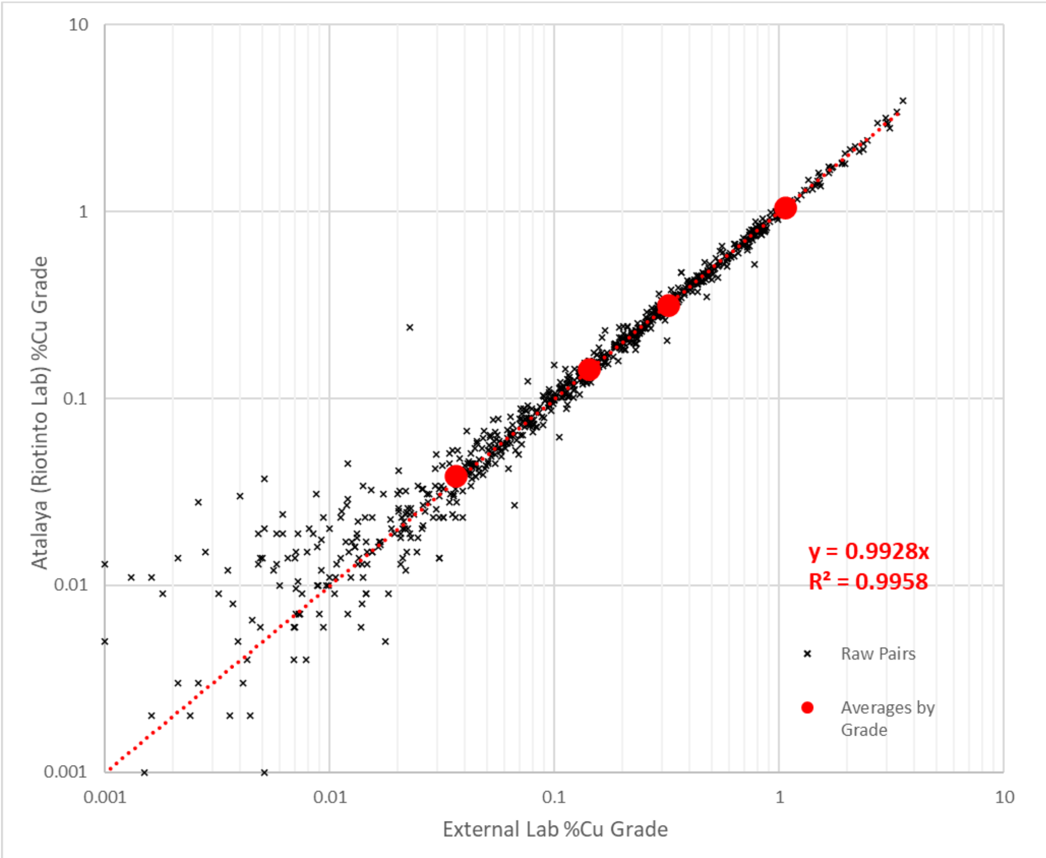


Figure 11-13: Duplicate Assays at External Labs: August 2018 to April 2021 (Ore Reserves Engineering 2022)

12. DATA VERIFICATION

Data for Proyecto Riotinto has been collected from historic and current production actuals, as well as historic and current exploration.

12.1 Geologic Data Inputs

The geologic inputs were reviewed for the Resource estimation. Historic drillhole assays for San Dionisio and San Antonio were compared against the hard copy certificates, with minor errors found and corrected. Atalaya drillhole assays were provided in digital format and compared to the laboratory certificates, with minor errors identified and corrected.

Check sampling, as described in **Section 11**, has been conducted on the assay results. There is a large quantity of current and historic data, which has been verified in a manner consistent with a study of this level and is considered adequate for the purposes of the Resource estimate.

12.2 Mine Methods Inputs

Tetra Tech conducted a site visit to the Project to verify the parameters used for mine planning are adequate for a study of this level. The visit included the operational Cerro Colorado pit, as well as the historic pit at the San Dionisio deposit. Additional data surrounding the underground deposits was sourced from historical production and geotechnical reports.

At no time was there any limitation to, or failure to provide requested technical information pertaining to mining methods. The data reviewed by Tetra Tech is adequate for use in a study of this level.

12.3 Mineral Processing Inputs

Technical and cost data were obtained during the Project site visit, previous studies by the same authors, and in subsequent communications with site personnel. The data provided by Atalaya conforms to industry standards and is within the required accuracy for a study of this level.

At no time was there any limitation to, or failure to provide the requested technical and cost data for the processing plants or infrastructure to Tetra Tech's metallurgical or infrastructure personnel.

12.4 Economic Data Inputs

Economic data provided by Atalaya staff was reviewed by Tetra Tech. The data provided conforms to industry standards and is within the required accuracy for a study of this level. Required economic data that was not provided by Atalaya was developed through benchmarking to similar projects. All economic data is adequate for use in a study of this type.

At no time was there any limitation to, or failure to provide the requested technical and cost data for the economic model to Tetra Tech.

12.5 Environmental Information

A list of current and pending permits and local environmental regulations was provided by Atalaya. Copies of the current closure plan as well as documents supporting Atalaya's environmental management program were also provided by and reviewed by Tetra Tech. The environmental information provided is adequate for the purposes of this PEA.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

This section was jointly compiled by Atalaya Mining technical staff and Jaye Pickarts, who is a Qualified Person for the purpose of NI 43-101 – Standards of Disclosure for Mineral Projects.

13.1 Summary

From 1995 to 2001 the Riotinto concentrator processed ore with similar characteristics to what is processed today. In that period a total of 23.9 Mt of ore at an average 0.54% Cu were processed, which generated information that was used to develop the design criteria and startup plan for the current operation. The old concentrator initially processed 4.5 Mtpa of ore, and an expansion increased the concentrator processing capacity to 7.3 Mtpa in 1997; a peak annual throughput of 9 Mtpa was achieved in 1998.

Metallurgical testwork results and current plant performance indicate that Riotinto mineralized material is amenable to conventional crushing, grinding, froth flotation, dewatering, and filtering processes. The mineralized material for the current operation is mined from 5 different zones (CCW, Isla, Salomon, Lago and QUEB), with different but acceptable metallurgical performance variability when processing it with conventional flotation machines and Isopropyl Ethyl thiocarbamate (IPETC)-based chemistry at basic pH of over 10.5. The optimum target P_{80} in the flotation feed has been set to 175-200 microns as a compromise between copper recovery and throughput.

Mineralized material from future Resources will contain polymetallic, primarily lead and zinc, as well as copper. Historical and recent preliminary polymetallic testwork has focused on maximizing both the metal recovery and concentrate grade. These data indicate that a finer liberation size as well as selective flotation techniques are required to achieve economic recoveries.

13.2 Polymetallic Testwork

A preliminary metallurgical investigation of the polymetallic Resources from the San Antonio and San Dionisio deposits was started in 2020. As described in Chapters 7 and 14, these deposits contain potentially economically recoverable base metals, lead and zinc, in addition to the copper, silver, and gold. The primary ore minerals are chalcopyrite, galena, sphalerite with minor amounts of tetrahedrite, covellite, and other copper complex minerals. Many of which are associated or encapsulated in pyrite.

Historical metallurgical testwork evaluated bulk sulfide and differential flotation. The presence of pyrite encapsulation required a fine grind in the range of d80 20-30 microns to liberate the ore minerals. While bulk sulfide flotation produced recoveries in the 70-90% range, concentrate grades remained very low due to the inability to selectively recover only the ore minerals.

13.3 Historical Polymetallic Testwork

The first laboratory studies of the massive polymetallic sulfides of Masa San Dionisio and San Antonio were made by ESPINDESA, and reached the following conclusions:

- By employing differential flotation, it is impossible to produce a lead concentrate, because the lead is evenly distributed between the concentrations of copper and zinc
- Bulk flotation using a sulfite oxidant to control the activation of pyrite achieved the test results shown in **Table 13-1**

Table 13-1: Historical Metallurgical Testing Results Using Bulk Flotation

Grade (%)			Recovery (%)		
Cu	Pb	Zn	Cu	Pb	Zn
11.5	5.5	23.5	85.0	69.0	90.0

Subsequently, when differential flotation was employed using SO_2, the grade improved but lower recoveries were achieved, as shown in **Table 13-2**.

Table 13-2: Historical Metallurgical Testing Results Using Differential Flotation

Deposit	Concentrate	Grade (%)			Recovery (%)		
		Cu	Pb	Zn	Cu	Pb	Zn
San Dionisio	Copper	22.0	0.82	1.93	65.0	3.4	2.8
San Dionisio	Lead	10.5	20.0	10.5	13.0	35.0	6.3
San Dionisio	Zinc	0.70	2.30	49.0	2.2	10.4	76.0
San Antonio	Copper	23.5	1.12	2.80	76.0	5.0	5.9
San Antonio	Lead	1.82	38.0	12.0	1.4	40.6	0.1
San Antonio	Zinc	0.66	2.30	58.0	1.4	6.5	78.0

An additional investigation was completed to evaluate differential flotation, bulk flotation, and bulk-differential flotation on a combined sample. Both the selective differential flotation and the bulk flotation achieved poor results. However, in the bulk-differential flotation testwork, bulk flotation was used in the roughers, followed by differential flotation of the rougher concentrate. Results of the bulk-differential flotation testwork is shown in **Table 13-3**.

Table 13-3: Historical Metallurgical Testing Results Using Bulk-Differential Flotation

Concentrate	Grade (%)			Recovery (%)		
	Cu	Pb	Zn	Cu	Pb	Zn
Copper	24.0	2.5	3.0	60.0	7.1	4.8
Lead	16.0	30.0	8.5	16.2	34.5	12.0
Zinc	2.5	3.0	49.0	5.6	7.6	70.0

Solvay completed a test program on San Dionisio mineralized material in 2021. This program focused on developing preliminary recovery data for copper, lead, and zinc using a combination of bulk flotation and differential flotation.

The bulk flotation work utilized Atalaya copper flotation conditions to produce a copper/lead concentrate. The tails were then re-floated to produce a zinc concentrate. While recoveries were high for copper, lead, and zinc, the grades were extremely low. This is consistent with the previous testwork which concluded that a finer liberation size will be required, likely minus 20 microns.

The differential tests utilized more selective copper/lead flotation followed by regrinding and cleaner flotation. The results were also very poor and due to the insufficient liberation size.

The mass pull in all of the tests were similar to Atalaya mill conditions, around 60-70%. However, even with a mass pull of 78%, the copper grade was only around 1%.

13.4 Current Testwork

A 2022 metallurgical test program was conducted by Base Met Labs (Base 2022) to assess the performance of the polymetallic samples using various floatation methods to determine the preliminary metallurgical performance of the ore minerals.

Mineralized material from the San Dionisio deposit were used for this test program. Head assays from the sample are shown in **Table 13-4**.

Table 13-4: Head Assays (Atalaya 2022)

San Dionisio	Assay, percent or g/t										Cu, Dist. %	
	Cu	Pb	Zn	Fe	S	Au	Ag	As	CuOx	CuCN	CuOx	CuCN
Head 1	1.16	0.83	3.60	36.1	50.7	0.57	32	3784	0.07	0.15	6.3	13.1
Head 2	1.16	0.81	3.60	36.1	48.6	0.64	33	3890	0.08	0.13	6.7	11.6
Average	1.16	0.82	3.60	36.1	49.7	0.61	33	3837	0.08	0.14	6.5	12.3

Copper measured 1.16 percent, with a small portion present as oxide and secondary copper minerals, as indicated by the CuOX and CuCN sequential assays respectively. The presence of secondary copper in a polymetallic flotation process can cause challenges in selective metal recovery, due to the activation of sphalerite from dissolved copper. Lead and zinc measured 0.8 and 3.6 percent respectively. Gold and silver measured 0.6 and 33 g/tonne, respectively.

The Bond work index of the sample was moderately soft at 11.5 kWh/tonne. After crushing the samples to minus 3.35 mm, the feed material was ground to a p_{80} of 75 microns and split into four sub-samples. A QEMSCAN analysis showed that the pyrite (87%) was the main mineral with minor amounts of arsenopyrite. The ore minerals included Chalcopyrite (3.07%), Sphalerite (4.94%), Galena (0.88%), as well as other minor coper minerals (chalcocite, covellite, enargite, bornite, and tetrahedrite). The copper sulfides, galena, and Sphalerite were locked with the pyrite. Many of the ore minerals were very finely grained and would be difficult to recover into a high-grade concentrate.

A series of rougher flotation tests were completed to determine the general flotation characteristics. As expected, the best results were achieved at a finer grind. The tests were set up sequentially; throughout all rougher flotation testing, the copper selectivity over zinc did not change significantly based on the conditions. The reason for this is thought to be related to the presence of secondary copper mineral and acid-producing potential of the sample causing sphalerite activation form copper ions in solution. While further optimization in the rougher may provide some difference in selectivity, a bulk rougher showed good selectivity over pyrite, and was a suitable first step to reducing mass prior to further processing. The metal losses to bulk rougher tailings would likely be very challenging to recover in subsequent cleaner flotation.

Following the initial rougher tests, additional tests were conducted with a bulk Cu, Pb, Zn rougher, followed by regrind and selective rougher flotation of a bulk Cu/Pb concentrate, and zinc concentrate. SMBS was used in the regrind and selective rougher stages. Significant improvements to the copper selectivity over zinc were measured, indicating SMBS and fine regrind is a suitable means for rejecting zinc.

Cleaner tests were conducted using the bulk rougher, regrind, and selective rougher tests. The Cu/Pb rougher was cleaned, followed by a copper lead separation with cyanide. Two tests were conducted, at various regrind sizes with the P_{80}, 10µm resulted in improved performance with a final copper concentrate, after Cu/Pb separation, of 23 percent copper at 48 percent copper recovery. About 37 percent of the lead was recovered to the bulk Cu/Pb concentrate. The zinc performance measured 67 percent zinc recovery at a grade of 49 percent zinc, as shown in **Table 13-5**.

Table 13-5: Cleaner Test Results (Atalaya 2022)

Product	Test	Mass	Assay – percent or g/t				Distribution – percent			
		%	Cu	Pb	Zn	S	Cu	Pb	Zn	S
Cu/Pb Ro	T07	12.2	7.04	3.44	18.7	41.7	72.1	52.0	65.1	10.7
	T08	10.5	8.0	4.44	13.0	42.1	72.4	57.7	41.7	8.9
Zn Ro	T07	4.5	0.98	0.58	15.4	48.0	3.7	3.2	19.7	4.5
	T08	9.9	1.10	0.66	15.8	47.6	9.4	9.4	47.6	9.5

Lock cycle testing provided the better results, which included a combination of bulk rougher flotation, fine regrinding, and then selective flotation of a combined copper-lead concentrate and a zinc concentrate.

Table 13-6: Locked Cycle Test Results (Atalaya 2022)

Product	Weight	Assay – percent or g/t						Distribution – percent					
	%	Cu	Pb	Zn	S	Ag	Au	Cu	Pb	Zn	S	Ag	Au
Feed	100	1.07	0.79	3.25	51	37.2	0.6	100	100	100	100	100	100
Pb Con	0.9	8.5	31.9	6.0	35	654	0.4	7.4	37	1.7	0.6	16.3	0.7
Cu Con	3.3	18.9	3.1	6.2	41	118	0.3	58.2	12.7	6.3	2.7	10.5	1.5
Zn Con	4.9	1.4	0.5	49.9	37	75	0.5	6.3	2.9	74.7	3.5	9.9	4.2
Zn 1st Clnr Tls	3.0	0.7	0.6	1.7	52	65	0.7	2.0	2.5	1.5	3.1	5.3	3.4
Zn Ro Tail	25.6	0.22	0.33	0.4	52	17.8	0.64	5.3	10.7	2.9	26.3	12.3	26.5
Bulk Ro Tail	63.2	0.35	0.42	0.66	51.6	26.9	0.63	20.9	33.9	12.8	63.8	45.7	63.8

As shown in **Table 13-6**, the locked cycle test recovered 58 percent of the copper into the final copper concentrate, grading 19 percent copper. The lead concentrate graded 32 percent lead at a recovery of 37 percent. Zinc recovery measured 75 percent at a concentrate grade of 50 percent zinc. Silver recovery trended with lead recovery, and silver credits may be payable particularly in the lead concentrate. Gold recovery was very low, and trended with sulfur recovery, indicating an association with pyrite, possibly in solid solution that would be unrecoverable in flotation. While these data are improved, additional testwork should focus on a sub-10 micron regrind, reagent optimization, and more efficient bulk rougher flotation. An economic trade-off study should also be conducted to determine the financial impacts from these optimizations.

13.5 E-LIX™ Technology Summary

E-LIX™ is a process for the leaching of refractory minerals such as the primary sulfides of copper, lead, zinc, and millerite, in particular chalcopyrite, galena, sphalerite, and millerite. Previous methods for leaching of primary sulfides have been met with extremely slow leaching rates and poor recoveries caused by development of a "passivation layer" on the mineral surface that inhibits further dissolution of the mineral. The E- LIX™ technology incorporates systems to solve both the problem of the passivation layer as well as the slow kinetics, resulting in fast reaction rates with high recoveries, and the possibility of selective metal deposition during leaching of complex, polymetallic sulfides.

The process is primarily focused on the leaching of the primary sulfide minerals mentioned above for copper, zinc, lead, and nickel, but the invention is relevant for primary sulfide minerals of all metals. While many hydrometallurgical processes have been devised for leaching of chalcopyrite, none of the methods for atmospheric temperature/pressure leaching have reached industrial scale due to feasibility issues at laboratory or pilot stages. Currently, the only industrially viable hydrometallurgical system for processing of chalcopyrite is to autoclave at 220˚C and 700 kPa, where water reacts with chalcopyrite to form copper sulphate and sulfuric acid. Because of the high temperatures and pressures, autoclave plants are very costly to build, maintain, and operate; therefore, the industrial use of hydrometallurgy in primary copper mineral processing is currently restricted to secondary copper minerals such as copper oxide.

E-LIX™ is a newly developed electrochemical extraction process developed and patented by Lain Technologies with the financial support of Atalaya. The E-LIX™ process:

- Uses electrochemical methods to dissolve sulfide mineral with use of singular catalysts and physicochemical conditions
- Allows for the dissolution of chalcopyrite and other primary sulfides while avoiding the passivation of particles
- Generates zero emissions and does not consume water or acid and runs under mild operating conditions (atmospheric pressure and room temperature).
- Can treat concentrates with high concentrations of penalty elements such as antimony and arsenic.
- Can treat a bulk sulfide concentrate containing a mix of minerals such as copper, zinc, and lead. Compared to differential flotation and smelting, recovery may be increased by 20% to 30%.
- After copper or other metals are brought into solution, they can be recovered by conventional precipitation or solvent extraction followed by electrowinning ("SX-EW")
- Atalaya has an exclusive license to use E-LIX™ in the Iberian Pyrite Belt

The idea was developed initially for laboratory bench tests and was refined over the years, going through several stages until reaching industrial practicality. The scale was sequentially increased from large laboratory tests to small pilot tests up to, finally, a larger, semi-industrial pilot plant that has been successfully run continuously.

The development was staged as follows:

- Laboratory Stage (Batch discontinuous testing, confirmed the high metals recovery potential and mild operating conditions and set the potential design for a discontinuous operation).
- Small Pilot Plant (Confirmed high recoveries and set key operating cost expectations, proved continuous automatic operation in a single leach tank, copper electroplating was achieved at small scale from solution, pregnant solution was produced for Solvent Extraction (SX) design and basic design parameters for a larger continuous pilot campaign were provided).
- Larger Pilot plant (Designed to prove the industrial concept including production of Cu cathodes (and potentially zinc): achieved continuous operation successfully leaching copper and zinc concentrates; it included the leaching steps as well as a small SXEW installation for both copper and zinc; it produced high purity copper and zinc soluble precipitates and high purity copper cathodes; it confirmed detailed estimates of future Operating Costs; it provided the basis for a full plant design and a Final Feasibility Study; and it included the flexibility to treat other concentrates, including low grade and complex sulfide materials.

In summary, the E-LIX™ Process is a novel hydrometallurgical method that has shown promising results at a semi-industrial scale for the treatment of copper and polymetallic primary sulfide concentrates. It has achieved high recoveries at fast rates under mild, economically competitive operating conditions. It makes it possible to treat combined polymetallic concentrates, thus increasing overall recoveries considerably versus traditional selective flotation, where recoveries are severely compromised to produce concentrates with sufficiently high grades for smelting. It therefore has potential for significant added value in the case of polymetallic deposits, even possibly making the difference between a deposit being economically feasible or not.

14. MINERAL RESOURCE ESTIMATES

Resource estimations were estimated for Proyecto Riotinto. Block models were created for the Cerro Colorado, San Dionisio, and San Antonio deposits in Datamine Studio software by Alan C. Noble, P.E. of Ore Reserves Engineering, Lakewood, CO USA, and by Mónica Barrero Bouza, EurGeol, and verified by Tetra Tech's Qualified Persons for this PEA.

14.1 Cerro Colorado

The Mineral Resource model for the main mineralized zone of Cerro Colorado was created as a three-dimensional block model using Datamine Studio RM software. The model block size is 10x10x10 meters for the Cerro Colorado model, and 5x5x5 meters for the Filón Sur model. The models were estimated with Inverse-Distance and Nearest neighbor methods, after using the unfolding routine in Datamine.

14.1.1 Input Data

Drill-hole data were provided by Atalaya geology personnel as ASCII files containing assays, collar locations, down-hole surveys, and geologic logging for all drilling in the Resource area. Only those core holes and reverse-circulation holes drilled from the surface were used for the estimate of the mineralized zone for Cerro Colorado.

The Resource estimate includes 318 additional drillholes that were drilled between 2018 and 2021, as summarized in **Table 14-1**. These holes were reviewed and validated during 2021.

The 2018-2021 drilling provides additional definition of the Filón Sur area and those areas enriched in deleterious elements (particularly antimony). In addition, the drilling provides further detail throughout the deposit. A group of historical underground drill-hole data and the historical underground channel samples were available but were not used for Resource estimation because of concerns regarding the confidence level of those data, due to their historical nature.

Due to the of the scarcity of sample data for the deleterious elements, the short (approximately 12 m), close-spaced grade-control holes and a 20 m-grid of blastholes were used for the estimation of arsenic, lead, zinc, and antimony.

Table 14-1: Summary of Drilling used for Resource Estimation at Cerro Colorado

Drill Series	Type	Year	Holes	Assays	Total Length (m)
RTM	Core	Historic	682	68,050	142,355
CCR	RC	2014	12	1,444	1,480
ETR & RT	RC	2015	361	18,058	28,659
RTD 2017	RC	2017	28	2,682	5,437
FS (Filón Sur)	RC	2017	43	2,759	10,255
GT (Geotech)	Core	2017	6	847	1,170
ARD		2017	3	759	769
Geotech 2018	Core	2018	11	419	1,061
Special (PZ&SA)		2020	5	82	167
RT 2018	RC/Core	2018	41	4,236	8,557
RT Penalty 2019	RC/Core	2019	54	4,972	11,180
RT Penalty 2020	RC	2020	164	9,346	18,880
RT 2021	RC/Core	2021	43	3,017	6,800
Total			**318**	**116,671**	**236,770**

14.1.2 Assay Corrections

Prior to estimation and within the mineralized zone MinZ, legacy holes with a default lead assay value of 0.05% were in the collar file. A Pb-Zn power-law regression was used to estimate the default lead assays of the flagged holes, and to correct those assays less than 0.01% Pb:

$$Pb\_pct = 0.4786*Zn\_pct^{1.286}$$

This correction was not applied to the Filón Sur assay intervals.

14.1.3 Compositing

Drillhole assays were composited to 10 m composites using the standard Datamine downhole compositing with domain boundaries. Assay intervals were coded with a domain code prior to compositing and composites were then computed with the compositing routine set to compute nominal 10 m composites that started and ended on domain boundaries.

The resulting composites are as close to 10 m long as possible, while using all assays within the defined zone intervals. Assays were composited using length-weighted averages for this study.

14.1.4 Capping

Grade distributions were examined for copper, sulfur, and zinc. Based on the analysis, no grade capping was used for the Cerro Colorado model. Grade distributions were identified, and nearest neighbor estimation was used to minimize problems with the multiple populations.

14.1.5 Vein Modeling

Wireframes corresponding to the main mineralized zone at Cerro Colorado anticline (MinZ), Filón Sur massive sulfides (MS), and *cloritas* (CLO) were constructed and used as the basis for the combined mineralized zone model, with adjustments to incorporate the drilling completed to April 2021 and the historical sections information.

For Resource modeling purposes, three domains were identified: The MinZ at Cerro Colorado, the Filón Sur massive sulfides, and the Filón Sur *cloritas*. Geological modeling, data selection, unfolding procedures, and estimations have been done separately within each domain wireframe.

A 3D wireframe of MinZ was modeled based on digitized NE vertical sections with an approximate spacing of 50 m (**Figure 14-1**). The Filón Sur massive sulfides (MS) and the Filón Sur *cloritas* were modeled in 3D based on the digitized legacy NE vertical sections and plans with an approximate spacing of 30. The NW fault, which splits MinZ into East and West zones, was modeled based on drillhole data and mapped surveyed points on pit slopes (**Figure 14-2**). This structure is considered to be an important control on the mineralization.

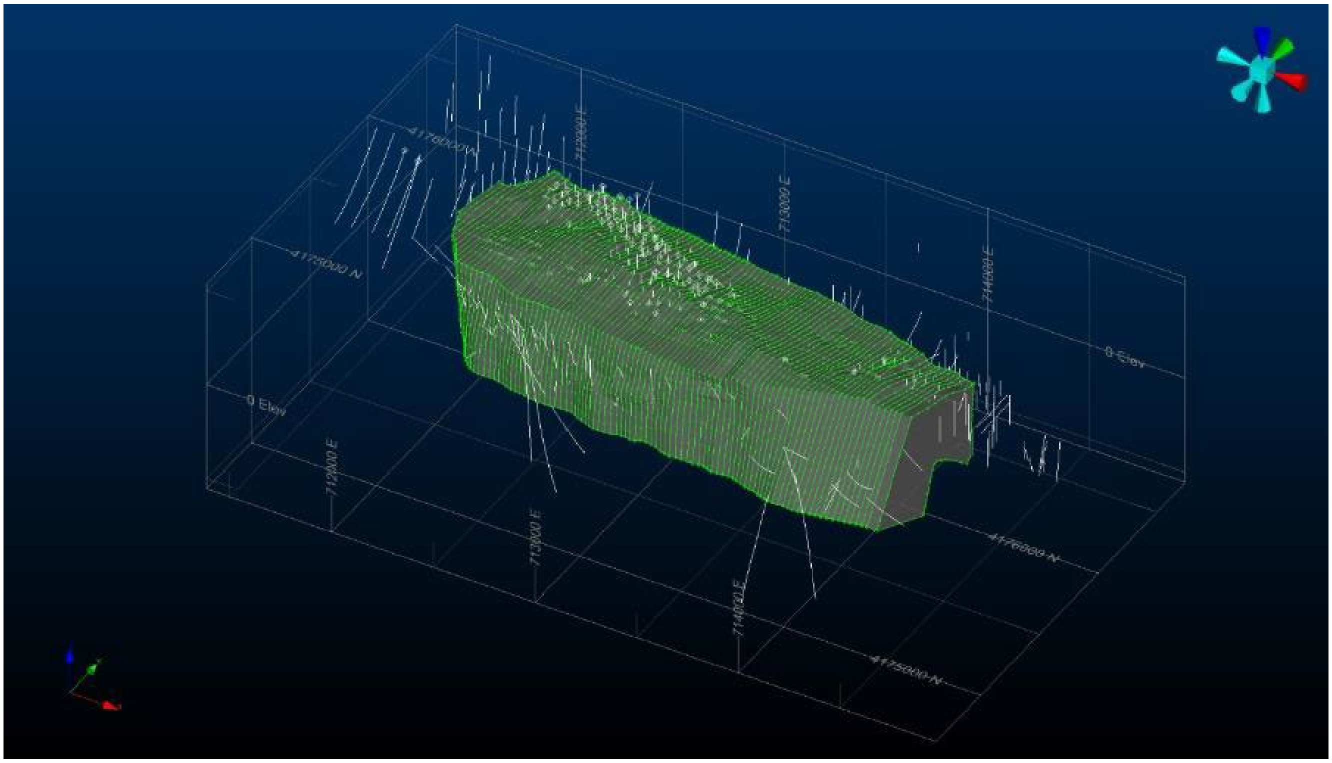


Figure 14-1: 3D view of the modeled Mineralized Zone (MinZ), (Ore Reserves Engineering 2022)

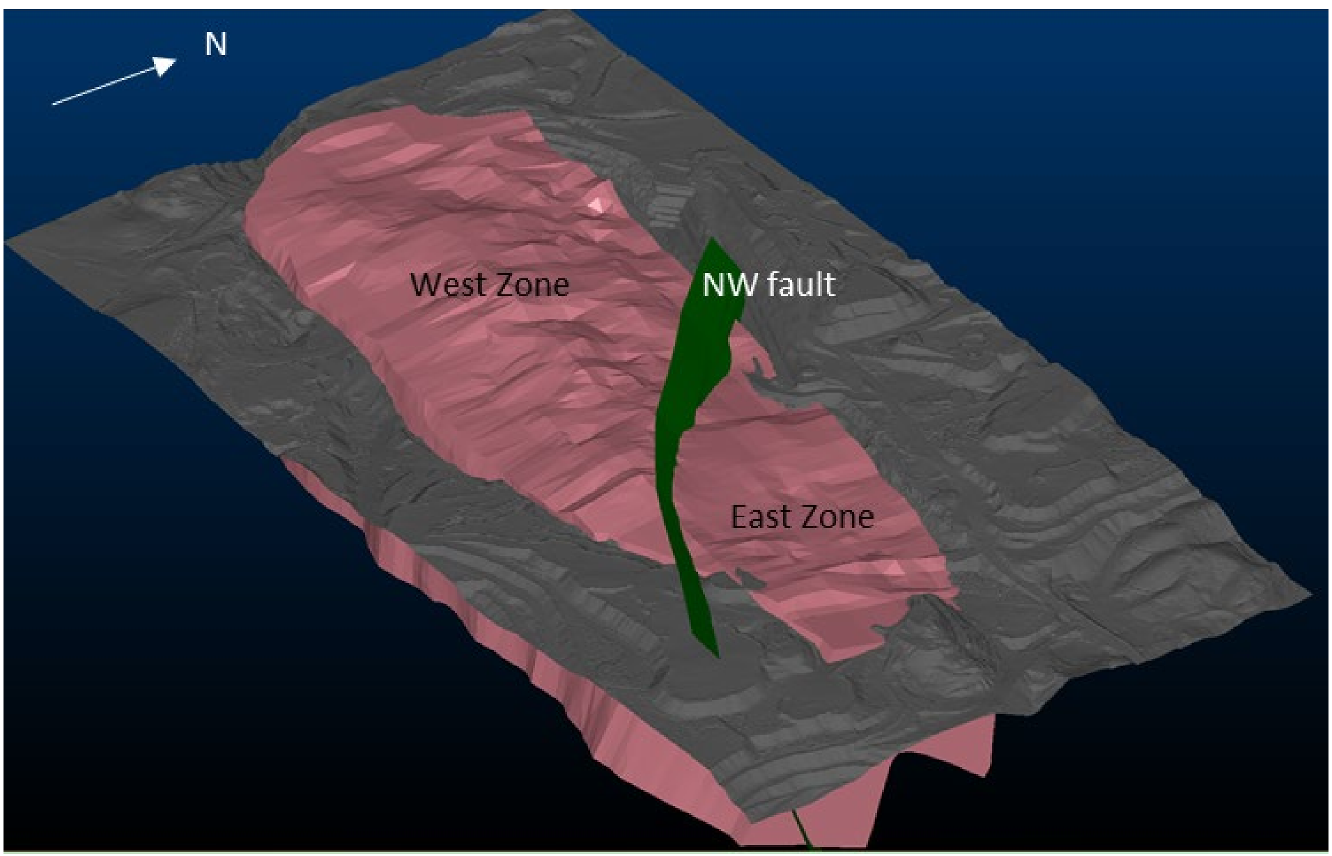


Figure 14-2: 3D view of the location of the NW structure (Ore Reserves Engineering 2022)

14.1.6 Density Determinations

The Cerro Colorado density formula was based on the year 2000 data with a slight discount on the constant from 2.8 to 2.7 to account for void space and fracturing in the in-situ rock, as described in **Section 11**.

$$\text{Density} = 2.7 + (0.025 \text{ x } \%\text{S})$$

The 2010 work suggests the constant may be lower than indicated by the Resource formula, but the slope of the line may be steeper than the slope of the Resource formula. Thus, low-sulfur rock may be lighter than suggested by the Riotinto formula, and high-sulfur rock may be heavier. These differences are minor, however, and the effect on Resources is negligible.

The Cerro Colorado density formula and IDP sulfur estimates were used for estimation of block model density. A default sulfur grade of zero (0.0) was used for density estimation where there is insufficient sulfur data for an estimated sulfur grade.

In addition to in-situ material, density was assigned for waste rock, open pit backfill, and underground backfill. Waste rock was assigned a density value of 2.7 t/m^3. Fill material, particularly the backfilled Filón Sur open pit, was assigned a default density of 2.00 t/m^3. Mined-out underground workings were assigned a density of 2.00 t/m^3, which is equivalent to assuming that the underground openings have either caved, were backfilled during underground operations, or will be backfilled for safety during current open-pit operations.

14.1.7 Estimation Methods and Parameters

A 3D block model was created for the Cerro Colorado deposit in Datamine software. The estimation steps are described in this section.

14.1.7.1 Variography and Search Parameters

Variograms were computed for copper in both the ETRS coordinate system and the unfolded coordinate system (**Figure 14-3** and **Figure 14-4**). Sulfur variograms were only computed in the unfolded coordinate system. The results of variogram modeling are summarized in **Table 14-2**. All variograms were modeled using two nested exponential variogram structures except for sulfur, which was modeled with a single exponential variogram.

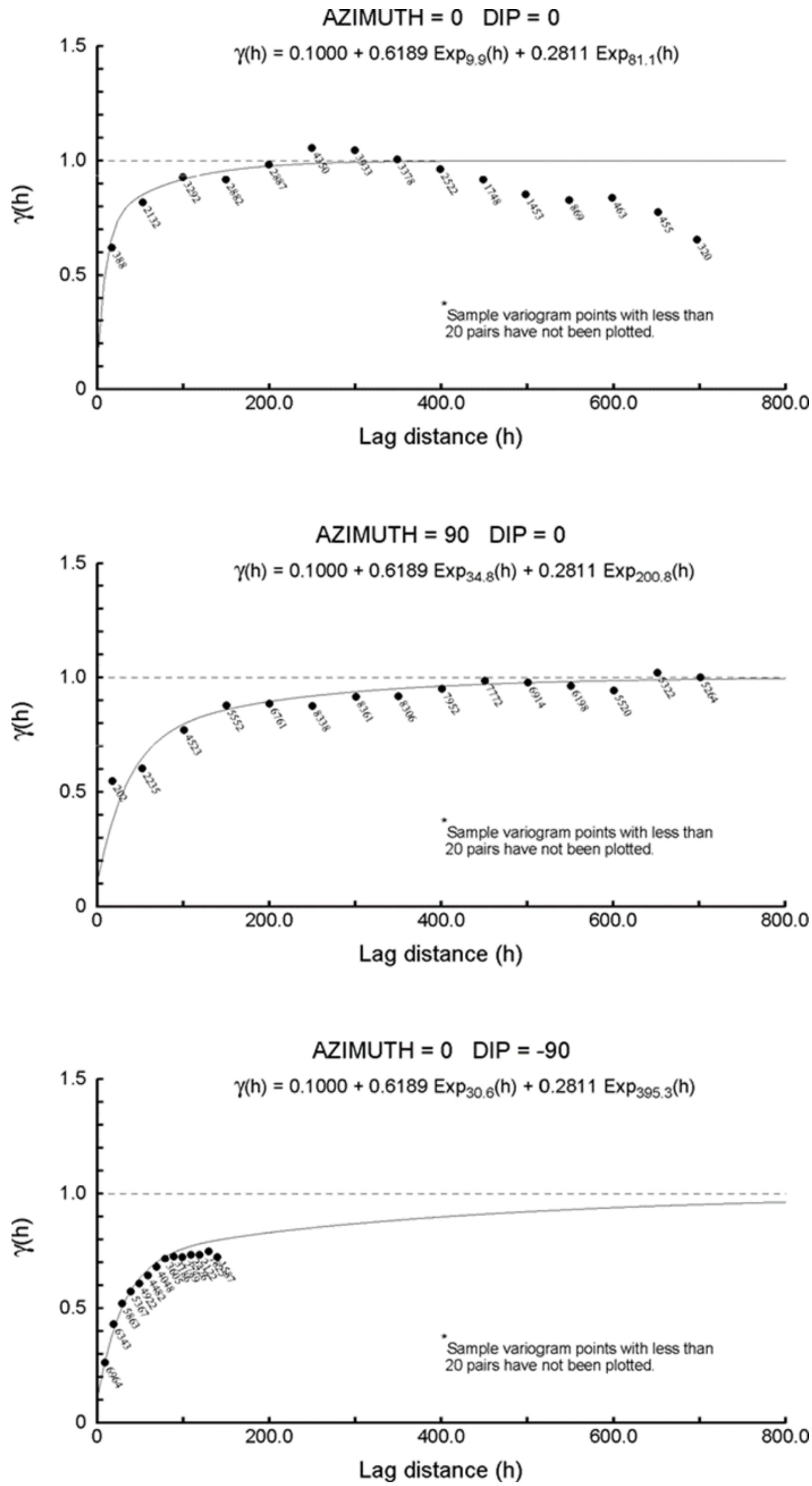


Figure 14-3: MinZ Variograms Copper ETRS Coordinates (Noble 2016)

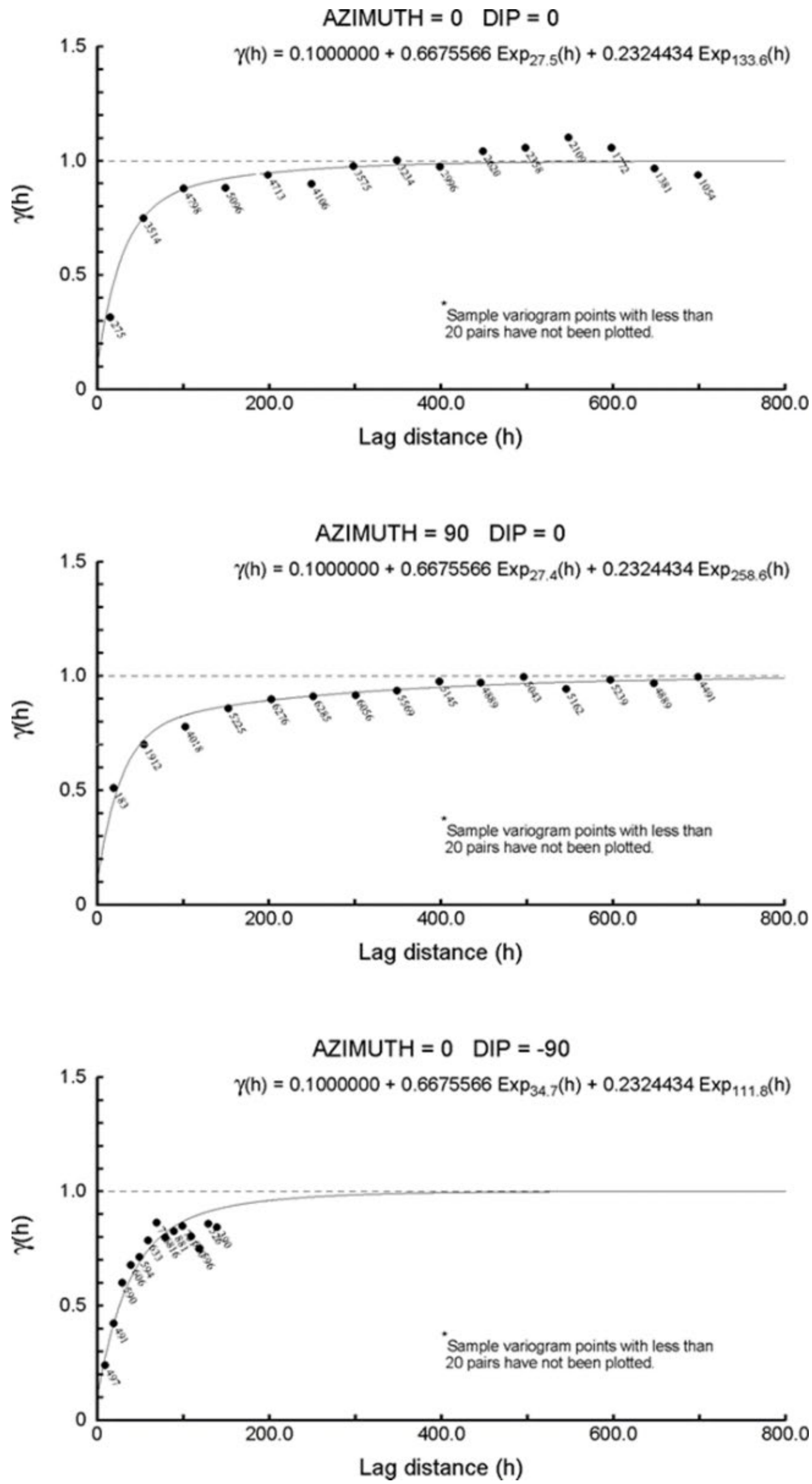


Figure 14-4: MinZ Variograms Copper Unfolded Coordinates (Noble 2016)

Comparison of the overall copper variogram in ETRS coordinates with the variogram in the unfolded coordinates shows that continuity in the East-West direction, along strike, is only slightly different. This is not unexpected, since the Cerro Colorado anticline plunges almost due west at only about 8 degrees. In the North-South direction, however, the unfolded variogram has a significantly longer range than the ETRS variogram, confirming that copper mineralization is following parallel to the fold. In the vertical direction, however, the ETRS variogram has better continuity than the unfolded variogram, which suggests that additional improvement could be achieved in the unfolding process by making the hanging wall-footwall links more vertical.

When the variograms are computed with grade-zoned data (**Table 14-2**), the immediate effect is that overall variability is reduced by removing the effect of grade-zone crossing from the variogram. The grade-zone effect, also known as a zonal effect, is caused by the squaring of large grade differences when data from different grade zones are added to the general variation within the zones. The relative variance in all the grade-zoned variograms is much lower than the relative variance of the variogram without grade zones. The relative nugget effect for the grade-zoned variograms is also lower, even though the Sage-scaled nugget effect is higher. Variogram ranges are shorter in the mid-grade and high-grade zones than for the overall variogram, while variability in the low-grade zone is much more continuous, confirming that the grade zones represent different types of mineralization.

Table 14-2: Summary of Variogram Models for Copper in Unfolded Coordinates (Noble 2020)

Variogram	Rotation	Nugget	Structure 1			Structure 2		
			Range X	Range Y	Range Z	Range X	Range Y	Range Z
No Zones	0	0.1	27.4	27.5	34.7	259	133	112
Cu-Low	-10	0.2	10	22	20	132	75	125
Cu-Mid	15	0.27	10	10	12	109	61	80
Cu-High	0	0.35	10	10	23	110	61	32
Sulfur	0	0	303	143	185	-	-	-

The sulfur variogram has much greater continuity than the copper variograms and is easily modeled with a single exponential variogram component. Sulfur-grade continuity is best along the strike of the anticline and is slightly better in the vertical axis than in the north-south axis, crossing the anticlinal fold.

Copper, Sulfur, and Zinc Search Ellipse Parameters

Search ellipse parameters were developed for each zone based on the variograms and a general assessment of the continuity of grades. All search ellipses are relative to the unfolded coordinate system and are not rotated, except for sulfur, which is rotated 11 degrees clockwise around the +Z axis. Search ellipse parameters are summarized in **Table 14-3**.

Table 14-3: Copper, Sulfur, and Zinc Search Ellipse Parameters (Noble 2020)

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
NN S	11	150	70	10	5	10	1.5	5	10	2	1	10
IDP/OK S	11	150	70	70	8	10	1.5	8	10	2	5	10
Grid Flag	0	160	65	10	5	10	1.5	5	10	2	1	10
NN Cu, GZONES	0	300	175	70	8	10	1.5	8	10	2	5	10
NN VHG Cu, GZONES	0	35	10	15	1	1	0	1	20	0	1	20

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
IDP/OK Cu-Zn by GZONE	0	150	80	50	8	10	1.5	8	10	2	5	10
IDP/OK Cu-Zn in VHG GZONE	0	60	15	30	5	10	2	5	10	3	1	10

Copper, Sulfur, and Zinc Grade Estimation

Grade models were estimated for copper and sulfur grades using the unfolded coordinate space and nearest-neighbor (NN), inverse-distance-power (IDP), and ordinary kriging. Zinc was estimated using the unfolded coordinate space and inverse-distance-power (IDP) with the copper grade zones. Sulfur was estimated as a single zone and copper was estimated both with and without grade zones.

Copper grade estimation was done using nearest-neighbor (NN), inverse-distance-power (IDP), and ordinary kriging with grade zone control.

Zinc grade estimation was done using inverse-distance-power (IDP) with copper grade zone control.

Sulfur grade estimation was done using nearest-neighbor (NN), inverse-distance-power (IDP), and ordinary kriging with no zone control. An IDP power of 3 was used for estimation.

IDP anisotropies are the same as the search ellipse radii. The optimized IDP powers are shown in **Table 14-4**.

Table 14-4: IDP Copper and Zinc Estimation Powers by Grade Zone (Noble 2020)

Cu Grade Zone	Power for IDP Cu	Power for IDP Zn
Low-grade	2	3
Mid-grade	1.5	3
High-grade	2	3
Very High-grade	1	3

The Mineral Resource model for the main mineralized zone of Cerro Colorado was created as a three-dimensional block model using Datamine Studio RM software. The model block size is 10x10x10 meters, which is consistent with the mining bench height and the estimated selective mining unit. The horizontal extent of the model is defined to cover the Cerro Colorado mineral deposit, plus sufficient space outside the deposit to cover the ultimate pit. Resource model size and location parameters, in ETRS89 coordinates, are shown in **Table 14-5**.

Table 14-5: Cerro Colorado Resource Model Size and Location Parameters (Ore Reserves Engineering 2022)

	Minimum	Maximum	Cell Size (m)	Number of blocks	Model Size (m)
Easting (X)	711,900	714,750	10	285	2,850
Northing (Y)	4,174,900	4,176,500	10	160	1,600
Elevation (Z)	0	550	10	55	550

At Filón Sur, the model block size is 5x5x5 meters, which is consistent with the narrow shape of the domains. For estimation purposes, empty models were created for *cloritas* and massive sulfide domains, initial model size, and location parameters, in ETRS coordinates, are shown in **Table 14-6**.

Table 14-6: Filón Sur Resource Model Size and Location Parameters (Ore Reserves Engineering 2022)

	Minimum	Maximum	Cell Size (m)	Number of blocks	Model Size (m)
Easting (X)	711,900	714,750	5	570	2,850
Northing (Y)	4,174,900	4,176,500	5	320	1,600
Elevation (Z)	0	550	5	110	550

Key items included in the block models are the geologic model zones, flattened XYZ coordinates from Datamine unfolding, copper-grade zone, Mineral Zone code, and Resource classification codes. Grades were estimated using inverse-distance-power estimation for copper, sulfur, lead, zinc, antimony, and arsenic. Density was estimated from sulfur grade using the mine's sulfur grade estimation formula.

In addition to the inverse distance (IDP) estimates, values were estimated for all the elements using Nearest-Neighbor-Assignment (NN) for additional validation of the IDP estimates; in the case of copper and sulfur, Nearest-Neighbor-Assignment (NN) and Ordinary Kriging (OK). Other variables include a mined code to identify previously mined blocks, the Datamine search volume code, the number of samples used for estimation, the composite grid-spacing parameter, and the Resource classification code.

Experimental variograms of the different elements within the grade zones were created and modeled to define the anisotropy parameters for each grade zone. Inverse-distance power (IDP) interpolation was conducted on each interpolation zone applying the anisotropy parameters. Variogram modelling was performed with SAGE 2001 software[1]. It should be noted that Sage normalizes all variogram sills to a value of 1.00; traditional sills and nugget effect values may be obtained by multiplying the individual structure sill times the overall relative variance.

The Datamine UNFOLD process was used to address the folded nature of the deposit. MinZ and Filón Sur (massive sulfide and *cloritas*) were unfolded and estimated separately. Estimation has been performed in flat or unfolded coordinates and transformed back to the current folded state.

For estimation, the Datamine search expansion feature was used to expand an initial search ellipse until the desired number of composites were located inside the search ellipse. The primary objective of the search ellipse expansion was to keep the search as localized as possible, subject to finding sufficient samples for reliable estimation. The final search ellipse expansion was set to provide estimates in areas with widely spaced drilling.

The Datamine unfolding tool was used to flatten the anticlinal fold of Cerro Colorado (**Figure 14-5)** and the Filón Sur massive sulfide and *cloritas* into a geometry that is as close as possible to the original geologic shape of the deposit.

Unfolding was applied separately to the main mineralized zone at Cerro Colorado, and to the Filón Sur massive sulfides, and the *cloritas*.

[1] SAGE 2001 Version 1.08, Issaks & Co.

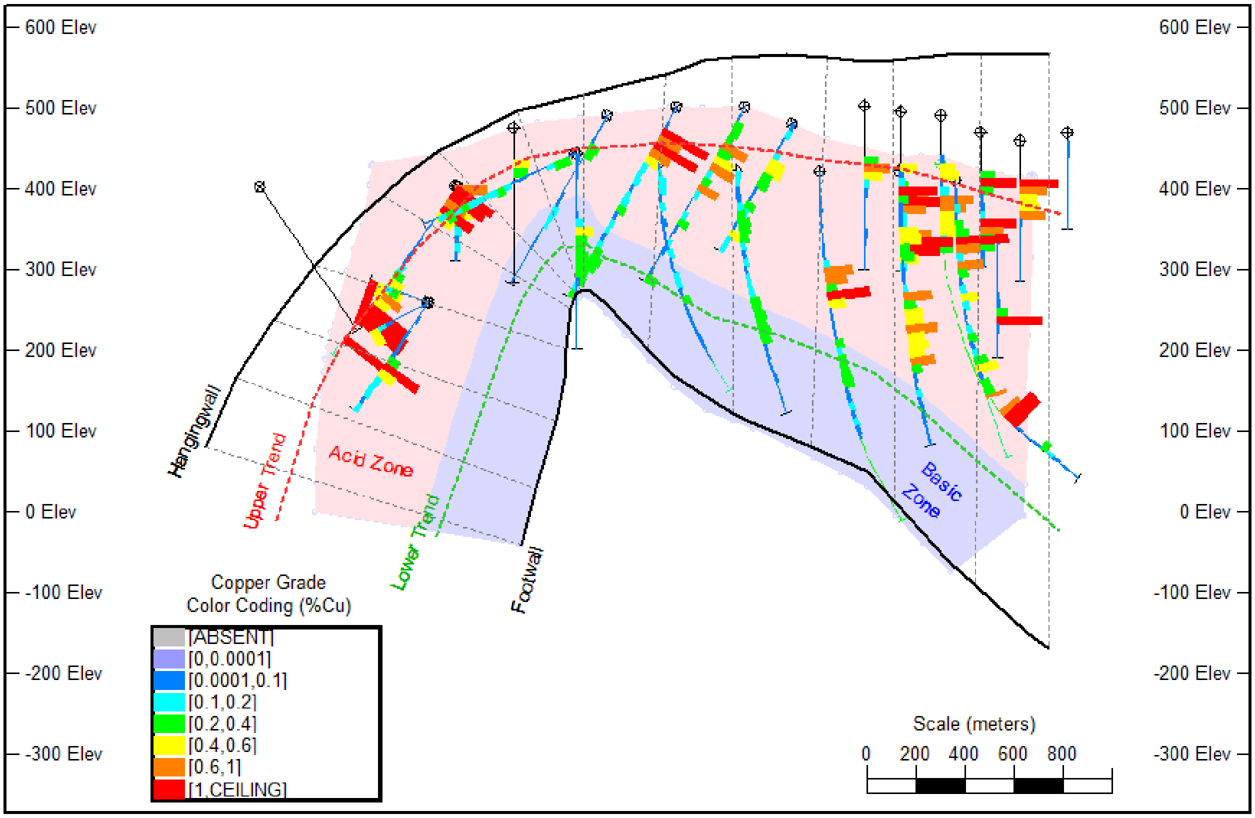


Figure 14-5: Typical Cross-Section of Cerro Colorado looking N83W, showing Drillholes, Trends, and Unfolding Strings (Noble 2018)

The procedure for unfolding of the main mineralized zone at Cerro Colorado is as follows:

- Trend strings were drawn through the two strongest mineralized horizons, as shown in **Figure 14-5**. The lower trend generally follows a well-defined band of mineralization just below the bottom of the Acid Zone (top of the Basic Zone) and is maintained subparallel to the bottom of the Acid Zone in areas of weak mineralization. The upper trend follows stronger mineralization near the hanging wall of the Acid Zone.
- Between-trend strings were drawn that connect between the lower trend and the upper trend. North of the anticline apex, the between-trend strings were drawn vertically. South of the anticline apex, the between-trend strings were drawn approximately perpendicular to the trend strings.
- The between-trend strings were extended up and down 50% of the length of the between-trend strings. The extended between-trend strings were used as guidelines for drawing the hanging wall and footwall strings and for the footwall-to-hanging wall tag strings.
- The resulting footwall-to-hanging wall tag strings define the Z’ axis in the unfolded coordinate system. The Z’ unfolded axis is scaled proportional to the average “thickness” of the zone, which is approximately 440m. The Z’ values were adjusted so that the unfolded Z’ value is approximately 58 at the footwall and 500 at the hanging wall.
- The unfolded Y’ axis is oriented parallel to the N7E direction and is approximately perpendicular to the strike of the deposit. The origin of the unfolded Y’ coordinates is at the crest of the anticline and Y’ is negative to the south and positive to the north. The Y’ coordinates are scaled relative to the average unfolded width of the deposit in the Y’ direction.

- A final tag string was drawn to connect horizontally between the section strings. This string generally follows the crest of the anticline. The X' unfolded axis follows parallel to this axis and is in unscaled units.

The same procedure was performed at Filón Sur where the hanging wall and foot wall of the massive sulfide and the *cloritas* zones were defined individually and unfolded separately for each domain.

The MinZ copper and the models of the deleterious elements and sulfur were combined using the Datamine process ADDMOD, then the Filón Sur model subset was added to the combined model. Fill, and mined-out models were added afterward on top of the grade model. Corresponding fractions of fill and rock are calculated for each block. Horizontal and vertical sections of the final copper block model are shown in **Figure 14-6** and **Figure 14-7.**

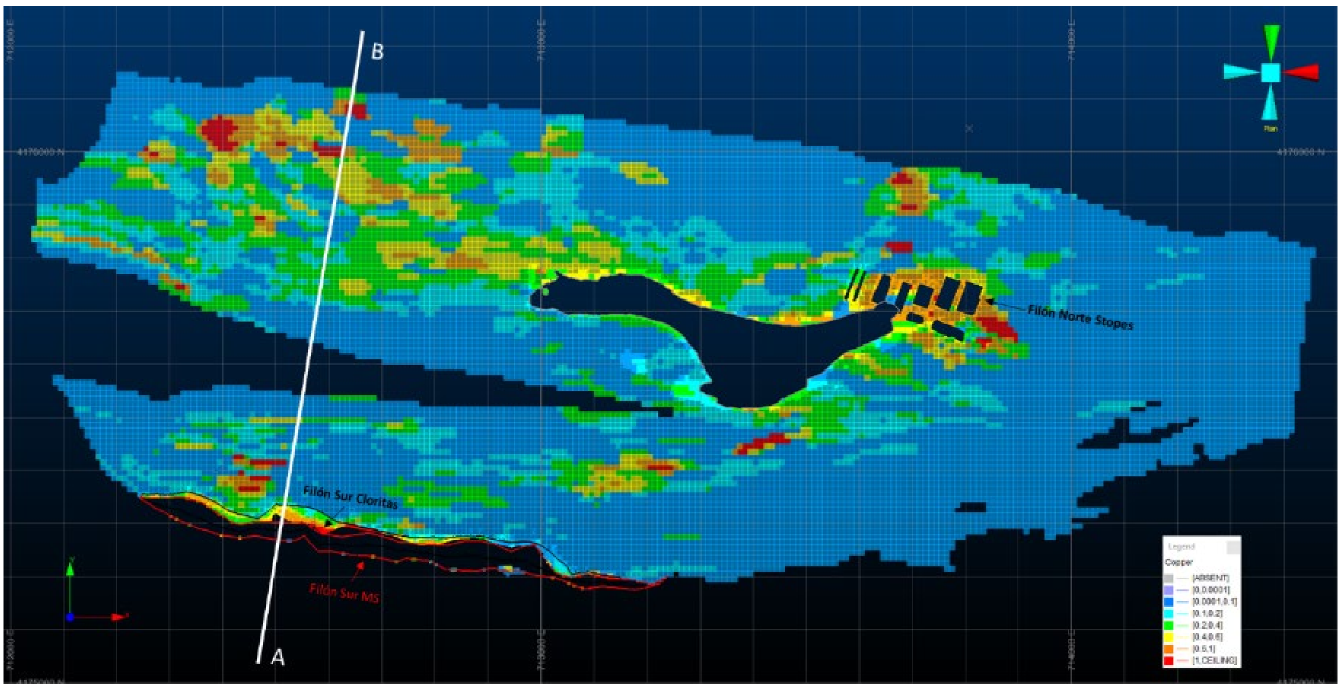


Figure 14-6: Horizontal section at 235m elevation of the copper model (Cu_IDP>0) (Ore Reserves Engineering 2022)

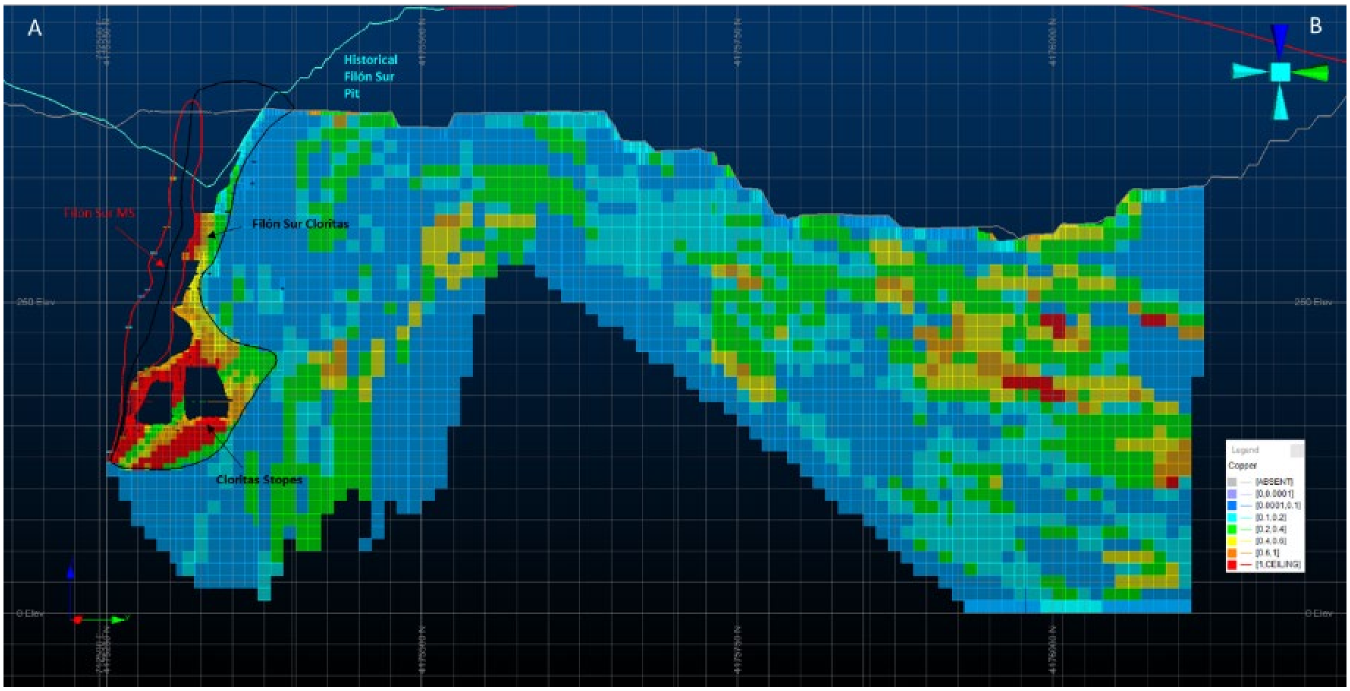


Figure 14-7: Vertical Section A-B on Figure 14-26 showing the copper model (Cu_IDP>0) (Ore Reserves Engineering 2022)

14.1.7.2 Classification

Classification of Mineral Resources into Measured, Indicated, and Inferred Resource classes is based on drill-hole spacing and the number of drillholes selected for estimation. Drill-hole spacing is measured based on the kriging variance from a point-kriging estimate using a “FLAG” variable that is set to 1.0 for composites with copper values and “absent” for composites with insufficient sampling to make a composite. A linear, zero-nugget variogram with a slope of 0.5 is used for this kriging run. The kriging variance for a block at the center of a 4-point, square drill-hole pattern is approximately equal to 28% of the drill-hole spacing. If the block is outside the drilling pattern (extrapolated), the kriging variance is equal to the distance to the nearest drillhole. The Resource classification parameters are summarized in **Table 14-7.**

Table 14-7: Mineral Resource Classification Parameters Classification

	Drill spacing (m)	Search Volume
Measured	<=60 m	SVOL<=1
Indicated	>60 m to <= 100m	SVOL<=2
Inferred	>100 m to <= 150m	
Unclassified	>150 m or no estimate	

14.1.7.3 Cutoff Grade

The cutoff for Mineral Resources is 0.14 % Cu, considering a copper price of US$3.50/lb.

14.1.7.4 Resource Statement

The copper Resource was summarized using a Lerchs-Grossmann pit shell that was run using a copper price of US \$3.50/lb Cu and all Mineral Resources, including Inferred Resources. All other slope and economic parameters are the same as those used for the design of the open pit for mine production scheduling (**Section 16**). The resulting pit shell is considered to have reasonable prospects for economic extraction, assuming that the copper price is above US \$3.50/lb. Mineral Resources are estimated from the end of December 2020 topography. The cutoff for Mineral Resources at a copper price of US\$3.50/lb is 0.14 % Cu. The Mineral Resource estimate, using multiple cutoffs, is summarized in **Table 14-8**.

Table 14-8: Mineral Resource Summary for Cerro Colorado

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	0.14	151,621	0.36	0.15	0.03	1,203,349	501,395	100,279
Indicated	0.14	49,094	0.38	0.14	0.03	411,284	151,526	32,470
Measured + Indicated	0.14	200,715	0.37	0.15	0.03	1,637,236	663,744	132,749
Inferred	0.14	4,428	0.40	0.15	0.03	39,048	14,643	2,929

Effective date of December 31, 2020.
Includes material mined from December 31, 2020, to October 31, 2022.

Mining has progressed since the cutoff for the Resource with a cutoff date of December 31, 2020. Approximately 25.2 Mt tonnes at 0.41 Cu%, 0.11% Zn, and 0.01% Pb were mined from December 31, 2020, through October 31, 2022, reducing the Resource amount. **Table 14-9** shows the Resource estimate with the production from the mine removed through October 31, 2022.

Table 14-9: Mineral Resource Summary for Cerro Colorado with Production Material Removed

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	0.14	132,699	0.36	0.15	0.03	1,053,170	438,821	87,764
Indicated	0.14	43,203	0.38	0.14	0.03	361,930	133,343	28,573
Measured + Indicated	0.14	175,901	0.37	0.15	0.03	1,434,831	581,688	116,338
Inferred	0.14	4,074	0.4	0.15	0.03	35,924	13,472	2,694

Excludes material mined from December 31, 2020, to October 31, 2022.

14.1.8 Model Verification

Copper and sulfur grades were estimated using Nearest Neighbor methods to confirm the Inverse-Distance estimations. Drillholes, assays, and blocks were compared visually. Tetra Tech has reviewed the methodology and results of the estimation and finds them to be within best practices for a study for this level.

14.2 San Dionisio

The Mineral Resource model was created as a three-dimensional block model using Datamine Studio RM software. The model block size is 10x10x10 m, which is consistent with the mining bench height and the estimated selective mining unit. The block model was estimated using the Datamine unfolding option. Grades were estimated using inverse-distance-power estimation for copper, sulfur, lead, and zinc.

14.2.1 Input Data

Drill-hole data contain assays, collar locations, and down-hole surveys for all drilling in the Resource area. The drilling used for Resource estimation at San Dionisio is summarized in **Table 14-10**.

Atalaya drilling comprises only drillholes drilled from surface, most of which are core drillholes. Drilling used for the Resource estimate includes 45 drillholes that were drilled between 2015 and 2021 to define the San Dionisio Resource, and 5 holes from Cerro Colorado, which are within the south-east area of the San Dionisio model limits.

Table 14-10: Summary of Drilling used for Resource Estimation at San Dionisio

Drill Series	Type	Year	Holes	Assays	Total Length (m)
RTM	Core	Historic	949	29,473	65,611
7000 series	Core	1996	9	520	1,033
Atalaya	RC/Core	2015-2021	45	8,085	16,911
Total			1,003	38,078	83,555

14.2.2 Compositing

Drillhole assays were composited to 5-m composites using a domain boundary. Intervals were assigned a code based on their domain prior to compositing by domain. The resulting composites are as close to 5-m long as possible, while using all assays within the defined zone intervals. Assays were composited using length-weighted averages.

14.2.3 Capping

Zinc grades were capped prior to estimation at 3% for the MinZ domain, 8% in the low-grade zinc zone, and were not capped within the high-grade zinc zone. Pb was capped at 1% in the MinZ, 1.5% in the low-grade zones, and was not capped in the high-grade lead zones. Grade populations were examined for each element. Copper shows two overlapping populations, no capping was used in the estimation for copper, but nearest neighbor estimations and a combination of hard and soft boundaries were used to work with the over lapping populations.

14.2.4 Geologic Modeling

The geologic model was constructed to provide geologic control for grade estimation and to provide parameters for pit optimization in the non-ore-bearing geologic units (**Figure 14-8**).

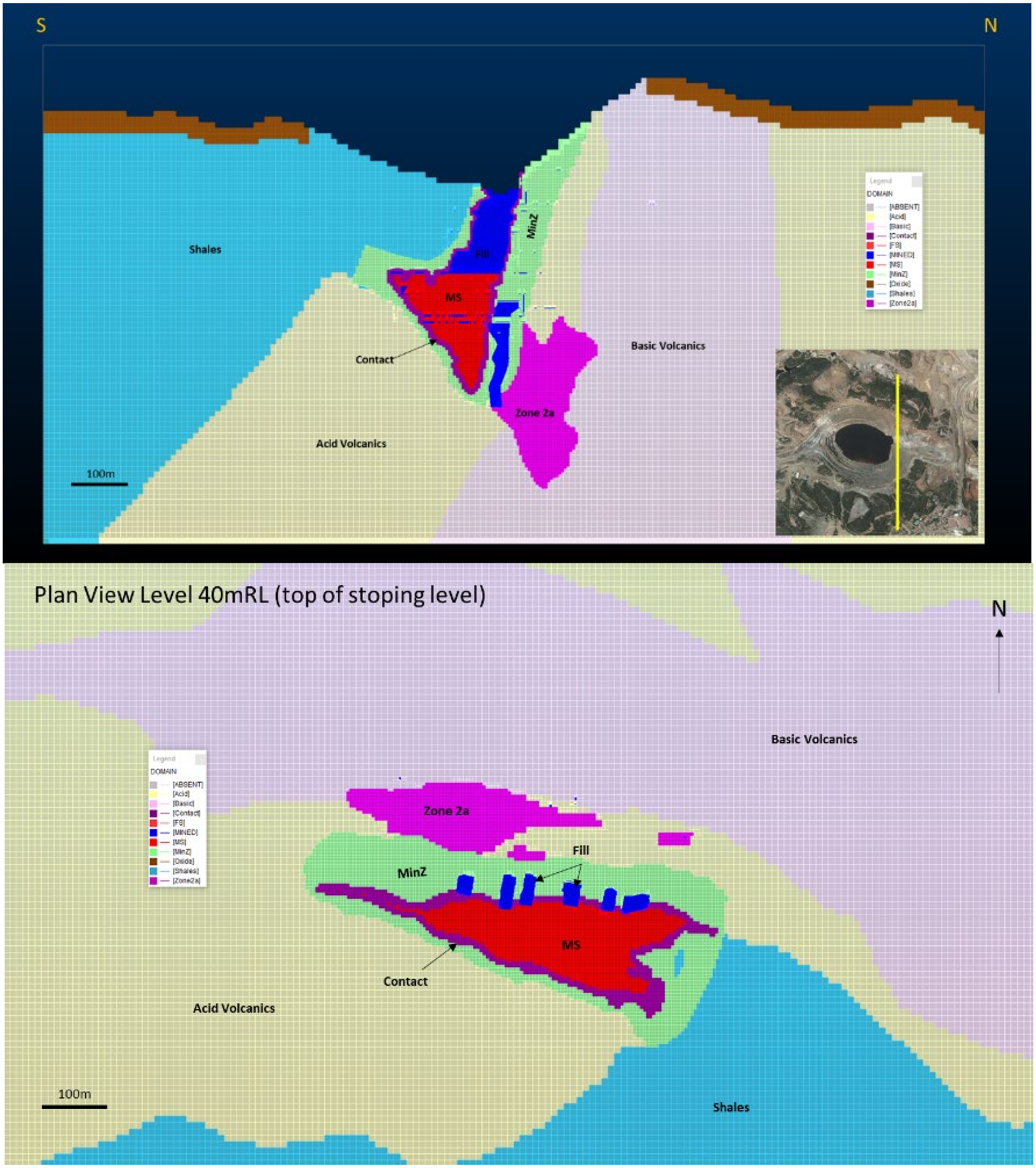


Figure 14-8: Vertical section (above) and plan section (below) of the San Dionisio geological model (Ore Reserves Engineering 2022)

14.2.4.1 Mineralized Zones

Wireframes corresponding to the main mineralized *cloritas* zone (MinZ), massive sulfides (MS), and Zone 2a were constructed and used as the basis for the combined mineralized zone models.

Empty 5x5x5 m block models were created for the MinZ, MS, and Contact, and then added together to create one model. The Contact zone was created as the contact between the MS and the *cloritas*, 5 m inside and 5 m outside of the MS wireframe. The same procedure was followed to create the Zone 2a mineralized zone model, which was created as a 5x5x5 m block model.

14.2.5 Density Determinations

The San Dionisio density formula defined in the previous sections and IDP sulfur estimates are used for the calculation of block model density.

Default values for sulfur are assigned based on the estimated sulfur zones. Density in high-sulfur areas was capped to 4.54, which corresponds to an estimated 50% sulfur. When estimated sulfur is above 17%, the San Dionisio density formula is used, if estimated sulfur is below 17%, the Cerro Colorado density formula is used instead.

Fill material is assigned a default value of 2.00 t/m^3. Volumes of mined-out with underground stopes and other workings were assigned a density of 2.00 t/m^3, which is equivalent to assuming that the underground openings have either caved, were backfilled during underground operations, or will be backfilled for safety during current open-pit operations.

14.2.6 Estimation Methods and Parameters

The Mineral Resource model was created as a three-dimensional block model using Datamine Studio RM software. The model block size is 10x10x10 m, which is consistent with the mining bench height and the estimated selective mining unit. The horizontal extent of the model is defined to cover the San Dionisio mineral deposit, plus sufficient space outside the deposit to cover the ultimate pit. Resource model size and location parameters are shown in **Table 14-11**.

Table 14-11: San Dionisio Resource Model Size and Location Parameters

	Minimum	Maximum	Block size	Number of Blocks	Model Size
Easting	710,450	712,400	10	195	1950
Northing	4,174,830	4,176,530	10	170	1700
Elevation	-350	550	10	90	900

14.2.6.1 Variography and Search Parameters

Experimental variograms of the different elements within the grade zones were created and modeled to define the anisotropy parameters for each grade zone. Inverse-distance interpolation was conducted on each interpolation zone, applying the anisotropy parameters. Grades were estimated using inverse-distance estimation for copper, sulfur, lead, and zinc. Values were estimated for copper and sulfur using Nearest-Neighbor for confirmatory purposes. A mined code was used to identify previously mined blocks.

Variogram modeling was performed with SAGE 2001 software, which normalizes all variogram sills to a value of 1.00. Variograms were modeled using one or two nested exponential variogram structures, except for sulfur in Zone 2a where two nested spherical variogram structures were used. Variogram modelling and estimation of Zone 2a was performed in the ETRS89 coordinate system.

For Resource modeling purposes, three domains were identified: Massive Sulfides (MS), *Cloritas* or mineralized zone (MinZ) representing the copper stockwork, and Zone 2a which is a deeper stockwork zone of lower sulfur content. Geological modeling, data selection, unfolding procedures, and estimations were completed separately within each domain.

Each domain was modeled in 3D based on legacy sections and plans and the geology of historical and current Atalaya drilling. A total of 195 horizontal plans and 133 sections were georeferenced from local coordinates to ETRS 89 system coordinates and digitized to define each domain and the mined-out portions of the deposit.

The Datamine UNFOLD process was used to address the folded nature of the deposit. MinZ and MS were unfolded together but estimated separately. Both variogram modeling and estimation have been performed in flat or unfolded coordinates and transformed back to the current folded state.

Material identified as previously mined out was removed from the Resource estimate.

Copper Variograms

Variograms were computed for copper in the unfolded coordinate system for MinZ and MS (**Figure 14-9** and **Figure 14-10**), the Contact area did not have enough samples to get reliable variograms.

The results of variogram modeling are summarized in **Table 14-12**. All variograms were modeled using two nested exponential variogram structures.

Table 14-12: Summary of Variogram MinZ Models for Copper Unfolded Coordinates (Ore Reserves Engineering 2022)

Variogram	Rotation	Nugget	Structure 1			Structure 2		
			Range X	Range Y	Range Z	Range X	Range Y	Range Z
Cu-Low	-28	0.35	17.2	7.6	6.8	1,674	37.7	33
Cu-Mid	0	0.50	5	5	5	63.1	67.5	58.1
Cu-High	-10	0.20	18	10	10	350	350	15.5

For the MinZ the variograms were computed for the copper grade zones. When the variograms are computed with grade-zoned data, the immediate effect is that overall variability is reduced by removing the effect of grade-zone crossing from the variogram. The grade-zone effect, also known as a zonal effect, is caused by the squaring of large grade differences when data from different grade zones are added to the general variation within the zones. The relative variance in all the grade-zoned variograms is much lower than the relative variance of the variogram without grade zones.

For the MinZ low-grade zone, copper continuity in the unfolded coordinates is slightly better in the East-West direction, along strike, than in the Y and Z direction which show similar ranges. Mid-grade zone copper variogram has low number of samples and exhibits the lowest continuity, it is almost isotropic in all directions. MinZ high-grade copper variograms in the unfolded coordinates are isotropic in the X and Y directions with the longest ranges, and a very short range in the vertical Z axis indicating strong zonal anisotropy.

MS copper grades show geometrical and zonal anisotropy and much greater continuity than in the MinZ. Grade continuity is best along strike of the orebody than across strike, with the shortest ranges in the Z direction.

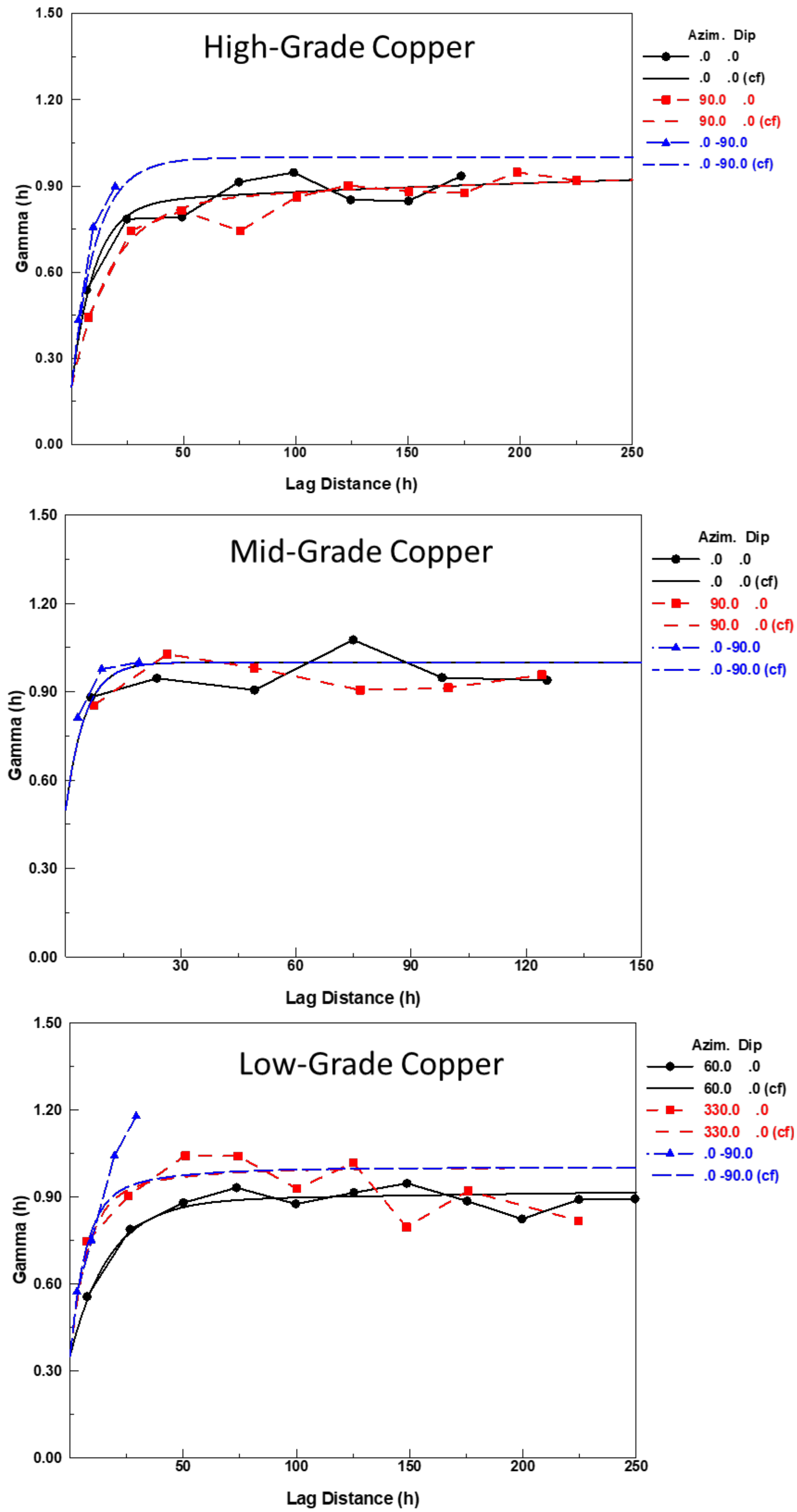


Figure 14-9: MinZ Variograms Copper Unfolded Coordinates (Ore Reserves Engineering 2022)

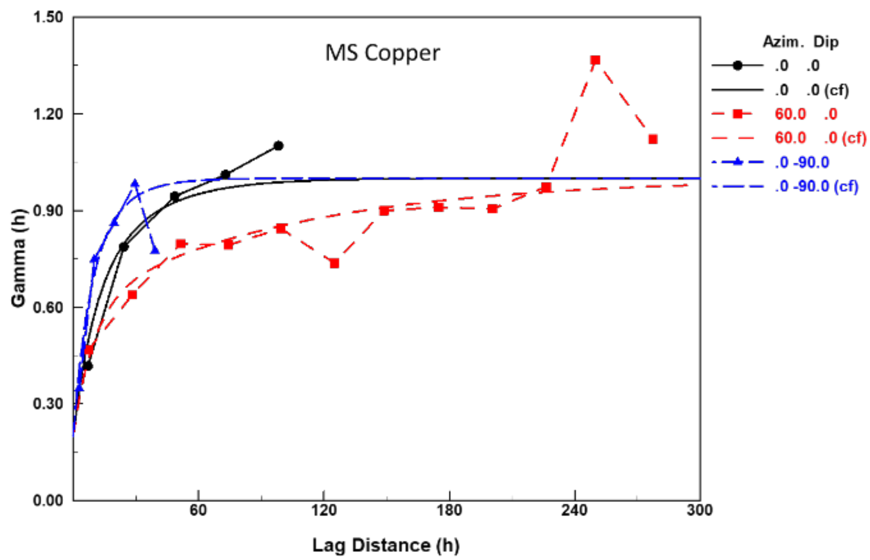


Figure 14-10: MS Variograms Copper Unfolded Coordinates (Ore Reserves Engineering 2022)

Zinc and Lead Variograms

Variograms were computed for zinc and lead in the unfolded coordinate system for the grade zones and are shown graphically in **Figure 14-11** and **Figure 14-12**.

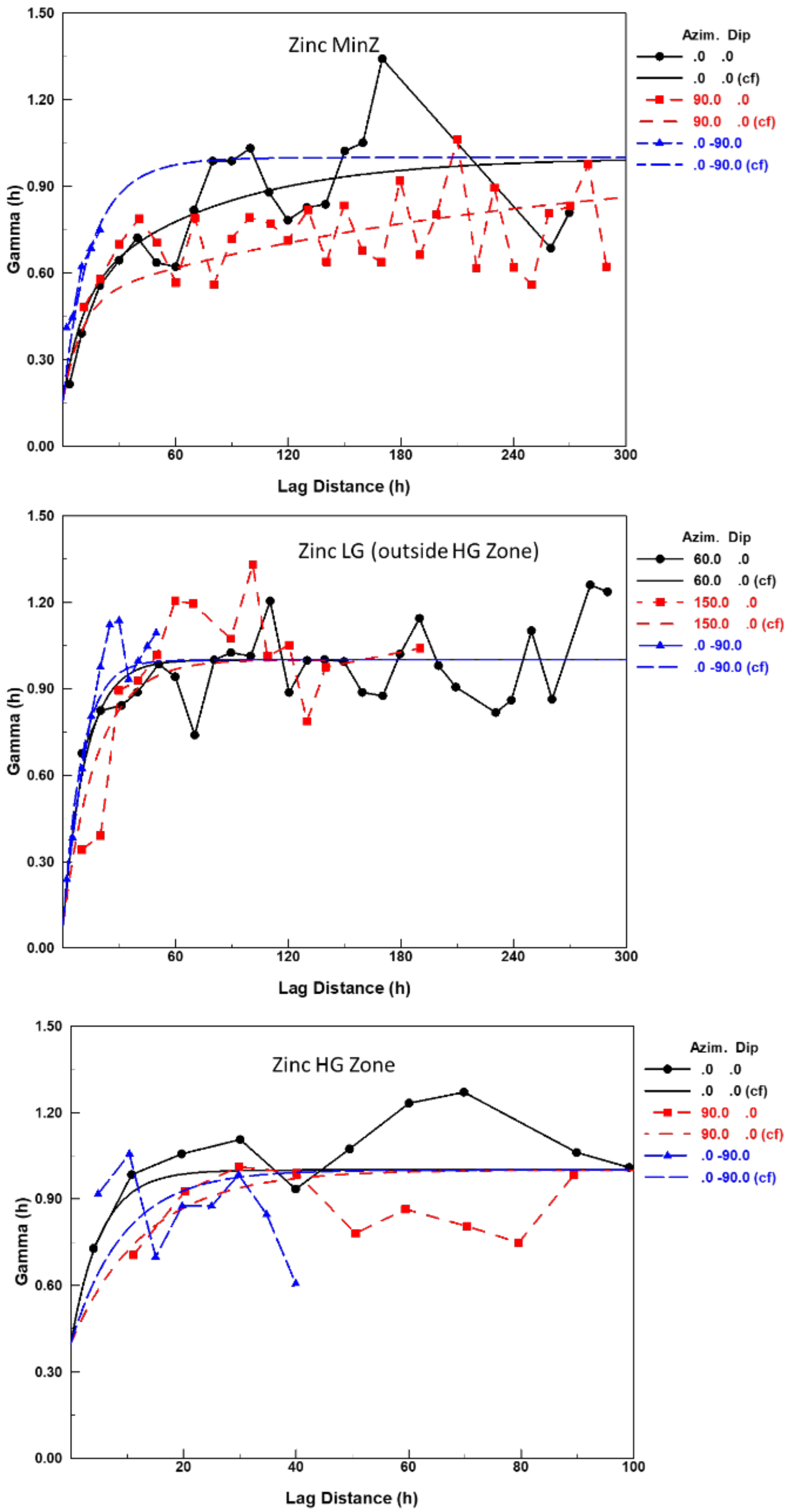


Figure 14-11: Variograms Zinc Unfolded Coordinates (Ore Reserves Engineering 2022)

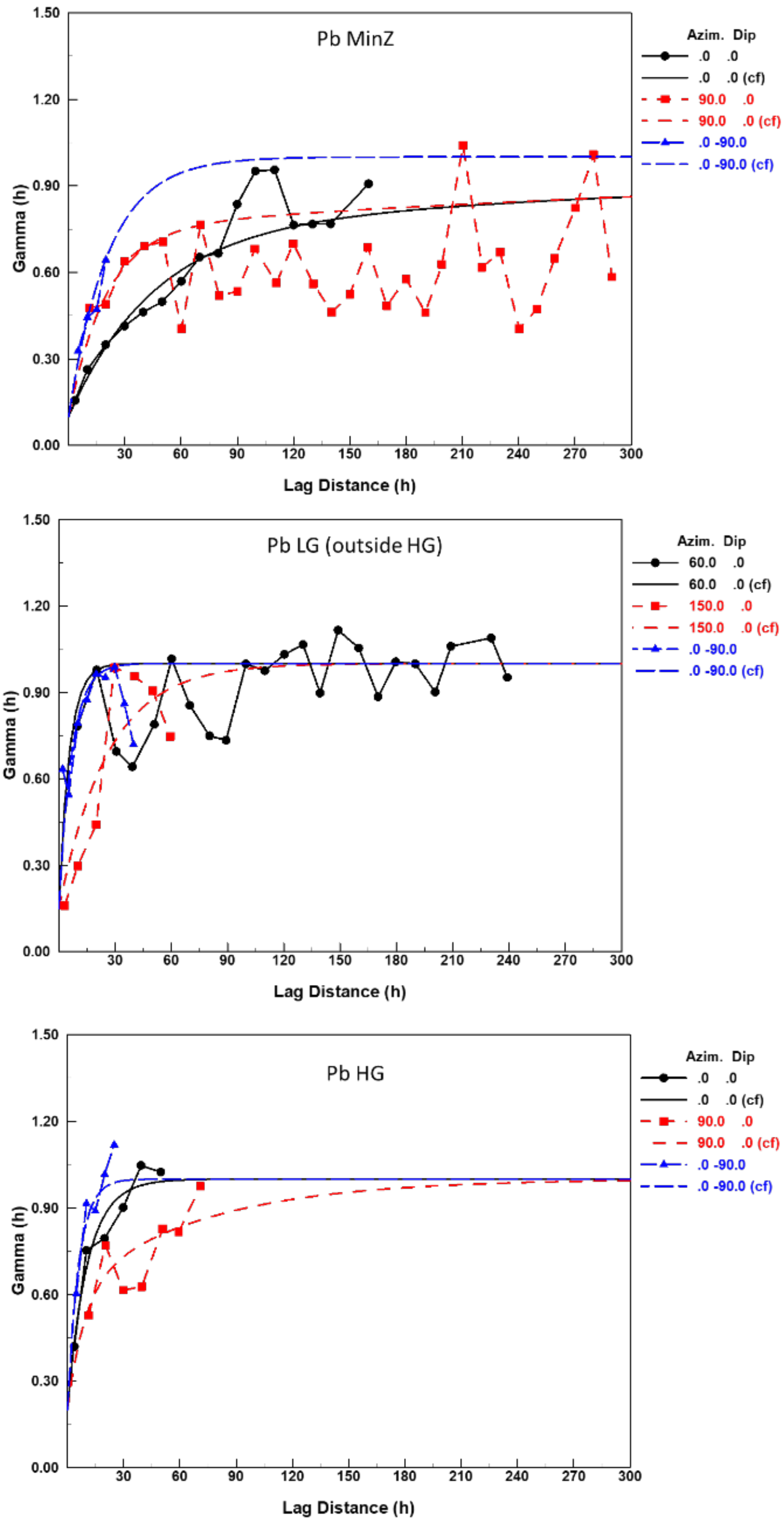


Figure 14-12: Variograms Lead Unfolded Coordinates (Ore Reserves Engineering 2022)

The results of variogram modeling are summarized in **Table 14-13** for zinc and **Table 14-14** for lead. All variograms were modeled using two nested exponential variogram structures except for the LG zinc and LG lead zones where only one structure was used.

Zinc continuity in the MinZ, in the unfolded coordinates, shows geometrical and zonal anisotropy with much better continuity along the strike of the deposit than across strike, with the shortest ranges in the vertical Z axis.

Zinc grades in the low-grade zone of the Contact and MS areas have the lowest continuity with a slightly better continuity along the rotated X axis (155 azimuth) and isotropic continuity along the rotated Y axis (65 azimuth) and the vertical Z axis.

Grade continuity in the high-grade zone of the Contact and MS areas is better along strike in the E-W direction, with similar ranges in the Y and Z directions.

Table 14-13: Summary of Variogram Models for Zinc Unfolded Coordinates (Ore Reserves Engineering 2022)

Variogram	Rotation	Nugget	Structure 1			Structure 2		
			Range X	Range Y	Range Z	Range X	Range Y	Range Z
MinZ Zn	0	0.16	10	10	10	235	75	20
LG Zn	65	0.08	18	10	10	-	-	-
HG Zn	0	0.43	5	5	3	53	11	15

Lead continuity in the MinZ, in the unfolded coordinates, shows geometrical and zonal anisotropy with much better continuity along the strike of the deposit than across strike and the shortest ranges in the vertical Z axis.

Lead grades in the low-grade zone of the Contact and MS areas, have the highest continuity along the rotated X axis (162 azimuth) and isotropic continuity along the rotated Y axis (72 azimuth) and the vertical Z axis, with very short ranges along both axes.

Lead grade continuity in the high-grade zone of the Contact and MS areas is better along strike in the E-W direction, with similar ranges in the Y and Z directions.

Table 14-14: Summary of Variogram Models for Lead Unfolded Coordinates (Ore Reserves Engineering 2022)

Variogram	Rotation	Nugget	Structure 1			Structure 2		
			Range X	Range Y	Range Z	Range X	Range Y	Range Z
MinZ Pb	0	0.10	20	45	20	500	25	0.25
LG Pb	72	0.15	143.1	5.5	6.8	-	-	-
HG Pb	-5	0.20	9	9	6	80	6	0.39

Search ellipse parameters were developed for each element and grade zone based on the variograms and a general assessment of the continuity of grades through inspection of the sample data in plans and sections.

Search Ellipse Parameters

Search ellipse parameters for each element and grade zone, are summarized in **Table 14-15** and **Table 14-16**. All search ellipses are relative to the unfolded coordinate system, and the rotation, as indicated in the tables, is clockwise around the +Z axis.

Table 14-15: Copper Search Ellipse Parameters (Ore Reserves Engineering 2022)

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
MinZ NN Cu Gzones	0	100	35	5	5	10	1	5	10	1	5	10
MinZ IDP Cu Gzone LG	-28	90	90	90	5	10	1.5	5	10	2	1	10
MinZ IDP Cu Gzone MG	0	140	40	40	5	10	1.5	5	10	2	1	10
MinZ IDP Cu Gzone HG	-10	100	100	5	5	10	1.5	5	10	2	1	10
MS NN/IDP Cu	-14	160	50	25	5	10	1.5	5	10	2	1	10

Table 14-16: Zinc and Lead Search Ellipse Parameters (Ore Reserves Engineering 2022)

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
IDP-NN MinZ	0	50	25	10	5	10	1.5	5	10	3	1	10
IDP-NN LG	0	50	30	10	5	10	1.5	5	10	3	1	10
IDP-NN HG	0	50	20	10	5	10	1.5	5	10	3	1	10

14.2.6.2 Grade Estimation

Grade models were estimated for copper, sulfur, lead, and zinc grades using the unfolded coordinate space and nearest-neighbor (NN) and inverse-distance-power (IDP). The estimated grade models were constrained by the defined grade zones and/or by the wireframe domains (MinZ, Contact, MS)

The IDP models were optimized relative to the NN models by matching the average grade of the IDP model to the average grade of the NN model to ensure that the overall estimates are unbiased.

Copper was estimated as a single zone in the MS and with grade zones of low, mid, and high grade in MinZ and Contact area, which were estimated together.

The optimized IDP powers are shown in **Table 14-17**.

Table 14-17: Copper Estimation Powers by Grade Zone (Ore Reserves Engineering 2022)

Cu Grade Zone	Power for IDP Cu
MinZ/Contact Low-grade	2
MinZ/Contact Mid-grade	1
MinZ/Contact High-grade	2.3
MS	3.5

Sulfur was estimated with low-, mid-, and high-grade zones. Average sulfur grade of each grade zone was assigned as default value to the corresponding zone when the IDP estimates were missing: 45% S in the high-grade zone, 25% S in the mid-grade zone, and 15% in the low-grade zone.

IDP anisotropies are the same as the search ellipse radii; the optimized IDP powers are shown in **Table 14-18**.

Table 14-18: Sulfur Estimation Powers by Grade Zone (Ore Reserves Engineering 2022)

Grade Zone	Power for IDP S
Sulfur LG	3.75
Sulfur MG	3.85
Sulfur HG	1.5

Zinc and lead were estimated for the MinZ and outside the MinZ inside the low-grade and high-grade zones described previously. IDP anisotropies are the same as the search ellipse radii; the optimized IDP powers are shown in **Table 14-19**.

Table 14-19: Zinc and Lead Estimation Powers by Grade Zone (Ore Reserves Engineering 2022)

Grade Zone	Power for IDP Zn	Grade Zone	Power for IDP Pb
MinZ Zn	3.5	MinZ Pb	3.8
LG MinZ	3.5	LG Pb	1.5
HG Zn	1	HG Pb	2.1

14.2.6.3 Classification

Classification of Mineral Resources into Measured, Indicated, and Inferred Resource classes is based on drill-hole spacing and the number of drillholes selected for estimation. Drill-hole spacing is measured based on the kriging variance from a point-kriging estimate using a "FLAG" variable that is set to 1.0 for composites with copper values and "absent" for composites with insufficient sampling to make a composite. A linear, zero-nugget variogram with a slope of 0.5 is used for this kriging run. The kriging variance for a block at the center of a 4-point, square drill-hole pattern is approximately equal to 28% of the drill-hole spacing. If the block is outside the drilling pattern (extrapolated), the kriging variance is equal to the distance to the nearest drillhole. The Resource classification parameters are summarized in **Table 14-20.**

Table 14-20: Mineral Resource Classification Parameters

Classification	Drill spacing (m)	Search Volume
Measured	<=60 m	SVOL<=1
Indicated	>60 m to <= 100m	SVOL<=2
Inferred	>100 m to <= 150m	
Unclassified	>150 m or no estimate	

14.2.6.4 Cutoff Grade

The cutoff for Mineral Resources is 0.14 % Cu, considering a copper price of US$3.50/lb.

14.2.6.5 Resource Statement

The copper Resource was summarized using a Lerchs-Grossmann pit shell that was run using a copper price of US $3.60/lb for the Resources near the surface. Resources were constrained by a $35/tonne price for the underground polymetallic mineralized material. Mineral Resources are estimated from the end of December 2020 topography. The Mineral Resources estimated for San Dionisio at a cutoff of 0.14 % Cu is summarized in **Table 14-21** for the open pit material, and **Table 14-21** for the underground material.

Table 14-21: Mineral Resource Estimate for San Dionisio for Open Pit

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Stockwork Resource								
Measured	0.14	28,118	0.76	0.27	0.06	471,116	167,370	37,193
Indicated	0.14	2,115	0.63	0.18	0.04	29,375	8,393	1,865
Measured + Indicated	0.14	30,233	0.75	0.27	0.06	499,888	179,960	39,991
Inferred	0.14	443	0.91	0.19	0.03	8,887	1,856	293
Polymetallic Resource								
Measured	0.14	22,699	1.12	2.11	0.40	560,473	1,055,891	200,169
Indicated	0.14	4,461	0.73	1.85	0.49	71,793	181,942	48,190
Measured + Indicated	0.14	27,161	1.06	2.07	0.41	634,719	1,239,498	245,504
Inferred	0.14	429	0.62	0.91	0.43	5,864	8,607	4,067
Total Resource								
Measured	0.14	50,817	0.92	1.09	0.21	1,030,687	1,221,140	235,265
Indicated	0.14	6,576	0.70	1.31	0.35	101,482	189,917	50,741
Measured + Indicated	0.14	57,393	0.89	1.12	0.23	1,126,105	1,417,120	291,016
Inferred	0.14	872	0.77	0.54	0.23	14,803	10,038	4,422

Table 14-22: Mineral Resource Estimate for San Dionisio for Underground

Classification	Cutoff $/tonne	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	35	0	0			0	0	0
Indicated	35	0	0			0	0	0
Measured + Indicated	35	0	0			0	0	0
Inferred	35	12,388	1.01	2.54	0.62	275,837	693,689	169,326

14.2.7 Model Verification

Copper and sulfur grades were estimated using Nearest Neighbor methods to confirm the Inverse-Distance estimations. Drillholes, assays, and blocks were compared visually. Tetra Tech has reviewed the methodology and results of the estimation and finds them to be within best practices for a study for this level.

14.3 San Antonio

The Mineral Resource model was created as a three-dimensional block model using Datamine Studio RM software with a block size of 2x2x2 meters. The estimation parameters are described in the following section.

14.3.1 Input Data

Drill-hole data files contain assays, collar locations, down-hole surveys, for all drilling in the Resource area. The drilling used for Resource estimation at San Antonio is summarized in **Table 14-23.**

Atalaya drilling only includes core drillholes drilled from surface on the west side of the deposit. Drilling used for the Resource estimate includes 8 drillholes that were drilled in 2015. The Atalaya drilling at Planes was not considered, as it lies outside of the San Antonio orebodies.

Table 14-23: Summary of Drilling used for Resource Estimation at San Antonio

Drill Series	Type	Year	Holes	Assays	Total Length (m)
Historic Surface	Core	1960s	20	241	6,838
Historic Underground	Core	1960-1970s	157	3,011	9,963
Atalaya	Core	2015	8	456	1,504
Total			185	3,708	18,305

14.3.2 Compositing

Drillhole assays were composited to 2 m composites using the geologic domain codes of the composites. The domain codes for the composites were based on the mineralized zone wireframes. Intervals inside the mineralized zone wireframes were assigned a code SA_UP for the upper block and SA_LOW for the lower block wireframe, and the code NOZN if lying outside the mineralized wireframes. All samples are forced to be included in one of the composites by adjusting the composite length, while keeping it as close as possible to 2 m. Assays were composited using length-weighted averages.

14.3.3 Capping

Grade distributions were examined for copper, sulfur, zinc, and lead. Based on the analysis, no grade capping was used for the San Antonio model. Grade distributions were identified, and nearest neighbor estimation was used to minimize problems with the multiple populations.

14.3.4 Vein Modeling

Wireframes corresponding to the main mineralized upper and lower massive sulfide orebodies were constructed and used as the basis for the mineralized zone models. The footwall of the overlying Culm Shales was modeled as a DTM surface using geological sections.

Empty 2x2x2 m block models were created for the upper and lower blocks which are separated by the Nerva Fault, then combined for the Resource model.

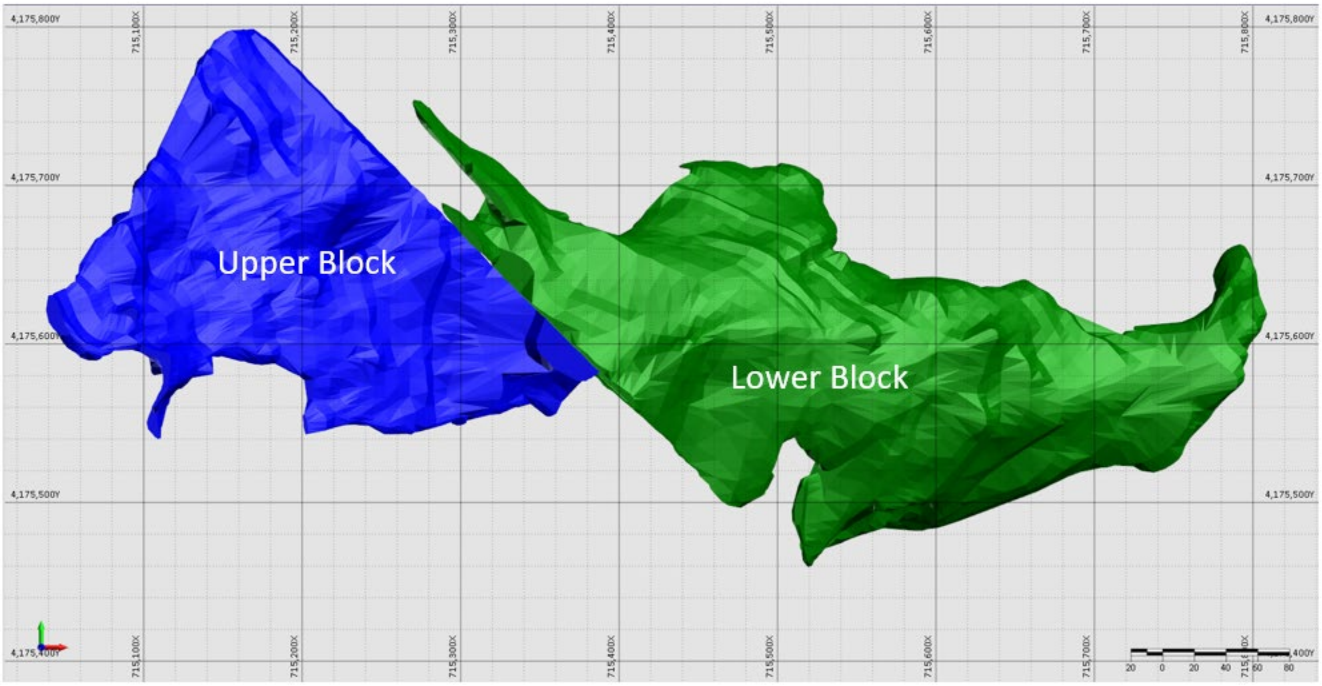


Figure 14-13: Plan view of the orebodies of San Antonio

14.3.5 Density Determinations

Density for the San Antonio deposit is based on a formula, as described in **Section 11**.

The density formula is:

$$\text{Density} = 2.6654 + (0.0175 * (2.427*\%\ \text{S\_IDP}+1.543*\%\ \text{Zn\_IDP}))$$

In those cases where the estimated zinc grade is absent, the density formula used only considers the estimated sulfur grade:

$$\text{Density} = 3.5695 + (0.0241 * \%\ \text{S\_IDP})$$

The San Antonio density formula defined in the previous sections and IDP sulfur and/or zinc estimates are used for estimation of block model density.

Fill material was assigned a default density of 2.00 t/m^3. Volumes mined-out with underground stopes and other workings were assigned a density of 2.00 t/m^3, which is equivalent to assuming that the underground openings have either caved, were backfilled during underground operations.

14.3.6 Estimation Methods and Parameters

The Mineral Resource model was created as a three-dimensional block model using Datamine Studio RM software. The model block size is 2x2x2 m to define the geometry of the deposit. The horizontal extent of the model is defined to cover the San Antonio mineral deposit, plus sufficient space outside for mine planning. Resource model size and location parameters are shown in **Table 14-24**, with coordinates in ETRS89 meters.

Table 14-24: San Antonio Resource Model Size and Location Parameters

	Minimum	Maximum	Block size	Number of Blocks	Model Size
Easting	714,610	715,978	2	684	1,368
Northing	4,175,270	4,175,970	2	350	700
Elevation	-180	500	2	340	680

14.3.6.1 Variography and Search Parameters

All variograms were computed in the unfolded coordinate system. Details of the copper, lead, and zinc variograms are detailed in this section.

Copper Variograms

The copper variograms were computed separately for the upper and lower blocks; the results are summarized in **Table 14-25** and graphically in **Figure 14-14**. Experimental variograms were constructed in a sample neighborhood in the range of 0.3 and 4% Cu.

Upper and lower blocks show both zonal and geometric anisotropy with a strong anisotropy in the NS to NW unfolded direction in the X'Y' plane and the shortest ranges along the Z' direction.

Table 14-25: Summary of Variogram Models for Copper in Unfolded Coordinates (Ore Reserves Engineering 2022)

Variogram	Rotation (Z)	Nugget	Structure 1			Structure 2		
			Range X	Range Y	Range Z	Range X	Range Y	Range Z
Upper Cu	0	0.301	68	40	5	8.6	65	5
Lower Cu	-33	0.388	6.9	20.2	4.3	-	-	-

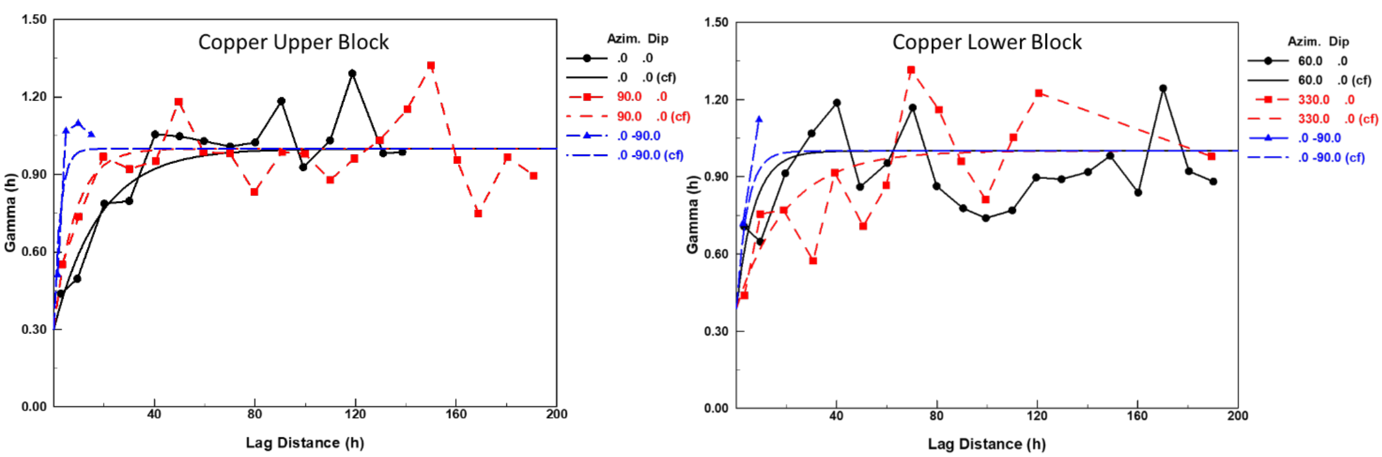


Figure 14-14: Copper variograms for the upper and lower blocks (Ore Reserves Engineering 2022)

14.3.6.2 Zinc Variograms

The zinc variograms were computed for the defined high-grade zinc grade zones in the upper and lower blocks separately; the results are summarized in **Table 14-26** and graphically in **Figure 14-15**.

Zinc grades in the upper block are almost isotropic in the high-grade zinc zone. In the low-grade zone, there is a geometric anisotropy along the rotated Y' axis in the 41° direction, variograms are isotropic with short ranges in the rotated X' axis along the 131° direction and the Z' direction.

Zinc grades in the lower block exhibit strong geometrical anisotropy along the rotated X' axis in the 140-139° direction in both grade zones, with much better continuity and longer ranges in the high-grade zone in that direction. In both grade zones, the variograms are almost isotropic along the rotated Y' axis and the and Z' directions with the shortest ranges.

Table 14-26: Summary of Variogram Models for Zinc in Unfolded Coordinates (Ore Reserves Engineering 2022)

Variogram	Rotation (Z)	Nugget	Structure 1		
			Range X	Range Y	Range Z
Upper LG Zn	41	0.00	4.2	17.1	5.5
Upper HG Zn	37	0.33	9.5	6.2	5.8
Lower LG Zn	49	0.05	17.4	5.4	4
Upper HG Zn	50	0.23	35.6	3.4	4.2

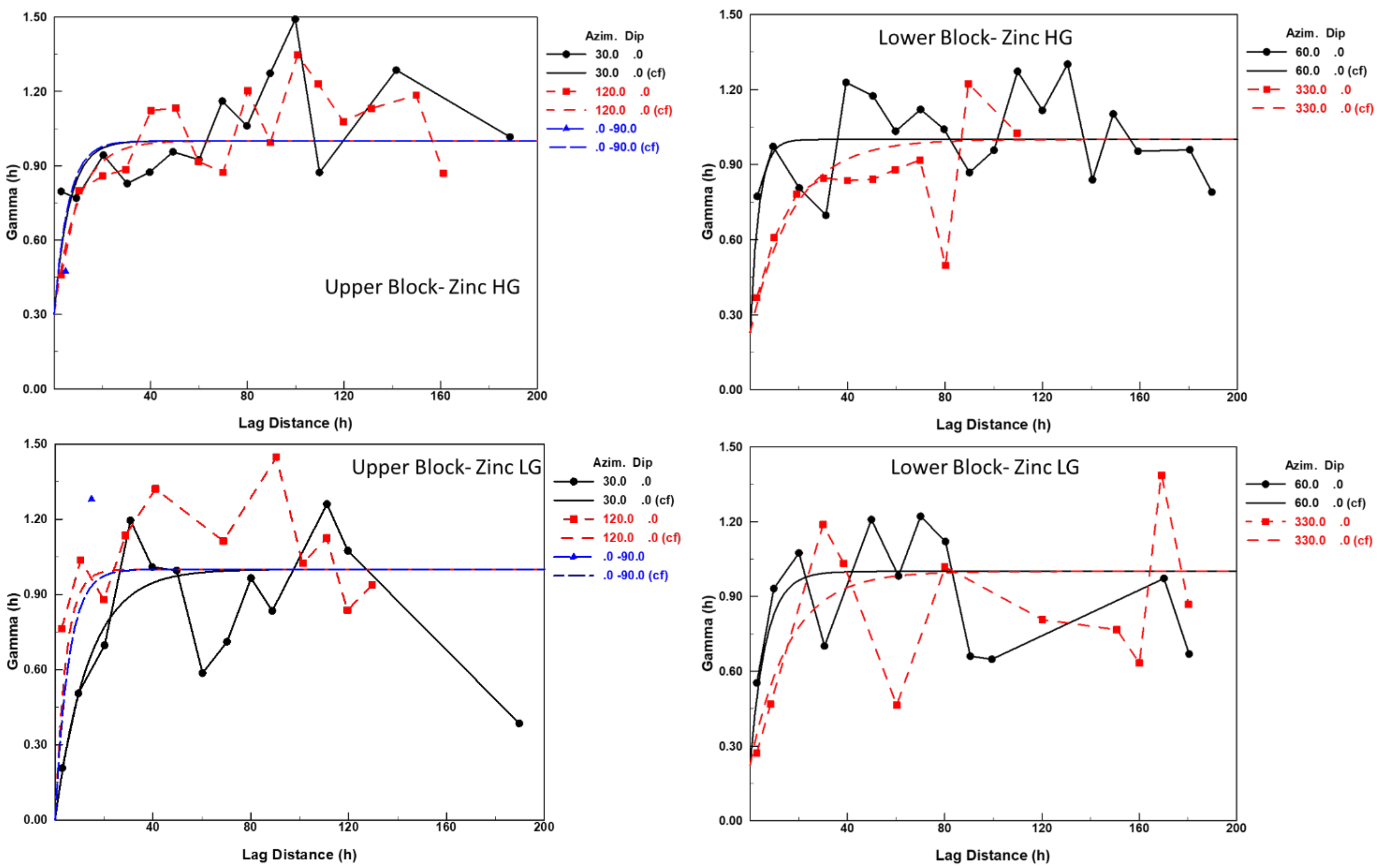


Figure 14-15: Zinc variograms for the upper and lower blocks (Ore Reserves Engineering 2022)

14.3.6.3 Lead Variograms

The lead variograms were computed for the high-grade lead grade zones in the upper and lower blocks separately. The results are summarized in **Table 14-27** and graphically in **Figure 14-16**.

Lead variograms in the high-grade zone of the upper block show a strong anisotropy along the rotated X' axis in the 75° direction and are isotropic in the rotated Y' and Z' axis. In the lower block, the lead in the high-grade zone is isotropic in the X'Y' plane and presents a very short range in the Z' direction.

Table 14-27: Summary of Variogram Models for Lead HG Grade Zones in Unfolded Coordinates (Ore Reserves Engineering 2022)

Variogram	Rotation (Z)	Nugget	Structure 1		
			Range X	Range Y	Range Z
Upper LG Pb	-15	0.35	38.8	7	7.7
Upper HG Pb	-30	0.00	10	7	3.3

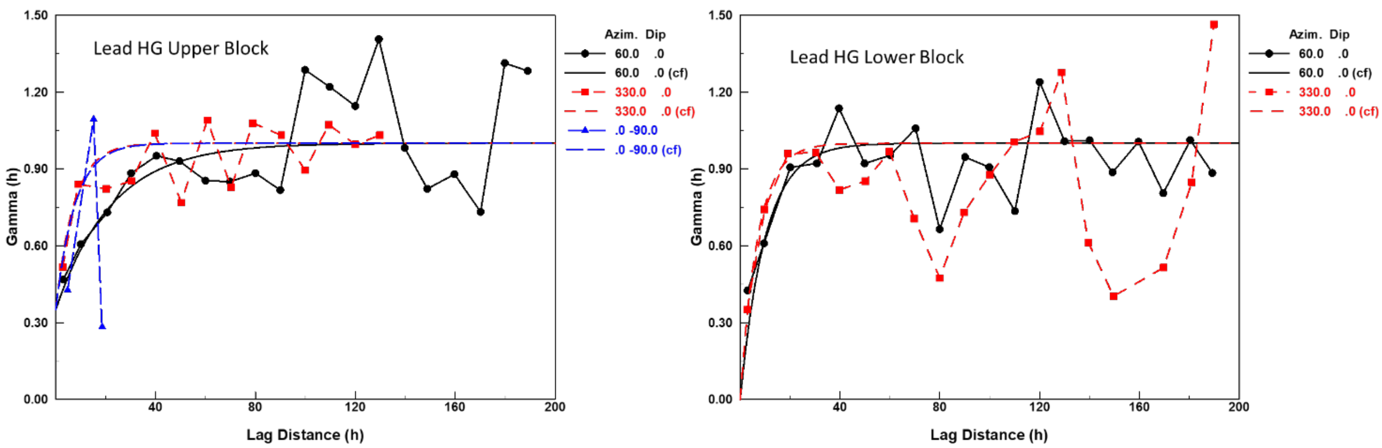


Figure 14-16: Lead variograms for the HG zones of the upper and lower blocks (Ore Reserves Engineering 2022)

14.3.6.4 Search Ellipse Parameters

Search ellipse parameters were developed for each element based on the variograms and a general assessment of the continuity of grades through inspection of the sample data in plans and sections.

Search ellipse parameters for each element and grade zone are summarized in **Table 14-28**, **Table 14-29**, and **Table 14-30**. All search ellipses are relative to the unfolding coordinate system, and the rotation, as indicated in the tables, is clockwise around the +Z axis.

Table 14-28: Copper& Sulfur Search Ellipse Parameters IDP & NN Estimation

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
Upper IDP-NN Cu LG	0	65	100	10	5	10	1.5	5	10	3	1	10
Upper IDP-NN Cu MG	0	65	100	10	5	10	1.5	5	10	3	1	10
Upper IDP-NN Cu HG	0	30	50	10	5	10	1.5	5	10	3	1	10
Lower IDP-NN Cu LG	-33	40	80	10	5	10	1.5	5	10	3	1	10
Lower IDP-NN Cu MG	-33	40	80	10	5	10	1.5	5	10	3	1	10
Lower IDP-NN Cu HG	-33	20	40	10	5	10	1.5	5	10	3	1	10

Table 14-29: Zinc Search Ellipse Parameters IDP & NN Estimation

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
Upper IDP-NN Zn LG	41	20	80	10	5	10	1.5	5	10	3	1	10
Upper IDP-NN Zn HG	37	40	30	10	5	10	1.5	5	10	3	1	10
Lower IDP-NN Zn LG	49	80	25	5	5	10	1.5	5	10	3	1	10
Lower IDP-NN Zn HG	50	50	10	5	5	10	1.5	5	10	3	1	10

Table 14-30: Lead Search Ellipse Parameters IDP & NN Estimation (Ore Reserves Engineering 2022)

Estimation Case	Rotation	Search 1					Search 2			Search 3		
		X (m)	Y (m)	Z (m)	Comp Min	Comp Max	Factor	Comp Min	Comp Max	Factor	Comp Min	Comp Max
Upper IDP-NN Pb LG	0	40	40	10	5	10	1.5	5	10	3	1	10
Upper IDP-NN Pb HG	0	40	40	10	5	10	1.5	5	10	3	1	10
Lower IDP-NN Pb LG	0	40	40	10	5	10	1.5	5	10	3	1	10
Lower IDP-NN Pb HG	0	40	40	10	5	10	1.5	5	10	3	1	10

Unfolding

The Datamine unfolding tool was used to flatten the anticlinal fold of San Antonio composed of the two massive orebodies into a geometry that is as close as possible to the original shape of the deposit.

The procedure for the unfolding of at San Antonio is very similar to the method applied to Cerro Colorado or San Dionisio, which has been described in a previous section:

- Upper and lower trend strings in 4 m spacing N60°E trending vertical sections were drawn, representing the hanging wall and footwall of the mineralized upper and lower zone. Between-trend tag strings were drawn that connect between hanging wall and footwall strings.
- The unfolded Y' axis (Y FLAT) is oriented parallel to the N60°E direction (downdip axis) and is approximately perpendicular to the strike of the deposit. The Y' coordinates are in unscaled units (**Figure 14-17**).
- A tag string was drawn to connect horizontally between the section strings in the Y' axis direction (N150°E).
- The X' unfolded axis follows parallel to the N150°E direction or the nominal strike of the deposit, and the X' coordinates are scaled relative to the average unfolded width of the deposit in the X' direction (along strike axis).

- The resulting footwall-to-hanging wall tag strings define the Z’ axis in the unfolded coordinate system. The Z’ unfolded axis is scaled proportionally to the average “thickness” of the mineralized zone.

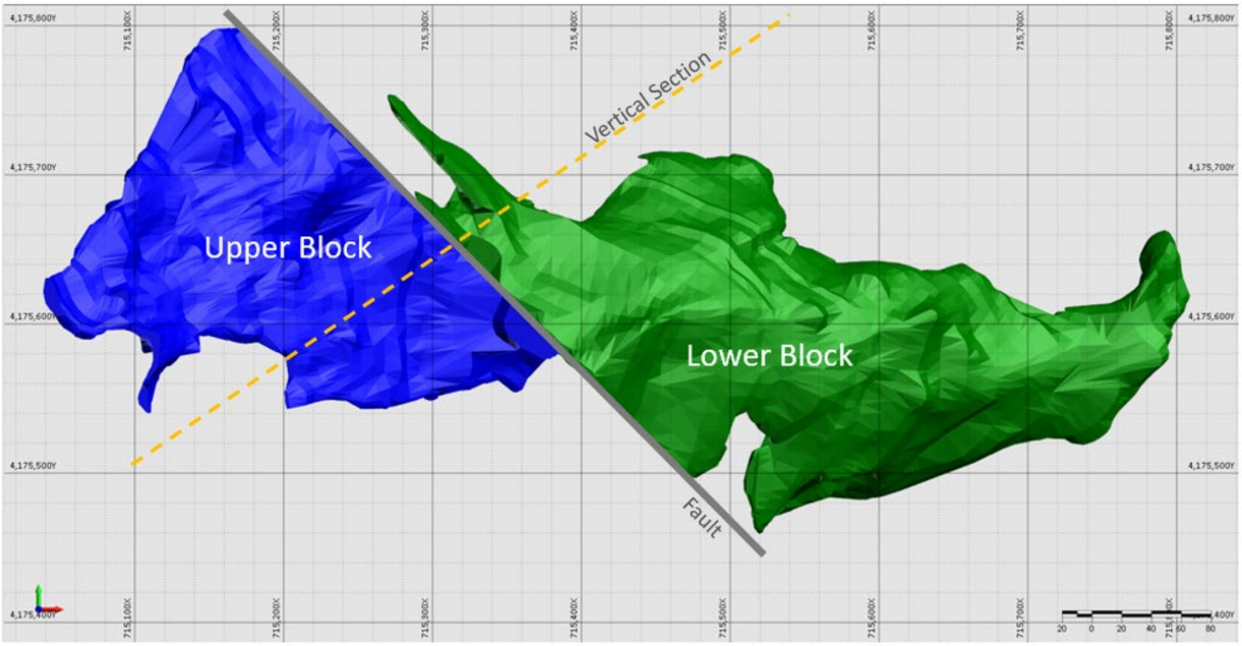


Figure 14-17: Plan view showing the wireframes and unfolding axis

14.3.6.5 Classification

For the San Antonio deposit, the estimated underground Mineral Resources are classified as Inferred due to the historic nature of the drilling information used for Resource estimation. New drilling data is limited. Historical data had been validated and is considered good quality and reliable but should be confirmed with additional new drilling.

14.3.6.6 Cutoff Grade

Resources were constrained by a $35/tonne price for the underground polymetallic mineralized material. Mineral Resources are estimated from the end of December 2020 topography.

14.3.7 Resource Statement

Resources were constrained by a $35/tonne price for the underground polymetallic mineralized material. Mineral Resources are estimated from the end of December 2020 topography. The Mineral Resources estimated for San Antonio is summarized in **Table 14-31.**

Table 14-31: Mineral Resource Estimate for San Antonio Underground

Classification	Cutoff $/tonne	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	35	0	0			0	0	0
Indicated	35	0	0			0	0	0
Measured + Indicated	35	0	0			0	0	0
Inferred	35	11,776	1.32	1.79	0.99	342,690	464,709	257,018

14.3.8 Model Verification

Copper and sulfur grades were estimated using Nearest Neighbor methods to confirm the Inverse-Distance estimations. Drillholes, assays, and blocks were compared visually. Tetra Tech has reviewed the methodology and results of the estimation and finds them to be within best practices for a study for this level.

14.4 Statement of Resources

Proyecto Riotinto consists of the Cerro Colorado, San Dionisio, and San Antonio Deposits. **Table 14-32**, **Table 14-33**, **Table 14-34**, **Table 14-35**, and **Table 14-36** summarize the Resources for the project by deposit. Resource estimations were prepared in Datamine Studio software by Alan C. Noble, P.E. of Ore Reserves Engineering, Lakewood, CO USA, and by Mónica Barrero Bouza, EurGeol, and verified by Tetra Tech's Qualified persons for this PEA.

Mineral Resources are estimated from the end of December 2020 topography. The cutoff for Mineral Resources at a copper price of US$3.50/lb is 0.14 % Cu. The Mineral Resource estimate, using multiple cutoffs, is summarized in **Table 14-32**.

Table 14-32: Mineral Resource Summary for Cerro Colorado

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	0.14	151,621	0.36	0.15	0.03	1,203,349	501,395	100,279
Indicated	0.14	49,094	0.38	0.14	0.03	411,284	151,526	32,470
Measured + Indicated	0.14	200,715	0.37	0.15	0.03	1,637,236	663,744	132,749
Inferred	0.14	4,428	0.40	0.15	0.03	39,048	14,643	2,929

Effective date of December 31, 2020.
Includes material mined from December 31, 2020, to October 31, 2022.

Mining has progressed since the cutoff for the Resource with a cutoff date of December 31, 2020. Approximately 25.2 Mt tonnes at 0.41 Cu%, 0.11% Zn, and 0.01% Pb were mined from December 31, 2020, through October 31, 2022, reducing the Resource amount. **Table 14-33** shows the Resource estimate with the production from the mine removed through October 31, 2022.

Table 14-33: Mineral Resource Summary for Cerro Colorado with production material removed

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	0.14	132,699	0.36	0.15	0.03	1,053,170	438,821	87,764
Indicated	0.14	43,203	0.38	0.14	0.03	361,930	133,343	28,573
Measured + Indicated	0.14	175,901	0.37	0.15	0.03	1,434,831	581,688	116,338
Inferred	0.14	4,074	0.4	0.15	0.03	35,924	13,472	2,694

Excludes material mined from December 31, 2020, to October 31, 2022.

Table 14-34: Mineral Resource Estimate for San Dionisio for Open Pit

Classification	Cutoff % Cu	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Stockwork Resource								
Measured	0.14	28,118	0.76	0.27	0.06	471,116	167,370	37,193
Indicated	0.14	2,115	0.63	0.18	0.04	29,375	8,393	1,865
Measured + Indicated	0.14	30,233	0.75	0.27	0.06	499,888	179,960	39,991
Inferred	0.14	443	0.91	0.19	0.03	8,887	1,856	293
Polymetallic Resource								
Measured	0.14	22,699	1.12	2.11	0.40	560,473	1,055,891	200,169
Indicated	0.14	4,461	0.73	1.85	0.49	71,793	181,942	48,190
Measured + Indicated	0.14	27,161	1.06	2.07	0.41	634,719	1,239,498	245,504
Inferred	0.14	429	0.62	0.91	0.43	5,864	8,607	4,067
Total Resource								
Measured	0.14	50,817	0.92	1.09	0.21	1,030,687	1,221,140	235,265
Indicated	0.14	6,576	0.70	1.31	0.35	101,482	189,917	50,741
Measured + Indicated	0.14	57,393	0.89	1.12	0.23	1,126,105	1,417,120	291,016
Inferred	0.14	872	0.77	0.54	0.23	14,803	10,038	4,422

Table 14-35: Mineral Resource Estimate for San Dionisio for Underground

Classification	Cutoff $/tonne	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	35	0	0			0	0	0
Indicated	35	0	0			0	0	0
Measured + Indicated	35	0	0			0	0	0
Inferred	35	12,388	1.01	2.54	0.62	275,837	693,689	169,326

Table 14-36: Mineral Resource Estimate for San Antonio Underground

Classification	Cutoff $/tonne	Tonnes (000s)	Cu %	Zn %	Pb %	Cu lb (000s)	Zn lb (000s)	Pb lb (000s)
Measured	35	0	0			0	0	0
Indicated	35	0	0			0	0	0
Measured + Indicated	35	0	0			0	0	0
Inferred	35	11,776	1.32	1.79	0.99	342,690	464,709	257,018

14.5 Relevant Factors

Parameters used as inputs to calculate the cutoff grade of the Resource can change over time. Factors that could have an impact on the Resource reported in this PEA include:

- Changes in metal price or contract terms
- New density measurements could affect tonnages and content
- Processing of the polymetallic mineralized material could affect the Mineral Resource

Mineral Resources are not Mineral Reserves and therefore do not have demonstrated economic viability.

There are no additional environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors not already discussed in this report that Tetra Tech is aware of that could materially affect the Mineral Resource estimate.

14.6 Conclusions and Recommendations

14.6.1 Conclusions

Tetra Tech has reviewed the Resource model for Proyecto Riotinto estimated by Alan C. Noble, P.E. of Ore Reserves Engineering, Lakewood, CO USA, and by Mónica Barrero Bouza. The inputs, parameters, and estimation results are within industry best practices for a study of this level and a mine with historic data.

14.6.2 Recommendations

- Assay for silver when exploration as additional exploration is completed and estimate silver values into the block model to gain an understanding of the silver content that could be saleable.
- Confirm historical drilling data with new drilling and the corresponding QA/QC data. This could upgrade the current Inferred Resource to a higher classification confidence.
- Sample recovery (drill core) issues and the possible correlation with high lead and zinc values discussed in historical reports should be clarified with new drilling core recovery data. Diamond drill core is recommended for future confirmation and infill drilling programs.

15. MINERAL RESERVE ESTIMATES

Mineral Reserves were not estimated for this PEA.

As there will be no modifications to Cerro Colorado's mineral inventory, mining method, or recovery assumptions used in the declaration of the Cerro Colorado Mineral Reserves, Tetra Tech considers that the Mineral Reserves declared in the September 2022 technical report can be considered current and valid.

Per CIM definitions, the mineral inventory of Cerro Colorado is included in this PEA as Mineral Resources.

16. MINING METHODS

Mining has historically been completed through open pit and underground methods. The Cerro Colorado deposit will continue to be mined using open pit methods. The historic open pit for San Dionisio will be expanded, before continuing underground. Mining at the San Antonio deposit has been completed through underground methods in the past and will continue to be mined with underground methods. Underground mining is planned to be completed by underground sublevel stoping methods, with delayed backfill. The mining methods planned for each area are detailed in this section.

16.1 Geotechnical and Hydrological

Geotechnical and hydrological studies completed for the project are detailed in this section for each of the deposits.

16.1.1 Cerro Colorado

Geotechnical information pertaining to the Cerro Colorado pit is summarized from Ore Resources Engineering (2022).

Updated geotechnical pit design parameters were provided by Atalaya Mining based on revised pit stability analysis (Terratec 2021). Below the 320 m elevation in the main mineralized zone (MinZ), an increase of the bench face angle in the North pit wall from 70° to 78° is supported. No constraints to the inter-ramp height were provided; as a result, a catch berm of 20 m has been designed at the 320 m elevation.

Geotechnical design parameters for the ultimate pit are specific to lithology, location, and orientation of the pit wall and are tabulated in **Table 16-1**. The internal phases were designed using the same geotechnical inputs.

Table 16-1: Cerro Colorado Geotechnical Design Parameters

Slope Code	Region Description	Face Angle (°)	Bench Height (m)	Berm Width (m)
1	South Shales above 320 mRL	50	20	10
2	MinZone above 320 mRL	70	20	10
3	North Shales above 320 mRL	50	20	10
4	Filón Sur Cloritas	70	20	10
5	Filón Sur Massive Sulfides	45	20	10
6	Weathered Zone	45	20	10
7	Fill	50	20	10
8	MinZone below 320 mRL	See **Figure 16-1**	20	10
9	North & South Shales below 320 mRL	70	20	10

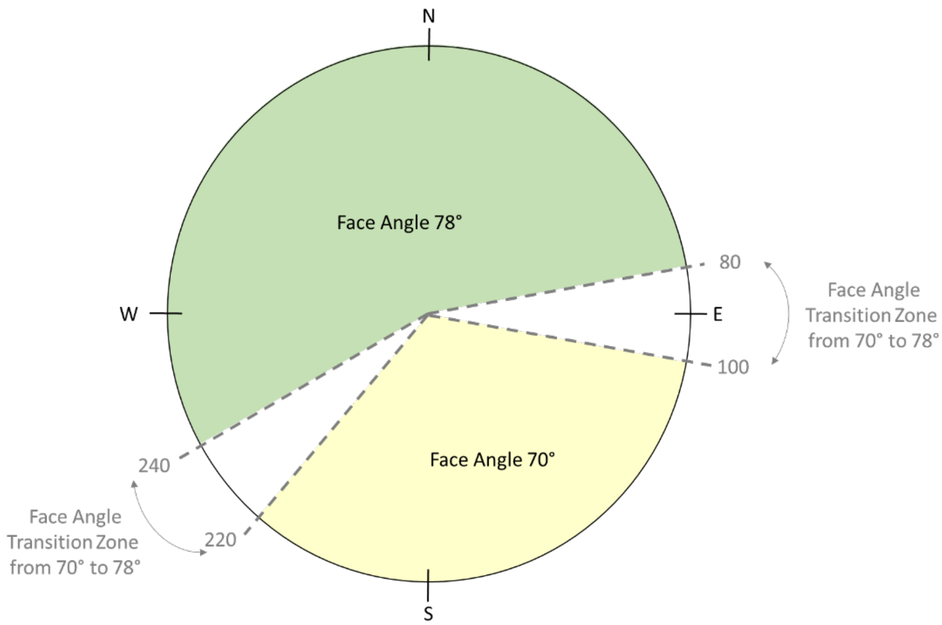


Figure 16-1: Slope rosette for Cerro Colorado MinZone below 320 mRL

Hydrological studies for Cerro Colorado have not been performed or reviewed by Tetra Tech.

16.1.2 San Dionisio

16.1.2.1 Geotechnical

Open Pit

The extant Atalaya open pit is 1,000 m long and 850 m wide, with an average overall slope of 35-37°. Instability in the pit was initially detected in 1973, when a surface crack appeared 200 m from the crest of the south wall and parallel to it. In the 1990s, with the extraction of the gossan zone, new fractures appeared in the southern and eastern sectors of the pit. The pit has undergone monitoring evaluations and stability studies, the most recent summary of which is (Arias Prieto, López Fernández and Pando González 2020). The most significant area of geotechnical instability is the eastern sector of the pit known as Resto de Alfredo, where movements from 10 to 30 cm have been observed. This movement indicates a general instability of the southern edge of the pit, which currently contains backfill material. This movement could be due to insufficient resistance of the fill material to resist the movement of the southern edge and by subsidence due to historical underground workings.

Overall slope angles for the rock types found in the pit for the purposes of Mineral Resource estimation have been developed based on historical data and consultant recommendations. Detailed geotechnical analysis for pit slope design parameters have not been performed or reviewed by Tetra Tech but are recommended to advance the project to higher levels of study.

Underground

Much of the underground geotechnical information for San Dionisio is historic, dating back to the 1980s and before. The underground deposit at San Dionisio has used a combination of room-and-pillar mining, cut-and-fill mining, and, most recently, large-scale blasthole stoping with cemented backfill. Recommendations for the size of the blasthole stopes vary based on stability of the host rock, with a stope dimension of 20 m wide by 70 m high for the *cloritas* (MinZ and Zone 2A), and 14 m wide by 35 m tall for the massive sulfides. Sill pillars are included between stopes to provide additional stability. Roof support within 15 m of the stopes would involve a combination of fully grouted rebar on the back and walls, along with wire mesh on the back where needed. Some stope areas may also require the use of cable bolts to delay caving in potential failure zones. In development areas, mechanical rock bolts accompanied by screen may be sufficient.

16.1.2.2 Hydrological

Hydrological studies for San Dionisio have not been performed or reviewed by Tetra Tech. Dewatering of the existing Atalaya pit ceased in 2005, and the average in-pit water level in 2021 was 241.7 m elevation. Based on this water elevation, the volume of water at the pit bottom and held within the historic underground workings, as reported by Ore Reserves Engineering (2022), is shown in **Table 16-2**.

Table 16-2: Calculated Water Volumes – San Dionisio

	Volume (m^3)
In-pit water	5,925,346
Water in underground workings	431,241
Total	**6,356,587**

16.1.3 San Antonio

No detailed geotechnical information on the San Antonio deposit was available for review. Historical evidence indicates that the deposit can support blasthole stope openings of 20 m wide with pillars 8 m wide. Confirmatory geotechnical studies should be performed to confirm the support requirements for the underground mine at San Antonio.

No hydrological studies or evaluations for San Antonio have been performed or reviewed by Tetra Tech. The underground workings will have to be dewatered prior to beginning rehabilitation, development, and operational work. Historical reports indicate the Rio Tinto River, which runs above the deposit area, does not cause inflow into the underground workings. However, a hydrological study should be conducted to confirm the hydrological conditions at the deposit.

16.2 Open Pit Mining

Open pit mining will continue at Cerro Colorado and San Dionisio. The details of the preliminary mine designs are discussed in this section.

16.2.1 Cerro Colorado

Mining is currently being conducted at the Cerro Colorado open pit using conventional open pit mining methods. Mining benches are on 10 m vertical intervals that are double benched to a total height of 20 m. Small- to medium-scale mining equipment are used to execute the development plan, including rock drills capable of drilling 102- to 127-mm-diameter blast holes, hydraulic excavators with bucket capacities of 6-14 m^3, off-highway trucks with 91-tonnes payload capacity, and suitably sized support equipment. Mining of the pit is being carried out by experienced metal mining contractors.

Tetra Tech has reviewed the ultimate pit and internal phase designs for Cerro Colorado as described in the report by Ore Reserves Engineering (2022) and considers them appropriate for use in this PEA. There have been no modifications to the designs of the Cerro Colorado pit.

The ultimate pit and internal phase designs for Cerro Colorado are shown in **Figure 16-2** through **Figure 16-8** (Ore Reserves Engineering 2022).

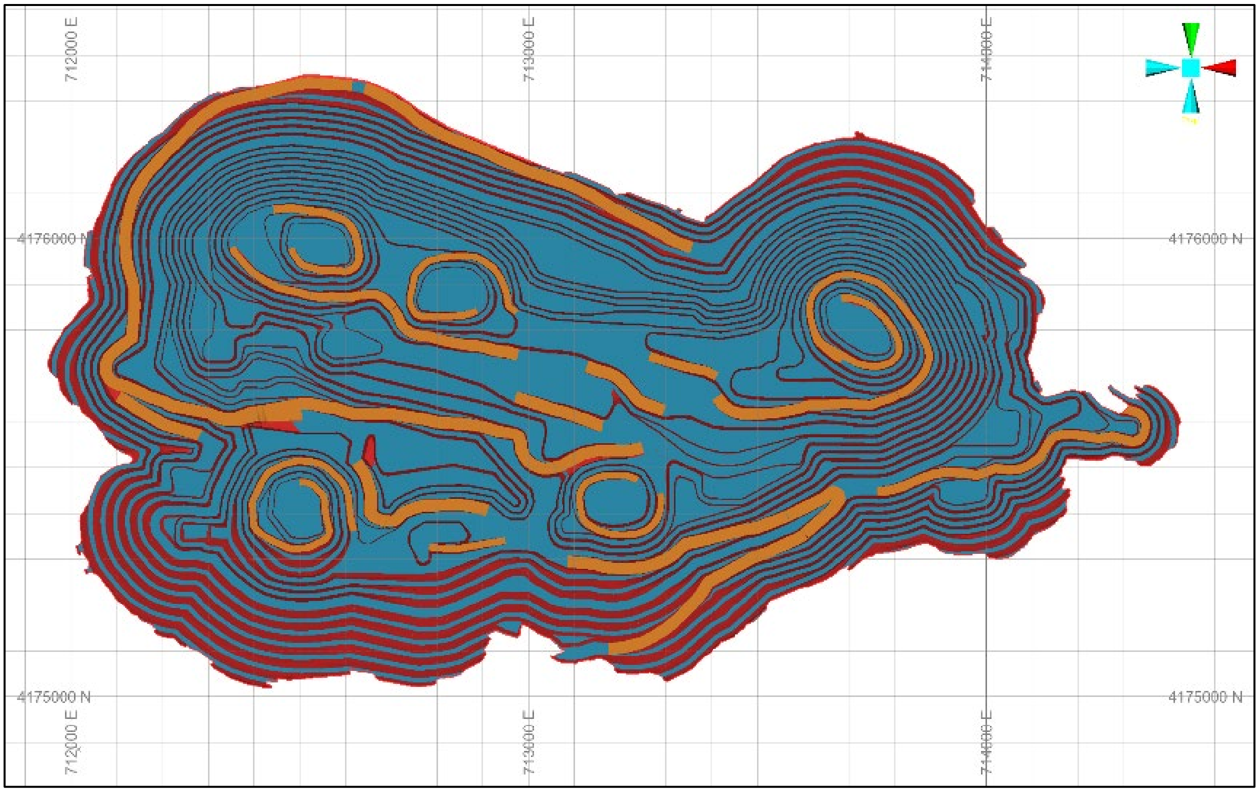


Figure 16-2: Cerro Colorado ultimate pit design

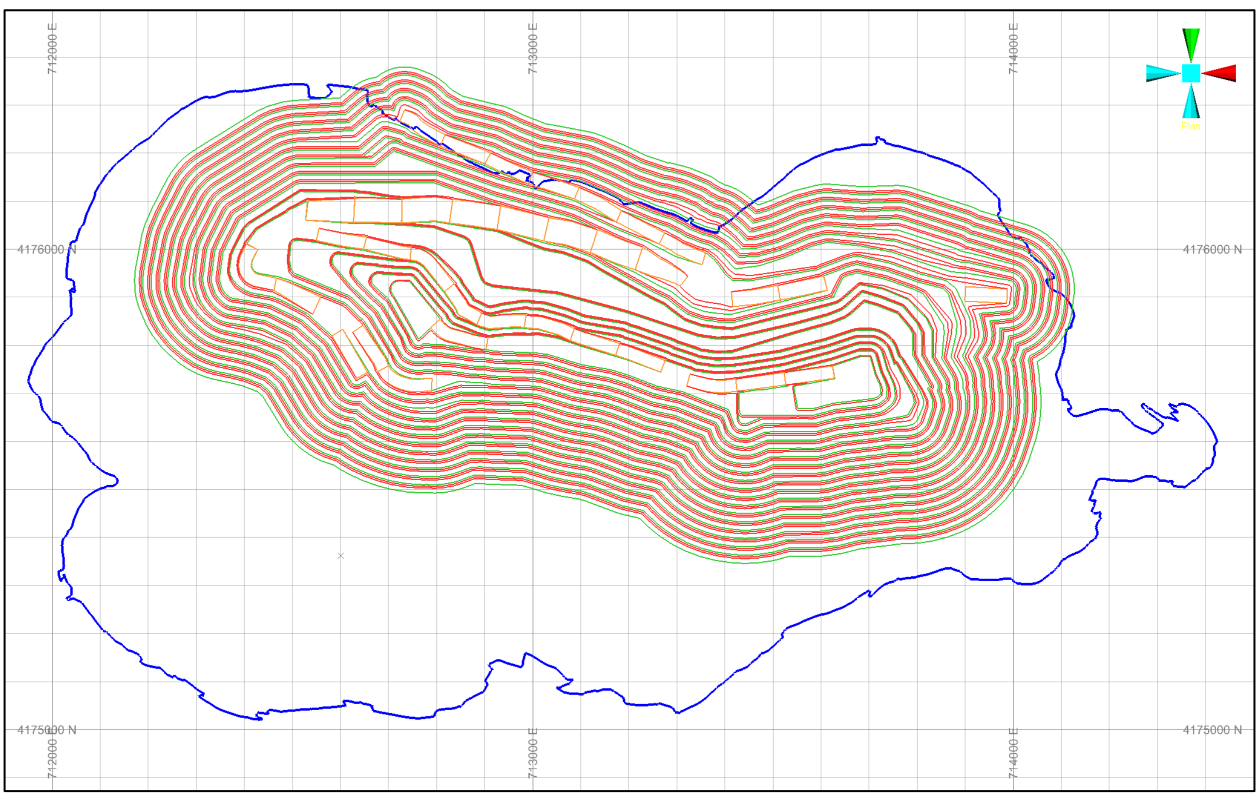


Figure 16-3: Cerro Colorado Phase 2

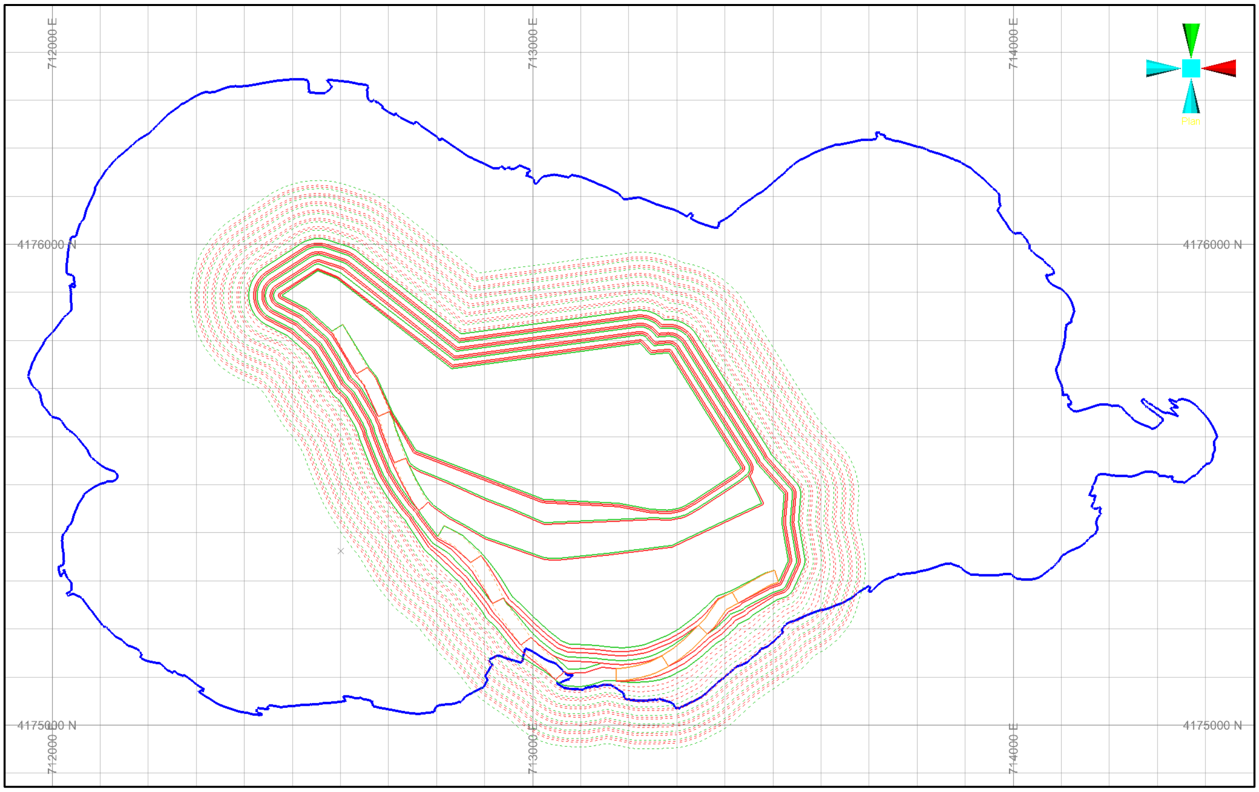


Figure 16-4: Cerro Colorado Phase 3

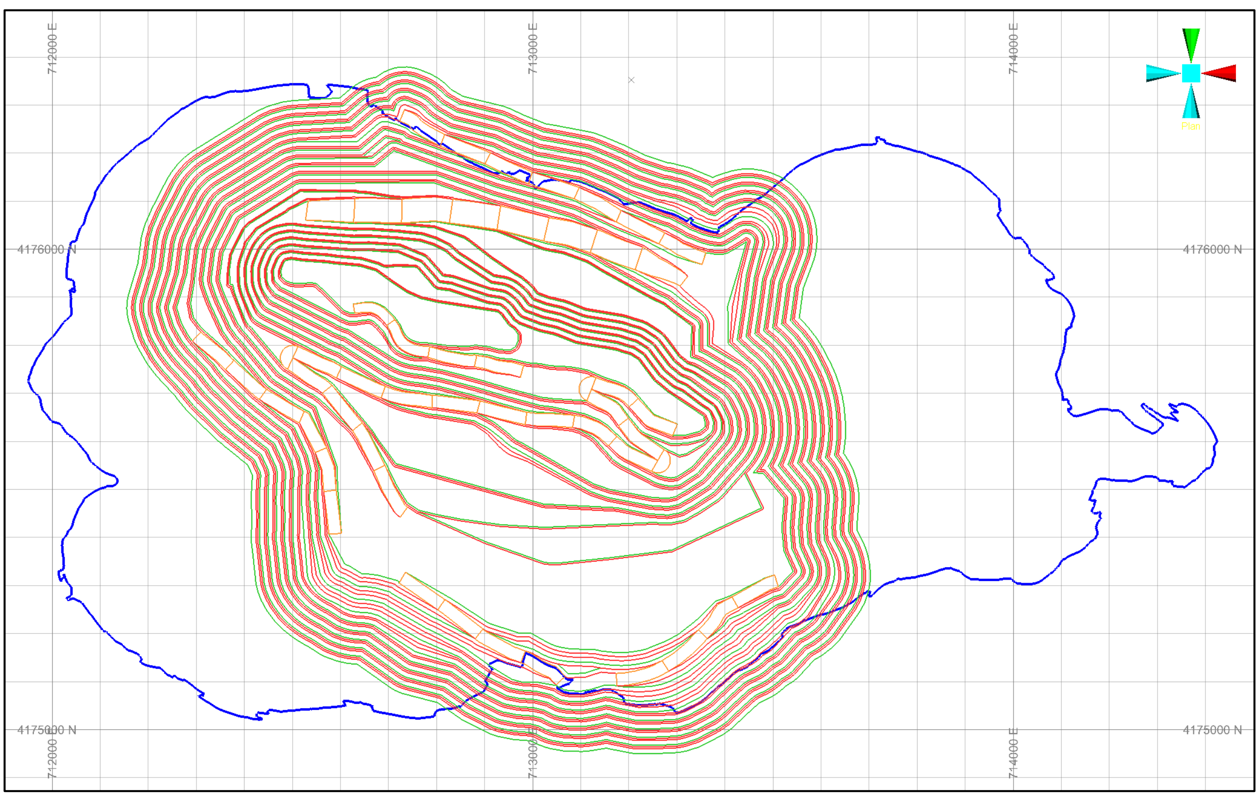


Figure 16-5: Cerro Colorado Phase 4

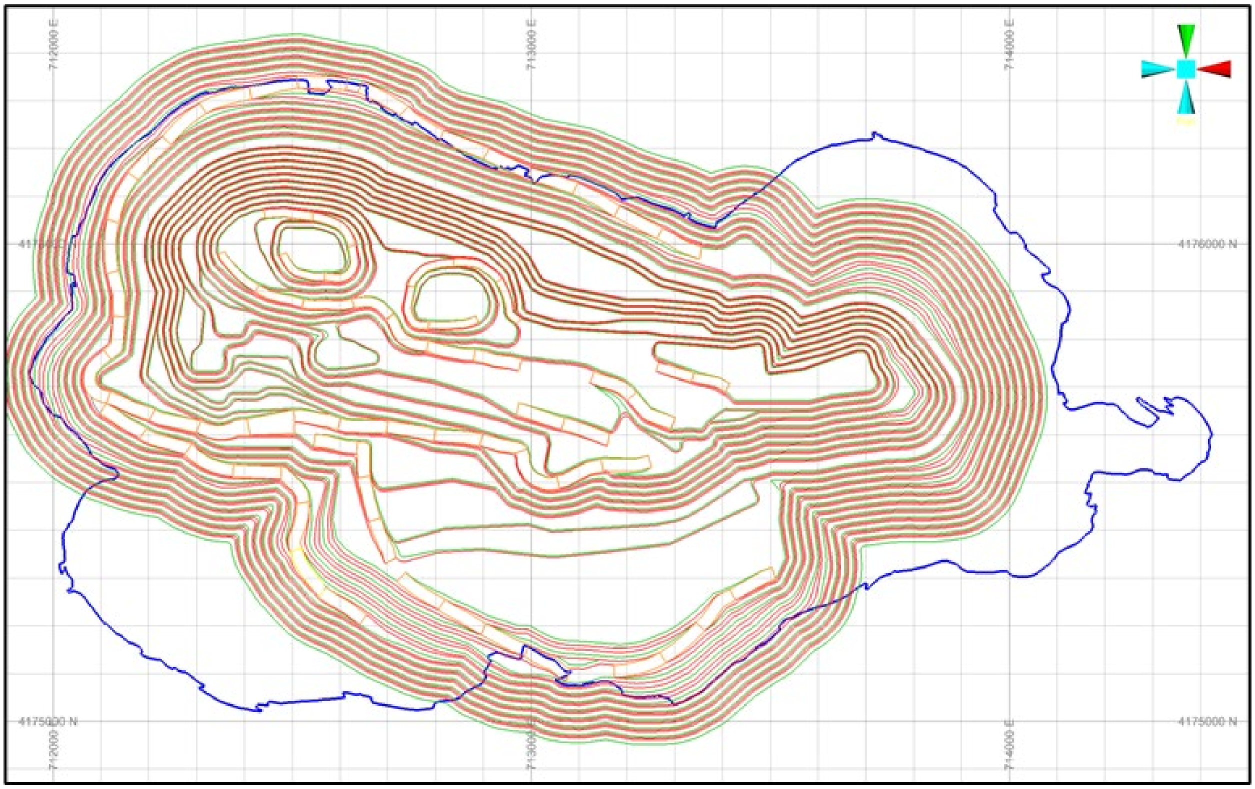


Figure 16-6: Cerro Colorado Phase 5

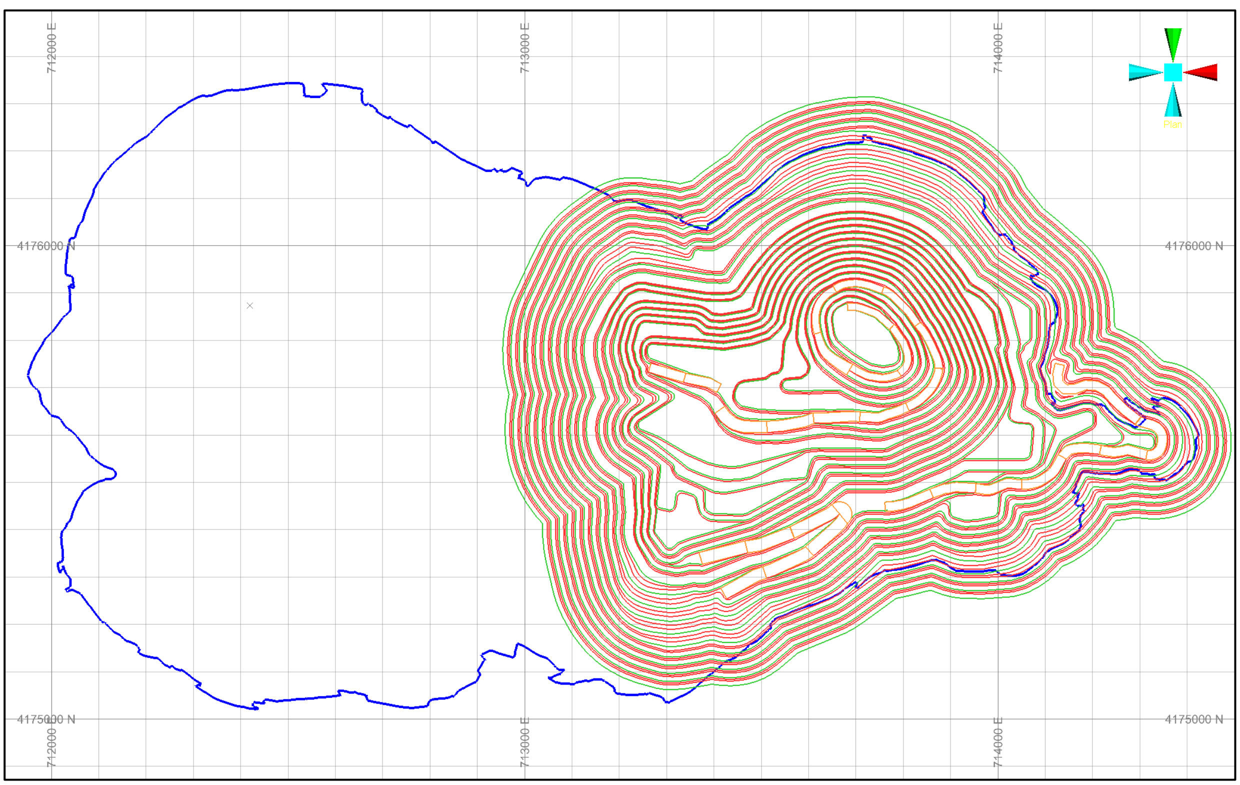


Figure 16-7: Cerro Colorado Phase 6

Figure 16-8: Cerro Colorado Phase 7

Mineral Resources contained within the Cerro Colorado pit were adjusted to account for production through October 2022 for scheduling. Phase inventories used for scheduling are shown in **Table 16-3**.

Table 16-3: Cerro Colorado Pit Inventory

Pit	Mineralized Material (kt)	Cu %	Waste (kt)	Strip Ratio
Phase 2	19,941	0.43	11,446	0.57
Phase 3	631	0.43	7,630	12.08
Phase 4	23,530	0.32	20,344	0.86
Phase 5	55,156	0.34	101,853	1.85
Phase 6	45,882	0.39	95,034	2.07
Phase 7	22,760	0.43	60,629	2.66
Total	**167,900**	**0.37**	**296,936**	**1.77**

16.2.2 San Dionisio

Mining of the San Dionisio open pit will be conducted with the same methods, equipment, and contractors as Cerro Colorado. A conceptual pit design was prepared for the San Dionisio deposit using the design parameters shown in **Table 16-4**.

Table 16-4: San Dionisio Conceptual Pit Design Parameters

Parameter	Value
Bench Face Angle	70°
Total Bench Height	20 m
Berm Width	10 m
Overall Slope Angle	Not to exceed 47°
Haul Road Width	26 m

To aid in the scheduling process, the conceptual open pit design includes two phases as shown in **Figure 16-9** and **Figure 16-10**. Access to the San Dionisio underground mine will be via an adit at the 170 m elevation, as indicated in **Figure 16-10**.

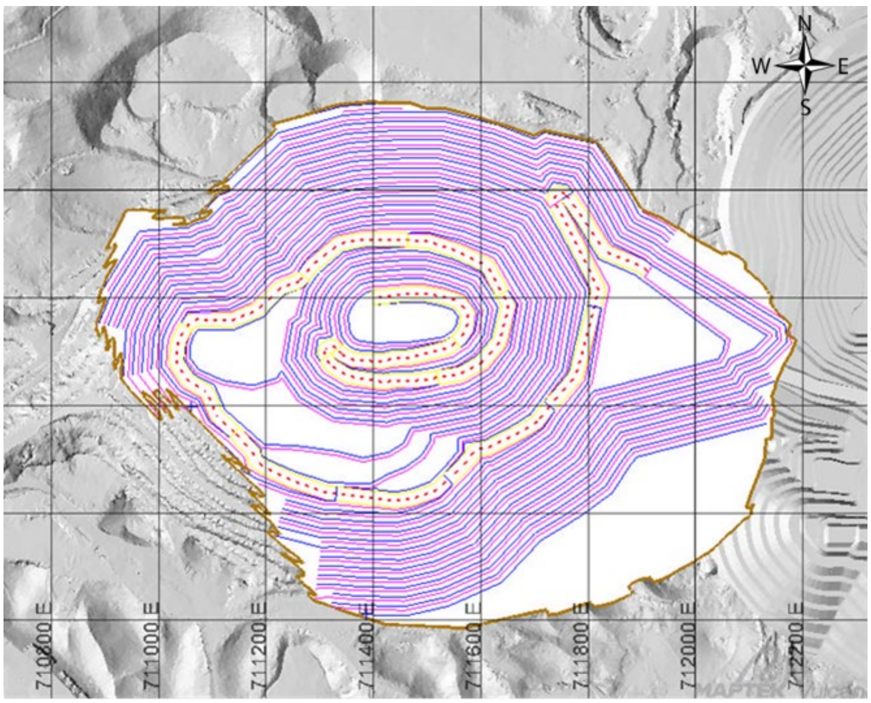


Figure 16-9: San Dionisio conceptual pit design – Phase 1

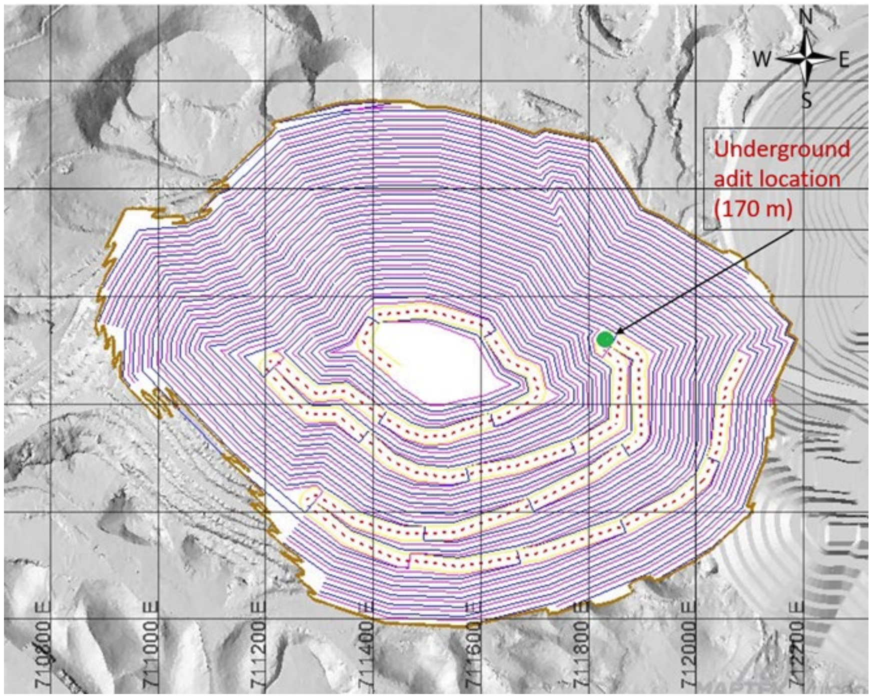


Figure 16-10: San Dionisio conceptual pit design – Phase 2, with underground adit location indicated

The first phase was designed to prioritize the recovery of stockwork mineralized material (MinZ and Zone 2A). Phase inventories are tabulated in **Table 16-5**. Pre-production stripping requirements for the open pit are estimated to be 31 Mt, requiring one year to complete.

Table 16-5: San Dionisio Phase Inventory

Pit	Total Mineralized (kt)	Stockwork (kt)	Cu %	Polymetallic (kt)	Cu %	Zn %	Pb %	Waste (kt)	Strip Ratio
Phase 1	17,457	13,747	0.70	3,710	1.06	1.25	0.23	152,025	8.7
Phase 2	37,579	14,243	0.70	23,336	0.89	1.91	0.40	106,677	2.8
Total	55,036	27,990	0.70	27,046	0.92	1.82	0.38	258,702	4.7

There are old galleries and waste fill zones, as well as some other underground workings that were created by prior mining operations in the San Dionisio deposit. Although the location of many of these workings is known, procedures will be developed to drill from operating benches of the pit to locate all voids left by previous operations. These old workings may be filled if necessary to ensure the safety of pit operations and personnel.

16.3 Underground Mining

Underground mining activities have been carried out previously at both San Dionisio and San Antonio, and the method employed has varied throughout the operational history. Development requirements include dewatering and rehabilitation of old shafts and drifts as well as development of any required new underground openings. Detailed engineering has not been performed for the underground mines at this time. For the purposes of this PEA, development requirements and costs have been estimated from information provided by Atalaya that Tetra Tech has reviewed and found consistent with other underground mines of this type. **Figure 16-11** shows the historic mining methods for underground extraction at the site.

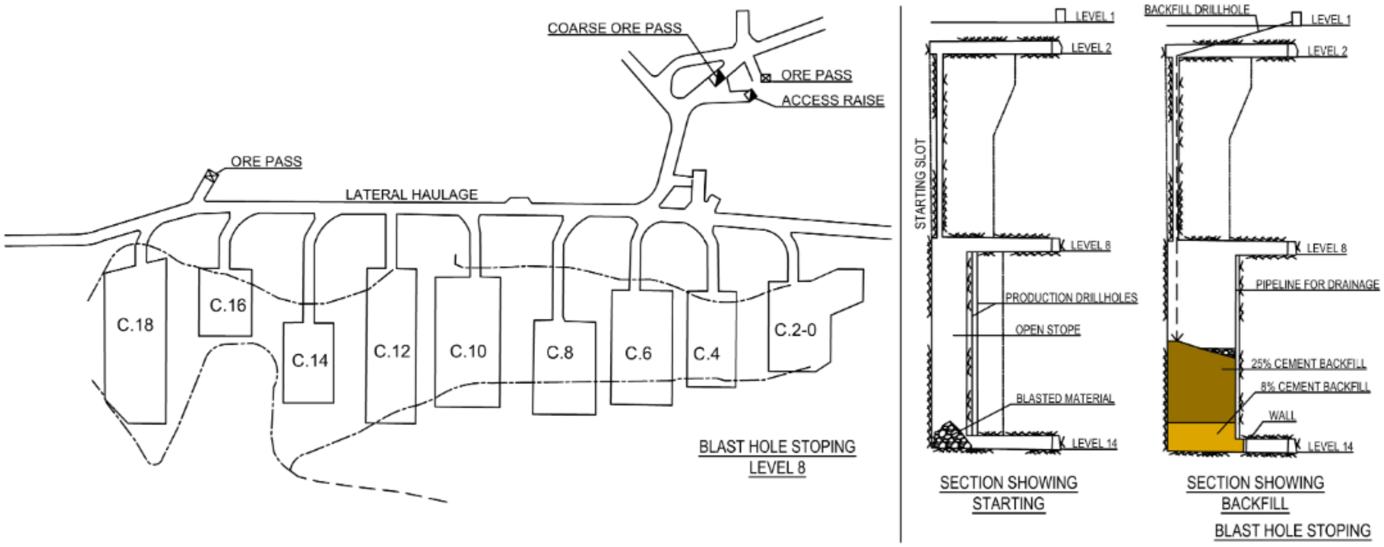


Figure 16-11: Blast hole stoping sketch

Underground mining is planned to be completed using sublevel open stoping methods with delayed backfill. In sublevel open stoping, the mineralized material is divided into sublevels. The sublevels are then mined from the bottom up.

A haulage drift is developed at the bottom level and the mining sublevels are developed and connected with an ore pass. A slot is created to start the blasting process, it is used as the open face. Blasting is performed and the material is mucked by LHD to the end of the sublevel to be transported by ore pass to the haulage level.

After the bottom stope is mined, it is backfilled with a combination of 25% cement and tailings and/or rock, to a height of 5 m from the floor. The remainder is filled with a 6% cement content backfill. The upper stope is then mined by drifting through the 25% cement content backfill. After mining the upper stope, it is backfilled with a 6% cement content. **Figure 16-12** shows the sequence and the proposed cement backfill percentage in section. The percent of cement required for the backfill is dependent on the mining sequence and the amount of stability required to continue the mining sequence. A cross section of this mining method is shown in **Figure 16-13**.

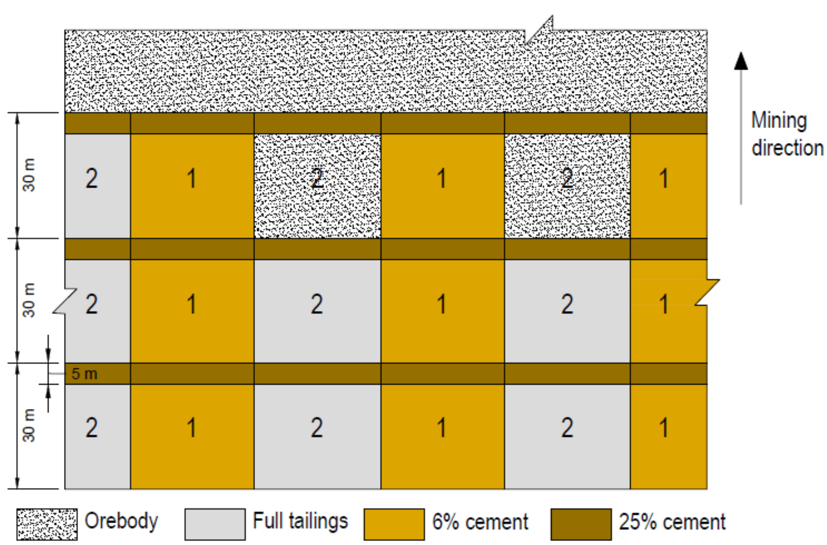


Figure 16-12: Drift and fill mining method with backfill cement percentage and sequence, modified after (Xu, et al. 2021)

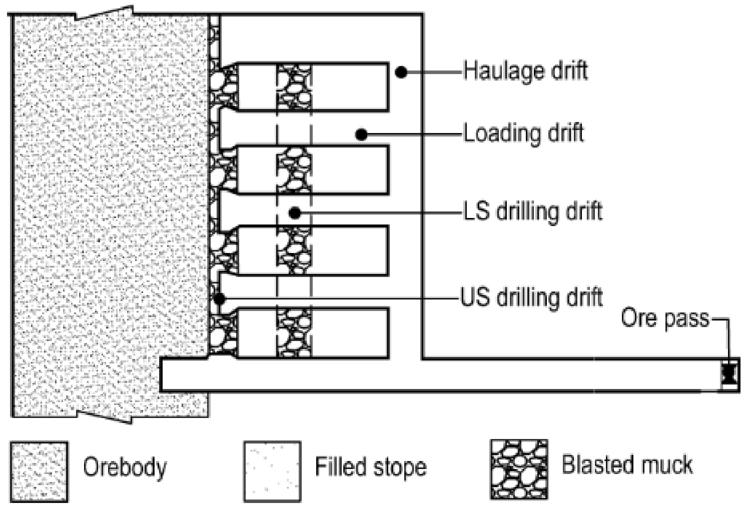


Figure 16-13: Cross section of the proposed mining method, modified after (Xu, et al. 2021)

16.3.1 San Dionisio

Based on historical production results of approximately 700 ktpa and the size and dimensions of the current orebody, a blasthole stoping method is recommended for the deposit to allow for high rates of production with minimal cost. Stopes would be mined and backfilled using a cemented fill material. Sill pillars would be left between stopes to provide stability; however, there is potential to extract every other pillar once the backfill has cured. Recommendations for the size of the blasthole stopes described by historical reports vary based on stability of the host rock, with a stope dimension of 20 m wide by 70 m high for the *cloritas* (MinZ and Zone 2A), and 14 m wide by 35 m tall for the massive sulfides. These dimensions should be confirmed by future geotechnical study, and therefore to simplify scheduling the potentially minable Resource was sliced into 35 m tall stoping sections separated by a 5 m crown pillar between levels. Advances in mining technology should allow the underground mine at San Dionisio to meet or exceed annual production rates of 1.5 Mtpa. For the purposes of this PEA, a dilution factor of 10% has been applied. Mining recovery is estimated at 80% to account for mineralized material left unrecovered in sill pillars.

16.3.2 San Antonio

Based on Tetra Tech's review of the size and dimensions of the orebody, as well as historical information on the deposit, a blasthole stoping method is recommended for San Antonio. Stope dimensions could be 20 m wide with sill pillars 8 m wide, but these dimensions should be confirmed by future geotechnical study. Most critical to the mining of the deposit is to avoid surface subsidence that would impact the Rio Tinto River. The stopes would be backfilled with unconsolidated hydraulic backfill with no planned removal of the sill pillars. For the purposes of this PEA, a dilution factor of 10% has been applied. Mining recovery is considered at 70% to account for mineralized material left in the pillars. The San Antonio underground resource was divided in the same way as San Dionisio for scheduling purposes, and production from San Antonio is planned at 1.0 Mtpa.

16.4 Production Schedule

A production plan for Proyecto Riotinto was developed that combined the mining and processing of stockwork and polymetallic mineralized material from both open pit and both underground mines. The plan was developed using a maximum processing throughput of 15.5 Mtpa.

Mineralized material movement by mining area is shown in **Figure 16-14**, and the plan is presented annually in **Table 16-6**. The expected life of mine for Proyecto Riotinto is 15.6 years.

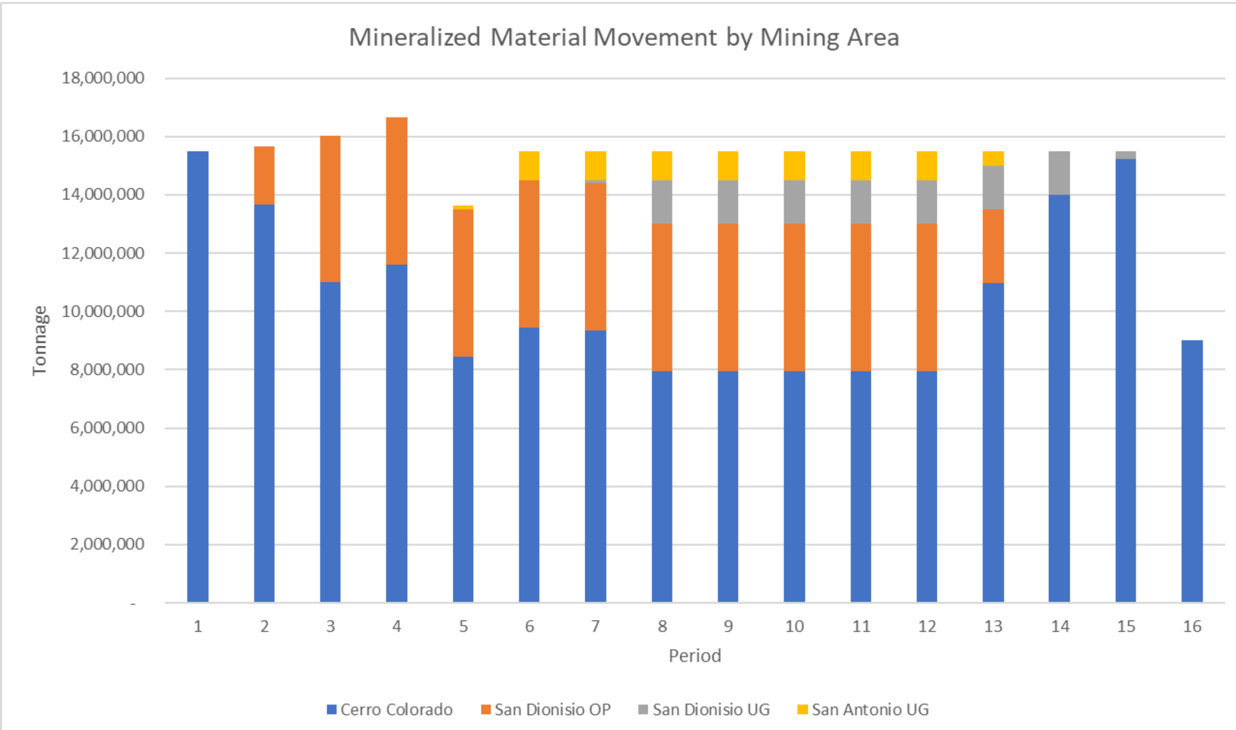


Figure 16-14: Mineralized material movement by mining area

Table 16-6: ROM Production Plan – Proyecto Riotinto

Mine Plan Summary		Units	Total	Year -1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Material Mined																			
Stockwork																			
	Tonnes Mined	ktonnes	195,991	15,500	15,500	15,500	15,500	11,423	12,316	11,594	9,047	9,063	8,917	9,585	10,986	12,851	14,000	15,218	8,992
	Grade Cu	%	0.42	0.42	0.37	0.43	0.46	0.44	0.36	0.41	0.49	0.50	0.42	0.43	0.49	0.47	0.39	0.34	0.35
	Grade Zn	%																	
	Grade Pb	%																	
Polymetallic																			
	Tonnes Mined	ktonnes	45,601	-	173	538	1,150	2,217	3,184	4,007	6,453	6,437	6,583	5,915	4,514	2,648	1,500	282	-
	Grade Cu	%	0.98	0.00	0.63	0.75	0.86	1.17	0.83	0.76	0.86	0.98	1.09	1.01	1.15	1.20	0.91	0.83	0.00
	Grade Zn	%	1.69	0.00	0.65	0.93	1.35	1.30	1.12	1.32	1.72	1.80	1.93	2.10	1.83	1.61	1.56	0.96	0.00
	Grade Pb	%	0.45	0.00	0.23	0.17	0.33	0.22	0.48	0.48	0.49	0.50	0.47	0.50	0.41	0.39	0.47	0.40	0.00
Waste	Total Waste Mined		555,638	41,865	69,198	73,610	60,000	60,514	54,099	36,249	32,015	11,050	30,906	17,487	11,055	29,933	17,260	8,260	2,137
	Hard Rock		404,469	23,829	32,363	45,086	36,614	30,365	41,548	35,186	31,760	10,881	30,781	17,417	11,050	29,933	17,260	8,260	2,137
	Shale		61,070	9	2,256	3,515	18,560	24,951	11,142	597	38	1	-	-	-	-	-	-	-
	Fill		90,099	18,026	34,579	25,009	4,826	5,198	1,409	467	218	168	125	70	5	-	-	-	-

Mineralized material processed by type (stockwork vs. massive sulfides) is shown in **Figure 16-15**. During the initial years of mining the San Dionisio open pit, any polymetallic material mined is considered stockpiled until the plant upgrades have been completed to allow for its processing.

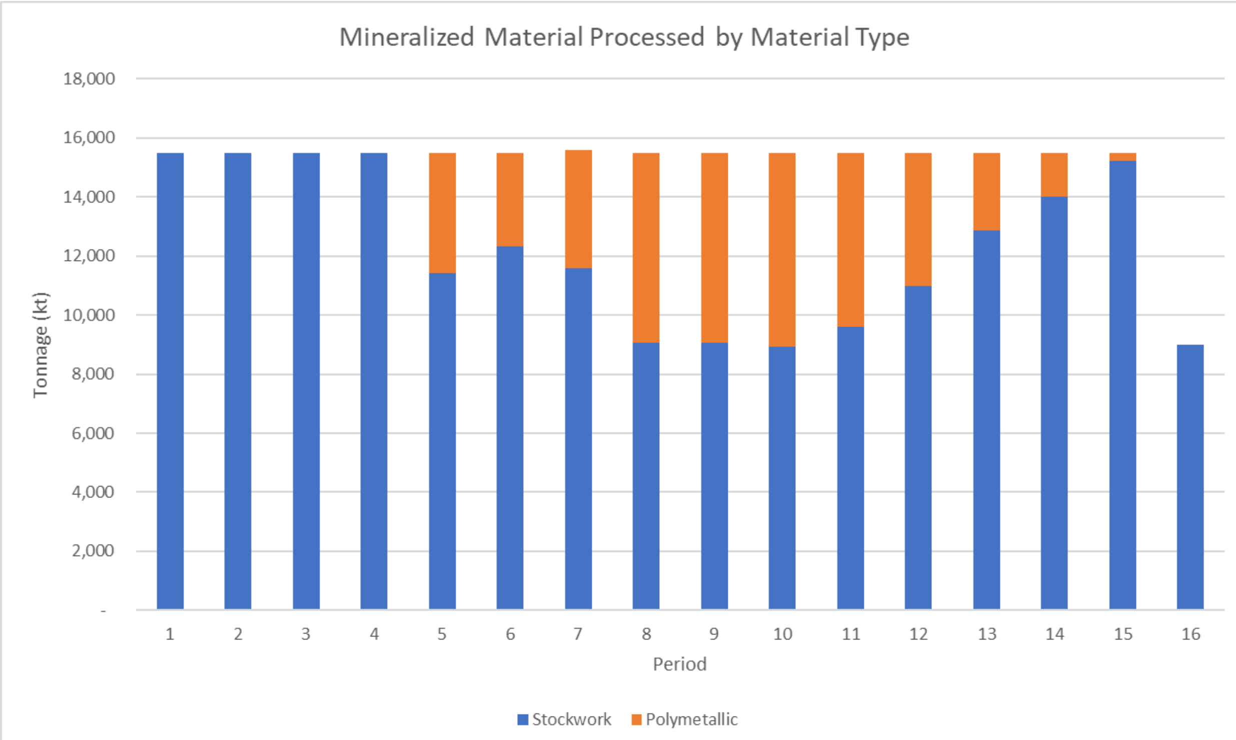


Figure 16-15: Mineralized material processed by material type

16.5 Equipment and Personnel

Mining at the Cerro Colorado pit is currently being performed by experienced contract mining personnel. For the purposes of this PEA, it is assumed that contract mining will be employed for the development and operation of the San Dionisio and San Antonio open pit and underground mines.

16.6 Risk Factors

The production schedule presented in this report involves the concurrent mining of Cerro Colorado, San Dionisio, and San Antonio. If one of the mines is not advanced to production, or experiences other operational delays, the production schedule and the subsequent economic model results will be affected.

Delays in permitting or in the relocation of the road and the power line would affect the production schedule presented in this report.

17. RECOVERY METHODS

This section was jointly compiled by Atalaya Mining technical staff and Jaye Pickarts, who is a Qualified Person for the purpose of NI 43-101 – Standards of Disclosure for Mineral Projects.

17.1 Process Summary

The Riotinto concentrator processes copper sulfide mineralized material using conventional froth flotation to produce a copper concentrate. The plant employs a combination of existing equipment associated with the historical operations as well as expanded and upgraded facilities.

Relatively coarse primary and secondary grinding, at a P_{80} of approximately 160–220 µm, is used to float the minerals containing chalcopyrite and pyrite to produce a rougher concentrate. This concentrate must then be re-ground to a relatively fine grain size of around 40 to 20 µm in order to increase the concentrate grade.

The Filón Sur Zone (FSUR) located in the Southwest area of Cerro Colorado requires the same processing parameters.

The processing department staff consists of 115 people, 10 of whom work in management and supervisory positions, and the balance occupy positions assigned to middle management and operating personnel. The concentrator is being managed through an ongoing improvement system which aims to maintain or improve the historic metallurgical results.

Since refurbishment and re-commissioning in June 2015 (Phase 1), the process was upgraded and successfully expanded to 9.5 Mtpa (Phase 2) and is currently operating at above 15 Mtpa.

17.2 Current Process

17.2.1 Current Operations, 15 Mtpa

As part of the Proyecto Riotinto 15M Upgrade Project, the basic engineering design to increase the plant throughput rate from 9.5 Mtpa to 15 Mtpa commenced in July 2017. Detailed engineering design and installation activities were completed, and the plant operated at design capacity in 2021.

After the installation of modern mechanically forced air flotation cells during Phase 2, it was observed that acceptable upgrading and recoveries were achievable with rougher and cleaners only utilizing the new flotation cells on cleaning duty.

A summary of the Phase 3 design criteria and its comparison with the previous facility is shown in **Table 17-1**. In the primary crushing plant, 15 Mtpa of copper mineralized material is processed from open-pit mining in two crushing lines, gyratory and jaw crusher.

The gyratory crusher has a capacity of 1,700–2,200 t/h and processes 10 Mtpa with a product size of P_{80} 165 mm.

Similarly, the jaw crusher has a capacity of 700–900 t/h and processes 5 Mtpa with a product size of P_{80} 165 mm. The primary crushing product is fed into a live crushed mineralized material stockpile with a capacity of approximately 126,000 tones.

Mineralized material from the crushed ore stockpile is then fed into a conventional SAG Mill circuit that process 2,050 t/h. The SAG mill discharges through a trommel with a port opening of 12 mm and into the secondary ball mill circuit to further reduce the mineralized material to a P_{80} of 160-200 um. Secondary milling is followed by tertiary milling and cyclone classification in closed circuit.

The cyclone overflow is fed to a conditioning tank, where chemical reagents (collectors and frothers) are added, and then to the rougher flotation circuit. The rougher tailings are thickened and pumped to the tailings storage facility.

The rougher concentrate is then reground and floated in a cleaner circuit to achieve a concentrate grade between 21-25% Cu, depending on the ore type.

Table 17-1: Design Criteria for Previous Facility and current 15 Mtpa Operation

	Unit	15 Mtpa		Comments
Throughput				
Feed Grade	% Cu	0.49		
Total Plant Feed	t/y	15,000,000		
Availabilities				
Hours per Year	h	8,760		
Crushing Plant	%	65		Existing case includes 22% downtime
Rest of Plant	%	85		due to mining.
Crushing Plant		Parallel Trains		
		Re-tasked	New	
Configuration		2 Stage Crushing	1-Stage Crushing	
Operating Hours	h	5,694	5,694	
Crusher Plant Feed	t/y	10,000,000	5,000,000	Combined throughput of 15 Mtpa
	t/h	1,756	878	
F_{100}	mm	1,000	1,000	
F_{80}	mm	399	400	
Primary		1 x 460 kW Gyratory	1 x 250 kW Jaw	
Secondary		3 x 325 kW Cone	Nil	
Tertiary		Nil	Nil	
P_{80}	mm	65		Coarser product, suitable for SAG milling
Primary Grinding				
Configuration		ABC + 2 Stages Ball		
Operating Hours	h	7,446		
Grinding Feed Rate	t/h	2,015		
SAG		23 MW SAG		New in Open Circuit
Pebble Crushing		2 x 370 kW Cone		
Primary		1 x 7.6 MW Ball		Open Circuit
Secondary - Line 1		1 x 7.6 MW Ball		Closed Circuit - Oversize Motor
Secondary - Line 2		1 x 1.84 MW Ball		Closed Circuit
Secondary - Lines 3,4		2 x 2.47 MW Ball		Closed Circuit
Grind Product P_{80}	µm	183		Comparable grind product sizing
Configuration		Parallel Ball		
Open/Closed Circuit		Closed		
Regrind Mill 1		2.4 MW Ball		

	Unit	15 Mtpa	Comments
Regrind Mill 2		0.9 MW Ball	
Feed Rate	t/h	148	
F_{80}	µm	146	
P_{80}	µm	38	
Grinding Spec. Energy	kWh/t	19	
Power Required	kW	2,780	
Power Available	kW	3,000	
Flotation			
Rougher Vol.	m^3	1,500 + 644 + [300]	Five 300 m^3 cells + forty-six 14 m^3 cells + three 100 m^3 cells [optional]
Cleaner 1 Vol.	m^3	300	Re-tasked 3 x 100 m^3
Cleaner 1 Scav Vol.	m^3	Decommissioned	
Cleaner 2 Vol.	m^3	200	Re-tasked 2 x 100 m^3
Cleaner 3 Vol.	m^3	136	Sixteen 8.5 m^3 cells
Rougher 1 Res. Time	min	31.35	
Cleaner 1 Res. Time	min	25.9	Cleaner 1 tail to roughers
Cleaner 2 Res. Time	min	43.6	Cleaner 2 tail to Cleaner 1
Cleaner 3 Res. Time	min	N/A	Cleaner 3 tail to Cleaner 2
Production			
Concentrate	t/y	281,639	Thickening/Filtration upgraded as required
Copper in Con	t Cu	52,961	
Concentrate Grade	% Cu	22.0	
Recoveries			
Copper Recovery	%	84.3	
Mass Pull	%	1.9	

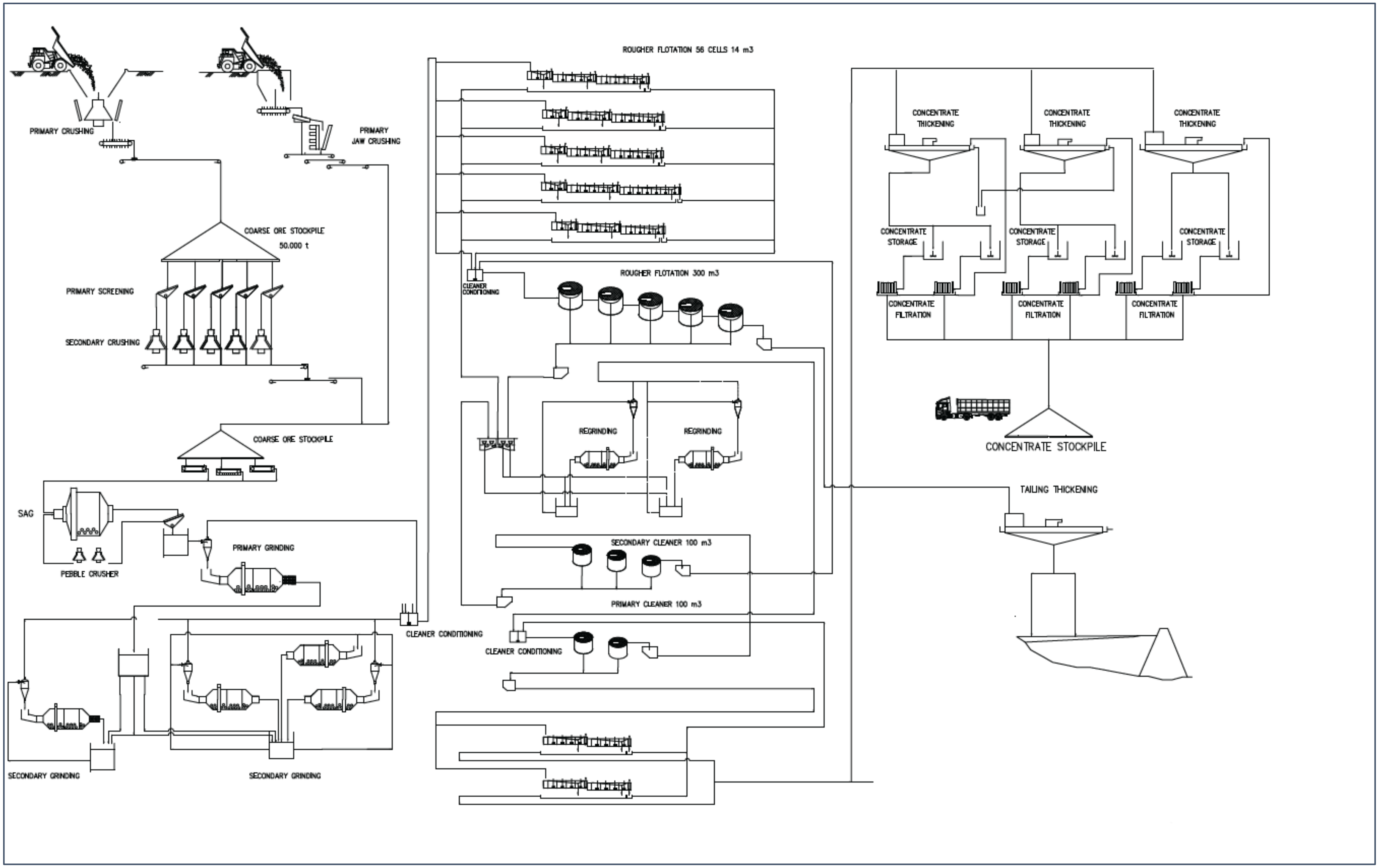


Figure 17-1: Current Flowsheet (15.0 Mtpa)

17.2.1.1 Concentrate Thickening and Filtration

The final cleaner concentrate, at approximately 15% solids by weight, is pumped to two, 9 m diameter concentrate thickeners operating in parallel, where the slurry is thickened to 55% solids by weight. Each thickener has underflow pumps to send the thickened concentrate to filtering systems, each with two 52-plate press filters. The final copper concentrate product contains approximately 6%-10% moisture. The filtered concentrate is transported to the concentrate storage building at site from where it is loaded onto trucks, weighed, and transported to the Port of Huelva.

17.2.2 Production Data

Proyecto Riotinto has been in continuous ramp-up since August 2015 with the goal of achieving 5.0 Mtpa. Ramp-up of Phase 1 and construction activities for Phase 2 started to overlap in September 2015 when the Phase 2 engineering and construction started.

At the end of December 2015, the processing plant achieved an annualized throughput rate of 4.9 Mtpa. In this same period Phase 2 reached 92% completion with final construction activities and tie-ins to existing operations pending.

Atalaya declared commercial production in February 2016. Overall copper recoveries during Q1 2016 were consistently above 82% and concentrate specifications were within commercial terms.

The Phase 2 expansion, with a planned increase in production from 5 Mtpa to 9.5 Mtpa, was declared as “mechanically complete” the first week of May 2016, ahead of schedule and under budget with the 15 Mtpa achieving design production in 2021.

Table 17-2 presents the Life of Mine (LOM) production data, which demonstrates that the upgraded facility is consistently achieving recoveries and final concentrate grades both higher than the original design criteria expectations.

Table 17-2: Plant Production 2015-2021 (Atalaya 2022)

PRODUCTION		2015	2016	2017	2018	2019	2020	2021
Grinding								
Dry Tons	t	1,347,778	6,505,883	8,796,715	9,819,838	10,453,116	14,833,916	15,822,610
Availability	%	88.89	87.82	90.44	93.23	93.05	83.68	87.07
Production Rate	t/h	413	843	1,110	1,202	1,282	2,018	2,074
Plant Head Grade								
Cu	%	0.57	0.48	0.49	0.49	0.49	0.45	0.41
Ag	ppm				3.86	3.57	3.68	3.87
Zn	%	0.13	0.11	0.09	0.11	0.13	0.12	0.11
Pb	%	0.05	0.02	0.01	0.01	0.01	0.01	0.01
As	ppm	850	393	253	146	125	177	213
Concentrate Grade								
Cu	%	17.66	21.42	22.39	23.31	23.01	21.83	21.29
Ag	ppm							64.40
Zn	%	4.37	4.45	3.49	4.21	4.53	4.10	4.07
Pb	%	0.60	0.38	0.17	0.11	0.07	0.21	0.30
As	ppm	7,360	3,868	2,352	1,546	1,194	1,043	1,442
Tailings Grade								
Cu	%	0.16	0.08	0.07	0.06	0.06	0.07	0.06
Ag	ppm							
Zn	%	0.04	0.03	0.03	0.04	0.06	0.06	0.05
Pb	%	0.04	0.01	0.00	0.00	0.00	0.01	0.01
As	ppm	652	319	208	121	102	164	190
Concentrate Grade								
Concentrate Production	t	31,047	122,284	165,965	180,660	195,072	256,001	264,569
Copper Production	t	5,483	26,179	37,163	42,114	44,886	55,890	56,326
Silver Production	oz							547,812
Copper Recovery	%	71.90	83.29	85.46	88.30	87.07	84.52	86.05

17.2.3 Production Support

Proyecto Riotinto has well-equipped analytical and metallurgical laboratories on site. These laboratories are delivering daily results to the metallurgical and to the process team. State of the art equipment and well-trained personnel deliver excellent results that go through routine quality controls to ensure accuracy and that all processes are performing with design specifications.

Proyecto Riotinto has a water supply system consisting of a fresh water make up system and a process water system, where water recovered from the tailings area is recirculated back to the concentrator.

The technical services area operates the water system and the tailings management system. This group makes sure that the system is operated with higher than 99% availability and that, at the same time, operational information is gathered to comply with operation and legal standards as indicated in all the permits Atalaya Mining has been granted to operate the mine.

Process water is a product of the thickened concentrate and of the tailings settling system. Water coming from the concentrate thickeners is blended with process water and pumped to the plant.

The plant has two air supply systems. One is a high-pressure compressed air system located throughout the plant. The other system is a low-pressure air system that mainly feeds the air needs of the rougher and cleaner flotation cells.

17.2.4 Manpower

The plant team is headed by a Plant Superintendent and has 5 crews of operators and supervisors who work in 8-hour shifts. There are 2 operating crews off site every day taking their breaks or vacations.

The analytical laboratory crew reports directly to the site General Manager. The concentrators also have a Metallurgy team with its own Superintendent. The maintenance team has millwrights and electricians working on all shifts, but most of the maintenance team work on day shift.

The Process Plant Manpower is shown in **Table 17-3**.

Table 17-3: Process Plant Manpower

Description	Existing Manpower
Plant Manager	1
Process Engineer	1
Chief Metallurgist	1
Metallurgy Team	5
Plant Operations Superintendent/Supervisor	2
Concentrate shipment	5
Operations Crew	99
Water Treatment Supervisor	1
Water Treatment Crew	11
Maintenance Manager	1
Maintenance staff (Supervisors and millwrights)	68
Electrical and Instrumentation Staff	28

New equipment has been added to the existing Phase 2 plant design and the resulting plant design has been modified as well as reconfigured to achieve the increased plant throughput rate of 15 Mtpa. A new primary crushing circuit, a coarse ore stockpile, a new primary milling circuit, a new rougher flotation circuit, a new thickener and two new filters has been incorporated in the Phase 3 plant design. Details of the new equipment and modified equipment are presented in **Table 17-4** and **Table 17-5** respectively.

Table 17-4: Equipment Summary for Current 15 Mtpa Operation

Plant Area	Equipment	Description of Duty
Primary Crushing	• 1 x 250 kW jaw crusher with associated feed arrangement.	• Parallel crushing line designed to process 5 Mtpa of ROM ore
Coarse Ore Handling	• Coarse ore stockpile • Conveyer system from new crushing circuit. • Reclaim system	• Transportation and storage of combined crushed product from exiting crushing circuit and new crushing circuit. • Reclaim to feed new SAG mill
Primary Milling	• 23 MW SAG Mill • 2 x 300 kW cone crusher	• Open circuit SAG mill with pebble crushers to process coarsely crushed product and preparation for existing ball milling circuit
Primary Mill Classification	• 10 x 600 mm cyclones	• Classification of SAG mill product • Overflow directly to flotation • Underflow to existing ball milling circuit
Rougher Flotation	• 4 x 300 m^3 tank cells	• Rougher flotation consists of existing 46 x 14 m^3 cells, 300 m^3 cell and 4 x new 300 m^3 cells to make combined rougher volume of 1,500 m^3
Concentrate Thickening	• 14 m diameter thickener	• Expansion of thickening capacity for additional concentrate generation
Concentrate Filtration	• 2 x 55.2 m^2 vertical plate filters	• Expansion of filtration capacity for additional concentrate generation
Tailings	• 2 x 14-12 pumps • 1 x pipeline	• Duty and standby pump for new pipeline as required for additional tailings generation

Table 17-5: Equipment Modifications Summary for Current 15 Mtpa Operations

Plant Area	Equipment	Description of Modification
Screening	Primary Screens	• Modify the double deck screen chutes to discharge to a common conveyor • Replace the top screen meshes with 120 mm screen meshes • Replace the bottom screen meshes with 65 mm screen meshes
Screening	Fine Ore Tripper Feed Belt Conveyor	• Shorten conveyor belt length • Modify discharge head and chute to feed new combined crushed ore conveyance system
Secondary and Tertiary Crushing	Tertiary Crushers	• Convert tertiary crushers from short head crushers to standard head crushers (ex-tertiary crushers to be on secondary crushing duty)
Regrind	2.4 MW Ball Mill D x L = 4.75 x 6.4m 0.9 MW Ball Mill D x L = 3.8 x 4.6m	• Increase ball charge to draw maximum power available • Refurbish and recommission smaller regrind mill

Plant Area	Equipment	Description of Modification
Rougher Flotation	300 m³ Pre-cleaner	• Reconfigure to re-task as first rougher cell • Tail to feed new rougher cells installed • Concentrate combines with the concentrate from the new rougher cells to be pumped to the existing regrind circuit
Primary Cleaner Flotation	3 x 100 m³ Primary Roughers	• Reconfigure to re-task as primary cleaner bank • Tail to be pumped to first rougher cell as described above • Concentrate to report to be pumped to secondary cleaner circuit as described below
Secondary Cleaner Flotation	2 x 100 m³ Primary Cleaners	• Reconfigure piping to re-task as secondary cleaner bank • Concentrate to be pumped to concentrate thickening • Tails to be pumped to primary cleaner bank as described above
Concentrate Thickening	Concentrate Thickener 1 or 2	• Convert thickener to a clarifier (clarification of overflows from the concentrate thickeners)

Figure 17-2 presents a simplified general arrangement for the 15 Mtpa upgrade including color coding to what equipment is new, existing, or has a modified duty compared to Phase 2.

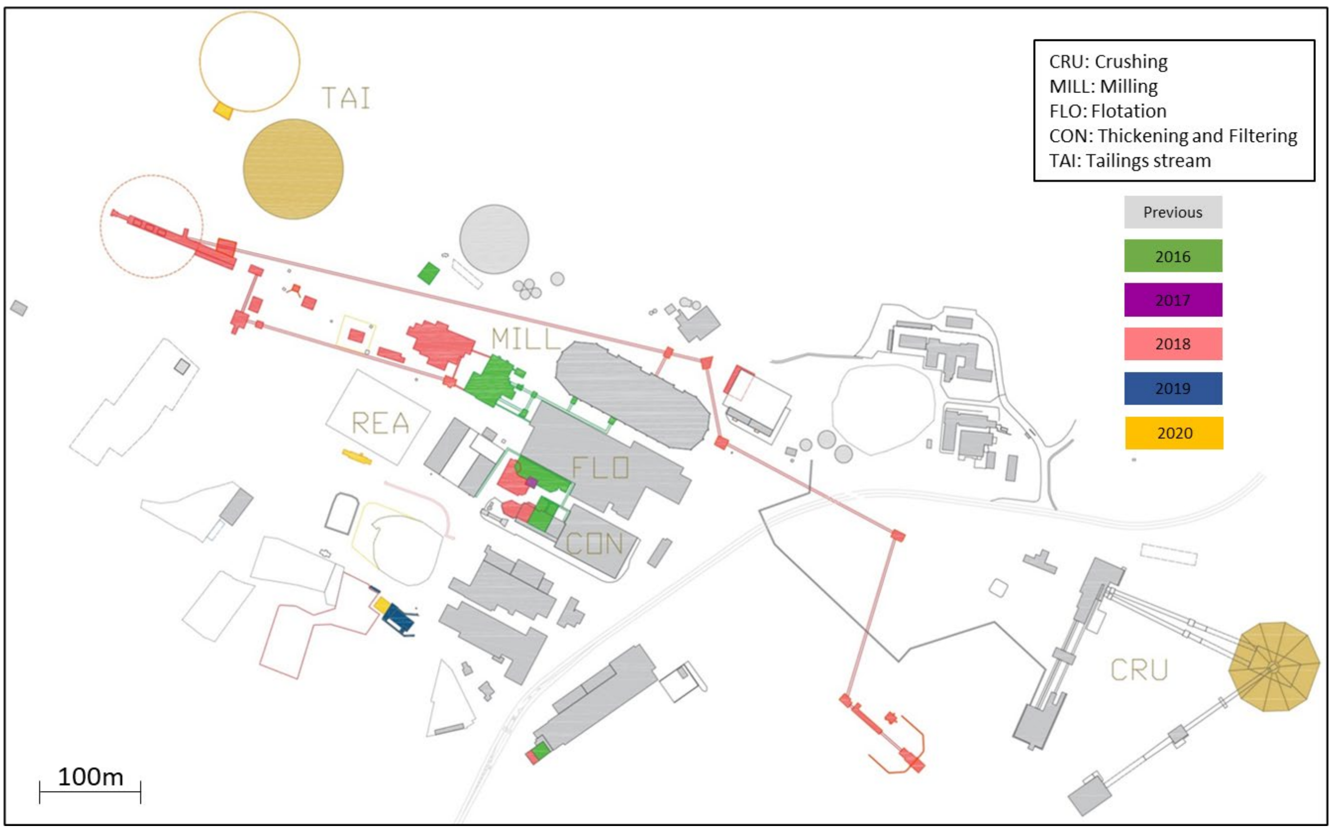


Figure 17-2: Current plant general arrangement (Atalaya 2022)

17.3 Polymetallic Mineralized Material Processing

To process the massive sulfide material associated with the San Dionisio and San Antonio deposits, a modified recovery circuit will need to be designed. The main economic elements found in the deposits are copper, zinc, lead, and minor amounts of gold and silver.

Preliminary testwork on these ores, as discussed in Chapter 13, indicate that ultra-fine grinding (<20 microns) followed by differential flotation may be required to achieve acceptable metal recovery and produce saleable concentrate grade. The process would likely produce three concentrates: copper concentrate, zinc concentrate, and lead concentrate.

The mineralized material would likely be processed by conventional bulk flotation to recover copper, lead, and minor amounts of gold and silver; followed by zinc flotation. The rougher bulk concentrate would be cleaned and further processed to separate the copper and lead to produce a lead concentrate and a copper concentrate. The final tailings from the zinc flotation circuit would be pumped to the TSF. Copper, lead, and zinc concentrates would be thickened, filtered, and transported to the port for shipment to smelters.

The existing Riotinto concentrator will be utilized to process the massive sulfides, replacing the primary copper ores from Cerro Colorado as they are mined out. This circuit would produce the rougher bulk concentrate with additional grinding and flotation to recover the polymetallic material.

A simplified flowsheet shown in **Figure 17-3**, is one of the possible differential flotation schemes that could be used for the polymetallic ores. Some additional capital expenditures will be required for the ultra-fine grinding, additional flotation cells, and concentrate handling. Operating costs may also increase for similar reasons, but most of the additional cost would be attributed to the ultrafine grinding.

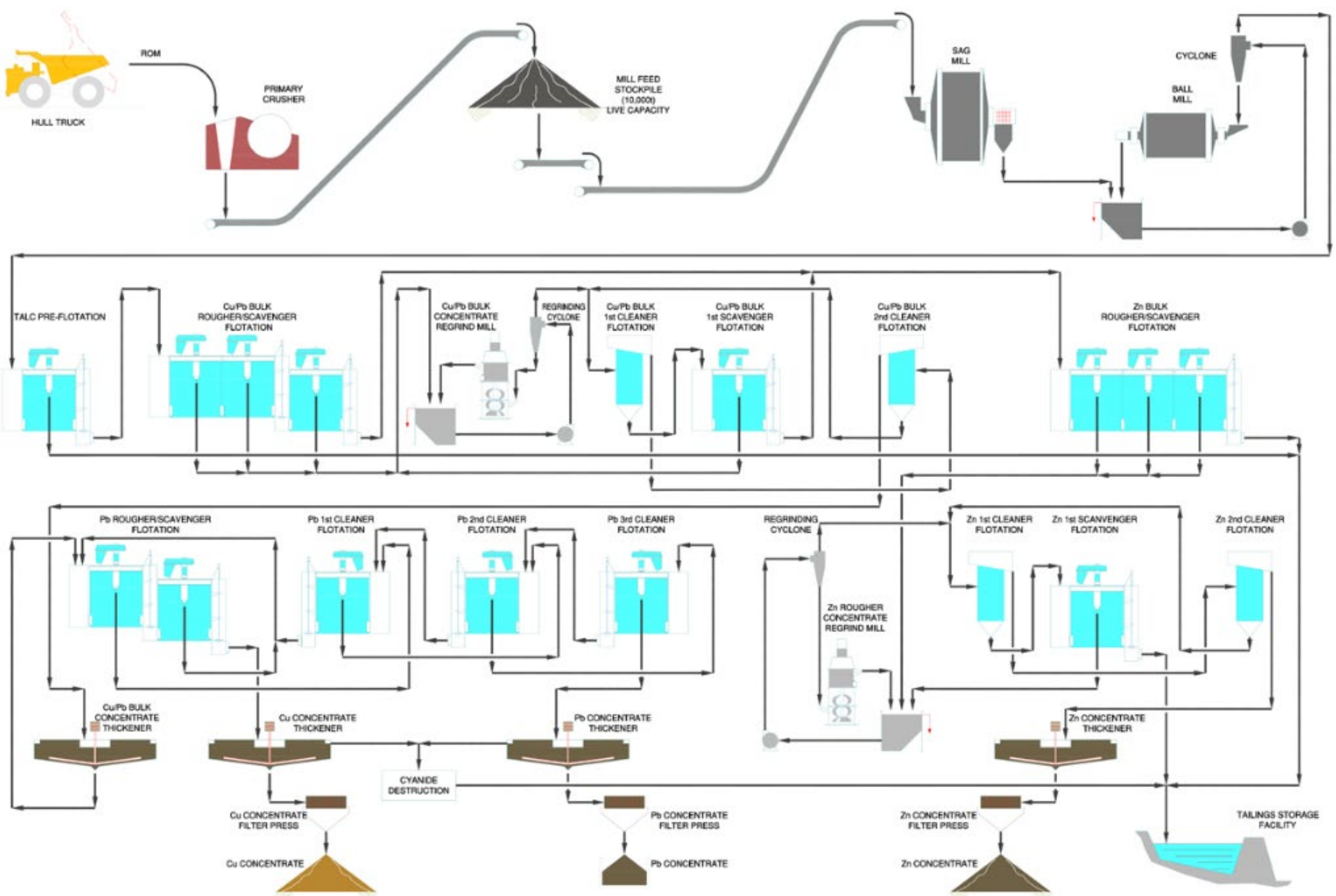


Figure 17-3: Simplified process flowsheet (Tetra Tech 2022)

Capital cost requirements for the differential flotation circuit are estimated at $92.24 M, with operating costs for the circuit estimated at $8.91/t. These are based on Tetra Tech's experience with similar polymetallic projects with economic factors applied to represent specific conditions associated with Riotinto. Additional engineering and metallurgical testwork will be required to properly establish specific design criteria and refinement of these economics.

18. PROJECT INFRASTRUCTURE

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary.

18.1 Access

The property is well connected for road transportation via a high-quality national road system that was recently renovated. The site is located 75 km from the port and the industrial city of Huelva, and 88 km from the regional capital, Seville.

Copper concentrate would be transported by road to the Huelva port where it would be stored for ocean transport to various commercial destinations. A fleet of 25-tonne-capacity trucks would transport the concentrate to the port facilities.

The project also has access to other nearby ports such as Algeciras and Cadiz, and international airports in Seville, Madrid, and Faro (Portugal).

18.2 Sources of Power

The main incoming electrical substation has a 132 kV capacity on the incoming high-voltage side and 6.3 kV and 20 kV on the outgoing low-voltage side. The substation was fully reconditioned and updated as part of previous development programs. The substation consists of a 1.3 km line that has been repaired and is currently operating from La Dehesa substation (ENDESA independent power supplier) using three outgoing lines on three main transformers. Operating areas are serviced by several 6.3 kV/400 V transformers.

An on-site 50 MW solar farm for self-consumption will reduce Atalaya’s long-term power costs while also lowering its carbon emissions. The plant is expected to provide approximately 22% of the company’s electricity needs and is currently under construction following the signing of an agreement with an affiliate of ENDESA (the Spanish power supply company). Construction approval was obtained in March 2022 and full commissioning of the plant is expected during 2023.

18.3 Sources of Water

Process water is supplied from Gossan Dam through two pumping stations, where it is pumped at a rate of approximately 4,400 m^3/h. These include two pumps with a flow rate of 1,000 m^3/h and two pumps with a flow rate of 1,200 m^3/h. In addition, thickened tailings process water (overflow) is pumped to steel tanks at a rate of 1,000 m^3/h. The process water system also includes an intermediate storage reservoir consisting of three pumps that pump at a rate of approximately 3,600 m^3/h to the three process tanks with storage capacities of 5,080 m^3, 3,600 m^3, and 30,000 m^3.

Process water from Cobre is pumped either to the Gossan Dam or directly to process tanks through a pumping system consisting of two pumps, each with a capacity of 1,700 m^3/h. Process water from Aguzadera is also pumped to the Gossan Dam through a pumping system consisting of three pumps with capacities of 2,100 m^3/h and 1,600 m^3/h.

Freshwater is supplied from the Campofrío, Aguas Limpias, and Odiel reservoirs using four pumps with a capacity of 230 m^3/h each, three operating and one standby. Water is pumped through two pipes to the freshwater tank. The Odiel reservoir, which is upstream from Campofrío, has recently been incorporated into the freshwater system as an additional reserve. A new pumping system has been installed with a capacity of 480 m^3/h, four pumps operating and one standby, and a 6.5 km distribution line. A new line is currently under construction. The freshwater storage tank has a capacity of 1,680 m^3 and has been repaired along with all the valves and distribution network to the plant. The distribution tanks are situated between the national road and the current office facility. Water is distributed to the entire operation via a pipeline system made of high-density polyethylene and carbon steel. Before commissioning, the existing tanks were re-conditioned with proper surface treatment, thicknesses were checked, and worn piping and valves were replaced or repaired. This freshwater distribution system is shown in **Figure 18-1**.

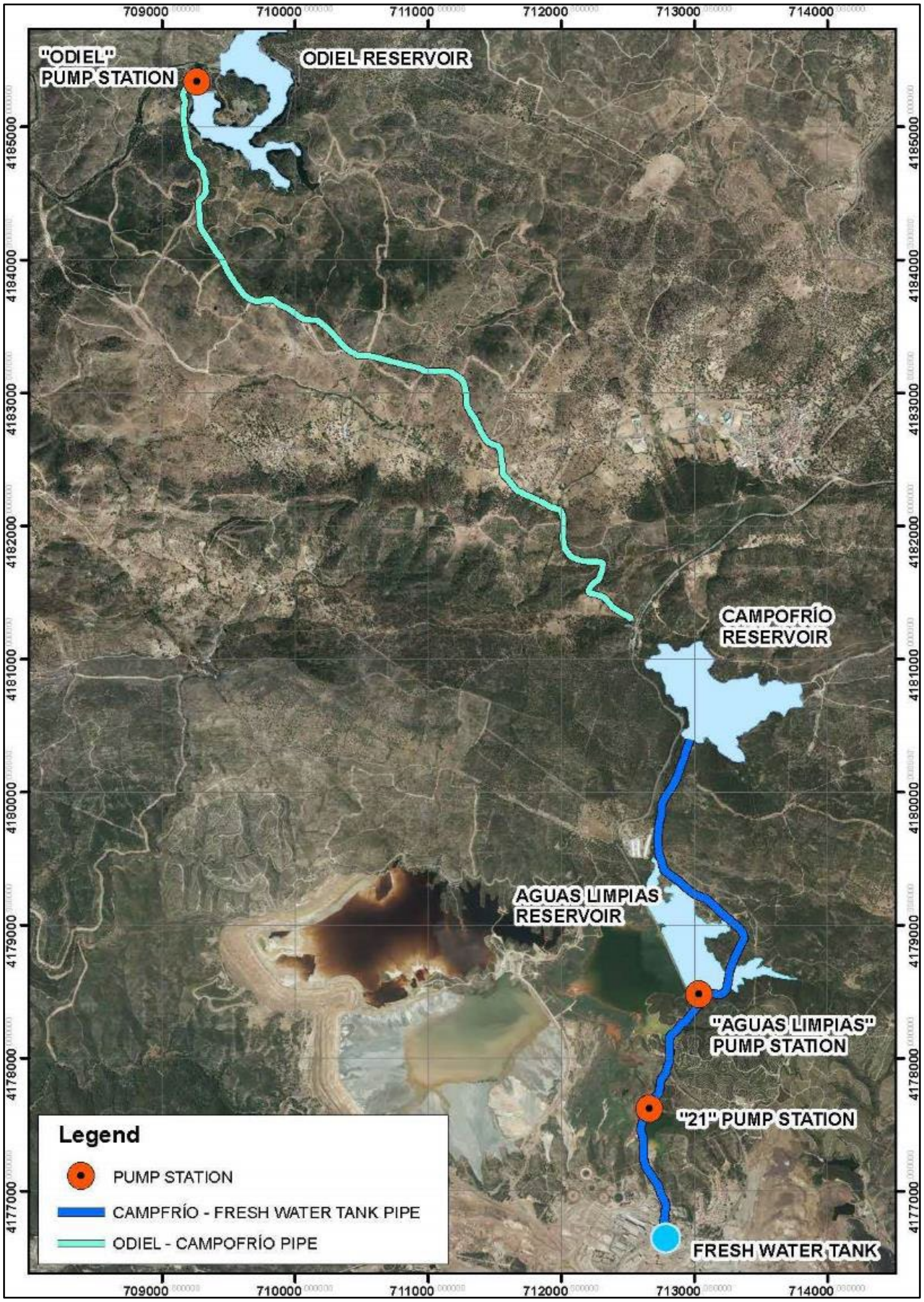


Figure 18-1: Fresh water distribution system

Potable water is supplied by the utility company, GIHASA, which manages the water system for the municipality of Minas de Riotinto. The potable water is stored in a 50 m^3 poly tank located next to the fresh water and process water tanks, where it is distributed to the dining hall, changing rooms, contractor huts, mine shops, and safety showers via polyethylene pipes.

Acidic water coming from Corta Atalaya, Cerro Colorado, and waste dump ponds is pumped through the piping and pumping system to the treatment plant and onto the process water storage tank.

Five Pachuca tanks from the old gold processing plant were rehabilitated for the water treatment plant. The water treatment plant has a capacity of 200 m^3/h, and the treated water is reused as process water.

18.4 Re-routing of National Road A-461 and Power Line

Cerro Colorado Phase 5, as well as the proposed restart of open pit operations at San Dionisio will require a re-routing of National Road A-461, the main road connecting Minas de Riotinto and the town of La Dehesa. Current power lines will also need to be relocated. Permitting for the re-routing of the infrastructure is ongoing, and Atalaya reports that the project will need to be completed prior to 2024 to avoid modifications to the current production plan at Cerro Colorado. The current and proposed road and power line layouts are shown in **Figure 18-2**.

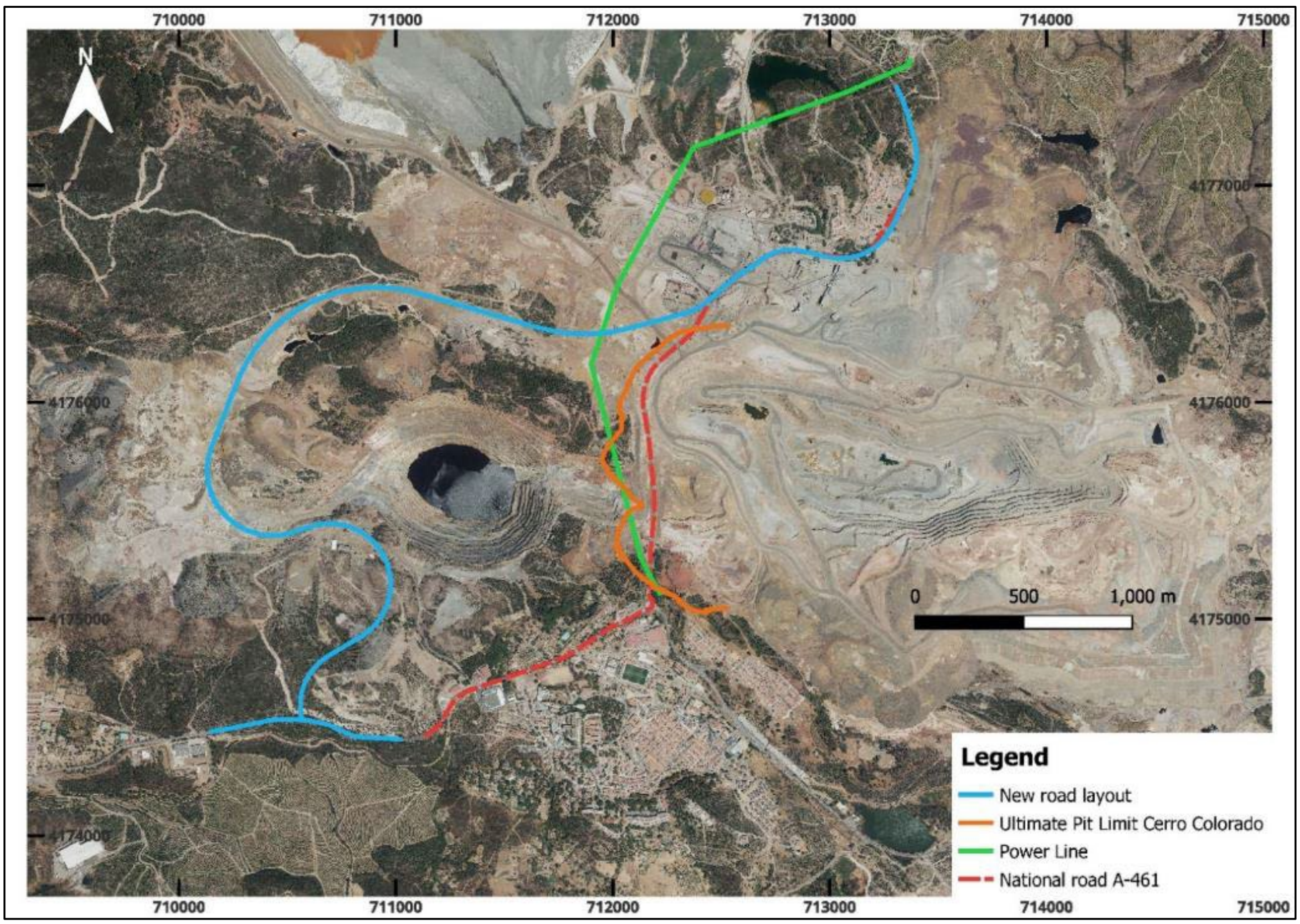


Figure 18-2: Current layout of National Road A-461 and proposed re-routing

18.5 Tailings and Waste Storage

The PRT property includes three tailings storage facilities (TSFs): The Cobre TSF, the Aguzadera TSF, and the Gossan TSF. The Cobre and Gossan TSFs were initially constructed in the early 1970s to contain 70 Mt of tailings. The Aguzadera TSF was constructed in the late 1980s. Of the three facilities, only the Cobre TSF and the Aguzadera TSF are still used for tailings storage, with the Cobre TSF now serving as a water reclaim reservoir. The location of the tailings facilities in relation to the mining operations and the villages of Minas de Riotinto, La Dehesa, Nerva, and El Campillo is shown in **Figure 18-3**.

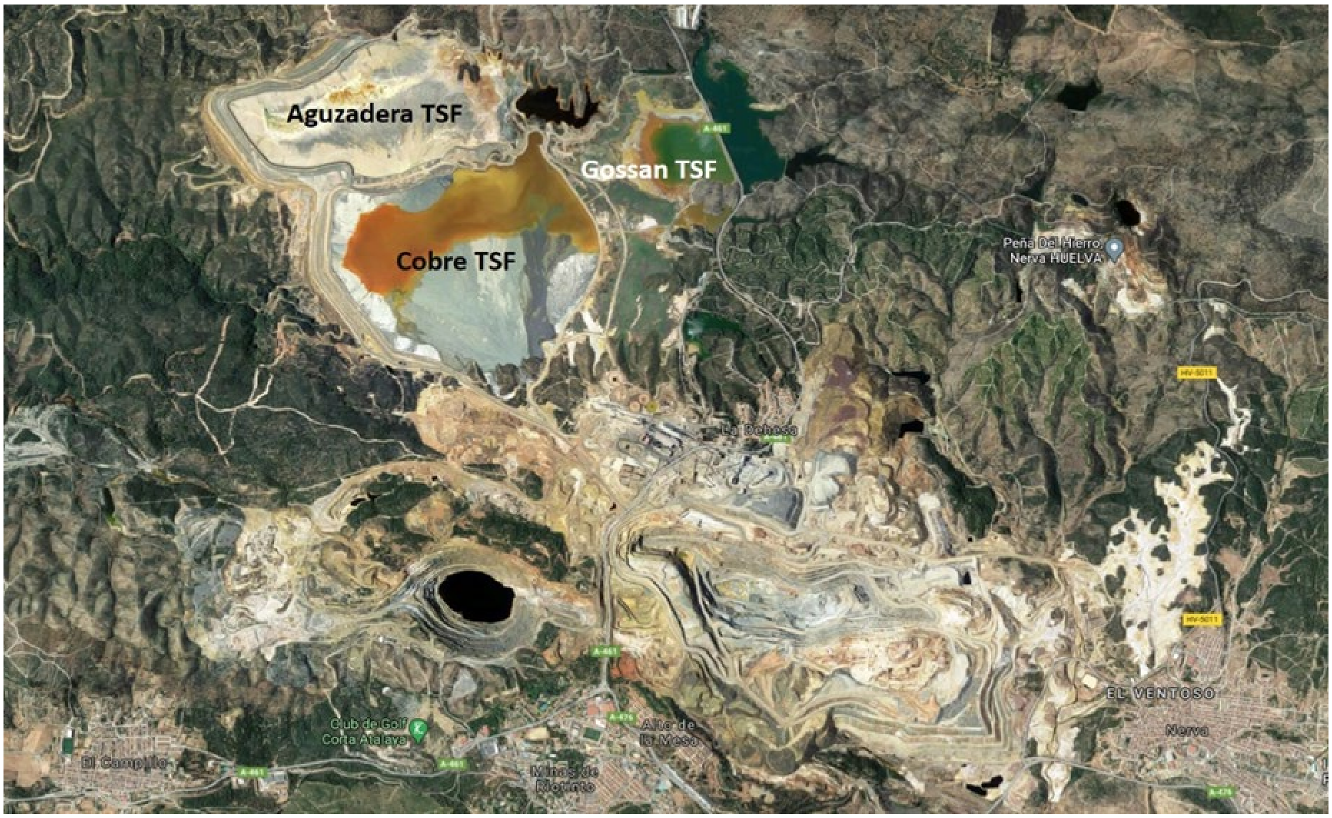


Figure 18-3: Location of tailings facilities at PRT

Current elevations at the Cobre and Aguzadera TSFs are 388 masl and 382 masl, respectively. To accommodate the production from PRT, engineering studies for expanding both facilities have been completed that would raise the final elevation of each TSF to an elevation of 417 masl. Atalaya is currently waiting for approval for these expansions from the regulatory authority.

With the addition of the San Dionisio and San Antonio projects, additional tailings storage capacity may be required to store the tailings generated by the Project after 2032. Studies for further tailings expansion are underway, but any additional expansion will require additional environmental and engineering studies before an application for approval is submitted. While there is a risk that the approval of additional capacity may be delayed or denied, for the purposes of this PEA Tetra Tech assumes that all permits for additional tailings storage area will be granted.

Waste rock from the open pits will be deposited in surface waste rock dumps. PRT has fully permitted waste rock dumps near the Cerro Colorado pit, but these will require expansion to accommodate the 555.6 Mt of open pit waste material generated by the production plan presented in this PEA. Waste rock would be placed into one of three locations: the main external dump northeast of the Cerro Colorado pit, a second external dump on the southeast, and in mined-out sections of the Cerro Colorado pit as in-pit backfill. Additionally, some mine waste will be utilized in the construction of the TSF expansions and for the construction of the solar power facility. While expanding the waste dumps will require additional permitting, for the purposes of this PEA Tetra Tech assumes that there will be sufficient capacity for waste storage within the area of PRT.

Underground waste rock from development activities will be stored underground as backfill, with only a minimal contribution to the surface dump facilities.

19. MARKET STUDIES AND CONTRACTS

Detailed market studies for the concentrates produced from San Dionisio and San Antonio have not been undertaken. Atalaya is currently selling copper concentrates from the nearby Cerro Colorado mine on the open market as well as to other companies according to market standard offtake agreements. It is expected that similar agreements will be negotiated for the sale of the zinc and lead concentrates produced from the polymetallic mineralized material at San Dionisio and San Antonio.

19.1 Commodity Prices

Commodity prices for Cu, Pb, and Zn are determined by the major metal exchanges. Long-term consensus prices based on information from capital lending institutions and other third parties are used in this PEA for the purposes of Mineral Resource estimation and economic analysis. Commodity prices are shown in **Table 19-1**.

Table 19-1: Commodity Prices

Commodity	Price
Cu	$3.50 /lb
Zn	$1.20 /lb
Pb	$0.95 /lb

19.2 Concentrate Marketing

Concentrates are complex materials and inevitably contain quantities of deleterious elements, including arsenic, antimony, mercury, and bismuth. These elements can impose limits on the quantities of concentrate able to be received by a smelter and will also incur penalties for processing. Detailed sales contracts for the polymetallic concentrate products have not been enacted. To account for treatment, refining, freight, and other downstream charges, the deductions shown in **Table 19-2** were applied to the payable copper values.

Table 19-2: Metal Price Deductions for Downstream Costs

Commodity	Downstream Deduction
Cu	$0.45/lb
Zn	$0.33/lb
Pb	$0.33/lb

Operational experience at the Cerro Colorado plant has demonstrated the presence of in recoverable quantities of silver contained in the copper concentrate. Additional sampling and assaying are required to fully quantify the silver content of the concentrates and the subsequent economic benefit. For the purposes of this PEA, it is assumed that the silver content will offset any charges due to impurities in the concentrates.

19.3 Material Contracts

No sales contracts for the products from San Dionisio and San Antonio have been negotiated to date.

Mining of the San Dionisio open pit and the San Dionisio and San Antonio underground mines is planned to be carried out by contract mining. No contracts have been enacted as of the date of this PEA for mining these deposits; however, Atalaya is currently employing contract mining for the nearby Cerro Colorado open pit operation and expects similar contracts can be negotiated for the San Dionisio and San Antonio mines.

Atalaya has a contract for the on-highway transportation of the concentrates from the Cerro Colorado operations to the port facilities at Huelva. It is expected that a similar contract would be enacted to transport concentrates from San Dionisio and San Antonio.

20. ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

Content in this section has been summarized from Ore Resources Engineering (2022), with minor additions and edits as necessary to describe the environmental, permitting, and social aspects that are the subject of this report.

20.1 Environmental Baseline Studies

Atalaya is committed to conducting its mining operation on a sustainable basis, with maximum prevention of any negative environmental, social, or cultural impact, which is reflected in the Environmental Policy approved for Proyecto Riotinto. The principles of this Policy include compliance with applicable environmental legislation and regulations, as well as other environmental commitments to which the Company subscribes. The policy was updated in 2021 to include a commitment to fight climate change and integrate resilience and adaptation as part of continuous improvement.

20.1.1 Environmental Management System

The Environmental Management System (EMS) is certified to the ISO 14001 standard. The certification of the EMS was completed in June 2020 and will be re-certified in 2022. Both internal and external audits are conducted every year.

The EMS is based on the Environmental Monitoring Plan (EMP) approved by the regulatory authorities. The aim of the EMP is to guarantee compliance with the preventive and corrective actions proposed in the Unified Environmental Authorization (AAU), as well as the applicable legislation.

The Plan establishes the frequent execution of environmental controls, as well as the submission of reports to the regulatory administration, and contains the environmental data and records of potential historical incidents, which allows feasible traceability of Riotinto.

Likewise, environmental performance monitoring is required. Riotinto has a series of specific criteria that cover all the project's environmental impacts. In total there are 20 criteria corresponding to environmental control points, such as emissions, air quality, noise, receiving environment, groundwater, and surface waters from the historical activity prior to Atalaya. For each of these, a reference value and a monitoring frequency are established. In addition, there is a program of inspection, control, and monitoring points where operations are verified with the indicated frequency, aimed at controlling consumption, waste, and emissions.

The project has an independent environmental technician on-site to guarantee compliance with these environmental conditions, including inspecting and controlling all aspects of the EMP.

20.1.2 Environmental Monitoring

Atalaya has developed a comprehensive monitoring program involving a combination of routine visual observations, physical inspections, sampling and analyses of air and water quality, and measurements of noise and vibration. A regular sampling program has been in place since 2008 to assess baseline conditions and monitor seepage from the tailings dam and existing waste dumps. The monitoring program will continually be updated to comply with any regulatory requirements and address operational changes.

20.1.3 Energy Transition and Climate Change

Energy consumption represents an important part of Proyecto Riotinto's carbon footprint. Atalaya has adopted actions to reduce energy consumption and greenhouse emissions:

- Installation of new flotation cells and replacement of old equipment.

- Construction of a solar power plant for self-consumption.
- Development of a plan to reduce its carbon footprint 15% by 2025.

20.1.4 Ecology

Fauna, flora, and habitat studies listed species occurring in the area but recognized that it was impossible to determine what the original ecosystem was like, having been impacted by mining and human activity for millennia. It is also acknowledged that the area is naturally acidic due to the underlying geology and mineralogy, and that the local ecosystem has evolved to suit the conditions that have been amplified by mining activities.

These studies identified regional protected ecosystems and species, developed management plans, and summarized general conservation and rehabilitation procedures for the site. Issues of feral and introduced species were also addressed, with eucalyptus, Scandinavian pine, and feral cats being the focus of study. Eucalyptus grows very well and rapidly in the area and is an easy and often effective revegetation species for erosion control and visual, noise, and dust screening. But it often out-competes indigenous trees and shrubs. Similarly, aggressive, and robust grass naturally colonizes inhospitable locations on the site, including the surface of mine tailings and on waste rock material, out-competing local species, and potentially restricting diversity.

20.1.5 Air, Noise, and Vibration

Areas and activities of noise generation have been identified and are monitored, and noise reduction methods have been implemented. Blasting, milling operations, and haulage have a strict timing schedule to reduce the impact on residential neighbors. Areas of dust generation have also been identified and optimum monitoring locations and suppressant methods adopted in the relevant EMPs.

Blast vibration monitoring is included in the EMP, and timing and operational practices are employed to reduce the impacts on close communities and residents. Monitoring and mitigation of blasting impacts have been incorporated into the mine operations contracts.

20.1.6 Circular Economy

The management policy for Proyecto Riotinto follows the *3Rs* rule (i.e., Reduce, Reuse, and Recycle), and includes a waste minimization plan that is reviewed annually.

Waste rock is used in the restoration and reinforcement of tailings dams. Non-mining waste is temporarily stored in a designated waste storage park until its collection by an authorized contractor. In 2021 Atalaya built a non-hazardous waste park to help segregate waste and provided specific training in waste management to the Proyecto Riotinto staff.

The Atalaya Environmental Management system incorporates procedures and facilities for collecting, segregating, handling, and disposing of or recycling all industrial and domestic waste materials. The system includes non-hazardous waste such as paper, glass, aluminum, timber, and other construction materials. Specific areas have been designated for storage of recyclables. Procedures are also in place for tires, scrap metal, and electrical equipment. There are also procedures for hazardous materials such as oils and grease, laboratory reagents, and solvents, and all are covered by the appropriate EMP.

20.1.7 Water Distribution System

The Project site is bounded to the east by the Río Tinto River, which has been impacted by the long history of mining in the area, and the Río Odiel to the west, where water quality is better. Water demand will largely be supplied from within the mine site recirculation system, which will be supplemented with fresh water from the Campofrío and Odiel reservoirs, and the nearby Aguas Limpias water dam for potential shortfalls of water during the summer. The site has a positive water balance, but various civil works will allow rainwater run-off to be diverted and increase storage on the site.

All water systems are regulated by both regional and federal governmental agencies. The operational plans maximize water recycling throughout the mine site, returning all decanted tailings water and accumulated catchment rainwater to the processing plant. Fresh surface water that has not contacted exposed mine workings or waste material is diverted away from the site to one of the river systems. A perimeter channel surrounding the TSF is designed to collect all fresh surface run-off. Emergency plans have been implemented and tested to divert as much water away from the TSF and other ponds as possible, with adequate pumping and alternative storage capacity, and an emergency discharge policy if the dam walls are threatened.

20.1.8 Water Management

Water resource management at Proyecto Riotinto prioritizes the reuse and recirculation of water by relying on supply from an external source only when necessary.

Under normal operating conditions, the project has a closed circuit by conditioning the various mining effluents for use in processing. The Company also has a water treatment line which allows mine water to be conditioned for use in mining and industrial applications. As a result, water consumption is reduced, with the percentage of fresh water being around 10-15% of the total.

20.1.9 Protection of Cultural Heritage

There is a historical and archaeological value in the area, with important examples of industrial and Victorian infrastructure, and evidence of medieval occupation going back through Roman, Carthaginian, and Phoenician times. Atalaya recognizes this responsibility and duty of care while operating at Riotinto.

Any activity on site must be approved by the Department of Culture and Heritage. General requirements for the preservation of cultural heritage in the area have been set out, and include:

- Restriction on re-vegetation of the old waste dumps to preserve certain historic vistas
- Prior inspection and documentation of heritage items and authorization by the Department before any extension of the open-pit and waste dumps
- Preservation of the Roman ruins outside the planned mining area and next to the pit
- Reassembly of the dismantled *Pozo Alfredo* headframe
- Building a large-scale model of the disused gold processing plant
- Consolidation and enhancement of various cultural elements within the mining perimeter, creation of tourist routes, and construction of an interpretation center for visitors

Any activities affecting items listed in the Heritage Register require detailed documentation and prior authorization of the Department of Culture and Heritage.

Atalaya has developed a Global Project for the Management of the Historical and Archaeological Heritage of Proyecto Riotinto, authorized by the Competent Administration, which establishes a series of actions for the management of the affected historical heritage including:

- Earthworks control to verify the existence of archaeological remains, and to enable their documentation and the collection of movable goods. The Director of the Riotinto Mining Museum undertakes the tasks of valuation and protection of any action involving earthworks, with the consensus of the Archaeological Inspection of the Territorial Delegation.
- Archaeological monitoring of all the elements that form part of Proyecto Riotinto and are protected as part of the Asset of Cultural Interest, documenting its transformation because of the development of the mining project.

- Archaeological excavations to discover and investigate all kinds of historical or paleontological remains, as well as geomorphological elements related to them. In all cases, the presentation of an intervention project authorized by the competent administration is required.
- Documentary and graphic studies of archaeological sites and of the materials deposited in museums or other institutions or centers.

20.2 Waste and Tailings Disposal

20.2.1 Waste Rock

In addition to the current and planned waste dumps, there are several areas inside and outside the Atalaya lease areas that contain waste material that must be managed. Although some of these waste areas are listed as protected, they will be covered as part of the final restoration plan to meet environmental requirements. Current sampling and analysis show that draining from these historic dumps is potentially acidic, and any seepage could pose a risk to the Rio Tinto River during periods of high rainfall. In a study to investigate the geochemical stability of the dumps, grab samples were analyzed to determine which areas were contributing to the acid drainage. All samples reported less than 2% sulfur and some produced neutral paste pH.

The dumps are to be constructed using a bottom-up method. An outer berm will contain the first 20-m lift that will be tipped progressively towards the berm. Subsequent lifts will be stepped back for a maximum overall slope of about 27 degrees, and each lift face will be covered with suitable material after final contouring. In this way, each lift can be progressively rehabilitated. The final landform will have whatever topsoil is available to spread to cover the slope to aid revegetation with mixed local species, reduce infiltration, and prevent erosion. The design will also incorporate final cover and progressive revegetation.

Drainage channels are incorporated into the waste rock dump designs to reduce the amount of water that can infiltrate the dumps and minimize acid drainage. The Atalaya operational and end-of-mine plan for waste dump drainage and toe seepage is for collection and treatment, and wetland remediation to raise water quality above that of the receiving waters, prior to discharge to the Rio Tinto River. Studies have looked at the long-term stability of the waste dump facilities and the development of suitable emergency management plans.

Atalaya will rehabilitate the historical waste rock dumps located within the mining permit. The proposed restoration work will largely be composed of re-contouring, covering, and revegetation, which requires a slight modification to the overall restoration design and an increase of the Project footprint.

20.2.2 Tailings

The site includes three tailings storage facilities named *Embalse Cobre* (Cobre TSF), *Embalse Aguzadera* (Aguzadera TSF), and *Embalse Gossan* (Gossan TSF). The Cobre and Gossan facilities were first constructed in the early 1970s to contain 70 Mt of tailings, and later the Aguzadera facility was constructed in the late 1980s, to provide a total of 86 Mt of tailings storage. The Gossan TSF is no longer used for tailings storage but as a water reclaim reservoir.

Tailings disposal has been undertaken at the Cobre and Aguzadera tailings facilities, which are currently at a crest elevation of 388 masl and 382 masl respectively. The design of the current raise of the Aguzadera tailings facilities was completed during 2019. Tailings are currently being discharged into this facility at a solids content of 55%. Prior to the granting of the approvals, Atalaya Mining undertook a series of ground improvements in the areas where the foundation material is previously deposited tailings for the final downstream embankment walls. These areas are in the northwest section of the Aguzadera dam, the southeast section of the Cobre dam, the area termed as *entronque* where Cobre and Aguzadera join to the south of the facility, and in the interfaces between these and the Gossan impoundment area.

The remaining Life of Mine production will be 15 Mtpa which will require additional total tailings storage requirement from 2022 of approximately 161 Mt. This future development of the tailings facilities will include raising the Aguzadera embankment to an initial crest elevation of 388 masl. From this elevation, both the embankments will be raised together with their dividing wall to a final elevation of 417 masl. The approval to raise both facilities to 417 masl has not yet been granted.

20.3 Permitting

The San Dionisio deposit is located within the Minas de Rio Tinto Exploitation Concession currently held by Atalaya, and therefore would be considered as an expansion to the current operation. Requirements and timelines to permit expansions depend on whether the expansion is considered substantial or non-substantial by the regulatory authorities. Non-substantial modifications apply for expansions that do not require mining method changes and do not materially change the project's environmental impact. Substantial modifications require full environmental permitting processes and therefore require more time to complete.

20.3.1 Current Status at Proyecto Riotinto

The current permitting status of PRT includes a Unified Environmental Authorization (*Autorización Ambiental Unificada* [AAU]) and an issued Mining Permit and Restoration Plan approval.

The AAU is an instrument of integrated environmental prevention and control created by the Andalucian government in 2007. It regulates mining activity and associated facilities at the environmental level. The AAU for PRT was initially obtained in 2014 and validated in May 2020. It has undergone several modifications, both substantial and non-substantial, with a substantial modification currently in progress that includes the expansion of the tailings storage facilities. This substantial modification is currently under review by the relevant regulatory authorities and is expected to be granted during the first quarter of 2023.

The Mining Permit and Final Restoration Plan was approved in January 2015 and validated in May 2020. In July 2020, Atalaya submitted an update to PRT that includes the expansion of the tailings facilities. The Final Restoration Plan is an integral part of PRT, and the submitted modification to PRT includes an update of the restoration plan. The modification is currently under review by the regulatory authorities and is expected to be granted in the first quarter of 2023.

20.3.2 San Dionisio

Initial development of the San Dionisio open pit will require a non-substantial modification to the current mining permit. The non-substantial modification will allow development of the open pit on the northern side and above the 250 m level. This non-substantial modification is expected to be issued in the second or third quarter of 2023.

Full development and operation of the open pit at San Dionisio, as well as the development and operation of the underground mine, will required a substantial modification to the extant mining permit. This substantial modification will include an expansion of the hard rock waste dumps to handle the waste being mined from the pit. The substantial modification requires full environmental permitting processes, and the expected timeline to obtain the permit is 2025.

20.3.3 San Antonio

The San Antonio deposit will require permitting, either as part of the substantial modification requested for San Dionisio, or fully permitted as a new operation. In either scenario, Atalaya expects to begin the process in 2023 and have the required approvals by 2025.

20.3.4 Additional Tailings Storage Facility

Additional tailings capacity will be required beyond 2032 to handle the additional material being processed from the mines at PRT. Expansion of the tailings storage facilities would require an evaluation either as a substantial modification of PRT or as a standalone new project.

20.4 Social Considerations

20.4.1 Environmental, Social and Governance (ESG)

Atalaya is committed to applying sustainability principles and to conducting its activities in accordance with the highest ESG standards. The Company approved a specific corporate policy in this area in 2021. This policy was based on a previous study, which made it possible to assess the state of management of the different aspects included in sustainability. It also includes commitments to operational safety, occupational health and safety, and innovation. At the end of 2020, Atalaya committed to supporting the Ten Principles of the United Nations Global Compact, referring to Human Rights, Labor Rights, the Environment, and Anti-corruption.

Atalaya has developed a specific sustainability strategy to ensure that management of its operations and the proposal of new projects are aligned with the principles of the policy. This strategy also aims to ensure the sustainable exploitation of its projects provides society with essential raw materials required to achieve goals established by the main national and international sustainability policies, such as climate change mitigation and energy transition.

Since the approval of this policy, the Company has applied several steps, including the creation of a specific department responsible for implementing the necessary procedures and practices. This department also has the support of a specific body, the Sustainability Committee, composed of management from the operation and departments of HR, safety, environment, communication, and R&D, among others, which are coordinated by the sustainability department. This Committee ensures compliance with the policy, as well as the priorities that may be established in management.

Atalaya is committed to the application of sound corporate governance as an AIM and TSX-listed company and complies with recognized corporate governance codes such as the QCA Code (Quoted Company Alliance) and the National Policy 58-201 of the Canadian Securities Administrators. Atalaya also has a Risk Management Policy whose objective is to assist the Company in establishing an effective system of both risk control and internal control.

20.4.2 Contracting and Training

Atalaya increased the workforce 814% since 2012 with 503 employees in 2021, including contractor employees. A significant proportion of them work on Proyecto Riotinto and, although the majority are men, the Company has a much higher proportion of female employees than the industry average in Spain.

The Company has relied heavily on people from Riotinto surrounding areas to create its workforce, demonstrating its commitment to the local community. The objective of preferentially hiring personnel from the area near the Project is to guarantee that local communities benefit from the economic activity.

This objective has been developed through a collaboration program between the Company and the seven municipalities in the mining area. Local personnel currently represent 65% of the staff. Technical and specialized personnel do not come from the area, but rather have been selected from within other areas in Spain. However, it is worth noting that nearly 100% of the personnel are Spanish nationals.

Emigration following the previous closure of the Riotinto mines has caused a lack of specialists and qualified labor. This situation has been resolved by re-attracting mining personnel to the area and with internal training.

Thus, the most pressing training needs are mainly related to mine safety and machinery operation, as well as specific training in different operational areas.

Collaboration programs have been implemented with various educational institutions to foster internships within the Company. Therefore, programs have been developed with post-secondary centers and the University of Huelva on subjects related to the Project (i.e., Electromechanics, Industrial Engineering, Chemistry, and Mine Engineering).

In 2021 Atalaya created a Diversity Committee composed of members of Human Resources, communications, corporate social responsibility, and sustainability departments, with the mission of promoting projects of a very diverse nature that foster knowledge of social reality, raising awareness in society in general and in business. The Company has also initiated the development of an Equality Plan which seeks to ensure equal opportunities for men and women in the company; this plan will be approved in 2022. The Diversity Committee had already launched the Family Plan, consisting of a program to identify potential needs to achieve maximum vital autonomy for people with disabilities.

Atalaya hires staff with special needs above the 2% threshold set by the applicable legislation. Atalaya has an Annual Training Plan aimed at the entire staff of the Company, which is administered by the Human Resources Department based on proposals by the area managers. The Plan includes legal requirements (i.e., Basic mining safety standards, guidelines for mobile mining machinery, etc.), as well as other staff development needs.

In accordance with the Company's Code of Ethics, Atalaya's salary policy promotes equal opportunities among staff members.

20.4.3 Labor Relations

The Spanish Workers' Statute establishes a law outlining minimum requirements in any sector in Spain. Company-employee relations are governed by a collective bargaining agreement that will be sector-related or internal to the Company. Companies with more than 50 workers shall choose a "Works Council", which is the body that represents all workers before the Company. Although union membership is not mandatory, it is likely most of the workers belong to one. The Spanish mining sector is strongly connected to the unions.

Atalaya is currently governed by a Sector Agreement. A Works Council is in place.

20.4.4 Public Relations

Atalaya Mining promotes the establishment of extensive communication channels, and actively seeks opportunities for dialogue with its stakeholders to ensure its business objectives are in line with societal expectations. The Company aims to be transparent by providing relevant and accurate information on its activities, fostering constructive dialogue, and encouraging continuous improvement.

Since the Project began, the Company has fostered a direct relationship and proactive line of communication with the groups, entities, government authorities, institutions, press, and the public that are interested in its operations. This is based on an open-door policy with a view to being transparent about its activities.

Members of the organization have also participated in internal, public sector, technical, and general events when there is an opportunity to communicate its values and explain its operations and activities.

Moreover, it is a member of different business and social organizations with which it shares goals, and which are used as a platform for its business and communication policies.

Finally, the Company has been effectively using all available channels to communicate new developments and explain its ideas using internal resources (website, social media, newsletters, e-mailing, etc.) as well as the press (press releases, interviews, participation in special editions, press visits, etc.).

20.5 Closure and Reclamation

To comply with regulatory requirements, Atalaya has produced a Final Restoration Plan (FRP) that details the steps that will be taken when operations at PRT cease. In addition, Atalaya has:

- Adopted a policy of progressive rehabilitation of non-operational areas of the property to reduce environmental impacts and reduce costs associated with final closure
- Regularly reviewed and revised the closure plans in accordance with changes to the regulatory framework and any changes to the operating mine plan
- Consulted with regulatory authorities and other stakeholders on matters related to post-mining land use, conservation of assets, and preservation of the landscape
- Made an appropriate financial commitment to ensure that sufficient funds are available to cover the expected costs of closure and reclamation

The scope of the current FRP includes the Cerro Colorado and San Dionisio open pits, the waste dumps, the TSFs, the processing plant, and all associated infrastructure.

Atalaya operations will leave the open pits in a geotechnically stable condition, and no further measures will be required post-closure. The sealed pits will be allowed to become inundated through rainfall and runoff and will also take excess surface water and treated seepage from the tailings dam. Perimeter drains will divert uncontaminated surface runoff, and water balances for the post-closure Cerro Colorado pit have been modelled.

The waste dumps will be constructed to ensure physical and geochemical stability and minimize the effects of acid drainage. Progressive rehabilitation and revegetation during mining operations will reduce the work and cost requirements for closure and reclamation once operations have ceased.

Operational design and closure plans for the TSF ensure their physical stability and capacity to withstand extreme flood events, prevent the overflow of seepage from site, and include capping and revegetation of surfaces. Storm water diversion channels will prevent clean water from entering the TSF, and the only water entering the tailings dam post-closure will be directly from rainwater. With natural evaporation rates, this will maintain sufficient freeboard on the walls. Rock armoring of the outer dam walls will increase strength and reduce erosion.

Wherever possible, the FRP separates fresh water from contact water, allowing fresh water to discharge off-site while any potential contact run-off will be redirected to the open pit. Seepage from both the TSF and waste dumps will be treated through appropriate systems to increase pH and reduce entrained metals before discharge to the river systems.

The scope of the currently approved FRP covers the existing Cerro Colorado operations. Atalaya will need to submit an updated FRP for approval by the regulatory authorities as part of the permit modifications required to begin operations at San Dionisio and San Antonio.

21. CAPITAL AND OPERATING COSTS

Capital and operating costs used in this report are based on information provided by Atalaya. Tetra Tech considers the costs used in this report to be appropriate for use in this PEA, and accurate to within ±50%.

21.1 Capital Costs

Capital cost expenditures for the LOM are estimated to be $566 million as shown in **Table 21-1**. A contingency of 15% has been applied to all capital costs.

Table 21-1: PRT Capital Cost Summary

Capital Costs	LOM Total ($M)
Mine Equipment	0
Mine Development	204
Process Plant	92
Closure	32
Sustaining Capital	71
Other Surface Infrastructure	93
Contingency	74
Total	**566**

Mine equipment is not included in capital costs as all equipment will be provided by the contractor. Mine development capital cost assumptions for the underground mines are based on information provided by Atalaya for similar mines and assumed contractor rates. These development cost estimates have been reviewed by Tetra Tech and are consistent with underground mines of this type and are suitable for use in a study of this level. Development capital for the San Dioniso open pit consists of the cost of mining 31 Mt of material as pre-production stripping. Additional capital costs include allocations for the tailings dam expansion.

Process plant assumptions have been discussed in **Section 17.3**. Annual sustaining capital requirements are estimated at $5M per year for the majority of the mine life. Closure costs are based on the information contained within the currently approved FRP and are divided equally over five years beginning in the final year of production.

21.2 Operating Costs

Operating costs will average $17.88/tonne-milled over the LOM as shown in **Table 21-2**. A contingency of 5% has been applied to all operating costs.

Table 21-2: PRT Operating Cost Summary

Item	Total LOM ($000s)	Unit Cost ($/t-milled)
Mining Costs	1,875	7.77
Processing Costs	1,962	8.12
G&A	275	1.14
Contingency	206	0.85
Total	**4,318**	**17.88**

All mining costs are based on assumed contractor rates provided by Atalaya. Milling costs are based on estimates provided in **Section 17.3** for the polymetallic circuit and on actual production values observed at the current processing plant for the stockwork material.

22. ECONOMIC ANALYSIS

An economic model was prepared for the Project using Measured, Indicated, and Inferred Mineral Resources. Mineral Resources are not Mineral Reserves, and do not have demonstrated economic viability. Inferred Mineral Resources are too speculative for use in defining Reserves. Summary results of the economic analysis are shown in **Table 22-1**.

Table 22-1: Economic Results Summary – Proyecto Riotinto

Item	Value
Life-of-Mine	15.6 years
Pre-tax $NPV_{10\%}$	$1,105M
After-tax $NPV_{10\%}$	$915M

22.1 Inputs and Assumptions

Technical assumptions used in the economic analysis are presented in **Table 22-2**. Metal prices are based on long-term consensus pricing from banks, as well as internal guidance from Atalaya. No salvage value has been considered.

Table 22-2: Economic Model Input Assumptions

Description	Value	Units
Market Prices		
Copper (Cu)	3.50	$/lb
Zinc (Zn)	1.20	$/lb
Lead (Pb)	0.95	$/lb
Taxes and Royalties		
Income Tax	18	%
Financial		
Discount Rate	10	%

The general corporate tax rate in Spain is 25%; however, the mining industry in Spain has a depletion factor tax benefit. The depletion factor is a tax figure established in Spain with the aim of promoting geological exploration research and mining of non-renewable resources. Through this benefit, companies can deduct from their tax base an amount that contributes to a fund which subsequently is allocated to new exploration-research works to foster mining activity. As a result, the effective tax for the Company becomes approximately 18%.

22.2 Economic Results

Results of the economic model are presented in **Table 22-3** below. The Project is projected to return an after-tax $NPV_{10\%}$ of $915M.

Table 22-3: Proyecto Riotinto Economic Results Summary

Item	Units	Value	Item	Units	Value
Stockwork Tonnes Processed	kt	195,890	Capital Costs		
Grade Cu	%	0.42	Mine Equipment	US$ M	-
Polymetallic Tonnes Processed	kt	45,601	Mine Development	US$ M	(204)
Grade Cu	%	0.98	Plant Capital	US$ M	(92)
Grade Zn	%	1.69	Other Capex	US$ M	-
Grade Pb	%	0.45	Closure	US$ M	(32)
Cu Recovered to Concentrate	Mlbs	2,213	Sustaining Capital	US$ M	(71)
Zn Recovered to Concentrate	Mlbs	1,267	Surface Infrastructure	US$ M	(93)
Pb Recovered to Concentrate	Mlbs	168	Contingency	US$ M	(74)
Average Recovery - Cu	%	79.0	**Total Capital Costs**	**US$ M**	**(566)**
Average Recovery - Zn	%	74.7	**Pre-tax Cash Flow**	**US$ M**	**2,561**
Average Recovery - Pb	%	37.0	**Income Tax**	**US$ M**	**(408)**
Cu Produced - Payable	Mlbs	2,118	**After-tax Cash Flow**	**US$ M**	**2,152**
Zn Produced - Payable	Mlbs	1,077	**Pre-tax $NPV_{10\%}$**	**US$ M**	**1,105**
Pb Produced - Payable	Mlbs	160	**After-tax $NPV_{10\%}$**	**US$ M**	**915**
Gross Revenues	**US$ M**	**8,855**			
TCs, RCs, and Freight	US$ M	(1,361)			
Net Revenue	**US$ M**	**7,494**			
Operating Costs					
Mining Costs	US$ M	(1,875)			
Processing Costs	US$ M	(1,962)			
G&A	US$ M	(275)			
Contingency	US$ M	(206)			
Total Operating Costs	**US$ M**	**(4,318)**			
EBITDTA	**US$ M**	**3,176**			
Change in Working Capital	US$ M	(50)			
Cash Costs					
Cash Costs[1]	US$/lb-Cu	2.00			
Cash Costs + Sustaining[1]	US$/lb-Cu	2.03			

[1] *Cash costs and cash costs plus sustaining capital per pound of payable Cu net of by-product credits from revenues attributable to Zn and Pb*

Penalties are assumed to be offset by revenues attributable to silver in the concentrate products. Due to the current production status of the Cerro Colorado pit, there are no periods of negative cash flow in the economic model. Therefore, there are no results for payback period and IRR for PRT.

An annualized LOM cash flow is presented on an annual basis in **Table 22-4** below.

Table 22-4: PRT Annual Cash Flow

Annual Cash Flow		Units	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Cash Flow Summary	Copper Price	US$/lb	**3.50**	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
	Zinc Price	US$/lb	**1.20**	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
	Lead Price	US$/lb	**0.95**	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
	Gross Revenue	**US$ M**	**8,855**	**430**	**382**	**449**	**474**	**604**	**482**	**551**	**745**	**790**	**794**	**761**	**738**	**618**	**467**	**362**	**209**				
	TC/RC and Freight	US$ M	**(1,361)**	(55)	(49)	(58)	(61)	(92)	(73)	(87)	(128)	(135)	(138)	(133)	(118)	(92)	(67)	(47)	(27)				
	Net Revenue	**US$ M**	**7,494**	**375**	**333**	**391**	**413**	**512**	**408**	**464**	**617**	**654**	**655**	**628**	**620**	**526**	**400**	**315**	**182**				
	Operating Costs	US$ M	**(4,318)**	(195)	(282)	(295)	(276)	(279)	(306)	(283)	(327)	(290)	(326)	(301)	(288)	(303)	(261)	(201)	(106)				
	EBITDA	**US$ M**	**3,176**	**179**	**51**	**97**	**137**	**233**	**102**	**180**	**290**	**365**	**330**	**327**	**332**	**223**	**139**	**114**	**76**				
	Capital Costs	US$ M	**(566)**	(56)	(6)	(32)	(92)	(55)	(52)	(95)	(56)	(56)	(6)	(6)	(6)	(6)	(5)	(2)	(7)	(7)	(7)	(7)	(7)
	Change in Working Capital	US$ M	**(50)**	(26)	11	(0)	(3)	(2)	6	(4)	1	(5)	4	(2)	(1)	4	(1)	(5)	(12)	(14)			
	Pre-tax Cash Flow	**US$ M**	**2,561**	**96**	**56**	**64**	**43**	**177**	**56**	**82**	**235**	**303**	**328**	**320**	**325**	**221**	**133**	**107**	**57**	**(21)**	**(7)**	**(7)**	**(7)**
	Income Tax	US$ M	**(408)**	(26)	(3)	(12)	(17)	(35)	(10)	(22)	(40)	(52)	(46)	(45)	(46)	(27)	(12)	(8)	(6)				
	After-tax Cash Flow	**US$ M**	**2,152**	**71**	**53**	**52**	**25**	**141**	**46**	**60**	**194**	**251**	**282**	**274**	**279**	**195**	**121**	**99**	**51**	**(21)**	**(7)**	**(7)**	**(7)**
Net Present Value	**Pre-tax $NPV_{10\%}$**	**US$ M**	**1,105**																				
	After-tax $NPV_{10\%}$	**US$ M**	**915**																				
Production Summary	Stockwork Tonnes Processed	kt	**195,890**	15,500	15,500	15,500	15,500	11,423	12,316	11,493	9,047	9,063	8,917	9,585	10,986	12,851	14,000	15,218	8,992				
	Grade Cu	%	**0.42**	0.42	0.37	0.43	0.46	0.44	0.36	0.41	0.49	0.50	0.42	0.43	0.49	0.47	0.39	0.34	0.35				
	Polymetallic Tonnes Processed	kt	**45,601**					4,077	3,184	4,007	6,453	6,437	6,583	5,915	4,514	2,648	1,500	282					
	Grade Cu	%	**0.98**					1.01	0.83	0.76	0.86	0.98	1.09	1.01	1.15	1.20	0.91	0.83					
	Grade Zn	%	**1.69**					1.24	1.12	1.32	1.72	1.80	1.93	2.10	1.83	1.61	1.56	0.96					
	Grade Pb	%	**0.45**					0.24	0.48	0.48	0.49	0.50	0.47	0.50	0.41	0.39	0.47	0.40					
	Cu Recovered to Concentrate	Mlbs	**2,213**	128	114	134	142	153	123	134	160	170	166	158	175	161	126	106	62				
	Zn Recovered to Concentrate	Mlbs	**1,267**					83	59	87	183	191	209	205	136	70	38	4					
	Pb Recovered to Concentrate	Mlbs	**168**					8	12	16	26	26	25	24	15	8	6	1					
	Cu Recovered to Concentrate	kt	**1,004**	58	52	61	64	69	56	61	73	77	75	72	79	73	57	48	28				
	Zn Recovered to Concentrate	kt	**575**	-	-	-	-	38	27	39	83	87	95	93	62	32	17	2	-				
	Pb Recovered to Concentrate	kt	**76**	-	-	-	-	4	6	7	12	12	11	11	7	4	3	0	-				
NSR	Cu Produced - Payable	Mlbs	**2,118**	123	109	128	135	146	117	128	153	163	159	152	167	154	121	102	60				
	Zn Produced - Payable	Mlbs	**1,077**	-	-	-	-	71	50	74	156	162	178	174	116	60	33	4	-				
	Pb Produced - Payable	Mlbs	**160**	-	-	-	-	8	12	15	24	25	24	23	14	8	6	1	-				
	Cu Produced - Payable	kt	**960**	56	49	58	61	66	53	58	69	74	72	69	76	70	55	46	27				
	Zn Produced - Payable	kt	**488**	-	-	-	-	32	23	34	71	74	81	79	53	27	15	2	-				
	Pb Produced - Payable	kt	**72**	-	-	-	-	3	5	7	11	11	11	10	7	4	3	0	-				
	Gross Revenues	**US$ M**	**8,855**	**430**	**382**	**449**	**474**	**604**	**482**	**551**	**745**	**790**	**794**	**761**	**738**	**618**	**467**	**362**	**209**				
	TCs, RCs, and Freight	US$ M	**(1,361)**	(55)	(49)	(58)	(61)	(92)	(73)	(87)	(128)	(135)	(138)	(133)	(118)	(92)	(67)	(47)	(27)				
	Net Revenue	**US$ M**	**7,494**	**375**	**333**	**391**	**413**	**512**	**408**	**464**	**617**	**654**	**655**	**628**	**620**	**526**	**400**	**315**	**182**				
Operating Costs	Mining Operating Cost	US$ M	**(1,875)**	(45)	(127)	(140)	(122)	(121)	(148)	(125)	(165)	(129)	(163)	(140)	(129)	(145)	(106)	(50)	(19)				
	Processing Operating Cost	US$ M	**(1,962)**	(123)	(123)	(123)	(123)	(127)	(126)	(127)	(129)	(129)	(129)	(129)	(127)	(126)	(125)	(123)	(71)				
	G&A	US$ M	**(275)**	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(10)				
	Contingency	US$ M	**(206)**	(9)	(13)	(14)	(13)	(13)	(15)	(13)	(16)	(14)	(16)	(14)	(14)	(14)	(12)	(10)	(5)				
	Total Operating Costs	**US$ M**	**(4,318)**	**(195)**	**(282)**	**(295)**	**(276)**	**(279)**	**(306)**	**(283)**	**(327)**	**(290)**	**(326)**	**(301)**	**(288)**	**(303)**	**(261)**	**(201)**	**(106)**				
	Cash Costs[1]	*US$/lb*	***2.00***	*2.04*	*3.03*	*2.75*	*2.49*	*1.90*	*2.63*	*2.09*	*1.61*	*1.26*	*1.43*	*1.34*	*1.51*	*2.05*	*2.35*	*2.38*	*2.22*				
	Cash Costs + Sustaining[1]	*US$/lb*	***2.03***	*2.08*	*3.08*	*2.79*	*2.53*	*1.94*	*2.67*	*2.13*	*1.64*	*1.29*	*1.46*	*1.37*	*1.54*	*2.08*	*2.38*	*2.40*	*2.22*				
	EBITDA	**US$ M**	**3,176**	**179**	**51**	**97**	**137**	**233**	**102**	**180**	**290**	**365**	**330**	**327**	**332**	**223**	**139**	**114**	**76**				
	Change in Working Capital		**(50)**	(26)	11	(0)	(3)	(2)	6	(4)	1	(5)	4	(2)	(1)	4	(1)	(5)	(12)	(14)			
Capital Costs	Mine Equipment	US$ M																					
	Mine Development	US$ M	**(204)**	(44)			(24)	(24)	(40)	(40)	(16)	(16)											
	Plant Capital	US$ M	**(92)**			(23)	(51)	(18)															
	Closure	US$ M	**(32)**																(6)	(6)	(6)	(6)	(6)
	Sustaining Capital	US$ M	**(71)**	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(4)	(2)					
	Surface Infrastructure	US$ M	**(93)**							(37)	(28)	(28)											
	Contingency	US$ M	**(74)**	(7)	(1)	(4)	(12)	(7)	(7)	(12)	(7)	(7)	(1)	(1)	(1)	(1)	(1)	(0)	(1)	(1)	(1)	(1)	(1)
	Total Capital Costs	**US$ M**	**(566)**	**(56)**	**(6)**	**(32)**	**(92)**	**(55)**	**(52)**	**(95)**	**(56)**	**(56)**	**(6)**	**(6)**	**(6)**	**(6)**	**(5)**	**(2)**	**(7)**	**(7)**	**(7)**	**(7)**	**(7)**
	Cash Flow Before Taxes	**US$ M**	**2,561**	**96**	**56**	**64**	**43**	**177**	**56**	**82**	**235**	**303**	**328**	**320**	**325**	**221**	**133**	**107**	**57**	**(21)**	**(7)**	**(7)**	**(7)**
Tax	Income Tax		**(408)**	(26)	(3)	(12)	(17)	(35)	(10)	(22)	(40)	(52)	(46)	(45)	(46)	(27)	(12)	(8)	(6)				
	Cash Flow After Tax		**2,152**	**71**	**53**	**52**	**25**	**141**	**46**	**60**	**194**	**251**	**282**	**274**	**279**	**195**	**121**	**99**	**51**	**(21)**	**(7)**	**(7)**	**(7)**

[1]Cash costs and cash costs plus sustaining capital per pound of payable Cu net of by-product credits from revenues attributable to Zn and Pb

22.3 Sensitivities

Sensitivity studies were performed on metal prices, capital and operating costs, discount rate, and metallurgical recoveries for the polymetallic mineralized material. All sensitivity study parameters were modified individually in 5% increments to +/- 25% of the base case value. The results of the sensitivity analyses show the Project is most sensitive to the price of copper and operating costs.

Project sensitivity to metal prices is shown in **Figure 22-1.** The metal price the Project is most sensitive to is copper, with a 5% decrease in copper price resulting in a 16% reduction in NPV; however, a positive change in copper price by 5% results in a 16% increase in project NPV.

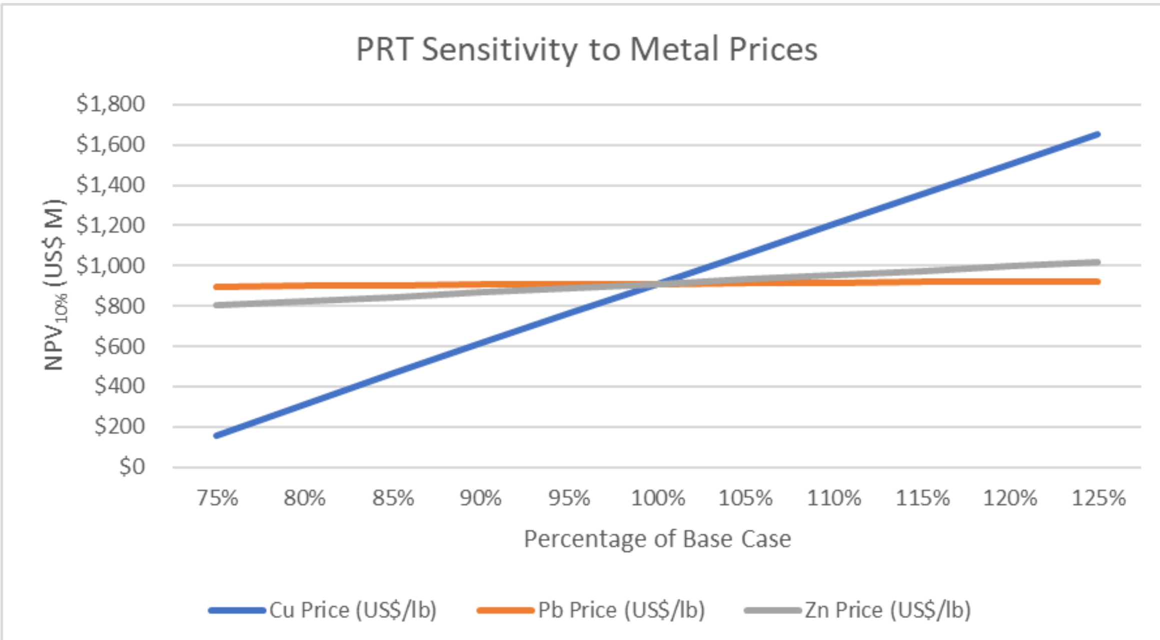
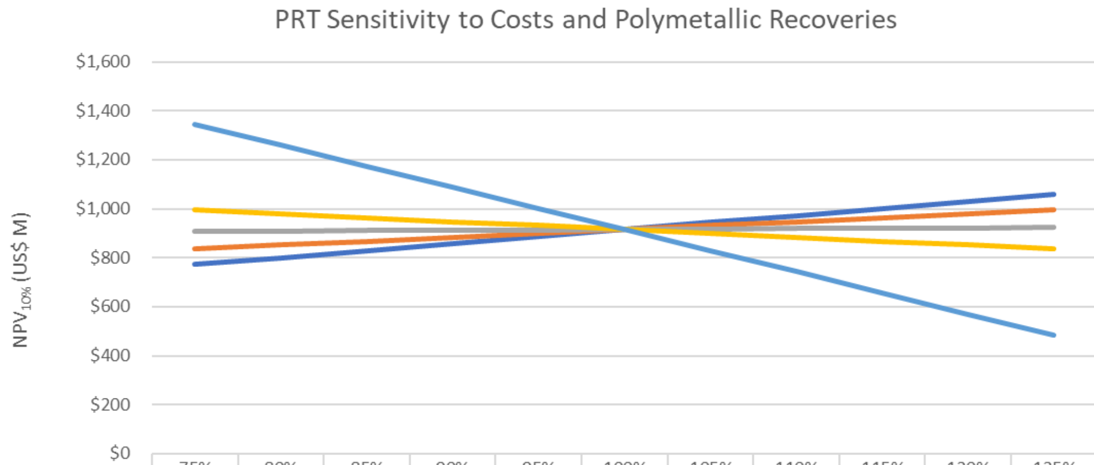


Figure 22-1: Project sensitivity to metal prices

Sensitivities on polymetallic recovery and capital and operating costs were also performed and are summarized in **Figure 22-2**. Regarding these sensitivities, the Project is most sensitive to operating costs, where a 5% increase in operating costs reduces the NPV by 10%.



	75%	80%	85%	90%	95%	100%	105%	110%	115%	120%	125%
Polymetallic Recovery Factor - Cu	$772	$801	$830	$858	$887	$915	$944	$973	$1,001	$1,030	$1,059
Polymetallic Recovery Factor - Zn	$836	$852	$868	$884	$900	$915	$931	$947	$963	$979	$995
Polymetallic Recovery Factor - Pb	$907	$909	$910	$912	$914	$915	$917	$919	$921	$922	$924
CAPEX Factor	$996	$980	$964	$948	$931	$915	$899	$883	$867	$851	$835
OPEX Factor	$1,346	$1,260	$1,174	$1,088	$1,002	$915	$829	$743	$657	$570	$483

Figure 22-2: PRT sensitivities to costs and polymetallic recoveries

As the primary metal price sensitivity driver, copper price was selected to perform additional sensitivities on a selection of discount rates. Results of these sensitivities are summarized in **Table 22-5**.

Table 22-5: Copper price and discount rate sensitivity results

After-tax NPV (US$ M)	Copper Price (US$/lb)										
Discount Rate (%)	$2.63	$2.80	$2.98	$3.15	$3.33	**$3.50**	$3.68	$3.85	$4.03	$4.20	$4.38
0%	$615	$928	$1,240	$1,545	$1,848	$2,152	$2,456	$2,760	$3,064	$3,368	$3,672
5%	$325	$539	$750	$957	$1,163	$1,369	$1,575	$1,781	$1,987	$2,193	$2,399
8%	$217	$392	$564	$733	$901	$1,069	$1,237	$1,405	$1,573	$1,741	$1,909
10%	$163	$318	$470	$619	$767	**$915**	$1,064	$1,212	$1,360	$1,508	$1,656
12%	$120	$258	$393	$526	$658	$790	$922	$1,053	$1,185	$1,317	$1,448
15%	$71	$189	$304	$418	$530	$642	$754	$866	$977	$1,089	$1,201

22.4 Risk Factors

The economic model results presented in this section are based on the production plan discussed in **Section 16.4** and the recovery assumptions presented in **Section 13.** Changes to metallurgical recovery and/or the mining sequence would affect the economic results presented.

In accordance with CIM best practice, the economic model is presented using constant metal price and foreign exchange rate assumptions. Changes in these economic input factors, and/or capital or operating costs, may impact the potential economic results of Proyecto Riotinto. As demonstrated in **Section 22.3** , the Project is most sensitive to changes in copper price and operating costs.

23. ADJACENT PROPERTIES

The Project is adjacent to Sandfire's MATSA Copper Operations in Huelva, Spain. The MATSA complex consists of three underground mines, Aguas Teñidas, Magdalena, and Sotiel. MATSA is processing approximately 4.7 Mtpa of polymetallic material to produce copper, lead, and zinc concentrates. The concentrates are shipped from the port of Huelva.

The polymetallic mineralized material mined from the Sotiel mine is similar in nature and being successfully processed. The underground mining method proposed for this PEA is similar to the method used at the Sotiel underground operation.

Information regarding the MATSA operations has been taken from publicly available data provided by Sandfire and the Qualified Person for this report has not been able to independently verify the information. The MATSA operation may not be indicative of mineralization at PRT.

24. OTHER RELEVANT DATA AND INFORMATION

Tetra Tech is not aware of any additional information for which the exclusion thereof would render this report misleading.

25. INTERPRETATION AND CONCLUSIONS

25.1 Geology and Resource

Tetra Tech has reviewed the Resource models for the Riotinto Project. The inputs, parameters, and estimation results are within industry best practices for a study of this level and a mine with historic data.

25.2 Mining

Pit designs for the San Dionisio pit were based on a generalized set of pit design parameters. While Tetra Tech considers these designs adequate for use in this PEA, detailed design work and validation with known areas of geotechnical instability was not completed. Underground scheduling was performed using simplified assumptions for stopes and crown pillars. Due to historical production experience at both underground mines, it is expected that resumption of underground mining in the two deposits using similar methods is feasible; however, detailed underground mine design and scheduling was not performed for this PEA due to the uncertainty of the Mineral Resource estimate for both deposits.

25.3 Metallurgy and Processing

Metallurgical testwork results and current plant performance indicate that Riotinto mineralized material is amenable to conventional crushing, grinding, froth flotation, dewatering, and filtering processes. The mineralized material for the current operation is mined from five different zones (CCW, Isla, Salomon, Lago and QUEB), with different but acceptable metallurgical performance variability when processing it with conventional flotation machines and Isopropyl Ethyl thiocarbamate (IPETC)-based chemistry at basic pH of over 10.5. The optimum target P_{80} in the flotation feed has been set to 175-200 microns as a compromise between copper recovery and throughput.

Mineralized material from future Resources will contain polymetallic minerals, primarily lead and zinc, as well as copper. Historical data developed by Riotinto and various metallurgical laboratories prior to 1986 and recent preliminary polymetallic testwork commissioned by Atalaya has focused on maximizing both the metal recovery and concentrate grade. The historical data clearly indicate that a finer liberation size, as well as selective flotation techniques are required to achieve economic recoveries. Regrinding cleaner concentrates below 20 microns typically yields higher metal recoveries and grades.

25.4 Environmental and Permitting

Tetra Tech has reviewed the available information on permits, agreements, and environmental aspects. Based on this information, Tetra Tech is unaware of any outstanding issues not discussed in this report on this regard that will affect the current operations or mine life.

25.5 Economic Analysis

An economic analysis was performed for the expected 15.6-year LOM of the Project. The economic analysis is based on Mineral Resources that are not Mineral Reserves and do not have demonstrated economic viability. Mineral Reserves have not been estimated for this PEA, and Cerro Colorado pit inventories were considered as Mineral Resources in accordance with CIM best practice. As there has been no modifications to Cerro Colorado's mineral inventory, mining method, or recovery assumptions used in the declaration of the Cerro Colorado Mineral Reserves, Tetra Tech considers that the Mineral Reserves declared in the September 2022 technical report can be considered valid. The after-tax NPV of the Project is $915M at a discount rate of 10%, indicating that the Project is potentially economically viable; however, there is no guarantee of economic performance. The Project is sensitive to the copper price and operating costs. Diligence in operating cost management and the identification of potential areas for operating cost reduction could improve the potential economic performance of the Project as metal price factors are outside the control of Atalaya.

25.6 Significant Risk Factors

Significant risks to the Project identified in this study include:

- If one of the mines is not advanced to production or experiences other operational delays, the results of this PEA will be affected
- Changes to metallurgical recovery parameters may impact the economic performance of the Project
- Processing of the polymetallic mineralized material
- Geotechnical information of the San Dionisio open pit and underground mines
- Waste rock and tailings storage capacity
- Delays in permitting and road relocation that would affect the mine schedule

26. RECOMMENDATIONS

Tetra Tech recommends completing a study of a higher confidence level, such as a pre-feasibility or feasibility study. Additional recommendations are provided in the following sections.

26.1 Geology and Resource

Tetra Tech recommends the following work be performed to increase confidence in the Mineral Resources at PRT:

- Assay for silver as additional exploration is completed and estimate silver values into the block model to gain an understanding of the silver content that could be saleable.
- Confirm historical drilling data with new drilling and the corresponding QA/QC data. This could upgrade the current Inferred Resource to a higher classification confidence.
- Sample recovery (drill core) issues and the possible correlation with high lead and zinc values discussed in historical reports should be clarified with new drilling core recovery data. Diamond drill core is recommended for future confirmation and infill drilling programs.

26.2 Mining

Recommendations for improving the confidence in mine designs and scheduling are:

- Determination of appropriate design angles and catch bench widths for future pit designs at San Dionisio using updated geotechnical analysis of shales, oxides, and fill materials.
- Perform detailed pit designs on the San Dionisio pit as Resource confidence increases, ensuring compliance with geotechnical considerations as part of the Project's advancement into a pre-feasibility or feasibility stage.
- Perform updated and/or confirmatory geotechnical studies of potential underground workings.
- It is critical to perform a high-level evaluation of the geometry of the potentially minable underground Resources, if confidence of the Resources is increased through additional exploration work. Once this evaluation has been completed, higher levels of study can be performed with more detailed engineering design for the underground mines.
- The development of a fully blended mine plan with stockpiling and cutoff grade optimization is recommended as part of any future studies on the Project.

26.3 Metallurgy and Processing

Recommendations for additional work surrounding metallurgy and processing are:

- Additional and more advanced metallurgical testwork will be required to properly design the polymetallic flowsheet. The existing Riotinto concentrator infrastructure would be utilized to support the additional equipment required to process the polymetallic material. A program should evaluate fine grinding (< 20 microns) vs. metal recovery and concentrate grade for each of the various deposits. The use of selective flotation reagents and pyrite depressants combined with the finer grind should be studied to optimize polymetallic recoveries. A metallurgical model can then be developed to create the appropriate blending formula that maximizes metal recovery and cash flow.

- Test work and studies to define the feasibility and cost of the E-LIX™ processing technology should be continued to see if it can be used as the processing option for the Project in the future. E-LIX™ has the potential to substantially influence the metallurgical performance of Atalaya mineralized material.

26.4 Tailings and Waste Rock Storage

Tetra Tech recommends additional studies to define capacity for tailings and waste rock storage on the surface and underground.

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28. DATE AND SIGNATURE PAGE

CERTIFICATE OF AUTHOR

Guillermo Dante Ramírez-Rodríguez, PhD, MMSAQP
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I, **Guillermo Dante Ramírez-Rodríguez, PhD, MMSAQP**, of Golden, Colorado do hereby certify:

a) I am a Principal Mining Engineer with Tetra Tech, Inc. with a business address of 350 Indiana St., Suite 500, Golden, CO 80401.

b) This certificate applies to the Technical Report titled "Preliminary Economic Assessment Proyecto Riotinto | Riotinto District | Huelva Province, Spain" with an effective date of October 31, 2022.

c) I have a Bachelor's degree in Mining and Metallurgical Engineering from the University of Zacatecas School of Mines in Mexico, and a Master and Doctorate degrees in Mining and Earth Systems Engineering from the Colorado School of Mines, in the United States of America. I am a QP member for the Mining and Metallurgical Society of America (Member No. 01372QP). I have over 35 years of professional experience since my graduation in 1987. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").

d) I visited the property November 7-9, 2022.

e) I am responsible for Sections 15, 16, 18-22, as well as portions of Sections 1-5, 12, and 24-27.

f) I satisfy all the requirements of independence according to NI 43-101.

g) I have read NI 43-101, Form 43-101 F1, and the Companion Policy to NI 43-101 (43-101 CP) and this Technical Report has been prepared in compliance with NI 43-101, Form 43-101 F1, and 43-101 CP.

h) As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

i) I consent to the filing of the Technical Report with any stock exchanges or other regulatory authority and any publication by them, including electronic publication in the public company files on the websites accessible by the public, of the Technical Report.

Dated February 21, 2023

"Guillermo Dante Ramírez-Rodríguez PhD, MMSAQP"

SIGNATURE OF QUALIFIED PERSON

Guillermo Dante Ramírez-Rodríguez PhD, MMSAQP

PRINT NAME OF QUALIFIED PERSON

CERTIFICATE OF AUTHOR

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I, **Jaye T Pickarts, P.E.**, of Littleton, Colorado do hereby certify:

a) I am currently employed as a Principal Engineer/ Senior Project Manager at Tetra Tech located at 350 Indiana Street, Suite 500, Golden, Colorado 80401.

b) This certificate applies to the Technical Report titled "Preliminary Economic Assessment Proyecto Riotinto | Riotinto District | Huelva Province, Spain" with an effective date of October 31, 2022.

c) I graduated from the Montana College of Mineral Science and Technology, Butte, Montana, with a Bachelor of Science Degree in Mineral Processing Engineering in 1982. I am a Licensed Professional Engineer in the State of Colorado, USA, PE37268, State of Wyoming, USA, PE13891 and the State of Nevada, USA, PE020893. In addition, I am a Registered Member of the Society for Mining, Metallurgy, and Exploration (SME) No. 2543360 and a Qualified Person member of the Mining and Metallurgical Society of America (MMSA). I have practiced my profession continuously since 1982, and have been involved in mineral processing, and metallurgical and environmental engineering for more than 36 years.

d) I visited the property most recently in July 2021.

e) I participated and am responsible for sections 13 and 17, and portions of Sections 1, 2, and 24-27 of this Technical Report.

f) I satisfy all the requirements of independence according to NI 43-101.

g) I have read NI 43-101, Form 43-101 F1, and the Companion Policy to NI 43-101 (43-101 CP) and this Technical Report has been prepared in compliance with NI 43-101, Form 43-101 F1, and 43-101 CP.

h) As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

i) I consent to the filing of the Technical Report with any stock exchanges or other regulatory authority and any publication by them, including electronic publication in the public company files on the websites accessible by the public, of the Technical Report.

Dated February 21, 2023

"Jaye T Pickarts, P.E."-Signed
Signature of Qualified Person

Jaye T Pickarts, P.E.
Print name of Qualified Person

CERTIFICATE OF AUTHOR

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I, **Kira Lyn Johnson, MMSAQP**, of Golden, Colorado do hereby certify:

a) I am a Senior Geological Engineer with Tetra Tech, Inc. with a business address of 350 Indiana St., Suite 500, Golden, CO 80401.

b) This certificate applies to the Technical Report titled “Preliminary Economic Assessment Proyecto Riotinto | Riotinto District | Huelva Province, Spain” with an effective date of October 31, 2022

c) I have a Bachelor’s degree in Geological Engineering from South Dakota School of Mines and Technology. I am a QP member for the Mining and Metallurgical Society of America (Member No. 01539). I have more than 15 years of professional experience. I am a “Qualified Person” for purposes of National Instrument 43-101 (the “Instrument”).

d) I visited the property November 7-9, 2022.

e) I am responsible for section 7-12, 14, and 23 of the report, as well as portions of Sections 1-6 and 24-27.

f) I satisfy all the requirements of independence according to NI 43-101.

g) I have read NI 43-101, Form 43-101 F1, and the Companion Policy to NI 43-101 (43-101 CP) and this Technical Report has been prepared in compliance with NI 43-101, Form 43-101 F1, and 43-101 CP.

h) As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

i) I consent to the filing of the Technical Report with any stock exchanges or other regulatory authority and any publication by them, including electronic publication in the public company files on the websites accessible by the public, of the Technical Report.

Dated February 21, 2023

“Kira Lyn Johnson, MMSAQP” - Signed

Signature of Qualified Person

Kira Lyn Johnson, MMSAQP

Print name of Qualified Person