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CAPSTONE MINING CORP.

MANTOVERDE MINE AND MANTOVERDE DEVELOPMENT PROJECT

NI 43-101 TECHNICAL REPORT

CHAÑARAL / REGIÓN DE ATACAMA, CHILE

Effective Date: 29 November 2021

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1 Summary

1.1 Property Description and Ownership

The Mantoverde Mine is a copper mine located in the province of Chañaral, Atacama Region, 56 km southeast of the city of Chañaral and 100 km north of Copiapó (straight line distances), at an altitude of approximately 900 masl. The site has two accesses from the town of Chañaral.

The Mantoverde property is owned by Mantos Copper Holding SpA, a Chilean company (70%) and Mitsubishi Materials Corporation (30%). Audley Mining Advisors Ltd. and Orion Mine Finance LLP indirectly own Mantos Copper Holding SpA. On 30 November 2021 it was announced that the Mantos Copper ownership would combine with Capstone Mining Corp. to form Capstone Copper Corp.

The Mantos Copper property covers an area of 39,254 ha with 303 mining exploitation licences and three exploration licences.

The Mantoverde Mine currently operates heap and dump (ROM) leaching and conventional SX-EW to treat oxide ore to produce 45 kt/y to 50 kt/y of copper cathodes. The Mantoverde Development Project (MVDP) will treat 12.3 Mt/y of sulphide material through a concentrator to produce copper concentrate. The mine will also continue to treat oxides as part of the MVDP plan.

1.2 Summary of Geology and Mineralization

The Mantoverde deposit is a typical iron oxide–copper–gold (IOCG) deposit located within the Atacama Fault System. It is located in an ancient mining district with numerous Fe, Fe-Cu-Au, Au and Mn deposits in the southern sector of the Atacama Fault System within the Cretaceous iron belt.

Copper mineralization is oxidized down to approximately 200 m depth and two types of oxidized copper ores are recognized. The breccias in the sloping fault block contain abundant haematite with brochantite, minor antlerite, chrysocolla, malachite and atacamite, which occur in veinlets, patches and disseminated in the specularite matrix.

Hypogene mineralization at depth occurs disseminated in the specularite matrix and consists of chalcopyrite and pyrite. Between the oxidized zone and the hypogene sulphide zone there is a thin sub-horizontal zone of weak supergene enrichment (3 m to 5 m thick) which includes native copper, cuprite, tenorite and chalcocite (±covellite) partially replacing the hypogene sulphides.

1.3 Status of Exploration, Development and Operations

Mantoverde is an operating mine and has implemented an exploration program that considers the execution of infill drilling campaigns and exploration programs in areas of geological interest located in the surroundings of its operation within its mining properties.

1.4 Mineral Processing and Metallurgical Testing

Mantoverde currently operates heap and dump leaching of oxide ore to produce 45 kt/y to 50 kt/y copper cathode. A feasibility study was completed in December 2017 to determine the feasibility of treating sulphide (hypogene) material.

Three metallurgical testwork programs have been conducted since 2005 on the sulphide (hypogene) material. Comminution testwork completed has included Bond ball mill work index (BWi); Bond rod mill work index (RWi); abrasion (Ai); low energy impact (LIT); JK drop weight (JKDWT); semi-autogenous grinding (SAG) mill comminution (SMC), SAG Power Index (SPI) tests and evaluation of high pressure grinding rolls (HPGR). Other testwork has included flotation kinetic rates; standardized flotation rougher tests; open cycle (OCT) and locked cycle (LCT) tests for flotation performance; assessment of tailings behaviour, including settling and rheology tests, thickening, classification, pumping loop and deposition performance; and tailings environmental characterization. Subsequent to the completion of the feasibility study in 2017, additional tests, including mineralogy and chemical assays, rougher flotation tests (kinetic rates and standard tests), BWi, SAG power index protocols (TSAG), and tailings settling tests were performed.

The metallurgical recoveries developed from testwork results were used to design the sulphide plant. The sulphide recoveries for the current mine plan and financial evaluation were obtained directly from the geometallurgical model estimates developed by Mantos Copper with the support of an external consultant (Geoinnova Consultores). Geoinnova subsequently updated the Mixed material recoveries for Mantoverde, Manto Ruso and Celso in April 2018, using new metallurgical testwork data collected after the cut-off date for data supporting the feasibility study. The oxide recoveries are based on historical and projected values.

The life-of-mine (LOM) recovery forecasts from 2023 onwards are provided in Table 1-1: Projected Metallurgical Recoveries

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Table 1-1: Projected Metallurgical Recoveries

Sulphide Plant	Unit	2023	2024	2025	2026	Average 2027-2031	Average 2032-2042	Total/Average MVDP20
Feed to Mill	kt	3,245	12,214	12,436	12,455	12,277	12,176	235,674
Total Cu Mill Grade	%TCu	0.82	0.78	0.75	0.74	0.72	0.50	0.60
Insoluble Cu Mill Grade	%ICu	0.71	0.65	0.68	0.68	0.67	0.46	0.55
Au Mill Grade	Au g/t	0.12	0.11	0.11	0.11	0.12	0.10	0.11
Cu Metallurgical Recovery	%	88.57	89.06	87.93	87.20	88.29	88.27	88.20
Au Metallurgical Recovery	%	72.89	72.92	70.59	69.32	73.10	69.03	70.40
Concentrate Grade	%	30.41	29.07	29.20	29.60	28.07	25.47	26.80
Concentrate Copper Production	kt	23.6	85.2	82.1	80.6	77.6	53.6	1,248.7
Gold Production	koz	9.3	32.7	31.9	30.5	34.9	28.3	590.4

Mantos Copper has expended significant effort to study in detail the behaviour of the hypogene material for the proposed process. More than 350 samples were tested to define the variability of the feed for the comminution and flotation processes. The testwork identified eight geometallurgical domains which describe the characteristic of the sulphide material. The design takes into consideration this variability, which is within the normal range experienced in the industry.

The QP is of the opinion that the test program reasonably covers the different types of material existing in the deposit. The response to the design conditions is reasonable and no major surprises should be expected. The only exception is the Mixed feed on which more testwork is necessary to improve the results; this should be done as part of the operational optimization program.

No significant deleterious elements have been reported during the oxide operations and thus are not expected from the treatment of the hypogene material.

1.5 Mineral Resource Estimate

Mantoverde estimated internally the Mineral Resource using drill data available at 31 December 2020. The Mineral Resource Estimate was based on a three-dimensional geological model in which lithology, mineralization and position with respect to the Mantoverde Fault were interpreted. The database included 4,895 drill holes totalling 901,024 m drilled and surface geological mapping, these were used to generate the geological model.

For the construction of the model, high yield restriction (HYR) outliers were controlled for high grades and those within the mineralized zones were composited into 2 m lengths. Grades were estimated in a three-dimensional block model using the Ordinary Kriging interpolation method in three nested passes. Variograms were constructed for each of the estimation units and these were used to support the search for ellipsoid anisotropy and linear trends observed in the data.

Mineral Resources have been classified using the indicator method (metal and tonnage), which is used to model the expected errors with some level of confidence in production volumes to determine the expected estimation errors with some level of confidence on production volumes.

The Mineral Resource Estimate in Table 1-2 is reported inclusive of those Mineral Resources that have been converted to Mineral Reserves, and uses the definitions set out in the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (the 2014 CIM Definition Standards).

Table 1-2: Mantoverde Mineral Resources as of 31 December 2020

	Category	Tonnage (Mt) (4)	Grade %TCu (2)	Grade g/t Au (2)	Contained Cu (5) (kt)	Contained Au (5) (koz)
Mantoverde Sulphides (Flotation) (1) (3)	Measured	183.6	0.58	0.10	1,065	590
	Indicated	335.9	0.41	0.10	1,377	1,080
	Total Measured & Indicated	**519.5**	**0.47**	**0.10**	**2,442**	**1,670**
	Total Inferred	554.5	0.37	0.08	2,052	1,426
Mantoverde Mixed (Flotation) (1) (3)	Measured	40.7	0.52	0.09	212	118
	Indicated	33.3	0.38	0.09	126	96
	Total Measured & Indicated	**74.0**	**0.46**	**0.09**	**338**	**214**
	Total Inferred	17.0	0.30	0.06	51	33
Mantoverde Sulphides + Mixed (Flotation) (1) (3)	Measured	224.3	0.57	0.10	1,276	708
	Indicated	369.2	0.41	0.10	1,504	1,176
	Total Measured & Indicated	**593.5**	**0.47**	**0.10**	**2,780**	**1,884**
	Total Inferred	571.5	0.37	0.08	2,103	1,459
	Category	**Tonnage (Mt) (4)**	**Grade %SCu (2)**	**Contained Cu (5) (kt)**		
Mantoverde Oxides+Mixed (Heap Leach) (1) (3)	Measured	171.0	0.31	530		
	Indicated	101.6	0.26	264		
	Total Measured & Indicated	**272.6**	**0.29**	**794**		
	Total Inferred	19.8	0.22	44		
	Category	**Tonnage (Mt) (4)**	**Grade %SCu (2)**	**Contained Cu (5) (kt)**		
Mantoverde Oxides+Mixed (Dump Leach) (1) (3)	Measured	127.7	0.13	166		
	Indicated	134.1	0.13	174		
	Total Measured & Indicated	**261.7**	**0.13**	**340**		
	Total Inferred	55.8	0.13	72		
	Category	**Tonnage (Mt) (4)**	**Grade % SCu (2)**	**Contained Cu (5) (kt)**		
Mantoverde Oxides+Mixed (Dump+Heap) (1) (3)	Measured	298.6	0.23	696		
	Indicated	235.7	0.19	438		
	Total Measured & Indicated	**534.3**	**0.21**	**1,134**		
	Total Inferred	75.6	0.15	116		

Notes to accompany Mineral Resources tables:

1. Mineral Resources are reported on a 100% basis and inclusive of Mineral Reserves. The attributable percentage to Mantos Copper Holding SpA is 69.993%.
2. Cut-off grade:
   a. Dump Leach: Oxide: 0.10%≤SCu<0.17%, Mixed: 0.10%≤SCu<0.17% and SCu/TCu >50%.
   b. Heap Leach: Oxide: SCu≥.17%, Mixed: SCu≥0.17% and SCu/TCu >50%.
   c. Flotation: Sulphide: TCu ≥0.20%, Mixed: TCu ≥0.23% and SCu/TCu ≤50%.
3. The Mineral Resource pit is based on US$3.77/lb Cu.
4. Tonnes are reported on a dry basis.
5. Contained Metal (CM) is calculated using the following formulae:
   a. CM = Tonnage (Mt) * TCu (%) *1,000 for Sulphides.
   b. CM = Tonnage (Mt) * g/t Au*1,000/31.1035 for Sulphides and Mixed.
6. Flotation recovery is based on a geometallurgical model, 89.36%TCu and 71.41% Au average. Heap Leach recovery is 79.2% average. Dump recovery is based on operating data 39.4%SCu.
7. Tonnage and contained metal have been rounded to reflect the accuracy of the estimate and numbers may not add exactly.

The QP is not aware of any environmental, permitting, legal, title, taxation, socio economic, marketing, political or other relevant factors that could materially affect the Mineral Resource Estimate that are not discussed in this Technical Report.

1.6 Mineral Reserve Estimate

The Mineral Reserves in this Technical Report consider oxide and sulphide minerals currently being mined at the Mantoverde Mine and the Mantoverde Development Project (MVDP), a brownfield development.

Mantoverde is an open pit mining complex, the oxide mineral is treated through heap and dump (ROM) leaching processes and recovered in a conventional SX-EW plant to produce copper cathodes.

The MVDP consists of processing the sulphide material in a concentrator with a capacity of 12.3 Mt per year. This is planned to start ramp-up in the second half of 2023. The Feasibility Study for the MVDP was completed in December 2017, detailed engineering was prepared during 2019 and funding for the MVDP was secured in February 2021. The MVDP adds Mineral Reserves to the current oxide Mineral Reserves.

The designed pit is based on a Lerchs-Grossmann (LG) optimization process using Whittle software and a detailed phased pit design using the oxide and sulphide pit shells. As a result of the optimization process, nine mine phases for oxide material, nine mine phases for sulphide material and one phase for mixed oxide and sulphide material were designed to prioritize the higher grade zones within the mineral extraction plan, at the same time maintaining suitable working widths to enable high productivity mining sequences using large-scale mining equipment.

Mining assumes conventional open pit operations using truck-and-shovel technology.

The mine plan was optimized by analyzing numerous NPV scenarios. However, a limiting factor for the evaluation is the tailings storage facility (TSF) capacity. If an expansion of the TSF is required, according to Chilean regulations, a new permit will be required.

The Mineral Resources were converted to Mineral Reserves based upon the following assumptions:

- Only Measured and Indicated Resources were converted. Inferred Mineral Resources were set to waste.
- The Mineral Resource block model was considered as fully diluted. Pit optimization and mine planning processes were performed without introducing any additional factors to account for dilution.
- The mineralized material was economically and technically feasible to extract.
- Mineralization was within Mantos Copper's mining concessions.

A full review of input data, methodology and results supporting the work done by Mantos Copper was done by NCL and Carlos Guzmán, the Qualified Person for the Mineral Reserves Estimate. Criteria, methodologies and algorithms used in preparing the Mantoverde Mineral Reserves follow industry accepted practices and conform with CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (November 2019) and are reported in accordance with CIM 2014 Definition Standards.

Mantoverde Mineral Reserves are subject to the types of risks common to most open pit copper mining operations that exist in Chile. The risks are reasonably well understood at the feasibility level of study for the concentrator project and should be manageable based on the operational experience and record of performance of the mine operation. NCL is not aware of any mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the Mineral Reserve Estimate.

The estimated Mineral Reserves are reported using metal prices of US$2.90/lb Cu and US$1,100/toz Au. Mineral Reserves are reported effective 31 December 2020. The Qualified Person for the estimate is Mr. Carlos Guzmán. Mineral Reserves are summarized in Table 1-3.

Factors that may affect the estimates include: changes to the metal price assumptions, changes to the estimated Mineral Resources used to generate the mine plan, changes in the metallurgical recovery factors, changes in the geotechnical assumptions used to determine the overall wall angles, changes to the operating cut-off grade assumptions for mill feed or stockpile feed, changes to the input assumptions used to derive the open pit outline and the mine plan that is based on that open pit design, ability to maintain social and environmental licence to operate, changes to the assumed permitting and regulatory environment under which the mine plan was developed.

There are no other known environmental, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that would materially affect the estimation of Mineral Reserves that are not discussed in this Technical Report.

Table 1-3: Mineral Reserves Statement as of 31 December 2020

Mineral Reserves	Category	Tonnage (Mt)	Grade (%TCu)	Grade (g/t Au)	Contained Cu (kt)	Contained Au (koz)
MVDP Sulphide (Flotation)	Proven	136.5	0.65	0.11	887	483
	Probable	58.4	0.54	0.11	315	206
	Total Reserves	**194.9**	**0.62**	**0.11**	**1,202**	**689**
MVDP Sulphide Mix (Flotation)	Proven	33.5	0.55	0.09	184	97
	Probable	7.3	0.44	0.09	32	21
	Total Reserves	**40.8**	**0.53**	**0.09**	**216**	**118**
MVDP Sulphide + Sulphide Mix (Flotation)	Proven	170.0	0.63	0.11	1,071	580
	Probable	65.7	0.53	0.11	347	228
	Total Reserves	**235.7**	**0.60**	**0.11**	**1,419**	**807**
MVDP - Oxide (Heap Leach)	Proven	98.3	0.35	-	344	-
	Probable	27.0	0.30	-	81	-
	Total Reserves	**125.4**	**0.34**	**-**	**425**	**-**
MVDP - Oxide (Dump Leach)	Proven	91.5	0.15	-	137	-
	Probable	38.8	0.14	-	54	-
	Total Reserves	**130.3**	**0.15**	**-**	**192**	**-**
MVDP - Oxide (Heap + Dump Leach)	Proven	189.8	0.25	-	481	-
	Probable	65.8	0.21	-	135	-
	Total Reserves	**255.6**	**0.24**	**-**	**617**	**-**

Notes to accompany Mineral Reserves table:

1. Mineral Reserves are reported effective 31 December 2020.
2. The Qualified Person for the estimate is Mr. Carlos Guzmán (RM CMC, FAusIMM).
3. Mineral Reserves are reported on a 100% basis using average off-site costs (selling cost) of US$0.28/lb for sulphides and US$0.30 for oxides.
4. Mineral Reserves are contained within an optimized pit shell. Mining will use conventional open pit methods and equipment and use a stockpiling strategy (direct mining costs are estimated by geological unit, averaging US$1.85/t of material mined).
5. Processing costs were estimated by geometallurgical units (from UG1 to UG10) averaging US$7.28/t of milled material, including concentrator, tailings storage facility, port and desalination costs.
6. Processing cost for material sent to the heap leach was US$6.24/t. For material sent to the run-of-mine dump leach, the processing cost was US$2.12/t.
7. Total copper recoveries average 88.4% for sulphides and gold recoveries average 71.2%.
8. Soluble copper recoveries average 76.4% for material sent to the heap leach and 45.8% for material sent to the dump leach process.
9. Inter-ramp angles vary from 26˚ to 60º. The life-of-mine strip ratio is 2.12 to 1.
10. Tonnage and contained copper are reported in metric units and grades are reported as percentages. Contained gold is reported in troy-ounces and grades in grams per tonne.
11. Grade %TCu refers to total copper grade in percent sent to the mill. Grade %SCu refers to soluble copper grade in percent sent to the leaching processes.
12. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal.

1.7 Mining Methods

The mine plan was developed by Mantos Copper staff in 2020. The plan is focused on two main areas, Celso–Manto Ruso and Mantoverde. The development case mill throughput assumption is based on hardness variability, resulting in an average throughput of 12.3 Mt per year of sulphide from Q1 2024 to 2042, with a ramp-up period (6 months) that assumes a production of 3.2 Mt in 2023.

The mine plan considers that oxide minerals will continue to be processed using additional oxide material available from the sulphide pits until 2034. Treatment in the heap leach process considers an annual rate of 10.7 Mt in 2021, reaching 10.9 Mt in 2025; the dump leach process will have an annual treatment rate of 15.0 Mt per year.

The required pre-stripping for the sulphide pits amounts to 52 Mt, scheduled over 23 months, starting in 2021. The mining schedule requires an average mine extraction of 93 Mt per year, with a maximum mine movement of 130 Mt per year between 2026 and 2028. The mine movement decreases from 2032 until the mining operations are completed in 2037. The process plant will continue to operate through to 2042 treating low-grade stockpile material. The production plan is summarized in Table 1-4 and Table 1-5.

Table 1-4: Sulphide Copper Production 2023-2042

SULPHIDE PLANT	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	TOTAL
Feed to Mill	kt	2,693	10,127	10,356	10,375	9,525	10,011	10,492	10,485	10,459	10,410	10,438	9,972	11,155	10,558	11,865	9,982	9,836	9,863	9,836	6,423	194,860
TCu Mill Grade	%TCu	0.84	0.79	0.74	0.74	0.71	0.78	0.68	0.75	0.69	0.62	0.64	0.60	0.70	0.83	0.67	0.32	0.29	0.29	0.29	0.29	0.61
ICu Mill Grade	%ICu	0.68	0.68	0.64	0.65	0.62	0.68	0.62	0.66	0.60	0.56	0.55	0.53	0.63	0.75	0.60	0.27	0.24	0.24	0.24	0.24	0.54
SCu Mill Grade	% SCu	0.10	0.06	0.06	0.04	0.03	0.04	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03
Au Mill Grade	Au g/t	0.13	0.12	0.11	0.11	0.08	0.12	0.14	0.14	0.14	0.13	0.10	0.10	0.14	0.17	0.14	0.08	0.07	0.07	0.07	0.07	0.11
$CaCO_3$ Mill Grade	% $CaCO_3$	3.58	4.19	5.51	11.26	6.37	8.65	17.58	10.64	13.93	18.73	8.50	10.42	19.94	18.33	20.09	11.72	11.53	11.53	11.53	11.53	12.26
Cu Metallurgical Recovery	%	91.6	92.3	91.0	90.1	93.2	91.7	90.8	91.6	90.9	91.5	92.2	92.7	91.0	90.8	91.6	91.5	91.5	91.5	91.5	91.5	91.5
Au Metallurgical Recovery	%	74.2	74.2	71.7	70.3	72.9	74.6	73.8	75.0	75.5	73.9	73.7	73.9	73.3	76.0	74.2	65.6	64.5	64.5	64.5	64.5	72.5
Concentrate Grade	%	30.0	28.4	28.6	29.0	29.7	28.0	27.5	28.0	24.1	27.1	26.8	26.3	27.8	28.9	28.1	22.4	21.6	21.6	21.6	21.6	26.9
Copper in Concentrate	kt	21	74	70	69	63	71	65	72	66	59	62	56	71	80	72	29	26	26	26	17	1,094
Gold Production	koz	8	27	27	25	19	27	33	33	33	30	24	24	33	41	40	16	15	15	15	10	494
Concentrate Production	kt	69	259	245	237	211	255	236	258	273	218	230	212	257	277	257	129	120	120	120	78	4,062

SULPHIDE MIX PLANT	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	TOTAL
Feed to Mill	kt	552	2,086	2,081	2,081	2,080	2,086	2,084	2,081	2,080	1,936	1,255	1,873	1,389	2,086	763	2,118	2,255	2,261	2,255	5,411	40,812
TCu Mill Grade	%TCu	0.75	0.76	0.78	0.78	0.75	0.69	0.66	0.69	0.61	0.56	0.44	0.50	0.49	0.59	0.64	0.29	0.29	0.29	0.29	0.31	0.53
ICu Mill Grade	%ICu	0.50	0.51	0.53	0.53	0.52	0.48	0.45	0.48	0.42	0.38	0.29	0.34	0.31	0.40	0.45	0.18	0.18	0.18	0.18	0.20	0.36
SCu Mill Grade	% SCu	0.15	0.15	0.16	0.16	0.15	0.13	0.14	0.14	0.11	0.10	0.07	0.09	0.15	0.13	0.13	0.06	0.06	0.06	0.06	0.06	0.11
Au Mill Grade	Au g/t	0.11	0.11	0.11	0.11	0.11	0.09	0.09	0.10	0.12	0.10	0.05	0.13	0.07	0.14	0.15	0.07	0.07	0.07	0.07	0.07	0.09
$CaCO_3$ Mill Grade	% $CaCO_3$	3.10	3.35	4.00	4.16	3.82	3.18	6.08	6.82	6.72	6.23	2.73	10.77	3.20	14.03	14.37	5.99	5.99	5.99	5.99	3.75	5.76
Cu Metallurgical Recovery	%	72.0	72.6	73.3	73.6	73.4	70.8	70.5	71.5	70.4	70.6	61.2	68.1	74.0	71.6	72.3	70.8	70.8	70.8	70.8	74.6	71.6
Au Metallurgical Recovery	%	65.2	66.2	65.0	64.6	66.7	69.3	64.9	64.9	61.6	64.5	73.5	62.0	51.1	62.8	63.4	61.6	61.6	61.6	61.6	64.6	63.9
Concentrate Grade	%	33.9	33.8	33.5	33.4	33.7	34.2	33.4	33.2	32.2	31.9	31.0	31.4	31.3	31.6	31.8	26.8	26.8	26.8	26.8	27.1	31.5
Copper in Concentrate	kt	3	11	12	12	12	10	10	10	9	8	3	6	5	9	4	4	5	5	5	12	154
Gold Production	koz	2	6	5	5	4	6	7	7	7	6	3	5	4	8	3	3	3	3	3	8	96
Concentrate Production	kt	9	34	36	36	34	30	29	31	28	24	11	21	16	28	11	16	17	17	17	46	490

SULPHIDE + SULPHIDE MIXED PLANT	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	TOTAL
Feed to Mill	kt	3,245	12,214	12,436	12,455	11,606	12,097	12,576	12,566	12,540	12,346	11,692	11,845	12,544	12,644	12,628	12,100	12,091	12,124	12,091	11,834	235,672
TCu Mill Grade	%TCu	0.82	0.78	0.75	0.74	0.71	0.76	0.68	0.74	0.68	0.61	0.62	0.59	0.68	0.79	0.66	0.31	0.29	0.29	0.29	0.30	0.60
ICu Mill Grade	%ICu	0.71	0.65	0.68	0.68	0.66	0.71	0.64	0.70	0.63	0.58	0.59	0.56	0.63	0.75	0.64	0.28	0.26	0.26	0.26	0.25	0.55
SCu Mill Grade	% SCu	0.11	0.13	0.07	0.06	0.05	0.05	0.04	0.05	0.05	0.03	0.03	0.03	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.04	0.05
Au Mill Grade	Au g/t	0.12	0.11	0.11	0.11	0.09	0.11	0.13	0.13	0.13	0.12	0.10	0.10	0.13	0.16	0.14	0.08	0.07	0.07	0.07	0.07	0.11
$CaCO_3$ Mill Grade	% $CaCO_3$	3.50	4.05	5.26	10.07	5.91	7.70	15.73	10.01	12.73	16.77	7.88	10.48	18.09	17.62	19.74	10.71	10.49	10.49	10.49	7.97	11.13
Cu Metallurgical Recovery	%	88.6	89.1	87.9	87.2	89.4	88.4	87.4	88.5	87.8	88.5	89.8	89.4	89.6	88.4	90.5	88.2	87.6	87.6	87.6	83.5	88.4
Au Metallurgical Recovery	%	72.9	72.9	70.6	69.3	71.5	73.9	72.7	73.7	73.5	72.7	73.7	71.7	72.0	74.1	73.5	64.6	64.0	64.0	64.0	64.6	71.2
Concentrate Grade	%	30.4	29.1	29.2	29.6	30.2	28.6	28.2	28.6	24.9	27.5	26.9	26.8	28.0	29.2	28.3	22.6	22.3	22.3	22.3	23.7	27.4
Copper in Concentrate	kt	24	85	82	81	74	82	75	83	75	67	65	62	76	89	76	33	31	31	31	29	1,249
Gold Production	koz	9	33	32	31	23	32	39	40	40	35	27	29	37	49	43	19	18	18	18	18	590
Concentrate Production	kt	78	293	281	272	245	285	264	289	301	242	241	233	273	304	269	147	137	137	137	124	4,553

Table 1-5: Oxide Copper Production 2021-2034

HEAP LEACH	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	LOM
Ore to Heap	kt	10,700	10,750	10,800	10,850	10,907	10,900	6,327	10,727	7,613	9,931	8,935	3,471	5,479	7,977	125,368
TCu Heap Grade	%TCu	0.61	0.64	0.49	0.45	0.40	0.38	0.41	0.48	0.49	0.34	0.33	0.39	0.36	0.39	0.45
ICu Heap Grade	%ICu	0.10	0.16	0.13	0.11	0.08	0.09	0.11	0.13	0.14	0.08	0.07	0.08	0.09	0.09	0.11
SCu Heap Grade	%SCu	0.50	0.48	0.36	0.34	0.31	0.29	0.29	0.35	0.35	0.26	0.26	0.31	0.28	0.29	0.34
$CaCO_3$ Heap Grade	% $CaCO_3$	3.06	5.02	2.98	2.54	1.83	2.60	3.71	5.14	3.06	2.97	2.64	2.55	5.90	5.91	3.49
Cu Metallurgical Recovery	%	82.352	78.007	77.077	74.433	75.921	73.399	75.139	75.029	78.213	73.126	69.649	79.909	74.169	76.726	76.325
Heap Cathode Production	**kt**	**42.2**	**40.9**	**31.2**	**27.7**	**26.4**	**23.2**	**14.0**	**28.1**	**21.0**	**19.1**	**16.3**	**8.5**	**11.4**	**18.0**	**328.0**
DUMP LEACH	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	LOM
Ore to Dump	kt	14,471	9,116	9,881	10,603	13,195	13,809	10,753	12,043	8,917	10,667	8,960	1,302	2,916	3,378	130,012
TCu Dump Grade	%TCu	0.25	0.18	0.19	0.18	0.19	0.19	0.17	0.19	0.20	0.19	0.20	0.20	0.19	0.20	0.20
ICu Dump Grade	%ICu	0.06	0.04	0.05	0.05	0.05	0.05	0.04	0.06	0.07	0.05	0.07	0.06	0.06	0.07	0.06
SCu Dump Grade	%SCu	0.19	0.16	0.15	0.14	0.14	0.14	0.13	0.13	0.13	0.14	0.13	0.13	0.13	0.14	0.15
$CaCO_3$ Heap Grade	% $CaCO_3$	1.93	2.64	2.71	2.34	2.08	2.95	2.28	2.54	1.96	3.00	2.65	1.93	4.54	4.86	2.56
Cu Metallurgical Recovery	%	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50	42.50
Dump Cathode Production	**kt**	**10.80**	**6.30**	**6.05**	**6.58**	**7.86**	**8.29**	**6.42**	**7.11**	**5.44**	**6.44**	**5.51**	**2.24**	**1.86**	**2.46**	**83.36**
Dump Norte Production	**kt**	**1.0**	**3.4**	**3.8**	**3.8**	**3.8**										**15.8**

The current mining operation strategy is to use a mixed owner and contractor loading and hauling fleet. The MVDP assumes integration with and transition from the current operation to higher productivity heavy mining equipment to increase the mine capacity. The heavy mining equipment is assumed to be fully owned by Mantoverde once the operation reaches steady-state production, planned to be by 2026.

The mine is scheduled to work on a 7 days a week, two 12 hour shift basis, for 365 days per year. The operation will include normal drilling, blasting, loading and hauling activities on a 15 m bench height (a double bench of 30 m) in the sulphide areas, and 10 m bench height (a final double bench of 20 m) in oxide zones. Mining will include supporting functions such as dewatering, grade control and equipment maintenance.

1.8 Recovery Methods

Mantoverde has a plant production capacity of 60,000 tonnes per year of copper cathodes, current production ranges between 45,000 t/y and 50,000 t/y. The current process plant consists of a three stage crushing plant, a heap leach facility, a dump leach facility and a solvent extraction and electro-winning (SX-EW) plant. The MVDP is planned to add a new concentrator, a new tailings storage facility (TSF) and to expand the desalination plant.

The existing oxide process is a conventional heap leach operation producing LME Grade A quality cathode. The proposed sulphide process will be conventional concentrator plant. The concentrator is designed to process 11.6 Mt per year of sulphide feed, equivalent to 31,781 t/d and will produce copper concentrate.

Unit process areas for the new sulphide plant will include:

- Primary crushing area:
  - Gyratory crusher
  - Coarse ore stockpile
- Milling area:
  - SAG mill

- Ball mill
- Flotation area:
  - Rougher flotation
  - Cleaner flotation
  - First cleaner flotation (agitated cells)
  - Scavenger flotation (agitated cells)
  - Second cleaner flotation (column)
  - Third cleaner flotation (column)
- Concentrate:
  - Thickening
  - Filtration
  - Storage
- Tailings:
  - Hydrocyclone cluster
  - Thickening and transport
- Tailings storage facility (TSF).

Fresh water will be supplied from the expanded Mantos Copper-owned desalination plant located in the Bahía Flamenco area, 40 km from the mine site.

Reagents will include lime, two sulphide collectors, one frother and flocculant.

An expanded dump leach process is planned for low-grade oxide material as part of the updated mine plan. The existing facilities and processes will be used. This is a well known process and uses conventional methods and equipment.

1.9 Project Infrastructure

The MVDP is a brownfield expansion located in an area where the expansion of existing facilities is not considered to present any major design challenges. The facilities supporting the expansion for the MVDP will be located at three main sites:

- The mine and concentrator plant at an elevation of approximately 900 masl
- TSF at an elevation of approximately 750 masl, located about 3.5 km west of the concentrator
- Sea water desalination plant at the coast.

Copper cathodes will continue to be shipped to Antofagasta. Copper concentrate will be shipped through Chañaral to the north and Caldera to the south. Concentrate will be transported using 30 t trucks, on a 360 days per year basis, with an average of about 25 trips per day.

Current facilities and infrastructure include:

- Open pits
- Mine and process support buildings

- Truck shop
- Low-grade and high-grade heaps (static and dynamic heaps, respectively)
- Waste rock storage facilities
- Primary and secondary crushing plant
- SX-EW plant
- Sea water desalination plant (intake, filtration and reverse osmosis building located on the coast), pumping stations (EB1 and EB2) and water storage ponds (located at the mine site)
- Desalinated water pipeline
- Power lines
- Camp
- Sewage treatment facility.

Additional facilities and infrastructure required to support the sulphide project include:

- Additional truck maintenance shop
- Primary crusher
- Coarse ore stockpile
- SAG/ball mill building
- Flotation and regrind circuit building
- Thickening and filtration buildings
- Potable water storage and potable water plants
- Storage area for lime, reagents and flocculants
- Compressed air supply
- Construction and accommodation camp
- Additional offices and change house
- Additional pipelines (water, air, copper concentrate, slurries, tailings)
- Expansion of the heap and dump piles.

Facilities required at the port are assumed to be provided by port facility service provider.

The water desalination plant will be expanded from the current capacity of 120 L/s to 380 L/s.

Power is supplied to site from the Diego de Almagro substation via a 110 kV transmission line. A new substation will be required on site adjacent to the existing 110 kV Mantoverde substation, which will provide power to the comminution, flotation and regrind circuits, truck shop, fresh water supply and mine operations.

1.10 Environmental Studies and Permitting

An environmental impact assessment study (EIA) for the Mantoverde Development Project has been approved by the Chilean environmental authority by Exempt Resolution N° 16/2018 issued by the Atacama Region Evaluation Commission (environmental qualification resolution, Resolución de

Calificación Ambiental, RCA). The RCA covers the combined sulphide and oxide mining and processing plan up to 2034 and the sulphide mining and processing up to 2042.

The general objective of the MDVP is to provide operational continuity for Mantoverde, diversifying the operations through the exploitation and processing of sulphide minerals (hypogene minerals associated with the oxide mineral currently in exploitation). The total sulphide reserves are estimated to be 235.6 Mt from which copper concentrate will be produced. The processing of oxidized minerals will continue (total remaining reserves estimated to be 255.6 Mt) from which cathode copper will be produced using the existing facilities.

After the MVDP EIA, Mantoverde submitted an Environmental Impact Statement (DIA) for the Optimization Supply Autonomy of the Oxides Line (approved by RCA N° 119/2018) and the DIA for the Mantoverde Oxides Optimization Project (approved by RCA 132/2021).

A new tailings dam is considered in the MVDP. Tailings will be thickened to 55% solids prior to deposition and transported about 3.5 km from the plant to the TSF on the south side of Quebrada Guamanga. The dam will be a conventional type with thickened tailings and a maximum storage capacity of 230 Mt. The initial wall will be built of borrow material and wall growth will use cycloned sands until reaching a final elevation at 794 masl, a maximum height of 80 m, and a total length of 4,059 m. The tailings will be transported at a nominal rate of approximately 31,000 tpd.

1.10.1 Water Management

Fresh water will be provided from the desalination plant located on the coast and transported to the site by a pipeline. The water supply to the MVDP will continue to be provided by the current desalination plant owned by Mantoverde. The desalination plant will be expanded as part of the MVDP to produce 380 L/s.

Reclaimed water from the TSF will provide some of the process water supply. Reclaimed water from the TSF will be pumped to the recovered water distribution tank and from the tank will flow by gravity to the tailings cyclone station or to the concentrator.

The potable water plant will consist of a packaged reverse osmosis system that will provide drinking quality water for the concentrator and camps.

1.10.2 Baseline Studies

Baseline studies for the MVDP EIA were carried out during 2015 and 2016. Complementary baselines studies have been submitted in support of the 2018 and 2020 DIAs.

Potential impacts on flora and fauna habitats and a modification of ground water levels were identified. The MVDP RCA establishes mitigation, restitution and compensation measures, consisting of eight mitigation measures and eight compensation measures. Among other control plans, a ground water monitoring and control plan will be developed for the TSF. A number of additional voluntary measures offered by Mantoverde were integrated into the MVDP RCA.

1.10.3 Permitting

Chilean mining projects require sectoral and environmental permits prior to mine construction and operation. Development of the MVDP will require additional sectoral and environmental permits to those already granted for the operating mine.

The latest approved EIA for the MVDP covers the combined sulphide and oxide mining and processing plan to 2034 and the sulphide material mining and processing plan to 2042.

Mantoverde has developed a Master Plan for Sectoral Permits to ensure that the supporting documentation is provided when required to the regulatory authorities so that the permits are applied for, granted and maintained in force. The sectoral permits already granted cover potable water, sewage and sanitation, landfill and closure planning. Specific sectoral permits have also been granted for open pit mining activities. At this stage, it is estimated that at least 250 separate permits will be required for the MVDP.

1.10.4 Closure Plan

The Mine Closure Plan was approved by SERNAGEOMIN on 19 December 2018 by Exempt Resolution N° 3544/2019. The estimated closure and post-closure cost is US$47.7M for the existing installations[1].

The Closure Plan follows the requirements of RCAs issued for the Mantoverde operation and describes the measures that must be undertaken for closure and reclamation. However, this Closure Plan does not include provisions from the RCAs for the MVDP (RCA 16/2018); for the Optimization Supply Autonomy of Oxides Line (RCA 119/2018) and Mantoverde Oxides Optimization Project (RCA 132/2021). The updated Closure Plan including these projects was submitted on 17 September 2020 and is still being reviewed by SERNAGEOMIN.

1.10.5 Considerations of Social and Community Impacts

The closest town is El Salado, in the community of Chañaral 15 km from the mine site. Other towns of interest are located on the coast and include Barquitos, Flamenco, Portofino, Las Piscinas and Torre del Inca. These towns are located on common use roads and near the desalination plant and pumping system. No indigenous peoples recognized in Law No. 19,253 or Indigenous Law were identified in these communities. Significant impacts on the populations in these communities were ruled out in the MVDP EIA evaluation.

1.11 Capital and Operating Costs

Capital and operating costs were estimated for the MVDP, including an extension of the oxide operations to 2034 and mining and treatment of sulphides through a flotation plant from 2023 to 2042. All capital and operating costs were determined by Mantos Copper and developed for the operation as a whole, without assigning separate costs to oxide and sulphide materials.

Expansion capital is estimated to be US$784 M between years 2021 and 2024 (US$140 M for Mine Equipment, US$470 M for Land and Buildings, US$71 M for Pre-stripping, US$37 M for Other Fixed Assets and US$56 M for the Tailings Storage Facility).Over the LOM the sustaining capital cost is estimated to be US$476 M (US$92.5 M for Mine Equipment and US$383.7 M for Other Fixed Assets (mining projects, desalination plant, oxide plant, leached material dump (*ripios*) expansion, smaller projects, oxide stay in business (SIB), sulphide SIB and long term SIB).

Total operating costs are estimated to be US$5,862 M for the life of mine, corresponding to US$ 1.60/lb, as summarized in Table 1-6.

[1] At UF exchange rate at 21 June 2021.

Table 1-6: Operating Cost Summary

Item	Estimated LOM Total US$M	Unit Value
Mining	2,508	1.43 US$/t-moved
Processing (Oxides)	1,529	167.3 cUS$/lb (cathodes)
Processing (Sulphides)	1,717	7.3 US$/t-milled
G&A	318	8.9 cUS$/lb (total)
Other Operating Expenses	94	2.6 cUS$/lb (total)
TOTAL	6,166	172.8 cUS$/lb (total)

1.12 Economic Analysis

Certain information and statements contained in this section are "forward looking" in nature. Forward-looking statements include, but are not limited to, statements with respect to the economic and feasibility level parameters discussed for the Mantoverde Development Project; Mineral Reserve Estimates; the cost and timing of any development of the Mantoverde Development Project; the proposed mine plan and the mining method; dilution and mining recoveries; processing method and rates, and production rates; projected metallurgical recoveries; infrastructure requirements; capital, operating and sustaining cost estimates; the projected life of mine and other expected attributes of the Mantoverde Development Project; the net present value (NPV), internal rate of return (IRR), and payback period of capital; capital; future metal prices; the timing of the environmental assessment process; changes to the configuration that may be requested as a result of stakeholder or government input to the environmental assessment process; government regulations and permitting timelines; estimates of reclamation obligations; requirements for additional capital; environmental risks; and general business and economic conditions.

All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this section, where applicable. In addition to, and subject to, such specific assumptions discussed in more detail elsewhere in this Report, the forward-looking statements in this section are subject to the following assumptions:

- There being no signification disruptions affecting the development and operation of the Mantoverde Development Project.
- Exchange rates being approximately consistent with the assumptions in the financial analysis.
- The availability of certain consumables and services and the prices for power and other key supplies being approximately consistent with assumptions in the financial analysis.
- Labour and materials costs being approximately consistent with assumptions in the financial analysis.
- Permitting and arrangements with stakeholders being consistent with current expectations.
- All environmental approvals, required permits, licences and authorizations will be obtained from the relevant government and other relevant stakeholders within the expected timelines.
- Certain tax rates, including the allocation of certain tax attributes.
- The availability of financing for Mantos Copper's planned development activities.
- The timelines for development activities for the Project.

The production schedule and financial analysis annualized cash flow tables are presented with conceptual years. Years shown in these tables are for illustrative purposes only and are based on the anticipated project schedule.

The Project was valued using a discounted cash flow (DCF) approach. Estimates were prepared by Mantos Copper for all the individual elements of cash revenue and cash expenditures for ongoing operations, using information derived from independent consultants and operating experience at Mantoverde.

Capital cost estimates have been prepared using 2021 as the initial year of the Project valuation, starting with concentrator construction activities and pre-stripping for the sulphides. The construction period extends into mid-2023. In addition to the initial capital for construction of facilities for the MVDP, ongoing sustaining capital is included from 2021 for the Oxide Plant and from 2023 for the sulphide facilities in the MVDP.

Cash flows are assumed to occur at the middle of each annual period and are discounted for half a year to bring all flows to the start-of-year. The resulting net annual cash flows are discounted back to the date of valuation as of the start of 2021.

The currency used to document the capital and operating cost estimates is US$ Q4 2020.

The financial analysis uses a standard Mantos Copper-defined 8% discount rate. The economics were evaluated and presented as before-tax and after-tax for the purpose of NPV calculation.

Table 1-7 presents pre-tax cumulative cash flows, on an undiscounted basis, with the 8% discount rate applied, giving the NPV. The resulting after-tax NPV is US$1,283 M. The cumulative, undiscounted, incremental cash flow after-tax value for the Project is $3,286 M.

Table 1-7: LOM Cash Flow Summary

Item	Pre-Tax (US$M)	After-Tax (USA$M)
Net Cash Flow, Cumulative, Undiscounted	4,803	3,286
Net Present Value at 8% Discount Rate (valuation start of 2021)	1,973	1,283

Cash flow details over the LOM are provided in Table 1-8. These are undiscounted real values which include the escalation factors determined by Mantos Copper. The table includes production data, revenues and costs (operation, deductions, sales costs and non-operational), taxes and capital expenditures. As a result of this information, the pre-tax and after-tax undiscounted values of cash are shown at the base of the table.

Table 1-8: LOM Cash Detail

Item	Unit	MVDP 2021-2042
Metal Price		
Copper (Long Term after fifth year)	US$/lb	3.45
Gold (Long Term after fifth year)	US$/oz	1,585
Metal in Concentrate		
Copper	M lbs	2,755
Gold	M oz	0.5905
Extracted Metal Value		
Copper (Cathodes)	US$M	3,324
Copper (Concentrate)	US$M	9,601
Gold		941
Hedge Revenue	US$M	-102
Total	**US$M**	**13,765**
Smelter deduction		
Copper deduction	US$M	348
Gold deduction	US$M	81
Total	**US$M**	**429**
Treatment and Refining charges	US$M	
Copper concentrate (treatment)	US$M	380
Copper (refining)	US$M	222
Gold (refining)	US$M	2.7
Selling Cost (Sulphide)	US$M	329
Selling Cost (Oxide)	US$M	38
Total	**US$M**	**368**
Production costs (Sulphide and Oxide)		
Mining	US$M	2,508
Oxide Plant	US$M	1,529
Sulphide Plant	US$M	1,717
G&A	US$M	318
Other non-operating (exploration)	US$M	94
Total	**US$M**	**6,166**
Net Income before Tax		
Earnings before taxes, depreciation & amortization	**US$M**	**6,197**
Corporate Income and Mining Taxes		
Corporate Income Tax	US$M	1,220
Specific Mining Tax (Royalty)	US$M	298
Total Income Taxes and Royalty	**US$M**	**1,517**
Capital expenditure		
Anglo American Payment	US$M	49
Mine Initial Capital	US$M	212
Plant Initial Capital	US$M	526
Other Fixed Assets	US$M	46
Sub-Total Initial Capital	US$M	833
Mine SIB	US$M	92.5
Sulphide Plant SIB	US$M	58
Oxide Plant SIB	US$M	194.9
Long Term SIB	US$M	126.5
Closure Costs	US$M	58.9
Total Capital Expenditure	**US$M**	1,363
Change in Working Capital	US$M	31
Total undiscounted cash flow		
Pre-tax	US$M	4,803
After tax	US$M	3,286

Note: Totals may not sum due to rounding. SIB = stay in business. All costs in real terms.

1.13 Other Relevant Information

The proposed execution plan for the engineering, procurement and construction (EPC) for the new processing facilities required for the MVDP has been awarded to Ausenco Limited, a multi-national engineering, procurement and construction management company. Ausenco has broad experience in the design and construction of copper concentrator projects in the international market. It is expected that Ausenco will use industry-standard practices. The execution plan assumes that Mantos Copper will have an owner's team working with the contractors during the execution phase.

The MVDP schedule is based on the following key milestone dates:

- RCA approved: March 2018
- Start of Project construction: December 2021 Sulphide Line
- EPC01 Process plant and services mechanical completion: June 2023
- EPC06 Desalination plant mechanical completion: June 2023
- EPC05 Tailings Storage Facility mechanical completion: May 2023

Mantos Copper is analyzing an expansion of the concentrator by adding a second ball mill and a pebble crusher to increase the capacity; this has been named Phase II. If installed this expansion would increase copper production from 2026. Phase II will require an application for a new environmental permit for the expansion of the TSF. Several options are being assessed at the conceptual level to support a longer LOM.

1.14 Risks and Opportunities

The most significant risks evaluated in a risk review were:

- Schedule delays not identified for the MVDP
- Contractor engagement and price uncertainty
- Delay in mine equipment and supplies arrival due to the Covid 19 pandemic
- Increased equipment and labour costs.

The opportunities that were identified include:

- Increase the concentrator processing capacity, adding an additional ball mill (Phase II) or adding a second line
- Increase the TSF capacity to release reserves restricted by the current TSF capacity
- Enhance recovery through further metallurgical testing
- Additional copper production from mineralized waste dumps
- Share infrastructure with other local companies/projects
- Produce a magnetite concentrate from sulphide tailings
- Recovery of cobalt from sulphide and oxide material
- Additional copper production from brownfield exploration around the property.

Risks and opportunities will be continuously assessed and reviewed throughout the various phases of the Project, in accordance with Mantos Copper's Risk Management Framework.

Mantos Copper considered the following mitigation steps to control the Capex and meet Project deadlines:

- Costs

  Periodically review the Project progress. At the time of issuing this Report, the costs of the major equipment purchases, pre-stripping and Owner's costs are aligned with the budget. For the EPC lump sum turnkey (LSTK) contract cost, 88% is associated with the contractor's fixed lump sum cost and delivery dates. There are appropriate controls that give confidence that the expected result will be achieved. The remaining 12% of cost is related to the TSF, this could have variations due to construction deviations on site, Mantoverde will hire an expert consultant to mitigate these deviations.

- Schedule

  - The schedule is under control and well advanced
  - The contractor has its own contingencies in the master schedule
  - There are 4 weeks associated with delays due to the Covid-19 pandemic
  - There is a US$6 M bonus if the ramp-up period is achieved early.

1.15 Interpretations and Conclusions

The estimation of the Mantoverde Mineral Resources and Mineral Reserves follow industry accepted practices, conform with CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (November 2019) and are reported in accordance with CIM 2014 Definition Standards.

The Mantoverde Development Project (MVDP) is a brownfield expansion at an existing oxide operation to incorporate a new copper concentrator and tailings facility. The expansion of the existing plant and infrastructure will not present design challenges. Where expansion or additional facilities are considered, the designs are appropriate, and the areas are available in and around the existing facilities.

The MVDP will use conventional open pit mining methods and conventional equipment. The current mining operation is based on an owner and contractor loading and hauling fleet. The MVDP assumes integration with, and transition from, the current operation to use higher productivity heavy mining equipment to increase the mine capacity. The heavy mining equipment is assumed to be fully owned by Mantoverde when the operation reaches steady-state production.

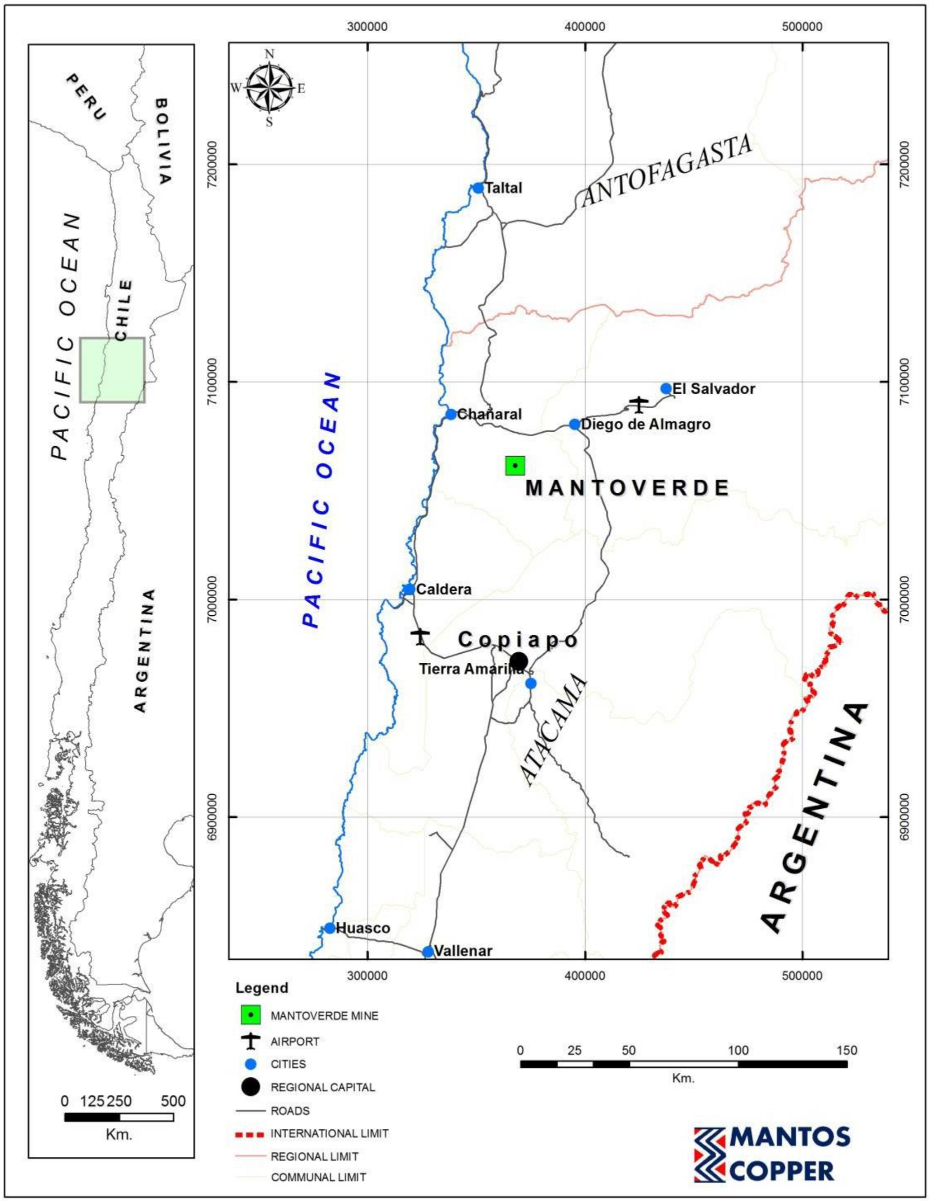
Under the assumptions outlined in this Report, the Mantoverde Development Project shows positive economics.

2 Introduction

2.1 Introduction

This Technical Report (Report) describes the Mantoverde operation and Manto Verde Development Project (MVDP). Mantoverde is located in the Province of Chañaral in the Atacama Region of Chile. The site is 56 km southeast of the city of Chañaral and 100 km north of Copiapó (straight line distances) at an altitude of approximately 900 masl (Figure 2-1).

Figure 2-1: Mantoverde Location



Note: Figure courtesy Mantos Copper, 2020

The Mantoverde mine commenced operation in 1995 and there are five open pits currently operating with annual movements of material of approximately 57 Mt (mined rock and rehandling). The oxide copper ores are treated through a crushing, leaching, solvent extraction and electro-winning SX-EW) plant, producing high purity (LME Grade A quality) copper cathodes.

This Technical Report assumes that current open pit mining will continue to 2024 and after this date, Mantos Copper will also start full operation of the MVDP. The MVDP will mine oxide and sulphide material, processing the oxide material through heap and dump leaching and processing the sulphide material through a new concentrator. The MVDP is also referred to as the Sulphide Project or the Development Project.

2.2 Terms of Reference

NCL Ingeniería y Construcción SpA. (NCL) was commissioned by Mantos Copper Holding SpA (Mantos Copper) to compile a report on the Mantoverde Mine in Chile meeting NI 43-101 standards (the Report) based on a recently completed feasibility study and current operations. The feasibility study evaluated exploiting sulphide mineralization in addition to the currently mined oxide materials.

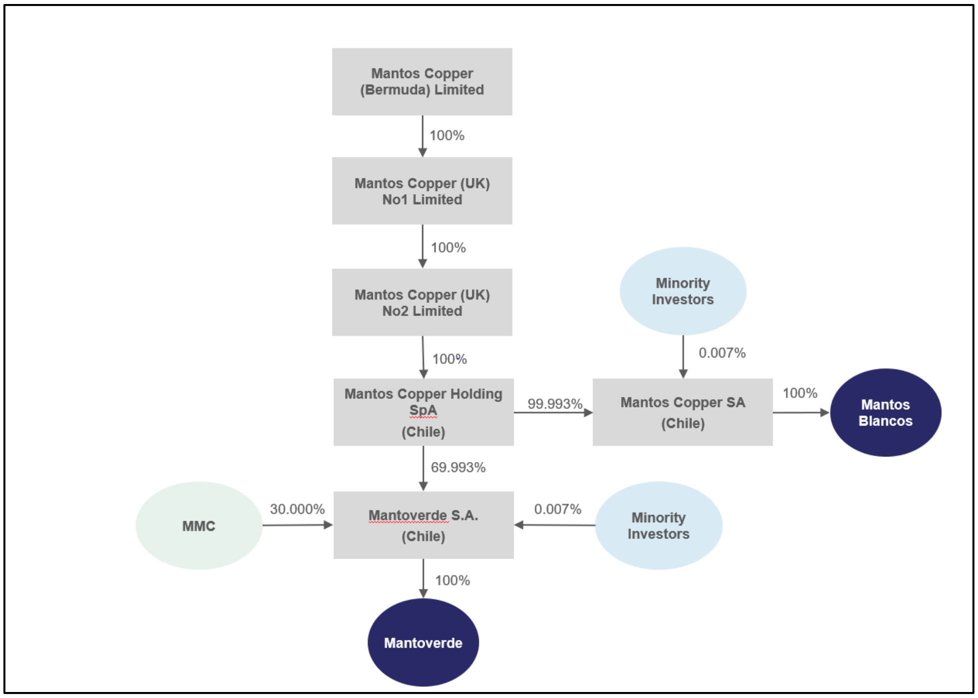
Mantoverde is an open pit mine operation 100% owned by Mantoverde S.A. Mantoverde SpA is in turn 69.99% owned by Mantos Copper Holding SpA and 30% directly or indirectly owned by Mitsubishi Materials Corporation (MMC). Audley Mining Advisors Ltd. and Orion Mine Finance LLP indirectly control Mantos Copper Holding SpA. The operating company is Mantos Copper.

On 30 November 2021 Capstone Mining Corp. (Capstone) and Mantos Copper (Bermuda) Limited (Mantos), the indirect parent company of Mantos Copper Holding SpA, entered into a definitive agreement to combine pursuant to a plan of arrangement under the Business Corporations Act (British Columbia) (the Transaction). Upon completion of the Transaction, Mantos would be renamed Capstone Copper Corp. (Capstone Copper). Pursuant to the agreement, each Capstone shareholder would receive one newly issued Capstone Copper share per Capstone share and the existing Mantos shareholders would continue to hold Capstone Copper shares. Upon completion of the Transaction, former Capstone and Mantos shareholders would collectively own 60.75% and 39.25% of Capstone Copper, respectively, on a fully diluted share basis and Capstone would be a wholly owned subsidiary of Capstone Copper.

This Technical Report has been prepared by NCL and Mantos Blancos and has been addressed to Capstone to support its disclosure under applicable Canadian securities laws in connection with the Transaction described below.

The ownership of Mantos Copper, Mantos Blancos and Mantoverde prior to the Transaction is shown in Figure 2-2.

Figure 2-2: Ownership Structure



Note: Figure courtesy Mantos Copper, 2020

This Report was prepared using the format and content requirements in Form NI 43-101F1 to provide updated information on the Mineral Resources, Mineral Reserves and current and proposed mine plans.

This Report uses Canadian English. Monetary units are in United States dollars (US$) unless stated otherwise. The Chilean currency is the peso (CLP). Units are metric unless otherwise stated. In this Report, heap leach is used to refer to the processing of crushed material that is leached and dump leach is used to refer to the processing of run-of-mine (ROM) material that is leached.

2.3 Qualified Persons

The following serve as the QPs for this Report as defined in National Instrument 43-101, Standards of Disclosure for Mineral Projects, and in compliance with Form 43- 101F1:

- Mr. Carlos Guzmán, RM CMC, FAusIMM, Principal/Project Director, NCL
- Mr. Gustavo Tapia, RM CMC, Metallurgical and Process Consultant, GT Metallurgy
- Mr. Ronald Turner, MAusIMM CP(Geo), Senior Resource Geologist, Golder Associates

2.4 Site Visits and Scope of Personal Inspection

Mr. Ronald Turner visited the site several times, the last time on 10 November 2021. During those visits Mr. Turner inspected the current mining operations, discussed geology and mineralization and reviewed geological interpretations with staff. Also, he inspected core, sample cutting and logging areas, drilling, geological sampling and logging procedures and the current conditions for sample storage. Mr. Turner also checked that data collection was being conducted in accordance with Mantos Copper procedures and industry standards.

Mr. Carlos Guzmán visited the site on 10 November 2021. During the visit he inspected the area planned for the mine and process infrastructure to assess topography and reviewed the layout and general site overview with respect to mine planning and execution. He also viewed drill core.

Mr. Gustavo Tapia visited the site on 10 November 2021. During the visit he inspected the area planned for the process infrastructure and TSF to assess topography and general ground conditions.

2.5 Effective Dates

The Report has a number of effective dates as follows:

- Date of Mineral Resource Estimates: 31 December 2020
- Date of Mineral Reserve Estimates: 31 December 2020
- Date of supply of latest information on mineral tenure and surface rights: 3 November 2021
- Date of supply of latest information on Project ownership: 29 November 2021
- Date of financial analysis: 15 November 2021
- Date of QPs site visits: 10 November 2021.

The overall effective date of the Report is taken to be the date of the information on ownership and is 29 November 2021.

2.6 Units of Measurement

The metric system has been used throughout this report, except where clearly otherwise stated. For example, process equipment such as screens and crushers are more frequently sized and recognized in the industry using imperial units (ft and inches).

Tonnes are metric (1,000 kg or 2,204 lb). All currency is in US$ Dollars (US$) unless otherwise stated.

2.7 Information Sources and References

Reports and documents listed in Section 3 and Section 27 of this Report were used to support preparation of the Report. Additional information was provided by Mantos Copper personnel as requested.

Information sources supporting the Report include the 2017 Mantoverde Development Project Feasibility Study.

Information used to support this Report was also derived from expert documents cited in Section 3 and from the reports and documents listed in Section 27. Additional information was sought from Mantos Copper personnel where required.

Mr. Carlos Guzmán, the NCL QP, has reviewed and summarized information supplied by Fernando Toledo, General Manager of GS3 Consultores, Santiago, Chile, a company specializing in environmental, permitting and social issues, that was used in support of the information presented in Section 20 of the Report. Mr. Toledo was provided with information by Alejo Gutiérrez, the Mantos Copper Environmental Manager, regarding the status of Mantoverde permitting and social issues. Mr. Jim Varas, Investment Director for Mantos Copper, was the source of information that Mr. Guzmán used, in the financial model presented in Section 22 of the Report.

Mr. Gustavo Tapia, the GT Metallurgy QP, has reviewed and summarized information contained in the 2017 Mantoverde Development Project Feasibility Study and appendices prepared by Amec Foster Wheeler, that was used in support of the information presented in Section 17 and Section 18 of the Report, for aspects of the concentrator and TSF engineering designs and cost estimates pertaining to plant and tailings facilities and the estimated closure and reclamation costs.

3 Reliance on Other Experts

The QPs have relied upon the following other expert reports, which provided information regarding mineral rights, surface rights, property agreements, marketing and environmental and social impacts sections of this Report as noted below.

3.1 Project Ownership

The QPs have not reviewed the ownership, nor independently verified the ownership legal status. The QPs have fully relied upon, and disclaim responsibility for, information derived from Mantos Copper experts through the following document:

- Ortuzar, A., 2021: Ownership: letter prepared by Baker McKenzie for Mantos Copper, 29 November 2021, 2 p.

This information is used in Section 4 of the Report. It is also used in support of the Mineral Resource statement in Section 14, the Mineral Reserve statement in Section 15, and the financial analysis result in Section 22.

3.2 Mineral Tenure, Rights of Way and Easements

The QPs have not reviewed the mineral tenure, nor independently verified the legal status, ownership of the project area, underlying property agreements or permits. The QPs have fully relied upon, and disclaim responsibility for, information derived from Mantos Copper experts and experts retained by Mantos Copper for this information through the following documents:

- Ortuzar Vicuña A., 2021: Mantoverde S.A.: Title opinion prepared by Baker McKenzie., for Mantoverde, 3 November 2021, 3 p. plus appendices.

This information is used in Section 4 of the Report. It is also used in support of the Mineral Resource statement in Section 14, the Mineral Reserve statement in Section 15, and the financial analysis result in Section 22.

3.3 Environmental and Social Impacts

The QPs have relied upon information supplied by Mantos Copper staff and experts retained by Mantos Copper for information related to social and community impacts and waste storage facilities (waste dumps, tailings storage facilities and ripios):

- República de Chile Comisión de Evaluación, 2018: Califica Ambientalmente el Proyecto Desarrollo Mantoverde, Resolución Exenta Nº 16: public document dated 9 March, 2018 160 p.

This information is used in Section 20 of the report. It is also used in support of the Mineral Resource statement in Section 14, the Mineral Reserve statement in Section 15, and the financial analysis result in Section 22.

3.4 Taxation

The QPs have fully relied upon, and disclaim responsibility for, information supplied by Mantos Copper staff and experts retained by Mantos Copper for information related to taxation as applied to the financial model as follows:

- Fischer y Cia, 2021 – Certification of the Mantos Blancos and Mantoverde Financial Models for Technical Reports- Taxation Narrative, 29 November 2021, 4 p.

This information is used in the financial model in Section 22 of the Report. It is also used in support of the Mineral Reserve statement in Section 15.

4 Property Description and Location

4.1 Location

The Mantoverde mine is located at the approximate UTM centroid coordinates of 7,061,860 N and 369,340 E.

4.2 Project Ownership

All legal title to and ownership of the project is in the name of Mantoverde S.A., which is owned by Mantos Copper Holding SpA, a Chilean company (70%) and Mitsubishi Materials Corporation (30%). Audley Mining Advisors Ltd. and Orion Mine Finance LLP indirectly own Mantos Copper Holding SpA.

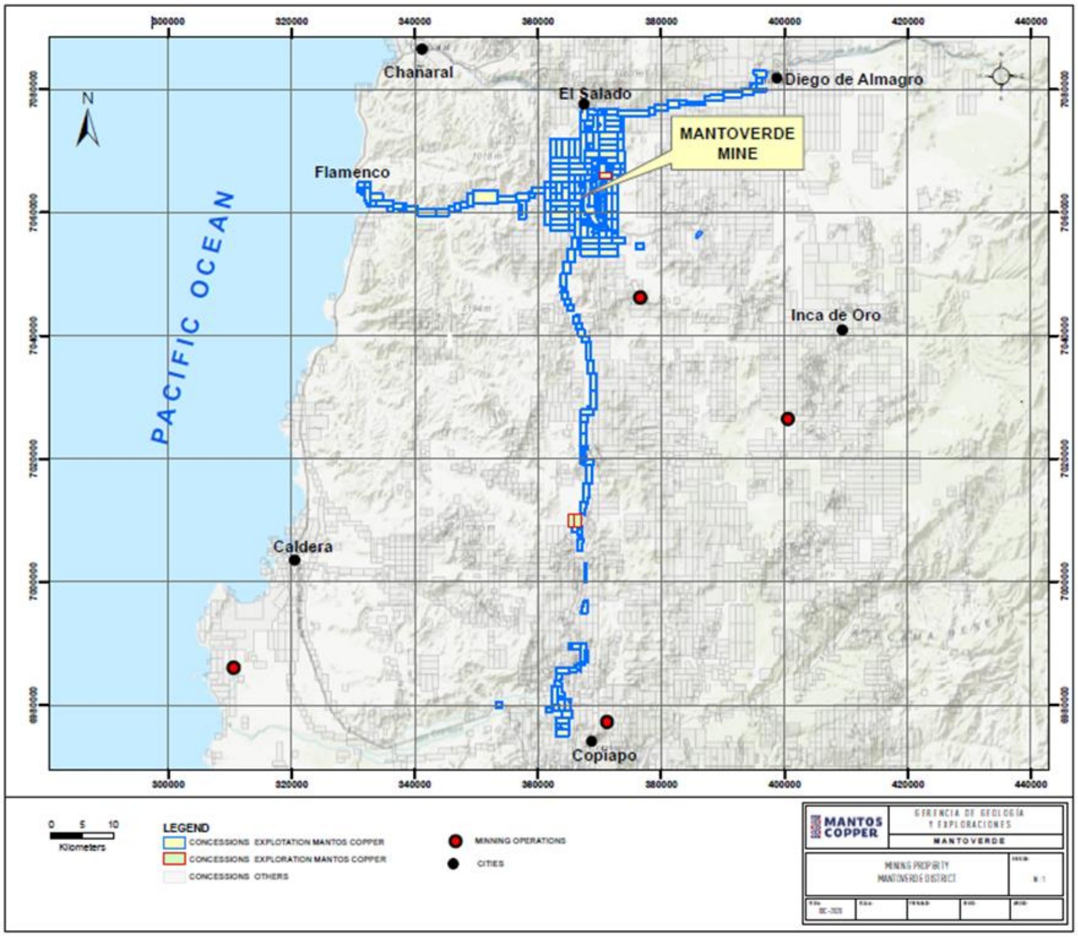
4.3 Mineral Tenure

Mantoverde S.A. currently owns and controls 39,254 ha of land covered by 303 exploitation mining concessions and three exploration mining concessions (Figure 4-1, Table 4-1 and Table 4-2), (38,654 ha of exploitation licences and 600 ha of exploration licences).

Exploitation mining concessions are granted indefinitely and give the holder the right to explore and to exploit any mineral resource found within the concession boundary. All of the Mineral Resources and Mineral Reserves are within granted exploitation concessions (Figure 4-2). Figure 4-3 shows the location of the main infrastructure in the operations area, including the open pits and the proposed location for the tailings storage facility (TSF).

Annual concession maintenance requirements include annual patent payments and annual procedure payments. Expert opinion was provided that indicated that all payments are current for the exploitation and exploration mining concessions.

Figure 4-1: Mineral Tenure Layout Plan



Note: Figure courtesy Mantos Copper, 2020

Table 4-1: Mineral Tenure Exploitation

N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
1	03101-1125-2	ALTAMIRA I 1/10	Manto Verde S.A.	100	104	26	2019	Constituted
2	03101-1126-0	ALTAMIRA II 1/20	Manto Verde S.A.	150	105	27	2019	Constituted
3	03101-1127-9	ALTAMIRA III 1/20	Manto Verde S.A.	117	106	28	2019	Constituted
4	03101-0450-7	AMALIA	Manto Verde S.A.	3	107	29	2019	Constituted
5	03202-0212-4	AMERICA	Manto Verde S.A.	2	108	30	2019	Constituted
6	03202-0193-4	ANDREA	Manto Verde S.A.	5	109	31	2019	Constituted
7	03201-5719-6	ANDREITA I 1/30	Manto Verde S.A.	137	1195 vta.	303	2019	Constituted
8	03101-0449-3	ANITA	Manto Verde S.A.	1	110	32	2019	Constituted
9	03202-0194-2	ANITA	Manto Verde S.A.	5	111	33	2019	Constituted
10	03202-0195-0	ATACAMA 1/39	Manto Verde S.A.	195	112	34	2019	Constituted
11	03202-0196-9	ATACAMA 1/50 (40)	Manto Verde S.A.	3	113	35	2019	Constituted
12	03202-0197-7	ATACAMA 41/50	Manto Verde S.A.	50	114	36	2019	Constituted
13	03101-0169-9	AVANZADA	Manto Verde S.A.	5	115	37	2019	Constituted
14	03202-0446-1	AZUL 1/3	Manto Verde S.A.	15	116	38	2019	Constituted
15	03101-1068-K	BARBARA I 3/25	Manto Verde S.A.	92	117	39	2019	Constituted
16	03101-1069-8	BARBARA II 1/8	Manto Verde S.A.	31	118	40	2019	Constituted
17	03101-1070-1	BARBARA III 1/6	Manto Verde S.A.	26	119	41	2019	Constituted
18	03101-1686-6	BARBARA IV	Manto Verde S.A.	1	120	42	2019	Constituted
19	03101-1687-4	BARBARA V	Manto Verde S.A.	1	121	43	2019	Constituted
20	03101-0958-4	BLANCA C 1/17	Manto Verde S.A.	34	122	44	2019	Constituted
21	03101-0995-9	BLANCA D 1/12	Manto Verde S.A.	12	123	45	2019	Constituted
22	03101-1039-6	BLANCA F 1/15	Manto Verde S.A.	30	124	46	2019	Constituted
23	03202-0201-9	BORNITA 1	Manto Verde S.A.	2	125	47	2019	Constituted
24	03202-0199-3	BRILLADOR	Manto Verde S.A.	5	126	48	2019	Constituted
25	03101-0136-2	CALIFORNIA	Manto Verde S.A.	5	127	49	2019	Constituted
26	03101-1242-9	CARAMELO I 1/4	Manto Verde S.A.	8	128	50	2019	Constituted
27	03202-0202-7	CARMEN	Manto Verde S.A.	2	129	51	2019	Constituted
28	03101-0160-5	CEBADILLA	Manto Verde S.A.	5	130	52	2019	Constituted
29	03201-A319-8	CHAMONATE I 1/20	Manto Verde S.A.	191	1196 vta.	304	2019	Constituted
30	03201-A321-K	CHAMONATE III 1/20	Manto Verde S.A.	180	1197 vta.	305	2019	Constituted
31	03201-A322-8	CHAMONATE IV 1/10	Manto Verde S.A.	50	1198 vta.	306	2019	Constituted
32	03101-3289-6	CHILLON I 1/30	Manto Verde S.A.	260	131	53	2019	Constituted
33	03202-0183-7	CONSUELO	Manto Verde S.A.	5	132	54	2019	Constituted
34	03101-3529-1	CORONA I 1/30	Manto Verde S.A.	300	133	55	2019	Constituted
35	03101-3530-5	CORONA II 1/30	Manto Verde S.A.	300	134	56	2019	Constituted
36	03101-3531-3	CORONA III 1/30	Manto Verde S.A.	300	135	57	2019	Constituted
37	03101-3532-1	CORONA IV 1/30	Manto Verde S.A.	300	136	58	2019	Constituted
38	03101-3537-2	CORONA IX 1/20	Manto Verde S.A.	190	137	59	2019	Constituted
39	03101-3533-K	CORONA V 1/30	Manto Verde S.A.	270	138	60	2019	Constituted
40	03101-3534-8	CORONA VI 1/30	Manto Verde S.A.	300	139	61	2019	Constituted
41	03101-3535-6	CORONA VII 1/30	Manto Verde S.A.	300	140	62	2019	Constituted
42	03101-3536-4	CORONA VIII 1/30	Manto Verde S.A.	300	141	63	2019	Constituted
43	03101-3538-0	CORONA X 1/25	Manto Verde S.A.	250	142	64	2019	Constituted
44	03101-3539-9	CORONA XI 1/30	Manto Verde S.A.	300	143	65	2019	Constituted
45	03202-0186-1	COVELITA 1/2	Manto Verde S.A.	4	144	66	2019	Constituted
46	03202-0185-3	CUARTA	Manto Verde S.A.	5	145	67	2019	Constituted
47	03101-1815-K	DE LA PAZ 1/10	Manto Verde S.A.	41	146	68	2019	Constituted
48	03202-0187-K	DECIMA QUINTA	Manto Verde S.A.	5	147	69	2019	Constituted
49	03202-0189-6	DECIMA SEPTIMA	Manto Verde S.A.	4	148	70	2019	Constituted
50	03202-0188-8	DECIMA SEXTA	Manto Verde S.A.	5	149	71	2019	Constituted

N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
51	03101-3215-2	DELFIN E10 1/10	Manto Verde S.A.	100	150	72	2019	Constituted
52	03101-3216-0	DELFIN E11 1/10	Manto Verde S.A.	100	151	73	2019	Constituted
53	03101-3217-9	DELFIN E12 1/20	Manto Verde S.A.	200	152	74	2019	Constituted
54	03101-3218-7	DELFIN E13 1/80	Manto Verde S.A.	800	153	75	2019	Constituted
55	03101-3219-5	DELFIN E14 1/30	Manto Verde S.A.	300	154	76	2019	Constituted
56	03101-3220-9	DELFIN E15 1/20	Manto Verde S.A.	300	155	77	2019	Constituted
57	03101-3221-7	DELFIN E16 1/10	Manto Verde S.A.	85	156	78	2019	Constituted
58	03101-3211-K	DELFIN E6 1/20	Manto Verde S.A.	200	157	79	2019	Constituted
59	03101-3212-8	DELFIN E7 1/30	Manto Verde S.A.	300	158	80	2019	Constituted
60	03101-3213-6	DELFIN E8 1/20	Manto Verde S.A.	200	159	81	2018	Constituted
61	03101-3214-4	DELFIN E9 1/10	Manto Verde S.A.	100	160	82	2019	Constituted
62	03102-2672-6	DELFIN II 1/20	Manto Verde S.A.	200	520 vta.	104	2019	Constituted
63	03102-2673-4	DELFIN III 1/20	Manto Verde S.A.	200	521 vta	105	2019	Constituted
64	03102-2674-2	DELFIN IV 6/10 - 16/20	Manto Verde S.A.	100	522 vta	106	2019	Constituted
65	03101-1650-5	DELFIN XI 1/50	Manto Verde S.A.	420	161	83	2019	Constituted
66	03101-1651-3	DELFIN XIV 1/50	Manto Verde S.A.	500	162	84	2019	Constituted
67	03101-1737-4	DELFIN XIX 1/10	Manto Verde S.A.	100	163	85	2019	Constituted
68	03102-3515-6	DELFIN XLII 1/13	Manto Verde S.A.	130	523 vta.	107	2019	Constituted
69	03102-3516-4	DELFIN XLIII 1/20	Manto Verde S.A.	100	524 vta.	108	2019	Constituted
70	03102-3518-0	DELFIN XLIV 1/30	Manto Verde S.A.	290	525 vta	109	2019	Constituted
71	03101-2682-9	DELFIN XLV 1/20	Manto Verde S.A.	189	164	86	2019	Constituted
72	03101-1724-2	DELFIN XVIII 1/10	Manto Verde S.A.	100	165	87	2019	Constituted
73	03101-1799-4	DELFIN XXI 1/10	Manto Verde S.A.	100	166	88	2019	Constituted
74	03101-1813-3	DELFIN XXII 1/30	Manto Verde S.A.	248	167	89	2019	Constituted
75	03101-1814-1	DELFIN XXIII 1/20	Manto Verde S.A.	200	168	90	2019	Constituted
76	03102-3027-8	DELFIN XXIV 1/30	Manto Verde S.A.	296	526 vta	110	2019	Constituted
77	03101-2334-K	DELFIN XXXIX 1/5	Manto Verde S.A.	25	169	91	2019	Constituted
78	03101-2024-3	DELFIN XXXVI 1/20	Manto Verde S.A.	200	170	92	2019	Constituted
79	03101-2025-1	DELFIN XXXVII 1/20	Manto Verde S.A.	200	171	93	2018	Constituted
80	03101-0141-9	DELICIA	Manto Verde S.A.	1	172	94	2019	Constituted
81	03102-3000-6	DIEGUITO I 1/20	Manto Verde S.A.	175	527 vta	111	2019	Constituted
82	03102-3001-4	DIEGUITO II 1/10	Manto Verde S.A.	100	528 vta	112	2019	Constituted
83	03102-3018-9	DIEGUITO III 1/9	Manto Verde S.A.	83	529 vta.	113	2019	Constituted
84	03101-1134-1	DON DIPE I 1/17	Manto Verde S.A.	32	173	95	2019	Constituted
85	03101-1767-6	DON DIPE II 1	Manto Verde S.A.	1	174	96	2019	Constituted
86	03101-0143-5	DOWA 1/36	Manto Verde S.A.	126	175	97	2019	Constituted
87	03202-1427-0	DUCTO MV I 1/20	Manto Verde S.A.	126	67	16	2019	Constituted
88	03202-1419-K	DUCTO MV II 1/20	Manto Verde S.A.	165	67 vta.	17	2019	Constituted
89	03202-1420-3	DUCTO MV III 1/30	Manto Verde S.A.	290	68	18	2019	Constituted
90	03202-1421-1	DUCTO MV IV 1/30	Manto Verde S.A.	283	68 vta.	19	2019	Constituted
91	03201-9330-0	DUCTO MV IX 1/50	Manto Verde S.A.	200	1199 vta.	307	2019	Constituted
92	03202-1422-K	DUCTO MV V 1/20	Manto Verde S.A.	144	69	20	2019	Constituted
93	03202-1428-9	DUCTO MV VI 1/12	Manto Verde S.A.	92	69 vta	21	2019	Constituted
94	03201-9328-1	DUCTO MV VII 1/25	Manto Verde S.A.	50	1200 vta.	308	2019	Constituted
95	03201-9329-K	DUCTO MV VIII 1/50	Manto Verde S.A.	200	1201 vta.	309	2019	Constituted
96	03201-9331-1	DUCTO MV X 1/50	Manto Verde S.A.	200	1202 vta.	310	2019	Constituted
97	03101-0161-3	EL POZO	Manto Verde S.A.	1	176	98	2019	Constituted
98	03202-0174-8	EMILIO	Manto Verde S.A.	3	177	99	2019	Constituted
99	03101-0451-5	EMMA	Manto Verde S.A.	5	178	100	2019	Constituted
100	03101-0145-1	ENRIQUITO	Manto Verde S.A.	5	179	101	2019	Constituted
101	03101-1487-1	ESCAPADA 1/3	Manto Verde S.A.	3	180	102	2019	Constituted
102	03101-1400-6	ESTEBAN I 1/20	Manto Verde S.A.	80	181	103	2019	Constituted

N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
103	03101-1459-6	ESTEBAN II 1/20	Manto Verde S.A.	200	182	104	2019	Constituted
104	03101-1804-4	ESTEBAN IV 1/5	Manto Verde S.A.	5	183	105	2019	Constituted
105	03101-1805-2	ESTEBAN V 1/2	Manto Verde S.A.	2	184	106	2019	Constituted
106	03101-1806-0	ESTEBAN VI 1	Manto Verde S.A.	1	185	107	2019	Constituted
107	03101-2239-4	ESTEBAN VII 1/5	Manto Verde S.A.	5	186	108	2019	Constituted
108	03101-1385-9	FILADELFIA II 1-3/6	Manto Verde S.A.	19	187	109	2019	Constituted
109	03101-1234-8	FLAMENCO I 1/10	Manto Verde S.A.	60	188	110	2019	Constituted
110	03101-1235-6	FLAMENCO II 1/20	Manto Verde S.A.	200	189	111	2019	Constituted
111	03101-1236-4	FLAMENCO III 1/20	Manto Verde S.A.	186	190	112	2019	Constituted
112	03101-1237-2	FLAMENCO IV 1/15	Manto Verde S.A.	91	191	113	2019	Constituted
113	03101-1238-0	FLAMENCO V 1/10	Manto Verde S.A.	100	192	114	2019	Constituted
114	03101-1239-9	FLAMENCO VI 1/20	Manto Verde S.A.	144	193	115	2019	Constituted
115	03101-1240-2	FLAMENCO VII 1/20	Manto Verde S.A.	200	194	116	2019	Constituted
116	03101-1723-4	FLAMENCO X 1/20	Manto Verde S.A.	200	195	117	2019	Constituted
117	03101-2637-3	FLAMENCO XI 1/10	Manto Verde S.A.	100	196	118	2019	Constituted
118	03101-3290-K	FLEURANCE 1/4	Manto Verde S.A.	4	197	119	2019	Constituted
119	03101-2318-8	FORTUNA I 1/10	Manto Verde S.A.	100	198	120	2019	Constituted
120	03101-2319-6	FORTUNA II 1/28	Manto Verde S.A.	242	199	121	2019	Constituted
121	03101-2320-K	FORTUNA III 1/29	Manto Verde S.A.	270	200	122	2019	Constituted
122	03202-0573-5	FRANKO 1/4	Manto Verde S.A.	20	201	123	2019	Constituted
123	03101-0452-3	GENERAL KUROKI	Manto Verde S.A.	3	202	124	2019	Constituted
124	03202-0355-4	GRITON	Manto Verde S.A.	5	203	125	2019	Constituted
125	03101-1339-5	GUAMANGA 1/3	Manto Verde S.A.	3	204	126	2019	Constituted
126	03101-1720-K	GUAMANGA I 1/30	Manto Verde S.A.	300	205	127	2019	Constituted
127	03101-1721-8	GUAMANGA II 1/20	Manto Verde S.A.	200	206	128	2019	Constituted
128	03101-1722-6	GUAMANGA III 1/10	Manto Verde S.A.	100	207	129	2019	Constituted
129	03101-2638-1	GUAMANGA IV 1/30	Manto Verde S.A.	300	208	130	2019	Constituted
130	03101-2643-8	GUAMANGA IX 1/20	Manto Verde S.A.	200	209	131	2019	Constituted
131	03101-2639-K	GUAMANGA V 1/20	Manto Verde S.A.	200	210	132	2019	Constituted
132	03101-2640-3	GUAMANGA VI 1/10	Manto Verde S.A.	100	211	133	2019	Constituted
133	03101-2641-1	GUAMANGA VII 1/10	Manto Verde S.A.	100	212	134	2019	Constituted
134	03101-2642-K	GUAMANGA VIII 1/20	Manto Verde S.A.	200	213	135	2019	Constituted
135	03101-2644-6	GUAMANGA X 1/20	Manto Verde S.A.	200	214	136	2019	Constituted
136	03101-2645-4	GUAMANGA XI 1/20	Manto Verde S.A.	200	215	137	2019	Constituted
137	03101-2867-8	GUAMANGA XII 1/20	Manto Verde S.A.	200	216	138	2019	Constituted
138	03101-2868-6	GUAMANGA XIII 1/30	Manto Verde S.A.	300	217	139	2019	Constituted
139	03101-2869-4	GUAMANGA XIV 1/30	Manto Verde S.A.	300	218	140	2019	Constituted
140	03101-2870-8	GUAMANGA XV 1/10	Manto Verde S.A.	100	219	141	2019	Constituted
141	03101-2871-6	GUAMANGA XVI 1/30	Manto Verde S.A.	300	220	142	2019	Constituted
142	03101-2333-1	JESUS NORTE 1/9	Manto Verde S.A.	9	221	143	2019	Constituted
143	03101-2332-3	JESUS SUR 1/15	Manto Verde S.A.	15	222	144	2019	Constituted
144	03101-0150-8	JORGE	Manto Verde S.A.	5	223	145	2019	Constituted
145	03202-0177-2	JUPITER	Manto Verde S.A.	5	224	146	2019	Constituted
146	03101-1631-9	LA CORINA 1/3	Manto Verde S.A.	3	225	147	2019	Constituted
147	03101-1084-1	LA REGALADA 1/3	Manto Verde S.A.	3	226	148	2019	Constituted
148	03101-0162-1	LAS CASAS	Manto Verde S.A.	2	227	149	2019	Constituted
149	03101-0163-K	LAURA	Manto Verde S.A.	2	228	150	2019	Constituted
150	03101-0164-8	LAURITA	Manto Verde S.A.	1	229	151	2019	Constituted
151	03101-1892-3	LOURDES 1/10	Manto Verde S.A.	86	230	152	2019	Constituted
152	03101-0152-4	LUCITA	Manto Verde S.A.	5	231	153	2019	Constituted
153	03202-0182-9	MANTO ATACAMA	Manto Verde S.A.	5	232	154	2019	Constituted
154	03101-0194-K	MANTO RUSO 1/2	Manto Verde S.A.	10	233	155	2019	Constituted

N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
155	03101-1340-9	MANTO SUR 1/20	Manto Verde S.A.	20	234	156	2019	Constituted
156	03202-0429-1	MANTO VERDE	Manto Verde S.A.	5	235	157	2019	Constituted
157	03202-0165-9	MANTO VERDE 1/197	Manto Verde S.A.	985	235	157	2019	Constituted
158	03101-0165-6	MARGARITA	Manto Verde S.A.	2	236	158	2019	Constituted
159	03101-0153-2	MARTE	Manto Verde S.A.	5	237	159	2019	Constituted
160	03202-0180-2	MAURICIO	Manto Verde S.A.	5	238	160	2019	Constituted
161	03101-0154-0	MERCURIO	Manto Verde S.A.	5	239	161	2019	Constituted
162	03202-0957-9	MICHEL VII 1/20 (19/20)	Manto Verde S.A.	20	240	162	2019	Constituted
163	03202-0179-9	MIRADOR	Manto Verde S.A.	5	241	163	2019	Constituted
164	03202-0222-1	MONTECRISTO 1/20	Manto Verde S.A.	100	242	164	2019	Constituted
165	03101-1684-K	OLVIDADA	Manto Verde S.A.	1	243	165	2019	Constituted
166	03202-0168-3	ORIENTE	Manto Verde S.A.	3	244	166	2019	Constituted
167	03202-0903-K	PALOMA I 1/20	Manto Verde S.A.	200	70	22	2019	Constituted
168	03202-0904-8	PALOMA II 1/20	Manto Verde S.A.	200	70 vta.	23	2019	Constituted
169	03201-5639-4	PALOMA III 1/30	Manto Verde S.A.	300	1203 vta.	311	2019	Constituted
170	03201-5640-8	PALOMA IV 1/10	Manto Verde S.A.	100	1204 vta.	312	2019	Constituted
171	03101-1516-9	PALOMA IX 1/10	Manto Verde S.A.	100	245	167	2019	Constituted
172	03201-8249-2	PALOMA LIII 1/15	Manto Verde S.A.	150	1205 vta.	313	2011	Constituted
173	03201-8250-6	PALOMA LIV 1/30	Manto Verde S.A.	200	1197 vta.	280	2011	Constituted
174	03201-8251-4	PALOMA LV 1/20	Manto Verde S.A.	141	1207 vta.	315	2019	Constituted
175	03101-1512-6	PALOMA V 1/9	Manto Verde S.A.	90	246	168	2019	Constituted
176	03101-1513-4	PALOMA VI 1/14	Manto Verde S.A.	124	247	169	2019	Constituted
177	03101-1514-2	PALOMA VII 1/10	Manto Verde S.A.	100	248	170	2019	Constituted
178	03101-1515-0	PALOMA VIII 1/10	Manto Verde S.A.	100	249	171	2019	Constituted
179	03101-1738-2	PALOMA XL 1/30	Manto Verde S.A.	270	250	172	2019	Constituted
180	03101-1740-4	PALOMA XLI 1/30	Manto Verde S.A.	300	251	173	2019	Constituted
181	03201-6484-2	PALOMA XLII 1/20	Manto Verde S.A.	151	1208 vta	316	2019	Constituted
182	03201-6969-0	PALOMA XLIX 1/20	Manto Verde S.A.	80	1209 vta.	317	2019	Constituted
183	03201-6966-6	PALOMA XLVI 1/20	Manto Verde S.A.	200	1210 vta.	318	2019	Constituted
184	03201-6967-4	PALOMA XLVII 1/10	Manto Verde S.A.	92	1211 vta,	319	2019	Constituted
185	03201-6968-2	PALOMA XLVIII 1/10	Manto Verde S.A.	92	1212 vta.	320	2019	Constituted
186	03201-5900-8	PALOMA XVIII 1/15	Manto Verde S.A.	126	1213 vta.	321	2019	Constituted
187	03101-1739-0	PALOMA XXXIX 1/20	Manto Verde S.A.	200	252	174	2019	Constituted
188	03202-1947-7	PALOMITA E5 1/10	Manto Verde S.A.	100	71	24	2019	Constituted
189	03201-5689-0	PALOMITA I 1/20	Manto Verde S.A.	150	1214 vta.	322	2019	Constituted
190	03201-6036-7	PALOMITA II 1/6	Manto Verde S.A.	38	1215 vta.	323	2019	Constituted
191	03101-1685-8	PALOMITA III 1/30	Manto Verde S.A.	150	253	175	2019	Constituted
192	03201-8342-1	PALOMITA XII 1/15	Manto Verde S.A.	120	1216 vta.	324	2019	Constituted
193	03101-1393-K	PATRICIO I 1/25	Manto Verde S.A.	238	254	176	2019	Constituted
194	03101-1394-8	PATRICIO II 1/30	Manto Verde S.A.	300	255	177	2019	Constituted
195	03101-1395-6	PATRICIO III 1/30	Manto Verde S.A.	289	256	178	2019	Constituted
196	03101-1396-4	PATRICIO IV 1/30	Manto Verde S.A.	300	257	179	2019	Constituted
197	03101-1397-0	PATRICIO V 1/10	Manto Verde S.A.	100	258	180	2019	Constituted
198	03202-1943-4	PICHON A3 1/20	Manto Verde S.A.	200	87	29	2019	Constituted
199	03202-1944-2	PICHON A4 1/10	Manto Verde S.A.	100	71 vta.	25	2019	Constituted
200	03101-3610-7	PICHON B1 1/20	Manto Verde S.A.	200	259	181	2019	Constituted
201	03101-3611-5	PICHON B2 1/20	Manto Verde S.A.	200	260	182	2019	Constituted
202	03101-2632-2	PICHON I 1/30	Manto Verde S.A.	300	261	183	2019	Constituted
203	03101-2633-0	PICHON II 1/20	Manto Verde S.A.	198	262	184	2019	Constituted
204	03101-2634-9	PICHON III 1/10	Manto Verde S.A.	100	263	185	2019	Constituted
205	03101-2635-7	PICHON IV 1/10	Manto Verde S.A.	90	264	186	2019	Constituted

N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
206	03101-2636-5	PICHON V 1/30	Manto Verde S.A.	300	265	187	2019	Constituted
207	03202-0171-3	PORVENIR	Manto Verde S.A.	3	266	188	2019	Constituted
208	03202-0170-5	PRIMERA	Manto Verde S.A.	5	267	189	2019	Constituted
209	03101-1597-5	PRINCESA I 1/2	Manto Verde S.A.	2	268	190	2019	Constituted
210	03101-2859-7	PUERTO I 1/20	Manto Verde S.A.	117	269	191	2019	Constituted
211	03101-2860-0	PUERTO II 1/30	Manto Verde S.A.	261	270	192	2019	Constituted
212	03101-2861-9	PUERTO III 1/20	Manto Verde S.A.	200	271	193	2019	Constituted
213	03101-2862-7	PUERTO IV 1/10	Manto Verde S.A.	100	272	194	2019	Constituted
214	03101-2863-5	PUERTO V 1/27	Manto Verde S.A.	270	273	195	2019	Constituted
215	03101-2864-3	PUERTO VI 1/10	Manto Verde S.A.	100	274	196	2019	Constituted
216	03101-2865-1	PUERTO VII 1/20	Manto Verde S.A.	175	275	197	2019	Constituted
217	03101-2866-k	PUERTO VIII 1/10	Manto Verde S.A.	50	276	198	2019	Constituted
218	03101-3291-8	PUNTA FLAMENCO 1/10	Manto Verde S.A.	100	277	199	2019	Constituted
219	03202-0226-4	QUINTA	Manto Verde S.A.	5	278	200	2019	Constituted
220	03202-0153-5	RAQUEL	Manto Verde S.A.	5	279	201	2019	Constituted
221	03101-1129-5	REINA I 1/30	Manto Verde S.A.	250	280	202	2019	Constituted
222	03101-1092-2	REINA I/34,7/8,11/12,14/16,Y 18/20	Manto Verde S.A.	17	281	203	2019	Constituted
223	03101-1100-7	REINA II 1/30	Manto Verde S.A.	210	282	204	2019	Constituted
224	03101-1101-5	REINA III 1/30	Manto Verde S.A.	181	283	205	2019	Constituted
225	03101-1130-9	REINA IV 1/20	Manto Verde S.A.	125	284	206	2019	Constituted
226	03101-1131-7	REINA V 1/23	Manto Verde S.A.	206	285	207	2019	Constituted
227	03101-0128-1	RESGUARDO	Manto Verde S.A.	5	286	208	2019	Constituted
228	03101-0166-4	RESGUARDO	Manto Verde S.A.	5	287	209	2019	Constituted
229	03101-0129-K	ROBERTO	Manto Verde S.A.	5	288	210	2019	Constituted
230	03101-1770-6	SALITROSA I 1/14	Manto Verde S.A.	110	289	211	2019	Constituted
231	03101-1771-4	SALITROSA II 1/6	Manto Verde S.A.	20	290	212	2019	Constituted
232	03101-1772-2	SALITROSA III 1/10	Manto Verde S.A.	100	291	213	2019	Constituted
233	03101-1773-0	SALITROSA IV 1/18	Manto Verde S.A.	150	292	214	2019	Constituted
234	03101-1819-2	SALITROSA IX 1/10	Manto Verde S.A.	32	293	215	2019	Constituted
235	03101-1775-7	SALITROSA V 1/12	Manto Verde S.A.	109	294	216	2019	Constituted
236	03101-1816-8	SALITROSA VI 1/10	Manto Verde S.A.	100	295	217	2019	Constituted
237	03101-1817-6	SALITROSA VII 1/10	Manto Verde S.A.	100	296	218	2019	Constituted
238	03101-1818-4	SALITROSA VIII 1/10	Manto Verde S.A.	100	297	219	2019	Constituted
239	03101-2329-3	SALITROSA X 1/10	Manto Verde S.A.	100	298	220	2019	Constituted
240	03101-2328-5	SALITROSA XII 1/10	Manto Verde S.A.	100	299	221	2019	Constituted
241	03101-2856-2	SALITROSA XIII 1/21	Manto Verde S.A.	201	300	222	2019	Constituted
242	03101-2857-0	SALITROSA XIV 1/9	Manto Verde S.A.	75	301	223	2019	Constituted
243	03101-2858-9	SALITROSA XV 1/20	Manto Verde S.A.	200	302	224	2019	Constituted
244	03101-1457-K	SAN FELIPE 1/10	Manto Verde S.A.	50	303	225	2019	Constituted
245	03202-0155-1	SAN FRANCISCO	Manto Verde S.A.	5	304	226	2019	Constituted
246	03201-C318-0	SAN FRANCISCO 1/10	Manto Verde S.A.	100	1217 vta.	325	2019	Constituted
247	03101-1117-1	SAN JUAN I 1/20	Manto Verde S.A.	122	306	227	2019	Constituted
248	03101-1118-K	SAN JUAN II 1/16	Manto Verde S.A.	56	306	228	2019	Constituted
249	03101-1119-8	SAN JUAN III 1	Manto Verde S.A.	1	307	229	2019	Constituted
250	03101-1120-1	SAN JUAN IV 1/10	Manto Verde S.A.	78	308	230	2019	Constituted
251	03101-1180-5	SAN JUAN V	Manto Verde S.A.	1	309	231	2019	Constituted
252	03101-1241-0	SAN JUAN VI 1/9	Manto Verde S.A.	9	310	232	2019	Constituted
253	03101-2325-0	SAN JUAN X 1/17	Manto Verde S.A.	68	311	233	2019	Constituted
254	03101-2326-9	SAN JUAN XI 1/10	Manto Verde S.A.	76	312	234	2019	Constituted
255	03101-2848-1	SAN JUAN XII 1/30	Manto Verde S.A.	269	313	235	2019	Constituted

N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
256	03101-2849-K	SAN JUAN XIII 1/19	Manto Verde S.A.	173	314	236	2019	Constituted
257	03101-2850-3	SAN JUAN XIV 1/30	Manto Verde S.A.	300	315	237	2019	Constituted
258	03101-2855-4	SAN JUAN XIX 1/30	Manto Verde S.A.	300	316	238	2019	Constituted
259	03101-2851-1	SAN JUAN XV 1/30	Manto Verde S.A.	300	317	239	2019	Constituted
260	03101-2852-K	SAN JUAN XVI 1/30	Manto Verde S.A.	300	318	240	2019	Constituted
261	03101-2853-8	SAN JUAN XVII 1/20	Manto Verde S.A.	200	319	241	2019	Constituted
262	03101-2854-6	SAN JUAN XVIII 1/30	Manto Verde S.A.	300	320	242	2019	Constituted
263	03101-0239-3	SAN MANUEL 1/56	Manto Verde S.A.	50	321	243	2019	Constituted
264	03101-1778-1	SAN PABLO I 1/6	Manto Verde S.A.	24	322	244	2019	Constituted
265	03101-1776-5	SAN PABLO II 1/10	Manto Verde S.A.	40	323	245	2019	Constituted
266	03101-1777-3	SAN PABLO III 1/4	Manto Verde S.A.	16	324	246	2019	Constituted
267	03101-2680-2	SAN PABLO XIII 1/30	Manto Verde S.A.	245	325	247	2019	Constituted
268	03101-2681-0	SAN PABLO XIV 1/30	Manto Verde S.A.	289	326	248	2019	Constituted
269	03101-2876-7	SAN PABLO XIX 1/25	Manto Verde S.A.	250	327	249	2019	Constituted
270	03101-2322-6	SAN PABLO XIX 1/30	Manto Verde S.A.	284	328	250	2019	Constituted
271	03101-2872-4	SAN PABLO XV 1/30	Manto Verde S.A.	300	329	251	2019	Constituted
272	03101-2873-2	SAN PABLO XVI 1/30	Manto Verde S.A.	300	330	252	2019	Constituted
273	03101-2874-0	SAN PABLO XVII 1/20	Manto Verde S.A.	200	331	252	2019	Constituted
274	03101-2324-2	SAN PABLO XVII 1/26	Manto Verde S.A.	200	332	254	2019	Constituted
275	03101-2323-4	SAN PABLO XVIII 1/26	Manto Verde S.A.	260	333	255	2019	Constituted
276	03101-2875-9	SAN PABLO XVIII 1/30	Manto Verde S.A.	300	334	256	2019	Constituted
277	03101-2877-5	SAN PABLO XX 1/20	Manto Verde S.A.	200	335	257	2019	Constituted
278	03101-2321-8	SAN PABLO XX 1/30	Manto Verde S.A.	300	336	258	2019	Constituted
279	03101-2327-7	SAN PABLO XXI 1/10	Manto Verde S.A.	100	337	259	2019	Constituted
280	03101-2878-3	SAN PABLO XXI 1/30	Manto Verde S.A.	201	338	260	2019	Constituted
281	03101-2331-5	SAN PABLO XXII 1/10	Manto Verde S.A.	50	339	261	2019	Constituted
282	03101-2879-1	SAN PABLO XXII 1/20	Manto Verde S.A.	175	340	262	2019	Constituted
283	03101-2330-7	SAN PABLO XXIII 1/10	Manto Verde S.A.	50	341	263	2019	Constituted
284	03101-0167-2	SAN PEDRO	Manto Verde S.A.	5	342	264	2019	Constituted
285	03101-1458-8	SAN RAFAEL 1/10	Manto Verde S.A.	50	343	265	2019	Constituted
286	03202-0156-K	SAN RAMON	Manto Verde S.A.	1	344	266	2019	Constituted
287	03101-0170-2	SANTA CLARA 1/20	Manto Verde S.A.	100	345	267	2019	Constituted
288	03202-1005-4	SANTA CLARA 21/50 (21/30)	Manto Verde S.A.	50	346	268	2019	Constituted
289	03202-0219-1	SANTA CLARA 21/50 (31/50)	Manto Verde S.A.	100	347	269	2019	Constituted
290	03101-0171-0	SANTA CLARA 51/80	Manto Verde S.A.	150	348	270	2019	Constituted
291	03101-0172-9	SANTA CLARA 81/120	Manto Verde S.A.	200	349	271	2019	Constituted
292	03202-0157-8	SATURNO	Manto Verde S.A.	5	350	272	2019	Constituted
293	03202-0158-6	SEGUNDA	Manto Verde S.A.	5	351	273	2019	Constituted
294	03202-0159-4	SEPTIMA	Manto Verde S.A.	5	352	274	2019	Constituted
295	03201-C319-9	TENAMOCHA 1/9	Manto Verde S.A.	90	1218 vta.	326	2019	Constituted
296	03202-0151-9	TERCERA	Manto Verde S.A.	4	353	275	2019	Constituted
297	03202-0209-4	TRILLIZOS 1/5	Manto Verde S.A.	25	354	276	2019	Constituted
298	03202-0019-9	VENUS 1	Manto Verde S.A.	5	118	171	1906	Constituted
299	03202-0445-3	VERDE 1/2	Manto Verde S.A.	10	355	277	2019	Constituted
300	03101-0168-0	VICTORIA	Manto Verde S.A.	2	356	278	2019	Constituted
301	03101-1627-0	YOLANDA 1/18	Manto Verde S.A.	18	357	279	2019	Constituted
302	03201-A320-1	CHAMONATE II 1/34	Manto Verde S.A.	143	3281	2109	2019	In Progress
303	03202-1948-5	PALOMITA E6 1/39	Manto Verde S.A.	144	207	149	2019	In Progress

Note: ROL is a unique identifier used for properties in Chile

Table 4-2: Mineral Tenure Exploration

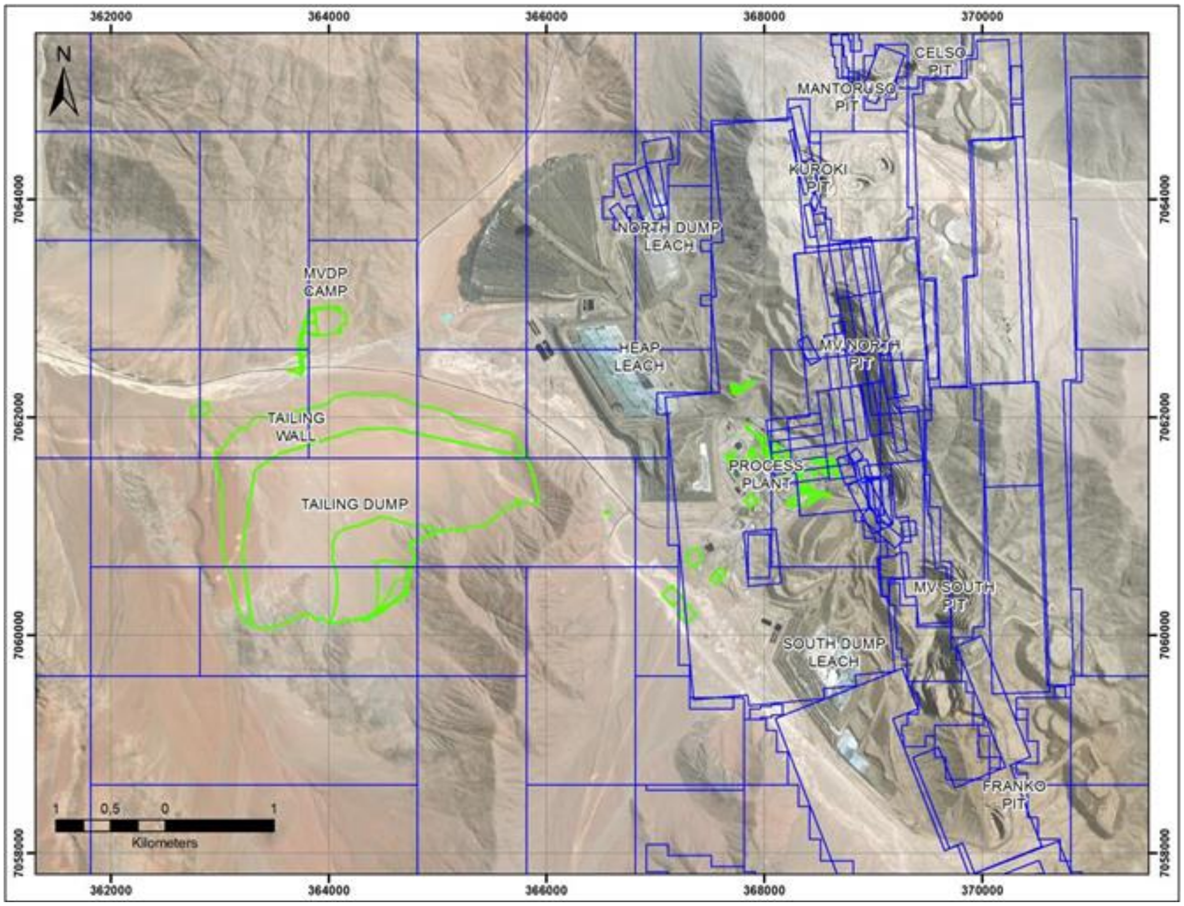
N°	ROL	Concession	Owner	Ha	Page	Number	Year	Status
1	03101-8189-7	LOS MORADOS II 3	MANTOS COPPER S.A.	200	339	237	2019	Constituted
2		LOS MORADOS III 1	Manto Verde S.A.	200	477	383	2020	In Progress
3		LOS MORADOS III 2	Manto Verde S.A.	200	479	384	2020	In Progress

Note: ROL is a unique identifier used for properties in Chile

Figure 4-2: Mining Concessions, Mine Area

Note: Figure courtesy Mantos Copper, 2020

Figure 4-3: Mineral Tenure Layout in Relation to Operating Pits

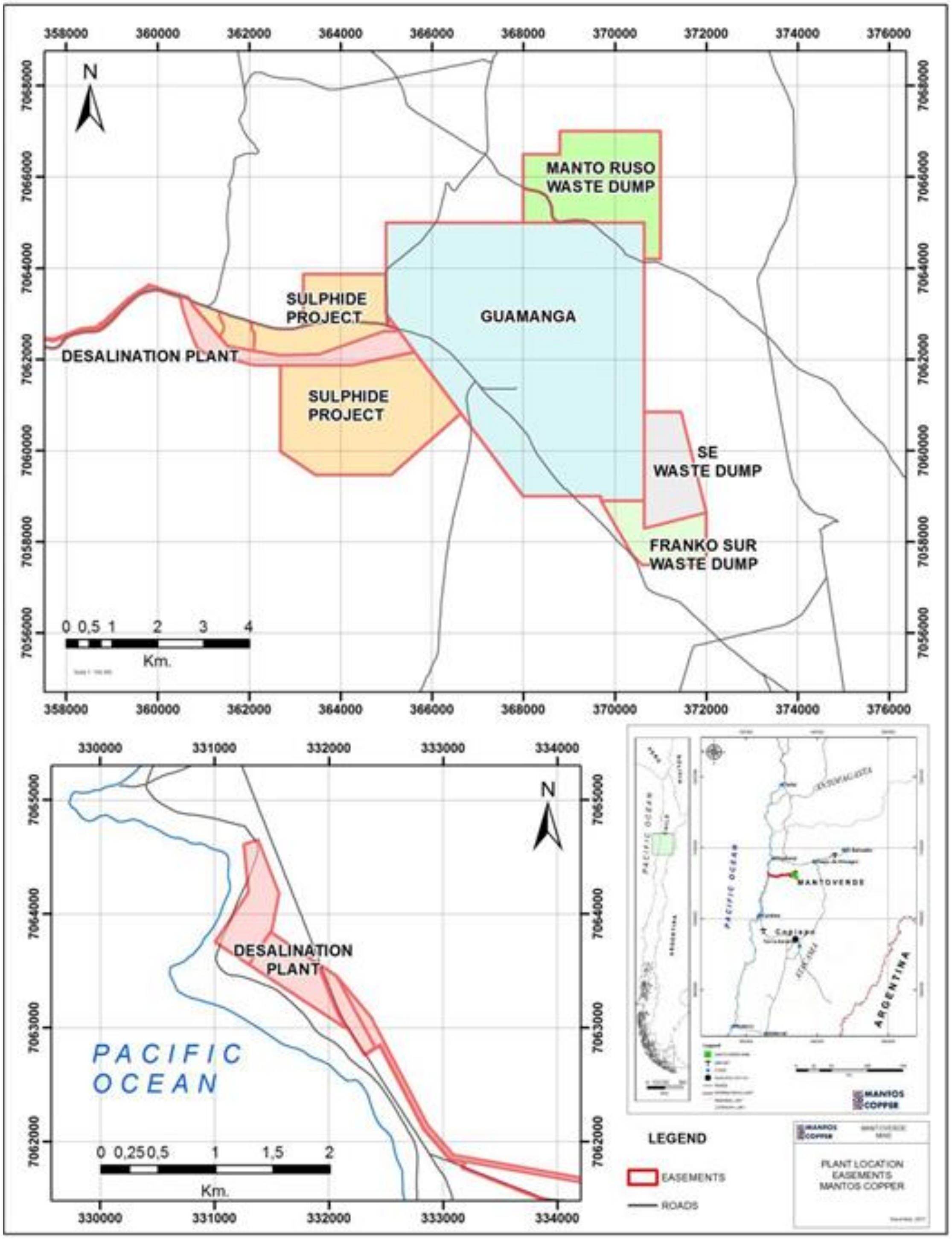


Note: Figure courtesy Mantos Copper, 2020

4.4 Surface Rights

Mantos Copper currently holds approximately 4,291 ha of surface rights (Figure 4-4). This is sufficient to support the open pit oxide operations, the desalination plant and associated pipelines and power transmission lines. An additional 1,221 ha approximately will be needed to support the sulphide operations in the areas proposed for the mine, plant and TSF. Mantos Copper applied for these remaining areas and they have been provisionally granted by the Chilean courts. The final documentation is expected to be provided to Mantos Copper during 2022.

Figure 4-4: Current Surface Rights in Relation to Existing and Proposed Facilities



Note: Figure courtesy Mantos Copper, 2020

4.5 Water Rights

The water requirements for the current mine (approximately 120 L/s) are supplied by a wholly-owned sea water desalination plant located on the coast about 40 km from the mine site. The plant was designed and built to be readily expandable to meet the MVDP water requirements (to 380 L/s).

Mantos Copper also holds a total of 343.8 L/s of water rights in the provinces of Copiapó and Chañaral. Two of these rights (one of 45 L/s and one of 28.8 L/s) will be returned to the provinces as proposed in the EIA and included in the RCA, because they are not required as part of the current mine planning.

4.6 Royalties and Encumbrances

No royalties are payable on the MVDP operation. As part of the share purchase agreement executed with Anglo American in September 2015, a one time payment of US$50 M becomes due when the Mantos Copper Board of Directors approves the development of the MVDP, executed during 2021.

No other royalties or encumbrances are currently known other than the requirement to pay the Chilean mining tax.

4.7 Offtake Agreements

4.7.1 Anglo American

Mantoverde and Mantos Blancos have entered into offtake agreements relating to cathode production with Anglo American (AA), both of which were amended and re-stated on 31 August 2019.

Under the agreements, Mantoverde and Mantos Blancos are required to sell, and AA is required to buy, all the Mantos Copper production of copper cathodes, until the aggregate sum of cathodes delivered from Mantoverde and Mantos Blancos reaches 275,000 t, which is expected to occur by 31 December 2025. If this amount is not delivered by 31 December 2025, the agreement can be extended through to 31 December 2027 subject to a 20% increase in the amount of cathodes to be delivered. The price for cathodes is determined based on the monthly average LME copper price.

4.7.2 Boliden

As part of the financing for the MVDP, Mantoverde entered into an offtake agreement with Boliden Commercial AB (Boliden) dated 4 February 2021 for 75,000 t of copper concentrates in each contract year. The agreement expires 10 years after the commencement of commercial production of the MVDP (as defined in the agreement), subject to potential extension if less than 750,000 t of copper concentrates have been delivered at the contract terms, and subject to termination if production does not commence by 31 December 2024. The price of the full copper content of the concentrate is based on average LME prices and subject to adjustments based on the percentage of copper content. The amount payable for the gold by-product is determined by LBMA prices, subject to terms stated in the agreement.

4.7.3 Mitsubishi

As part of the financing for the MVDP, Mantoverde entered into a copper concentrate offtake agreement with Mitsubishi Materials on 11 February 2021. Mantoverde agreed to sell 30.00% (which may be increased if Mitsubishi Material’s equity interest in Mantoverde increases) of all annual copper production at Mantoverde per year (to be serviced by the equivalent in copper concentrate), plus an additional amount per annum of 20,000 t to 30,000 t of copper concentrate depending on the amount that is drawn by Mantoverde under the cost over-run facility provided by Mitsubishi Materials in connection with the MVDP. The agreement is for the duration of Mantoverde's commercial mine life. The amount payable for copper is based on average LME prices, subject to terms stated in the agreement. The amount payable for gold by-product is determined by LBMA prices, subject to terms stated in the agreement.

4.8 Property Agreements

There are no property agreements relevant to the current operation or the MVDP.

4.9 Permitting Considerations

Permitting is discussed in Section 20.

4.10 Environmental Considerations

These are discussed in Section 20.

4.11 Social Licence Considerations

Social licence considerations are discussed in Section 20.

4.12 Comments on Section 4

Information from Mantos Copper S.A. land experts supports that the mining tenure held is valid and is sufficient to support the declaration of Mineral Resources and Mineral Reserves.

All current infrastructure is covered by existing surface rights. A significant portion of the required surface rights have been obtained for the infrastructure that will be required to support the MVDP. Discussions are underway with land holders to acquire the remaining surface rights; if they are required. Alternatives are available and have been considered in each case.

No royalties or encumbrances are currently known other than the requirement to pay the Chilean mining tax. A one off payment of US$50 M was payable to Anglo American, when the Mantos Copper Board of Directors approved the MVDP in 2021.

There are no other, known significant factors or risks that may affect access, title or the right or ability to perform work on the property that have not been discussed in this Report.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

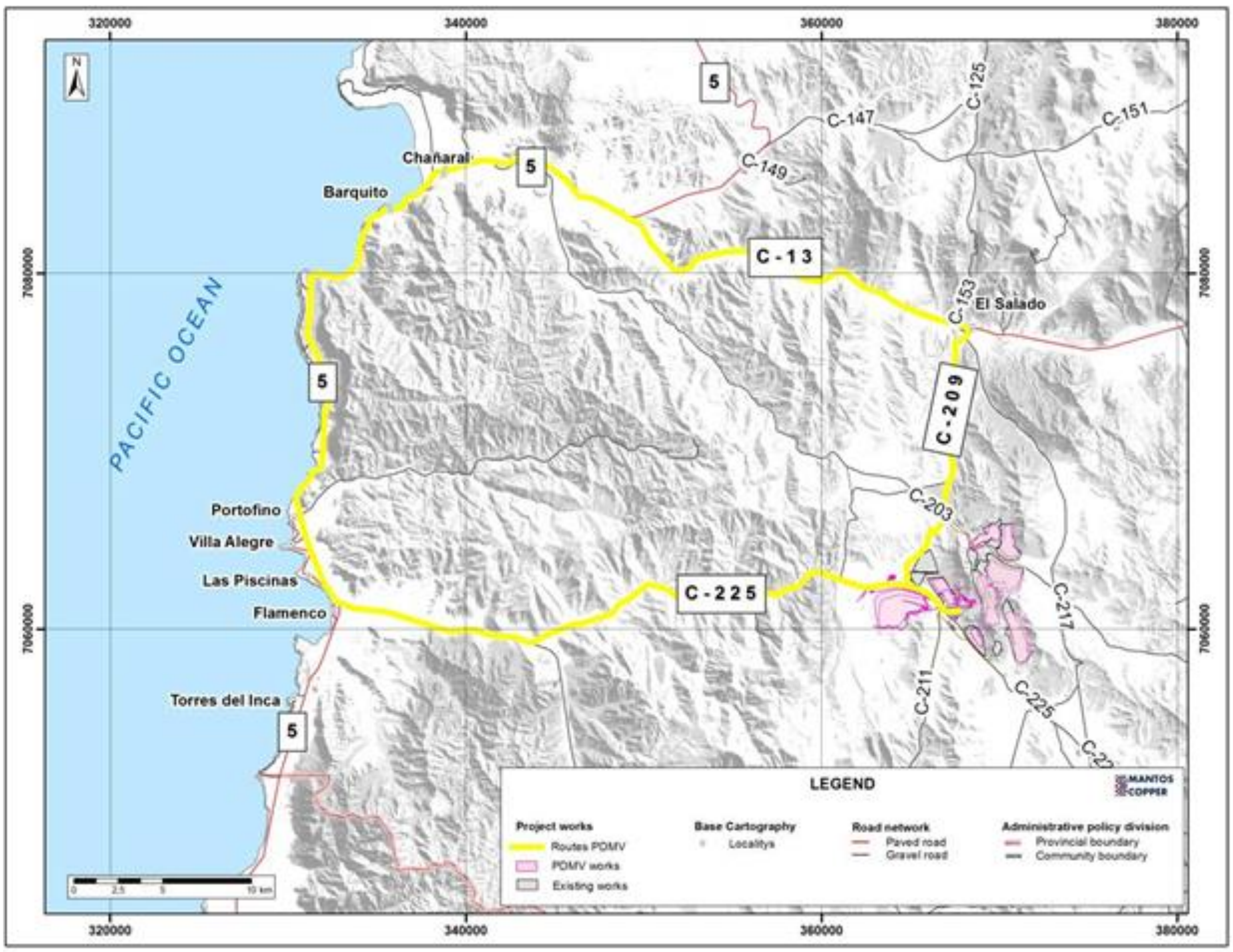
5.1 Accessibility

5.1.1 Roads

The mine is situated about 176 km by paved road from the major city of Copiapó. A 45 km long secondary road which turns off Route 5 North at Bahía Flamenco between Chañaral and Caldera (to the south not shown on the map) (Figure 5-1) provides site access. The site can also be accessed from the north from Chañaral via El Salado.

Access roads within the site are gravel.

Figure 5-1: Road Access to Mantoverde Site



Note: Figure courtesy Mantos Copper, 2020

5.1.2 Airport

The Desierto de Atacama airport is the main regional airport and is located 50 km to the northwest of Copiapó about 133 km from the operation (by road).

5.1.3 Port

Port assumptions are discussed in Section 18.

5.2 Climate

The Mantoverde deposit is located in a desert area, with hot, dry summers and colder winters that have limited rainfall. If rainfall does occur, it is normally between May and August. The area is also subject to fog.

Mining operations are currently conducted year-round. It is expected that the future mining operation will also be conducted on a year-round basis.

5.3 Local Resources and Infrastructure

Additional information on the infrastructure and setting is provided in Section 18 and Section 20.

The closest settlement is El Salado, about 15 km to the north of the mine. The communities of Chañaral, Diego de Almagro and Flamenco are located in the province of Chañaral, Atacama Region, and are within the mine area of influence. The closest major population centre is Copiapó which provides services for a number of large mining operations in the area.

5.4 Physiography

Mantoverde is located in the Norte Grande macro-zone in the sub-zones of the Cordillera de la Costa (coastal range) and the Atacama Desert, in the Atacama Region. The general physiography is typical of the Atacama Region, consisting of high altitude desert plains and strongly dissected mountain ranges. The current process plant is located at an altitude of 900 masl.

The physiography in the mine area has been significantly impacted by the mining operations (Figure 5-2).

There is no known Area under Official Protection that is affected by the current mining activity or the projected sulphide operation. There are no Priority Sites under official protection within the operation and Project boundaries. However, some of the surface works proposed will affect the Quebrada Guamanga area, which is included in the list of 28 Regional Priority Sites of the Region of Atacama in the Red Book of Native Flora of Atacama. Potential impacts were assessed in the environmental approval processes; control, mitigation and compensation measures were proposed and are being implemented by Mantoverde.

The areas to be used for mining and processing purposes have been classified as unsuitable for agricultural use.

Figure 5-2: Aerial Photograph Showing Physiography of the Mine Area

Note: Photograph provided by Mantos Copper, 2020. Photograph is looking from the southeast

5.5 Seismicity

The central Andes Mountain range is considered to be one of the most active seismic regions in the world. Earthquakes are distributed in three main zones based on the hypo-centre depth:

- A low-depth strip that ranges from 0 km to 60 km in coastal and underwater areas
- A medium-depth strip that ranges from 60 km to 300 km at the foothills and mountain range
- A high-depth strip of 700 km to the east of the Andes Mountains.

The maximum credible earthquake (MCE) is defined as:

- Seismic envelope (percentile 84)
- Earthquake interface M9.0
- Earthquake superior interpolate M8.0
- Located at a hypo-central distance of 57 km from the Project
- Peak ground acceleration (PGA) of 0.63 g.

5.6 Geohazards

Geomorphological assessment has identified a number of geohazards including rock falls, debris avalanches, debris flows, debris flood and landslide deposits.

Within the mine and plant area two specific zones with potential rock falls along the slope have been identified: on the northern side of the existing Oxide Plant and on the western side of the south low-grade leach pad. The first area shows some indications of rock block movements on the high slope and debris flows on the lower slope which has formed a foothill. A ditch has been excavated between the slope and the mining road to mitigate the risk of rock falling on the road. Debris flows and landslides are found in quebrada (ravine) areas. The Guamanga and Las Ánimas Quebradas and El Salado River are the areas most prone to this type of risk.

Historically, major rainfall events have affected local communities about every 5 to 10 years in the El Salado River basin. There are no human settlements in the Guamanga and Las Ánimas basins. The rainfall events can result in flooding, debris flows and landslides that can block access roads and railways, damage buildings, affect drinking water quality and cause temporary interruption of access roads. The effect of these events on existing operations has been primarily temporary interruptions on access roads and power supply, no significant impact on operating facilities has occurred.

5.7 Comments on Section 5

- Mantos Copper is familiar with the site and local conditions.
- The Mantoverde site is easily accessible by road and has good access to ports and the local airport.
- There is sufficient area within the current holdings to host the planned infrastructure required for the MVDP.
- Operations are currently conducted year-round, the MVDP is also expected to operate year-round.

6 History

6.1 Exploration History

The exploitation of copper minerals in the Mantoverde District dates back to the beginning of the last century. Early exploration in the district was completed by the Anaconda Mining Company in 1950, Empresa Nacional de Minería (ENAMI) in 1972 and Sociedad Minera Pudahuel from 1978 to 1981.

At the end of 1988 Empresa Minera Mantos Blancos S.A. (EMMB) acquired an option to purchase the Mantoverde Mine. Exploration was undertaken by Minera Anglo American Chile (MAAC) on behalf of EMMB from 1989 to 1990. EMMB completed a feasibility study in 1991–1992, which evaluated the Mantoverde Norte and Manto Ruso deposits and the Montecristo area. Subsequently, the Mantoverde Sur and Franko deposits were discovered.

In August 2001 the mine was renamed the Mantoverde Division of Anglo American Chile. The Kuroki, Punto 62, Celso and Quisco deposits were subsequently identified.

Audley Mining Advisors Ltd. and Orion Mine Finance LLP obtained the operation in August 2015 through the purchase of Mantos Copper from MAAC.

6.2 Production

Open pit mining operations started in 1995. A complete production history is not available; however, the last 5 years of production when the mine was an operating division of MAAC are presented in Table 6-1.

Table 6-1: Historical Production 2010-2015

Period	Production (t Cu)
2010	61,058
2011	58,718
2012	62,239
2013	56,755
2014	51,795
To Aug. 2015	32,276

The current Mantoverde operation consists of five open pits with an annual material movement of approximately 57 Mt (mined rock and rehandling). Heap leach grade material is leached on a dynamic leach pad. Copper is recovered via a solvent extraction-electro-winning (SX–EW) process. Production from Mantoverde for the period August 2015 to August 2017 is provided in Table 6-2.

Table 6-2: Historical Production 2015-2017

Period	Production (t Cu)
aug-15	4,165
sept-15	4,330
oct-15	4,570
nov-15	4,741
dec-15	4,525
jan-16	4,646
feb-16	4,232
mar-16	4,828
apr-16	4,556
may-16	4,636
jun-16	3,940
jul-16	3,702
aug-16	4,004
sept-16	3,805
oct-16	4,140
nov-16	3,551
dec-16	3,699
jan-17	3,065
feb-17	2,824
mar-17	3,255
apr-17	3,650
may-17	3,602
jun-17	3,519
jul-17	3,908
aug-17	4,007

7 Geological Setting and Mineralization

7.1 Regional Geology

The Mantoverde deposit is located in the Province of Chañaral, Atacama Region, Chile, in the eastern part of the Cordillera de la Costa.

Mantoverde is located in an ancient district with numerous Fe, Fe-Cu-Au, Au and Mn deposits, in the southern sector of the Atacama Fault System and within the Cretaceous iron belt.

This metallogenic belt extends along the Cordillera de la Costa between 22° and 34° south latitude and has a diverse assemblage of metalliferous deposits, including copper porphyries, Fe-Cu-Au oxide deposits (IOCG), Fe-apatite oxide deposits, Fe-apatite oxide deposits (IOCG), and Cu-Au oxide deposits (IOCG), Fe-apatite oxide deposits and stratabound deposits (Maksaev et al. 2007) (Figure 7-1).The most important deposits associated with this economically important metallogenic belt are: Andacollo with hybrid type mineralization with porphyry characteristics transitioning to epithermal; Candelaria and Mantoverde with IOCG type mineralization; and El Soldado with stratabound type mineralization.

The larger Cu-rich deposits are associated with the main and, more commonly, subsidiary structures of the Atacama Fault System, and are hosted by Middle to Upper Jurassic andesites and Lower Cretaceous dioritic to quartz dioritic plutons. In the western and northern areas of the belt exists a restricted pre-Andean basement, consisting of Palaeozoic metasedimentary rocks and Triassic plutons, respectively.

Volcanic rocks are the Middle to Upper Jurassic andesites of the La Negra Formation, and the Lower Cretaceous Punta del Cobre Formation. Marine sedimentary rocks assigned to the Lower Cretaceous Chañarcillo Group (Segerstrom and Parker, 1959) are exposed mainly in the eastern part of the region. The Atacama and Chivato Fault Systems (AF and ChFS, respectively, see Figure 7-2 and Figure 7-3) are the main structural elements in the Mantoverde area. Several internal oblique faults have favoured the development of extensional structures that served for the emplacement of the mineralization.

The lithologies of the Mantoverde area show a complex evolution involving early sub-sea floor albitization, followed by very low-grade metamorphism. This was followed, in paragenetic terms, by local K and Fe metasomatism (stage 1) and hydrolysis (stage II), all preceding the emplacement of mineralized sulphide-bearing hematitic breccias and veins (stage II) (Benavides et al., 2008).

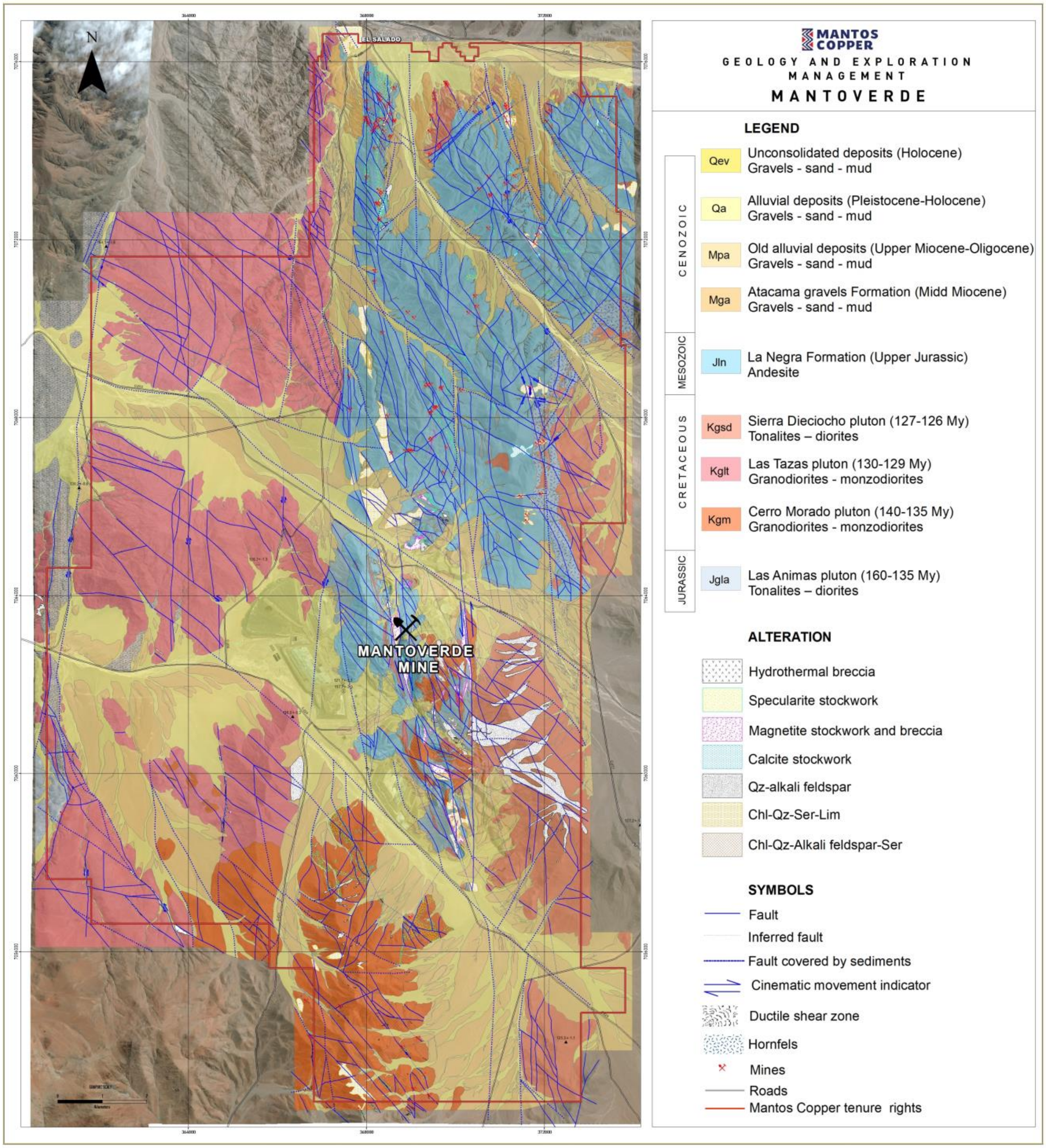
Figure 7-1: Mines in the North of Chile by Era and Metallogenisis

Era	Period	Epoch		Million Years	Metallogenic Belt
CENOZOIC	QUATERNARY	Holocene		0.011	
		Pleistocene		1.8	
	NEOGENE	Pliocene	Upper		
			Lower	5.3	Middle Miocene early Pliocene
		Miocene	Upper		
			Middle		
			Lower		Early to mid Miocene
	PALEOGENE	Oligocene	Upper	23	
			Lower	33.9	Late Eocene - early Oligocene
		Eocene	Upper		
			Middle		
			lower	55.8	Early Eocene Paleocene belt
		Paleocene	Upper		
			Lower	65.5	
MESOZOIC	CRETACEOUS		Santonian	99.6	
		Upper			
		Lower			Early Cretaceous belt
			Neocomian	145.5	
	JURASSIC	Upper (Malm)			Jurassic belt
		Middle (Dooger)		161.2	
				175.6	
		Lower (Lias)		199.6	
	TRIASSIC	Upper		228	
		Middle		245	
		Lower		251	

- Jurassic
- Early Cretaceous
- Early Paleocene Eocene
- Late Eocene - Early Oligocene
- Early to Mid Miocene
- Mid Miocene early Pliocene

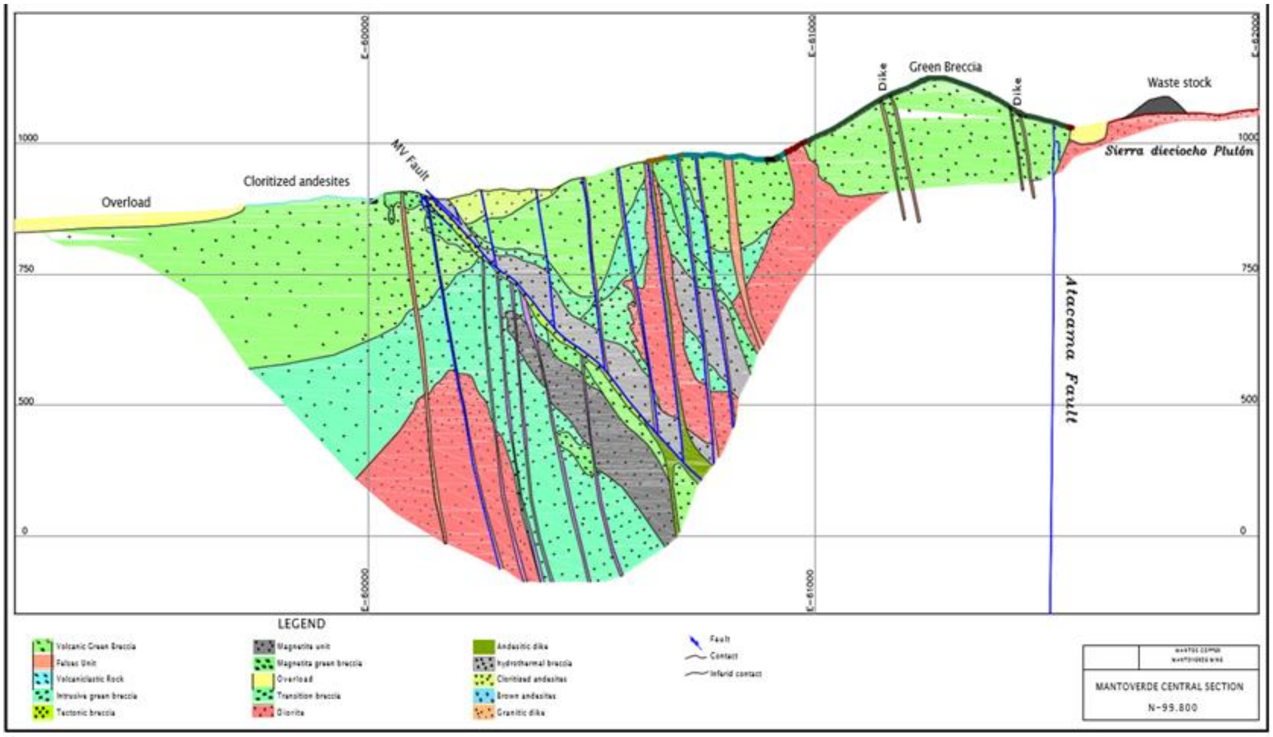
Source: Cochilco, modified from Maksaev et al (2020)

Figure 7-2: Mantoverde Regional Geology



Note: Figure courtesy Mantos Copper, 2020

Figure 7-3: Cross Section through Mantoverde Central



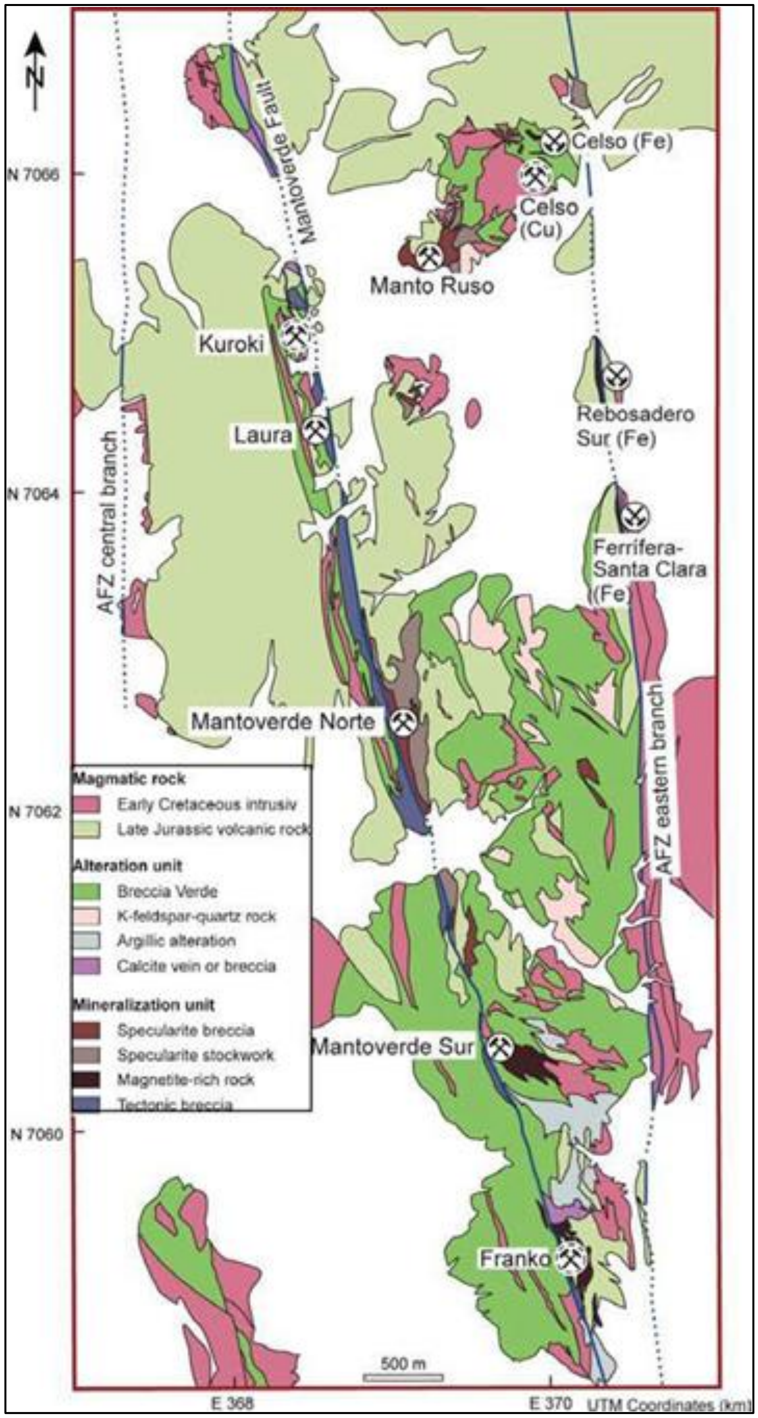
Note: Figure courtesy Mantos Copper, 2020.

7.2 Deposit Geology Overview

The Mantoverde deposit has been defined as a Fe-Cu-Au type (IOCG), located in the Chilean Iron Belt, within the Atacama Fault System (AFS). Locally, it is located along the Mantoverde Fault (FMV) of general orientation N15°-20°W and dip varying from 40°E in the south to 65°E in the north.

Mineralization is hosted in Lower Cretaceous cataclastic andesitic and intrusive (dioritic porphyry) rocks, with three breccia units paralleling the NNW-striking, 40° to 50°E-dipping Mantoverde Fault, a 12 km long subsidiary structure between two N-S master faults of the Atacama Fault System. In the southern half of the Mantoverde Fault there is discontinuous copper mineralization in the form of tabular bodies dominated by specularite (Mantoverde and Laura), pipe breccias (Manto Monstruo and Manto Ruso) and irregular stockwork deposits (Montecristo) (Figure 7-4).

Figure 7-4: Mantoverde District Geology Map



Note: Figure courtesy Mantos Copper, 2020.

Copper mineralization extends for 2.5 km in the EW, 600 m in NS and 800 m in depth. The deposit is oxidized down to 200 m depth. The breccias in the sloping fault block contain abundant haematite with brochantite, minor antlerite, chrysocolla, malachite and atacamite, occurring in veinlets, patches and disseminated in the specularite matrix.

Hypogene mineralization at depth occurs disseminated in the specularite matrix and consists of chalcopyrite and pyrite (chalcopyrite/pyrite = 5/1); same as Candelaria). Between the oxidized zone and the hypogene sulphide zone there is a thin sub-horizontal zone of weak supergene enrichment (3 m to 5 m thick) which contains native copper, cuprite, tenorite and chalcocite (±covellite) partially replacing the hypogene sulphides.

The volcanic and intrusive rocks at Mantoverde were affected by potassic alteration characterized by an intergrowth of K-feldspar and chlorite with minor quartz and hematite. Part of the breccias show K-feldspar and chlorite moderately altered to sericite and clays, accompanied by an increase in specularite, quartz and finely disseminated tourmaline. In addition, late calcite veining occurred. K-Ar ages of altered andesites and altered dikes have yielded 117±3 Ma and 121±3 Ma (Aptian), which have been assigned to the alteration-mineralization process.

7.2.1 Age Dating

There are two methods used to establish the age of iron–copper–gold mineralization and/or hydrothermal alteration. Samples were obtained from altered andesites of the Transition Zone and an altered granite dike. These were dated using the potassium–argon method in sericite, and delivered minimum values of 117±3 Ma and 121±3 Ma, respectively. These values are similar to the sericitic alteration accompanying mineralization in the same age range identified in other Cretaceous deposits in the Cordillera de la Costa (Vila et al., 1996).

7.2.2 Fluid Inclusion Studies

Fluid inclusion studies indicate 180°C to 250°C as homogenization temperatures, and salinities of 30 to 47 wt%NaCl for the iron–copper–gold mineralization. This suggests a late magmatic to hydrothermal origin for the mineralization (Vila et al., 1996; Collao and Ortega, 1999). Deposition of magnetite and chalcopyrite is produced by the oxidation of iron in solution, whereas the subsequent deposition of hematite and chalcopyrite results from the progressive oxidation of magnetite (Zamora and Castillo, 2001; Lopez, 2002).

7.3 Oxide Deposit Descriptions

The main oxide deposits at Mantoverde include:

- Franko: mineralization is controlled by the FMV, is associated with magnetite and occurs in the form of breccias, stockworks and disseminations.
- Laura and Kuroki: hosted in a tectonic breccia formed in a recumbent block of the FMV (i.e. under FMV). At depth the oxide gives way to chalcopyrite that is associated with hydrothermal breccias and specularite stockwork zones.
- Manto Ruso and Celso: oxide copper mineralized bodies are associated with hydrothermal specularite breccias that can grade into specularite stockwork zones.
- Rebosadero: located in a tectonic breccia generated by the intersection of the eastern branch of the ZFA with a set of northwest–southeast and northeast–southwest-trending structures. It consists of a tabular body with oxide copper mineralization in the upper levels, and pyrite and chalcopyrite at depth.

Hypogene sulphide mineralization consists mainly of chalcopyrite and pyrite with lesser amounts of chalcocite, covellite and traces of bornite within specularite and magnetite-cemented breccias and associated stockworks. Magnetite is predominant in the Mantoverde deposits and hematite dominates in the Manto Ruso and Celso deposits.

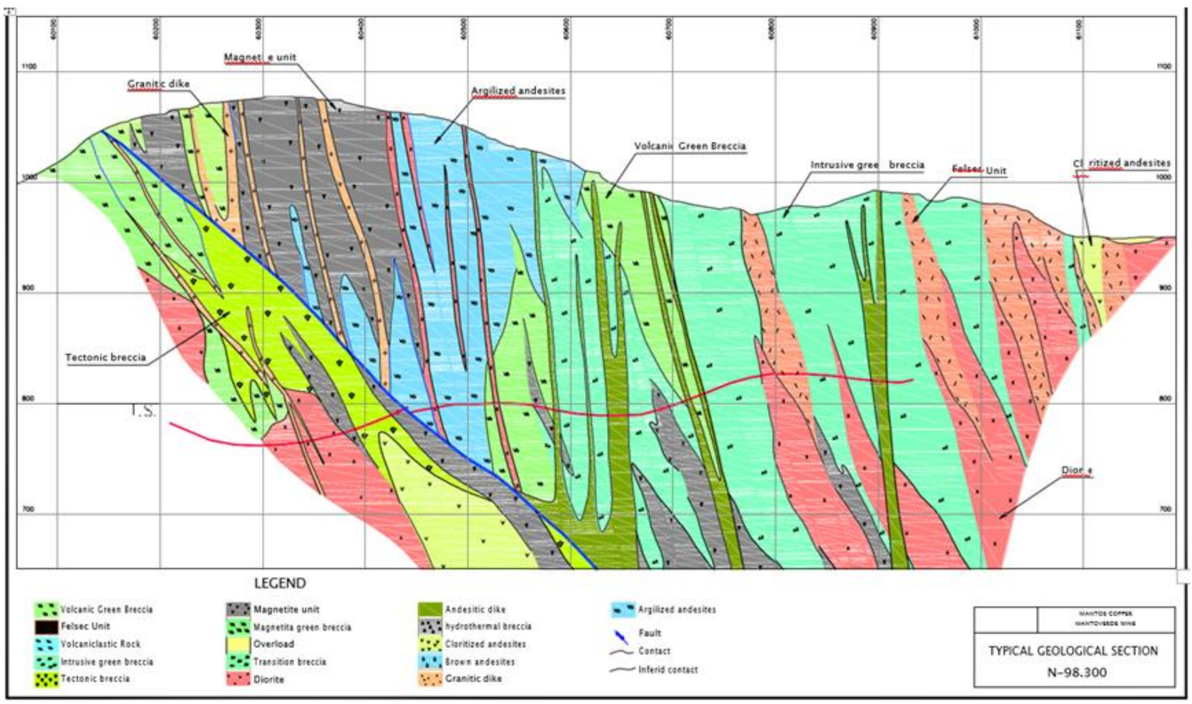
7.4 Hypogene Deposit Description

Based on the different lithologies and location with respect to the FMV four main geological units (UG) have been defined that host mineralization in the Mantoverde deposit (Vila et al., 1996; Rieger et al., 2010). These units are known as UG1 to UG4:

- UG1: magnetite zone that is found mainly in the south of the Mantoverde district, also forms small subordinate bodies. In the central and northern areas, the UG1 unit occurs below 650 masl.
- UG2: green breccia, found in all deposit areas.
- UG3: hydrothermal breccia, found mainly in the centre of the district; forms small bodies in the southern portion of the area.
- UG4: pipe-like breccias that grade into areas of specularite stockwork; found in the Manto Ruso and Celso deposits.

Figure 7-5 is a typical geological section showing the locations of the four units in relation to the FMV.

Figure 7-5: Geological Section Crossing FMV



Note: Red line indicates the Sulphide Roof
Figure courtesy Mantos Copper, 2020

7.4.1 Magnetite Zone (UG1)

The UG1 unit is a magnetite-rich zone hosting copper sulphides which can be located in both the hanging wall and foot wall of the FMV. It is characteristic of the Montecristo and Altavista areas of the Mantoverde Sur deposit. Two styles of mineralization are known:

- Magnetite stockworks and disseminations
- Elongate magnetite-cemented breccia or massive magnetite bodies.

Rocks in the magnetite zone typically consist of magnetite-chlorite-K-feldspar cemented breccias, with igneous rock fragments that have been altered by magnetite, K-feldspar and quartz. Magnetite and muscovite (the pseudomorphic replacement of an earlier specular hematite by magnetite) have been observed. The rocks are cut by K-feldspar ±quartz, calcite, sericite and late specularite-calcite veins. The magnetite-rich rocks may be barren or may contain chalcopyrite (and/or pyrite), mainly in the form of disseminations, patches and discontinuous veining.

The magnetite zone is overlain or enveloped by pervasive argillic alteration in the Mantoverde Sur and Montecristo sectors. The argillic zone stretches from the present surface to the base of the oxidation zone.

At Mantoverde Norte the magnetite zone occurs below 680 masl and is open at depth.

7.4.2 Green Breccia (UG2)

The UG2 unit consists of silicified clasts of volcanic and intrusive rocks of andesitic composition in an altered chlorite-silica-feldspar matrix. The matrix may also contain calcite, subordinate sericite and, locally, zeolite-group minerals (chabasite-phyllite) and small amounts of tourmaline. The rock is cut by low to moderately dense assemblages of K-feldspar quartz, calcite ±siderite, specularite ±quartz and sericite veins.

Rock fragments show pervasive K-feldspar alteration. Towards the surrounding country rocks the UG2 unit grades into a chlorite–quartz-rich stockwork. The UG2 is mostly barren, though locally it can host elevated copper–gold grades. In this case, mineralization is normally related to specularite veinlets.

7.4.3 Hydrothermal Breccia (UG3)

The UG3 unit is a roughly tabular hydrothermal breccia, with an average thickness of about 80 m, but can be up to 200 m thick. The breccia is composed of sub-angular to sub-rounded andesite or granitoid igneous rock fragments in a coarse-grained, calcite-bearing, mineralized specularite matrix. Rock fragments range from a few millimeters to about 35 cm in diameter. They are usually affected by varying degrees of widespread feldspar alteration with chloritization, sericitization, silicitization and/or carbonatization. Locally, tourmaline, minor sphene or scapolite may be present.

Below the oxidation zone (below mining level 780 masl), the specularite-rich matrix contains pyrite and chalcopyrite. Digenite and bornite can locally replace the chalcopyrite.

The rock is cut by veinlets of K-feldspar ±quartz, tourmaline or sericite. The last stage of hydrothermal activity consists of calcite and specularite veinlets.

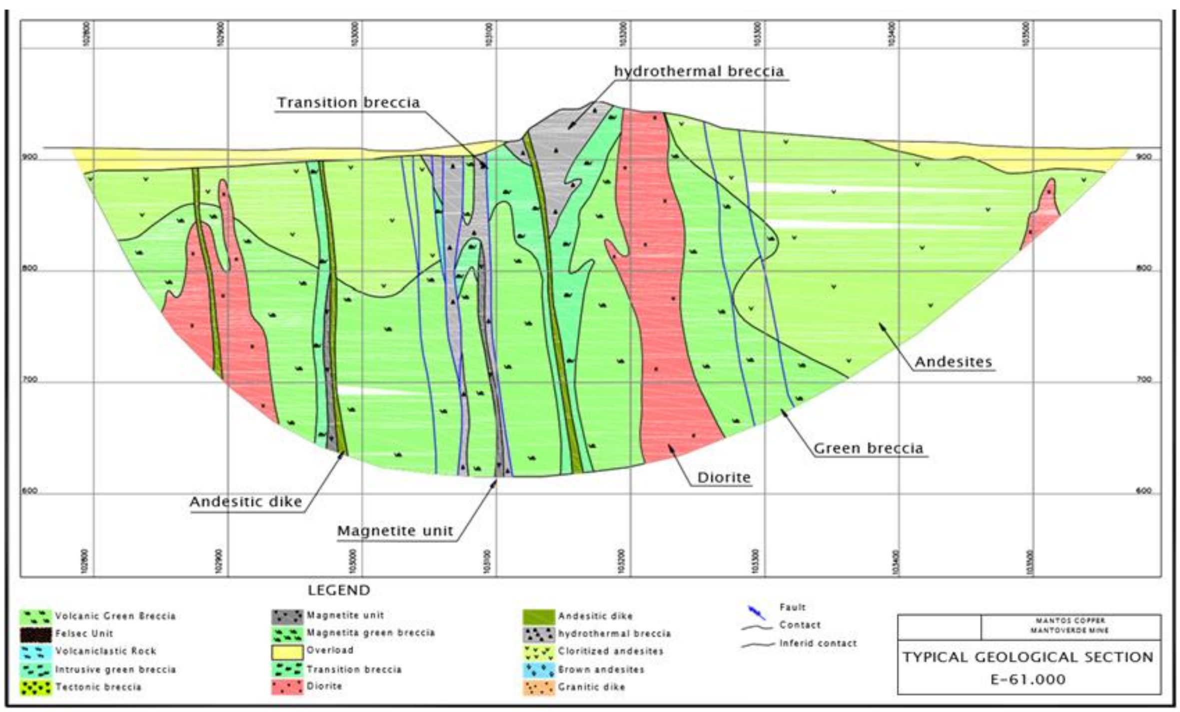
The distal zone of the hydrothermal breccia unit is called the Transition Zone and is characterized by specularite stockworks that contain, depending on depth, oxide, mixed or sulphide copper mineralization. The wall rock alteration is essentially the same as that seen in the UG3 unit. Minor alteration phases include tourmaline, sphene and apatite.

7.4.4 Manto Ruso (UG4)

The UG4 unit is found in the Manto Ruso deposit that has been subject to small-scale mining activity. Prior to mining, the deposit was a 400 m long and 100 m wide body, oriented N70° to 80°E, it was covered by unconsolidated material to the south. The thickness of the oxidation zone is variable and lies between 40 m and 150 m below surface level (800 masl to 850 masl). Hypogene copper mineralization is present at depth.

The Manto Ruso deposit is hosted in andesitic volcanic–volcaniclastic rocks and intrusive diorite of the Sierra Dieciocho complex; the latter outcrops immediately to the east of the deposit. The deposit consists of a sub-horizontal specularite-cemented hydrothermal breccia. The breccia contains angular andesite and diorite fragments which are affected by strong K-feldspar alteration and silicification ±chloritization. Pyrite, chalcopyrite and, locally, bornite and digenite occur interstitial to specularite. The specularite-cemented breccia grades into a specularite stockwork zone (the Transition Zone). Host rocks are characterized by strong pervasive quartz, K-feldspar or sericite alteration. The rocks are cut by specularite–calcite veinlets (see Figure 7-6).

Figure 7-6: Manto Ruso Geological Section



Note: Figure courtesy Mantos Copper, 2020

7.4.5 Celso (UG4)

The UG4 unit is also found in the Celso area, east of Manto Ruso, this area was previously mined for iron (Ferrífera Celso). The martitized magnetite bodies appear to be controlled by north and northwest-trending structural corridors and are located mainly at the contact between volcanic rocks and diorites. The copper mineralization is related to a 20 m to 60 m thick, N 40° to 55° W trending and 55° to 70° W dipping, specularite-cemented hydrothermal breccia body (the Celso breccia). The breccia is surrounded by a specularite stockwork hosted predominantly in diorites. The oxidation level extends to 100 m to 150 m depth (820 masl to 920 masl). Below these levels hypogene sulphides occur over a vertical distance of at least 300 m. The host rocks at Celso are similar to those hosting the mineralization at Manto Ruso, the Celso breccia is also similar to the breccias at Mantoverde Norte and Manto Ruso. The breccia is composed of fragments of silicified diorite and minor andesite in a specularite matrix. It contains matrix disseminations of chalcopyrite and pyrite and is cut by chalcopyrite–pyrite–bearing veinlets. The surrounding copper sulphide-bearing specularite stockwork (the Transition Zone) is hosted in pervasively silicified and chloritized rocks.

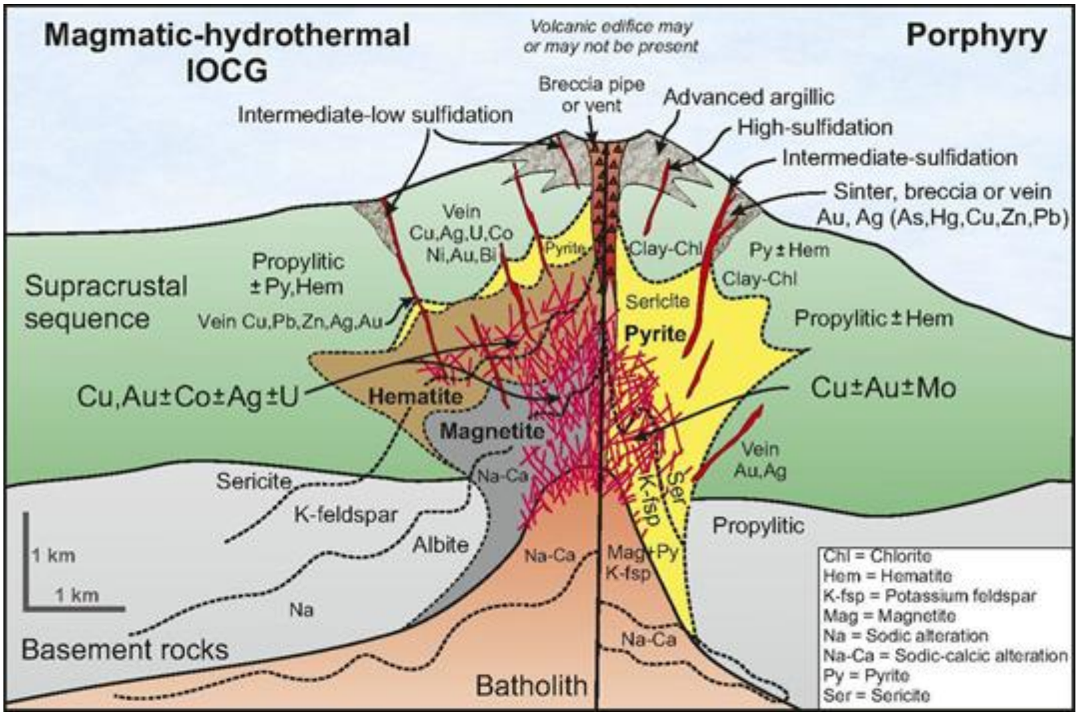
The hydrothermal breccias of the Manto Ruso and Celso deposits were considered as a single metallurgic unit (UG4) within the traditional geological model. This model has subsequently been updated for geometallurgical purposes.

8 Deposit Types

8.1 Introduction

The Mantoverde deposit is considered to be an example of an iron oxide–copper–gold (IOCG) deposit. Global examples include Olympic Dam in Australia, Candelaria and Punta del Cobre in Chile, and Salobo and Sossego in Brazil. Figure 8-1 shows a typical schematic of an IOCG deposit.

Figure 8-1: Typical Schematic Section, IOCG Deposit



Note: Figure from Richards and Mumin, 2013

8.2 Iron Oxide–Copper–Gold (IOCG) Deposits

The following general description of IOCG deposits is based on Williams et al. (2005).

IOCG deposits as a group generally have the following characteristics:

- Copper ±gold as the main elements of economic interest
- Hydrothermal mineralization styles
- Strong structural controls
- Abundant magnetite ±hematite
- Iron oxides with the iron:titanium ratio greater than those found in most igneous rocks or the bulk crust
- No obvious spatial association with igneous intrusions, whereas porphyry and skarn deposits do show such associations.

IOCG deposits typically present the following characteristics:

- Space–time association with Kiruna-type apatite-bearing iron oxide ores
- Space–time association with granite batholiths
- Occur in crustal settings that commonly display extensive and pervasive alkali metasomatism
- Unusual minor element suite, including combinations of fluorine, phosphorus, cobalt, nickel, arsenic, molybdenum, silver, barium, lighter rare earth elements (LREE) and uranium
- Wide age range from Archean to Jurassic–Cretaceous
- Wide range of host rock settings, the most common of which include plutonic granitoids, volcanic and metavolcanic rocks, siliclastic–metabasic rocks and their metamorphic equivalents
- Host rocks may be similar in age to the mineralization or there may be a significant age gap such that host rocks pre-date mineralization and ore formation relates to a different geological event
- Mineralization occurs over a wide depth range from close to the surface to nearly 10 km deep
- Structural and stratigraphic controls are important; deposits frequently are located on fault bends and intersections, shear zones, rock contacts, breccia bodies; they can also occur as lithology-controlled replacements
- Can display strongly zoned mineral paragenesis
- Intense hydrothermal alteration is common
- Variable pressure and temperature conditions associated with alteration and mineralization can result in a deposit continuum
- When iron mineralization is dominantly magnetite; biotite, K-feldspar and amphibole are the dominant alteration minerals
- When iron mineralization is dominantly hematite; sericite and chlorite are the dominant alteration minerals
- Where present, sodium and sodium–calcium alteration is more distal from the ore, is more extensive than potassium–iron alteration and pre-dates that event.

8.3 Mantoverde Deposit

Features of the Mantoverde deposit that support classifying it as an IOCG deposit include:

- Strong structural controls: hosted in a subsidiary structure of the plate boundary-parallel Atacama Fault System; strong regional tectonic control by northwest to north–northwest-trending brittle structures
- Space–time association with batholiths: hosted by Middle to Upper Jurassic andesites and Lower Cretaceous dioritic to quartz dioritic plutons
- Space–time association with Kiruna-type apatite-bearing iron oxide bodies: district-scale association with bodies of metasomatic magnetite and magnetite–fluoroapatite–pyrite

- Copper ±gold as the main elements of economic interest: abundance of iron oxides associated with copper minerals and a lower proportion of gold; chalcopyrite-rich and hematite-cemented breccias and veins
- Hydrothermal mineralization styles: hypogene zone formed mainly by chalcopyrite, pyrite and minor amounts of chalcocite, covellite and bornite in specularite and magnetite breccia associated with the Mantoverde fault and/or second order structures, distributed in three main bodies: Mantoverde (MV), Manto Ruso (MR) and Celso (CE).

The Mantoverde deposits differ slightly from the classic IOCG model in that the deposits have high cobalt grades and no arsenic anomaly.

9 Exploration

9.1 Geological Mapping

Field mapping was completed by Empresa Minera de Mantos Blancos (EMMB) over a 5 year period from 1977 to 1982, generating reports and detailed maps describing lithology, alteration, structure, mineralogy and copper–molybdenum–gold–silver distributions.

A 1:10,000 scale geological mapping program over the Mantoverde property was completed during 2012 and 2013 by Anglo American. This mapping program focused on identification of lithologies, alteration, mineralization and structures. The mapping program was extended during 2013 to areas outside the Mantoverde concessions and resulted in the generation of several exploration targets. The geological interpretation was revisited during 2014 to incorporate findings from a high resolution, aerial magnetic/radiometric data set into the 1:10,000 scale district maps.

Detailed geological mapping at 1:2,000 and 1: 5,000 scales was undertaken at selected exploration targets from 2012 onwards. This program was also used to identify local-scale structures and alteration mineralization assemblages.

During 2015 Mantoverde developed a program to compile the geoscientific data, including geological, geochemical and geophysical interpretations, available for the mine and surroundings into a single database. As part of this program structural mapping and structural interpretation was conducted in 2015–2016 by a structural geologist consultant (Daniel Carrizo).

In 2017 geological mapping was carried out at a scale of 1:5000 for all Mantos Copper's mining properties around the Mantoverde deposit. The detailed mapping defined sectors of interest (targets) where NS structures intersect with NE structures and whose geology shows evidence of surface mineralization.

9.2 Geochemical Sampling

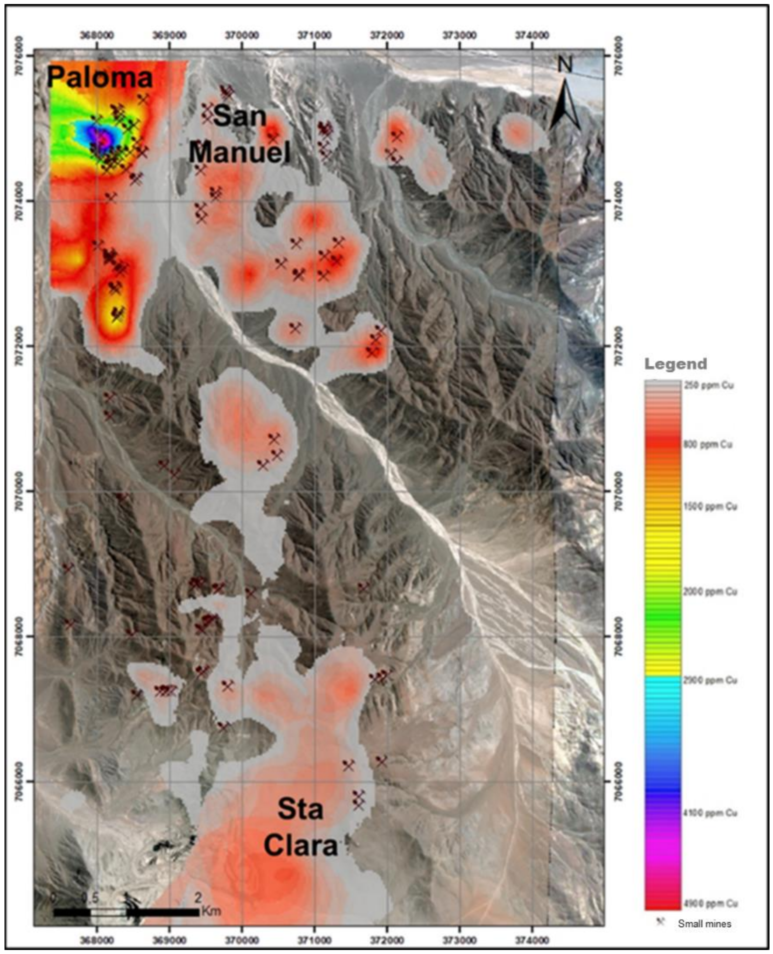
Geochemical sampling in the form of rock chip, grab and soil sampling has been undertaken since the 1970s to delineate surface copper, gold and silver anomalies. As road cuts became available, these were typically channel sampled to provide additional vectors to mineralization. The majority of this work has been superseded by drilling and mining activity.

Occasionally, as drill platforms were established, a detailed rock chip program on approximately 5 m centres, accompanied by 1:100 scale geological mapping, was undertaken where there was a surface outcrop at the drill site.

Between 2017 and 2018 geochemical sampling of drainage sediments to the north and northeast of the Mantoverde area (787 samples) was carried out. The sectors to be sampled were defined based on the district geological mapping. This sampling included chemical analysis of Ag, Al, As, Au, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sr, Ti, Tl, U, Zn and Zr.

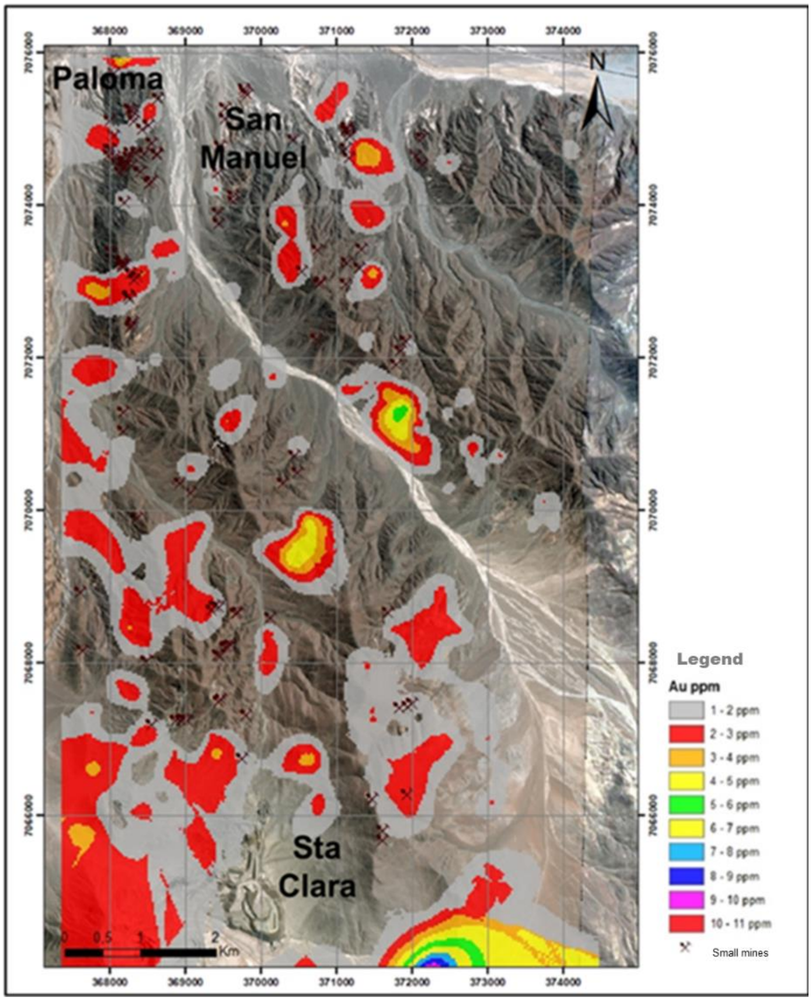
The chemical analysis resulted in the identification of copper and gold anomalies which are shown in Figure 9-1 and Figure 9-2.

Figure 9-1: Mantoverde Copper Anomalies



Note: Figure courtesy Mantos Copper, 2020

Figure 9-2: Mantoverde Gold Anomalies



Note: Figure courtesy Mantos Copper, 2020

9.3 Geophysical Surveys

Mantoverde is an IOCG type deposit with magnetite mineralization, therefore, geophysical exploration is considered to be a useful exploration tool for this deposit. Several geophysical campaigns were carried out by specialist contractors over the Mantoverde area during the 1990s and 2000s, including Geoexploraciones S.A., Geodata Ltda., Flight Falcon, World Geoscience Corporation (WGC) and Fugro Airborne Surveys (Fugro). Methodologies included: electrical (induced polarization (IP)/resistivity), electromagnetic audio-magnetotellurics (AMT), aerial gravity and ground and aerial magnetic surveys.

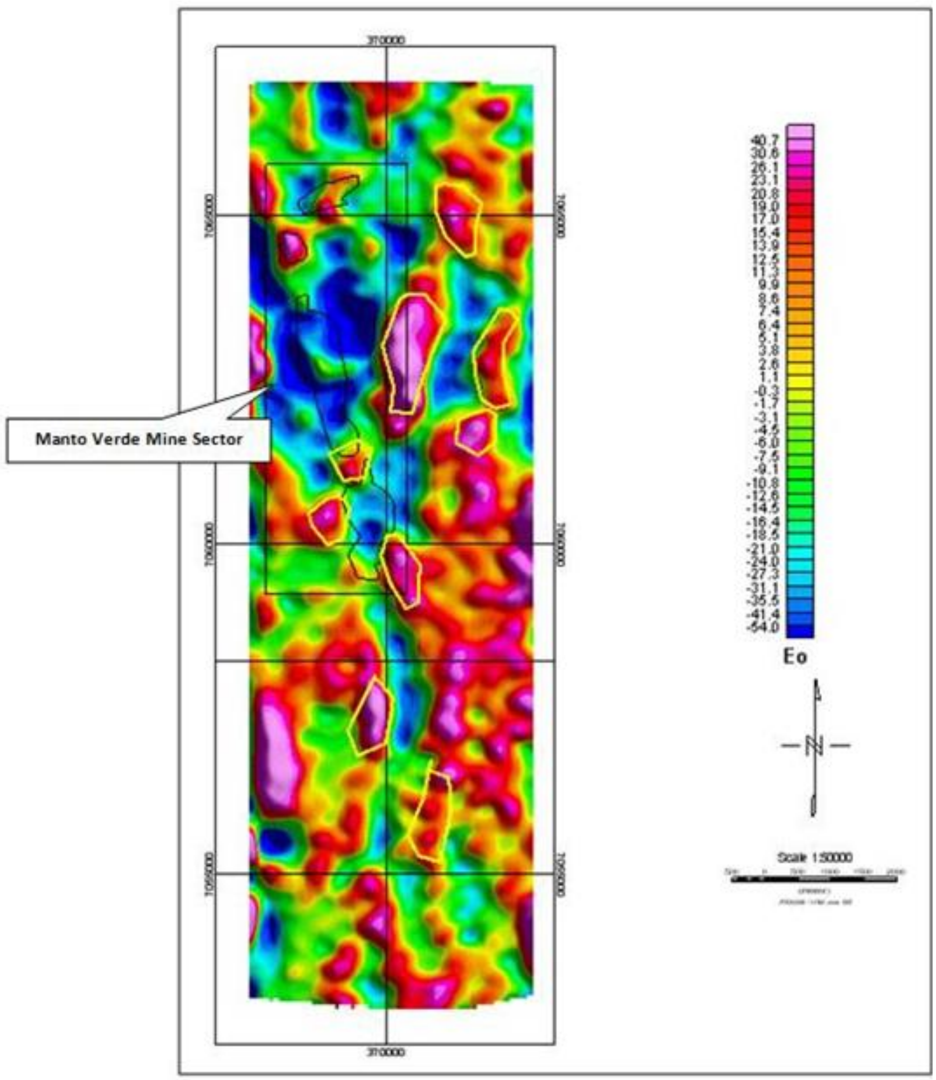
Resistivity and AMT surveys identified areas of disseminated sulphides in veins and zones of moderate to strong resistivity contrasts. Other methods supported structural and lithological interpretations that could be used for exploration vectoring.

9.3.1 Airborne Magnetic Geophysics Survey

Figure 9-3 shows the results of a regional airborne magnetic survey with anomalous zones outlined in yellow.

Drill testing of selected geophysical targets in 1999–2000 indicated that the magnetic anomalies were caused by magnetite–pyrite bodies.

Figure 9-3: Gravity, Vertical Gradient



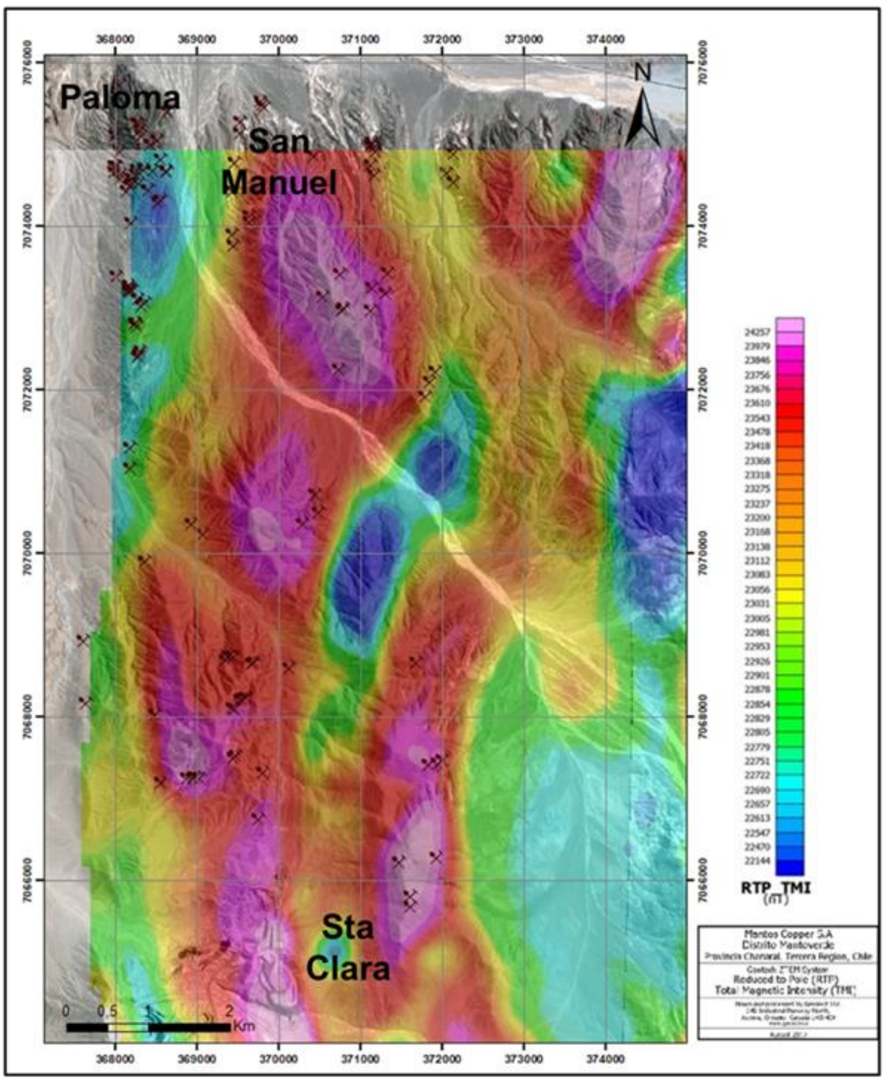
Note: Figure courtesy Mantos Copper, 2020. Yellow polygons show known mineralized zones

9.3.2 ZTEM Geophysical Survey

During July and August 2017 a geophysical survey was carried out along the Mantoverde deposit, focusing on the areas of major geological interest defined based on the geological mapping. The survey was carried out using the ZTEM methodology and helicopter flight lines separated by 500 m and 250 m.

The results of this geophysical survey provided useful data at different depths depending on the penetration of the applied Hz, which ranged from 600 Hz (360 m) to 19 Hz (2,000 m). The geophysical results reflect the NE structures that are present in the area of interest and that the geological mapping and mining experience identified as controlling the occurrence of copper mineralization. This is shown in Figure 9-4.

Figure 9-4: Geophysics for Mantoverde



Note: Figure courtesy Mantos Copper, 2020

9.4 Petrology, Mineralogy and Research Studies

A number of petrographic and metallurgical studies have been completed in support of determination of deposit mineralogy and mineralization paragenesis. A number of research papers have been published or presented describing the deposit genesis and deposit setting. Three bachelor's degree theses have been completed on the deposit, and one PhD thesis:

- Diaz, M., 2000: Geologic Resource Estimation for Guamanga Prospect (Montecristo – Franko sectors). Chañaral Province. III Region, Chile. Thesis for Geology Degree. Geology Department. Engineering and Geological Science School. Católica del Norte University. Antofagasta
- Astudillo, C., 2001: Distribution and Characterization of Mantoverde Carbonates, Chañaral Province. III Region, Chile. Thesis for Geology Degree. Geology Department. Engineering and Geological Science School. Católica del Norte University. Antofagasta
- Lopez, E., 2002: Petrographic Characterization and Study of the Hydrothermal Alteration and Mineralization of the Mantoverde District, Chañaral Province. III Region, Chile. Thesis for Geology Degree. Geology Department. Engineering and Geological Science School. Católica del Norte University. Antofagasta
- Benavides, J., 2006: Iron oxide-copper-gold deposits of the Mantoverde area, northern Chile: Ore genesis and exploration guidelines: Unpublished Ph.D. thesis, Kingston, Ontario, Queen's University, 355 p.

9.5 Exploration Potential

Based on the existing experience of the Mantoverde mine operation and the exploration program completed over recent years, it is considered that there is significant exploration potential in the area under the control of Mantoverde.

9.5.1 Structural Control

A drilling campaign was conducted during 2016-2017 in an area where intersections of north-south, northwest and northeast trending structures were identified. As a result of this campaign several intercepts with copper-iron mineralization were identified, which in some cases extended under the waste dumps of the Manto Ruso open pit.

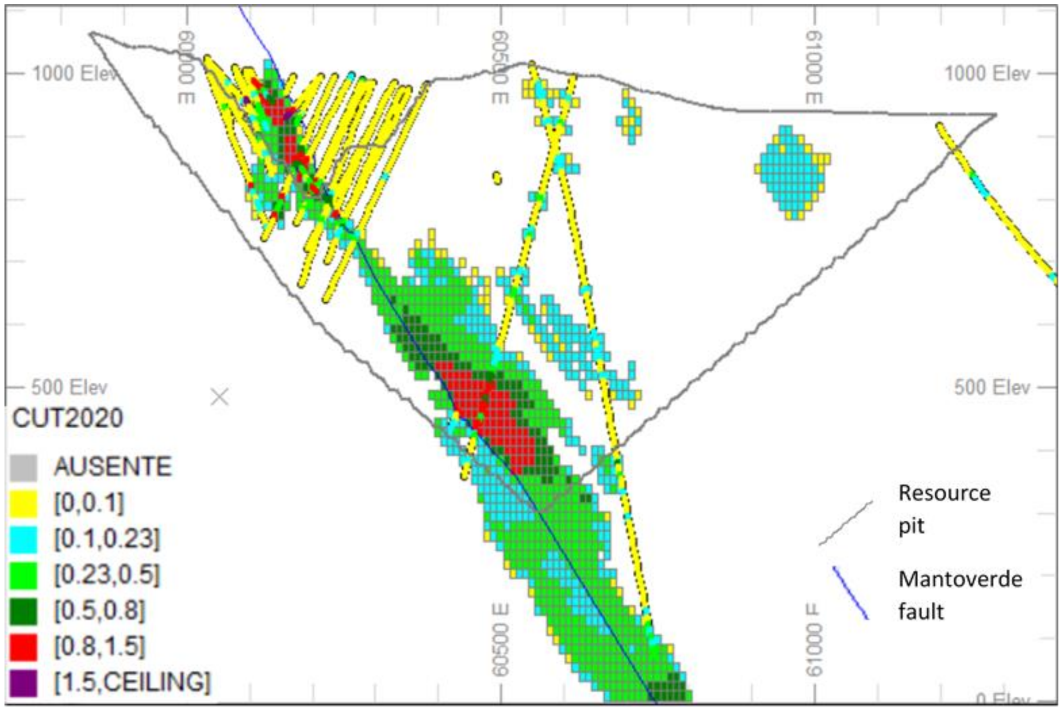
The results of the drilling also resulted in a re-interpretation of the fault movement and the displacement of the fault block where the Mantoverde Fault and the northeast faults intersect. This new interpretation indicates that the Mantoverde Fault block has tilted to the east, causing the specularite hydrothermal breccia to descend to deeper depths in this area (Figure 9-5).

9.5.2 Northward Extension

Drilling completed in 2001 (DDH01CN01, DDH01CN04, DDH01DS11) indicates that mineralization continues to the north of Mantoverde Norte and may be continuous as far as the Manto Ruso area (Figure 9-6). This interpretation is supported by the presence of oxide mineralization that has been mined along the projected extension.

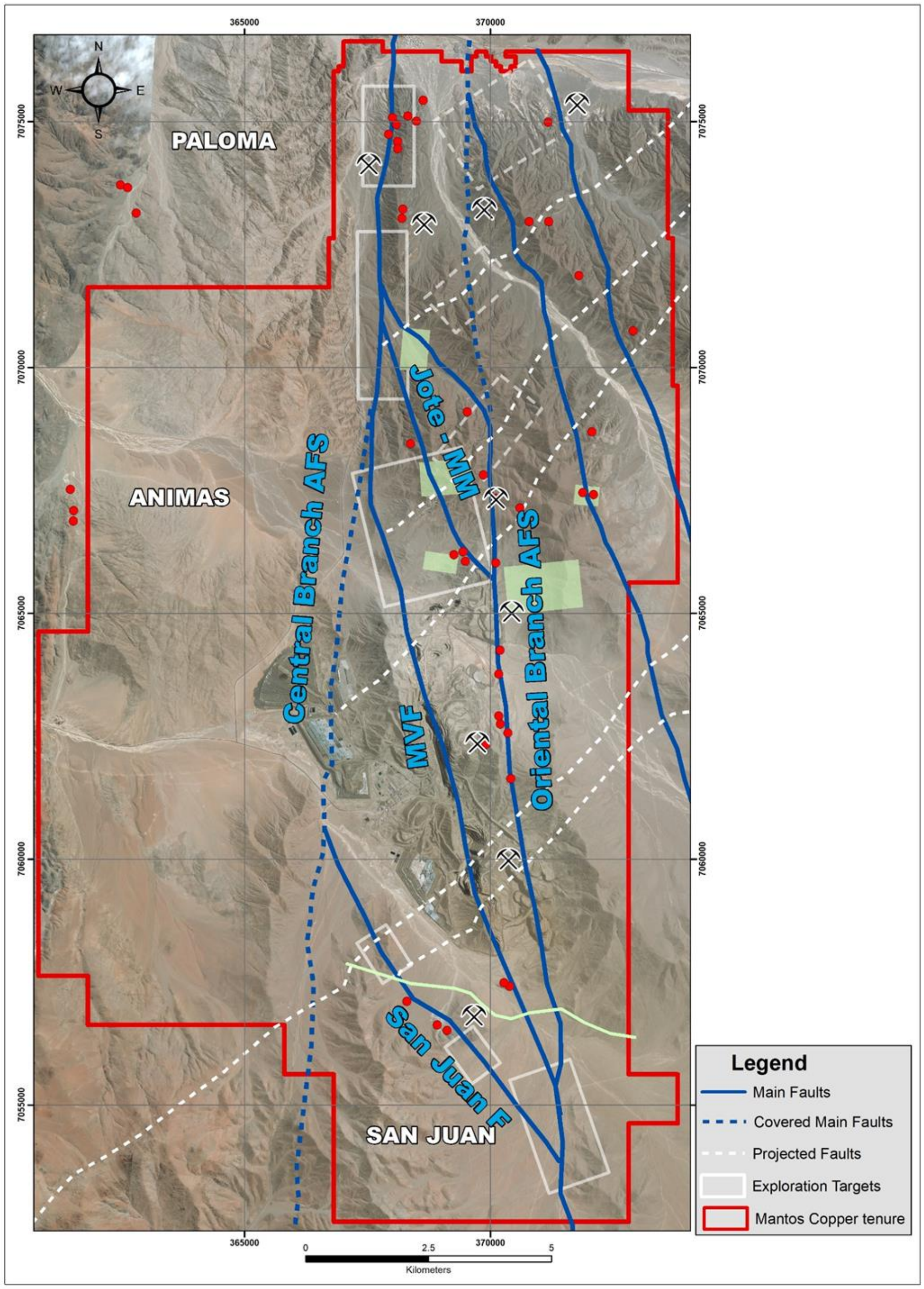
Additional exploration potential remains within the concession holdings in the 12 km corridor that extends northward along the Atacama Fault Zone between Mantoverde Mine and the settlement of El Salado.

Figure 9-5: Interpretation of Location of Hydrothermal Breccia Subsequent to Fault Movement.



Note: Section W-E 102.000N, using 60 m clipping. Figure courtesy Mantos Copper, 2020.

Figure 9-6: Exploration Targets within Mantoverde District



Note: Figure courtesy Mantos Copper, 2020.

10 Drilling

10.1 Introduction

From 1989 to 2020 a total of 871,098 m has been drilled in 4,322 reverse circulation (RC) and diamond drill holes (DDH); the majority (3,450) are RC (623,645 m).

Drilling is summarized in Table 10-1 by operator. Drill collar locations are shown in Figure 10-1. Table 10-2 presents the drill holes that constitute the data support for the MVDP. The drill collar locations are shown in Figure 10-2.

10.2 Historical Drill Data

10.2.1 Mantos Blancos–Anglo American (1988–2014)

Anglo American Chile began exploration activities during 1988 in the area now occupied by the Mantoverde Norte pit.

The DTH method was used only to a maximum depth of 60 m. No DTH drilling is used in the construction of the block model and no DTH data is used to support the Mineral Resource Estimate.

All drill holes were drilled with initial angles ranging between -50° and 90°. RC holes were drilled at 5½" diameter and core holes were HQ size.

Drilling identified the presence of hypogene sulphide mineralization at depth. Hence, during 2000 and 2001 drill holes were drilled specifically to test for hypogene mineralization. During 2000 two RC drill holes (180 m) and six DDH drill holes (2,724 m) were completed; and during 2001 nine RC holes (3,518 m) and 18 DDH holes (10,106 m) were drilled (see Table 10-2).

Several exploration campaigns for sulphide mineralization were carried out between 2007 and 2014, supported by findings from infill drilling campaigns during mining operations (see Table 10-2).

10.2.2 Enami (1999)

During 1999 seven RC (2,127 m) and seven DDH (1,122 m) drill holes totaling 3,249 m were drilled in the Laura-Laurita sector. RC holes were drilled at 114.3 mm diameter. Core holes were HQ (63.5 mm core diameter).

10.2.3 Mantos Copper (2015-2020)

The Mantos Copper drilling program includes all data collected since Mantos Copper acquired the project in September 2015. Mantos Copper has completed a total of 285 RC drill holes (47,714 m) and 129 DDH (44,882 m), totalling 92,596 m (see Table 10-1, years 2016-2020).

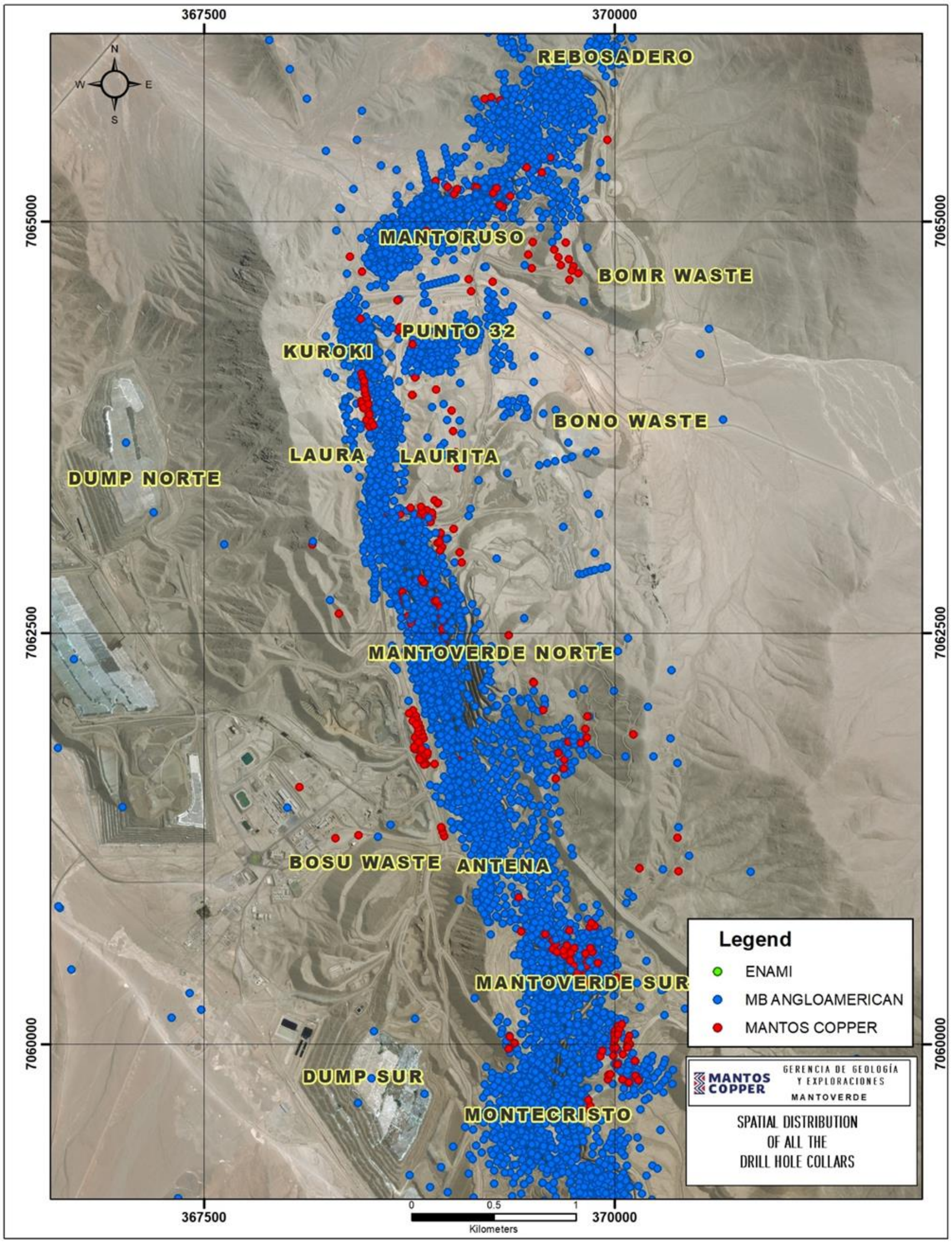
For DDH drill holes the usual diameter is HQ, although occasionally PQ (85 mm) was used to obtain metallurgical samples and NQ (47.6 mm) was used to solve operational problems or to deepen holes beyond the original planned depth. For RC holes the normal diameter is 114.3 mm.

Drilling companies acting as contractors during the hypogene drilling programs include Geoperaciones S.A., Terraservice S.A. and Mineral Drilling S.p.A. Equipment used includes a Schramm T685WS drill rig for RC drilling, and Sandvik DE710 and Atlas Copco CT20 drill rigs for DDH.

Table 10-1: Drilling Campaigns Summary

Company	Year	RC Holes	Metres (m)	DDH Holes	Metres (m)	Total Metres (m)
Mantos Blancos Anglo American	1989	47	10,547	20	4,599	15,147
	1990	25	4,176	10	1,901	6,077
	1991	14	896	71	8,156	9,052
	1992	1	29	83	8,312	8,341
	1993	14	2,471	0	0	2,471
	1994	0	0	21	2,353	2,353
	1996	46	7,475	30	4,248	11,722
	1997	64	8,824	17	2,072	10,896
	1998	99	19,190	16	3,388	22,578
Enami	1999	7	2,127	7	1,122	3,249
Anglo American	1999	122	23,827	11	5,336	29,163
	2000	164	29,634	26	7,957	37,591
	2001	261	50,104	31	15,711	65,815
	2002	253	43,262	7	1,015	44,277
	2003	325	52,729	0	0	52,729
	2004	291	49,040	0	0	49,040
	2005	143	26,556	0	0	26,556
	2006	102	18,678	3	253	18,931
	2007	94	20,030	32	13,350	33,380
	2008	87	23,229	76	27,428	50,656
	2009	102	17,472	6	1,991	19,464
	2010	138	30,936	33	13,956	44,892
	2011	143	25,574	29	5,893	31,467
	2012	95	18,999	35	12,680	31,679
	2013	157	25,200	58	18,363	43,563
	2014	209	36,935	105	34,075	71,010
	2015	162	27,991	16	8,413	36,403
Mantos Copper	2016	127	27,146	113	37,772	64,918
	2017	84	12,046	0	0	12,046
	2018	51	5,862	15	6,990	12,852
	2019	19	1,486	1	120	1,606
	2020	4	1,174	0	0	1,174
Total		*3,450*	*623,645*	*872*	*247,454*	*871,098*

Figure 10-1: Drill Hole Collar Locations

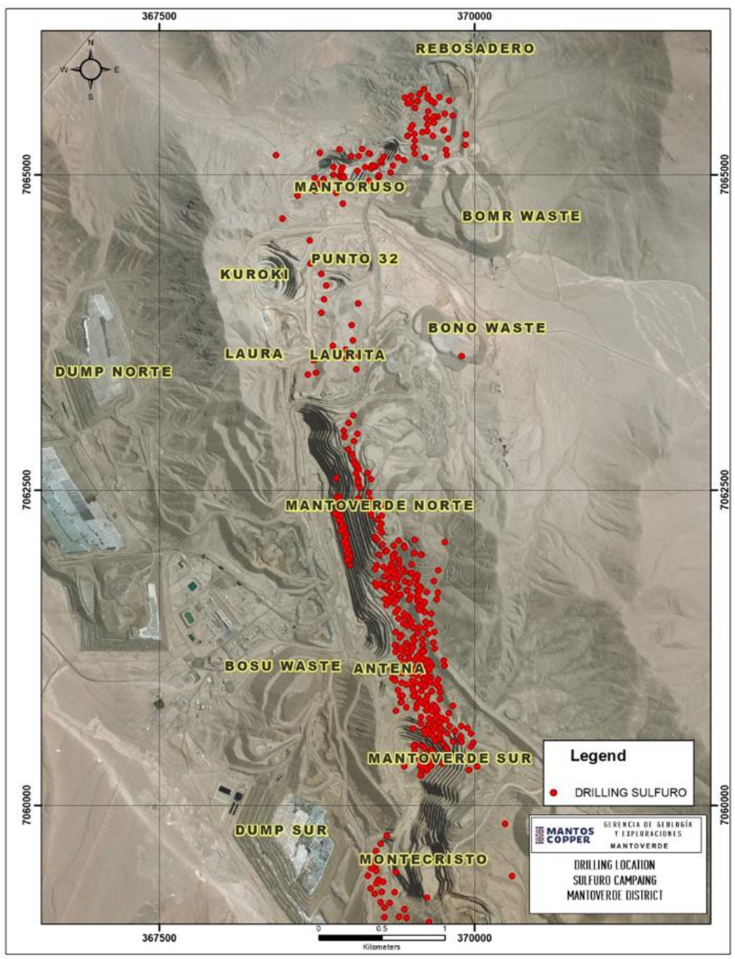


Note: Figure courtesy Mantos Copper, 2020.

Table 10-2: Drilling Campaigns Summary MVDP

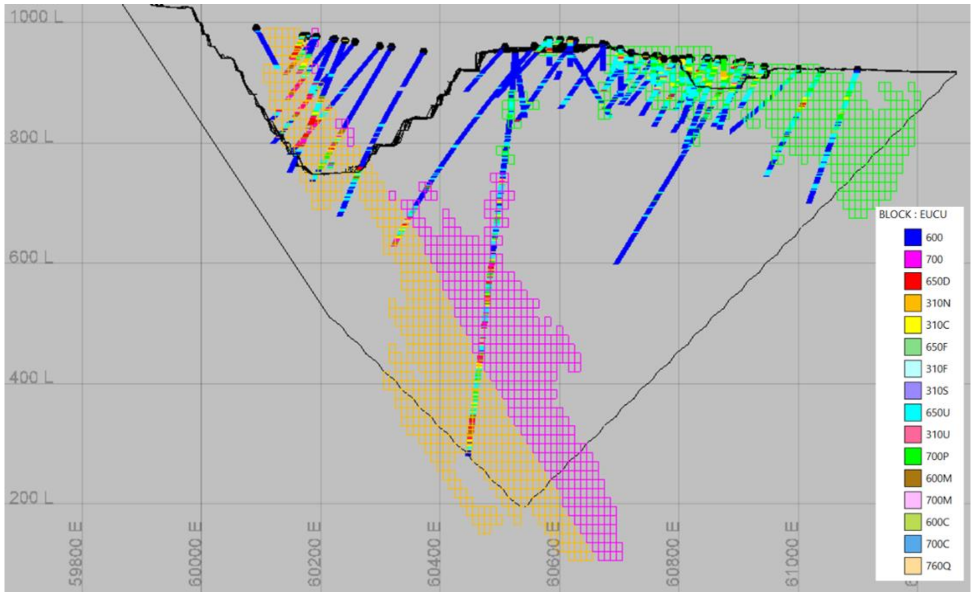
Company	Year	RC Holes	Metres (m)	DDH Holes	Metres (m)	Total Metres (m)
Anglo American	2000	2	180	6	2,724	2,904
	2001	9	3,518	18	10,106	13,624
	2007	27	8,574	32	13,401	21,975
	2008	36	11,632	69	26,427	38,059
	2010	43	13,158	33	13,741	26,899
	2011	5	1,720	18	4,545	6,265
	2012	0	0	1	601	601
	2014	1	580	95	29,860	30,440
	2015	0	0	16	8,587	8,587
Mantos Copper	2016	0	0	113	37,772	37,772
	2017	0	0	0	0	0
	2018	0	0	15	6,990	6,990
	2019	0	0	0	0	0
	2020	0	0	0	0	0
Total		*123*	*39,362*	*416*	*15,4754*	*19,4116*

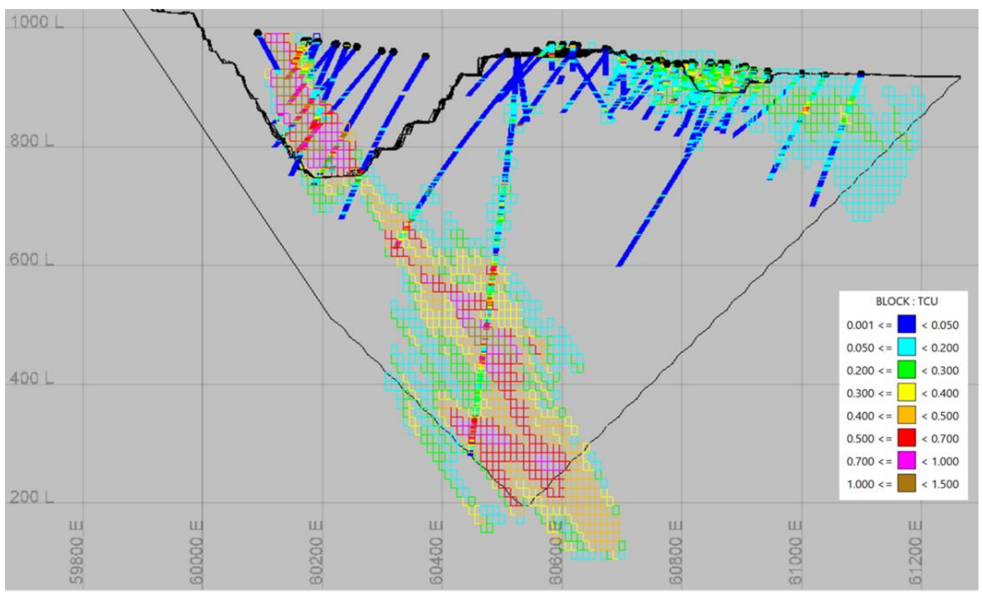
Figure 10-2: Drill Collar Location MVDP



Note: Figure courtesy Mantos Copper, 2020.

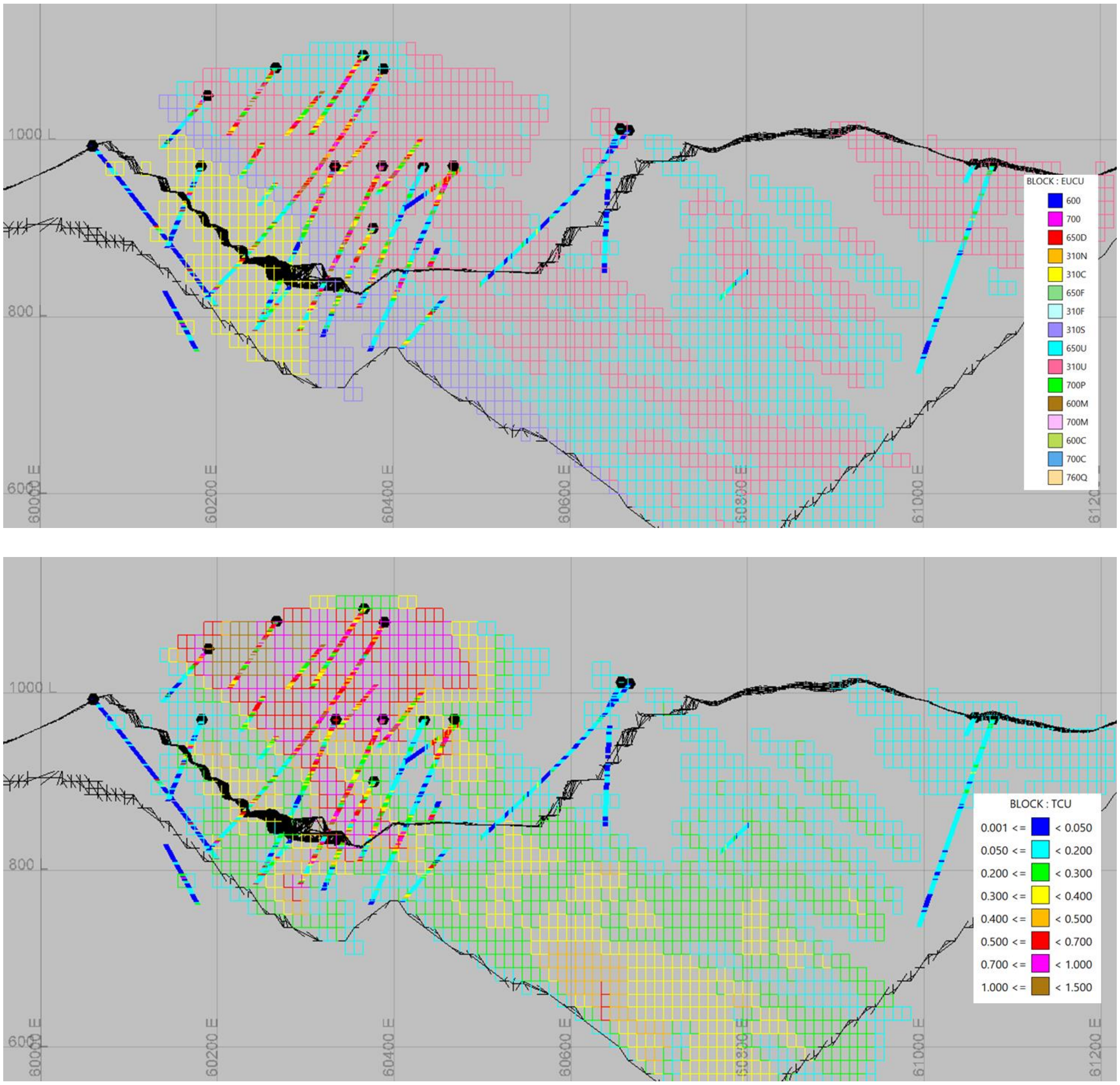
Figure 10-3: Section 102,390 N showing Block Model and Composites





Note: Top: EU
Bottom: TCu
Topography corresponds to the Resource Pit at December 2020
Figure courtesy Mantos Copper, 2020

Figure 10-4: Section 98,220N showing Block Model and Drill Holes



Note: Top: EU
Bottom: TCu
Topography corresponds to the Resource Pit at December 2020
Figure courtesy Mantos Copper, 2020

10.3 Logging Procedures

10.3.1 Historical Logging

There is no record of the logging procedures used in the geological description of the drill holes drilled by Enami; however, these drill holes are now mostly located in mined zones.

Previously, during the Anglo American drilling campaigns, the corporate procedures were used. Paper sheets were used to record the main geological variables that are used in the construction of the geological models.

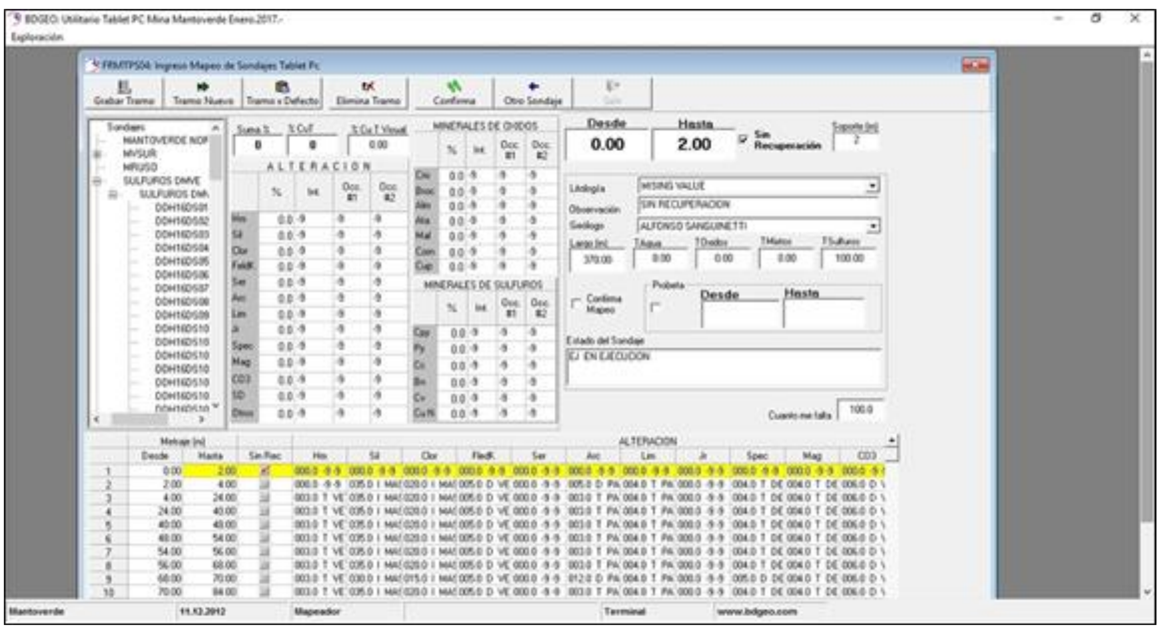
Starting with the 2007 drilling campaign, the logging of drill holes was done digitally using a laptop computer and exported to a corporate database managed using BDGEO. Pre-defined legends and alphanumeric codes were used to record RC and DDH drill hole descriptions. Data recorded includes geological variables of lithology, structure (faults, fractures, fault angles with respect to the core axis), alteration (sodic-calcareous, potassic, silicification, chloritization and presence of magnetite, specularite, calcite), mineralization (iron oxides, copper oxides, copper sulphides, pyrite, style of mineralization) and oxidation zones (oxide, sulphide and transition).

10.3.2 Mantos Copper Logging

Logging is performed by external contractors following Mantos Copper standards and under the supervision of Mantos Copper personnel. The logging activities are carried out in the Mantoverde core shed, where special facilities are available for these activities.

RC drill cuttings and DDH cores are logged by recording and considering the geological contacts in the Mantoverde logging shed. Geologists use the same format and codes to log cores and RC drill holes. The information is recorded digitally using portable field computers (Getac Notebook V110G3). Figure 10-5 shows a snapshot of a logging screen.

Figure 10-5: Example of Notebook Getac V110G3 Logging Screen



Note: Figure courtesy Mantos Copper, 2020.

Logging includes recording geological variables such as lithology, alteration intensity, mineralogy, occurrence types, structures and visual grade estimation. For geomechanical logging the information collected includes weathering, alteration, rock quality designation (RQD), estimated strength, presence of water, fracture spacing, fracture opening, fracture frequency, fracture shape, roughness, fill thickness, fill type, fracture condition, rock mass ratio (RMR), geological strength index (GSI), fault angle and fault fill.

10.4 Drill Hole Sample Recoveries

10.4.1 Historical Recoveries

Drill hole recovery information is not available for the Enami period. During the Mantos Blancos-Anglo American drilling programs drill hole recovery was determined by calculating the ratio of actual drill hole footage to core footage as a percentage. Recovery in RC drilling for each 2 m sample interval was calculated by comparing the real weight to the estimated weight, which was calculated using the drill hole diameter (mainly 5½"), the length of the interval and the sample density, which ranged from 2.49 g/cm^3 to 3.08 g/cm^3. Recoveries typically ranged from 85% to 95%.

10.4.2 Mantos Copper Recovery

RC recoveries were calculated using the same methodologies employed by Mantos Blancos-Anglo American. Core recoveries were measured for each sample interval at the logging facility by trained personnel. Recoveries were typically greater than 90% due to the good quality of the rock mass. Recovery percentages are set by contract with the drilling company; recoveries out of the expected ranges are penalized.

10.5 Drill Hole Collar Surveys

All historical drill collars have been measured as well as all drill collars for the MVDP, the surveyor uses a total station instrument, certifies the information and enters the data into BDGEO. A Trimble R4 GPS with an error of ±4 mm has been in use since November 2014. Previous measurements were made with a Trimble S6 total station instrument.

10.6 Downhole Surveys

The strong structural control of the mineralized deposits, defined by structures such as the FMV and subsidiary structures, causes the mineralized deposits to be tabular in shape. To intercept true widths drill holes are usually directed orthogonal to the mineralized deposit or to the mineralization-controlling structures.

Historical and ongoing downhole deviation surveys have been performed by the drilling contractors using methods and instruments that are unaffected by magnetic rocks. Historically, measurements were taken every 10 m downhole and every 50 m topside.

Since 2000 measurements have been taken by Comprobe Ltd. using a Humphrey digital gyroscope. Records are submitted digitally and in hard copy and are reviewed and validated by Mantoverde personnel before being uploaded to the database. Original certificates are archived in folders.

As part of the current quality assurance/quality control (QA/QC) program 5% of the drill holes are checked and measurements are taken from a standard drill hole to calibrate the equipment. Calibration is also performed when a new downhole survey instrument is acquired. Prior to the start of the 2016 drilling campaign, the deviation of a test hole was measured using two different gyroscopes (Gyro-197 and Gyro Reflex).

10.7 Grade Control

Grade control is essentially done through blast holes during mining operations. Mantoverde personnel plan and execute the drilling and blasting with Caterpillar MD6240 and Atlas Copco DM50 equipment. The blast hole grids are 7.5 m x 7.5 m and 8.5 m x 8.5 m. Drilling is carried out with 9" tricone drill bits.

Samples from the blast holes are collected by trained personnel from the rubble in the blast hole collar, using a spatula and a receiving tray along a pre-marked sampling direction on the rubble cone. If necessary, two samples are collected, the second perpendicular to the first one. The samples are about 16 kg, representing a 10 m bench. The hypogene pit is expected to follow similar procedures. Sampling of blast holes is not used in resource modelling.

10.8 Sample Length/True Thickness

The strong structural control of the mineralized deposit, defined by structures such as the FMV and subsidiary surfaces, determines that the deposit contours are tabular in shape. To intercept true widths drill holes are normally directed orthogonal to the mineralized deposit or structures controlling the mineralization.

Depending on the dip of the drill hole and the dip of the mineralization, drill hole intercept widths are usually greater than the true thickness of the mineralized deposit.

11 Sample Preparation, Analyses and Assurance

11.1 Sampling Methods

The sampling methodologies, sampling preparation and sampling assay used by Anglo American and Mantos Copper are the same.

11.1.1 Diamond Drilling (DDH)

Diamond drilling is the main source of samples used in the construction of the Mantoverde resource model. All DDH sampling activities at Mantoverde follow Mantos Copper's internal protocols: PNP.OMVGEGLE.0003 and REG.OMVGEGLE.0012.

Core are placed into wooden boxes (Figure 11-1) with wooden run blocks inserted at appropriate distances; the boxes are closed using lids. The drill hole identifier and interval meterage in the box are written on the box lid. Core boxes are delivered by the drilling contractor to the geology sampling station. Core are photographed and core recovery and RQD are recorded. Any induced fractures in the core are noted.

Figure 11-1: Example of Mineralized Core

Note: Figure courtesy Mantos Copper, 2020.

The sampling interval is fixed and typically 2 m; the cutting plane is drawn by the geologist with a line parallel to the core axis. The core cutting process uses a hydraulic guillotine for oxide and sulphide material (Figure 11-2). This is acceptable for the mineralization found in the deposit. For poorly consolidated material, small sampling shovels are used.

One half of the core is placed back in the core box, and the other half is bagged into a plastic sample bag. After each 2 m sampling interval is completed, a sample tag is attached to the bag and the bag is sealed. The entire sampling and sample identification process is carried out using bar codes.

Approximately every 20 m, a 20 cm length sample is taken for density and geomechanical testing in the laboratory.

Figure 11-2: General View of Sampling Area

Notes: Left, hydraulic guillotine. Right, electric saw

Figure courtesy Mantos Copper, 2020.

11.1.2 Reverse Circulation Drilling

The sampling interval is fixed and typically 2 m. All RC sampling activities at Mantoverde follow Mantos Copper's internal protocols; REG.OMVGEGLE.0011 and REG.OMVGEGLE.0013.

Dry samples are collected at the drill rig, weighed and split in halves and quarters using a riffle splitter. A rotary wet splitter is used when extremely wet conditions exist and two smaller fractions are collected in porous sample bags at the drill rig, labelled and dried.

A sample of approximately 15 kg to 20 kg representing 1/4 of the original sample is bagged and labelled for shipment to the chemical laboratory. A second sample is stored as a duplicate sample.

From the smaller samples, a sample of approximately ½ kg is used for geological logging purposes and a representative sample of the rock cuttings from each sampling interval is placed in labelled chip trays. The samples are delivered by the drilling contractor to the geological sampling station. Drillers deliver the sample reject material to a central sample store.

11.1.3 Blast Hole Drilling

Blast hole samples are taken in a tray that collects the material using a guillotine-type blade from the four gutter walls formed along a straight line that cuts the cone, totaling approximately 16 kg. Sampled material is placed into a polyethylene bag which contains a sample tag listing the date, bench number, blast number and drill hole number. A sample submission form is completed to accompany the samples to the mine laboratory.

Figure 11-3 shows an example of a blast hole rig setting out a blast pattern in the floor of the oxide open pit and also shows the blast hole cone being sampled.

Figure 11-3: Blast Hole Drilling and Sampling

Note: Figure courtesy Mantos Copper, 2020.

11.2 Density Determinations

A comprehensive program to enhance the existing density database was developed during 2019 and included a total of 4,345 specific gravity (density) records. Density measurements were undertaken by Rock Test, an independent consultant, using the water displacement method. Samples were dried and wax coated prior to immersion. Figure 11-4 shows the equipment used in the non-destructive density testing.

Density values returned are discussed in Section 14.7.

Figure 11-4: Density Measurement Equipment

Note: Figure courtesy Mantos Copper, 2020.

11.3 Analytical and Test Laboratories

Sample preparation and analysis was conducted by the GeoAssay Group, which is accredited under ISO 9001: 2000. GeoAssay is independent of Mantos Copper.

11.4 Sample Preparation and Analysis

11.4.1 Sample Preparation

Sealed plastic bags labelled with bar codes containing chip or half-core samples are sent to the laboratory for sample preparation. Each sample shipment to the laboratory is accompanied by a detailed report describing the samples included. As part of the protocol when the samples are received the laboratory checks and verifies the reception.

Samples are weighed and dried at 105ºC. Core samples are crushed to 10 mesh (minus 2 mm) with a jaw crusher. Chip samples are screened to 10 mesh and oversize fractions are primary and secondary crushed.

The crushed material is reduced using a rotary divider through 24 increments to obtain a 750 g to 1,000 g fraction. A crushed (coarse) reject is taken and the rejects are returned to Mantoverde each month.

The size fraction is pulverized to 95% minus 150 mesh in a LM-2 pulverizer to obtain a 200 g sub-sample that is sent to the laboratory for assaying.

11.4.2 Chemical Assay

The standard assay packages have included:

- 2000–2001: TCu (total copper), SCu (soluble copper) $CaCO_3$ and Au
- 2001-2007: TCu, SCu, $CaCO_3$, Au, Fe, Co, and S
- 2008 to date: SCu (soluble copper by citric acid), TCu, SCu, $CaCO_3$, Au, Fe, Co and S.

The general procedures for assaying are as follows:

1. Soluble Copper

(1) 1 g of sample is dissolved in 25 ml of H_2SO_4

(2) the solution is heated to the boiling point

(3) 1 ml of Na_2SO_4 is added after the solution has cooled

(4) Soluble copper assay measured with atomic absorption.

2. Total Copper

(1) First 1 g of sample is dissolved in 10 ml of perchloric acid, then 5 ml of nitric acid and finally 10 ml of hydrochloric acid

(2) this solution is stirred for 20 minutes at 140 revolutions per minute

(3) Total copper assay is performed with atomic absorption.

Total copper assay is conducted by atomic absorption spectroscopy (AAS) after a three-acid digestion. The method has a detection limit of 0.003%TCu.

Soluble copper assay is conducted by AAS with a citric acid digestion, with a detection limit of 0.003% SCu.

Gold assay is conducted using fire assay with an atomic absorption (AA) finish. The method has a detection limit of 0.01 g/t Au.

The sulphur and $CaCO_3$ assay is conducted by LECO. Sulphur has a detection limit of 0.01%, and $CaCO_3$ has a detection limit of 0.05%.

11.5 Mantos Quality Assurance and Quality Control

Quality Assurance (QA) is the system and set of procedures used to ensure the quality of sampling and assay results. Quality Control (QC) is the data used to check that the results of sample preparation and chemical analysis are adequate.

Mantos Copper has continued with the Quality Assurance and Quality Control (QA/QC) program originally implemented by Anglo American, which is described in the procedure "Instructivo estándares_2019.pdf", which considers the insertion of:

- Coarse Duplicate: material weighing between 15 kg and 18 kg, twin of the original "A" sample and collected in the field (the B sample).
- Pulp Duplicates: Corresponds to the twin of the "A" pulp. Mantoverde accepts differences of less than 10% in 90% of the results.
- Standard Reference Materials (SRM): Corresponds to the control sample introduced in a blind manner for the laboratory in the sample batches. The SRMs were constructed and certified in 2012 by GeoAssay Group. SRMs were prepared using mineralized material from Mantoverde. The total copper (TCu) SRMs used in 2003 were prepared by the Acme Laboratory, Chile and certified by Ore Research & Exploration Pty. Ltd. (ORE) in Australia. In 2006 four new standards were prepared, analyzed at the Mantoverde mine laboratory and then certified by ORE. The 2006 standards were subjected to round robin analysis at the Acme, Mantos Blancos, Mantoverde and Geolaquim laboratories for soluble copper (SCu) and at the Mantos Blancos and Mantoverde laboratories for LECO carbonate determinations. Six additional SRMs were prepared in 2011, four of which were certified by ORE for TCu, SCu and carbonate in oxide mineralization, and two of which were certified by ORE for TCu and Au in sulphide material. In 2012, 10 SRMs were prepared. Five of these SRMs were certified by ORE and five were certified by GeoAssay Group. These 10 SRMs were used in the 2016-2017 drilling campaigns.
- Blank: Material in which the presence of the elements to be monitored is confirmed to be under the detection limit. It is obtained from waste material from the Mantoverde pits. There are two types:
    - Coarse Blanks: Material with the same granulometry as the routine samples, which follows the entire mechanical preparation process. They are inserted when generating the batch. These establish the presence of contamination during the mechanical preparation.
    - Analytical Blanks (BA): Material pulverized and inserted after mechanical preparation. These establish the presence of contamination during the chemical assay in the laboratory.

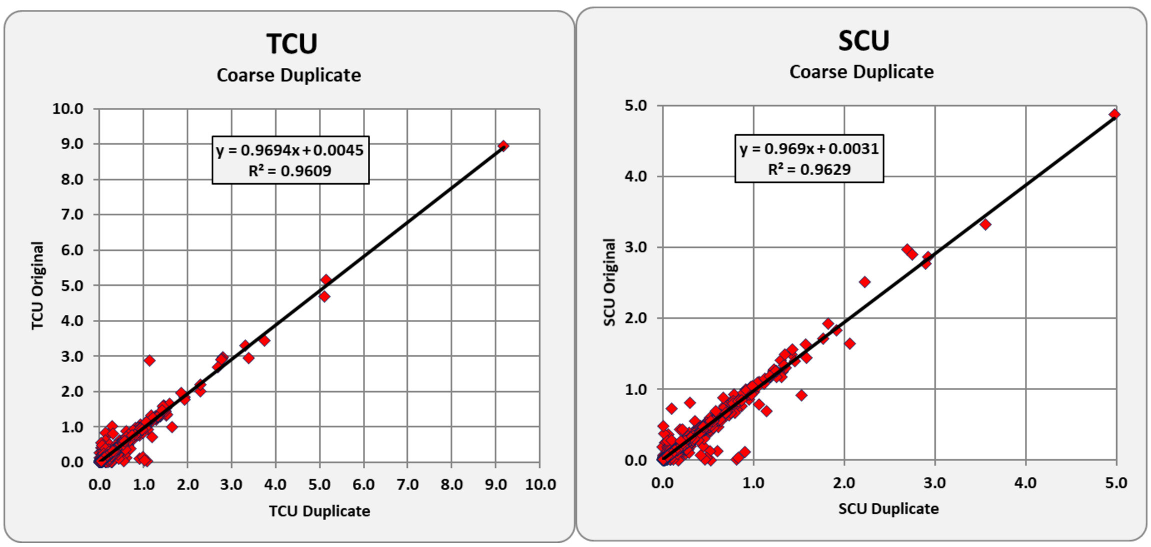
11.5.1 2012–2016

The QA/QC program included coarse and pulp duplicates, coarse and fine blanks, and SRMs.

Error rates for the duplicate samples are within acceptable limits for TCu and SCu, and there is no material evidence of contamination from the fine and coarse blank results. Figure 11-5 and Figure 11-6 show the coarse and pulp duplicate results for TCu and SCu for the period 2012-2016.

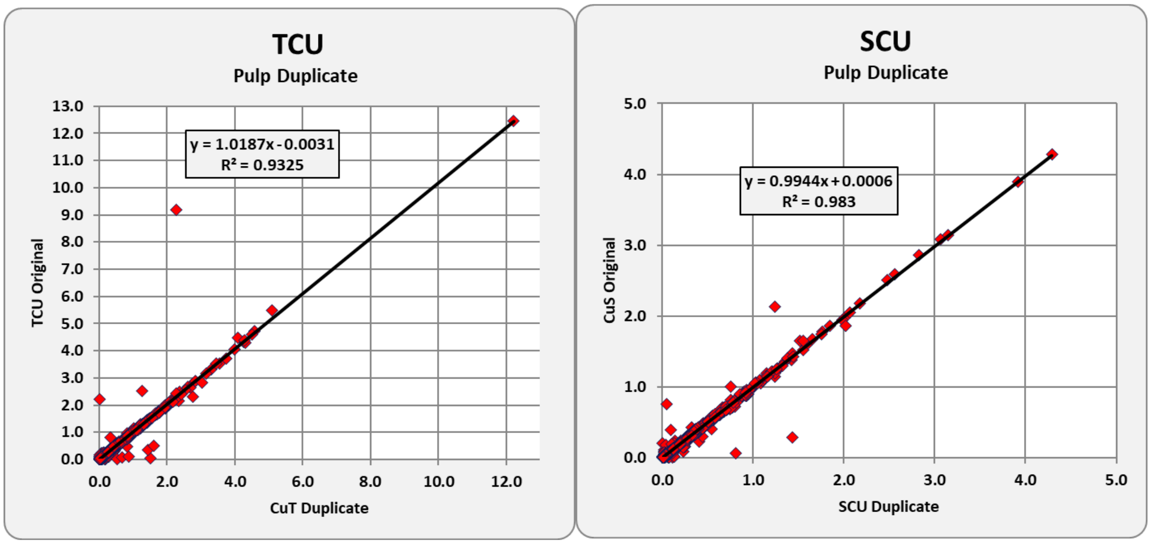
Twenty SRMS covering high, intermediate and low copper grades were used in the drill programs. Results indicate acceptable performance, with scarce results outside the 2 standard deviation acceptable ranges and no evidence of bias. Figure 11-7, Figure 11-8, Figure 11-9 and Figure 11-10 show the results for Standards 7355 and 73576, coarse and fine blanks, respectively.

Figure 11-5: TCu and SCu Coarse Duplicates Results 2012-2016



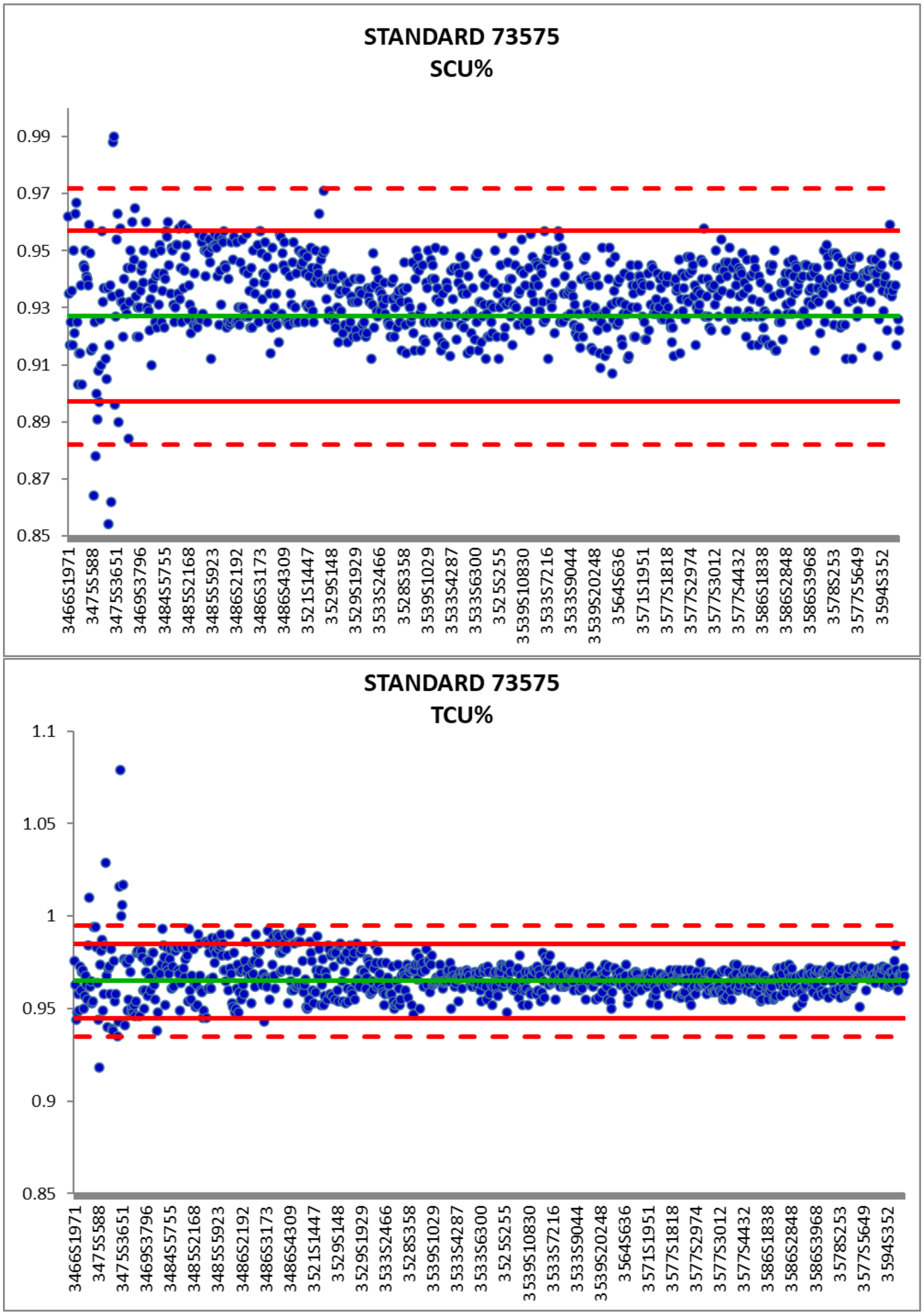
Note: Figure courtesy Mantos Copper, 2020

Figure 11-6: TCu and SCu Pulp Duplicates Results 2012-2016



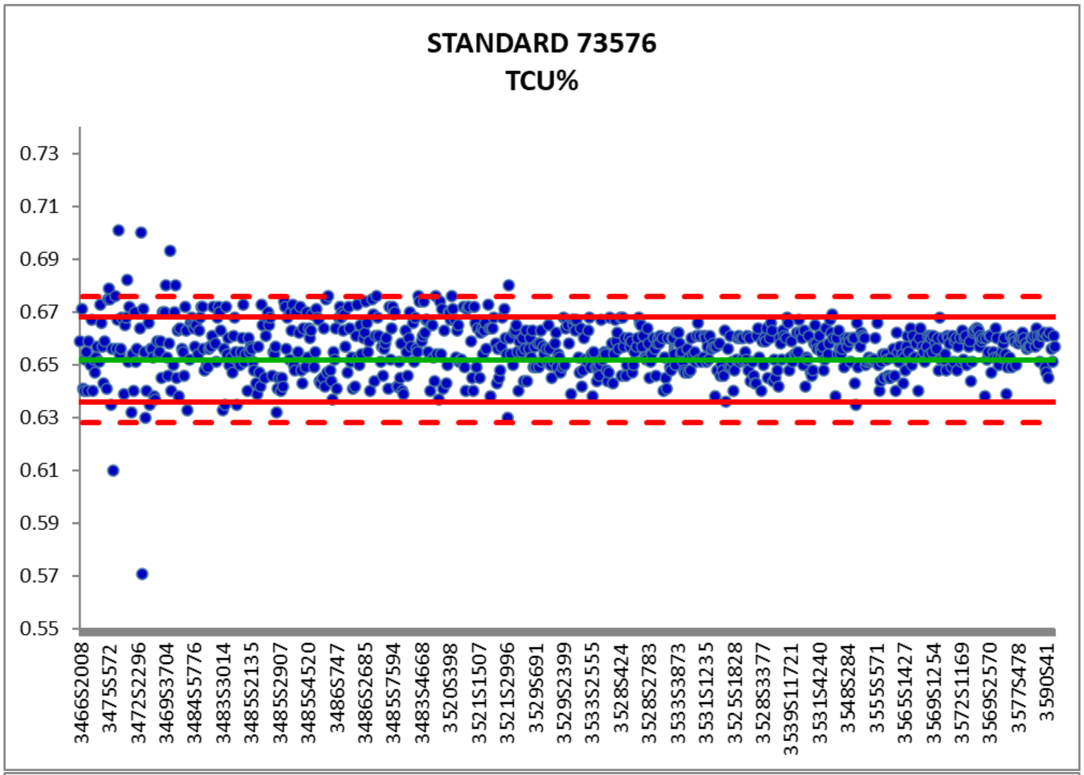
Note: Figure courtesy Mantos Copper, 2020

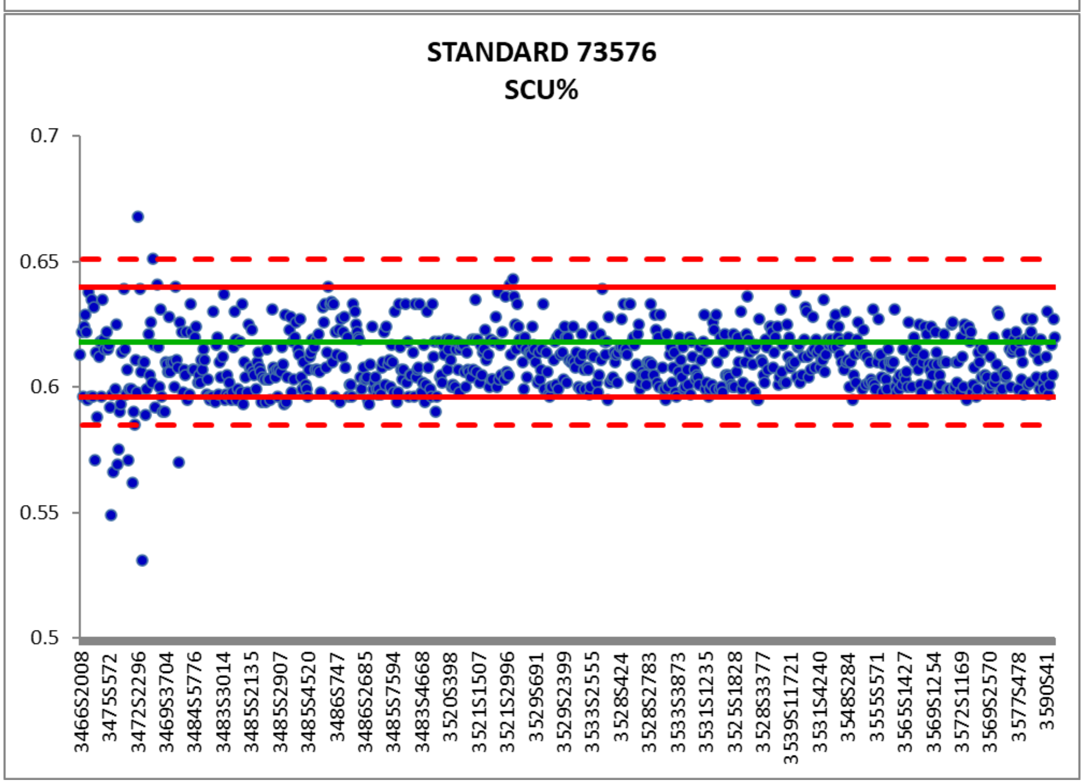
Figure 11-7: SRM 73575 for TCu and SCu, 2012-2016



Note: Figure courtesy Mantos Copper, 2020

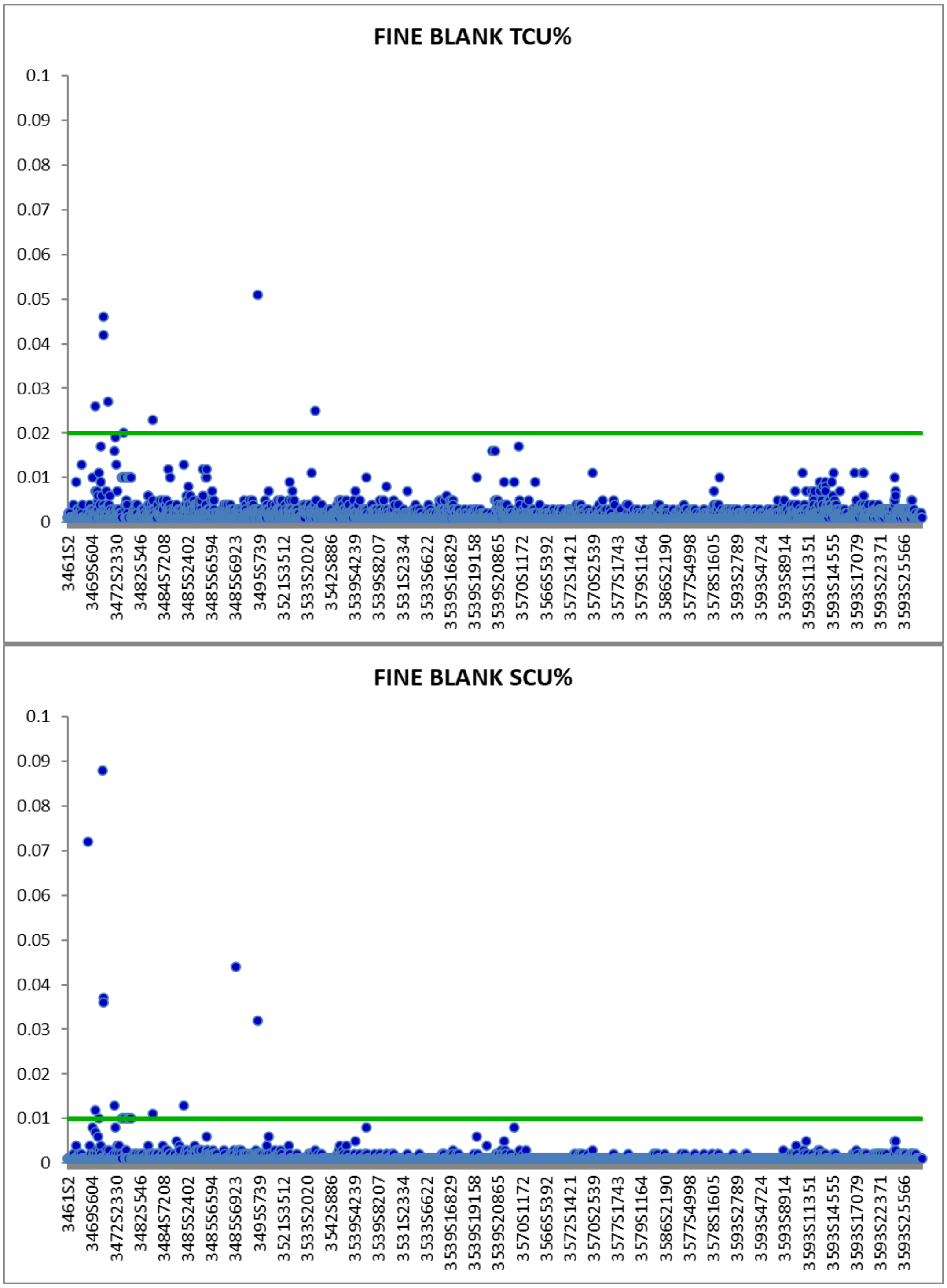
Figure 11-8: SRM 73576 for TCu and SCu, 2012-2016





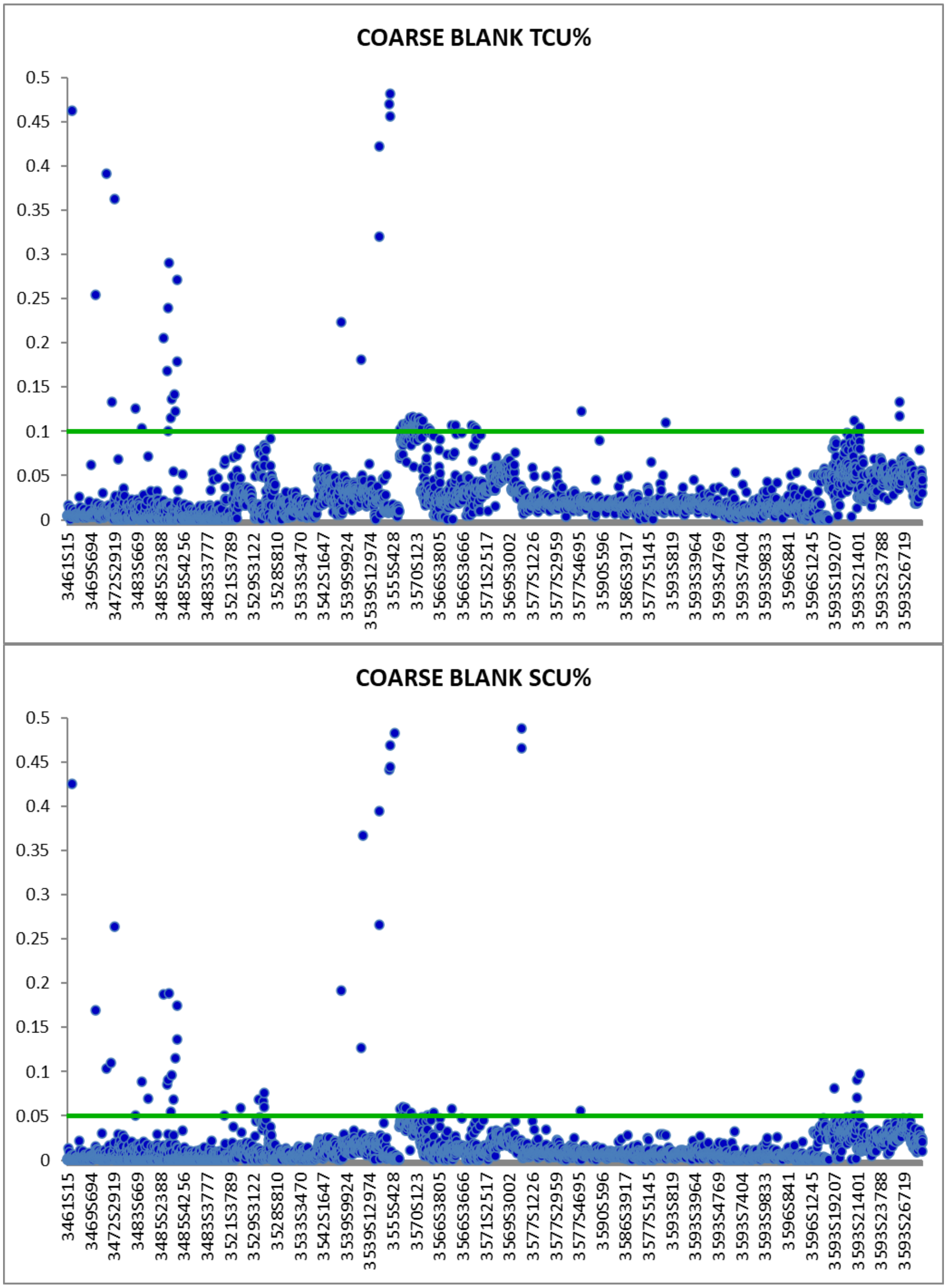
Note: Figure courtesy Mantos Copper, 2020

Figure 11-9: Fine Blanks for TCu and SCu, 2012-2016



Note: Figure courtesy Mantos Copper, 2020

Figure 11-10: Coarse Blanks for TCu and SCu, 2012-2016



Note: Figure courtesy Mantos Copper, 2020

11.5.2 2016–2020

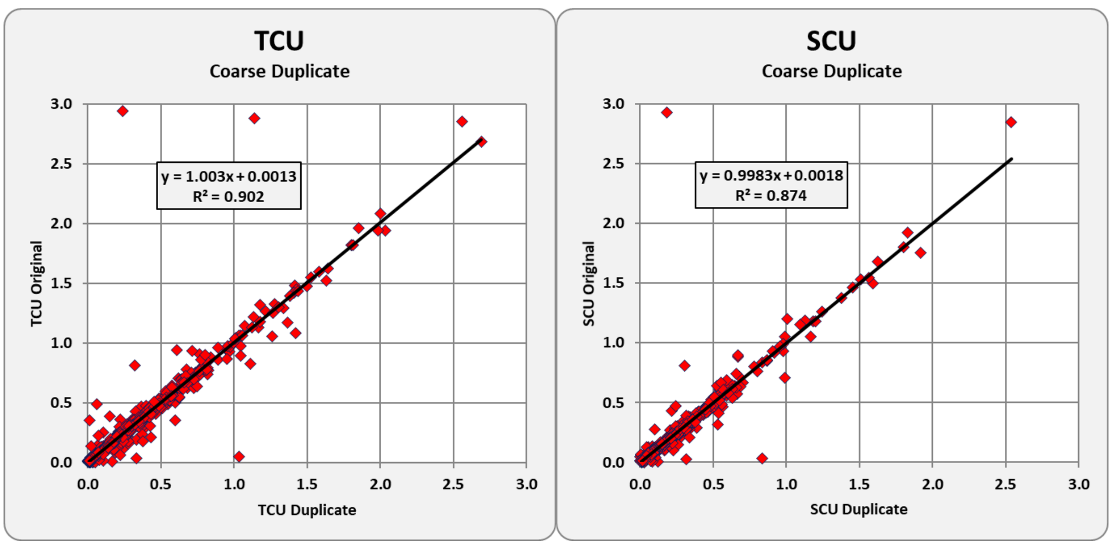
For the 2016–2020 drill program Mantos Copper's QA/QC program included insertion of coarse and pulp duplicates, coarse and fine blanks, and SRMs. No field duplicates or external check samples were used.

The control samples were inserted into the batches on site, prior to submission to GeoAssay. The QA/QC program results indicate acceptable preparation and analytical precision; error rates for coarse and fine duplicates are within accepted limits. $CaCO_3$ error rates for coarse duplicates are slightly over the limit. Contamination and accuracy for all SRMs analyzed are also within acceptable limits of 2 standard deviations.

Figure 11-11 and Figure 11-12 show the coarse and pulp duplicate results for TCu and SCu for the period 2012-2016

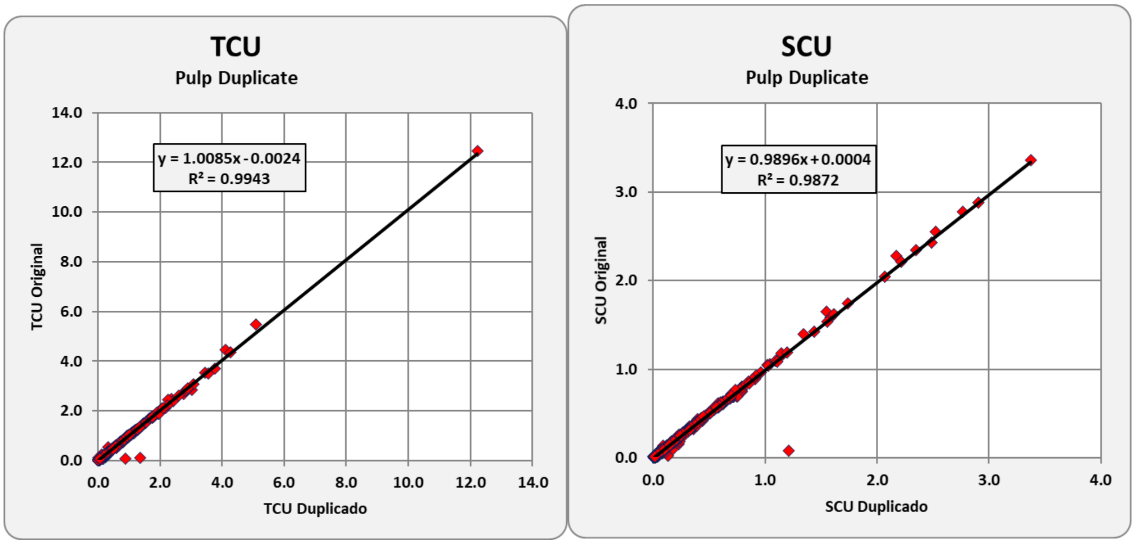
Figure 11-13, Figure 11-14 and Figure 11-15 show the results for TCu and SCu for SRM 73575, and fine and coarse blanks, respectively.

Figure 11-11: TCu and SCu Coarse Duplicates Results 2016-2020



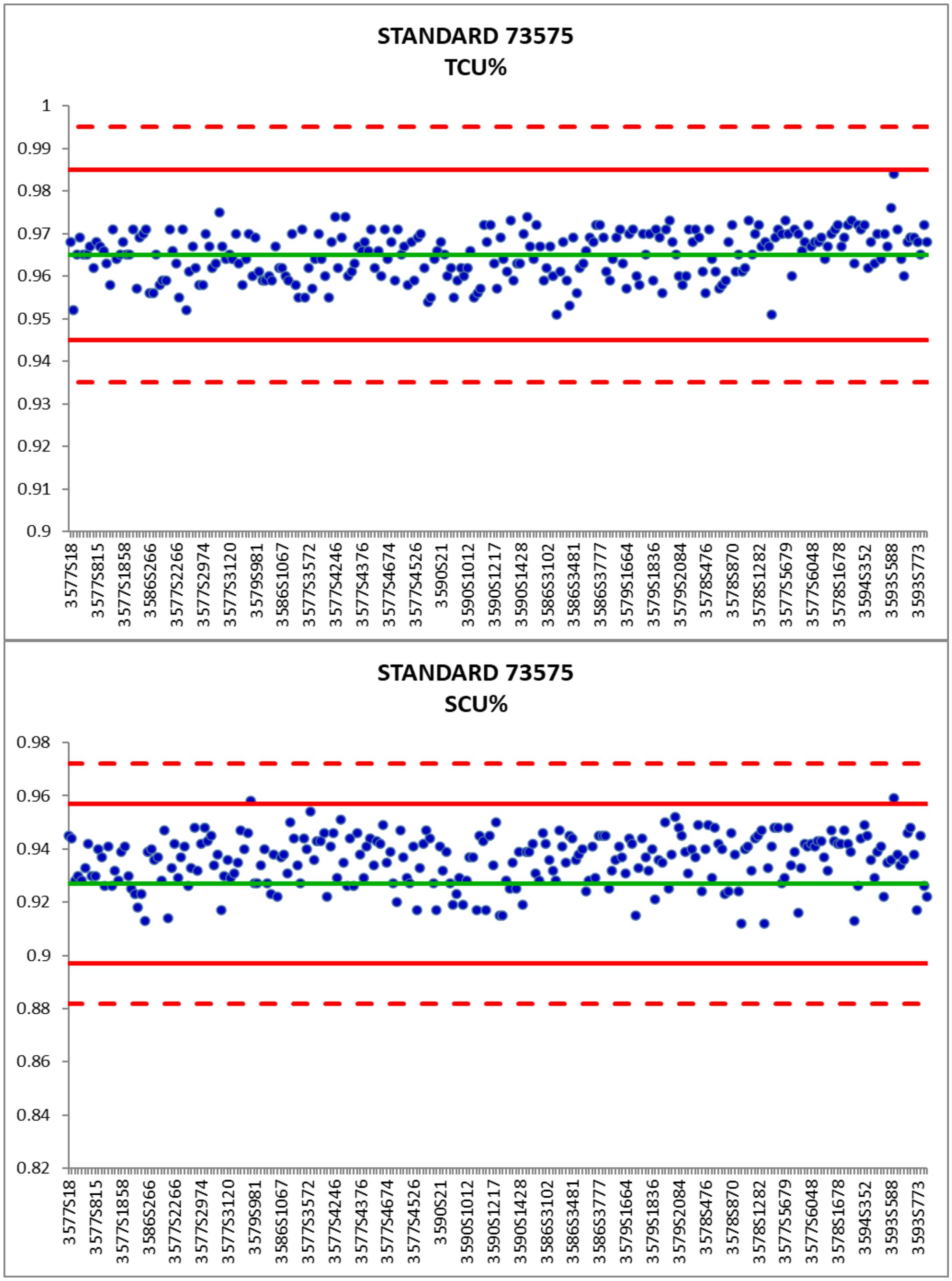
Note: Figure courtesy Mantos Copper, 2020

Figure 11-12: TCu and SCu Pulp Duplicates Results 2016-2020



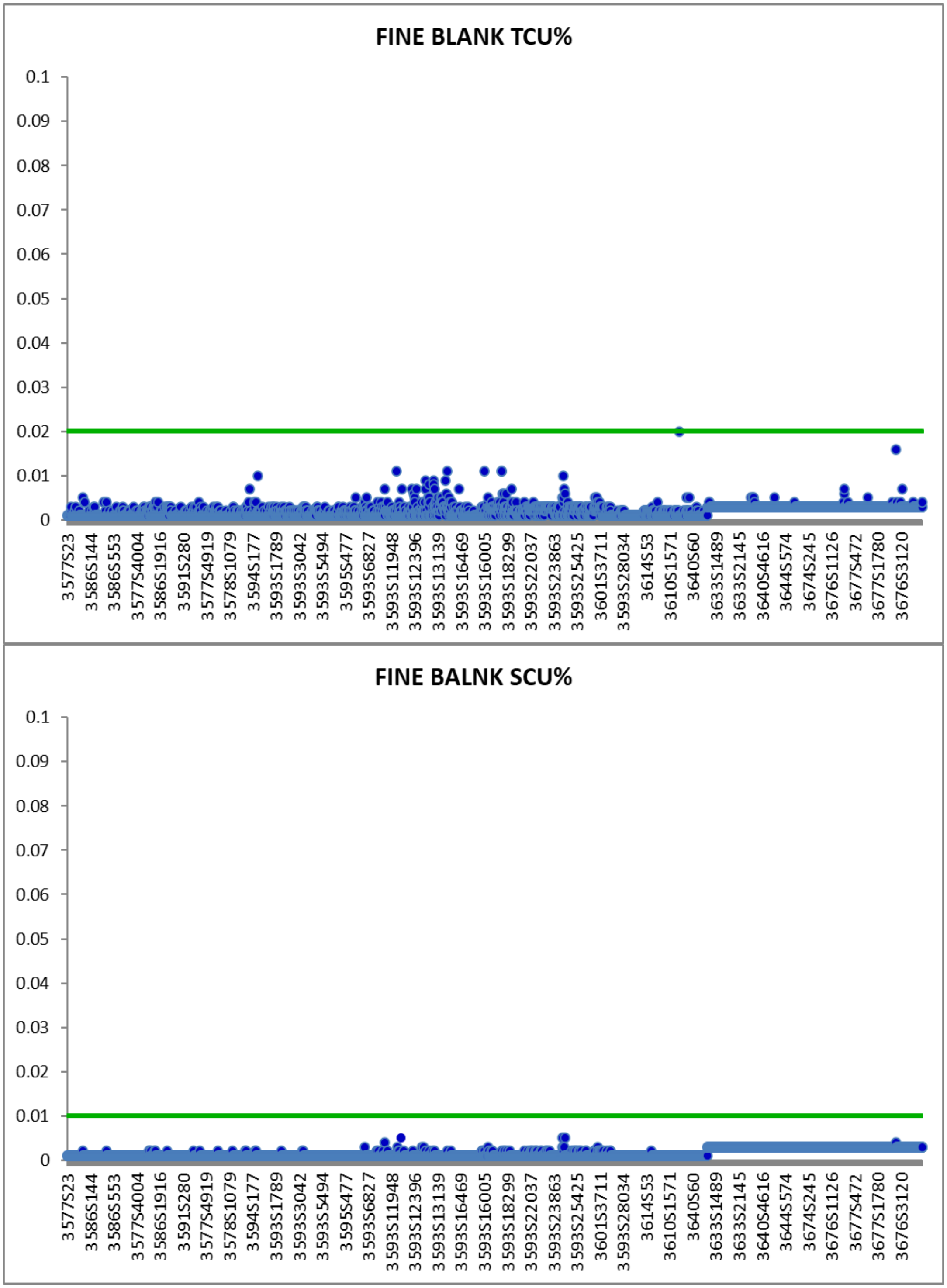
Note: Figure courtesy Mantos Copper, 2020

Figure 11-13: SRM 73575 for TCu and SCu, 2016-2020



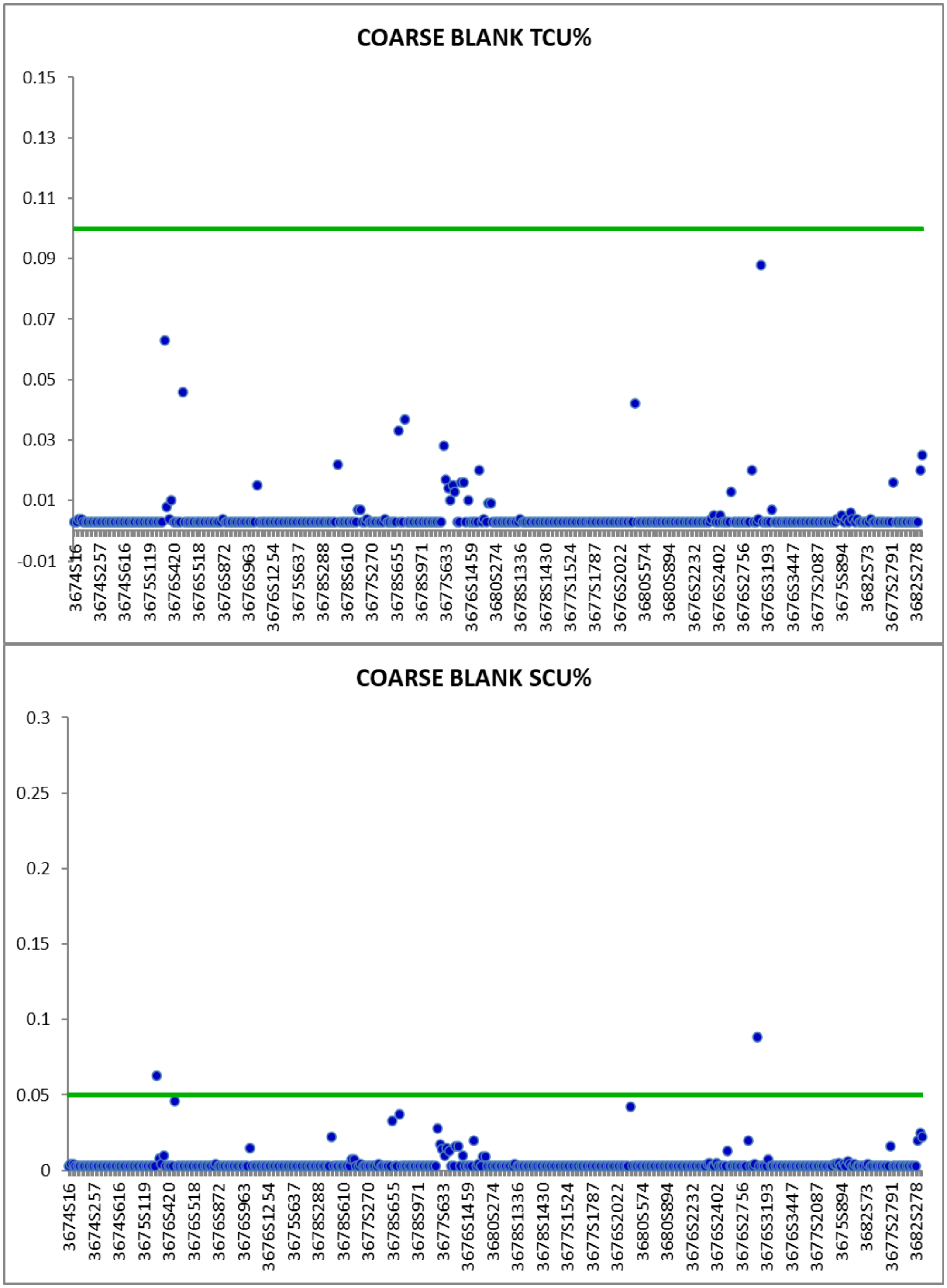
Note: Figure courtesy Mantos Copper, 2020

Figure 11-14: Fine Blanks for TCu and SCu, 2016-2020



Note: Figure courtesy Mantos Copper, 2020

Figure 11-15: Coarse Blanks for TCu and SCu,2016-2020



Note: Figure courtesy Mantos Copper, 2020

11.6 Databases

Assay data is digitally imported into the database directly from the analytical laboratory information management system (LIMS) files.

Drilling and assay data are currently stored in the Mantoverde BDGEO database. BDGEO is an information management system designed and built to facilitate the capture, registration, processing, maintenance, storage, recovery and safeguarding of geological data.

The database is subject to regular back-up procedures.

11.7 Sample Security

Core boxes are transported daily to the core shed by personnel from the drilling company. Analytical samples are transported by company or laboratory personnel using company-owned vehicles. Core boxes and samples are stored in safe, controlled areas.

Sample bags with RC material that are bar coded are transported daily by the drilling company personnel from the rig to the sample warehouse. RC reject and back-up samples are also taken off the drill platform daily to sample storage areas destined for this purpose.

Chain of custody procedures are followed whenever samples are moved between locations, to and from the laboratory, by filling out sample submittal forms.

11.8 Sample Storage

Currently, three types of samples are stored: half core, and coarse and pulp sample rejects. Half-core samples are stored indoors in wooden boxes stored on steel racks. Mantos Copper personnel advised that there is adequate storage space available for future drilling campaigns.

Pulp samples are stored in paper packets and identified by a bar code inside cardboard boxes. There is a map in the storehouse showing the locations of the stored samples. Boxes placed near the floor have been impacted by floods, resulting in sample integrity having been compromised. Action has been taken to prevent water from entering the storage shed in the future.

Figure 11-16 and Figure 11-17 show the current storage conditions.

Figure 11-16: Storage Conditions

Notes: Left, pulp. Right rock chips
Figure courtesy Mantos Copper, 2020

Figure 11-17: Core Storage Conditions

Notes: Left, general view. Right, detail showing labels on core racks
Figure courtesy Mantos Copper, 2020

11.9 Comments on Section 11

The nature, extent and results of the sample preparation, security and analytical procedures, the quality control procedures employed and the quality assurance actions taken by Mantoverde are consistent with 2019 CIM Best Practise Guidelines and provide adequate confidence in the drill hole data collection and processing for use in Mineral Resource estimation.

12 Data Verification

12.1 Site Visit

Mr. Ronald Turner has visited the site several times, the last visit was on 10 November 2021.

During those visits Mr. Turner inspected the current mining operations, discussed geology and mineralization and reviewed geological interpretations with staff. He inspected core, sample cutting and logging areas, drilling, sampling geological and logging procedures and the current conditions for sample storage. Mr. Turner also checked that data collection was being conducted in accordance with Mantos Copper procedures and industry standards.

12.2 External Mineral Resource Audit

As part of its internal procedures Mantoverde undertakes external, annual Mineral Resources and Mineral Reserves audits. The audits from 2016 are listed below:

- Golder Associates, Level 2 Resource Audit, Mantoverde Sulphides, III Region, Chile, Technical Report, July 2016
- Golder Associates, Level 1 Resource Audit, Mantoverde Sulphides, III Region, Chile, Technical Report, October 2017
- Golder Associates, Level 1 Resource Audit, Mantoverde Resources, III Region, Chile, Technical Report, May 2019
- Golder Associates, Level 2 Cobalt Estimation Audit, Mantoverde Resources, III Region, Chile, Technical Report, March 2019
- Golder Associates, Level 2 Resource Audit, Mantoverde Sulphides, III Region, Chile, Technical Report, April 2020.

The findings of the 2020 Resources Audit state that:

"QPs carried out a detailed validation of the Mineral Resources reported for the project and consider that they were estimated using appropriate data, geological interpretation and estimation methodology, which represent the current understanding of the deposit.

The methodologies used in the construction of the Resource model are reasonable, repeatable and were applied correctly. The resources comply with the 2019 CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and adequately support the resource inventory. Mantoverde has developed internal protocols and controls to manage its processes to ensure the adequacy of the data in the construction of the resource model. Furthermore, the grade estimate has implemented routines that allow for adequate traceability and repeatability, allowing the work to be carried out to the industry standards.

Mantoverde's resource audit has not detected any fatal errors that invalidate its results."

All Mineral Resource audits were performed by Golder; the QP for this Technical Report, Ronald Turner, was also responsible for the audits. During the annual resource audits, reviews and validations of the data used in the construction of the resource model, of the correct implementation of the estimation methodologies and of the results obtained are conducted. These activities include review of: QA/QC program in order to verify any precision, accuracy and contamination issues, comparison of original assay certificates against database records, appropriate definition and implementation of high-grade control, variography, Mineral Resource estimation, Mineral Resource classification, changes in Mineral Resources with respect to the previous model, reproduction of Mineral Resource statement.

12.3 Internal Data Verification

Two reports on internal data verification were prepared:

- Tomasz Wawruch, Mantoverde Development Project MVDP Competent Persons' Statement Sulphide Mineral Resources, July 2016
- Leticia Villagrán, Geólogo consultor, VLMet Consultorías, Reporte Técnico N°1, Servicio de Apoyo de Estudios de Geología, Proyecto Desarrollo Mantoverde, February 2015.

No significant issues with the data reviewed were identified.

12.3.1 QA/QC

Mantoverde personnel have conducted QA/QC programs for the data capture process; these include the following.

- QA/QC Proyecto Súlfuro, 2007–2008
- Actualización Modelo Geológico Proyecto Sulfuro, 2011
- QA/QC en Campaña de Exploración Sulfuros, 2010–2011
- Estado y Actualización de Recursos Minerales, April 2014
- M. Arce, L. Tapia, Informe de Elaboración Modelo de Recursos Minerales Mantoverde (Block Model 2020 Report), May 2020.

As part of the resource audits the QP performed an audit of the results of the QA/QC program without identifying any problems of precision, accuracy or contamination.

12.3.2 Annual Mineral Resource and Mineral Reserve Reports

Mantos Copper prepares a resource report for the Mantoverde operation every year. This report provides a review of the data used to support the year's estimates, includes an annual summary of the results and interpretations of the QA/QC performed on exploration and blast hole data, and provides a discussion of the reconciliation trends and observations.

As part of the annual resource audits the QP reviewed the information contained in the reports and considered it adequate for the purposes of constructing a resource model, no issues were noted with the exploration data collected each year that would materially affect the Mineral Resource Estimates during these annual resource audits.

12.3.3 Annual Internal Audits

Mantos Copper's Resource Group conducts an annual review for each of the company's operations, including the Mantoverde mine. The reviews check that the corporate governance processes in terms of data collection, data verification and validation, and estimation procedures are being followed and met. The audits also review the governance process results.

No issues that would materially affect the Mineral Resource Estimates were noted during these process audits.

12.3.4 Production Monitoring

No significant issues have been observed during the reconciliation of the production data with the Resource Model and the collected data.

No reconciliation data are available for sulphide material, because it has not yet been mined.

12.4 Comments on Section 12

The reviews and validations conducted by the QP establish that the Mantoverde database is suitable to support Mineral Resource estimation.

13 Mineral Processing and Metallurgical Testing

13.1 Introduction

The plant has a production capacity of 67 kt per year of copper in cathodes, current production ranges between 45 kt per year and 50 kt per year. The existing process infrastructure consists of a three stage crushing plant, heap leach facility, dump leach facility and a solvent extraction and electro-winning (SX-EW) plant. The MVDP will add a new concentrator at the Mantoverde mine site and a tailings storage facility (TSF), there will also be an expansion of the existing sea water desalination plant at the coast. The throughput rate will be a nominal 11.6 Mt/y.

Since 2005 three metallurgical programs evaluating the sulphide mill feed material have been conducted:

- 2005-2008 - Centro de Investigación Minero-Metalúrgico (CIMM): exploratory flotation testwork identifying potential geometallurgical domains.
- 2009-SGS Lakefield Santiago: laboratory-scale metallurgical program based on 189 variability samples and four geometallurgical domains to establish the optimum comminution and flotation process conditions, as well as identifying differences in the mineralization responses. Tests performed included hardness indices such as Bond ball mill work index (BWi), Bond rod work index (RWi), abrasion index (Ai), low energy impact (LIT) and exploratory potential for the use of high pressure grinding rolls (HPGR). In addition, testwork on flotation recovery methods was completed, including kinetic rates for rougher stage, standard rougher flotation, and open cycle (OCT) and locked cycle (LCT) flotation tests. Several environmental characterization tests were conducted.
- 2014–2017 - ASMIN: laboratory-scale program on 158 variability drill samples and 11 composites that represented eight geometallurgical domains. In addition to the characterization (mineralogy and chemical assays), comminution testwork included hardness tests such as JK drop weight (JKDWT) and semi-autogenous grinding (SAG) mill comminution (SMC) tests, work indices (CWi, RWi, BWi, Ai), and TSAG tests (SAG power index protocols). Flotation tests included kinetic rates and standard flotation rougher tests for all samples. OCT and LCT were undertaken on the sample composites. Standard settling tests for tailings, as well as tailings environmental test responses in terms of acid generating capacity and metals leaching were also performed.

  ASMIN also conducted pilot-scale testwork for flotation performance on two composite samples assessing the copper sulphide response. The program included a tailings assessment program with settling and rheology, thickening, classification, pumping loop and deposited tailings characterization.

  In addition, during 2017 testwork on 70 selected samples was performed to improve the information used in the geometallurgical model that is the basis for the current mine plan. The program included characterization (mineralogy and chemical assays), rougher flotation tests (kinetic rates and standard), Bond ball work indices, TSAG and tailings settling. The geometallurgical information obtained was used to update the block model.

13.2 Metallurgical Testwork – Oxides

13.2.1 Metallurgical Recovery

Metallurgical recovery for the oxide material varies by lithology and the soluble copper (SCu) content as shown in Table 13-1. For lithologies where the soluble copper is >1%, a single recovery value is assigned; however, the recovery for those lithologies with the soluble copper content is <1% is estimated using the equations included in the table. The equations are based on a combination of metallurgical testwork (bottle, column and pilot plant) completed during the pre-feasibility and feasibility studies, leach column testwork, and results from operations. The set values were defined by Mantos Copper and are used for the budget for the mine planning period from 2020–2027 (Mantos Copper, 2020)

Table 13-1: Recovery Models for Copper Oxide

Heap Leach Recovery Model 2020		
Valid Range	**Sector (MS-ZOREC)**	**Soluble Copper Recovery (%)**
% Soluble Cu > = 1%	1_CEL-QUI-MR-REB	81.4
	2_KUR	85.7
	3_PTO62	86.5
	4_MVN-MVW	88.3
	5_MVS-PE-LLA	89.1
	6_FRA	88.5
0.38% ≤ % Soluble Cu <1% (*)	1_CEL-QUI-MR-REB	((0.32*Ln(%SCu) + 84.1) - 0.81*%$CaCO_3$)*0.96
	2_KUR	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.95 * 0.97)
	3_PTO62	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.95 * 0.98)
	4_MVN-MVW	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.95)
	5_MVS-PE-LLA	((5.6171 * Ln(%SCu) + 92.125) -0.81*%$CaCO_3$)*0.96
	6_FRA	((9.7835 * LN(%SCu)+91.44) -0.81*%$CaCO_3$)*0.96
0.20% ≤ %Soluble Cu < 0.38% (*)	1_CEL-QUI-MR-REB	((0.32*Ln(%SCu) + 84.1) -0.81*%$CaCO_3$)*0.93
	2_KUR	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.92 * 0.97)
	3_PTO62	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.92 * 0.97)
	4_MVN-MVW	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.92)
	5_MVS-PE-LLA	((5.6171 * Ln(%SCu) + 92.125) -0.81*%$CaCO_3$)*0.93
	6_FRA	((9.7835 * LN(%SCu)+91.44) -0.81*%$CaCO_3$)*0.93
0.15% ≤ % Soluble Cu < 0.20%	All	46

*** For $CaCO_3$ greater than 30%, consider $CaCO_3$ = 30%**

Dump Leach Recovery Model 2020	
Valid Range	**Soluble Copper Recovery (%)**
0.13% ≤ %Soluble Cu < 0.30%	42
0.10% ≤ % Soluble Cu < 0.13%	32

13.2.2 Acid Consumption

Acid consumption is determined using semi-empirical methods based on a combination of the acid consumption tests and the operational response from the heap leach and dump leach facilities. Table 13-2 and Table 13-3 presents the acid consumptions for the heap leach and dump leach.

Table 13-2: Estimated Acid Consumption Heap Leach

Grade $CaCO_3$ (%)	Acid Addition in Agglomeration (kg/t)	Acid Addition in Leaching (kg/t)
$CaCO_3 < 1.5$	3.53 x $CaCO_3$ + 15.21	21.25
$1.5 \leq CaCO_3 < 2.5$	3.53 x $CaCO_3$ + 15.21	23.8
$2.5 \leq CaCO_3 < 3.5$	3.53 x $CaCO_3$ + 15.21	26.35
$3.5 \leq CaCO_3 < 4.5$	3.53 x $CaCO_3$ + 15.21	27.2
$4.5 \leq CaCO_3 < 5.5$	3.53 x $CaCO_3$ + 15.21	28.9
$CaCO_3 \geq 5.5$	3.53 x $CaCO_3$ + 15.21	35.7

Table 13-3: Estimated Acid Consumption Dump Leach

Grade $CaCO_3$ (%)	Acid Addition in Agglomeration (kg/t)	Acid Addition in Leaching (kg/t)
$CaCO_3 < 1.0$	5	4.55
$1.0 \leq CaCO_3 < 2.0$	6	5.2
$2.0 \leq CaCO_3$	8	6.5

13.3 Metallurgical Testwork – Sulphide

Metallurgical testwork in support of the planned sulphide operation is summarized in Table 13-4.

Table 13-4: Metallurgical Testwork – Sulphide

Year	Laboratory	Work Completed
2005	CIMM T&S	Comminution tests, BWi, chemical and mineralogical characterization, kinetic rougher flotation tests, OCTs and LCTs
2007	CIMM T&S	Comminution tests, BWi, chemical and mineralogical characterization, kinetic rougher flotation tests, OCTs and LCTs
2008	CIMM T&S	Chemical and mineralogical characterization, kinetic rougher flotation tests, OCTs, settling tests on rougher tailings
2009	SGS Lakefield Chile	Chemical and mineralogical characterization; comminution, rougher flotation, cleaning flotation tests; OCTs and LCTs
2015	ASMIN	Chemical and mineralogical characterization; comminution, rougher flotation cleaning flotation tests; OCTs and LCTs, tailings settling tests. Flotation/tailings pilot-scale performance. Magnetic susceptibility and Davis tube test (DTT)
2017	ASMIN	Chemical and mineralogical characterization; comminution, rougher flotation, cleaning flotation tests; OCTs and LCTs, tailings settling tests

13.3.1 CIMM (2005-2008)

The exploratory tests at CIMM indicated positive results for the flotation process to be used to recover copper from the sulphide mineralization.

13.3.2 SGS Lakefield Chile (2009)

13.3.2.1 Metallurgical Samples

At the time this campaign was performed, four geometallurgical domains or units (UGM) were identified. Composites and variability samples were assigned to each geometallurgical unit and the amount of sample for testwork depended on the available HQ drill core. Table 13-5 summarizes the number of variability samples for each test performed by geometallurgical domain.

Table 13-5: Samples Used for Comminution and Flotation Tests

Domain (UGM)	Number of Samples Used for BWi Tests	Number of Samples Used in Other Hardness Tests	Number of Samples Used in Flotation Tests
1	35	11	105
2	9	6	24
3	13	5	44
4	6	3	16
Total	*63*	*25*	*189*

Note: See Table 13-6 for the descriptions of the domains/UGMs

Four composite samples representing each domain (the description of each domain (UGM) is shown in Table 13-6) were tested to define the flotation standards i.e. the grinding product or particle size (P80), primary grinding and regrinding requirements, pH, water chemistry, reagent suite and doses, slurry density (solids concentration).

Flotation tests on variability samples included the following activities: chemical and mineralogical characterizations, kinetic rates and standard flotation for the rougher stage. Subsequently, open and locked cycle tests (OCT and LCT) were performed on the four composites representing the geometallurgical domains by using the parameters established for the kinetic rates from rougher and cleaner tests.

Comminution testwork was conducted on composites by domains. The hardness investigation focused on the Bond ball work index, but some composites were also tested for the following hardness indices: RWi, Ai, LIT and HPGR (exploratory).

Table 13-6: UGM Description

UGM	Description
UGM 1	Magnetite body
UGM 2	Hydrothermal green breccia
UGM 3	Mantoverde hydrothermal breccia
UGM 4	Manto Ruso hydrothermal breccia

13.3.2.2 Comminution Testwork Results

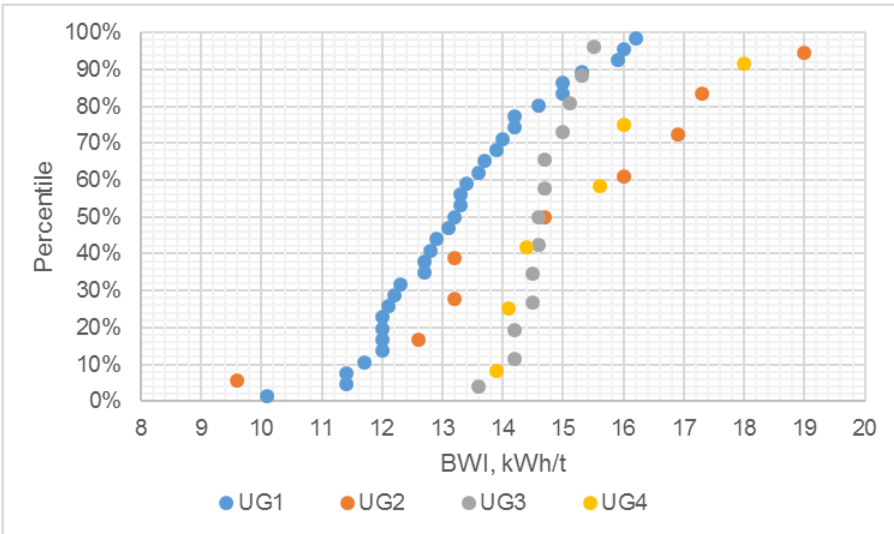
CWi values ranged from 10.22 kWh/t to 21.00 kWh/t at the 50th percentile. At the 80th percentile, the range was slightly higher from 11.02 kWh/t to 22.14 kWh/t.

BWi was the main hardness index tested and the values ranged from 13.20 kWh/t to 15.00 kWh/t at the 50th percentile. The 80th percentile range was from 14.44 kWh/t to 17.04 kWh/t. Figure 13-1 shows the percentile responses. The material is medium soft for the average of the industry.

RWi values ranged from 11.99 kWh/t to 16.00 kWh/t at the 50th percentile. The 80th percentile ranged from 12.09 kWh/t to 17.20 kWh/t. Figure 13-2 shows the percentile responses.

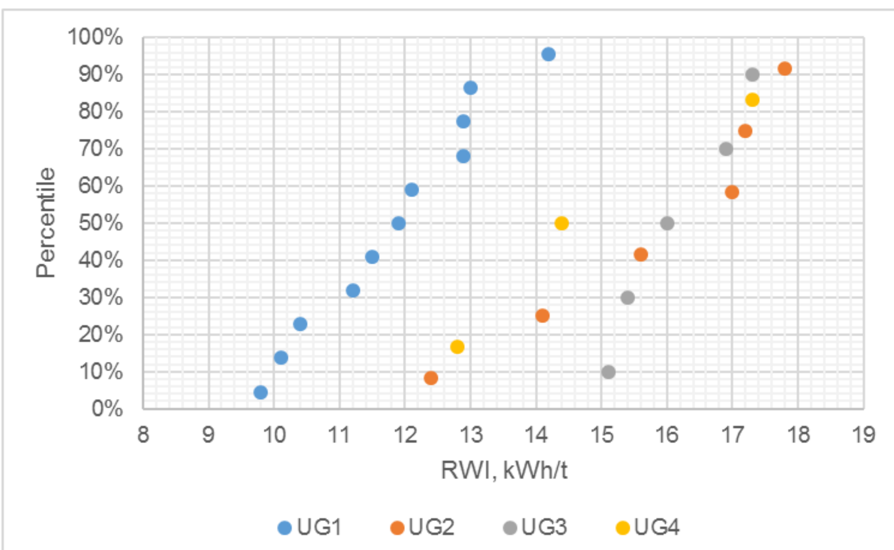
The Bond abrasion index (Ai) values ranged from 0.167 to 0.388 at the 50th percentile. The range for the 80th percentile was from 0.202 to 0.527. Figure 13-3 shows the percentile responses.

Figure 13-1: BWI Results



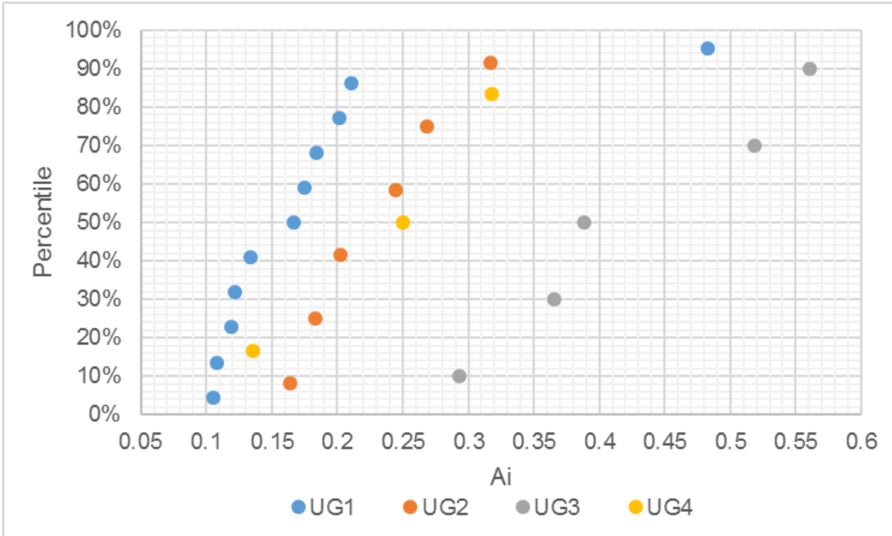
Note: Figure courtesy Mantos Copper, 2020

Figure 13-2: RWi Results



Note: Figure courtesy Mantos Copper, 2020

Figure 13-3: Ai Results



Note: Figure courtesy Mantos Copper, 2020

The results indicate that:

- UGM1 is the least abrasive unit and has the lowest grinding energy requirements
- UGM3 returned an abrasion index (Ai) that is nearly double that of the other geometallurgical domain responses.

13.3.2.3 Flotation Tests

Some of the variability samples selected for the testwork campaign were high grade (>3.5%Cu), in particular within the UGM1 and UGM3 units. However, the average grades for each unit, excluding the high-grade samples were within the expected range:

- UGM1 (104 samples): 0.82 ±0.53%Cu
- UGM2 (23 samples): 0.54 ±0.22%Cu
- UGM3 (42 samples): 0.56 ±0.20%Cu
- UGM4 (15 samples): 0.82 ±0.41%Cu.

The results of the mineralogy performed on variability samples are summarized in Table 13-7.

Table 13-7: Mineralogical Analysis Summary for Geometallurgical Domains

	UGM1	UGM2	UGM3	UGM4
Number of samples	30	12	22	7
Chalcopyrite	2.36 ±1.82	1.33 ±0.72	1.28 ±0.66	2.33 ±2.07
Chalcocite	0.02 ±0.04	0.2 ±0.12	0.1 ±0.17	0.06 ±0.07
Pyrite	2.5 ±1.23	1.11 ±0.78	1.47 ±0.89	0.78 ±0.55
Magnetite	16.66 ±9.89	0.66 ±0.99	0.15 ±0.16	0.02 ±0
Hematite	7.94 ±7.08	3.04 ±2.87	10.35 ±2.8	21.6 ±10.13
Gangue	70.48 ±10.74	93.36 ±3.95	86.74 ±3.43	74.84 ±11.96

Flotation tests included the following:

- From the initial exploratory test performed on each mineralized domain, the reagent dose was selected based on copper recovery and grades. Gold recoveries were not considered in the reagent selection. The grinding product (P80) ranged from 128 µm and 150 µm; 135 µm was selected as the standard for rougher flotation. The recovery obtained in each case was higher than 92%Cu and rougher concentrate grade was >8.4%Cu.
- pH 9 was selected as the rougher flotation standard.
- Rougher kinetic rates were performed using the standards defined above. The optimum flotation time was about 20 minutes. However, the increment in rougher recovery from 14 to 20 minutes was lower than 1% recovery (see Table 13-8 and Table 13-9). Rougher testwork on variability samples was therefore conducted using 14 minutes as the standard time.
- No kinetic tests for the cleaner stage were conducted to determine the optimal time for the first, second or third cleaner stages. These were established based on laboratory experience.
- The regrinding kinetic rates were performed in OCTs, which were defined targeting a P80 of 32 µm.
- The OCTs were conducted on the four composites, one per each domain (UGM). In the LCTs the flotation time of the UGM1 sample for the second and third cleaning stage was increased from 2 to 3 minutes.
- The global recovery calculated in the LCTs for UGM2 was 82.5%; the recoveries on the remaining UGMs were 90.1% on average.
- Concentrate grade for UGM1 and UGM4 was 30%; however, UGM2 and UGM3 reported copper grades lower than the target of 24%Cu. In UGM2 and UGM3 the pyrite content was 33.7% and 24.3%, respectively; however, in UGM1 and UGM4 the pyrite content was 4% and 9.17%, respectively. In UGM2 and UGM3 pyrite floated naturally along with chalcopyrite, hence additional tests were carried out to depress pyrite in these two UGMs. By modifying the pyrite depressant, the copper grade was increased by 3% for UGM2; in UGM3 the copper grade did not vary with respect to the initial result.
- The effect of the type of water on the flotation performance was only tested in a single OCT on UGM1. There were no differences between the use of desalinated sea water and tap water.

Table 13-8: Rougher Recovery Accumulated by UGM

Time (min)	Unit	UGM1	UGM2	UGM3	UGM4
1	%Cu	54.8	61.5	77.5	54.0
2	%Cu	77.7	74.0	85.4	72.2
4	%Cu	87.4	85.5	90.8	87.3
8	%Cu	91.8	90.3	94.0	94.4
14	%Cu	94.2	92.3	95.3	95.2
20	%Cu	95.3	93.0	95.8	95.7

Table 13-9: Rougher Concentrate Grade Accumulated by UGM

Time (min)	Unit	UGM1	UGM2	UGM3	UGM4
1	%Cu	17.3	12.9	10.8	22.1
2	%Cu	15.8	12.1	10.4	21.8
4	%Cu	14.1	10.7	10.1	20.6
8	%Cu	12.2	8.6	8.7	16.0
14	%Cu	10.5	7.5	7.7	14.8
20	%Cu	9.3	7.1	7.3	13.8

13.3.2.4 Settling Tests

Settling tests were performed on about half of the variability composites. UG1, UG2 and UG3 showed settling rates from 1.1 m/h to 1.2 m/h, UG4 was about 0.63 m/h. Settling rates varied, but on average the specific rate ranged from 0.34 t/h/m^2 to 0.47 t/h/m^2.

13.3.3 ASMIN Laboratory Tests (2014–2015)

At the time the ASMIN tests were conducted eight mineralized domains (UGMs) were defined. UGM1 and UGM2 were the same as in the 2009 definition. UGM3 and UGM4 were divided into smaller domains. The program tested 158 variability samples from PQ drill holes plus 11 representative composites: eight domain composites, two samples of Mixed feed and one low-grade composite. The Mixed samples were defined as samples with soluble/total copper content ranging from 15% to 25% (SCu/TCu). The number and weight of variability samples selected for the comminution and flotation tests are provided in Table 13-10.

The testwork program included chemical assays, electronic and optical mineralogy, hardness tests, flotation tests and settling tests. Desalinated sea water from site was used in the testwork.

Table 13-10: ASMIN Test Samples

UGM SGS 2009	UGM ASMIN 2015	Description	Weight at the MV Site (%)	Nº of Samples
UG1	UGM1	MV-UG1 Mantoverde	19.0	39.0
UG2	UGM2	MV-UG2 Mantoverde	25.3	23.0
UG3	UGM3	MVA Mantoverde	8.4	10.0
	UGM4	MVB Mantoverde	14.0	16.0
	MMV	Mixed Mantoverde	13.0	8.0
UG4	UGM5	MRA Manto Ruso A	1.0	5.0
	UGM6	MRB Manto Ruso B	3.5	17.0
	UGM7	Celso A	1..0	12.0
	UGM8	Celso B	8.4	22.0
N/A	MMR-MCE	Mixed Manto Ruso (MMR) and Mixed Celso (MCE)	6.4	6.0
N/A	BL	Low Grade Composite		
Total			100.0	158.0

13.3.3.1 Mineralogy

Mineralogical analysis noted the following:

- The main silicate gangue minerals are feldspars, quartz, chlorite/biotite and sericite/muscovite.
- The Celso and Manto Ruso samples have relatively similar modal compositions and are different to UGM1 and UGM2 (Mantoverde pit).
- Composite UGM1 is magnetite-rich, in contrast to the remaining composites where hematite is the primary iron oxide mineral. UGM1 also has the highest pyrite content.
- Concentrates have high pyrite content, in particular the Mantoverde and Celso samples, values are as high as 28.7%.

- Chalcopyrite is the main copper sulphide mineral, followed by secondary copper minerals such as chalcocite/digenite. The Mixed samples (MMR and MMV) show the presence of copper oxides such as cuprite/tenorite, brochantite and chrysocolla, native copper was also identified as well as the presence of secondary copper sulphides.
- The soluble copper ratio of the Mixed samples ranged from 5.9% to 24.8% SCu/TCu (average 16.4%). The main soluble copper minerals included native copper, cuprite, tenorite and copper phyllosilicates. Only one sample had a different mineralogy (MIMV-080) where the secondary sulphide copper minerals chalcocite/digenite were identified.
- The Manto Ruso Mixed sample had a high soluble copper content (33.8% to 40.3%), most of the soluble copper consisted of secondary sulphide and copper oxides.
- The Celso Mixed sample showed a low soluble copper content (<2.7%).

13.3.3.2 Comminution Tests

The main findings from these tests are:

- The 2015 BWi indicated harder materials than the 2009 campaign, but still medium soft compared to the industry average.
- Axb values indicated medium to moderately soft material (≥45) for the 80th percentile. UGM8 was the hardest domain (Axb: 41.8).
- The CWi ranged from 14.09 kWh/t to 32.63 kWh/t. The average value is 23.48 kWh/t.
- The BWi ranged from 13.93 kWh/t to 18.37 kWh/t. The average value was 16.76 kWh/t.
- The RWi ranged from 18.37 kWh/t to 24.39 kWh/t. The average value was 21.73 kWh/t.
- Ai values ranged from 0.08 to 0.43. The average value was 0.24, which indicated that the material is slightly abrasive. The 2015 results indicated that the material tested was less abrasive than in the 2009 campaign.
- The TSAG test is used to obtain the SAG power index (SPI) which defines the specific power consumption (CEE) required to reach 1.5 mm as the ground product. This figure corresponds to the transfer size (T80) from the SAG mill to the ball mill. The CEE ranged from 4.8 kWh/t to 6.27 kWh/t for the 50th percentile of the samples and ranged from 5.35 kWh/t to 7.05 kWh/t for the 80th percentile (harder material). The average value was 6.48 kWh/t.

13.3.3.3 Flotation Tests

The flotation test program carried out by ASMIN in 2015 included chemical and mineralogical characterization, screening tests to establish flotation standards, primary grinding and regrinding calibration, kinetic rates and standardized rougher flotation tests on 158 variability samples, and OCTs and LCTs on 10 composite samples (eight UGMs + two Mixed samples). The flotation campaign was performed using Mantoverde desalinated sea water.

The composites for each domain were selected for the screening test purposes, as well as the open and closed cycle tests. In general, the grades were higher than the average of the variability samples.

The grade of the variability samples was 0.61%Cu and 1.06%Cu for the 50th and 80th percentiles, respectively, which is in line with the grade estimated in the geological model.

Most of the flotation protocols for the 2015 testwork were adopted from the 2009 campaign.

Initial investigation on the optimal grinding product for flotation indicated that 180 µm will be the optimum. This is coarser than 2009 testwork protocol.

No significant difference in copper recovery was seen between the 212 µm and 180 µm ground product, which suggest an opportunity for future process optimization.

From the kinetic rate tests, 14 minutes was adopted as the rougher flotation standard time, which is similar to that used in 2009.

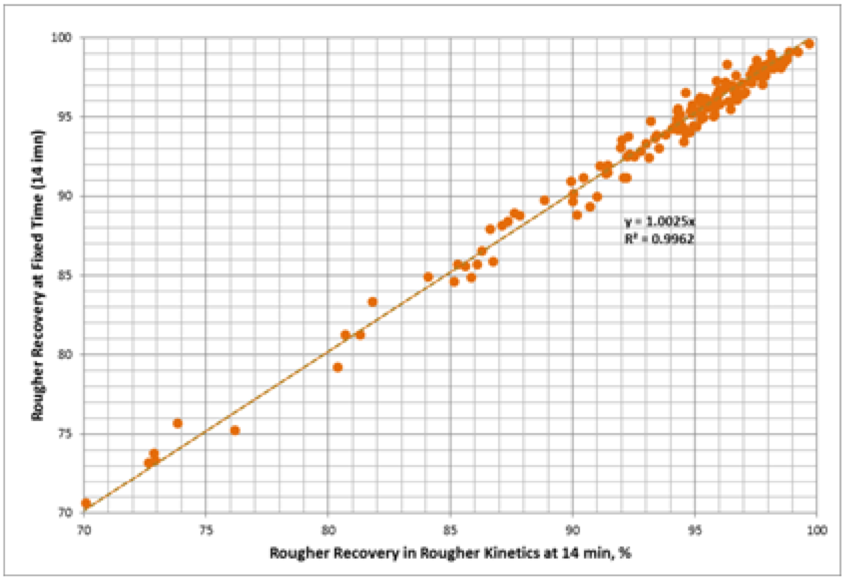
The Mixed samples show slower kinetic rates, which is in line with the high soluble copper content.

As shown in Figure 13-4 the difference between the copper recovery from the rougher kinetic rate tests and the 14 minute fixed-time rougher test was between -1.4 and 2.0 points, which shows consistency.

The average rougher recovery for all variability samples was estimated to be 92.1%Cu. For Mixed material, the copper recovery was 62.7%Cu on average, ranging from 61.4% to a maximum of 84.9%.

The mass recovery by weight was 8.1% average.

Figure 13-4: Recovery Consolidation Rougher Kinetics versus Fixed Time (14 min.)



Note: Figure courtesy Mantos Copper, 2020

13.3.3.4 Open Cycle Flotation Tests (OCT)

The recovery data from the OCTs are shown in Table 13-11.

Table 13-11: Open Cycle Test Recovery

Sample Name	Recovery (%)		
	Rougher	Cleaning	Global
MV UGM1	93.9	99.2	93.2
MV UGM2	95.1	99.5	94.6
MVA - UGM3	93.5	98.9	92.4
MVB - UGM4	92.3	98.8	91.1
MRA - UGM5	92.3	99.1	91.5
MRB - UGM6	*	*	*
CELSO A - UGM7	98.4	99.7	98.1
CELSO B - UGM8	95.6	100	95.5
MMV (MV Mixed)	53.2	94.6	50.4
MMR (MR Mixed)	70.3	97.8	68.8

Note: * = this sample was not tested.

13.3.3.5 Locked Cycle Tests (LCT)

The LCTs were performed on 10 domain composite samples. Metal and mass recoveries and concentrate grades are presented in Table 13-12 and Table 13-13.

Table 13-12: Closed Cycle Test Recovery Results

UGM	Sample Name	Recovery (average last 3 cycles)											
		Rougher Recovery (%)				Cleaner Recovery (%)				Global Recovery (%)			
		Weight	Cu	Fe	S	Weight	Cu	Fe	S	Weight	Cu	Fe	S
1	MV UGM1	12.2	91.8	16.3	95.0	8.9	98.4	37.5	46.6	1.1	90.4	6.1	44.3
2	MV UGM2	9.7	94.3	21.5	97.1	11.5	97.8	56.0	76.1	1.1	92.2	12.1	73.9
3	MVA	11.7	94.9	13.2	92.6	12.0	97.8	43.1	96.4	1.4	92.8	5.7	89.3
4	MVB	11.5	91.9	15.5	94.6	9.7	96.4	19.8	36.2	1.1	88.6	3.1	34.3
5	MRA	9.1	91.4	9.8	90.9	9.1	97.2	29.6	93.3	0.8	88.9	2.9	84.8
6	MRB	8.5	91.8	10.6	96.1	13.8	96.5	35.3	96.3	1.2	88.6	3.7	92.5
7	CELSO A	9.1	95.8	11.7	95.4	13.6	99.0	25.9	48.4	1.2	94.8	3.0	46.2
8	CELSO B	7.6	97.3	9.7	93.7	15.3	99.0	35.0	67.5	1.2	96.3	3.4	63.2
Mixed 1	MMV	4.6	49.8	5.3	67.9	9.6	80.8	6.4	94.7	0.4	40.2	0.3	64.3
Mixed 2	MMR	7.4	70.9	7.5	79.9	10.7	94.2	6.0	96.9	0.8	66.8	0.5	77.4

Table 13-13: Closed Cycle Test Concentrate Grades Results

UGM	Sample Name	Final Concentrate (average last 3 cycles)			
		Metalab (EAA Individual)			Geolaquim Analysis
		Copper (%)	Iron (%)	Sulphur (%)	Gold (g/t)
1	MV UGM1	31.73	33.12	33.77	4.34
2	MV UGM2	30.24	32.22	35.2	6.28
3	MVA	23.23	35.03	37.87	5.26
4	MVB	30.54	33.69	35.7	9.14
5	MRA	37.00	26.35	34.1	4.95
6	MRB	25.3	31.53	36.1	4.7
7	CELSO A	32.8	32.65	35.6	4.36
8	CELSO B	30.83	32.98	35.5	2.79
Mixed 1	MMV	32.81	20.08	19.07	12.54
Mixed 2	MMR	46.88	17.96	27.63	6.6

13.3.3.6 Magnetic Susceptibility

Rougher tailings from the variability samples were tested using magnetic susceptibility to determine if it was possible to recover magnetite from the samples.

Exploratory Davis tube tests (DTT) were performed. The total iron (FeT) grade in the mass recovered in the DTT test is determined, with the results serving as a proxy for the assessment of the maximum iron grade that could be generated as an iron concentrate. In a DTT test about 100% of the magnetic material is recovered. The testwork indicated that there was insufficient grade to generate a commercial iron concentrate.

Additional analysis, reviews and related testwork to assess the potential of generating an iron concentrate is warranted.

13.3.3.7 Settling Tests

The tailings settling rate for the variability samples was estimated to be 0.471 $t/h/m^2$.

13.3.3.8 Acid-Generating Potential

An environmental characterization of the rougher and scavenger flotation tailings was carried out. Tests included acid/base accounting (modified ABA), toxicity characteristic leaching procedure (TCLP), humidity cells and chemical characterization.

The results from the modified ABA test indicated that the tailings samples are not potentially acid generators. The net neutralization potential returned values of over 20 t equivalent of $CaCO_3$ per 1,000 tonnes of material. Net neutralization potential ratios (neutralization potential/acid generation potential) were greater than 3.

The results of the TCLP tests indicated that the concentrations of critical inorganic elements in the solutions generated were below the regulatory limits (D.S. 148).

Humidity cell tests were carried out over a 21 week period. The pH remained at around 7.5, confirming the alkaline characteristic of the products.

The testwork showed that in environmental terms the tailings are not acid-generating and will not have hazardous inorganic element levels.

13.4 Metallurgical Variability

Mantos Copper has made a significant effort to study in detail the behaviour of the feed under the proposed process. More than 360 samples were tested to define the variability of the feed to the comminution and flotation process; eight geometallurgical dominions for sulphide material and two for Mixed material were identified, which describe the characteristic of the feed. The design takes this variability in consideration and the variability is within the normal range in the industry.

The QP is the opinion that the test program covered reasonably the different types of material existing in the deposit. The response of the material to the design is reasonable and no major surprises should be expected. The only exception is the Mixed material on which more testwork is necessary to improve the results. This testwork should be done as part of an operational optimization program improving the knowledge of this material and investigating reagent suites to improve recoveries.

13.5 Metallurgical Recovery

The metallurgical recoveries obtained from testwork results were used to design the sulphide plant. The recoveries for the current mine plan and economic evaluation were obtained directly from the geometallurgical model estimates that were developed by an independent consultant Geoinnova Consultores (Geoinnova) with support from the Mantos Copper team.

The recoveries applied in the life-of-mine plan were compared with the recoveries obtained from the metallurgical testwork and found to be consistent. The life-of-mine (LOM) model predicts a cleaner recovery of 97% for the main domains and for the two Mixed domains. The LOM recovery models assumed a maximum rougher recovery ranging from 93.36% to 98.17% for the main domains and 81.59% to 89.32%Cu for Mixed. Recovery for the Mixed material from Mantoverde and Celso/Manto Ruso were 55.7% and 72.8%Cu respectively, and the maximum recovery was 86.6% and 81.3%Cu respectively.

Geoinnova (Geoinnova, 2018) subsequently updated the Mixed recoveries for Mantoverde and Manto Ruso/Celso, using new metallurgical testwork data collected after the close-out date for data supporting the feasibility study.

The updated LOM model uses a cleaning efficiency of 98% for sulphide feed and two separate recoveries for the Mixed material; 96% was assumed for Mixed material with good recovery and 94% for Mixed material with low recovery.

The global recovery for Mixed material was set at 71.9% which is reasonably conservative for an annual plan.

The LOM metallurgical recoveries recommended for use in the financial analysis are provided in Table 13-14 for 2023 onward.

Table 13-14: Projected Metallurgical Recoveries

SULPHIDE PLANT	Unit	2023	2024	2025	2026	Average 2027-2031	Average 2032-2042	MVDP20
Feed to mill	kt	3,245	12,214	12,436	12,455	12,277	12,176	235,674
TCu Mill Grade	%TCu	0.82	0.78	0.75	0.74	0.72	0.50	0.60
ICu Mill Grade	%ICu	0.71	0.65	0.68	0.68	0.67	0.46	0.55
Au Mill Grade	Au g/t	0.12	0.11	0.11	0.11	0.12	0.10	0.11
Cu Metallurgical Recovery	%	88.57	89.06	87.93	87.20	88.29	88.27	88.20
Au Metallurgical Recovery	%	72.89	72.92	70.59	69.32	73.10	69.03	70.40
Concentrate Grade	%	30.41	29.07	29.20	29.60	28.07	25.47	26.80
Concentrate Copper Production	kt	23.6	85.2	82.1	80.6	77.6	53.6	1,248.7
Gold Production	koz	9.3	32.7	31.9	30.5	34.9	28.3	590.4

13.6 Deleterious Elements

The testwork data indicate that the Mantoverde concentrate will be clean and free of deleterious elements. No significant quantities of deleterious elements have been identified to date. Table 13-15 shows the expected concentrate characteristics for the MVDP.

Table 13-15: Projected Concentrate Specification

Element		Unit	Expected	Minimum	Maximum
Copper	Cu	(%)	31.3	25.1	34.0
Iron	Fe	(%)	30.4	19.9	33.0
Sulphur	S	(%)	32.9	26.8	36.0
Gold	Au	(g/t)	6.3	4.2	7.0
Cobalt	Co	(g/t)	1,512	588	1783
Zinc	Zn	ppm	26	74	120
Lead	Pb	ppm	476	194	675
Cadmium	Cd	ppm	0.50	0.50	1.00
Mercury	Hg	ppm	1.98	0.38	3.00
Silicon	Si	(%)	0.061	0.002	0.100
Arsenic	As	ppm	38.3	0.63	45.0
Chlorides	Cl	%	0.05	0.05	0.1
Antimony	Sb	ppm	5.5	2.50	8.0
Molibdenum	Mo	ppm	19.1	1.00	32.0
Fluorine	F	ppm	100	0.00	200

13.7 Comments on Section 13

The testwork campaign was supervised by two external consultants. One of the consultants oversaw the test protocols, and the second consultant supervised the test programs. Any issues identified during the testwork campaigns were corrected as soon as practical. The metallurgical testwork campaigns established the potential to produce copper concentrates at saleable grades from the hypogene mineralization using a conventional SAG–ball mill configuration and standard flotation circuit and equipment.

Gold grades in the concentrates ranged from 4 g/t to 12 g/t and generally were consistently >6 g/t. The economic analysis assumes gold grades in the copper concentrate at an average grade of 6 g/t Au.

The recovery models for the oxide mineralization are based on metallurgical testwork conducted during pre-feasibility level investigations that were updated with the currently budgeted 5 year recovery expectations. The geometallurgical characteristics of the feed that is planned to be mined and treated through the oxide circuit after the currently budgeted 5 year recovery expectations should be updated on an annual basis as per current practices; if needed, testwork could be conducted to verify that the future recoveries will be in line with current Mantoverde experience.

Concentrate filtration tests were undertaken on some of the metallurgical composites using three technologies: vacuum, press and ceramic filters. The current design is supported by these results. Additional filtration tests should be undertaken in conjunction with filter vendors, assuming the use of press filters, during the Project execution stage.

Cobalt has been identified in the Mantoverde oxide and sulphide mineralization and has been reported in the flotation tailings. Mantos Copper contracted an independent consultant, Saint Barbara LLP (Saint Barbara) to conceptually examine production of cobalt in the form of a concentrate, precipitate or metal product. The study results were positive and indicate that more detailed evaluations are warranted.

In the opinion of the QP the testwork programs that support the plant design are of good quality for the level of the study. The geometallurgical model should be improved when production starts to better support the monthly variations of the feed characteristic. Special efforts should be made for the Mixed material to improve the knowledge of the zone using additional flotation testwork with the addition of a sulphidizing agent to improve the flotation response of the oxide components.

14 Mineral Resource Estimate

14.1 Introduction

Mineral Resources were estimated for nine deposits (zones) within Mantoverde mine: the Mantoverde Norte (MVN), Mantoverde Sur (MVS), Franko (FR), Quisco (QUI), Celso (CE), Manto Ruso (MR), Kuroki (Ku), Punto 62 (P62) and Montecristo (MC).

Five deposits were in production during 2020: Celso, Kuroki, Franko, Mantoverde Norte and Mantoverde Sur.

The database was closed for estimation purposes on 21 February 2019. A total of 4,895 drill holes and 901.024 meters supports the estimate. The software used for estimation was Datamine Studio 3™.

The QP for the Mineral Resource Estimate can confirm that the resource estimate is still current and no significant new information that can be considered as material has been added.

The Mantoverde geological block model was primarily estimated using blocks of 5.0 m x 5.0 m x 5.0 m. Later a re-blocking process was done generating a 10.0 m x 10.0 m x 15.0 m block size, where eight small blocks define the block size for the resource block model. This process dilutes the grade in the contour and contact zones of the deposit. Waste dilutes Mineral Resources as low and high grades are combined and contact mineralized zones are blended. The block size selected is appropriate as a Selective Minig Unit (SMU) for this type of deposit.

The area contained by the models is shown in Table 14-1.

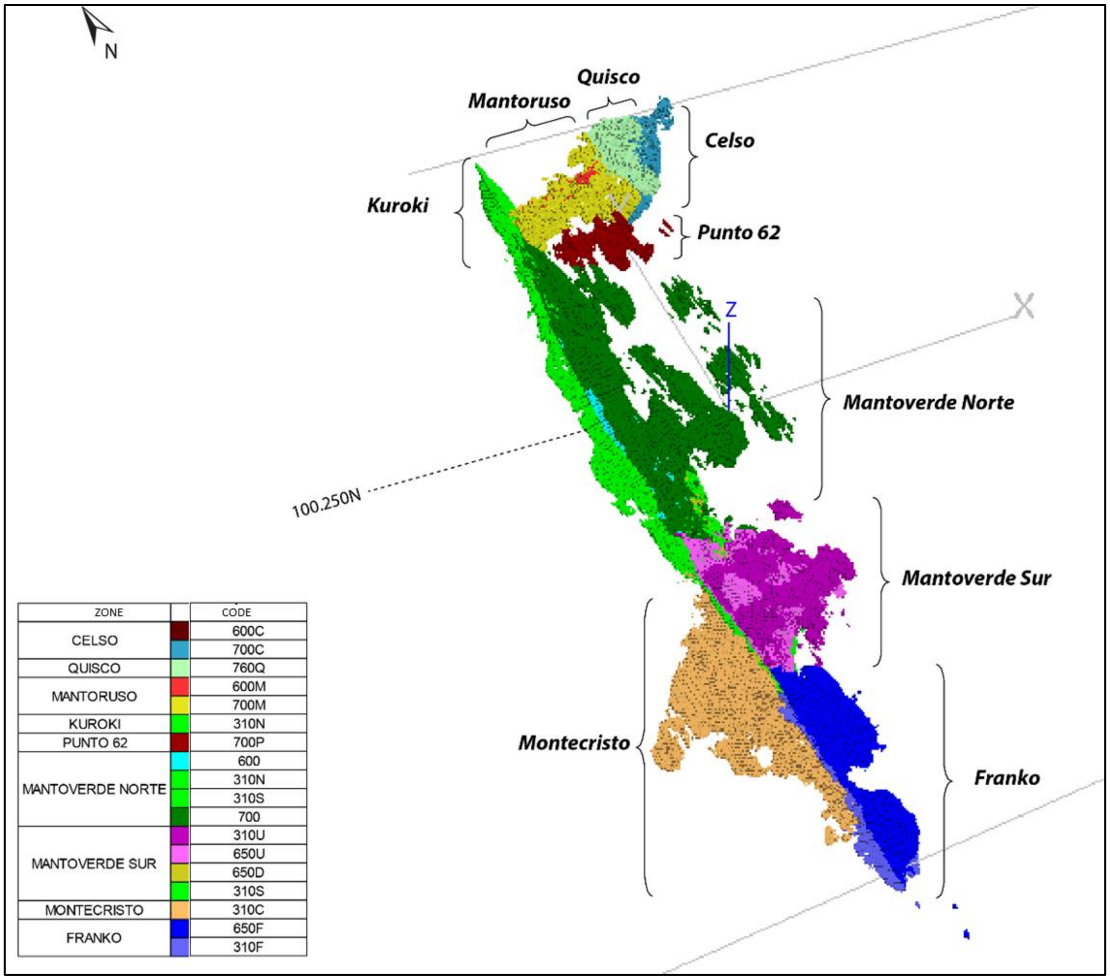
Table 14-1: Block Model Dimensions

	Azimuth	Dip	Plunge
	90°	0°	0°
Origin	East	North	RL
	59395	95390	0
Extension	2,840	9,060	1,200
Estimate Block Size	5	5	5
Regularized Block Size	10	10	15
N° Blocks	568	1,812	224

14.2 Geological Models

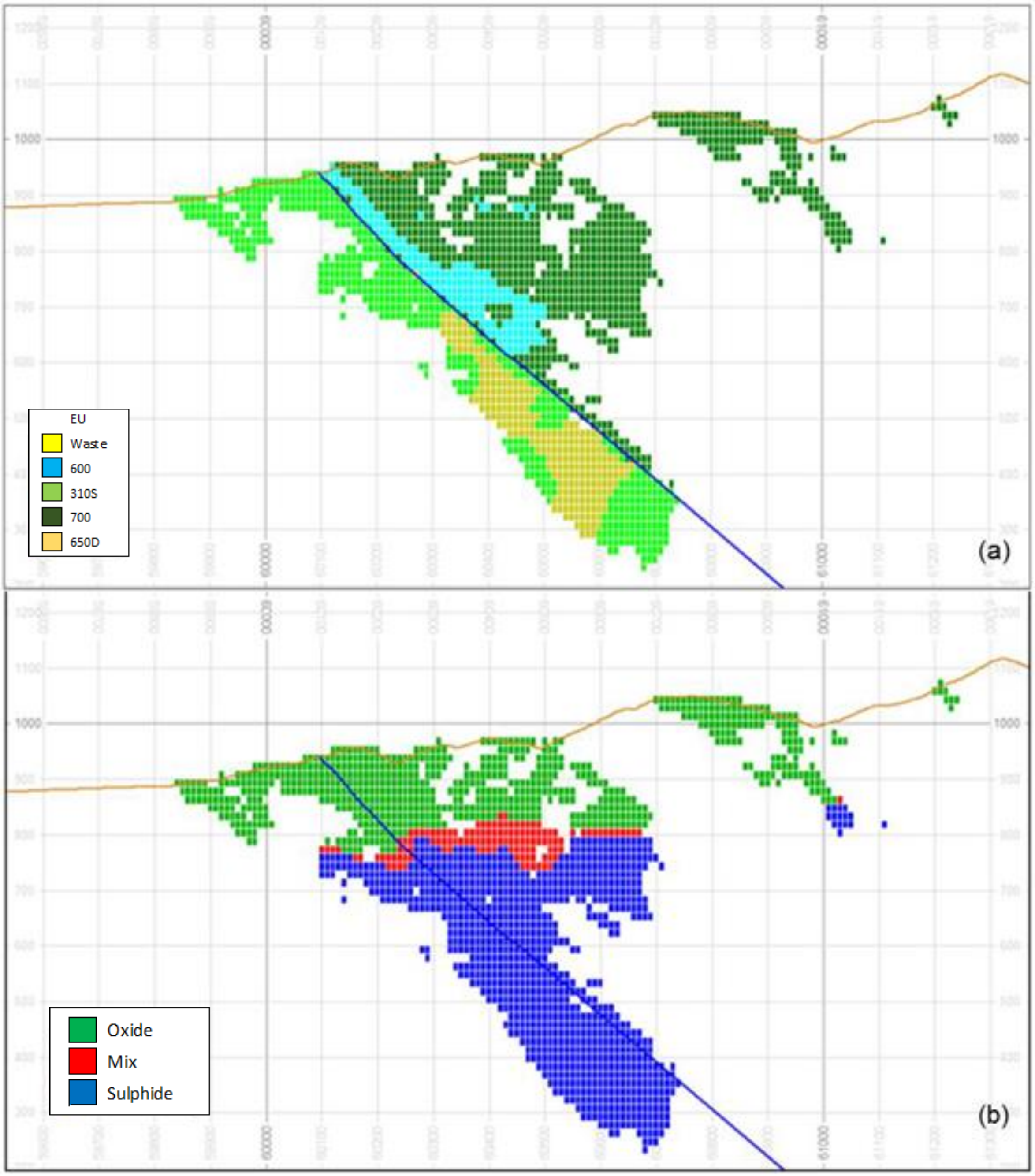
About 70% of the deposits lie along the north–northeast–south–southwest trace of the FMV (Figure 14-1) with the remaining deposits (Manto Ruso, Quisco, Celso) located along a northeast–southwest trend, extending about 700 m to the east from the Kuroki mine (see Figure 14-2 and Figure 14-3). In this area, the mineralization control is the intersection of secondary northwest–southeast and north–south trending faults.

Figure 14-1: Spatial Distribution of the EUs used in the 2019 Model



Note: Figure courtesy Mantos Copper, 2018.
Section lines shown on figure are the locations of Figure 14-2 and Figure 14-3.

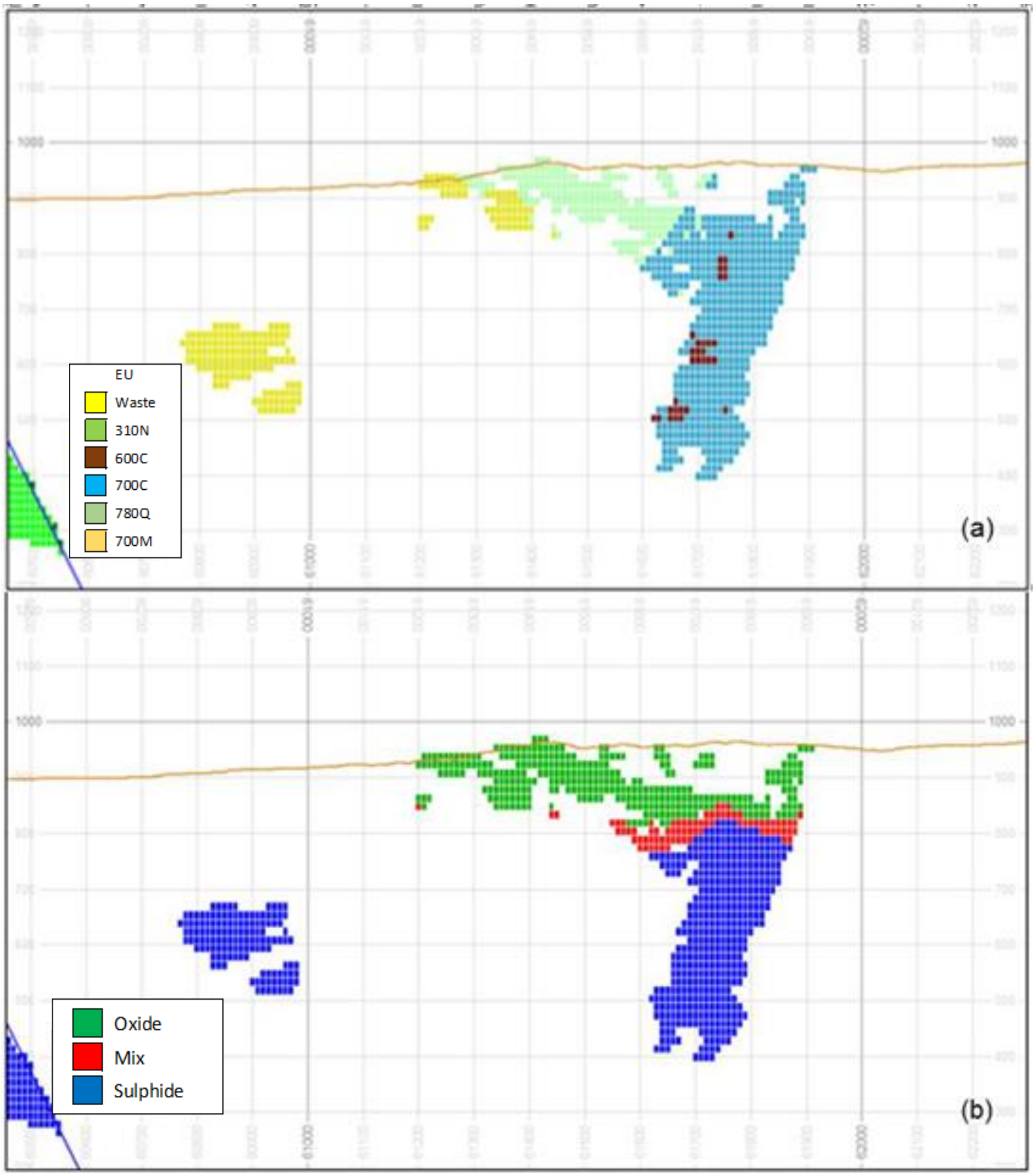
Figure 14-2: East–West Section (99.950 N) Showing Spatial Distribution of (a) EUs and (b) Oxidation States



Note: EU = Estimation Unit

Figure courtesy Mantos Copper, 2019

Figure 14-3: East–West Section (103.400 N) Showing Spatial Distribution of (a) EUs and (b) Oxidation States



Note: EU = Estimation Unit
Figure courtesy Mantos Copper, 2019

The geological modelling includes the interpretation of mineralized geological units that have been defined based on lithology, alteration, mineralization and position with respect to the Mantoverde Fault. The modelling methodology uses a spatial indicator approach to include all materials with an economic potential greater than 0.10%TCu, thus resulting in a probabilistic model. The probabilistic modelling method is based on mineralized volumes that have a probability of >50% and a cut-off grade of 0.10%TCu. As part of the review and validation of the geological model back-flag analysis of the composite samples with the EUs (estimation units) in the block model concluded that the blocks adequately represent the sample data. The concordance was >98.5%, which is considered acceptable.

14.2.1 Lithology Model

For the construction of the lithology model the lithologies logged by the geologists are grouped. These simplified units correspond to the basis of the resource estimation units and are stored within the variable ZONE (see Table 14-2).

- If the sample is mineralized (TCu>0.10%) and the rock corresponds to a ROCK (codes 150, 160,190, 200, 240, 250, 260, 270, 280, 281, 282, 283, 285, 300, 350, 400, 500, 550), then lithology (ZONE) is grouped within unit 310.
- Initially all breccias are denominated under code 310, then they are grouped according to the geographic location and separated between tectonic breccia-breccia-green mineralized.
- If the sample is mineralized (TCu>0.10%) and the rock corresponds to unit 610, this lithology is grouped within unit 600.
- If the sample is mineralized (TCu>0.10%) and the rock corresponds to unit 660, this lithology is grouped within unit 650.
- If the sample is mineralized (TCu>0.10%) and the rock corresponds to units 710 or 720, this lithology is grouped within unit 700.
- If the sample is mineralized (TCu>0.10%) and the rock corresponds to units 860 or 900, then this lithology is grouped within unit 850.
- If the rock corresponds to unit 800, this lithology is grouped within unit 800.
- If the sample is mineralized (TCu>0.10%) and the rock corresponds to Absent, this lithology is grouped within unit 850 and later assigned to a lithology according to the conceptual model.
- If the sample is mineralized (TCu>0.10%) in the Manto Ruso-Quisco-Celso deposits and the rock was mapped as unit 610 or 650), this lithology is grouped within unit 600.
- If the sample is mineralized (TCu>0.10%) in the Manto Ruso-Quisco-Celso deposits and the rock was mapped as units <600 or >650, this lithology is grouped within unit 700.

Table 14-2: Database Lithological Codes and ZONE Variables

Description	Code	ZONE		Description	Code	ZONE
Absent	-9	ABSENT		hydrothermal breccia	600	600
Overburden	100	100		hydrothermal breccia	610	
coarse gravel	101			magnetite breccias	650	650
medium gravel	102			magnetite dissemination	660	
fine gravel	103			transition zone	700	700
sand, silt	104			transition zone	710	
sand	105			epidote zone	720	
silt	106			salband	800	800
clay	107			fault zone	850	850
gravel-rock interface	108			calcite vein	860	
terraced deposits	170			mylonite	900	
clastic rocks	180					
alluvium	226					
tonalitic porphyry	255					

Description	Code	ZONE		Description	Code	ZONE
granitic dyke	150					
felsic body	160					
brownish andesite	190					
gray andesite	200					
chloritized andesite	240					
diorite	250					
argillized andesite	260					
green breccia	270					
granodiorite-tomalite	280					
fine granodiorite	281	310				
coarse granodiorite	282					
tonalite	283					
green breccia in Gd	285					
green breccia	300					
mineralized green breccia	310					
dioritic dike	350					
andesitic dike	400					
tectonic breccia	500					
tectonic breccia	550					

14.2.2 Position with Respect to Mantoverde Fault

Samples are flagged according to their position with respect to the Mantoverde Fault (FMV). This structure is modelled as a wireframe within Datamine Studio 3 and is updated annually with the new drill hole information. The flagging used is:

- PIN=1, hanging wall block of the Mantoverde Fault
- PIN=2, footwall block of the Mantoverde Fault.

14.2.3 Minzone

The mineralization of the deposit is classified according to its exposure to supergene effects, mainly in those zones close to the FMV. To replicate this behaviour two separate boundaries were defined between the mineral zones; the Sulphide Roof and the Oxide Floor. The shape of these surfaces is updated annually in Datamine Studio 3 with new information incorporated into the model. This surface allows three zones to be differentiated:

- Oxide Zone: location of the main part of the deposit where there are oxidized minerals such as chrysocolla, brochantite, malachite, cupriferous limonites and copper wad. It is located on top of the Sulphide Roof, its maximum solubility ratio1 is 0.65 and it is identified with the variable MINE=1.

- Mixed Zone: intermediate area where copper oxide minerals and copper sulphide minerals co-exist. It is located between the Oxide Floor and the Sulphide Roof and is identified with the variable MINE=2.
- Sulphide Zone: location of the deeper sulphides such as chalcopyrite, pyrite, covellite and bornite, located below the Oxide Floor and identified with the variable MINE=3.

14.2.4 Probabilistic Model

The probabilistic model was constructed based on indicators as follows:

- The samples are first composited to 10 m intervals respecting the original geological contacts and separated into two populations depending on the position relative to the FMV (hanging wall or footwall blocks).
- An indicator IND1 is coded 1 or 0 depending on whether the TCu grade is greater or equal to 0.1%TCu, or less than 0.1%TCu.
- A block model is constructed using Ordinary Kriging (OK). Blocks with a probability greater than or equal to 50% are considered mineralized (parameter MINERALISED), the remaining blocks are classified as waste (parameter WASTE).
- Indicators IND2 and IND3 are coded 0 or 1 depending on different combinations of the geological unit (parameter ZONE) and the location with respect to the FMV (parameter PIN). These indicators are estimated using OK.
- In collaboration with the exploration geologists, the internal geological consistency of the model is reviewed. The incremental volumes of the block are also reviewed in relation to the expected results after the exploration drilling campaigns and a comparison of the model with the control geological sections is run every 25 m to ensure consistency.
- A total of 16 estimation units (EU) were modelled using the probabilistic indicators methodology. The EUs that support the MVDP estimate are 700C, 700M, 600, 700, 650D, 650U and 310N (Figure 14-4).

Figure 14-4: Codes Used to Identify the EUs in the Block Model

Mantoverde Resources Estimation Model Codes							
ID	CODE	ESTIMATION UNIT	ZONE	SECTOR	PIN	AREA	YC
1	600	Hydrothermal Breccia	600	1	1	MANTOVERDE NORTE	
2	700	Transition Zone	700	1	1	MANTOVERDE NORTE	
3	650D	Magnetite Zone below MVF	650	3	2	MANTOVERDE SUR	
4	310N	North Tectonic Breccia	310	3	2	KUROKI/MANTOVERDE NORTE	YC>100,250
5	310C	MontecristoTectonic Breccia	310	4	2	MONTECRISTO	
6	650F	Franko Magnetite Zone	650	5	1	FRANKO	
7	310F	FrankoTectonic Breccia	310	6	2	FRANKO	
8	310S	South Tectonic Breccia	310	3	2	MANTOVERDE NORTE/ MANTOVERDE SUR	YC<100,250
9	650U	Magnetite Zone above MVF	650	2	1	MANTOVERDE SUR	
10	310U	Mineralized Green Breccia	310	2	1	MANTOVERDE SUR	
11	700P	Punto 62 Transition Zone	700	7	1	PUNTO 62	
12	600M	Mantoruso Hydrothermal Breccia	600	8	1	MANTORUSO	
13	700M	Mantoruso Transition Zone	700	8	1	MANTORUSO	
14	600C	Celso Hydrothermal Breccia	600	9	1	CELSO	
15	700C	CelsoTransition Zone	700	9	1	CELSO	
16	760Q	Quisco Hydrothermal Breccia	600/700	10	1	QUISCO	
PIN=1--> Hanging Wall Block; PIN=2--> Footwall Block							

Note: Figure courtesy Mantos Copper, 2019

14.3 Composites

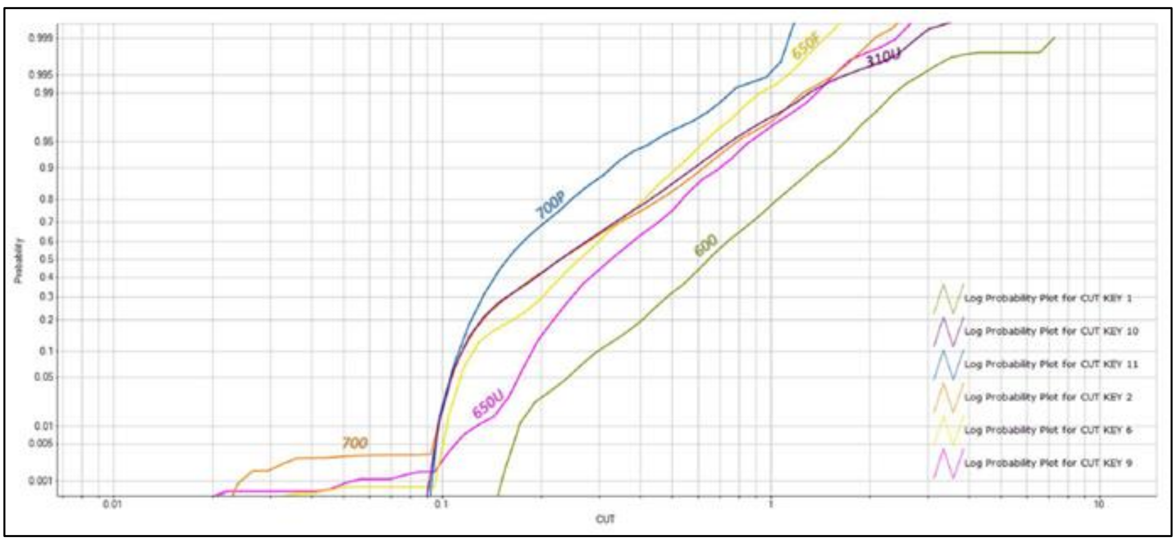
Typically, 2 m long sample intervals are composited to 10 m using the Datamine Studio 3 package. A 6 m to 14 m tolerance is considered and geological contacts are respected. After a first round of compositing, each interval is assigned to a definitive EU in Excel and then the file is re-composited at 10 m.

14.4 Total Copper (TCu) and Soluble Copper (SCu) Estimate

The exploratory data analysis is intended to find similarities of distributions among different populations and to determine possible groupings by geological attributes. The exploratory data analysis also seeks to detect possible drifts that may affect the estimation result. The statistical adequacy of the definitions of the EUs was verified through the implementation of statistical and geostatistical tools. The analyses included basic statistics, cumulative probability and swath plots. The statistical analyses were developed using the composites database. Sixteen EUs were defined using the geological units, sectors and the north coordinates as controls.

Figure 14-5 shows an example of a cumulative plot. Although EUs 700 and 310U exhibit very similar behaviour, they have been kept as separate EUs because there is a mineralization gap between the units.

Figure 14-5: Cumulative Probability Plot by EU at the Hanging Wall of the FMV



Note: Figure courtesy Mantos Copper, 2019

Mantos Copper applied a semi-hard boundary between high and low TCu grades to estimate copper grades. The separation between low and high grades is based on the proportional effect between grade and sample variance. A ±0.4%TCu break was identified (Figure 14-6).

- The low-grade population, characterized by a low TCu grade (below 0.4%TCu) and low variability
- The high-grade population, characterized by a high TCu grade (over 0.4%TCu) and higher copper variability.

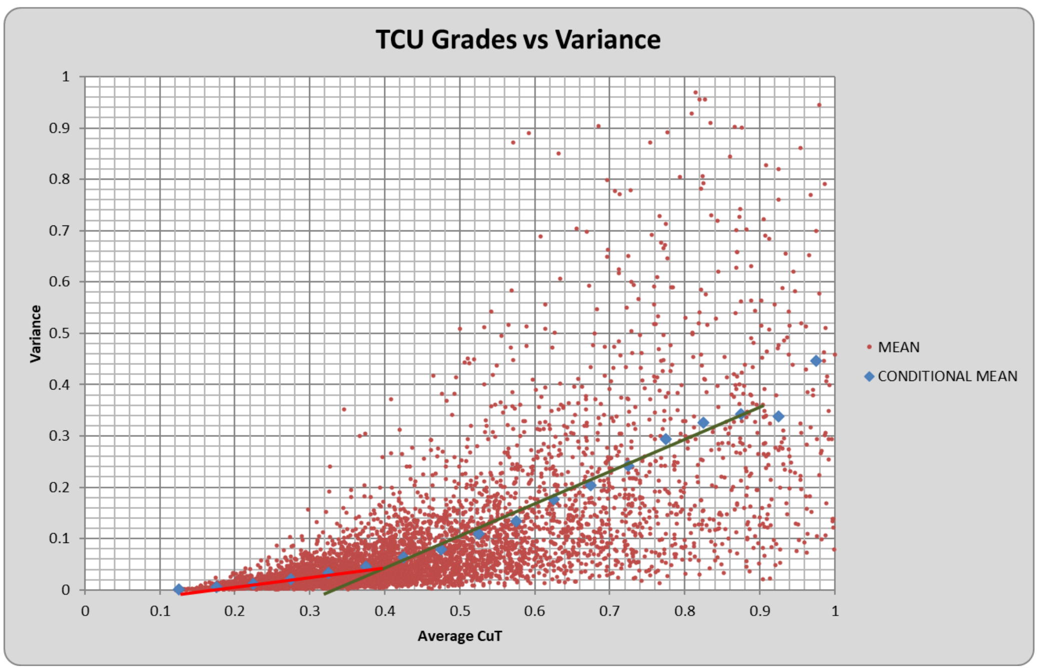
This was completed using a probabilistic indicator model and a probability of 50%. Once high-grade and low-grade blocks were defined for each EU, low- and high-grade composites were separated. Semi-hard boundaries were imposed using the following criteria:

- If along a composited drill hole trace, a low-grade section (either at the start or end) is found in contact with one or more high-grade sections, two high-grade composites in direct contact with the low-grade zone will be added to the low-grade database.
- This process will be conducted for each low-grade section per EU.

The procedure creates a low-grade drill hole database with a high-grade halo with a thickness of ±10 m for each EU.

Ordinary Kriging was used for TCu and SCu grade interpolation.

Figure 14-6: Sample Distribution as a Function of the TCu Grade and Variance



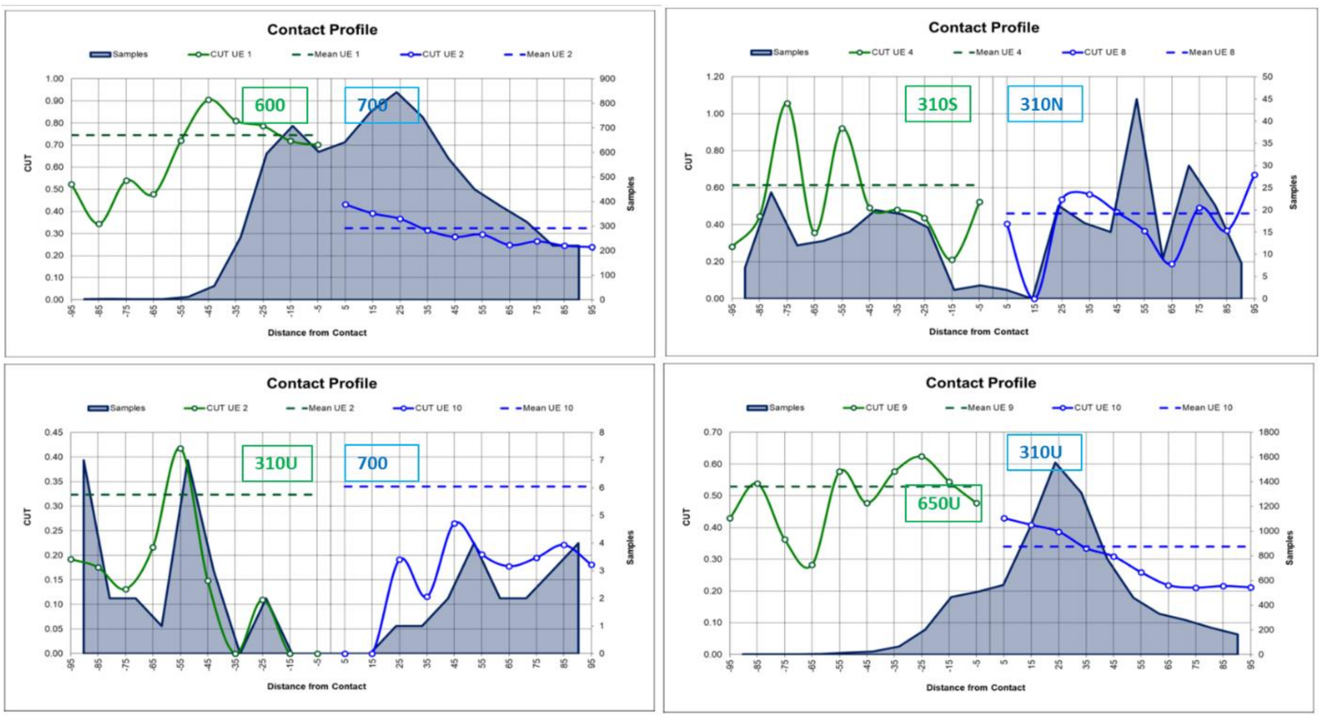
Note: Figure courtesy Mantos Copper, 2019

14.4.1 Contact Analysis

To establish the type of contact (soft, semi-soft or hard) between EUs, a contact analysis is carried out. Contact analysis is a mathematical method to define the grade behaviour between samples of different UEs as they approach a contact. Contact analysis takes samples from one EU and pairs them with samples from another EU based on a separation distance. Pairs are constructed over an average separation distance. For each separation distance the average grade of the composites from the first EU is plotted against the average grade calculated for the second EU. The graph locates the separation distances on the horizontal axis (X-axis) and the average grade on the vertical axis (Y-axis). The data for the first EU is plotted as a negative distance in order to observe the differences within the graph.

Mantoverde used only hard contacts between the EUs. Contact analyses (310N, 310S, 600 and 700) were prepared across the volumetrically most important units to assess the type of contact between the units. Although EU 700 and 310U show similar behaviour, they remain separate as there is no physical continuity between these two units (Figure 14-7).

Figure 14-7: Swath Plot for EUs



Note: Figure courtesy Mantos Copper, 2019

14.4.2 Grade Capping/Outlier Restrictions

High-grade outlier control is necessary to control the excess metal generation from samples that are considered anomalous in the global or local distribution of grades.

Mantoverde defined anomalous TCu samples by capping, the thresholds used are shown in Table 14-3.

Table 14-3: Capping Values by Estimation Domain

EU	Capping TCu (%)
600	4
310C	5.5
310F	2.4
600C	2.9
600M	3.1
700C	2.1
760Q	1.3
700, 310N, 310S, 310U, 650U, 650D, 650F, 700P, 700M	NA

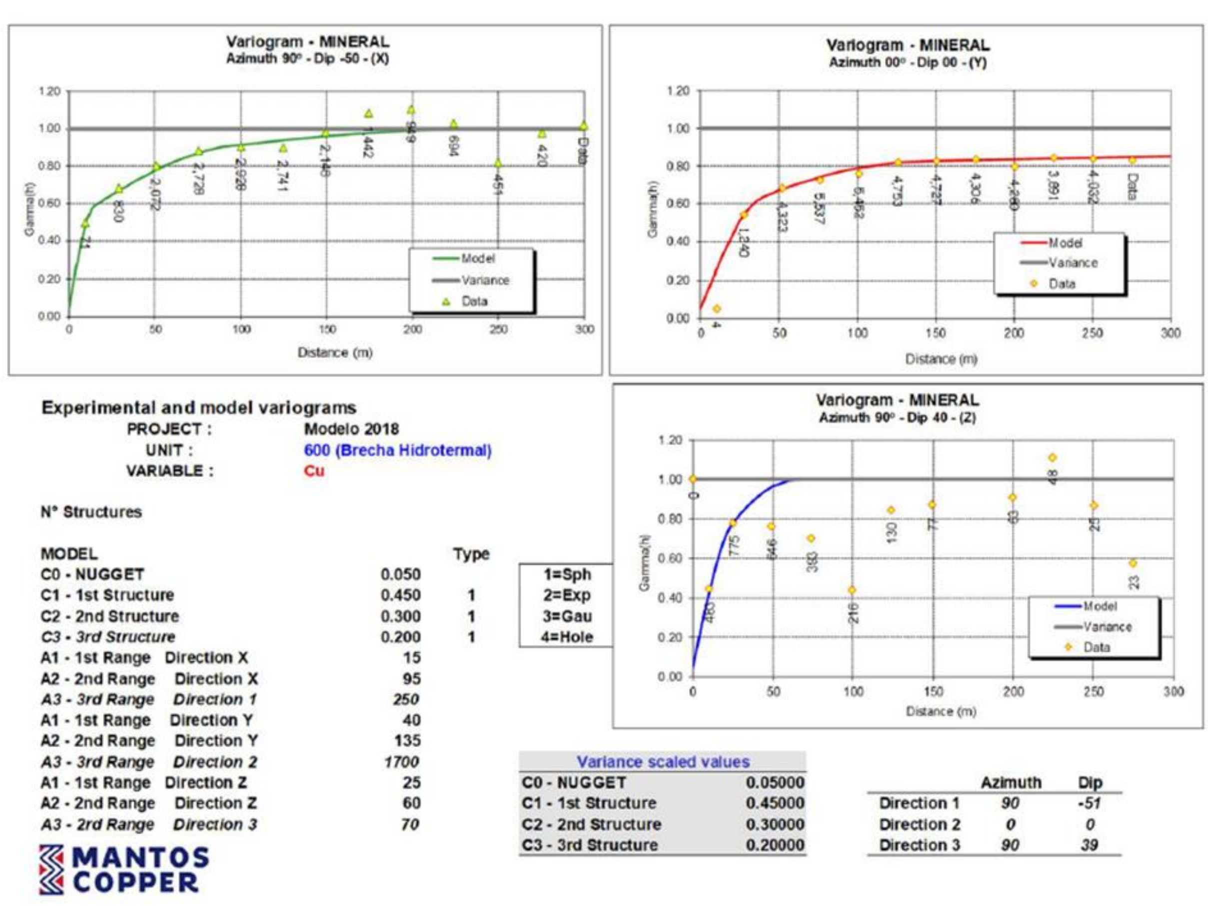
14.4.3 Variography

Mantoverde completed the variography by using down the hole (DTH) and 3D variograms. Directional correlograms were calculated for each EU based on 10 m composite sample. Each of the estimation domains presents a 3-structure spherical model correlogram where the same variograms were used for TCu and SCu. Table 14-4 shows the correlogram parameters used for the TCu and SCU estimates. Figure 14-8 shows the variogram for EU 600.

Table 14-4: Correlograms Parameters for TCu and SCu

EU	Nugget	Rotation X	Rotation Y	Rotation Z	Type	First Structure				Second Structure				Third Structure			
						Sill	Major Axis	Semi Major Axis	Minor Axis	Sill	Major Axis	Semi Major Axis	Minor Axis	Sill	Major Axis	Semi Major Axis	Minor Axis
600	0.05	0	-51	0	SPH	0.45	15	40	20	0.3	95	135	60	0.2	250	1700	70
700	0.2	0	-51	0	SPH	0.25	15	30	25	0.25	95	85	55	0.3	200	400	240
310N	0.15	-30	0	-42	SPH	0.35	20	35	18	0.23	35	50	30	0.27	150	250	50
310U	0.05	0	0	0	SPH	0.42	20	30	20	0.3	40	40	40	0.23	200	220	215
650U	0.1	0	0	0	SPH	0.3	60	30	100	0.4	50	71	150	0.2	1000	320	250
310S	0.2	-30	0	-42	SPH	0.35	55	30	30	0.2	95	40	40	0.25	140	250	150
650F	0.15	-0	-39	0	SPH	0.3	30	30	20	0.35	70	90	60	0.2	110	4000	100
310C	0.1	0	30	0	SPH	0.5	30	35	15	0.25	60	75	90	0.15	120	500	150
310F	0.2	0	-36	0	SPH	0.4	25	30	15	0.2	30	110	45	0.2	90	110	30
650F	0.1	0	-36	0	SPH	0.4	30	30	10	0.25	90	60	30	0.25	90	170	35
600C	0.15	64	0	0	SPH	0.38	20	30	20	0.25	30	60	35	0.22	130	100	60
700C	0.15	64	0	0	SPH	0.38	25	40	30	0.25	45	75	35	0.22	400	210	80
760Q	0.1	-28	0	0	SPH	0.3	15	20	10	0.35	40	30	15	0.25	70	120	30
600M	0.1	0	0	0	SPH	0.45	30	30	30	0.25	65	80	90	0.2	160	100	120
700M	0.1	0	0	0	SPH	0.45	30	40	30	0.25	35	60	60	0.2	130	120	120
700P	0.15	0	0	0	SPH	0.35	15	20	20	0.3	40	70	50	0.2	70	100	700

Figure 14-8: TCU Variography EU 600



Note: Figure courtesy Mantos Copper, 2020

14.4.4 Estimation Plan

TCu and SCu were estimated by Ordinary Kriging in three estimation passes. Table 14-5 provides the interpolation parameters used in estimation.

The Kriging plan includes three passes, in which the search radii are increased and the sample restriction are relaxed.

- Minimum number of samples is 7, 4 and 4 for the first, second and third passes, respectively
- Maximum number of samples per run is 16 for the three runs
- Estimation is allowed with a minimum of two drill holes (maximum 3 samples per hole)
- No sample restrictions were implemented for octants.

Table 14-5: Interpolation Parameters

Unit	Code	Type	Rotation			Pass	Samples		Max	Search (m)		
			x	y	z		Min	Max	Hole	x	y	z
Hydrothermal Breccia	600	Sphere	0	-51	0	1	7	16	3	180	150	45
						2	4	16	3	180	150	45
						3	4	16	3	360	300	90
Transition Zone	700	Sphere	0	-51	0	1	7	16	3	150	150	130
						2	4	16	3	150	150	130
						3	4	16	3	300	300	260
Mineralized Green Breccia	310U	Sphere	0	0	0	1	7	16	3	150	175	150
						2	4	16	3	150	175	150
						3	4	16	3	300	350	300
Magnetite Zone Above	650U	Sphere	0	0	0	1	7	16	3	60	150	100
						2	4	16	3	60	150	100
						3	4	16	3	120	300	200
Magnetite Zone Below	650D	Sphere	0	-39	0	1	7	16	3	100	100	80
						2	4	16	3	100	100	80
						3	4	16	3	200	200	160
North Tectonic Breccia	310N	Sphere	0	-56	0	1	7	16	3	100	150	50
						2	4	16	3	100	150	50
						3	4	16	3	200	300	100
South Tectonic Breccia	310S	Sphere	0	-42	-30	1	7	16	3	140	180	130
						2	4	16	3	140	180	130
						3	4	16	3	280	360	260
Montecristo Tectonic	310C	Sphere	0	30	0	1	7	16	3	100	100	100
						2	4	16	3	100	100	100
						3	4	16	3	200	200	200
Franko Magnetite Zone	650F	Sphere	0	-36	0	1	7	16	3	75	130	35
						2	4	16	3	75	130	35
						3	4	16	3	150	260	70
Franko Tectonic Breccia	310F	Sphere	0	-36	0	1	7	16	3	80	100	35
						2	4	16	3	80	100	35
						3	4	16	3	160	200	70
Punto 62 Transition Zone	700P	Sphere	0	0	0	1	7	16	3	60	80	70
						2	4	16	3	60	80	70
						3	4	16	3	120	160	140
Manto Ruso Hydrothermal	600M	Sphere	0	0	0	1	7	16	3	130	100	70
						2	4	16	3	130	100	70
						3	4	16	3	260	200	140
Manto Ruso Transition	700M	Sphere	0	0	0	1	7	16	3	100	100	80
						2	4	16	3	100	100	80
						3	4	16	3	200	200	160
Quisco Hydrothermal	760Q	Sphere	0	-28	0	1	7	16	3	60	100	30
						2	4	16	3	60	100	30
						3	4	16	3	120	200	60
Celso Hydrothermal	600C	Sphere	0	64	0	1	7	16	3	70	80	50
						2	4	16	3	70	80	50
						3	4	16	3	140	160	100
Celso Transition Zone	700C	Sphere	0	64	0	1	7	16	3	60	80	50
						2	4	16	3	60	80	50
						3	4	16	3	120	160	100

14.5 Gold (Au)

Even though the correspondence between the number of records is not 100%, the sulphide units show an acceptable degree of correspondence. Table 14-6 shows the parity in percentage of samples with Au grades with respect to TCu by mineral zone, it is observed that the oxides are less sampled with a total of 10%; the sulphides have a higher parity with a total of 92% of sampling with respect to TCu; this is considered sufficient for the purpose of estimating the Au variable for the MVDP.

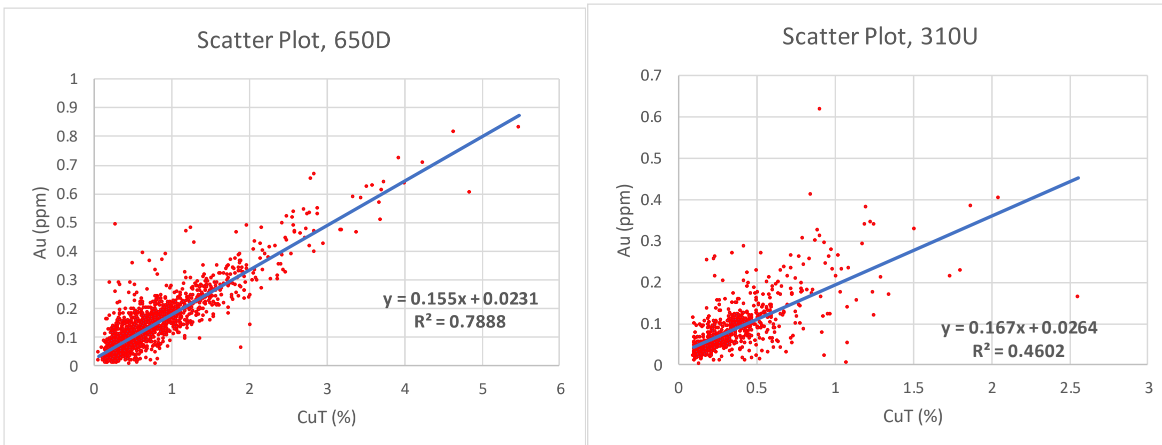
Table 14-6: Parity in Percentage of Samples with Au Grades with Respect to TCu by Zone - Au

EU	Oxide	Mixed	Sulphide	Total
600	22%	64%	97%	44%
700	19%	65%	90%	32%
310C	7%	42%	72%	13%
310F	3%	26%	30%	4%
310N	6%	41%	91%	18%
310S	7%	67%	94%	42%
310U	6%	70%	71%	9%
600C	5%	96%	100%	67%
600M	13%	41%	92%	35%
600Q	19%	63%	100%	22%
650D	7%	83%	99%	82%
650F	3%	43%	0%	3%
650U	5%	77%	95%	22%
700C	16%	83%	94%	54%
700M	12%	48%	83%	40%
700P	7%	67%	82%	16%
Total	10%	62%	92%	28%

14.5.1 Exploratory Data Analysis

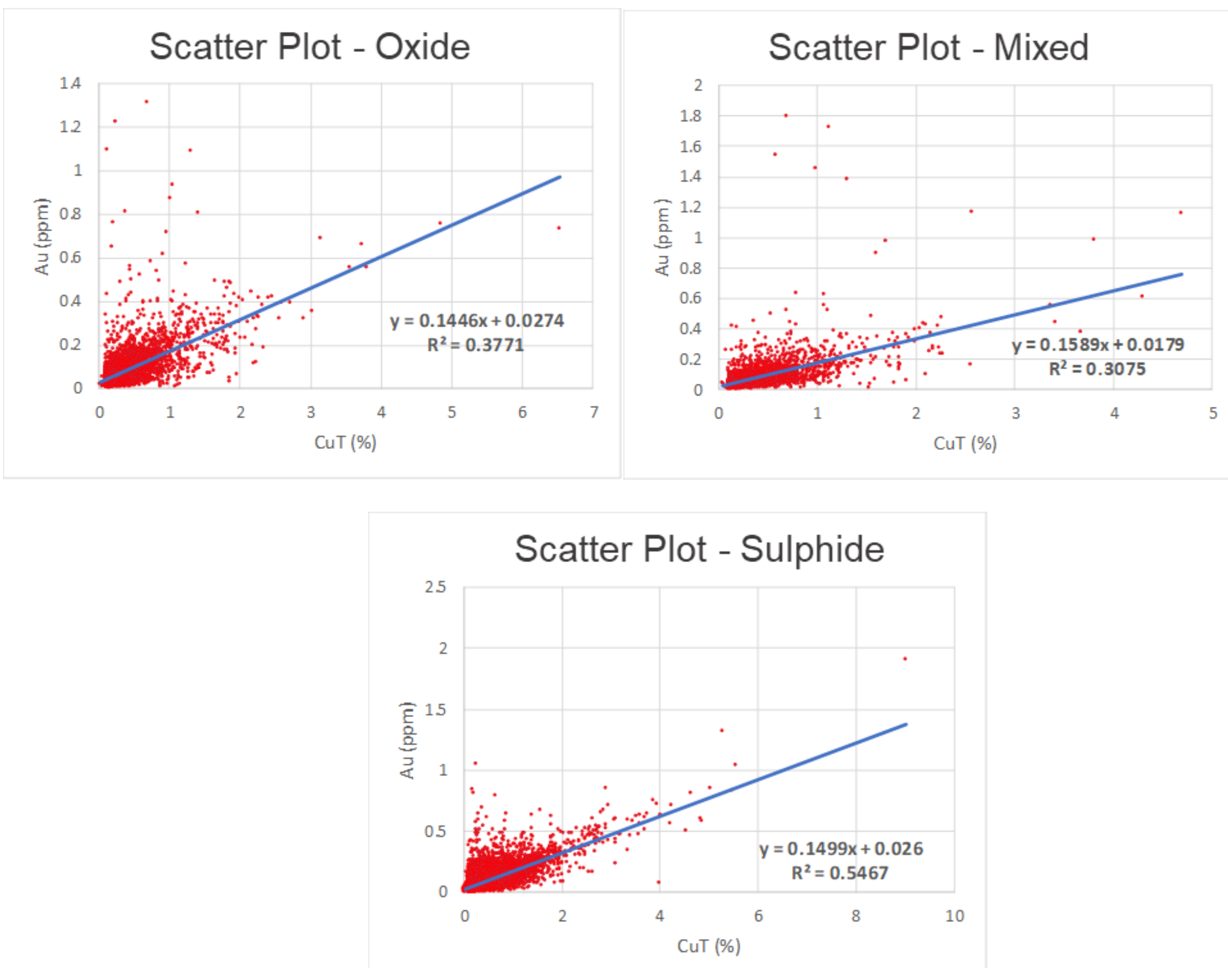
Because there was high correlation identified between TCu and Au, Mantoverde defined the EUs for the Au estimate based on those defined for TCu. This definition is considered consistent with the geology of the deposit. The main EUs have a high correlation index as shown in Figure 14-9, where EU 650D and 310U are highly correlated. Figure 14-10 shows the analysis of TCu vs Au correlations by mineral zone, it is observed that the sulphide presents the highest correlation.

Figure 14-9: Au-TCu Correlation for EU 650D and EU 310U



Note: Figure courtesy Mantos Copper, 2020

Figure 14-10: Au-TCu Correlation by Mineral Zone



Note: Figure courtesy Mantos Copper, 2020

14.5.2 Contact Analysis

Mantoverde used only hard contacts between the EUs.

14.5.3 Grade Capping/Outlier Restrictions

Mantoverde defined anomalous Au samples by capping, the thresholds used are shown in Table 14-7.

Table 14-7: Gold Capping Values by Estimation Domain

EU	Capping Au (ppm)
600	0.50
700	0.48
310U	0.32
650U	0.45
650D	0.62
310N	0.75
650F	NA
310F	0.14
700P	0.15
600M	0.37
700M	0.50
600C	0.40
700C	0.40
760Q	0.52
310S	0.62
310C	0.38

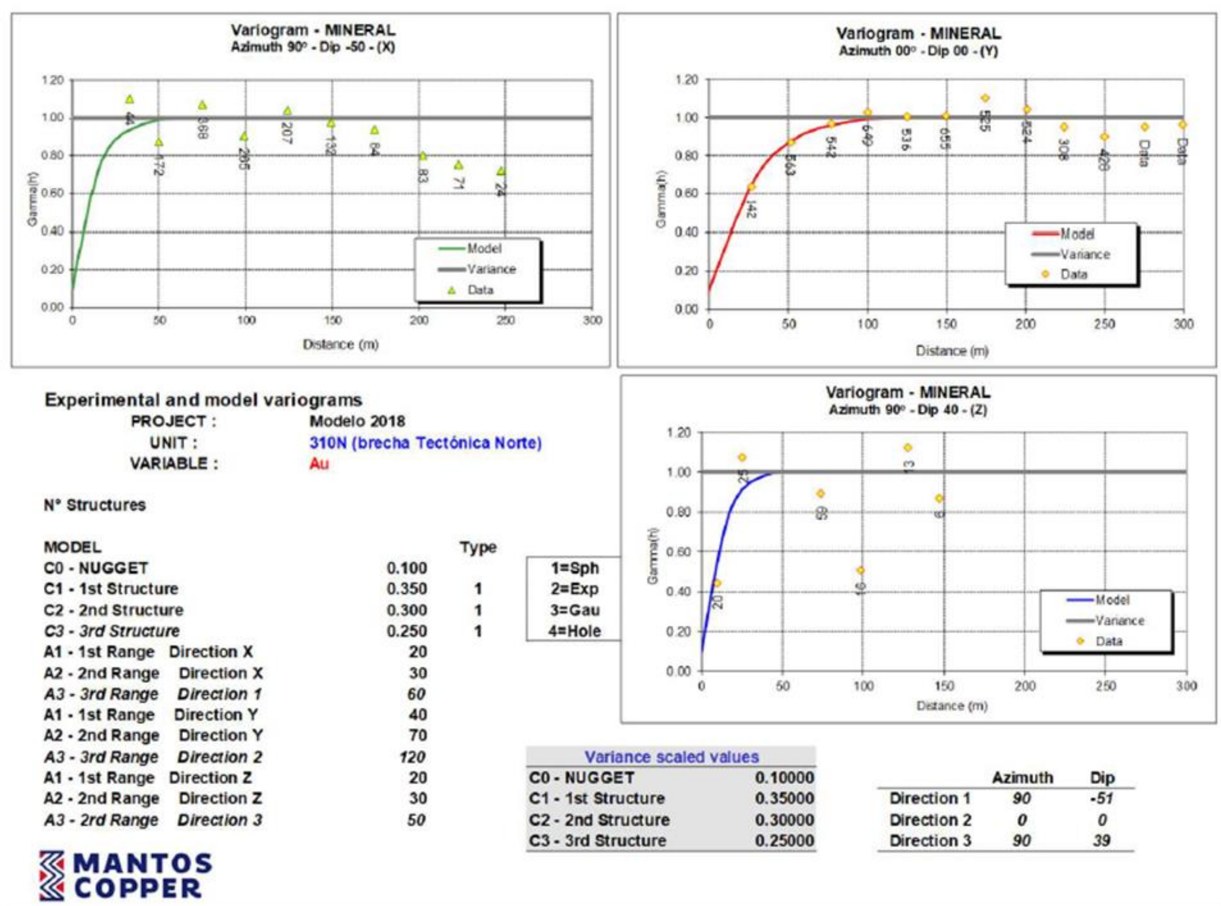
14.5.4 Variography

Mantoverde completed variography using down the hole (DTH) and 3D variograms for Au. Directional correlograms were calculated for each EU in 10 m composites. Table 14-8 shows the modelled correlogram parameters used for Au estimate. Figure 14-11 shows the variogram for EU 310N.

Table 14-8: Correlograms Parameters for Au

EU	Nugget	Rotation X	Rotation Y	Rotation Z	Type	First Structure				Second Structure				Third Structure			
						Sill	Major Axis	Semi Major Axis	Minor Axis	Sill	Major Axis	Semi Major Axis	Minor Axis	Sill	Major Axis	Semi Major Axis	Minor Axis
600	0.1	0	-51	0	SPH	0.3	20	40	15	0.3	30	80	60	0.3	100	240	80
700	0.1	0	-51	0	SPH	0.4	20	30	25	0.25	50	50	40	0.25	150	300	1000
310N	0.1	0	0	-56	SPH	0.35	20	40	20	0.3	30	70	30	0.25	60	120	50
310U	0.15	0	0	0	SPH	0.4	10	35	15	0.25	15	60	20	0.2	60	100	50
650U	0.2	0	0	0	SPH	0.4	15	40	15	0.25	20	70	20	0.15	30	100	500
310S	0.2	-30	0	-42	SPH	0.4	50	15	20	0.3	80	50	40	0.1	150	200	100
650D	0.15	-0	-39	0	SPH	0.25	20	30	20	0.25	50	60	80	0.25	110	500	100
310C	0.15	0	30	0	SPH	0.4	20	30	15	0.25	35	40	50	0.2	80	150	100
310F	0.15	0	-36	0	SPH	0.4	20	25	10	0.3	35	30	15	0.15	150	100	20
650F	0.2	0	-36	0	SPH	0.4	15	10	10	0.2	20	15	15	0.2	30	30	250
600C	0.1	64	0	0	SPH	0.45	15	40	20	0.3	35	90	40	0.15	80	100	50
700C	0.1	64	0	0	SPH	0.5	15	25	15	0.3	40	60	30	0.1	80	150	150
760Q	0.15	-28	0	0	SPH	0.3	15	40	20	0.4	30	80	60	0.15	80	120	130
600M	0.15	0	0	0	SPH	0.4	40	30	50	0.3	60	70	80	0.15	70	80	500
700M	0.1	0	0	0	SPH	0.45	20	30	15	0.3	30	50	100	0.15	150	70	1000
700P	0.15	0	0	0	SPH	0.4	50	40	15	0.3	70	60	20	0.15	500	80	30

Figure 14-11: Au Variography EU 310N



Note: Figure courtesy Mantos Copper, 2020

14.5.5 Estimate Plan

Au has not been analyzed in 100% of the historical drill holes, therefore, Mantoverde used two methodologies based on the high correlation between TCu and gold grades.

Methodology 1: In those blocks where sufficient information exists for the composites for each estimation unit, the estimation of Au is based on interpolation by Ordinary Kriging (Datamine Studio 3). Those blocks created manually (not by using Probabilistic Indicator Modelling methodology) were estimated as described above.

Methodology 2: Consists of assigning the Au value to those blocks that do not have enough assay data to be estimated by applying the relationship between TCu and Au for each EU. The correlation analyzed between the variable TCu v/s Au shows values around 80% (Geoinnova, 2015 Mantoverde Geometallurgical Model) in areas with better copper grade (MVN and MVS hydrothermal breccias with specularite and magnetite). This correlation decreases when moving away from the main sulphide mineralization conduit, so that the units with the lowest correlation are the units in the Franko zone, where the sulphide mineralization is lower. In order to define the best curve that represents the behaviour of Au with respect to TCu, Mantoverde carried out a sample by sample analysis, as well as using conditional averages using 0.05% TCu. Based on these results the average relative variance of the samples was calculated and hence the average relative error. In this analysis it was decided to apply a conservative correlation curve, hence, a negative factor equal to half the average relative error of the series was applied to each calculated Au value.

Table 14-9 shows the tonnage by INDAU (method used to estimate Au variable blocks) for the MVDP Mineral Resources, it is observed that for the Measured + Indicated Mineral Resource for sulphides (INDAU=1) (estimation by Ordinary Kriging) the tonnage is above 98%, this is considered adequate based on the risk assessment of the Au variable in the MVDP Mineral Resources.

Table 14-9: Tonnage by INDAU for the MVDP - Au Resource Table

Resource	INDAU	Mineral Resource		Measured + Indicated Mineral Resource	
		Tonne	%	Tonne	%
MVDP Sulphide Mixed (Flotation)	1 (OK)	75,292,249	83.5	70,455,483	98.6
	2 (OK manual)	2,338,245	2.6		0.0
	3 (Assigned)	12,524,784	13.9	986,257	1.4
Total		**90,155,278**	**100.0**	**71,441,741**	**100.0**
MVDP Sulphide (Flotation)	1 (OK)	781,709,968	74.2	482,222,210	98.3
	2 (OK manual)	71,009,703	6.7		0.0
	3 (Assigned)	201,260,456	19.1	8,313,952	1.7
Total		**1,053,980,127**	**100.0**	**490,536,162**	**100.0**

14.6 Block Model Validation

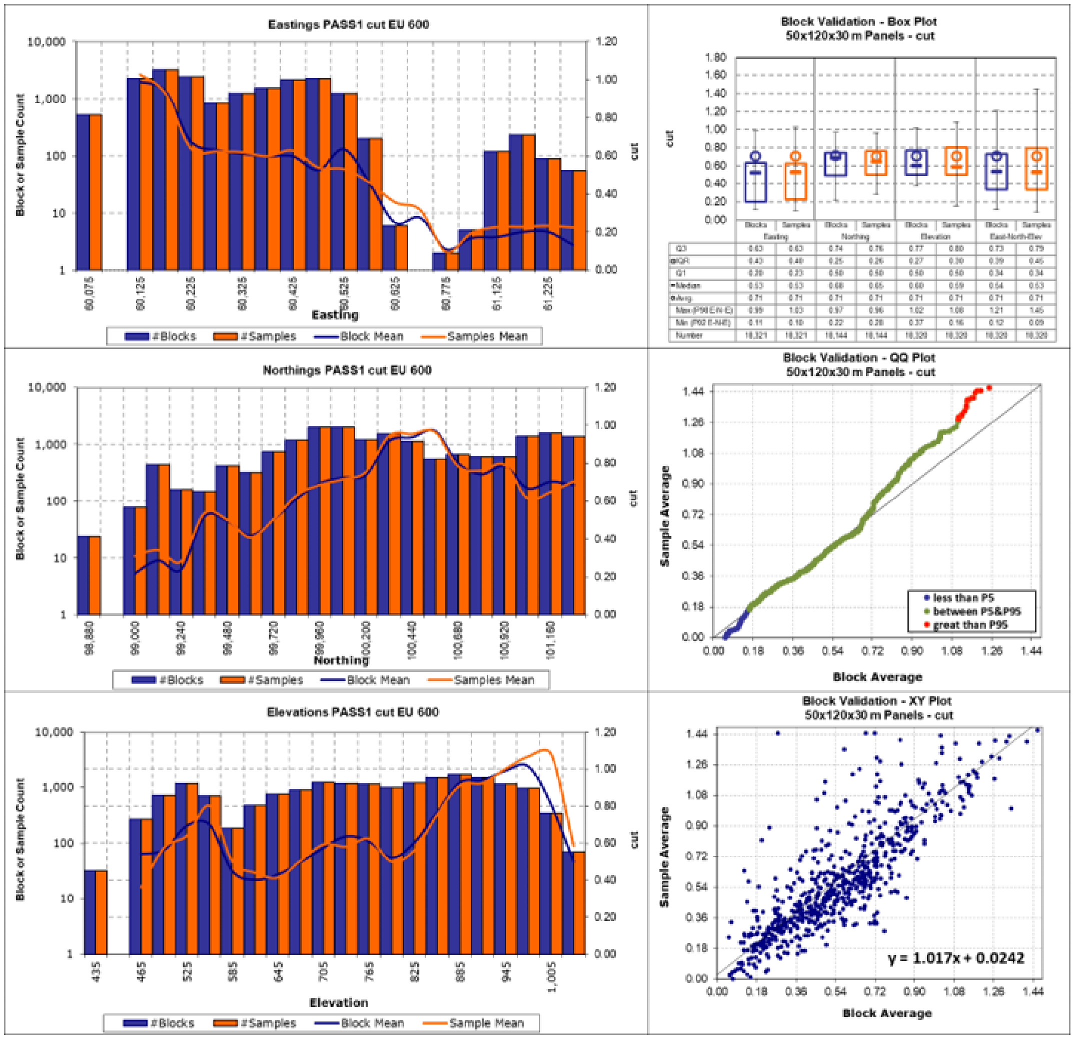
The validation performed by Mantoverde included:

- Swath plots in the X-Y-Z directions for each EU
- Validation plots using mobile blocks (blocks vs. samples) for each EU
- Visual validation using vertical and horizontal sections
- Statistical validation.

14.6.1 Swath Plots

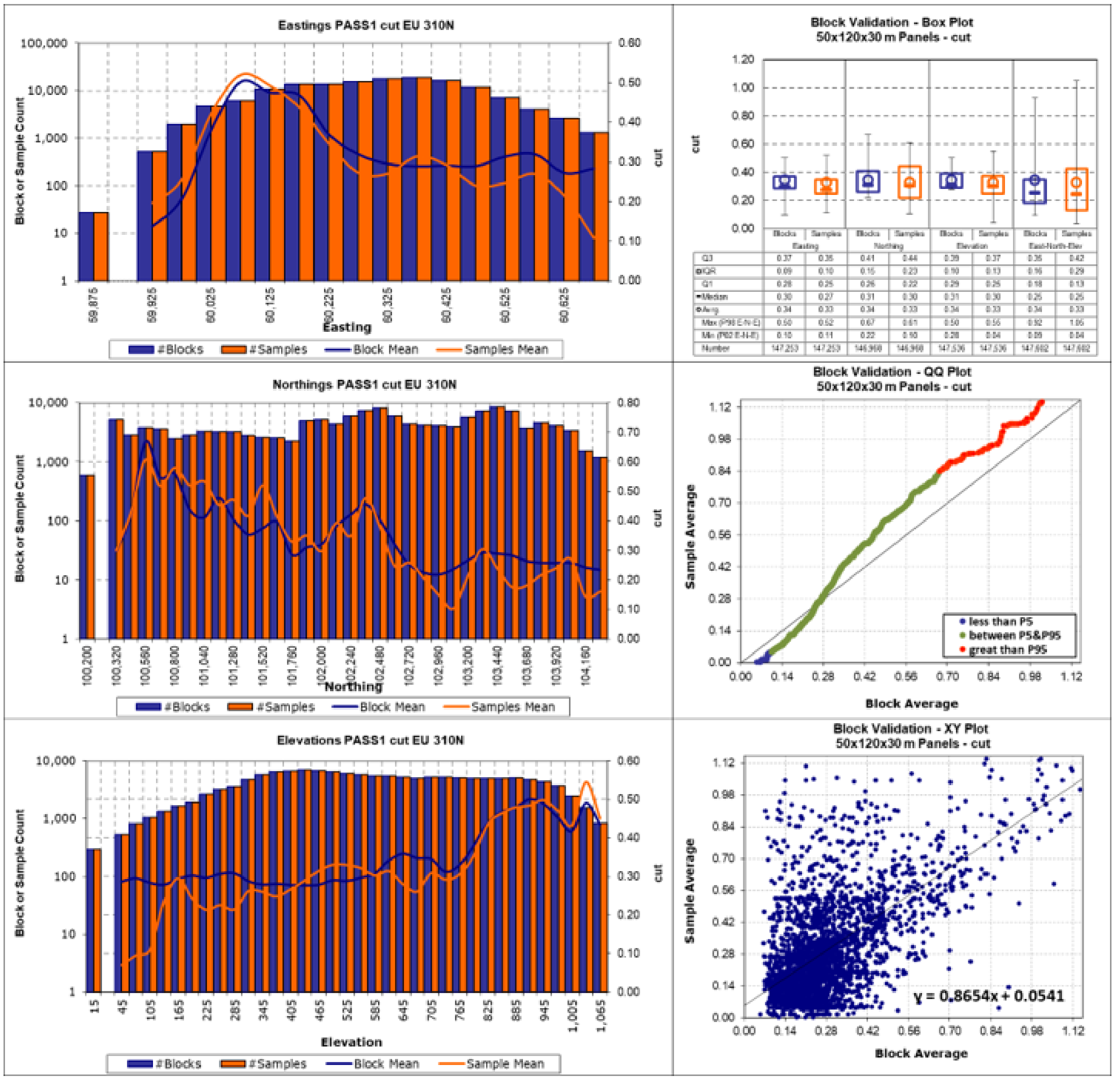
The swath plot validation allows checking the grade correspondence between the composites and the values estimated in the block model. Sample and estimated block grade values were compared every 50 m along north–south direction and east-west direction. Grades were also compared vertically separated every 10 m. Results were concordant in all directions analysed. Figure 14-12 and Figure 14-13 provide examples of the results for the high-grade EU 600 and EU 310N, respectively, in the north–south and vertical directions.

Figure 14-12: Drift Analysis for TCu in EU 600



Note: Figure courtesy Mantos Copper, 2020

Figure 14-13: Drift Analysis for TCu in EU 310



Note: Figure courtesy Mantos Copper, 2020

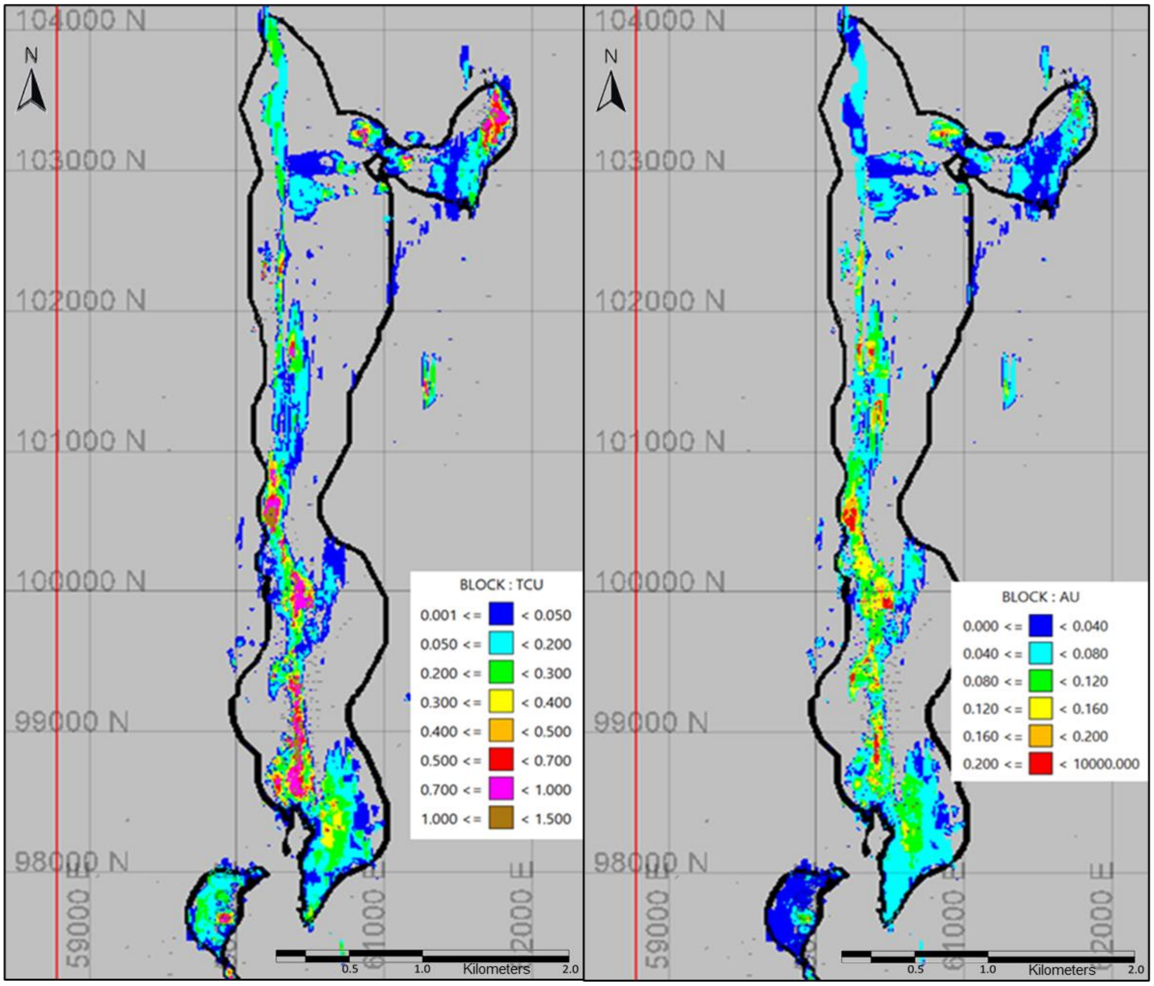
14.6.2 Visual Validation

Visual validation was performed in sections along each coordinate axis. Estimates and composites were compared using the same colour scheme to identify visually if problems of negative or positive differences occurred. Figure 14-14, Figure 14-15 and Figure 14-16 show horizontal and vertical sections of the block model and composites. In general, the visual validation for total copper estimates indicates that the composite grades are adequately represented by the block model. High grade zones are adequately represented, high grade samples are adequately controlled, validating the outlier treatment applied. Smoothing levels increase in deeper parts of the deposit due to the reduction in the number of composites available. However, the results show an acceptable level of smoothing.

Sections showing TCu and Au composite grades are provided in Figure 14-17 and- Figure 14-18.

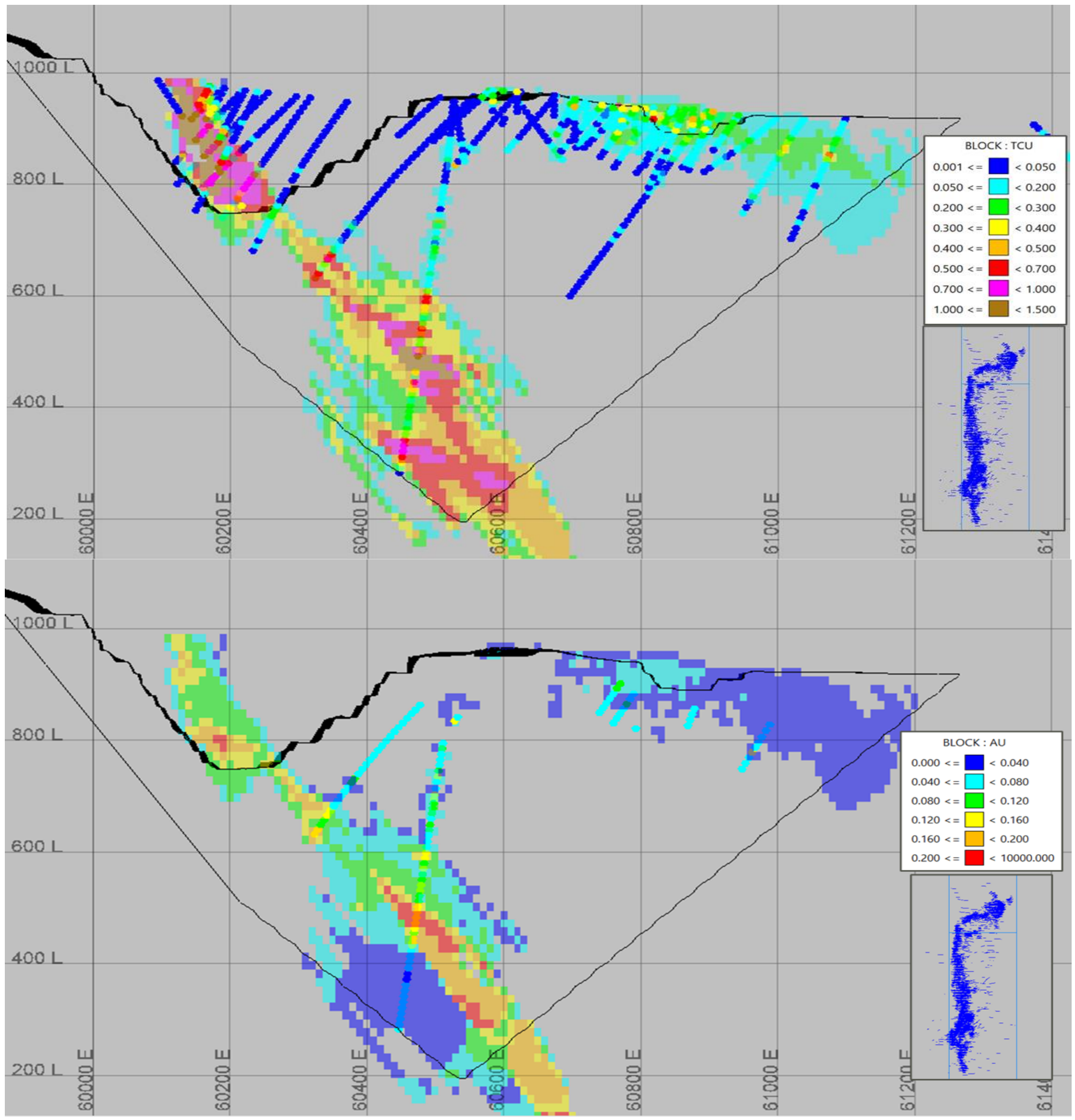
During the review, zones under the Sulphide Roof have been identified with solubility ratios higher than expected. These zones are located immediately below the Sulphide Roof and are of low significance. They represent less than 5% of the mine plan, hence they are not considered a material risk.

Figure 14-14: Horizontal Section 700RL showing Block Model against Composites. Left: TCu. Right: Au



Note: Figure courtesy Mantos Copper, 2020

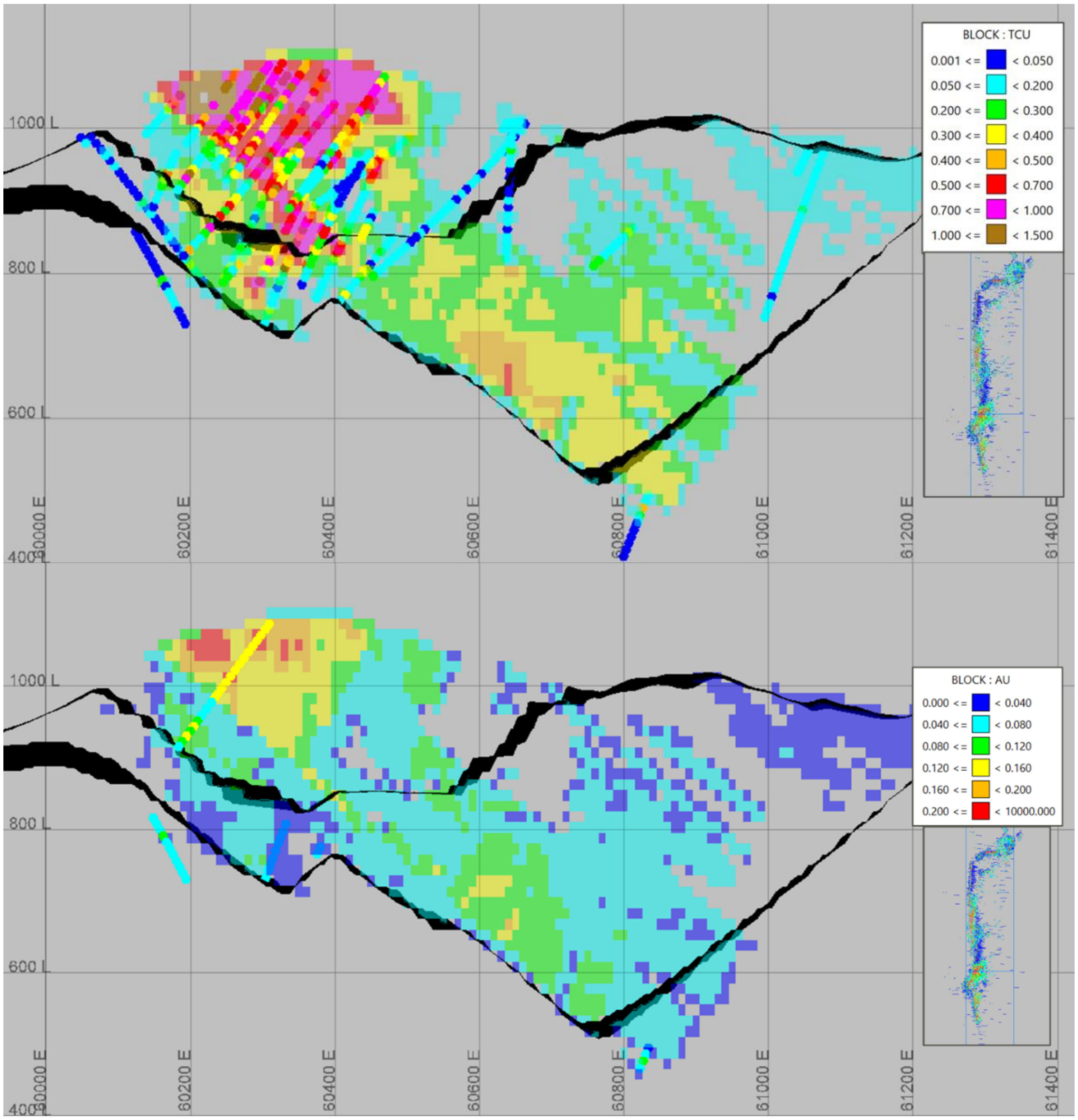
Figure 14-15: Section 102,390 N showing Block Model and Composites. Top: TCu. Bottom: Au



Note: Topography is from the Resource Pit at December 2020

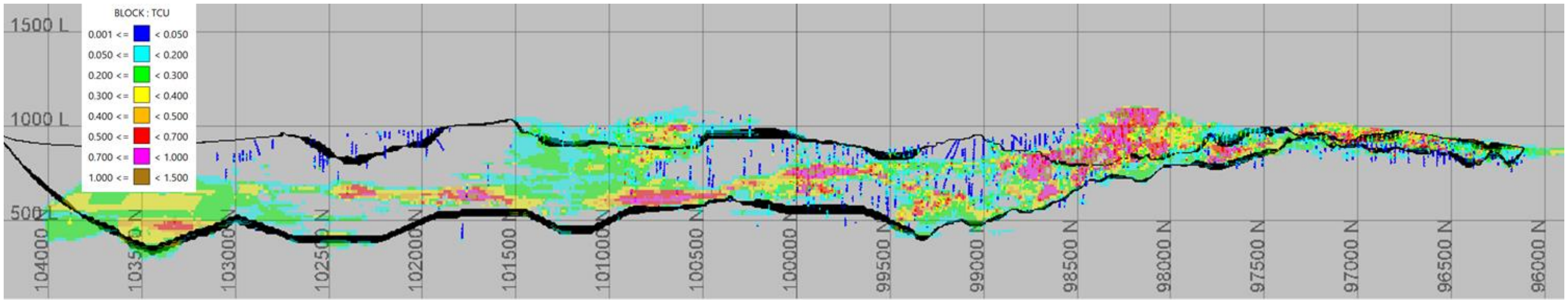
Figure courtesy Mantos Copper, 2020

Figure 14-16: Section 98,220N showing Block Model and Composites. Top: TCu. Bottom: Au



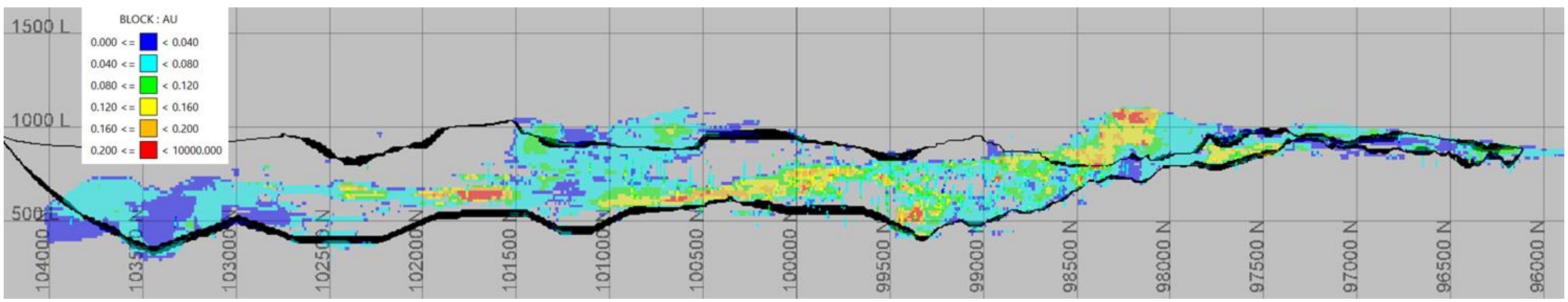
Note: Topography is from the Resource Pit at December 2020
Figure courtesy Mantos Copper, 2020

Figure 14-17: Section 60,330 E showing TCu Block Model and Composites



Note: Figure courtesy Mantos Copper, 2020

Figure 14-18: Section 60,330 E showing Au Block Model and Composites



Note: Figure courtesy Mantos Copper, 2020

14.7 Density Assignment

For the 2020 model density values for oxide material were assigned using the information in Table 14-10, sulphide and waste oxide material were estimated using OK. The estimation was performed for two groups of samples, Mantoverde (MVN, MVS, Franko, Montecristo, Kuroki, Punto 62) and Manto Ruso (Quisco, Celso and Manto Ruso) depending on the proximity of the sample to the FMV.

The density database contains 4,345 determinations (COSG19). The data were obtained from intact rock core samples of approximately 20 ±3 cm in length, systematically sampled every 20 m.

The density values determined per sector and EU are presented in Table 14-10.

Table 14-10: Density by Sector and EU

Sector	Unit	Code	Average (t/m^3)
MVN	North Tectonic Breccia	310N	2.49
	South Tectonic Breccia	310S	2.49
	Hydrothermal Breccia	600	3.08
	Transition Zone	700	2.68
MVS	Magnetite Zone above MFV	650U	2.76
	Magnetite Zone below MFV	650D	2.76
	Montecristo Tectonic Breccia	310C	2.55
	Mineralized Green Breccia	310U	2.61
	Magnetite Zone	650F	2.75
	Tectonic Breccia	310F	2.65
Kuroki	Kuroki North Tectonic Breccia	310N	2.73
Franko	Hydrothermal Breccia	600C	2.86
	Transition Zone	700C	2.86
Quisco	Quisco Hydrothermal Breccia	760Q	2.86
Celso	Hydrothermal Breccia	600M	2.86
	Transition Zone	700M	2.86
Punto 62	Punto 62 Transition Zone	700P	2.88

14.8 Mineral Resources Classification

The two indicators method was used to classify the Mineral Resources. The block indicators INDT (tonnage) and INDG (grade) were coded as follows:

- If TCu (%) < cut-off grade; INDT = 0 (cut-off grade = 0.1%)
- If TCu (%) > cut-off grade; INDT = 1 (cut-off grade = 0.1%)
- If TCu (%) < cut-off grade; INDG = 0 (cut-off grade = 0.1%)
- If TCu (%) > cut-off grade; INDG = TCu (%) (cut-off grade = 0.1%).

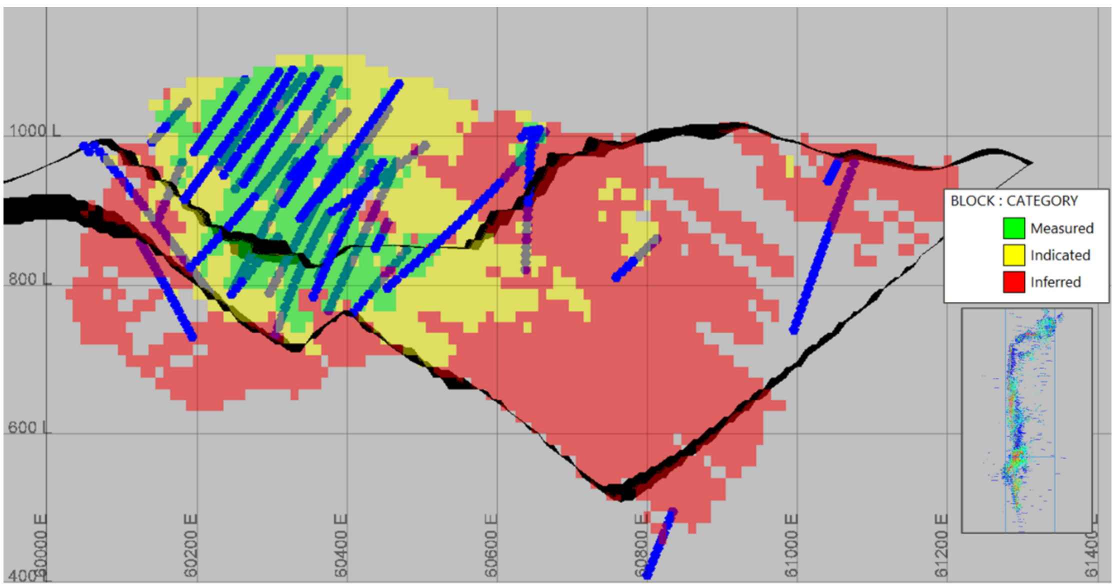
Once the blocks were tagged with the indicators the following steps were taken:

- Review of the spatial variability and continuity of the grade and tonnage indicators
- Creation of a production unit that is equivalent to (i) 1 month of production and (ii) 1 year of production.
- Establishment of different sampling grids within the above production increments

- Calculation of error panels for each sampling grid combination at the reference production increment
- Calculation of the Kriging variance at the local block size using all sample grid combinations
- Inspection of the results of the local Kriging variance versus the production panel estimation error.

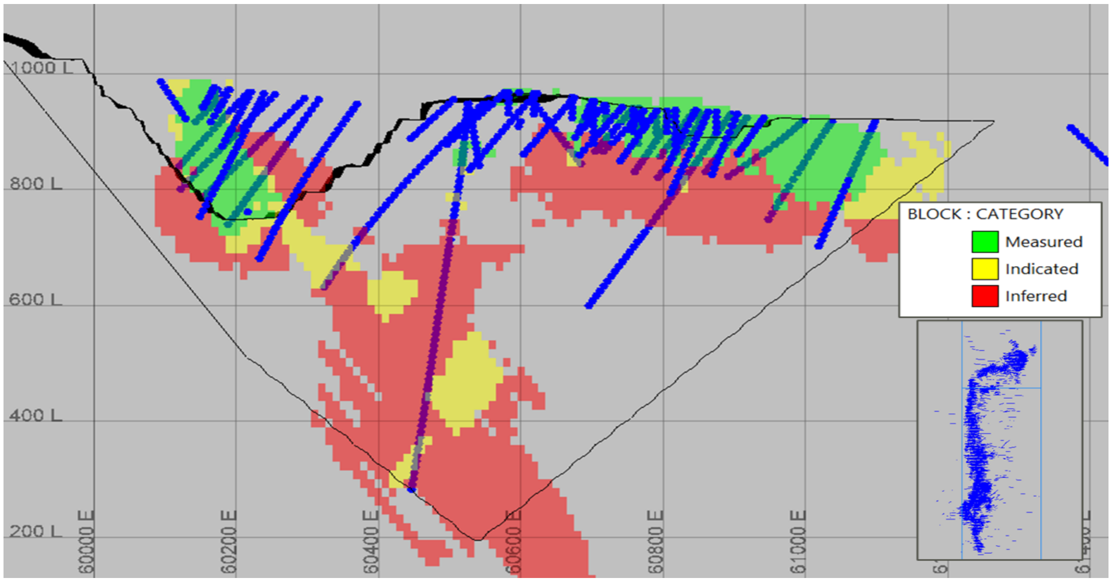
Blocks were classified as Measured Mineral Resources if 90% of a monthly production increment had a grade error of less than 15%. Blocks were classified as Indicated Mineral Resources if 90% of the annual/quarterly production had a grade error of less than 15%. The remaining estimated blocks were classified as Inferred Mineral Resources. Figure 14-19 and Figure 14-20 show vertical sections of the Mineral Resource Classification.

Figure 14-19: Section 98,220N showing Mineral Resource Classification and Drill Holes



Note: Topography is from the Resource Pit at December 2020
Figure courtesy Mantos Copper, 2020

Figure 14-20: Section 102,390 N showing Mineral Resource Classification and Drill Holes



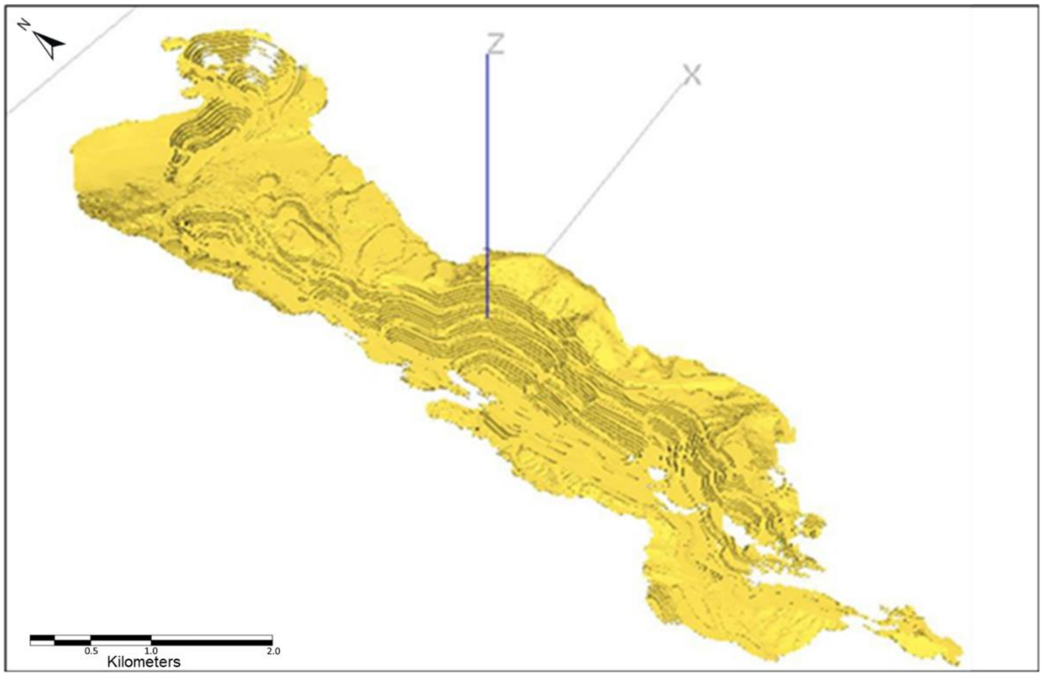
Note: Topography is from the Resource Pit at December 2020
Figure courtesy Mantos Copper, 2020

14.9 Reasonable Prospects of Eventual Economic Extraction

Mineral Resources were evaluated considering reasonable prospects for eventual economic extraction by constraining the estimates within a Lerchs–Grossmann (LG) pit shell (Figure 14-21) using the Geovia Whittle 4.5.5 software package. Optimization parameters were determined by Mantos Copper staff based on historical databases and factors derived from the pre-feasibility study.

The LG shell input parameter assumptions are shown in Table 14-11.

Figure 14-21: Mineral Resource Pit



Note: Figure courtesy Mantos Copper, 2019.

Table 14-11: LG Shell Input Assumptions

Item	Value	Unit
Metal price (Resources)		
Cu	3.77	US$/lb
Mining		
Mining cost	1.69	US$/t
Pit slope inter-ramp angles	26°-60º	º
Processing		
Sulphides		
Metallurgical recovery	88.4	%
Flotation cost	7.28	US$/t
Oxides		
Heap metallurgical recovery	80.70	%
Dump metallurgical recovery	42%	
Processing cost - heap	[(3.073 + 4.510 * PE + (6.8 * CACO.G + 22.894) / 1000 * PA) + DH19.G]	US$/t
Processing cost - dump	[(0.790 + 2.351 * PE + (3.3163 * CACO.G + 15.928) / 1000 * PA) + DD19.G]	US$/t
Acid consumption (CONS)	(6.8 * CACO.G + 22.894) (heap) (3.3163 * CACO.G + 15.928) (dump)	kg/t
Energy cost (PE)	0.1045	US$/kWh
Acid price (PA)	57.68	US$/t
Selling cost		
Concentrates		
Payable Cu	96.56	%
Selling cost	0.2756	US$/lb Cu pay
Cathodes		
Payable Cu	100	%
SX-EW	215/2204.6+((2206/2204.6xPE)/1000)+SELL	US$/lb Cu pay
Selling cost (SELL)	0.047	US$/lb cathode
General & Administration (G&A)		
G&A	1.4	US$/t

The gold price was not considered during LG optimization. CACO.G = calcium carbonate grade, DH. G = Delta HEAP, DD = delta distance per pit. Metallurgical recovery varies by domain and head grade; the average recovery is presented.

14.10 Mineral Resource Statement

The Mineral Resource Estimates are reported inclusive of those Mineral Resources that have been converted to Mineral Reserves, and uses the definitions set out in the 2014 CIM Definition Standards.

The Qualified Person for the estimate is Mr. Ronald Turner, MAusIMM (CP), a Golder Associates S.A. employee. Mineral Resources have an effective date of 31 December 2020.

Table 14-12, Table 14-13, Table 14-14 and Table 14-15 summarize the estimates by process type. The topography used to constrain the estimates was projected from July 2020 to December 2020.

Table 14-12: Mantoverde Mineral Resources Flotation – Sulphide +Mixed as of 31 December 2020

	Category	Tonnage (Mt) (4)	Grade %TCu (2)	Grade g/t Au (2)	Contained Cu (5) (kt)	Contained Au (5) (koz)
Mantoverde Sulphides (Flotation) (1) (3)	Measured	183.6	0.58	0.10	1,065	590
	Indicated	335.9	0.41	0.10	1,377	1,080
	Total Measured & Indicated	**519.5**	**0.47**	**0.10**	**2,442**	**1,670**
	Total Inferred	554.5	0.37	0.08	2,052	1,426
Mantoverde Mixed (Flotation) (1) (3)	Measured	40.7	0.52	0.09	212	118
	Indicated	33.3	0.38	0.09	126	96
	Total Measured & Indicated	**74.0**	**0.46**	**0.09**	**338**	**214**
	Total Inferred	17.0	0.30	0.06	51	33
Mantoverde Sulphides + Mixed (Flotation) (1) (3)	Measured	224.3	0.57	0.10	1,276	708
	Indicated	369.2	0.41	0.10	1,504	1,176
	Total Measured & Indicated	**593.5**	**0.47**	**0.10**	**2,780**	**1,884**
	Total Inferred	571.5	0.37	0.08	2,103	1,459

Table 14-13: Mantoverde Mineral Resources Heap Leach - Oxide+Mix as of 31 December 2020

	Category	Tonnage (Mt) (4)	Grade %SCu (2)	Contained Cu (5) (kt)
Mantoverde Oxides+Mixed (Heap Leach) (1) (3)	Measured	171.0	0.31	530
	Indicated	101.6	0.26	264
	Total Measured & Indicated	**272.6**	**0.29**	**794**
	Total Inferred	19.8	0.22	44

Table 14-14: Mantoverde Mineral Resources Dump Leach - Oxide+Mixed as of 31 December 2020

	Category	Tonnage (Mt) (4)	Grade %SCu (2)	Contained Cu (5) (kt)
Mantoverde Oxides+Mixed (Dump Leach) (1) (3)	Measured	127.7	0.13	166
	Indicated	134.1	0.13	174
	Total Measured & Indicated	**261.7**	**0.13**	**340**
	Total Inferred	55.8	0.13	72

Table 14-15: Mantoverde Mineral Resources Dump+Heap Leach - Oxide+Mixed Resources as of 31 December 2020

	Category	Tonnage (Mt) (4)	Grade %SCu (2)	Contained Cu (5) (kt)
Mantoverde Oxides+Mixed (Dump+Heap) (1) (3)	Measured	298.6	0.23	696
	Indicated	235.7	0.19	438
	Total Measured & Indicated	**534.3**	**0.21**	**1,134**
	Total Inferred	75.6	0.15	116

Notes to accompany Mineral Resources tables:

1. Mineral Resources are reported on a 100% basis, and inclusive of Mineral Reserves. The attributable percentage to Mantos Copper Holding SpA. is 69.993%.
2. Cut-off grade:
   a. Dump Leach: Oxide: 0.10% ≤ SCu < 0.17%, Mixed 0.10% ≤ SCu < 0.17% and SCu/TCu > 50%.
   b. Heap Leach: Oxide: SCu ≥ 0.17%, Mixed: SCu ≥ 0.17% and SCu/TCu > 50%.
   c. Flotation: Sulphide: TCu ≥ 0.20%, Mixed: TCu ≥ 0.23% and SCu/TCu ≤ 50%.
3. Mineral Resource pit is based on US$3.77/lb Cu.
4. Tonnes are reported on a dry basis.
5. Contained Metal (CM) is calculated using the following formulae:
   a. CM = Tonnage (Mt) * TCu (%) *1,000 for sulphides
   b. CM = Tonnage (Mt) * g/t Au*1,000/31.1035 for sulphides and Mixed.
6. Flotation recovery is based on a geometallurgical model, 89.36%TCu and 71.41% Au average. Heap Leach recovery is 79.2% average. Dump recovery is based on operating data 39.4%SCu.
7. Tonnage and contained metal have been rounded to reflect the accuracy of the estimate and numbers may not add exactly.

14.11 Factors That May Affect the Mineral Resource Estimate

Factors that may affect the Mineral Resource Estimates include:

- Metal price assumptions
- Changes to the assumptions used for the cut-off grade
- Changes in local interpretations of mineralization, geometry and continuity of mineralized zones
- Density and domain assignments
- Geometallurgical and oxidation state assumptions
- Changes to geotechnical, mining and metallurgical recovery assumptions
- Changes to input and design parameter assumptions that pertain to the conceptual Whittle pit design constraining the estimate
- Assumptions as to the continued ability to access the site, retain mineral and surface rights titles, maintain environmental and other regulatory permits, and maintain the social licence to operate.

There are no other known environmental, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that would materially affect the estimation of Mineral Resources that are not discussed in this Report.

14.12 Comments on Section 14

Mineral Resources were initially classified using the definitions set out in the 2012 JORC Code and subsequently compared to, and reconciled with, the 2014 CIM Definition Standards.

The QPs independently reproduced the tonnages and grades estimated in the resource statements included in this Technical Report.

15 Mineral Reserve Estimates

15.1 Introduction

The Mineral Reserves described in this Report include oxide and sulphide minerals currently extracted by Mantoverde Mine and the brownfield MVDP.

Mantoverde is an open pit mining complex; the oxide minerals are treated through either heap or dump (ROM) leaching processes and metals are recovered via conventional SX-EW to produce copper cathodes.

The MVDP consists of processing the sulphide material in a concentrator at a nominal rate of 11.6 Mt per year, planned to be in operation in the second half of 2023. The Feasibility Study for the MVDP was completed in December 2017, detailed engineering was prepared during 2019 and the funding to build MVDP was secured in February 2021. The MVDP adds potential Mineral Reserves to the current extraction of oxide materials.

The designed pit was based on a LG optimization process using Whittle software and a detailed phased pit design using the oxide and sulphide pit shells. As a result of the optimization process, nine mine phases for oxide material, nine mine phases for sulphide material and one mine phase for Mixed material were designed to prioritize the higher-grade zones within the mineral extraction plan, while maintaining suitable working widths to enable high productivity mining sequences with large mining equipment.

Mining assumes conventional open pit operations using truck and shovel.

The mine plan was optimized by analyzing numerous NPV scenarios. However, a limiting factor for the evaluations is the tailings storage facility (TSF) capacity, which according to Chilean regulation, will require a new permit if increased in size.

The Mineral Resources were converted to Mineral Reserves based upon the following assumptions:

- Only Measured and Indicated Resources could be converted. Inferred Mineral Resources were set to waste.
- The Mineral Resource block model was considered to be fully diluted. Pit optimization and mine planning processes were performed without introducing any additional factors to account for dilution.
- The mineralized material was economically and technically feasible to extract.
- Mineralization was within Mantos Copper's mining concessions.

NCL carried out a full review of input data, methodology and results supporting the work done by Mantos Copper. Carlos Guzmán of NCL is the Qualified Person for the Mineral Reserves Estimate. Criteria, methodologies and algorithms used in preparing the Mantoverde Mineral Reserves follow industry accepted practices and conform with CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (November 2019) and are reported in accordance with CIM (2014) Definition Standards. NCL is not aware of any mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the Mineral Reserve Estimate.

15.2 Block Model

Two different block models, both developed by Mantos Copper staff, were used during the process. The pit optimization was carried out using the 2019 Block Model.

An updated resource block model (June 2020) for oxide and sulphide materials was used for mine design and planning.

An original block size of 5 m N x 5 m E x 5m RL was selected for the block model and was re- blocked as needed during engineering to 10 m x 10 m x 15 m.

The selected block size was based on interpreted domain geometry, data configurations and operational constraints.

15.3 Open Pit Assumptions and Considerations

Information on the pit design is provided in Section 16.

15.3.1 Key Assumptions

The pit design assumes that both oxide and sulphide material will be mined. A separate optimization was completed for each material type and the results were integrated into a single mine design.

15.3.2 Selective Mining Unit Sizing

The selective mining unit (SMU) at Mantoverde was defined taking in account the mining equipment type, bench height, blast hole sampling, grade control practice and the effect of dilution. The use of electric shovels, large diameter holes and mass material movements were the main reasons to select a block size of 10 m N x 10 m E x 15 m RL. The same block size was considered for the pit optimization.

15.3.3 Topography

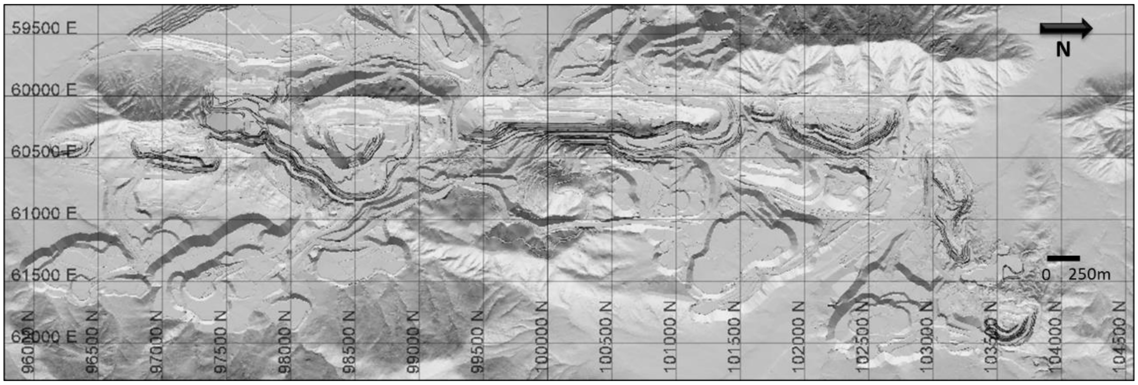
The initial topography used for estimating Mineral Reserves was based on the pit design projected tor the end of December 2020 (6 months real + 6 projected) (see Figure 15-1).

15.3.4 Design Criteria

Mantos Copper performed an open pit optimization using the LG methodology implemented in Whittle software. Pit optimization was based on Measured and Indicated Mineral Resources; Inferred Mineral Resources were set to waste. No minimum cut-off grade was used in the optimization process. The MVDP includes revenues from copper and gold.

The mining cost estimate for the pit optimization process is an in-house estimate completed by Mantos Copper (this replaced the Whittle MCAF methodology). This estimation method uses the distance of different areas of the deposit to the crusher, dump leach pads, stockpiles or waste dumps to distinguish the mining cost. A factor is also applied to reflect the additional cost of deepening the pit. The estimated average Mantoverde mining cost was separated into components such as fuel, explosives, tires, spare parts, salaries and wages, and benchmarked against similar current operations in Chile. Each component was updated for second quarter 2020 prices and the exchange rate from Chilean Pesos to US dollars. This resulted in an estimated mining cost of approximately US$1.85/t mined, assuming the use of Komatsu 830 haul trucks. The metal prices, processing costs, refining costs and processing recoveries were estimated using Mantos Copper’s internal guidelines (see Section 21).

Figure 15-1: Initial Topography



Note: Figure courtesy Mantos Copper, 2020

A summary of the initial input parameters used in the constraining LG pit shell is included in Table 15-1. The flotation processing cost has been considered variable per geometallurgical unit (UGM), as shown in Table 15-2.

Table 15-1: Open Pit Optimization Parameters

Pit Optimization Parameters		Unit	2020
Mine	Mine Cost	US$/t mov	1.85
Process	Flotation	US$/t min	7.28
	Heap Leach	US$/t min	6.24
	Dump Leach	US$/t min	2.12
Selling	*Concentrate (TC/RC)*	USc/lb	22.56
	Commercialization	USc/lb	5.00
	Total TC/RC	USc/lb	27.56
	Cathodes (SW/EX)	USc/lb	25.27
	Commercialization	USc/lb	5.00
	Total SX-EW	USc/lb	30.27
Price	Copper (M+I) Reserves	US$/lb	2.9
	Gold	US$/oz	1,100
G&A		MUS$/year	20.00
Energy		US$/kWh	0.10
Acid		US$/t	57.68

Table 15-2: Sulphide Processing and Selling Cost by UGM

UGM	UGM Description	Flotation Cost (US$/t)
1	Magnetite Body	7.00
2	Hydrothermal Green Breccia	7.07
3	Hydrothermal Breccia	7.48
4	Transition Zone	7.48
5	Manto Ruso Hydrothermal Breccia	7.31
6	Manto Ruso Transition Zone	7.31
7	Celso Hydrothermal Breccia	7.31
8	Celso Transition Zone	7.31
9	Mixt (MV)	7.00
10	Mixt (Celso- Manto Ruso)	7.00

15.3.5 Geometallurgical Considerations

Variable metallurgical recoveries have been used for flotation, heap leach and dump leach.

Flotation recoveries are constant values for each geometallurgical unit (UGM) and applied to total copper and gold grades, as shown in Table 15-3.

Heap and dump leach recoveries are dependent on soluble copper content (%SCu), sector and carbonate content (%CO_3), as shown in Table 15-4. The obtained recovery value is applied to the soluble copper content (%SCu).

Table 15-3: Flotation Recoveries

UGM	Copper Recovery (%)	Gold Recovery (%)
01	91.04	75.66
02	90.82	69.44
03	90.84	73.82
04	90.74	68.03
05	94.18	75.64
06	93.16	73.86
07	93.9	76.92
08	93.59	73.01
09	73.84	59.57
10	72.31	76.00
Average	88.79	71.41

Table 15-4: Heap and Dump Leach Recoveries by Sector

HEAP LEACH Recovery Model 2020		
Valid Range	Sector (MS-ZOREC)	Soluble Copper Recovery (%)
% Soluble Cu > = 1 %	1_CEL-QUI-MR-REB	81.4
	2_KUR	85.7
	3_PTO62	86.5
	4_MVN-MVW	88.3
	5_MVS-PE-LLA	89.1
	6_FRA	88.5
0.38% ≤ % Soluble Cu < 1% (*)	1_CEL-QUI-MR-REB	((0.32*Ln(%SCu) + 84.1) - 0.81*%$CaCO_3$)*0.96
	2_KUR	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.95 * 0.97)
	3_PTO62	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.95 * 0.98)
	4_MVN-MVW	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.95)
	5_MVS-PE-LLA	((5.6171 * Ln(%SCu) + 92.125) -0.81*%$CaCO_3$)*0.96
	6_FRA	((9.7835 * LN(%SCu)+91.44) -0.81*%$CaCO_3$)*0.96
0.20% ≤ %Soluble Cu < 0.38% (*)	1_CEL-QUI-MR-REB	((0.32*Ln(%SCu) + 84.1) -0.81*%$CaCO_3$)*0.93
	2_KUR	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.92 * 0.97)
	3_PTO62	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.92 * 0.97)
	4_MVN-MVW	((87.78 + 6.97 * %SCu – 0.85 * %$CaCO_3$) * 0.92)
	5_MVS-PE-LLA	((5.6171 * Ln(%SCu) + 92.125) -0.81*%$CaCO_3$)*0.93
	6_FRA	((9.7835 * LN(%SCu)+91.44) -0.81*%$CaCO_3$)*0.93
0.15% ≤ % Soluble Cu < 0.20%	All	46

*** For $CaCO_3$ greater than 30%, consider $CaCO_3$ = 30%**

DUMP LEACH Recovery Model 2020	
Valid Range	Soluble Copper Recovery (%)
0.13% ≤ %Soluble Cu < 0.30%	42
0.10% ≤ % Soluble Cu < 0.13%	32

15.3.6 Geotechnical Considerations

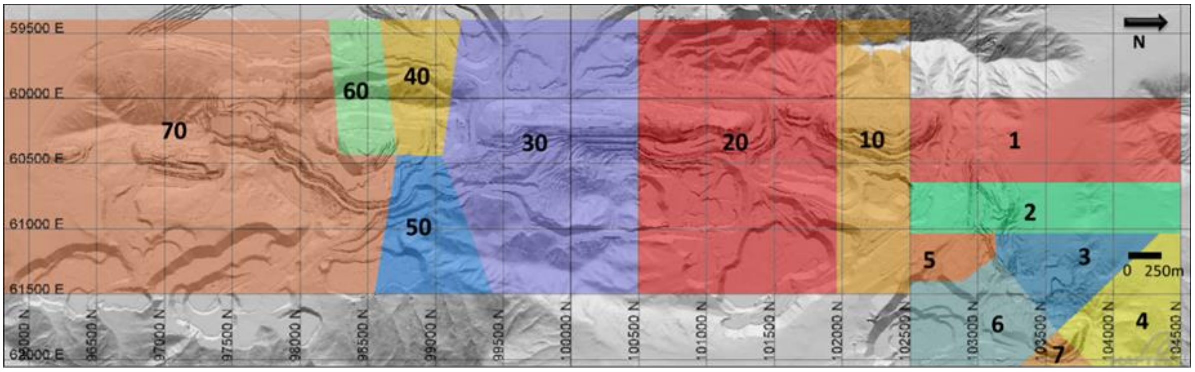
Design parameters follow geotechnical zone recommendations. Angles vary from 46° to 60°, batter angle is 85° but in operation this angle is drilled at 90°.

Oxide and sulphide phases have different bench heights because different equipment is selected for the operation. Oxides (currently in operation) will continue to use the current strategy: operating 10 m bench height, using front loaders and double benches at 20 m. Sulphide phases require higher productivity because of the stripping ratio, therefore, the operation will use electric rope shovels on 15 m benches and double benches at 30 m.

Pit optimizations using 10 m and 15 m bench models were performed to support both designs. Geotechnical zones are shown Figure 15-2 and geotechnical parameters are summarized in Table 15-5 and Table 15-6.

Global angles used in the optimization were measured from a previous exercise following the geotechnical recommendations. The zones and angles used as input are shown in Figure 15-3 and Table 15-7.

Figure 15-2: Geotechnical Zones



Note: Figure courtesy Mantos Copper, 2020

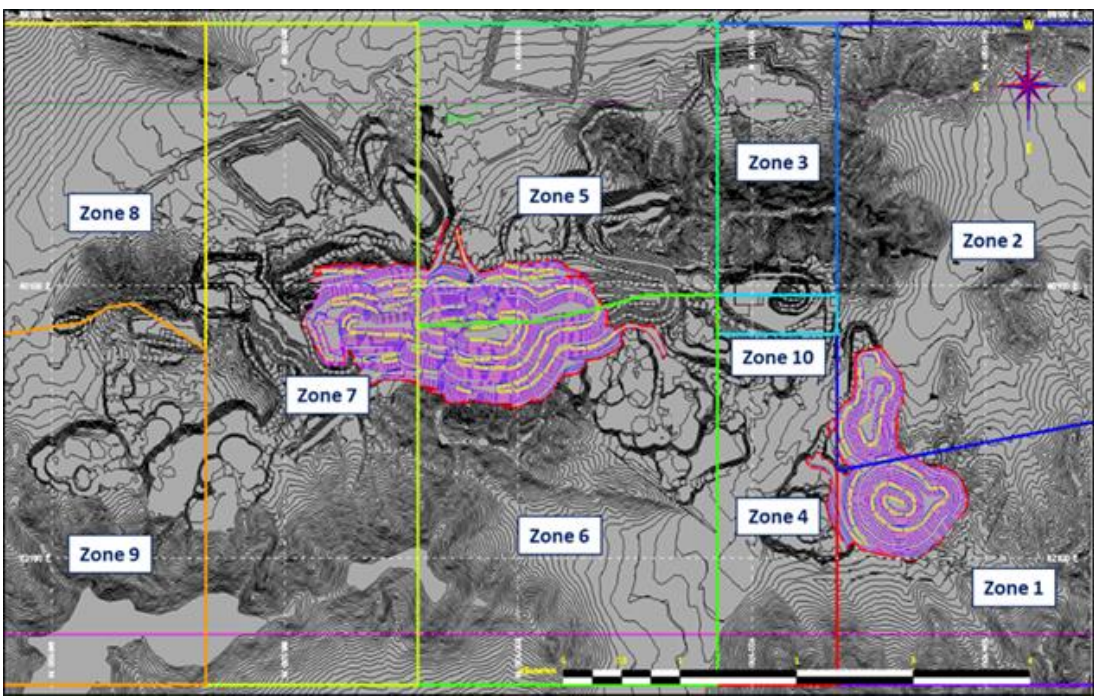
Table 15-5: Geotechnical Parameters, 10 m Model

Bench Height	20					
Domain Name	**Zone**	**IRA**	**Batter**	**Berm**	**Ramp Width (m)**	**Ramp Grade (%)**
Celso- Manto Ruso	1	58	85	108	30	10
	2	56	85	118	30	10
	3	55	85	122	30	10
	4	54	85	128	30	10
	5	53	85	134	30	10
	6	52	85	138	30	10
	7	56	85	118	30	10
Mantoverde	10	58	85	108	30	10
	20	58	85	108	30	10
	30	58	85	108	30	10
	40	56	85	118	30	10
	50	58	85	108	30	10
	60	58	85	108	30	10
	70	56	85	118	30	10
Filled Areas		26	36	6.7	30	10

Table 15-6: Geotechnical Parameters, 15 m Model

Bench Height	30					
Domain Name	Zone	IRA	Batter	Berm	Ramp Width (m)	Ramp Grade (%)
Celso- Manto Ruso	1	58	85	16.1	30	10
	2	56	85	17.6	30	10
	3	55	85	18.4	30	10
	4	54	85	19.2	30	10
	5	53	85	20	30	10
	6	52	85	20.8	30	10
	7	56	85	17.6	30	10
Mantoverde	10	58	85	16.1	30	10
	20	58	85	16.1	30	10
	30	58	85	16.1	30	10
	40	56	85	17.6	30	10
	50	58	85	16.1	30	10
	60	58	85	16.1	30	10
	70	56	85	17.6	30	10
Filled Areas		26	36	6.7	30	10

Figure 15-3: Geotechnical Zones used in Optimization



Note: Figure courtesy Mantos Copper, 2020

Table 15-7: Global Angles used in MVDP Optimization

Zone	MVDP Global Angles (°)
01 Celso	47.67
02 Manto Ruso	49.79
03 Kuroki Oeste	51.29
04 Kuroki Este	43.20
05 MVN Oeste	49.19
06 MVN Este	46.18
07 MVS	40.94
08 Franko Oeste	51.89
09 Franko Este	49.12
10 Punto 62	43.20
11 Filled Areas	28.00

15.4 Cut-off Grades

15.4.1 Heap Leach

The following formula defines the cut-off grade used for the heap leach process:

$$Heap\ Marginal\ Cut-off\ Grade = \frac{(Heap\ Cost) * 100}{(Copper\ Price - Cost\ SX-EW) * Heap\ Recovery * 2204.62}$$

Where:
Heap leach cost: US$6.24/t (note: general and administration costs not included)
Copper price: US$2.90/lb
SX–EW cost: US$0.30/lb
Heap leach metallurgical recovery: 75.8% (note: based on SCu grade)

The annual average LOM cut-off grade using the heap leach formula would be 0.14%SCu. However, in order to maintain an economic return, it has been decided to maintain for the heap leach Oxide Reserves at a cut-off grade of 0.17%SCu.

The mine plan is based on full utilization of the heap leach pad on an annual basis, assuming an annual pad capacity of 10.7 Mt. This requires the use of a variable cut-off strategy.

15.4.2 Dump Leach

The following formula defines the cut-off grade used for the dump leach process:

$$Dump\ Marginal\ Cut-off\ Grade = \frac{(Dump\ Cost) * 100}{(Copper\ Price - Cost\ RyF) * Dump\ Recovery * 2204.62}$$

Where:
Dump leach cost: US$2.12/t (note: general and administration costs not included)
Copper price: US$2.90/lb
SX–EW cost: US$0.30/lb
Dump leach metallurgical recovery: 42.5% (note: based on soluble copper grade %SCu).

The cut-off grade for the dump leach using the formula above is 0.09%SCu. However, there is a higher metallurgical limit of 0.10%SCu that is considered as the cut-off grade.

15.4.3 Flotation

The following formula defines the cut-off grade used for the flotation process:

$$Flotation\ Marginal\ Cut-off\ Grade = \frac{(Flotation\ Cost) * 100}{(Copper\ Price - Cost\ RyF) * Flotation\ Recovery * 2204.62}$$

Where:
Flotation cost: US$7.28/t (note: general and administration costs not included)
Copper price: US$2.90/lb
Refining cost: US$0.28/lb
Flotation metallurgical recovery: 88.24% (note: based on total copper grade %TCu).

The marginal cut-off grade for sulphide flotation is 0.14%TCu.

For Mixed materials the recovery is 73.3% (due to the higher soluble copper content) and the flotation cost (without G&A) is US$7.58/t. Using these data the calculated marginal cut-off grade is 0.18%TCu.

The flotation cut-off grade was set at 0.23%TCu to comply with the TSF capacity constraint of 235 Mt. Material with grades between the economic marginal cut-off grade and 0.23%TCu is stockpiled and is not included in the Mineral Reserves Estimate.

The cut off values used in each process are summarized in Table 15-8.

Table 15-8: Cut-Off Grade Summary

Process	COG	Comments
Concentrator		
Sulphide	%TCu ≥ 0.23	Defined by tailings dam capacity
Mixed	%TCu ≥ 0.23 and RS≤50%	Metallurgical limit
Heap Leach		
Oxides	%SCu ≥ 0.17	Variable per year in mining plan
Mixed	%SCu ≥ 0.17 and RS>50%	Variable per year in mining plan
Dump Leach		
Oxides	0.10 ≤ %SCu <0.17	Operating cut-off
Mixed	0.10 ≤ %SCu <0.17 and RS>50%	Operating cut-off and metallurgical limit

15.5 Mining Loss and Dilution

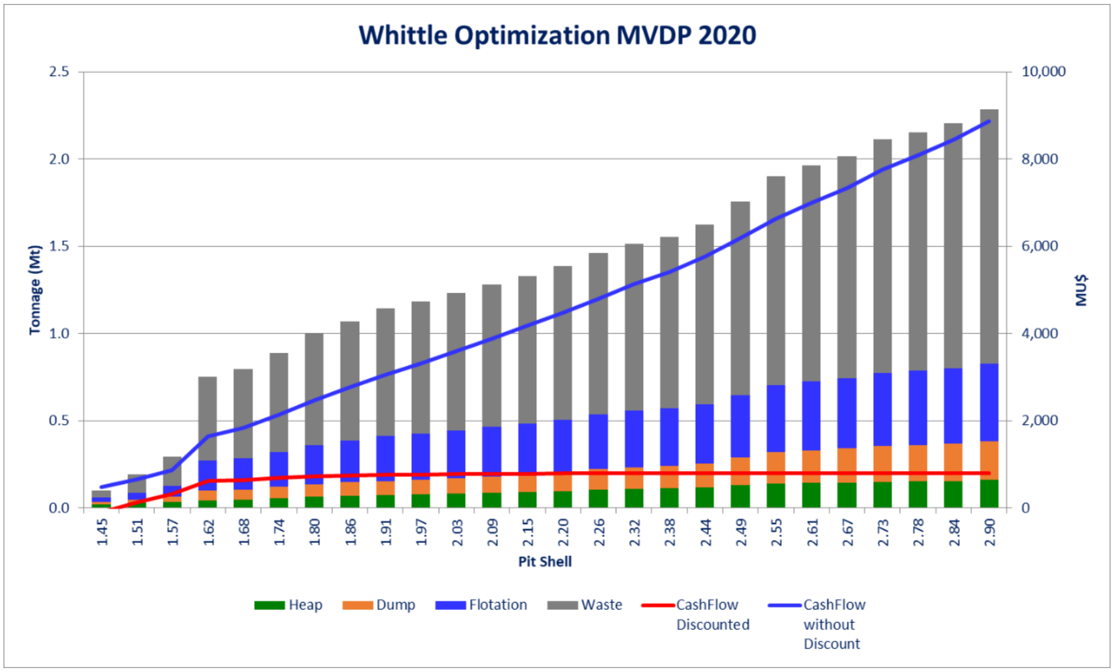
Dilution is already included as part of the block model. The mine plan for this Report assumes no additional dilution in any direction.

15.6 LG Optimization

Additional variables required for the mine scheduling process were added to the block models and updated as required. A set of 76 pit shells was generated in the Whittle optimization process that corresponded to break-even shell geometries based on incremental copper prices ranging from US$1.45/lb to US$5.8/lb Cu (revenue factor from 0.5 to 2.0 with a 0.02 step size).

The MILAWA-NPV methodology was used to identify the optimal pit envelope. As shown in Figure 15-4 and Table 15-9 the optimal final pit for the project would be Pit 22 (Revenue Factor 0.88 = US$2.55/lb Cu). Because of the TSF capacity limit of 235 Mt, Pit shell 11 (Revenue Factor 0.7 = US$2.03/lb Cu) was selected for detailed mine design.

Figure 15-4: NPV by Pit Cash Flow



Note: Figure courtesy Mantos Copper, 2020

Table 15-9: Optimization Final Pit Selection

Pit	RF	Pit	Heap Tonnage (Mt)	Heap SCu (%)	Dump Tonnage (Mt)	Dump SCu (%)	Flotation Tonelaje (Mt)	Flotation Tcu (%)	Flotation Au (g/t)	Flotation Scu (%)	Waste (Mt)	Total Extracted (Mt)	CashFlow without Discount MU$	CashFlow Discounted MU$
1	0.50	1.45	22.2	0.52	12.9	0.15	23.2	0.74	0.11	0.15	42.4	100.6	477	-113
2	0.52	1.51	26.9	0.50	19.1	0.15	40.6	0.70	0.11	0.14	104.2	190.9	656	120
3	0.54	1.57	32.8	0.48	32.3	0.15	61.4	0.67	0.10	0.13	164.8	291.2	865	324
4	0.56	1.62	43.2	0.45	56.1	0.15	170.6	0.58	0.11	0.09	480.9	750.9	1,634	621
5	0.58	1.68	46.2	0.44	58.3	0.15	181.0	0.58	0.11	0.09	509.0	794.5	1,831	644
6	0.60	1.74	55.5	0.42	65.5	0.15	200.2	0.57	0.11	0.09	567.7	888.9	2,138	687
7	0.62	1.80	62.3	0.41	71.5	0.15	227.1	0.56	0.11	0.09	640.3	1,001.3	2,469	722
8	0.64	1.86	67.9	0.40	77.9	0.15	242.0	0.55	0.10	0.09	682.2	1,070.1	2,761	741
9	0.66	1.91	72.0	0.40	81.2	0.15	258.0	0.55	0.10	0.09	732.2	1,143.4	3,053	755
10	0.68	1.97	76.4	0.40	84.4	0.15	265.8	0.54	0.10	0.09	756.0	1,182.6	3,305	762
11	**0.70**	**2.03**	**82.0**	**0.40**	**88.5**	**0.15**	**274.3**	**0.54**	**0.10**	**0.09**	**787.8**	**1,232.6**	**3,600**	**769**
12	0.72	2.09	86.2	0.39	93.5	0.15	284.3	0.54	0.10	0.09	817.8	1,281.8	3,870	776
13	0.74	2.15	90.7	0.39	98.6	0.16	292.9	0.53	0.10	0.09	844.8	1,327.0	4,170	780
14	0.76	2.20	95.4	0.39	104.3	0.16	303.7	0.53	0.10	0.08	881.3	1,384.7	4,485	785
15	0.78	2.26	104.0	0.38	116.5	0.16	315.8	0.52	0.10	0.08	924.0	1,460.3	4,801	790
16	0.80	2.32	108.5	0.38	123.1	0.16	325.5	0.52	0.10	0.08	958.5	1,515.5	5,129	793
17	0.82	2.38	111.6	0.37	127.3	0.16	331.4	0.51	0.10	0.08	981.0	1,551.4	5,418	794
18	0.84	2.44	117.5	0.37	135.7	0.16	341.4	0.51	0.10	0.08	1,030.5	1,625.1	5,771	797
19	0.86	2.49	131.8	0.37	157.5	0.16	356.7	0.50	0.10	0.08	1,108.5	1,754.4	6,189	800
20	**0.88**	**2.55**	**139.6**	**0.37**	**181.9**	**0.16**	**383.3**	**0.49**	**0.10**	**0.08**	**1,195.6**	**1,900.4**	**6,621**	**801**
21	0.90	2.61	141.6	0.37	187.0	0.16	395.1	0.49	0.10	0.08	1,240.8	1,964.5	6,993	801
22	0.92	2.67	144.1	0.36	195.4	0.16	404.6	0.48	0.10	0.08	1,273.4	2,017.6	7,337	801
23	0.94	2.73	149.6	0.36	204.3	0.16	418.3	0.48	0.10	0.08	1,338.7	2,111.0	7,748	801
24	0.96	2.78	151.2	0.36	208.5	0.16	426.1	0.48	0.09	0.08	1,367.9	2,153.7	8,095	801
25	0.98	2.84	153.7	0.36	213.4	0.16	433.2	0.47	0.09	0.08	1,405.7	2,206.1	8,450	801
26	1.00	2.90	160.5	0.36	222.4	0.16	441.4	0.47	0.09	0.08	1,461.6	2,285.9	8,870	801

The Mantoverde pit phase progression is described in more detail in Section 16. This strategy produced initial mine phases with low strip ratios that provide rapid access to high value material. The subsequent pit expansions have higher strip ratios.

The TSF approved capacity of 235 Mt was used as a constraint for the total mill feed over the life of mine, selecting the minimum cut-off grade to meet this constraint.

Marginal material, defined as the material with grades between the economic cut-off and the minimum grade which satisfies the TSF constraint, is stockpiled separately for future potential expansions; it is not included in the Mineral Reserves Estimate.

15.7 Mineral Reserves Statement

The estimated Mineral Reserves are reported using metal prices of US$2.90/lb Cu and US$1,100/toz Au. Mineral Reserves are reported effective 31 December 2020. The Qualified Person for the estimate is Mr. Carlos Guzmán, RM CMC, FAusIMM, Principal and Project Director at NCL. Mineral Reserves are summarized in Table 15-10.

15.8 Factors that May Affect the Mineral Reserves

- Changes to the metal price assumptions
- Changes to the estimated Mineral Resources used to generate the mine plan
- Changes in the metallurgical recoveries
- Changes in the geotechnical assumptions used to determine the overall wall angles
- Changes to the operating cut-off assumptions for mill feed or stockpile feed
- Changes to the input assumptions used to derive the open pit outline and the mine plan that is based on that open pit design
- Ability to maintain social and environmental licence to operate
- Changes to the assumed permitting and regulatory environment under which the mine plan was developed

There are no other known environmental, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that would materially affect the estimation of Mineral Reserves that are not discussed in this Report.

Table 15-10: Mineral Reserves Statement as of 31 December 2020

Mineral Reserves	Category	Tonnage (Mt)	Grade (%TCu)	Grade (g/t Au)	Contained Cu (kt)	Contained Au (koz)
MVDP Sulphide (Flotation)	Proven	136.5	0.65	0.11	887	483
	Probable	58.4	0.54	0.11	315	206
	Total Reserves	**194.9**	**0.62**	**0.11**	**1,202**	**689**
MVDP Sulphide Mixed (Flotation)	Proven	33.5	0.55	0.09	184	97
	Probable	7.3	0.44	0.09	32	21
	Total Reserves	**40.8**	**0.53**	**0.09**	**216**	**118**
MVDP Sulphide + Sulphide Mixed (Flotation)	Proven	170.0	0.63	0.11	1,071	580
	Probable	65.7	0.53	0.11	347	228
	Total Reserves	**235.7**	**0.60**	**0.11**	**1,419**	**807**
MVDP - Oxide (Heap Leach)	Proven	98.3	0.35	-	344	-
	Probable	27.0	0.30	-	81	-
	Total Reserves	**125.4**	**0.34**	**-**	**425**	**-**
MVDP - Oxide (Dump Leach)	Proven	91.5	0.15	-	137	-
	Probable	38.8	0.14	-	54	-
	Total Reserves	**130.3**	**0.15**	**-**	**192**	**-**
MVDP - Oxide (Heap + Dump Leach)	Proven	189.8	0.25	-	481	-
	Probable	65.8	0.21	-	135	-
	Total Reserves	**255.6**	**0.24**	**-**	**617**	**-**

Notes to accompany Mineral Reserves table:

1. Mineral Reserves are reported effective 31 December 2020.

- The Qualified Person for the estimate is Mr. Carlos Guzmán (RM CMC, FAusIMM).
- Mineral Reserves are reported on a 100% basis using average off-site costs (selling cost) of US$0.28/lb for sulphides and US$0.30 for oxides.
- Mineral Reserves are contained within an optimized pit shell. Mining will use conventional open pit methods and equipment and a stockpiling strategy (direct mining costs are estimated by geological unit, averaging US$1.85/t of material mined).
- Processing costs were estimated by geometallurgical units (from UG1 to UG10) averaging US$7.28/t of milled material, including concentrator, tailings storage facility, port and desalination costs.
- Processing cost for material sent to the heap leach was US$6.24/t. For material sent to the run-of-mine dump leach, the processing cost was US$2.12/t.
- Total copper recoveries average 88.4% for sulphides and gold recoveries average 71.2%.
- Soluble copper recoveries average 76.4% for material sent to the heap leach and 45.8% for material sent to the dump leach.
- Inter-ramp angles vary from 26° to 60º. The life-of-mine strip ratio is 2.12 to 1.
- Tonnage and contained copper are reported in metric units and grades are reported as percentages. Contained gold is reported in troy-ounces and grades in grams per tonne.

- Grade %TCu refers to total copper grade in percentage sent to the mill. Grade %SCu refers to soluble copper grade in percentage sent to the leach processes.
- Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal.

15.9 Comments on Section 15

The assumptions and results of the optimization process employed by Mantos Copper provide adequate confidence in the Mineral Reserves Estimate.

16 Mining Methods

16.1 Overview

Initial pit design considerations are described in Section 15.

The mine plan was developed by Mantos Copper staff in 2020. The plan focuses on two main areas, Celso–Manto Ruso and Mantoverde. The MVDP throughput assumption is based on hardness variability, resulting in an average throughput of 12.3 Mt per year of sulphide material from Q1 2024 to 2042, with a ramp-up period (6 months) that assumes a production of 3.2 Mt in 2023.

The mine plan considers the continuity of the oxide processing and additional oxide Mineral Reserves as part of sulphide pits until 2034. Treatment in the heap leach process considers an annual treatment of 10.7 Mt by 2021, reaching 10.9 Mt in 2025; the dump leach process will have a processing rate of 15.0 Mt per year.

The pre-stripping of the sulphide pits amounts to 52 Mt, this has been scheduled over 23 months starting in 2021. The mining schedule requires an average mine extraction of 93 Mt per year, with a maximum mine movement of 130 Mt per year between 2026 and 2028. The mine movement decreases from 2032 until mining operations are completed in 2037. The process plant will continue to operate through to 2042, treating low-grade stockpile material.

The production parameters for the MVDP are summarized in Table 16-1.

Table 16-1: Key Production Parameters

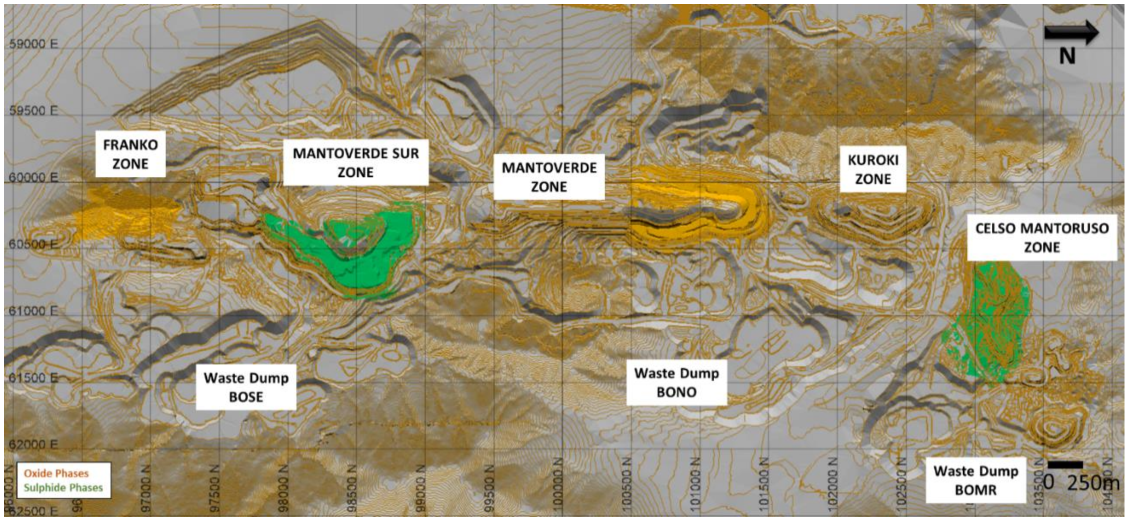
Parameter	Quantity
Proven and Probable Mineral Reserves (sulphide)	235.7 Mt at 0.60%TCu
Proven and Probable Mineral Reserves (oxide)	255.6 Mt at 0.24%SCu
Production (first 10 years without ramp-up)	Copper: 102.2 kt/year (2024 to 2033)
	Gold: 33.2 koz/year (by-product)
LOM Production	Copper: 169.3 kt/year (2021 to 2042)
Pre-stripping	52 Mt (23 months)
Maximum Material Movement	131 Mt/year (without rehandling)
Mine Life	22 years (2021 to 2042)

The current mining operation strategy is a mixed owner and contractor loading and hauling fleet. The MVDP assumes integration with, and transition from, the current operation to the use of higher productivity, heavy mining equipment to increase the mine capacity. The heavy mining equipment is assumed to be fully owned by Mantoverde when the operation reaches steady state production, planned to be by 2025.

The mine is scheduled to work on a 7 days a week, two 12 hour shift basis, for 365 days per year. The operation will include normal drilling, blasting, loading and hauling activities over a 15 m bench height (double bench of 30 m) in the sulphide areas, and 10 m bench height (final double bench of 20 m) in oxide areas. Mining will include supporting functions such as dewatering, grade control and equipment maintenance.

The current general mine layout is shown in Figure 16-1.

Figure 16-1: General Mine Layout



Note: Figure courtesy Mantos Copper, 2020

16.2 Pit Design

16.2.1 Design Parameters

The following criteria were established for the pit designs:

- Minimum expansion width design: 60 m which is sufficient for the XPC 4100 electric rope shovels and Komatsu 830E model 240 t haul trucks planned for the primary mining fleet in the sulphide area, and PC 5500 and 994 front-end loaders in the oxide areas. Minimum pit bottom width of 40 m.
- Haul roads: 30 m wide and 10% gradient to accommodate the proposed 240 t haul trucks. Ramps will be 20 m wide and 12% gradient at the pit bottoms, which is deemed acceptable because these will be low traffic areas. Ramp widths are designed to comply with Chilean regulations.

A summary of the design parameters is provided in Table 16-2

Table 16-2: Design Parameters

Parameter	Quantity
Bench height	30 m sulphide 20 m oxide
Operating bench height	15 m sulphide 10 m oxide
Maximum inter-ramp slope height	120 m sulphide 100 m oxide
Ramp width	30 m
Ramp gradient	10%
Overall slope	Ranges from 26.08° to 54.39°
Minimum phase width	60 m

16.2.2 Geotechnical Considerations

Geotechnical considerations for the mine design are provided in Section 0.

16.2.3 Manpower Considerations

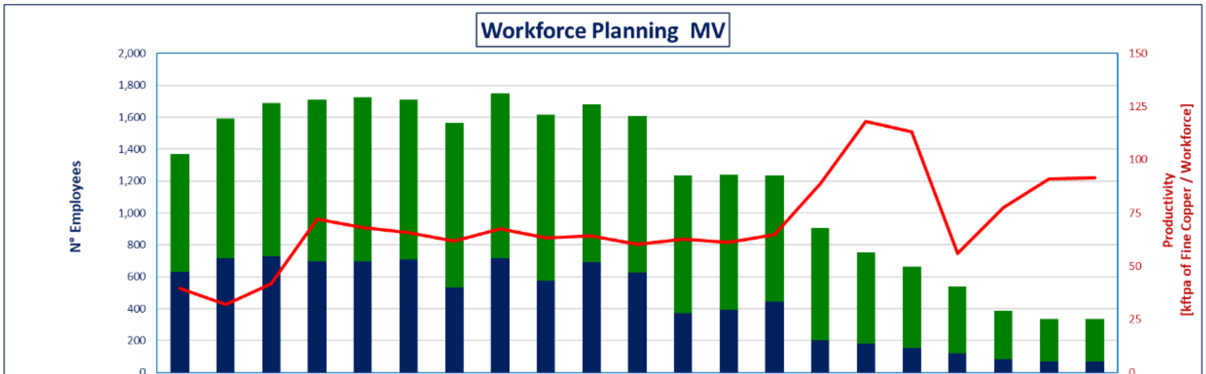
The planned mining scenario assumes:

- Operations will be on a 24 h/day, 365 days/year basis
- Four crews; crews will rotate on a 7 days on, 7 days off basis with two crews per day; each working a 12 hour shift
- Administration and support areas will work 11 hours per day on a 4 days on, 3 days off schedule.

The total estimated manpower averages around 1,000 based on the current operation and benchmarking with similar operations.

Figure 16-2 shows the annual workforce estimate by year used in the Opex calculation.

Figure 16-2: Workforce by Period



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Own Employees	741	878	959	1,014	1,033	1,000	1,030	1,037	1,041	991	980	864	847	791	703	570	509	416	305	267	265
Contractors	630	716	730	694	694	709	533	715	576	692	627	373	391	446	203	183	154	121	82	69	68
Total Headcount	1,371	1,594	1,689	1,708	1,727	1,709	1,563	1,752	1,617	1,683	1,607	1,237	1,238	1,237	906	753	663	537	387	336	333
Product LOM - 2020	39	32	42	72	68	66	62	68	63	64	60	63	61	65	89	118	113	56	78	91	91

Note: Figure courtesy Mantos Copper, 2020

16.3 Production Schedule

The production schedule was prepared using the software PolyPlan (2021-2023) and SP2 (from 2024 to 2042). Periods for mine scheduling were:

- 2021 to 2023 monthly
- 2024 to 2025 quarterly
- 2026 to 2042 annually.

The following inputs were considered:

- Mill feed requirements
- 2020 block model
- Topography surface surveyed in June 2020 and projected to year end December 2020.
- Operating mining phases as designed by Mantos Copper
- No additional mining loss or dilution; block model is considered to be fully diluted.

Table 16-3 shows the abbreviations for the pit phases used for scheduling.

Table 16-3: Pit Phase Abbreviations Key

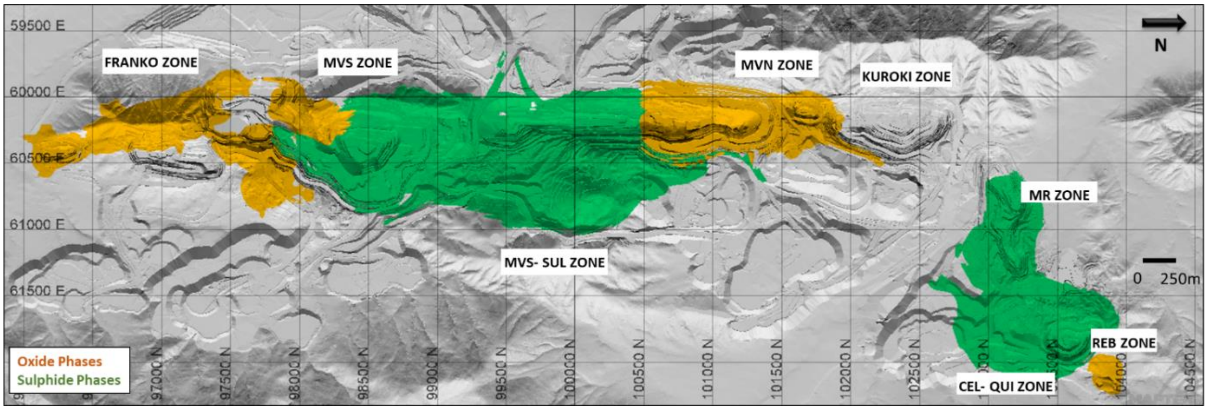
Phase	Code
Celso 1	CEL1
Celso 2	CEL2
Franko N1	FN1
Franko N2	FN2
Franko N3	FN3
Franko S1	FS1
Kuroki 3	KUR3
Llano	LLAN
Manto Ruso	MR
Mantoverde 1	MV01
Mantoverde 2	MV02
Mantoverde 3	MV03
Mantoverde 4	MV04
Mantoverde 5	MV05
Mantoverde 6	MV06
Mantoverde N4	MVN4
Mantoverde N5	MVN5
Mantoverde N6	MVN6
Mantoverde S4	MVS4
Mantoverde S4 Sul	MVS4-SUL
Mantoverde S6	MVS6
Pared Este	PE
Quisco	QUI
Rebosadero	REB

The mine plan includes 1,585 Mt of total material movement, consisting of 1,093 Mt waste (including pre-stripping), 237 Mt of sulphide material and 255 Mt of oxide material. Mine development will require an estimated 52 Mt of pre-stripping over the first 3 years beginning in 2021.

The schedule requires an average mining rate of 93 Mt/year, which will slowly decrease from 2032 onwards until mining operations are completed in 2037. The process plant will continue to treat low-grade stockpile material through to 2042.

Figure 16-3 provides an outline of the oxide and sulphide phases that will be mined as part of the LOM plan. The production plan is summarized in Table 16-4, Table 16-5, Table 16-6 and Table 16-7

Figure 16-3: LOM Oxide and Sulphide Phases Distribution



Note: Figure courtesy Mantos Copper, 2020

Mining of oxide materials will be completed during 2034. Mining of sulphide materials will start with a ramp-up period of 6 months until reaching the full production rate in January 2024. The production plan by phase and material is presented in Table 16-5.

The production plan categorization for the material to be sent to the concentrator, heap leach and dump leach is provided in Figure 16-4, Figure 16-5 and Figure 16-6.

Table 16-4: Mine Extraction and Total Movement LOM 2020

MINING_PDMV20	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	MVDP20
MINE EXTRACTION																								
Total mined_Sulphides	Mt	0.1	4.5	12.0	18.9	15.3	16.1	16.9	17.1	19.7	15.8	15.7	15.0	14.6	14.4	15.7	12.0	12.4	-	-	-	-	-	236.6
Total mined_Oxides	Mt	12.5	10.2	10.8	10.8	10.8	10.9	5.8	10.5	8.4	10.5	7.5	3.3	4.6	6.9	2.1	-	-	-	-	-	-	-	125.7
Total mined_Oxides Low Grade	Mt	13.9	9.1	9.9	10.6	13.2	13.8	10.8	12.0	8.9	10.7	9.0	1.3	2.4	2.9	0.9	0.0	-	-	-	-	-	-	129.4
Total waste mined	Mt	19.0	18.2	82.2	83.7	87.7	89.4	97.4	90.5	83.6	74.5	80.5	79.1	59.6	39.8	31.6	9.6	14.8	-	-	-	-	-	1,041.2
Pre-Stripping	Mt	9.5	41.5	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52.2
Total material mined (PS included.)	Mt	55.0	83.5	116.1	124.1	127.1	130.2	130.9	130.1	120.6	111.5	112.7	98.8	81.3	64.0	50.3	21.7	27.2	-	-	-	-	-	1,585.0
STOCK AND RH MOVEMENT																								
Rehandle Sulphides	Mt	-	-	3.2	4.0	2.4	2.1	2.1	2.1	2.2	2.1	2.1	1.9	2.5	1.9	2.3	2.1	1.9	12.1	12.1	12.1	12.1	11.8	95.0
Rehandle Sulph. High Grade	Mt	-	-	2.7	1.9	0.3	0.1	0.0	0.0	-	0.0	-	0.0	1.2	-	0.9	-	1.1	0.7	-	-	-	-	8.9
Rehandle Sulph. Low Grade	Mt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.4	12.1	12.1	12.1	7.9	55.6
Rehandle Mix Sulph. High Grade	Mt	-	-	0.6	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	1.9	1.3	1.9	1.4	2.1	0.8	-	-	-	-	-	26.6
Rehandle Mix Sulph. Low Grade	Mt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.9	3.9
Rehandle Oxides to Heap Leach	Mt	-	-	0.8	-	-	-	0.5	0.3	-	0.8	1.4	-	-	-	-	-	-	-	-	-	-	-	3.9
Heap Rehandle	Mt	10.7	10.8	10.0	10.8	10.9	10.9	5.8	10.5	7.6	9.1	7.5	3.3	4.6	6.9	2.1	-	-	-	-	-	-	-	121.5
Rehandle Bosu Stockpile to Dump Leach	Mt																							-
Total Rehandling	Mt	10.7	10.8	14.0	14.8	13.3	13.0	8.5	12.8	9.8	12.0	11.0	5.3	7.1	8.8	4.4	2.1	1.9	12.1	12.1	12.1	12.1	11.8	220.4
Total Rehandling- Dump Norte	Mt																							-
Total material moved	Mt	65.7	94.3	130.1	139.0	140.3	143.2	139.3	143.0	130.5	123.5	123.7	104.0	88.3	72.8	54.7	23.8	29.0	12.1	12.1	12.1	12.1	11.8	1,805.4

Note: The Total Mined Sulphides in the table shows the mineral extracted from the mine. This feed has various destinations (concentrator, high- and low-grade stockpiles and mixed sulphide stockpiles). The application of a high-grade cut-off policy and the necessity to restrict the Mixed feed to the concentrator requires the extraction rate to be greater than the concentrator plant capacity with subsequent re-handling.

Table 16-5: Mine Extraction by Phase and Material

Phase	MVDP 2020 (Mt)																					
	2021	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
MVS4			9	4	2	4																
MV01	4	19	36	26	14	5																
MV02			11	20	35	39	6	6	2	1	1											
MV03					3	25	57	60	46	15	2	2										
MR	9	26	26	22	3																	
Cel1				22	39	33	29	6	0	1	1											
Cel2									11	37	40	20	12	9								
MV04							11	30	40	35	26	19	2	1								
MV05									4	22	35	32	27	14	14	6						
MV06											9	26	40	40	36	16	27					
Total Sulphide Phases	**12**	**45**	**82**	**93**	**96**	**107**	**103**	**102**	**103**	**112**	**113**	**99**	**81**	**64**	**50**	**22**	**27**	**0**	**0**	**0**	**0**	**0**
MVS4	17	10																				
MVN6	21	7	1																			
FN2	4	10	8	17	2																	
REB		2	3	1																		
PE																						
LLAN	1	7	9	1																		
MVS6		2	8	7	8																	
FS2		0	5	2																		
FN3				3	21	18	3	4														
MVN5						5	18	10	5													
PE							7	13	12													
Total Oxide Phases	**43**	**38**	**34**	**31**	**31**	**24**	**27**	**28**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Mine	**55**	**84**	**116**	**124**	**127**	**130**	**131**	**130**	**121**	**112**	**113**	**99**	**81**	**64**	**50**	**22**	**27**	**0**	**0**	**0**	**0**	**0**
Sulphide Rehandle			3	4	2	2	2	2	2	2	2	2	2	2	2	2	2	12	12	12	12	12
Oxide Rehandle	11	17	16	15	13	12	11	14	8	10	9	3	5	7	2							
Dump Norte Rehandle			1	6	6	6	6															
Total Movement	**66**	**100**	**136**	**149**	**148**	**150**	**150**	**146**	**131**	**124**	**124**	**104**	**88**	**73**	**55**	**24**	**29**	**12**	**12**	**12**	**12**	**12**

Table 16-6: Sulphide Copper Production 2023-2042

SULPHIDE PLANT	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	TOTAL
Feed to mill	kt	2,693	10,127	10,356	10,375	9,525	10,011	10,492	10,485	10,459	10,410	10,438	9,972	11,155	10,558	11,865	9,982	9,836	9,863	9,836	6,423	194,860
TCu Mill Grade	%TCu	0.84	0.79	0.74	0.74	0.71	0.78	0.69	0.75	0.69	0.62	0.64	0.60	0.70	0.84	0.67	0.32	0.29	0.29	0.29	0.29	0.62
ICu Mill Grade	%ICu	0.68	0.68	0.64	0.65	0.62	0.68	0.62	0.66	0.60	0.56	0.55	0.53	0.63	0.75	0.60	0.27	0.24	0.24	0.24	0.24	0.54
SCu Mill Grade	% SCu	0.10	0.06	0.06	0.04	0.03	0.04	0.02	0.03	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.03
Au Mill Grade	Au g/t	0.13	0.12	0.11	0.11	0.08	0.12	0.14	0.14	0.14	0.13	0.10	0.10	0.14	0.17	0.14	0.08	0.07	0.07	0.07	0.07	0.11
$CaCO_3$ Mill Grade	% $CaCO_3$	3.58	4.19	5.51	11.26	6.37	8.65	17.58	10.64	13.93	18.73	8.50	10.42	19.94	18.33	20.09	11.72	11.53	11.53	11.53	11.53	12.26
Cu Metallurgical Recovery	%	91.6	92.3	91.0	90.1	93.2	91.7	90.8	91.6	90.9	91.5	92.2	92.7	91.0	90.8	91.6	91.5	91.5	91.5	91.5	91.5	91.5
Au Metallurgical Recovery	%	74.2	74.2	71.7	70.3	72.9	74.6	73.8	75.0	75.5	73.9	73.7	73.9	73.3	76.0	74.2	65.6	64.5	64.5	64.5	64.5	72.5
Concentrate Grade	%	30.0	28.4	28.6	29.0	29.7	28.0	27.5	28.0	24.1	27.1	26.8	26.3	27.8	28.9	28.1	22.4	21.6	21.6	21.6	21.6	26.9
Copper in Concentrate	kt	21	74	70	69	63	71	65	72	66	59	62	56	71	80	72	29	26	26	26	17	1,095
Gold Production	koz	8	27	27	25	19	27	32	33	33	30	24	24	33	41	40	16	15	15	15	10	494
Concentrate	kt	69	259	245	237	211	255	236	258	273	218	230	212	257	277	257	129	120	120	120	78	4,062

SULPHIDE MIXED PLANT	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	TOTAL
Feed to mill	kt	552	2,086	2,081	2,081	2,080	2,086	2,084	2,081	2,080	1,936	1,255	1,873	1,389	2,086	763	2,118	2,255	2,261	2,255	5,411	40,812
TCu Mill Grade	%TCu	0.75	0.76	0.78	0.78	0.75	0.69	0.66	0.69	0.61	0.56	0.44	0.50	0.49	0.59	0.64	0.29	0.29	0.29	0.29	0.31	0.53
ICu Mill Grade	%ICu	0.50	0.51	0.53	0.53	0.52	0.48	0.45	0.48	0.42	0.38	0.29	0.34	0.31	0.40	0.45	0.18	0.18	0.18	0.18	0.20	0.36
SCu Mill Grade	% SCu	0.15	0.15	0.16	0.16	0.15	0.13	0.14	0.14	0.11	0.10	0.07	0.09	0.15	0.13	0.13	0.06	0.06	0.06	0.06	0.06	0.11
Au Mill Grade	Au g/t	0.11	0.11	0.11	0.11	0.11	0.09	0.09	0.10	0.12	0.10	0.05	0.13	0.07	0.14	0.15	0.07	0.07	0.07	0.07	0.07	0.09
$CaCO_3$ Mill Grade	% $CaCO_3$	3.10	3.35	4.00	4.16	3.82	3.18	6.08	6.82	6.72	6.23	2.73	10.77	3.20	14.03	14.37	5.99	5.99	5.99	5.99	3.75	5.76
Cu Metallurgical Recovery	%	72.0	72.6	73.3	73.6	73.4	70.8	70.5	71.5	70.4	70.6	61.2	68.1	74.0	71.6	72.3	70.8	70.8	70.8	70.8	74.6	71.6
Au Metallurgical Recovery	%	65.2	66.2	65.0	64.6	66.7	69.3	64.9	64.9	61.6	64.5	73.5	62.0	51.1	62.8	63.4	61.6	61.6	61.6	61.6	64.6	63.9
Concentrate Grade	%	33.9	33.8	33.5	33.4	33.7	34.2	33.4	33.2	32.2	31.9	31.0	31.4	31.3	31.6	31.8	26.8	26.8	26.8	26.8	27.1	31.5
Copper in Concentrate	kt	3	11	12	12	12	10	10	10	9	8	3	6	5	9	4	4	5	5	5	12	154
Gold Production	koz	2	6	5	5	4	6	7	7	7	6	3	5	4	8	3	3	3	3	3	8	96
Concentrate	kt	9	34	36	36	34	30	29	31	28	24	11	21	16	28	11	16	17	17	17	46	490

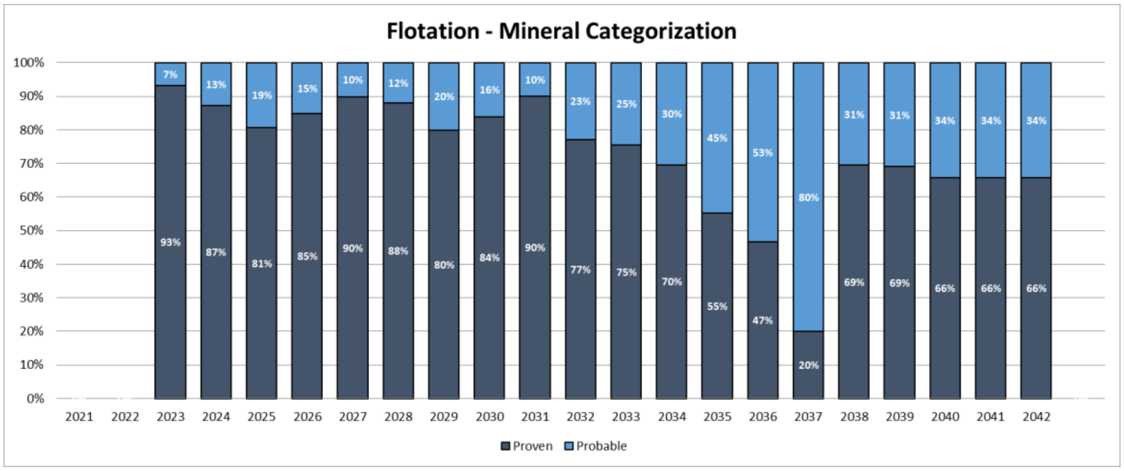
SULPHIDE + SULPHIDE MIXED PLANT	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	TOTAL
Feed to mill	kt	3,245	12,214	12,436	12,455	11,606	12,097	12,576	12,566	12,540	12,346	11,692	11,845	12,544	12,644	12,628	12,100	12,091	12,124	12,091	11,834	235,672
TCu Mill Grade	%TCu	0.82	0.78	0.75	0.74	0.71	0.76	0.68	0.74	0.68	0.61	0.62	0.59	0.68	0.79	0.66	0.31	0.29	0.29	0.29	0.30	0.60
ICu Mill Grade	%ICu	0.71	0.65	0.68	0.68	0.66	0.71	0.64	0.70	0.63	0.58	0.59	0.56	0.63	0.75	0.64	0.28	0.26	0.26	0.26	0.25	0.55
SCu Mill Grade	% SCu	0.11	0.13	0.07	0.06	0.05	0.05	0.04	0.05	0.05	0.03	0.03	0.03	0.05	0.05	0.03	0.03	0.03	0.03	0.03	0.04	0.05
Au Mill Grade	Au g/t	0.12	0.11	0.11	0.11	0.09	0.11	0.13	0.13	0.13	0.12	0.10	0.10	0.13	0.16	0.14	0.08	0.07	0.07	0.07	0.07	0.11
$CaCO_3$ Mill Grade	% $CaCO_3$	3.50	4.05	5.26	10.07	5.91	7.70	15.73	10.01	12.73	16.77	7.88	10.48	18.09	17.62	19.74	10.71	10.49	10.49	10.49	7.97	11.13
Cu Metallurgical Recovery	%	88.6	89.1	87.9	87.2	89.4	88.4	87.4	88.5	87.8	88.5	89.8	89.4	89.6	88.4	90.5	88.2	87.6	87.6	87.6	83.5	88.4
Au Metallurgical Recovery	%	72.9	72.9	70.6	69.3	71.5	73.9	72.7	73.7	73.5	72.7	73.7	71.7	72.0	74.1	73.5	64.6	64.0	64.0	64.0	64.6	71.2
Concentrate Grade	%	30.4	29.1	29.2	29.6	30.2	28.6	28.2	28.6	24.9	27.5	26.9	26.8	28.0	29.2	28.3	22.6	22.3	22.3	22.3	23.7	27.4
Copper in Concentrate	kt	24	85	82	81	74	82	75	83	75	67	65	62	76	89	76	33	31	31	31	29	1,249
Gold Production	koz	9	33	32	31	23	32	39	40	40	35	27	29	37	49	43	19	18	18	18	18	590
Concentrate	kt	78	293	281	272	245	285	266	289	301	242	241	233	273	304	269	146	137	137	137	124	4,552

Note: Design plant capacity 11.6 Mt/year, 12.3 Mt/year average treatment rate according to hardness

Table 16-7: Oxide Copper Production 2021-2034

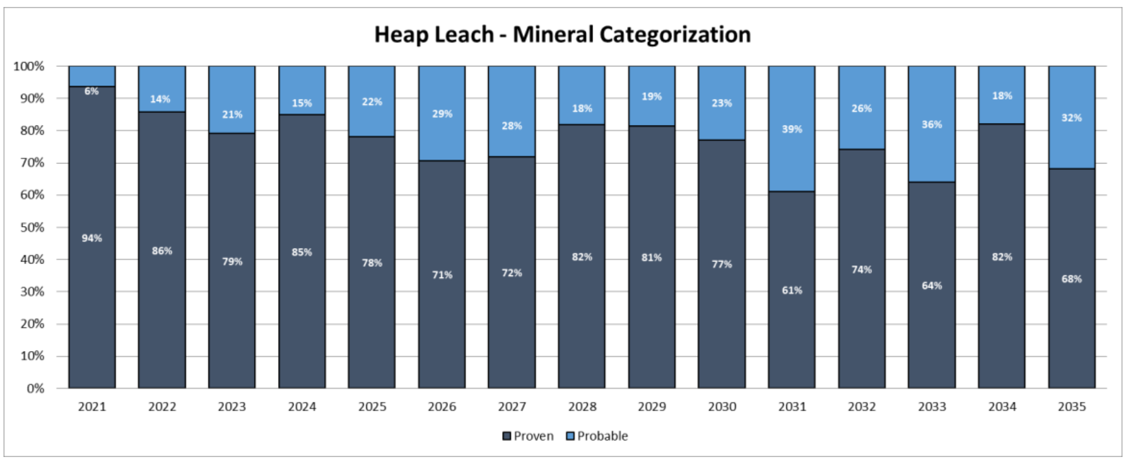
HEAP LEACH	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	LOM
Feed to Heap	kt	10,700.0	10,750.0	10,800.0	10,850.0	10,907.2	10,900.0	6,327.0	10,727.0	7,613.0	9,931.3	8,934.8	3,471.0	5,479.5	7,977.0	125,368
TCu Heap Grade	%TCu	0.61	0.64	0.49	0.45	0.40	0.38	0.41	0.48	0.49	0.34	0.33	0.39	0.36	0.39	0.45
ICu Heap Grade	%ICu	0.10	0.16	0.13	0.11	0.08	0.09	0.11	0.13	0.14	0.08	0.07	0.08	0.09	0.09	0.11
SCu Heap Grade	%SCu	0.50	0.48	0.36	0.34	0.31	0.29	0.29	0.35	0.35	0.26	0.26	0.31	0.28	0.29	0.34
$CaCO_3$ Heap Grade	% $CaCO_3$	3.06	5.02	2.98	2.54	1.83	2.60	3.71	5.14	3.06	2.97	2.64	2.55	5.90	5.91	3.49
Cu Metallurgical Recovery	%	0.79	0.79	0.79	0.76	0.78	0.73	0.75	0.75	0.78	0.73	0.70	0.80	0.74	0.77	0.76
Heap Cathodes Production	kt	42.2	40.9	31.2	27.7	26.4	23.2	14.0	28.1	21.0	19.1	16.3	8.5	11.4	18.0	328.0
DUMP LEACH	Unit	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	LOM
Feed to Dump	kt	14,471.1	9,116.1	9,881.5	10,602.8	13,195.1	13,808.9	10,753.5	12,043.0	9,168.1	10,666.9	8,959.7	1,302.0	2,916.3	3,378.0	130,263
TCu Dump Grade	%TCu	0.25	0.18	0.19	0.18	0.19	0.19	0.17	0.19	0.20	0.19	0.20	0.20	0.19	0.20	0.20
ICu Dump Grade	%ICu	0.06	0.04	0.05	0.05	0.05	0.05	0.04	0.06	0.07	0.05	0.07	0.06	0.06	0.07	0.06
SCu Dump Grade	%SCu	0.19	0.16	0.15	0.14	0.14	0.14	0.13	0.13	0.13	0.14	0.13	0.13	0.13	0.14	0.15
$CaCO_3$ Heap Grade	% $CaCO_3$	1.93	2.64	2.71	2.34	2.08	2.95	2.28	2.54	1.96	3.00	2.65	1.93	4.54	4.86	2.55
Cu Metallurgical Recovery	%	0.42	0.49	0.46	0.48	0.44	0.43	0.45	0.44	0.46	0.43	0.46	1.28	0.48	0.53	0.46
Dump Cathodes Production	kt	11.6	7.1	6.7	7.1	8.3	8.3	6.4	7.1	5.4	6.4	5.5	2.2	1.9	2.5	86.6

Figure 16-4: Production Plan Mineral Categorization, Flotation



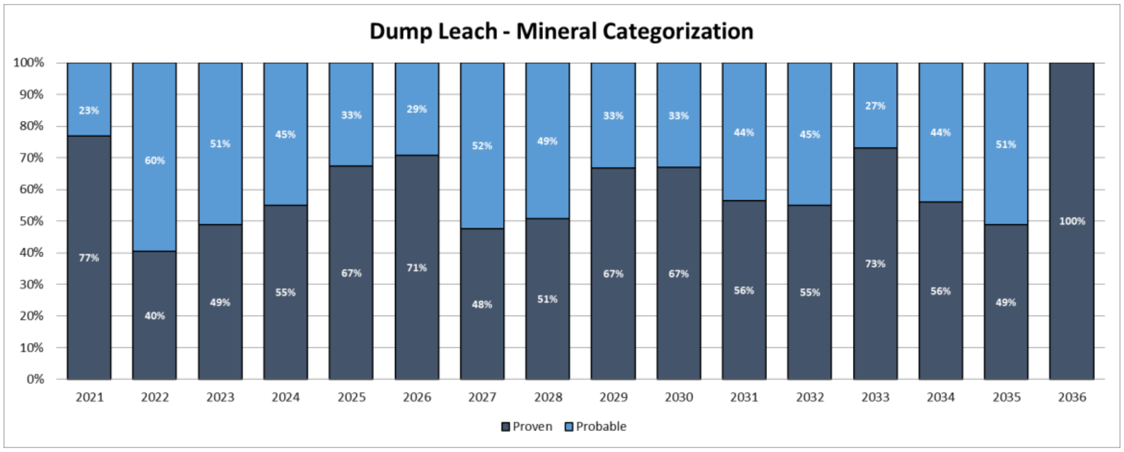
Note: Figure courtesy Mantos Copper, 2020

Figure 16-5: Production Plan Mineral Categorization, Heap Leach



Note: Figure courtesy Mantos Copper, 2020

Figure 16-6: Production Plan Mineral Categorization, Dump Leach

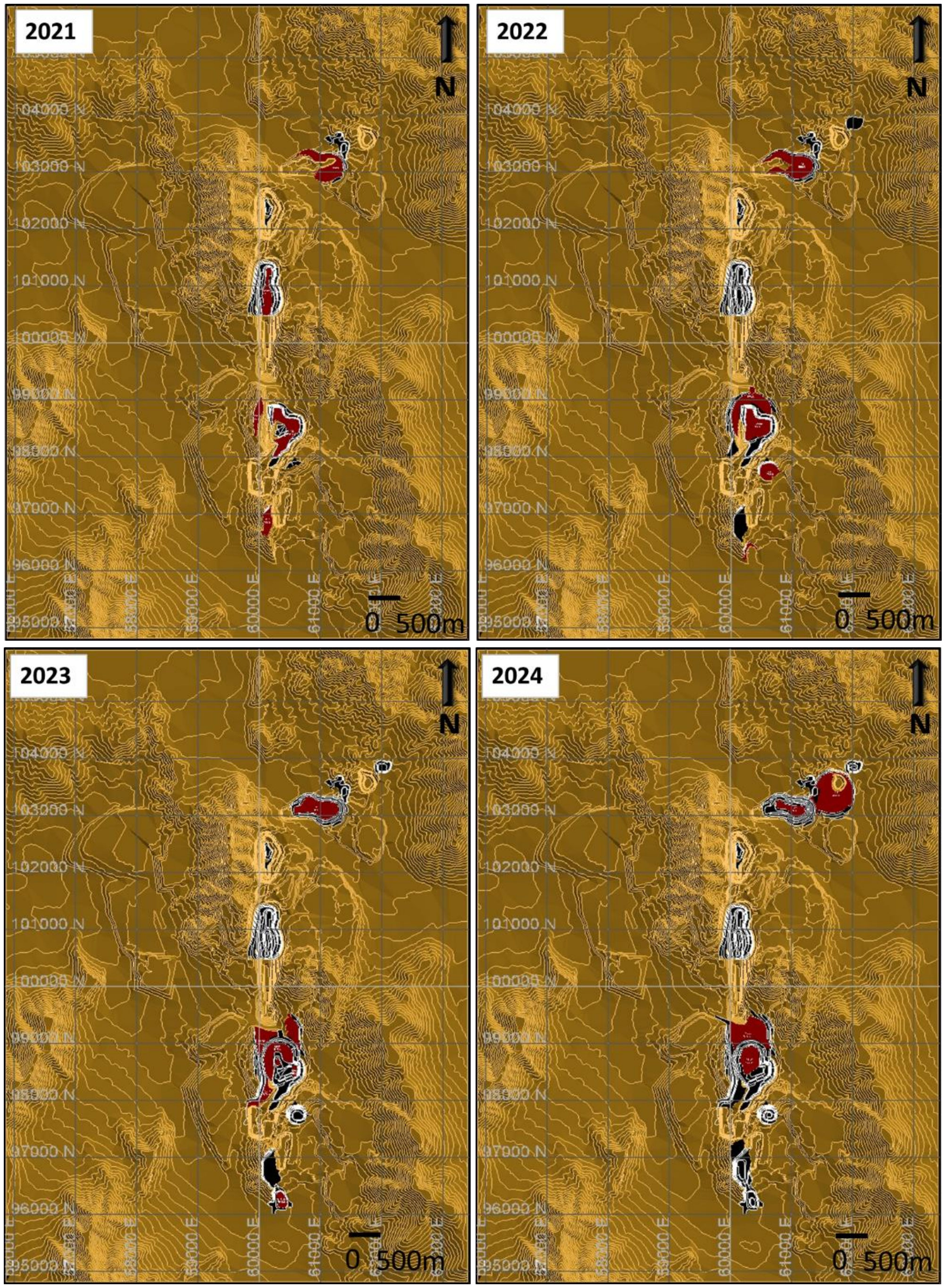


Note: Figure courtesy Mantos Copper, 2020

16.3.1 Mining Sequence

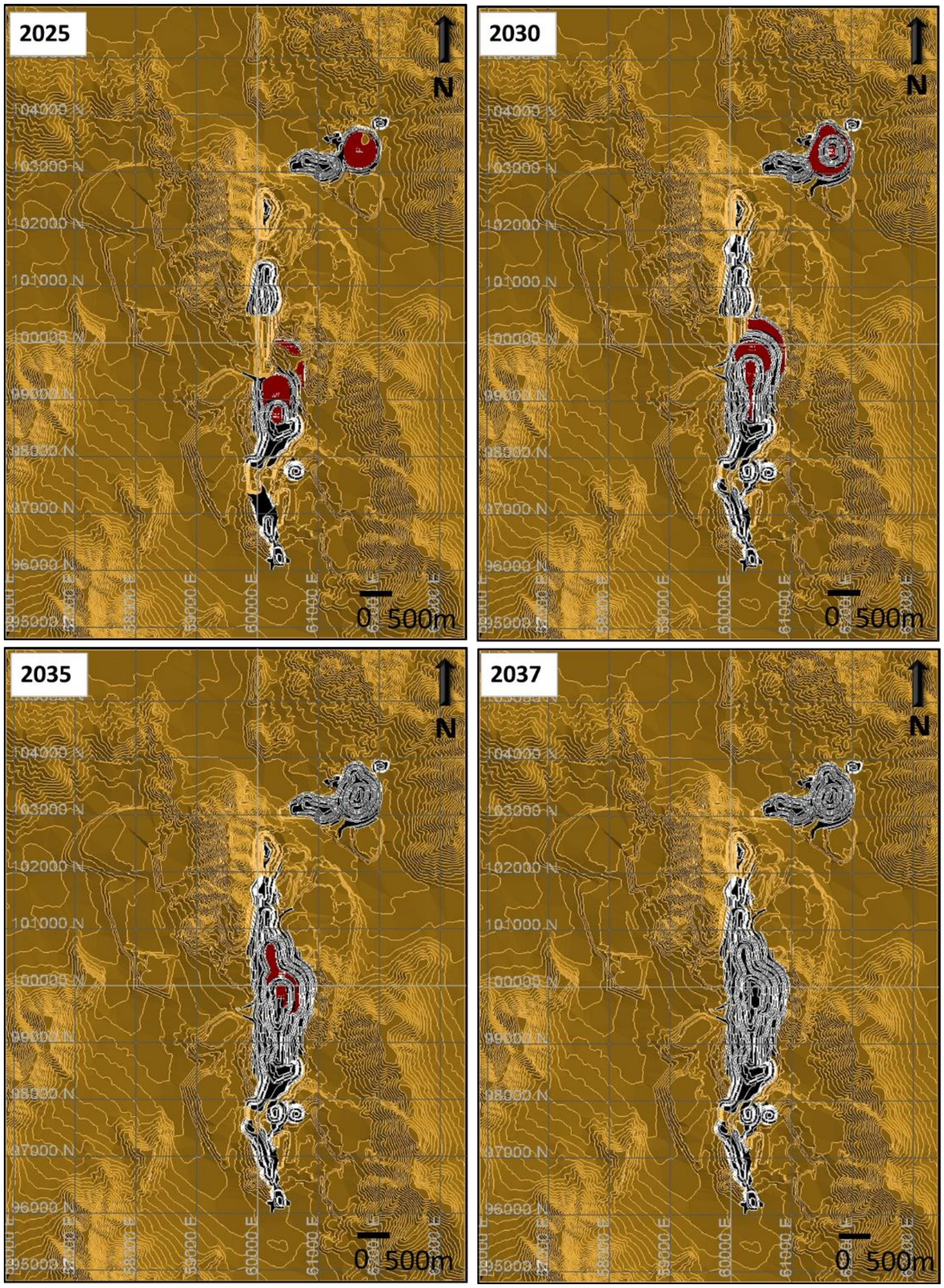
There are 19 designed phases and a maximum of eleven must be kept in operation at one time to meet the mine plan requirements. Figure 16-7 and Figure 16-8 show the mining plan sequence.

Figure 16-7: Mining Sequence (2021- 2024)



Note: Figure courtesy Mantos Copper, 2020

Figure 16-8: Mining Sequence (2025- 2037)



Note: Figure courtesy Mantos Copper, 2020

16.4 Mining Equipment

The mining equipment fleet was selected by taking the following into account:

- Equipment fleet that forms part of the currently operating mine
- Proposed mine design:
  - Bench height
  - Operating widths
  - Proposed mining schedule:
  - Number of simultaneously operating phases
  - Total movement per phases per year
  - Sinking rate
- Operational issues:
  - Mining selectivity and dilution.

The current equipment fleet will be increased and eventually replaced by the new fleet based on the capital investment schedule.

When the existing equipment reaches the estimated useful life the drill rigs will be replaced by the same type (Atlas Copco DM50 and Cat MD6240) to operate at the oxide phases. For the sulphide phases (15 m benches), different types of diesel and electric equipment are considered because larger drilling diameters are required.

The new loading fleet will be composed of 994K 22 m^3 front-end loaders (replacing the current 994SD), XPC4100 56 m^3 electric cable shovels, owned by Mantoverde. Additional loading requirement will be contracted and PC5500 26 m^3 hydraulic shovels are assumed.

A trade-off between electric and diesel shovels was completed for the sulphide phases. The selection of electric equipment was based on higher productivity, lower operating cost and higher reliability of the equipment.

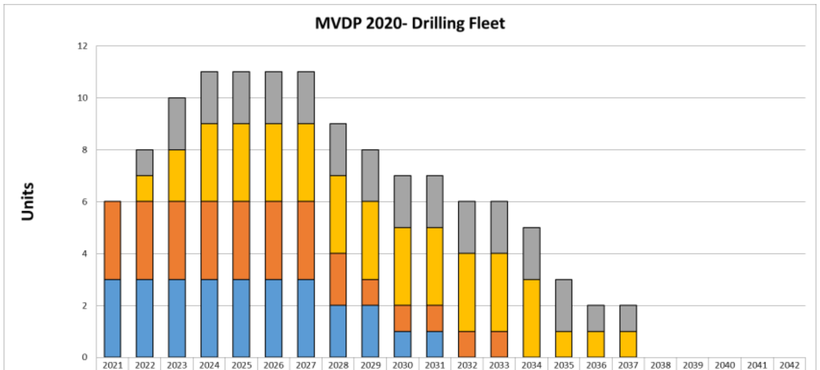
Hauling fleet will mainly consist of Komatsu 830E trucks and a fleet of CAT 785 to re-handle oxide material. The peak required trucks will be between 2026 and 2029 with a requirement of 50 units.

The auxiliary fleet will be supplemented by bulldozers and wheeldozers as the number of work fronts increases, and water trucks and motor graders as the hauling profile increases within the pit.

Estimates of the equipment fleet are based on the material movement scheduled in the mine plan and the criteria used for the operating schedule.

The drilling, loading and hauling fleet requirements are shown in Figure 16-9, Figure 16-10 and Figure 16-11. Calculation and optimization of haulage distances were completed using MineHaul software.

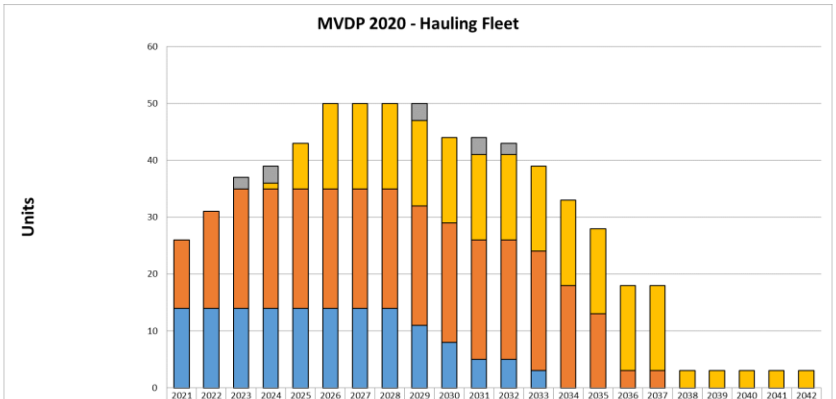
Figure 16-9: Drilling Fleet Requirements



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
MD6640 ELECTRICA	0	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	0	0	0	0	0
MD6380 DIESEL	0	1	2	3	3	3	3	3	3	3	3	3	3	3	1	1	1	0	0	0	0	0
DM50 + DMM2	3	3	3	3	3	3	3	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0
MD6240	3	3	3	3	3	3	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0

Note: Figure courtesy Mantos Copper, 2020

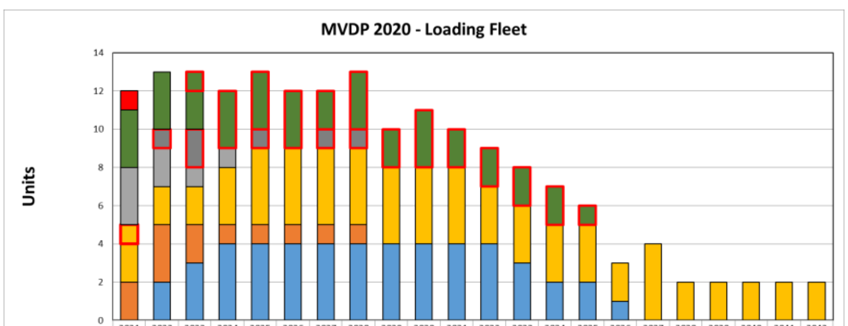
Figure 16-10: Hauling Fleet Requirements



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Mining Truck KOM 830E Rented	0	0	2	3	0	0	0	0	3	0	3	2	0	0	0	0	0	0	0	0	0	0
Mining Truck KOM 830E New	0	0	0	1	8	15	15	15	15	15	15	15	15	15	15	15	15	3	3	3	3	3
Mining Truck KOM 830E Leasing	12	17	21	21	21	21	21	21	21	21	21	21	21	18	13	3	3	0	0	0	0	0
Mining Truck KOM 830E	14	14	14	14	14	14	14	14	11	8	5	5	3	0	0	0	0	0	0	0	0	0

Note: Figure courtesy Mantos Copper, 2020

Figure 16-11: Loading Fleet Requirements



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
PC 2000	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CF 992 (rented)	0	0	1	3	3	3	2	3	2	3	2	2	2	2	1	0	0	0	0	0	0	0
CF 992	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAT 994G (rented)	0	1	2	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAT 994G	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAT 994k (rented)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAT 994k	2	2	2	3	4	4	4	4	4	4	4	3	3	3	3	2	4	2	2	2	2	2
PC 5500 (rented)	2	3	2	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
XPC 4100	0	2	3	4	4	4	4	4	4	4	4	4	3	2	2	1	0	0	0	0	0	0

Note: Figure courtesy Mantos Copper, 2020

17 Recovery Methods

17.1 Existing Leach Operation

Ore is delivered from the pit to a primary crusher and then conveyed to a coarse ore stockpile. The ore is discharged from the coarse ore stockpile by conveyor belts feeding a vibrating screen, from which oversize is reduced by a secondary standard cone crusher. The product is then conveyed to five surge bins, which feed five tertiary screens. The oversize product is reduced by five tertiary crushers. The crushed ore is stored in two bins then fed by conveyor to two parallel agglomeration drums. Agglomerated ore is transported by a system of overland conveyors, grasshopper and tripper conveyors to a stacker which places the ore on the dynamic leach pads in 5 m high layers.

The dynamic heap leach pad operation is complemented by a run-of-mine dump leaching process. Material for dump leaching is deposited directly on the pad without crushing.

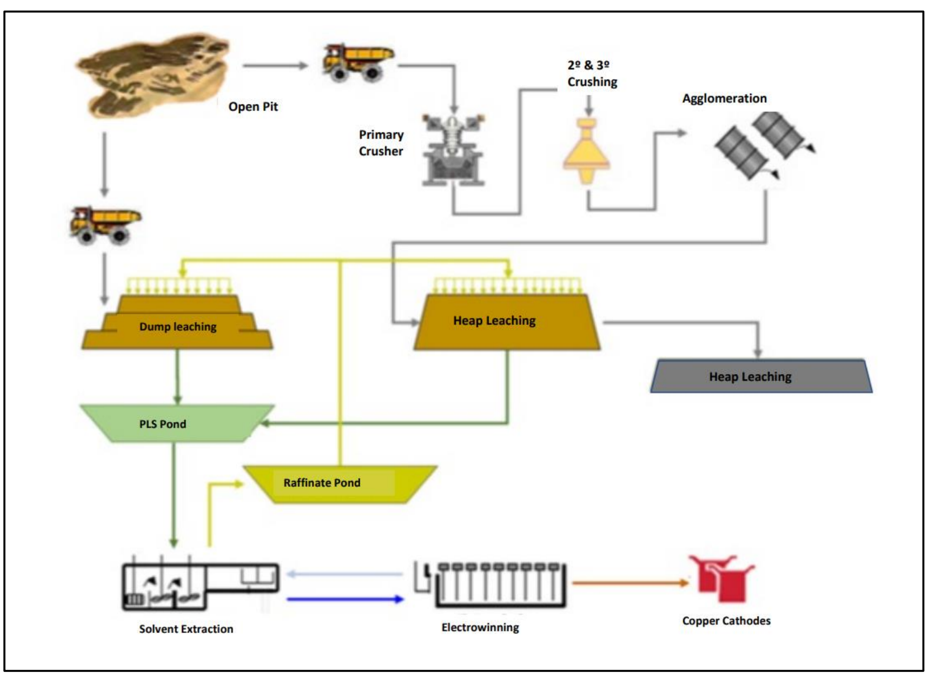
Sulphuric acid is used to leach the ore. The irrigation system is placed on the top of the leach piles. The pregnant leach solution (PLS) exiting the leach pads (heap and dump) is stored in a pond prior to being sent to the SX-EW plant.

The PLS is mixed with an organic reagent and diluent to capture the copper. Then the organic is stripped into the electrolyte solution. Raffinate leach solution is sent to a storage pond to be recycled to the heap leach process together with the dump leach PLS.

The copper-rich solution is sent to the electro-winning process which consists of 168 cells containing 1 m^2 stainless steel plate cathodes. Cathodes are harvested daily and are 95% LME Grade A quality.

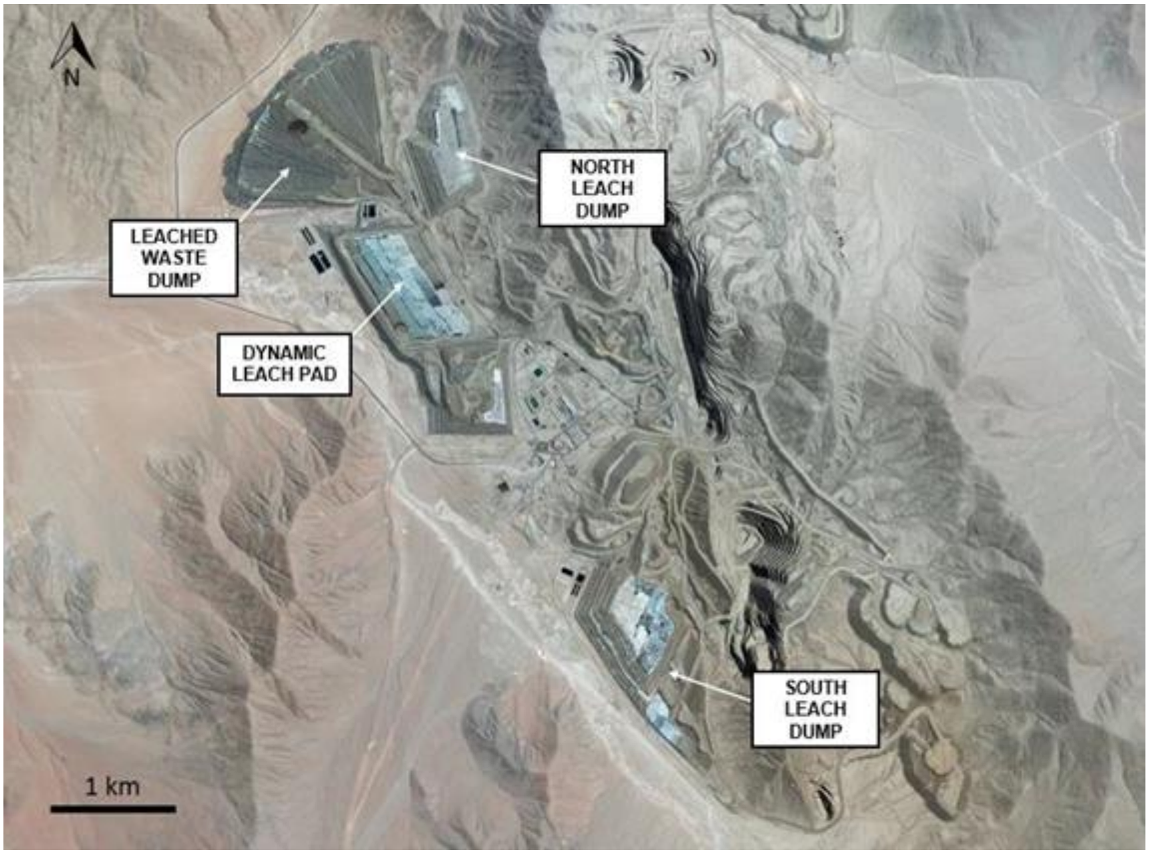
Figure 17-1 shows a simplified process flowsheet for the leaching process. Figure 17-2 shows the locations of the hydrometallurgical facilities currently in use.

Figure 17-1: Oxide Process Flowsheet



Note: Figure courtesy Mantos Copper, 2020

Figure 17-2: Heap and Dump Leach Areas



Note: Figure courtesy Mantos Copper, 2020

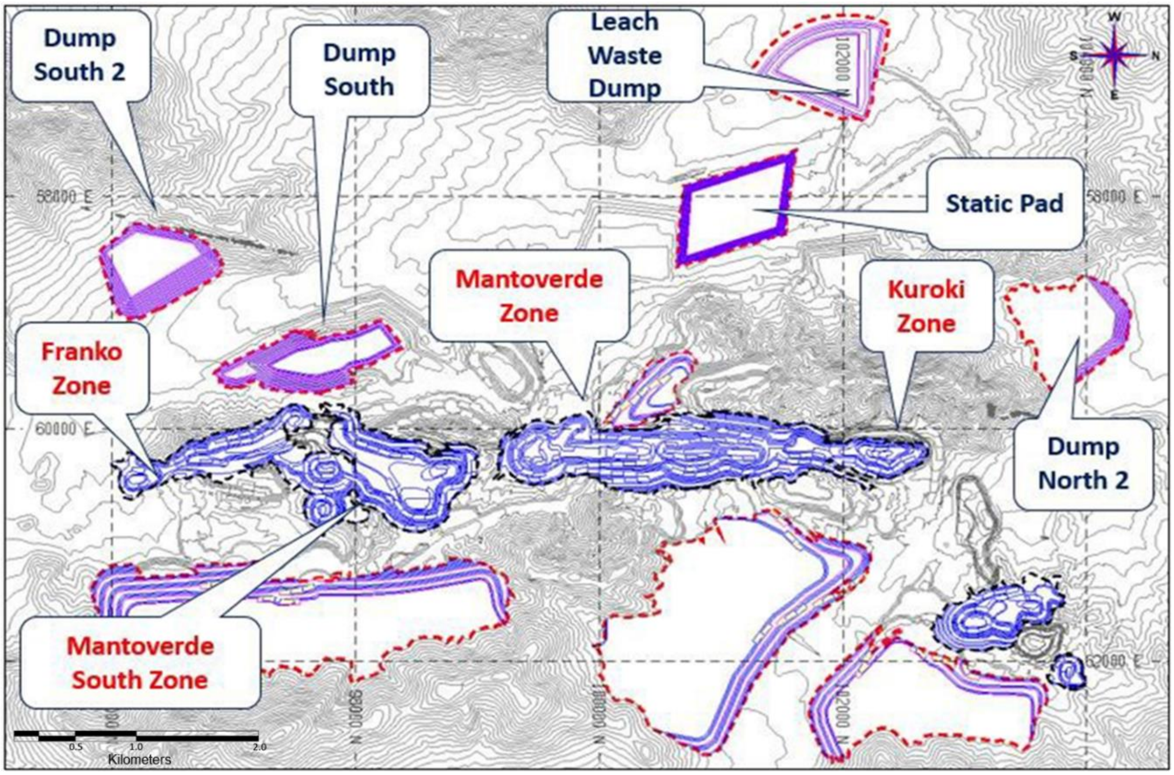
17.2 Oxides Base Case

The current heap and dump leach facilities have an authorized capacity that in the current LOM plan is expected to be met in 2024.

The current oxide operation uses existing heap and dump leach pads (Figure 17-3). The heap leach spent waste is removed and then spread on a leach waste dump using a mechanized haulage system, including an overland conveyor, mobile conveyor and spreader. A third level is under construction.

A new leach waste dump will be required to support operations. This dump will be located south of the existing leach waste dump. After 2027, the current dynamic heap leach pad will be converted into a static heap leach pad which will meet the Oxides Base Case requirement.

Figure 17-3: Process Facilities, Oxides Base Case



Note: Figure courtesy Mantos Copper, 2020

17.3 Mantoverde Development Project - Oxide

About 255 Mt of oxide material will be processed through the heap and dump leach facilities in the MVDP.

The current oxide operation uses existing heap and dump leach pads (Figure 17-3). The heap leach spent ore is removed and then spread on a leach waste dump through a mechanized haulage system, including an overland conveyor, mobile conveyor and spreader. A third level is under construction.

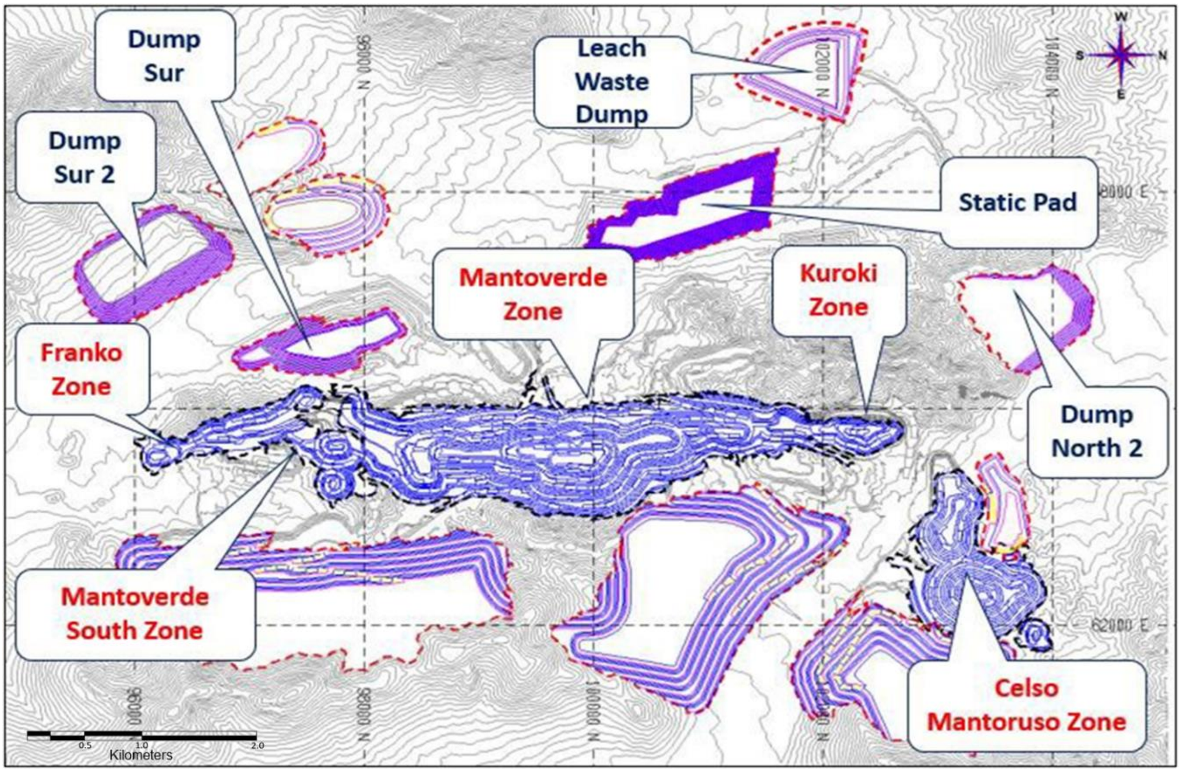
A new leach waste dump will be required to support operations (Figure 17-4). This dump will be located south of the existing leach waste dump, with a storage capacity of 82.2 Mt. After 2027 the current dynamic heap leach pad will be converted into a static heap leach pad, which will have 15 lifts and a storage capacity of 80.2 Mt.

The combination of the planned waste leach dump and the static leach pad will allow for a combined capacity of 162.3 Mt, which is more than the capacity required for the LOM.

The dump leach requires an additional pad named Dump South 2, which is located to the south of Dump South.

The oxide plan within the MVDP assumes the continued operation of existing equipment and facilities.

Figure 17-4: Process Facilities, MVDP Sulphides



Note: Figure courtesy Mantos Copper, 2020

17.4 MVDP Flowsheet – Sulphides

The layout is shown in Figure 17-4.

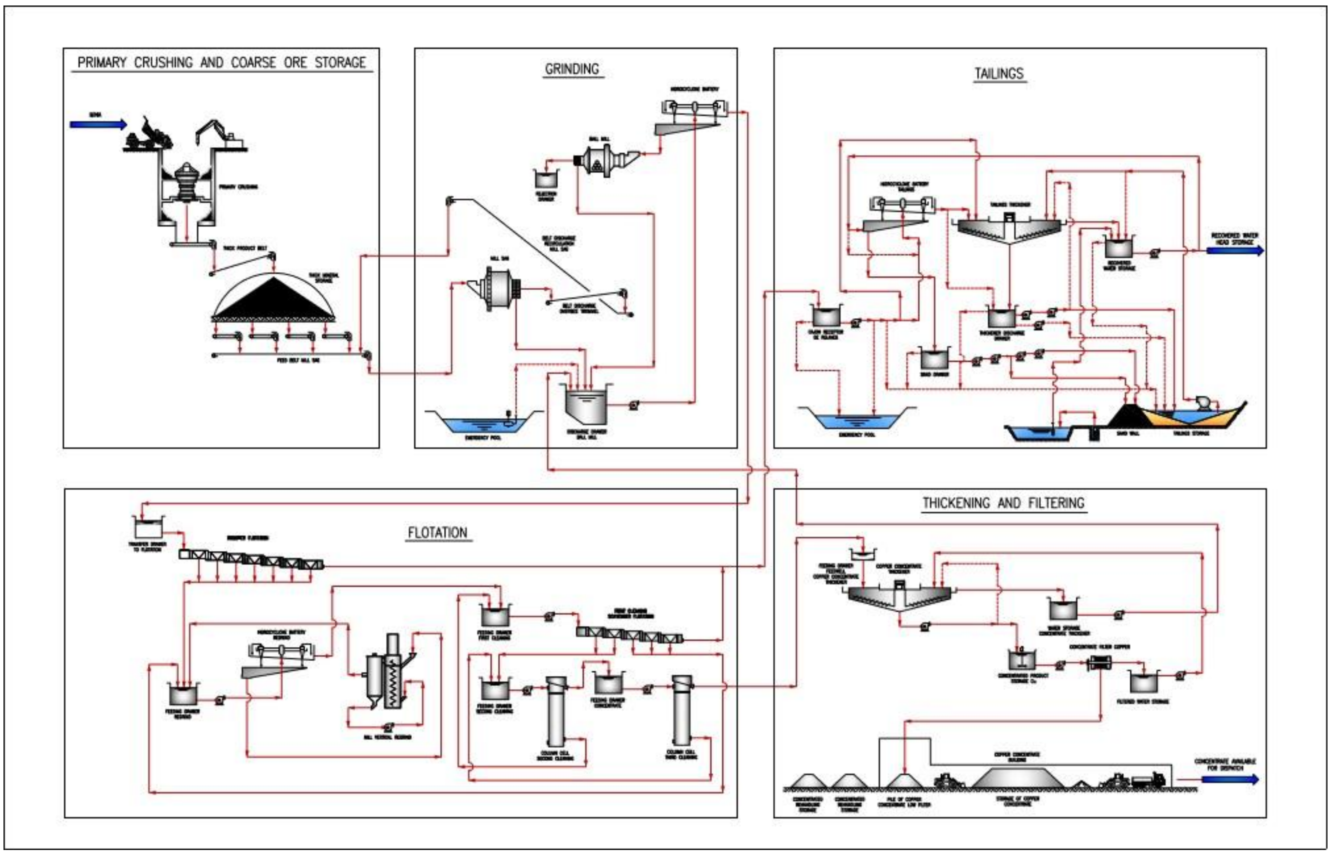
The plant will have the following areas (see Figure 17-5):

- Primary crushing area:
  - Gyratory crusher (42” by 65”)
  - Coarse ore stockpile (15,700 t live capacity)
- Milling area:
  - SAG mill
  - Ball mill
- Flotation area:
  - Rougher flotation
  - Cleaner flotation:
    - First cleaner flotation (agitated cells)
    - Scavenger flotation (agitated cells)
    - Second cleaner flotation (column)

- Third cleaner flotation (column)

- Concentrate:
  - Thickening
  - Filtration
  - Storage
- Tailings:
  - Hydrocyclone cluster
  - Thickening and tailings transport
- Tailings storage facility (TSF)

Figure 17-5: Proposed MVDP Process Flowsheet



Note: Figure courtesy Mantos Copper, 2020

17.5 MVDP Plant Design

The concentrator is designed to process 11.6 Mt per year of sulphide feed, equivalent to 31,781 tpd. The run-of-mine (ROM) material will be crushed in the primary crushing facility, with two 240 t trucks able to dump alternately.

The primary crusher (42"x65") has a feed hopper with a capacity of 327 t, equivalent to 1.5 trucks. The product will discharge into a 327 t capacity intermediate hopper. A belt feeder will be located under this hopper to transfer the material to a conveyor and then to the coarse ore stockpile.

The coarse ore stockpile will have a live capacity of 15,700 t (dry), allowing 11.1 hours of operation without new feed. Four belt feeders will be located under the coarse ore stockpile, these will discharge onto the SAG mill feed conveyor.

The milling process will begin with a semi- autogenous grinding (SAG) mill. The SAG mill, 34' x 15' with two 5,500 kW synchronous electrical motors with variable frequency drives (VFD) to regulate the rotation speed, will discharge to a trommel.

The oversize from the trommel (pebbles) will be recycled to the SAG mill by two conveyors. The undersize from the trommel, with a T80 of 1,500 µm, will discharge into the mill discharge box, which will be connected to two horizontal centrifugal pumps with variable speeds, one operating and one stand-by. The pumps will send the slurry to the secondary milling stage.

The secondary milling stage comprises a hydrocyclone cluster and a ball mill, 22`x 36.5` powered by two 6,000 kW electrical motors with VFDs. The slurry will be pumped to a hydrocyclone cluster where it is separated in two streams by size. The underflow (coarse) will feed the ball mill and the ground product (overflow, fine) is discharged via a launder back into the mill discharge box. The overflow will flow by gravity through a pipe to the flotation process. This slurry with a P80 of 180 µm will be the final mill product.

A trench will be used to contain spillage and mill drainage due to blackouts or planned shutdowns. This trench will end in a sump pump that will return the slurry to the mill discharge box. The trench will have a volumetric capacity of twice the mill discharge box capacity. A front-end loader can be used to remove the coarse material.

The flotation circuit comprises a first stage of rougher flotation with seven conventional cells (300 m^3 each). The concentrate produced in the rougher flotation will feed a transfer box, which will have two pumps, one in operation and one stand-by. These will pump the concentrate to the regrinding stage. The regrinding area will have a vertical mill, 13' x 44' with a 745 kW motor, and will work in an inverse closed circuit with a hydrocyclone cluster.

The overflow from the regrinding hydrocyclone cluster will discharge to a transfer box, which will have two pumps, one in operation and one stand-by. These pumps will feed the first cleaning stage consisting of two conventional cells (130 m^3 each). The tailings from the first cleaner stage will feed directly to the scavenger circuit. The scavenger circuit will consist of three conventional cells (130 m^3 each) and will produce a concentrate that will join the rougher concentrate in the regrinding circuit. The rougher and scavenger tailings will be sent to the final tailings transportation system.

Concentrate produced in the first cleaning stage will discharge to a transfer box, which will have two pumps, one in operation and one stand-by. These pumps will feed the second cleaning stage (one 5.79 m diameter flotation column cell). The tailings from the second cleaning stage will discharge to a transfer box, which will have two pumps, one in operation and one stand-by. These pumps will feed the first cleaning stage. The concentrate from the second cleaning will flow by gravity to a transfer box, which will have two pumps, one in operation and one stand-by. These will pump the concentrate to the third cleaning stage (a 4.57 m diameter column flotation cell), where the final concentrate will be produced.

The copper concentrate from the flotation process will feed a 19.5 m diameter conventional concentrate thickener. From this thickener, two pumps (one in operation and one stand-by) will pump the thickened concentrate to an agitated tank. This tank will have two centrifugal pumps with variable speeds, one in operation and one stand-by, which will feed the 275 m^2 filter press. The water (filtrate) from the filter will discharge into a transfer box, from where it will be pumped back to the concentrate thickener.

Process water will be recovered from the concentrate thickener overflow. This water will be sent to the recovered water tank and from there returned to the mill discharge box by two pumps (one in operation and one stand-by).

The filter will discharge the concentrate (9% moisture) onto the floor where it will be moved by mobile equipment. The filtration facility will also have areas for concentrate blending. The total storage capacity will be 3,200 t.

Concentrate will be loaded by a front-end loader into trucks which will transport the concentrate from the plant to a port for shipment.

The overall tailings, formed by the rougher tailings and the scavenger tailings, will flow by gravity to the tailings pump box, which will have two pumps, one in operation and one stand-by. These will pump the tailings about 1 km to a hydrocyclone cluster. The hydrocyclone overflow will be sent to a 60 m diameter conventional tailings thickener for water recovery. The thickener underflow (55% solids) will be sent to the tailings storage facility (TSF). Some of the hydrocyclone underflow will also be used to build the dam wall.

The water recovered from the thickeners and the TSF will be returned to the plant as recirculated water, thus reducing fresh water consumption.

17.6 MVDP Process Design Criteria

The design parameters for the main equipment for the concentrator and related plant infrastructure are listed below.

17.6.1 Main Design Criteria

- Annual throughput : 11.6 Mtpy
- Daily throughput : 31,781 tpd
- Operating Time
  - Days per year : 365
  - Hours per day : 24
- Specific Gravity – feed : 3.08
- Moisture content : 2.0%
- Copper head grade
  - Nominal : 0.72%
  - Design : 0.94%
- Area running time
  - Primary crushing : 70.0%
  - Grinding : 94.0%
  - Flotation : 94.0%
  - Concentrate Thickening : 80.0%

- Concentrate Filtration : 80.0%
- Fine Tailings Thickening : 94.0%

17.6.2 Primary Crushing

- Type : Gyratory
- Size : 42" x 65"
- Nominal Capacity : 1.324 t/h
- Capacity Coarse Ore Stockpile : 15,700 live t

17.6.3 SAG Milling

- SAG Mill Type : Dual Piñon
- Diameter EGL : 34 ft (10.4 m)
- Length EGL : 15 ft (4.6 m)
- Discharge : Grate
- Pebble Classification : Trommel

17.6.4 Feed and SAG Mill Characteristics

- A : 62.10
- b : 0.70
- Ta : 0.45
- Axb : 48.18
- SPI : 53.31
- BWi : 16.76 kWh/tm
- CEE (SPI, T80=1.5mm) : 6.45 kWh/tm
- Installed Power : 2 x 5,500 kW
- Type of motor : Synchronous
- Product SizeT80 : 1,500 µm
- Pebble Circulation Load (Design) : 30%
- Total Filling : 25%
- Steel Ball filling : 15%
- Steel Ball filling (Design) : 20%
- Steel Ball Consumption : 600 g/t

17.6.5 Ball Mill

- Discharge : Overflow
- Number of Units : 1
- Diameter EGL : 22 ft (6.7 m)
- Length EGL : 36.5 ft (11.1 m)

- Installed Power : 2 x 6,000kW

17.6.6 Regrind Mill

- Type : Vertical
- Number of Units : 1
- Installed Power : 745 kW
- Product Size P80 : 38 µm

17.6.7 Rougher Flotation

- Type : Conventional
- Laboratory Flotation Time : 14 min
- Design Flotation Time : 30 min
- Total Volume : 1,950 m^3
- Cell Size : 300 m^3

17.6.8 First Cleaning Cells

- Type : Conventional
- Design Flotation Time : 10 min
- Total Volume : 192 m^3
- Cell Volume : 130 m^3

17.6.9 Scavenger Cells

- Type : Conventional
- Design Flotation Time : 20 min
- Total Volume : 280 m^3
- Cell Volume : 130 m^3

17.6.10 Second Cleaning Column

- Type : Column
- Unit Capacity : 6.5 $t/h/m^2$
- Raise Capacity : 2.5 $t/h/m^2$
- Quantity : 1

17.6.11 Third Cleaning Column

- Type : Column
- Unit Capacity : 6.5 $t/h/m^2$
- Raise Capacity : 2.5 $t/h/m^2$
- Quantity : 1

17.6.12 Concentrate Thickener

- Type : Conventional
- Diameter : 19.5 m
- Quantity : 1
- Thickening Rate : 3.3 tpd/m^2
- % Solids Discharging : 60%
- Flocculant Addition : 4 g/t

17.6.13 Tailings Thickener

- Type : Conventional
- Diameter : 60 m
- Quantity : 1
- Thickening Rate : 0.46 t/h/m^2
- % Solids Discharging : 55%
- Flocculant Addition : 7 g/t to 8 g/t

17.6.14 Concentrate Filter

- Type : Filter Press
- Quantity : 1
- Filtration Rate : 180 kg/h/m^2
- Required Area : TBD m^2
- % Moisture Filter Cake : 9%
- Concentrate Storage Capacity : 3.200 t

17.7 Equipment Sizing

The comminution equipment was defined using power-based calculation tools. The SAG mill size was reviewed by an independent consultant. The flotation and thickening equipment were defined using Amec Foster Wheeler models based on metallurgical testwork.

Table 17-1 summarizes the sizes recommended for the main process plant equipment.

Table 17-1: Main Equipment Sizes

Equipment	Number	Type	Size	Power
Primary crusher	1	Gyratory	42" x 65"	600 kW
SAG mill	1	Dual pinion (D Eff x EGL)	34' x 15'	2 x 5,500 kW
Ball mill	1	Dual pinion (D Eff x EGL)	22' x 36.5'	2 x 6,000 kW
Hydrocyclone	11 operating and 3 stand-by	Conical	26"	—
Rougher	7	Mechanical	300 m^3	—
First cleaner	2	Mechanical	130 m^3	—
Scavenger	3	Mechanical	130 m^3	—
Second cleaner	1	Column	5.8 m x 12 m (D x L)	—
Third cleaner	1	Column	4.6 m x 12 m (D x L)	—
Regrind mill	1	Vertical	—	750 kW
Hydrocyclone (regrinding)	6 operating and 2 stand-by	Conical	15"	—
Concentrate thickener	1	High rate	D = 19.5 m	—
Concentrate filter	1	Press	246 m^2	—
Tailings hydrocyclone	7 operating and 3 stand-by	Conical	26"	—
Tailings thickener	1	High rate	D = 60 m	—

Note: D Eff = effective diameter, EGL = effective grinding length,
D = diameter, L = length

17.8 Product/Material Handling

Materials handling is discussed in Section 16.

17.9 Energy, Water and Process Reagents Requirements

17.9.1 Energy

The power supply required to support the process operation is discussed in Section 18.

17.9.2 Fresh Water Supply

Fresh water will be supplied from an expanded sea water desalination plant that is located close to Bahía Flamenco, about 40 km from the mine site. Fresh water will discharge into the existing pond on site which has a capacity of 23,000 m^3. From this pond, four pumps (three operating and one stand-by) will pump water to a header tank located at a higher elevation. The header tank will have a system of pipes and valves to feed the process plant.

Recovered water from the TSF will be fed to the recovered water header tank, and through a system of pipes and valves to feed specific plant areas.

17.9.3 Reagents

17.9.3.1 Lime

Quick lime will be supplied by trucks. The trucks will have their own discharge system to discharge the lime into the storage silo. The silo will feed a slaker reactor where the lime will be mixed with water, generating milk of lime. The slaked product will be a slurry that will flow by gravity to an agitated transfer tank.

The milk of lime will be transferred from the transfer tank to an agitated storage and distribution tank. From this tank, using two pumps (one in operation and one stand-by), the milk-of-lime will be pumped to the closed circuit distribution system (recirculation system) serving the milling, flotation and regrinding areas.

17.9.3.2 Flotation Reagents

The reagents used in the flotation process will consist of two collectors and one frother. The primary collector and the frother will be supplied in liquid form in isotanks delivered to site by trucks, and the isotanks will discharge by gravity into the reagent storage tanks. A short term storage area adjacent to the plant will be used for reagent storage.

The primary collector and the frother storage tanks will have a 2 day capacity. Reagent dosing assumes a pump for each destination with a stand-by pump per reagent.

The secondary collector will be supplied in solid form in bags that will be discharged into an agitated tank, and subsequently into a distribution tank that with storage for 1 day. In total six pumps will be needed for secondary collector dosage, five operating and one stand-by.

17.9.3.3 Flocculant Plant

Flocculant will be required for the concentrate and tailings thickeners. The flocculant will be supplied from compact plants, one dedicated to each thickener. These plants will be fed with flocculant in bags (approximately 25 kg weight). The flocculant will be prepared on a daily basis and then diluted and dosed.

17.9.3.4 Compressed Air System

The compressed air supply for the process plant and other instrumentation will be provided by three compressor rooms. One compressor room will be located in the primary crushing building, another will be located next to the flotation and milling area (these are the main compressors). The third room will be located in the filter building.

17.10 Comments on Section 17

17.10.1 Oxides

The existing facilities and process at site will continue to be used for treatment of oxide ores. This process uses conventional methods and equipment.

Mantoverde has extensive experience in the hydrometallurgical treatment of the oxide ore and in the operation of heap and dump leaching as well as solvent extraction and electro-winning.

The QP is the opinion that it is unlikely that there will be surprises in the rest of the LOM for the oxide ore treatment, the production plan and main KPIs are well supported and conservative.

17.10.2 MVDP Sulphide

In the opinion of the QP the process plant design is based on the metallurgical testwork and is acceptable. This is based on the following:

- The metallurgical testwork is appropriate for establishing the process design criteria
- The variability tests adequately cover the mineralogy characteristics
- The run-time considered for the process areas is adequate and is within industry standards
- The 80th percentile of hardness was considered for milling equipment simulation and sizing
- The process flowsheet is simple and conventional. Mantos Copper has an experienced team in milling and flotation in the Mantos Blancos operation which will be good source of the operating team. The only unknown technology for the Mantos Copper team is SAG technology but this is widely used in Chile and it will not be difficult to find experienced operators
- The circulating load assumed in the ball milling stage is 250%; this may be low. Simulations carried out by equipment suppliers had circulating load estimates that were as high as 350%, circulating load ranges are typically within the range of 250% to 300%. It is recommended that the mill manufacturers be consulted to confirm that the 250% assumption is applicable for the final equipment selection.

18 Infrastructure

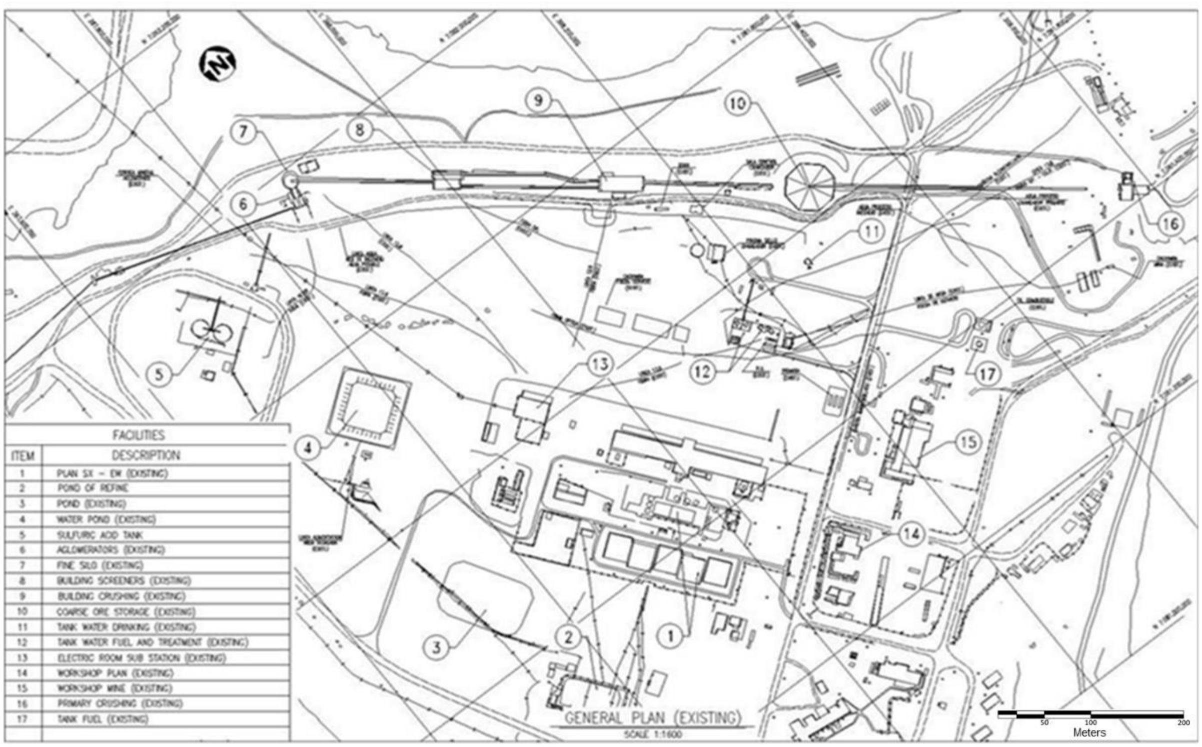
18.1 Introduction

The facilities supporting the expansion for the MVDP will be located at three main sites:

- The mine and concentrator at an elevation of approximately 900 masl
- TSF at an elevation of approximately 750 masl about 3.5 km southwest of the concentrator
- Water desalination plant at the coast.

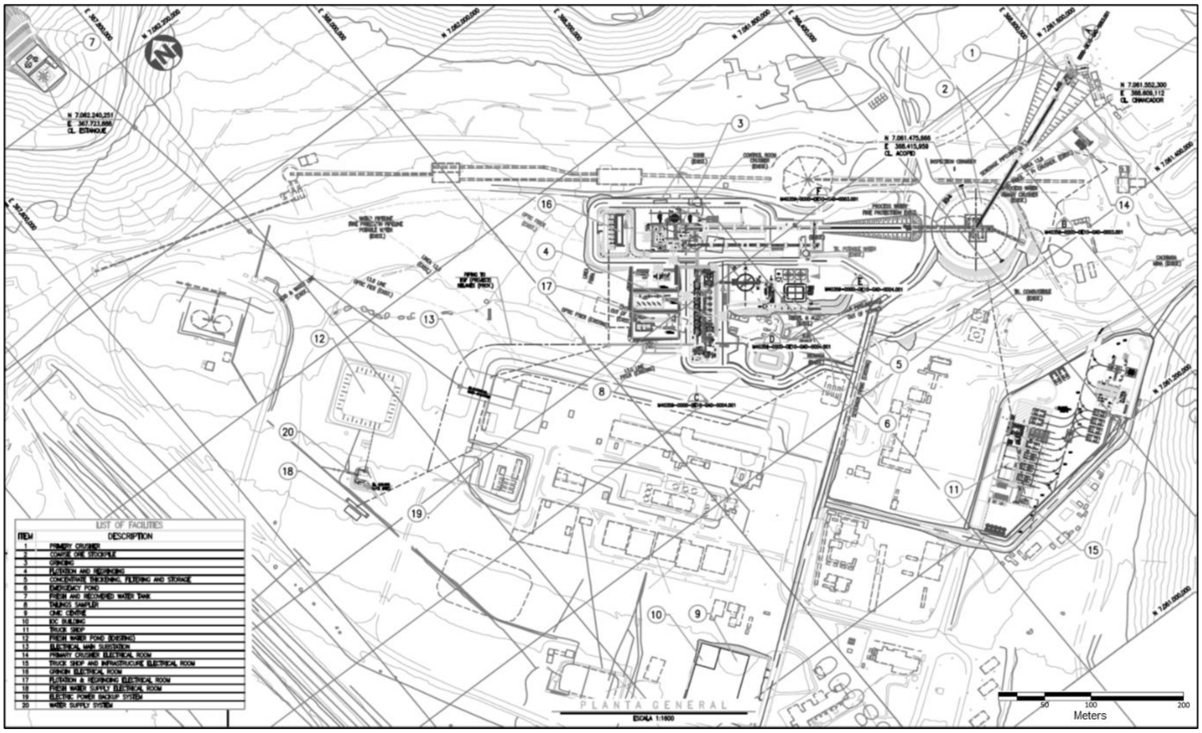
Figure 18-1 shows the current plant area layout. Figure 18-2 shows the layout of the process plant area for the MVDP.

Figure 18-1: Existing Infrastructure Layout



Note: Figure courtesy Mantos Copper, 2020

Figure 18-2: Planned Sulphides Plant Layout



Note: Figure courtesy Mantos Copper, 2020

18.2 Road and Logistics

Section 5 of this Report describes the mine access.

Copper cathodes will continue to be shipped to Antofagasta. Copper concentrate will be shipped through a port located on the coast between Barquitos in the north and Caldera in the south.

Concentrate will be transported using 30 t trucks, on a 360 day per year basis, with an average of about 25 trips per day.

Access to the existing desalination plant is by coast road C-260, crossing Route 5 North at kilometre 946. The existing desalinated water pipeline supplying water to Mantoverde and the existing power line supplying energy to the desalination plant from Mantoverde, run parallel to the Bahía Flamenco–Mantoverde road.

18.3 Infrastructure

18.3.1 Existing Infrastructure

Current infrastructure on site includes:

- Mine and process support buildings
- Truck shop
- Low-grade and high-grade heap leach pads (static and dynamic heaps, respectively)

- Waste rock and leached waste storage facilities
- Sea water desalination plant (intake, filtration and reverse osmosis on the coast), pumping stations (EB1 and EB2) and water storage ponds (at the mine site)
- Desalinated water pipeline
- Power lines connecting the desalination plant with the mine site, and a power line connecting the mine site with the Diego de Almagro substation.

The current facilities located inside the mine–plant area include:

- Access guard house
- Change house
- General offices (engineering and maintenance)
- Polyclinic
- Gym, sports facilities and recreation room
- Contractor yard area
- Parking area
- Warehouse
- Camp and canteen
- Sewage treatment facility.

18.3.2 Planned Infrastructure

Infrastructure required to support the MVDP operation includes:

- Additional truck maintenance shop
- Open building for the SAG/ball mill
- Open building for the flotation and regrind circuits
- Open building for the thickening and filtration circuits
- Potable water storage and potable water plants
- Storage area for lime, reagents and flocculants
- Compressed air supply
- Construction and permanent accommodation camp
- Additional offices and change house.

Pipelines will be required for:

- Services (water, air, instrumentation)
- Process (water, copper concentrate, flotation tailings, slurries)
- Tailings (tailings, water).

Facilities at the port are assumed to be provided and operated by a port service supplier.

The water desalination plant will be expanded from the current capacity of 120 L/s to 380 L/s. A potable water plant will be constructed to provide the drinking water supply for the accommodation camp, using water from the desalination plant; a second potable water plant will be constructed in the mine–process area.

Waste management will include sewage treatment facilities, storage areas for hazardous and non-hazardous waste, salvage yard and landfill for approved materials.

Temporary storage and waste rock storage facilities are discussed in Section 20, together with the TSF and water management.

18.4 General Infrastructure

The total area required for the on-site infrastructure (camp, access road, guardhouse and process plants) is approximately 20 ha.

18.4.1 Truck Shop

The MVDP will have a new closed building for truck maintenance, which will include five maintenance bays and space for future expansion of two additional bays. The building will house a tool shop, oil storage, compressor room and offices.

18.4.2 Camp and Other

The existing camp will be expanded for the MVDP and will be used as the operations camp in the future.

The number of beds required during construction will be 1,500. The location proposed for the construction camp is approximately 17 km from the current Mantoverde facilities.

A new office and change house facility will be constructed adjacent to the existing SX building.

18.4.3 Desalination Plant Expansion

A capacity increase of the existing desalination plant (Bahía Flamenco) owned by Mantos Copper, is proposed. The Mantoverde desalination plant currently produces 120 L/s of water. The facilities were designed and built to accommodate a future expansion to 380 L/s of desalinated water.

18.4.4 Potable Water Treatment Plant

A new potable water plant will treat desalinated water to provide potable water at a maximum rate of 250 L/day per person.

18.4.5 Communications

Communications will use twisted pair or optical fibre cables. Cabling will be required to support the process control systems, security, telephony, information technology and data uses.

18.4.6 Power and Electrical

Power is supplied to the site from the Diego de Almagro substation via a 110 kV transmission line. A new substation is required adjacent to the existing 110 kV Mantoverde substation to provide power to the comminution circuit, flotation and regrind circuits, truck shop, fresh water supply and the mine operations. The current contract with Guacolda Energía S.A is valid until 31 December 2034.

18.4.7 Tailings Storage Facility (TSF)

This section has been prepared based on the following documents:

- M40359-0000-BA10-RPT-0004: Informe Estudio de Factibilidad MVDP (27-09-2017) prepared by Amec Foster Wheeler
- M40359-4830-DT00-RPT-0001: Informe Técnico Plan de Depositación de Relaves, Rev P, prepared by Amec Foster Wheeler
- M40359-4830-DT00-RPT-0012: Informe de Análisis de Estabilidad Estática y Pseudo Estática, Rev P, prepared by Amec Foster Wheeler
- M40359-4830-DT00-RPT-0004: Informe de Balance de Agua Tranque de Relaves Rev P, prepared by Amec Foster Wheeler
- These documents are part of and support the Feasibility Study and supported the permitting process for the TSF.

A new tailing dam is considered as part of the MVDP. Tailings will be thickened to 55% prior to transportation about 3.5 km from the plant to the TSF on the south side of Quebrada Guamanga, in a very narrow sub-basin. Figure 18-3 is a layout of the proposed facility, approved by RCA 16/2018.

The TSF design is conventional, consisting of a starter dam followed by construction of the main dam using the centre-line method. The main dam wall at the end of the operations will be approximately 4 km long, with a maximum top elevation of 794.5 masl, a maximum height of 77 m at the dam axis and an overall area of about 320 ha. The dam design has provision for drainage (collectors, foot and blanket drains) and drainage collection ponds.

The tailings will be transported at a nominal rate of approximately 31,000 t/d (11.3 Mt per year) and will have a storage capacity of approximately 235 Mt.

18.4.7.1 Design Considerations

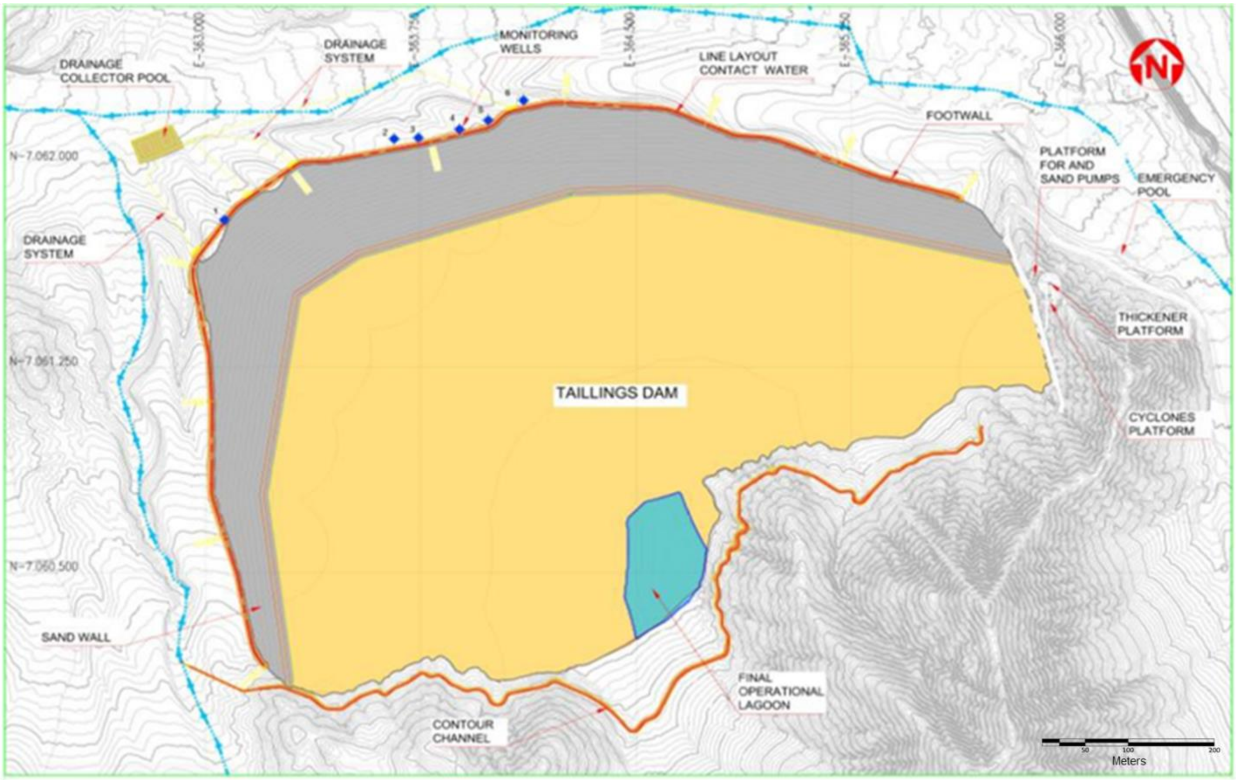
The TSF will include:

- Tailings transport system
- Classification, thickening and tailings distribution
- TSF wall and drainage system
- Contact water recovery system
- Non-contact water management system
- Initial wall constructed using borrowed earthfill material.

Rougher and scavenger tailings will be sent to the TSF area by gravity flow. At the TSF two pumps, one operating and one stand-by, will pump the tailings to a hydrocyclone system. Overflow will be sent to a tailings thickener, where water will be recovered, and the thickened underflow will report to the TSF. The design factor (nominal) is 40% sand and 60% slimes.

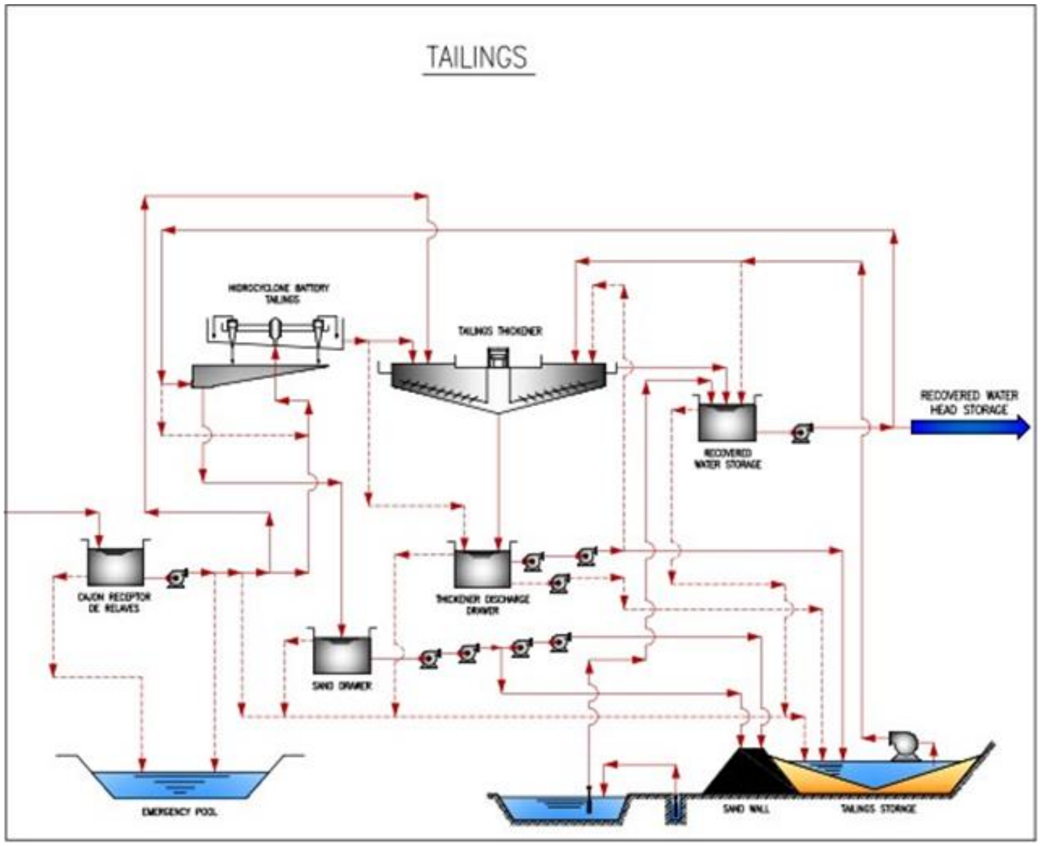
Water recovered from the TSF and the thickener overflow will be returned to the plant as reclaimed water. Figure 18-4 shows the flowsheet for the planned tailings handling system.

Figure 18-3: Tailings Storage Facility (TSF) Layout



Note: Figure courtesy Mantos Copper, 2020

Figure 18-4: Tailings Handling System Flowsheet



Note: Figure courtesy Mantos Copper, 2020

18.4.7.2 Main Design Criteria

The main design criteria for the TSF listed in Table 18-1.

Table 18-1: General TSF Design Criteria

Description	Unit	Value
Average Tailings Produced	kt/year	11,577
Process Plant Availability	%	94
Cyclone Availability	%	98
Operating Time	h/day	24
Operating Time	days/year	347
Projected Life of TSF	years	20
Specific Gravity of Tailings	t/m^3	2.9
Sand/Slimes Nominal Distribution	%	40/60
Sand/Slimes Nominal Distribution (sensitivity)	%	30/70
Minimum Operational Freeboard	m	2
Dry Density of Sand (compacted)	t/m^3	1.65
Dry Density of Tailings (Year 1)	t/m^3	1.38
Dry Density of Tailings (Year 2-20)	t/m^3	1.48
Operational Water Volume	Mm^3	0.3

The TSF dam will be constructed using the centre-line method with a 2:1 upstream slope and 4:1 downstream slope. The upstream wall will be protected by impermeable geotextile liner to prevent spillage and filtration through the wall.

18.4.7.3 Tailings Water Management

The TSF design has provision for drainage (collectors, foot and blanket drains) and drainage collection ponds:

- Water recovered from the TSF: Water will be recovered using two pumps installed on a barge and sent to a recovered water tank adjacent to the tailings thickener.
- Drainage collection ponds: Two HDPE-lined ponds will be situated downstream of the TSF wall and the ponds will collect water from the main dam as well as from the monitoring and pumping wells. Each pond will have a capacity of 11,200 m^3. One pond will be in active use and the second will provide emergency capacity.
- Monitoring and pumping wells: Any potential water infiltrations from the TSF will be recovered using submersible pumps located in a series of deep wells. These will be located downstream of the TSF dam along the entire northeast dam wall perimeter. Wells will range in depth from 30 m to 85 m, depending on the alluvium/colluvium thickness. Water will report to the drainage collection ponds.
- Water recovery. The water recovery system will consist of four water reclaim systems within the TSF area:
    - Water recovered from the tailings pond
    - Water recovered from underground seepage from the TSF
    - Water recovered downstream of the dam wall
    - Water recirculated from the water reclaim tank (located at the cyclone station) to the process plant.
- Non-contact water management: Non-contact water will be diverted around the TSF to the western creek using a 4 km long contour channel. The contour channel will also intercept and divert run-off from the adjacent hill slopes. The channel is sized for a flow rate equal to a 50-year return-period flood and has a 100-year return period capacity. Under normal operating conditions, the contour channel and associated rain water diversion infrastructure will only require routine inspections and maintenance.

18.4.7.4 Monitoring

Planned monitoring instrumentation includes:

- 23 vibrating rope piezometers in the TSF dam wall
- 10 large-scale piezometers and inclinometers downstream of the wall
- 50 (approximately) stations for topographic monitoring, situated at about 150 m intervals along the wall
- 2 accelerators, including data-loggers and solar panels.

18.5 Comment on Section 18

The MVDP design includes a brownfield expansion of an existing oxide operation to incorporate a new copper concentrator and tailings facility. In general, infrastructure requirements will be provided by expanding existing infrastructure and there are no major design challenges.

19 Market Studies and Contracts

19.1 Market Studies

Mantoverde currently produces copper cathode from oxide ore, the cathodes are transported approximately 400 km to the Antofagasta International Terminal Port (ATI) in the city of Antofagasta or to the Angamos Port located 75 km north of Antofagasta, at a cost of US$28.73/t plus VAT (IVA in Chile). The cathodes are 99.99%Cu, they are certified under ISO 9001 and are London Metal Exchange Grade A (with the symbol MV). The cathodes are exported to China, Korea, Taiwan, USA and Europe.

The MVDP will produce coppwer concentrate. Mantoverde used metallurgical testwork results to determine the projected concentrate grades presented in Table 19-1. The testwork completed to date indicates that contained copper and gold will be payable in the concentrates produced. The testwork also indicates that the concentrate product will be clean, is marketable, precious-metals rich and with low content of deleterious elements, particularly very low in arsenic and antimony.

Table 19-1: Copper Concentrate Specification (from Metallurgical Testwork)

Element		Unit	Expected	Minimum	Maximum
Copper	Cu	%	31.3	25.1	34.0
Iron	Fe	%	30.4	19.9	33.0
Sulphur	S	%	32.9	26.8	36.0
Gold	Au	g/t	6.3	4.2	7.0
Cobalt	Co	g/t	1,512	588	1783
Zinc	Zn	ppm	26	74	120
Lead	Pb	ppm	476	194	675
Cadmium	Cd	ppm	0.50	0.50	1.00
Mercury	Hg	ppm	1.98	0.38	3.00
Silicon	Si	%	0.061	0.002	0.100
Arsenic	As	ppm	38.3	0.63	45.0
Chlorides	Cl	%	0.05	0.05	0.1
Antimony	Sb	ppm	5.5	2.50	8.0
Molybdenum	Mo	ppm	19.1	1.00	32.0
Fluorine	F	ppm	100	0.00	200

The copper concentrate (and tailings) have elevated cobalt levels. Cobalt is a currently high price metal that may represent future upside potential for concentrate marketing.

No formal marketing studies have been carried out specifically for the MVDP. Potential markets would include local smelters and international smelters and trading companies who could use Mantoverde concentrates for blending with concentrates containing higher levels of deleterious elements. Preliminary market sounding indicated a high level of interest from international smelters and trading companies in Europe and Asia.

19.2 Smelter and Refining Terms

The commercial terms used to support the financial analysis in Section 22 were benchmarked against similar operations from publicly available information. The key elements of the terms include:

- Long-term treatment and refining charges (TC/RCs) of US$85/t concentrate and US¢8.5/lb Cu for concentrate smelting and refining
- Refining charges of US$5/oz Au
- Asian-style smelting terms:
  - 96.6% copper content paid subject to a 1% minimum deduction
  - Sliding scale gold payable, provided that there is more than 1 g per dry metric tonne (dmt)
- Ocean freight of US$44/wmt (9% moisture content assumed).

19.3 Commodity Price Projection

For the purposes of the financial analysis in Section 22, consensus metal prices were derived from the average of the long-term price projections from a number of analyst and bank forecasts. Table 19-2 shows the metal prices for the first years of the MVDP operation and the final long-term value assumed.

The exchange rate assumptions are based on second half 2020 averages reported by the Chilean Central Bank. These exchange rates are the basis of the Project capital and operating cost estimates, which were completed before the end of 2020.

Table 19-2: Short and Long-term Metal Price Assumptions

Element	Unit	2021	2022	2023	2024	2025	LT
Cu	US$/lb	3.80	3.95	3.65	3.65	3.75	3.45
Au	US$/oz	1,955	1,780	1,720	1,675	1,640	1,585

Table 19-3: Long-term Exchange Rate Assumptions

Currency	Unit	Exchange Rate Assumption
Dollar	US$	700 CLP

19.4 Cost Escalation Assumptions

For the purposes of the financial analysis in Section 22, Mantoverde, following internal budgeting procedures, escalates the future nominal cost of every item, assigning a percentage exposure to foreign currency (US dollars) to expenses incurred in Chile, with extreme values for salaries (100% exposure) and power (0% exposure).

Thus, nominal costs are adjusted each year considering a projected Chilean inflation rate (2.9%) and the USA consumer price index (CPI) growth rate (2.0%), the percentage dollar exposure described above, and a projection of the US dollar to CLP exchange rate. Real costs in US$ are finally calculated using the projected US CPI variation.

Table 19-4 summarizes the dollar exchange rate projection for the first 5 years of the MVDP operation, incorporating the appreciation of the Chilean peso from 2021 to 2022, and then progressively increasing the exchange rate by an average of 0.684% per year.

The escalation procedure established by Mantoverde, together with the assumed inflation and exchange rates, resulted in the following final conversion factors from nominal to real costs:

- Items with 100% US$ exposure have a 1.0 conversion factor (real cost equals nominal)
- Items with 0% US$ exposure have a flat 1.0635 correction factor from nominal to real.

This flat increase recognizes the one-off appreciation of the Chilean peso in 2021. Items with other percentage exposures to the US$ have intermediate conversion factors.

Table 19-4: Dollar Exchange Rate Projection

Item	Unit	2021	2022	2023	2024	2025	2026	LT
Exchange rate	CLP$/US$	770	850	850	850	850	850	700

19.5 Contracts

Contracts are based on bids where three or more bidders were invited. The proposals are evaluated considering the price, technical quality, health and safety requirements and reliability, based on an evaluation matrix.

Decreases in energy costs (electricity and diesel) and the devaluation of the CLP have allowed Mantoverde to re-negotiate some contracts with key suppliers.

Electrical power is provided under contract by Guacolda Energia S.A. For the purpose of the Project financial analysis, the electric power consultant to Mantos Copper (Electroconsultores) has recommended the power price projections shown in Table 19-5 with a long-term value of US$67/MWh. The current contract with Guacolda Energía S.A is valid until 31 December 2034.

Table 19-5: Electric Power Price Projection

Item	Unit	2021	2022	2023	2024	2025	LT
Power Price	US$/MWh	114.1	129.8	120.0	83.5	80.6	67.0

Acid is supplied through annual contracts with a diversified supplier base comprising nearby acid producers (Potrerillos, Paipote), smelters in the Antofagasta Region (Altonorte), direct supply from international suppliers (Peru, Republic of Korea, China) and traders. Annual contracts are normally secured for 90% and the balance is supplied through spot purchases during the course of the year. Forward looking assumptions for sulphuric acid supply, demand and price included in this report were obtained from independent expert reports (CRU, Cochilco and INCOMARE Ltda.).

Fuel is provided by COPEC based on a contract that ends in November 2025.

Explosives are supplied by Empresa Nacional de Explosivos (ENAEX) based on a contract that ends in June 2022.

The total contractor workforce (for operations) considered in the LOM plan for Mantoverde varies from approximately 400 to 450. These contractors operate under a number of contract terms.

It is envisaged that similar-style contracts would be negotiated with the main contract suppliers when the current contract periods end.

19.6 Comments on Section 19

Long-term metal price assumptions used in the Report are based on a consensus of price forecasts for those metals estimated by numerous analysts and major banks. The analyst and bank forecasts are based on many factors that include historical experience, current spot prices, expectations of future market supply and perceived demand. Over a number of years the actual metal prices can change, either positively or negatively, from what was predicted. If the assumed long-term metal prices are not realized, this could have a negative impact on the operation's financial outcome. Higher than predicted metal prices could have a positive impact.

20 Environmental Studies, Permitting, and Social or Community Impact

20.1 Introduction

An environmental impact assessment study (EIA) was approved for the MVDP by the Chilean environmental authority of the Atacama Region through Exempt Resolution No. N° 16/2018 (environmental qualification resolution, Resolución de Calificación Ambiental, RCA). The RCA covers the combined sulphide and oxide mining plan up to 2035, and mining sulphide material up to 2040.

A number of projects were environmentally approved for Mantoverde before the MVDP and constitute the Base Case (see Table 20-1).

Table 20-1: Mantoverde Operation Projects with RCAs prior to the MVDP RCA

#	RCA	Name of the Project	Description	Approved Facilities
1	Ordinary Environmental Report No. 3542/1993	EIA Manto Verde Project	The Project consists of the open pit exploitation of the Manto Verde mine for the extraction of 5,400,000 t/y) of mineral and processing through heap leaching, solvent extraction and production of 42,000 t/y of fine copper, through an electro-winning process	- Manto Verde open pit - Waste dumps: North Dump, South Dump and East Dump - Dump Norte Marginal Ore Leach Pad - Crushing and Classification Plant - Agglomeration - Leach Piles (Static) - SX Plant - EW Plant - Acid Supply.
2	RCA N° 83/1998	DIA Modification Manto Verde Electro-winning plant	Project involves adding 12 electrolytic cells to the west side of the aisle, representing 7.7% growth over the current facility	- EW Plant Expansion
3	RCA N° 79/2000	DIA Project Construction of Heap Leach Pads.	The Project contemplates the construction of a 100 ha pad for leaching of marginal mineral in the area of the former South Dump, which is part of the original design of the Manto Verde project	-Marginal mineral leach pad (South Dump Phases I, II and III) - Ponds
4	RCA N° 18/2002	DIA Manto Ruso Open Pit Mining Project at the Mantoverde Mine.	The project corresponds to the northern extension of the Mantoverde exploitation and involves the exploitation of a mineralized body located 2 km north of the Mantoverde deposit.	- Manto Ruso Pit -Manto Ruso waste rock dump - Internal road between Manto Ruso and Mantoverde

#	RCA	Name of the Project	Description	Approved Facilities
5	RCA N° 110/2002	DIA Leaching Process Optimization Project.	The purpose of the project is to incorporate technological improvements in equipment and operations at the mineral processing plant at the Mantoverde mine, to improve the overall performance of operation	- Crushing plant improvement - EW plant improvement - Conversion of permanent heap leach system to dynamic heap leaching - Leach waste (ripios) dump facility
6	RCA N° 209/2008 DIA	Project Installation of Back-up Generators Mantoverde Division.	The purpose of the project is to install three generators with a total power of 3.75 MW as back-up This power is equivalent to 15% of the total power of the operation	- Electric generation units
7	RCA N° 163/2009 DIA	Project Exploitation of Oxidized Minerals Pit Celso, Kuroki, Franko.	The project consists of the exploitation of the Celso, Kuroki and Franko pits	- Celso Pit - Kuroki Pit - Franko Pit-1 - Franko Pit-2 - Access roads - BOSU, BOSE, BONO and BOMR waste dumps
8	RCA N° 088/2011	DIA Mantoverde Desalinated Water Supply Project	The project consists of the installation of a Desalination Plant, located in the Bahia Flamenco area, for current and future production plans.	- Desalination plant - 40 km of power lines - 2 pumping stations - Desalinated water discharge pipe - Sea water collection system
9	RCA N° 50/2012	DIA Project for the Exploitation of Punto 62 Pit and Expansion of the Kuroki and Franko Norte-Sur Pits	The project consists of the exploitation of new phases of the Kuroki and Franko Norte-Sur pits and the exploitation of a new deposit of oxidized minerals (Punto 62)	- Expansion of the Kuroki Pit (new phase) - Franko Norte Pit - Franko Sur Pit - Punto 62 Pit - Access roads
10	RCA No. 114/2014	DIA Mantoverde Operational Continuity Project	The Project consists of the incorporation to the existing operation at the Mantoverde mine, the exploitation of the Kuroki Phase 3, Celso and Antenna pits (Mantoverde Expansion). In addition it includes Phase IV of the South Dump, expansion of the ripios dump and expansion of minor works	- Kuroki Phase 3 Pit - Celso Pit - Antenna Pit - Phase 4 of the South Dump - Extension of ripios dump stage 3 - Remodelling and Expansion of Mine Offices - New Mine Operators Modules - New Gym at Camp DMVE - Remodelling and Expansion of Maintenance Offices

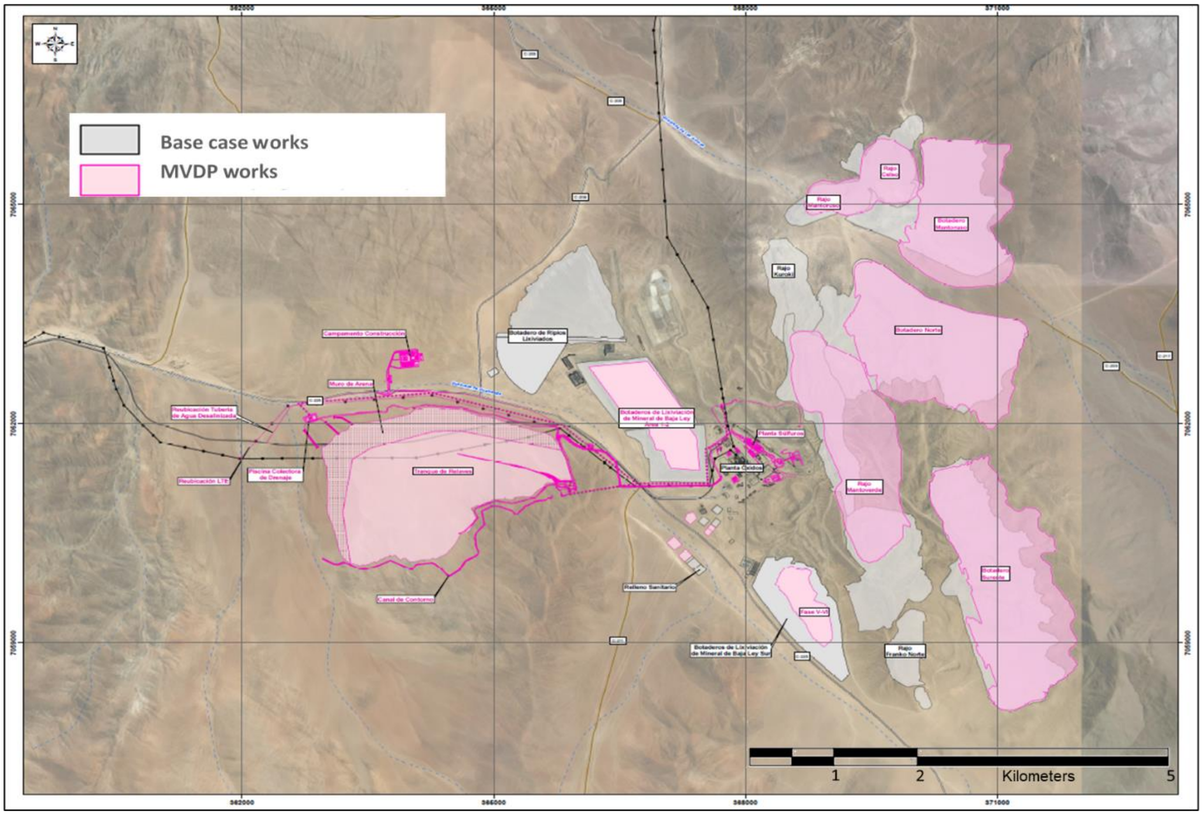
#	RCA	Name of the Project	Description	Approved Facilities
				- Choquera (casino) Expansion - Mine Workshop Expansion - Module K Extension - New Parking - Casino - Access improvements - Recreation Room and Pub - Sewage Water Treatment Plant - Landfill - Disposal of waste materials from pits in the BONO, BOSE and BOMR dumps.
11	RCA No. 202/2016	DIA Mantoverde Oxidized Minerals Exploitation	The Project considers the modification of the pits in the following areas: Celso Zone, Kuroki Zone, Mantoverde Zone and Franko Zone Including the expansion of the current sterile dumps (BONO, BOSE; BOMR), and the expansion of the ripios dump and the sanitary landfill. This project extends the mine life until 2024.	-Ripios Dump -Sanitary Landfill Expansion -Expansion Manto Ruso Dump (BOMR) -Expansion North Dump (BONO) -South-East Dump Extension (BOSE) -Celso Pit Zone -Kuroki Pit Zone -Mantoverde Pit Zone

20.2 Mantos Copper Mantoverde Development Project

The general objective of this Project is to extend the Mantoverde operation, diversifying the operations through the mining and processing of sulphide minerals, which are hypogene minerals associated with the oxide minerals currently being exploited. The sulphide reserves are estimated to be 235 Mt. The sulphide operation will produce copper concentrate; processing of oxide minerals will continue using the existing facilities. The total oxide reserves are estimated to be 255 Mt. The Project changes are shown in Figure 20-1.

After submitting the EIA for the MVDP, Mantoverde submitted an Environmental Impact Statement (DIA) for Optimization Supply Autonomy of Oxides Line (approved by RCA N° 119/2018) and the DIA for Mantoverde Oxides Optimization Project (approved by RCA Nº 132/2021).

Figure 20-1: MVDP EIA Project Works (adapted from EIA)



Note: Figure courtesy Mantos Copper, 2020

20.2.1 MVDP Major Modifications to the Base Case

Table 20-2 summarizes the works, parts and actions that are considered to be modifications to the Base Case.

Table 20-2: MVDP Modifications to the Base Case

Parts/Actions/Physical Works	Base Case	Modification associated with MVDP
Mine and Plant Area		
Exploitation pits	Mantoverde Zone Area: 185 ha Start Elevation: 1,010 masl Final Height: 750 masl Estimated total pit depth: 260 m	Mantoverde Zone: Final Area: 296 ha Start Level: 1,130 masl Final Height: 520 masl Estimated pit depth: 610 m
	Celso- Manto Ruso Zone Area: 102 ha Start elevation: 1,020 masl Final elevation: 810 masl Estimated total pit depth: 210 m	Celso-Manto Ruso Zone Final area: 107 ha Start elevation: 1,030 masl Final elevation: 660 masl Estimated total pit depth: 370 m

Parts/Actions/Physical Works	Base Case	Modification associated with MVDP
Waste rock dumps	Manto Ruso dump (BOMR) Area: 197 ha Capacity: 140 Mt Starting height: 950 masl Final height: 1,015 masl Height: 65 m North dump (BONO) Area: 311 ha Capacity: 140 Mt Starting height: 942 masl Final height: 1,030 masl Height: 88 m	Manto Ruso dump (BOMR) Final area: 252 ha Total capacity: 302 Mt Start elevation: 930 masl Final Level: 1,120 masl Height: 190 m North waste dump (BONO) Final area: 349 ha Total capacity: 462 Mt Starting height: 930 masl Final Elevation: 1,130 masl Height: 200 m
	Southeast waste dump (BOSE) Area: 282 ha Capacity: 194 Mt Starting height: 945 masl Final height: 1,075 masl Height: 130 m	Southeast waste dump (BOSE) Final area: 363 ha Total capacity: 458 Mt Starting height: 920 masl Final Elevation: 1,150 masl Height: 230 m
Leach dumps (low grade mineral)	South (Dump Leach South): Capacity: 100 Mt Final elevation: 925 masl Area: 100 ha	MVDP capacity: Phase VI: 12 Mt Total capacity Phase I, II, III, IV, V and VI: 112 Mt Final elevation: 945 masl Area: 100 ha
Leached waste dumps	Area: 158 ha Capacity: 194 Mt	No modification for MVDP
High grade heap leach	Dynamic Leaching Heap Leach area: 85 ha Leach Piles: Length: 1,100 m Width: 90 m Height: 7 m	Conversion of dynamic pad to static pad at the end of the high-grade oxide, to process low-grade oxide minerals on permanent heaps. Area: 98 ha Capacity: 45 Mt
Process plant (Sulphides)	Does not exist	Sulphide plant: - Processes: Crushing, grinding, flotation, thickening and filtering of concentrate, pumping and tailings disposal. - Estimated area: 12.7 ha. - Average processing capacity: 12 Mt/year, (Max. 13 Mtpy Nominal 11.6 Mtpy) - Average copper concentrate production capacity 264 ktpy, maximum 310 ktpy
Auxiliary facilities	Base case facilities	Existing facilities will be preserved, and the following will be added: - New Contractor area - Potable water treatment plant - Mine and Sulphide Plant Area. - Expansion of the landfill area. - Truck Maintenance Workshop. - Waste Transfer Yard. - Construction Yard

Parts/Actions/Physical Works	Base Case	Modification associated with MVDP
	Tailings Area	
Tailings dam	Does not exist	Design capacity: 230 Mt Area: 420 ha
Main tailings dam wall	Does not exist	Sand wall, centre line method, downstream Average final height: 80 m Final length: 4 km approx.
Relocation of HV power line feeding the desalination plant and piping of pumping system	Existing works	Modification due to interference with the tailings area works.
Auxiliary facilities	Does not exist	- Tailings Dam Area Camp. - Potable water treatment plant (Tailings Dam Area Camp). - Sewage Treatment Plant (Tailings Dam Area Camp).
Tailings dam related works	Does not exist	- Tailings Dam with Earthfill starter dam - Foundation drainage system - Cut-off trench - Contour canal - Drainage collection pond. - Pumpbox platform and sand pumps. - Thickener platform. - Fixed cyclone station platform. - Water tank platform and pumpbox and thickened tailings pumps. - Complete tailings pumping system platform. - Platform for the transport and distribution of tailings. - Projected emergency discharge platform - Water recovery platform - Emergency pond - Contact water recovery pipeline - Ground water pumping wells and ground water monitoring wells - Geotechnical instrumentation
	Desalination Plant and Pumping System	
Desalination plant	Suction flow Operating flow of 1,344 m^3/h	Increase in suction operating flow to 3,000 m^3/h
	Discharge flow 1,988 m^3/h	Discharge flow: 1,632m^3/h
	Discharge salinity: 58,126 PSU	Discharge Salinity: Increase in salinity to 68,012 PSU
	Reverse Osmosis: 2 racks of membranes	Reverse Osmosis: addition of 3 racks of reverse osmosis membranes (total of 5).
	Produced water: 120 L/s	Produced water: 380 L/s
	Reagents: pH adjustment, anti-corrosion and anti-scalant	Reagents: proportional increase in the amount of reagents.

Parts/Actions/Physical Works	Base Case	Modification associated with MVDP
Desalinated water pipe line	Pumping stations: - Number: 2 (Desalination plant and intermediate). - Number of Pumps per station: 3 units (2 operation and 1 stand-by)	Pumping stations Number: No modifications Number of pumps per station: 3 units are added for a total of 6 (5 in operation and 1 stand-by)
Electric Transmission Line		
Electric transmission line (LTE) 110 kV	Power 47.3 MW	Re-powering of the LTE Power: 81 MW Reversal of crossings, earthworks and re-tensioning works

20.2.2 Tailings Storage Facility Monitoring

Changes to the monitoring program were proposed in the Complementary Addendum for the MVDP EIA. However, these changes were not accepted by the authorities and the original monitoring program was authorized.

20.3 Modifications after the MDVP RCA

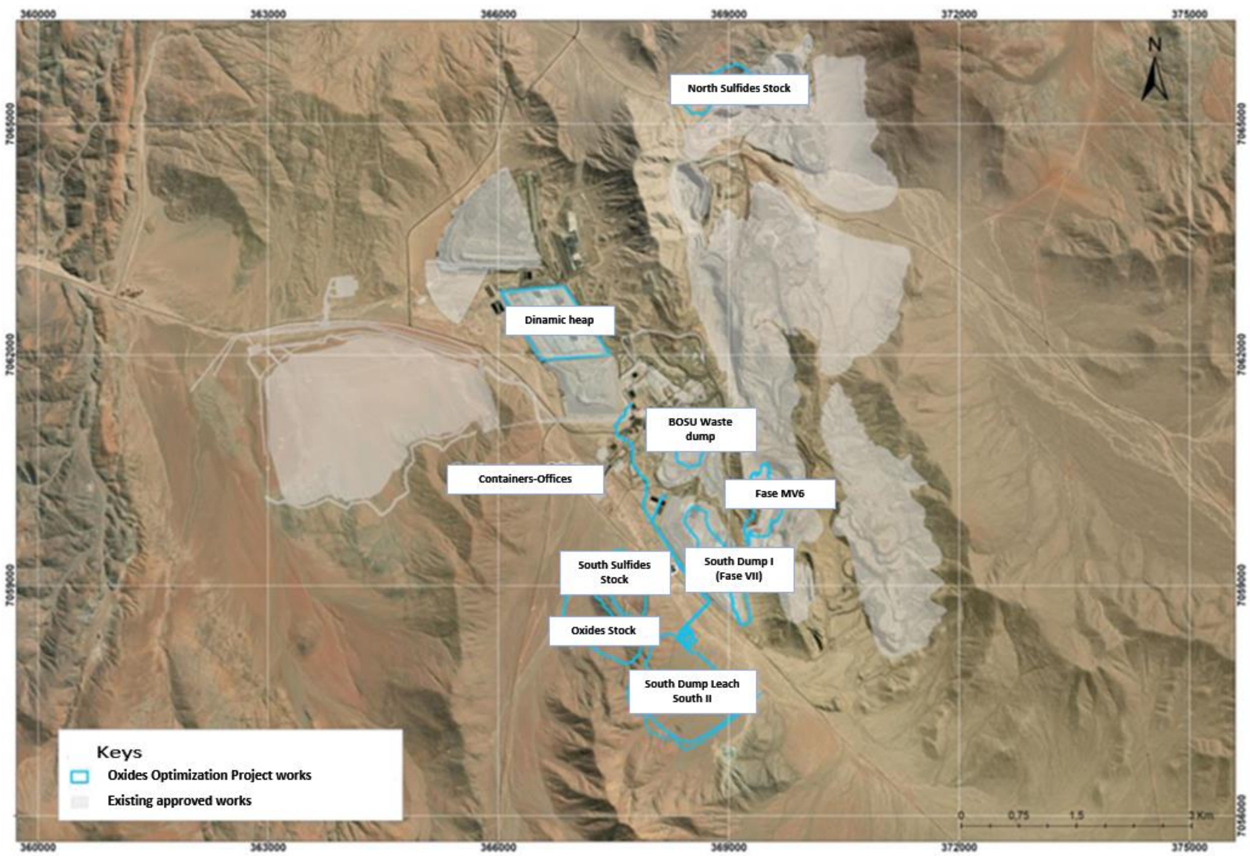
Mantoverde submitted a DIA for Optimization Supply Autonomy of Oxides Line, to guarantee the supply of sulphuric acid for oxide leaching by adding two storage tanks (capacity10,000 t each). This was approved by RCA N° 119/2018. Another DIA for Mantoverde Oxides Optimization Project was approved by RCA 132/2021, to continue the oxide operation and maintain production of high purity copper cathodes at 60,000 t/y (earlier RCA N° 110/2002) for the life of the oxide line (until 2036). This considers increasing the extraction rate of oxide ore by 18 Mt/year (1.5 Mt/month) and increasing the total capacity of the low-grade leach dumps by 197 Mt. This DIA modifies the MVDP and the Project for Exploitation of Oxidized Minerals Pit Celso, Kuroki and Franko, approved by RCA No. 163/2009. The modifications are summarized in Table 20-3 and shown in Figure 20-2.

Table 20-3: Oxide Optimization Project Modifications to the MVDP and Base Case

Aspect	RCA	Condition Approved	Condition Modified
Mine Exploitation	RCA N° 16/2018	• Total High-grade Mineral (Heap): 5,757 kt • Total Low-grade Mineral (Dump): 98,149 kt • Total Waste: 926,850 kt	• The extraction of high-grade ore (Heap) is modified from 5,757 kt to 109,214 kt • The extraction of low-grade ore (Dump) is modified from 98,149 kt to 144,852 kt. • The total waste extraction is modified from 926,850 kt to 1,064,986 kt
	RCA N° 16/2018	• Celso – Manto Ruso Zone • Mantoverde Zone • Kuroki Zone • Franko North Zone	• Expansion of the Mantoverde exploitation area, specifically the Phase VI expansion • This expansion incorporates 29 ha of additional mine exploitation • The rest of the Mantoverde pits will maintain the approved design criteria, not increasing the approved surfaces or depths, with the exception of the incorporation of the Mantoverde South Phase VI

Aspect	RCA	Condition Approved	Condition Modified
Low-grade leaching	RCA N° 16/2018	• Dump Leach Sur I (Phase V and VI). • Conversion from dynamic heap to low-grade dump leach	• Incorporates Phase VII to Dump Leach South • Incorporates Dump Leach South II • Conversion from dynamic heap to low-grade dump leach is delayed until 2031 • Phase VII of Dump Leach South and the new Dump Leach II add an additional 197 Mt of low-grade leaching capacity
Waste rock dumps	RCA No. 163/2009	BOSU Dump: • approved area of approximately 45.6 ha • Approximate approved capacity of 105 Mt	• Re-processing of the BOSU material deposited to date • The quantity of low-grade material to be re-processed from the BOSU dump (previously considered waste) is 26 Mt.

Figure 20-2: Mantoverde Oxide Optimization Works (Blue) and Existing Works



Note: Figure courtesy Mantos Copper, 2020

20.4 Baseline Studies

Baseline studies for the MVDP EIA were carried out during 2015 and 2016. Complementary baseline studies have been submitted in support of the 2018 DIA Optimization Supply Autonomy of Oxides Line and the 2020 DIA Mantoverde Oxides Optimization Project.

The following baseline surveys has been completed:

- Physical media
  - Climate and meteorology
  - Air quality
  - Noise
  - Luminosity
  - Electromagnetic fields
  - Geology, geomorphology and geological risks
  - Soils
  - Vibration
- Water
  - Hydrology
  - Hydrogeology
  - Underground water quality
- Terrestrial ecosystems
  - Flora
  - Fauna
  - Fungi, lichens and bryophytes
- Marine ecosystems
  - Marine biota – biological communities
  - Hydrological resources
- Cultural heritage
- Landscape
  - Protected areas and priority sites for conservation
  - Natural and cultural attractions
  - Land use and its relationships with land planning
- Human environment.

20.5 Environmental Considerations/Monitoring Programs

Mantos Copper has stated in the EIA and DIA submissions that the Oxide Case and the MVDP do not:

- Present health risks due to the quantity and quality of effluents, emissions or residues

- Generate significant alteration with respect to resettlement, displacement, relocation of human communities, and will not significantly alter life systems and customs of human groups
- Have a significant impact on the location of populations, resources and protected areas, priority sites for conservation, protected wetlands and glaciers, or affect the environmental value of the territory in which the operations will be sited
- Generate a significant alteration in the relation to the landscape or tourist value of the area
- Generate any significant alterations in relation to cultural heritage.

Potential impacts on flora and fauna habitats and a modification of ground water levels were identified; the MVDP RCA established mitigation, restitution and compensation measures. Eight of these measures are mitigation and eight are compensation. Among other control plans, a ground water monitoring and control plan will be developed for the TSF. Several additional voluntary measures offered by Mantoverde were integrated in the MVDP RCA.

The MVDP considers a network of 18 level monitoring and pumping wells, which will be located in the Guamanga creek downstream of the tailings dam. Together these will have a pumping capacity of 50 L/s, this is higher than the infiltration flow rate estimated by the infiltration model for the tailings facility (16 L/s approximately).

20.6 Permitting

Chilean mining projects require sectoral and environmental permits prior to mine construction and operation. The MVDP will require additional sectoral and environmental permits to those already granted for the current operation.

Mantoverde maintains compliance records on the SMA (Environmental Authority) platform and on a dedicated platform (SIGEA) on the Mantoverde intranet. For RCA 16/2018 for the MVDP, there are 260 environmental commitments, three of them were completed at the early start of construction, 27 are in progress and 234 are not yet applicable.

20.6.1 Environmental Permits

The latest approved EIA is for the MVDP. This covers the combined sulphide and oxide mining plan that would run to 2035 and mining sulphide material to 2040.

A list of the approved environmental (RCAs) permits is provided in Table 20-4.

Table 20-4: RCAs (Approved EIA and DIA)

Project		Resolution/Year
Manto Verde Project	EIA	Ord. 3542/1993
Modification Manto Verde Electro-winning	DIA	RCA N° 83/1998
Construction of Heap Leach Pads	DIA	RCA N° 79/2000
Manto Ruso Open Pit Mining Project at the Mantoverde Mine	DIA	RCA N° 18/2002
Leaching Process Optimization Project	DIA	RCA N° 110/2002
Installation of Back-up Generators Mantoverde Division	DIA	RCA N° 209/2008
Exploitation of Oxidized Minerals Celso, Kuroki, Franko Pits	DIA	RCA N° 163/2009
Mantoverde Desalinated Water Supply Project	DIA	RCA N ° 088/2011
Project for the Exploitation of Punto 62 Pit and Expansion of the Kuroki and Franko Norte-Sur Pit	DIA	RCA N° 50/2012
Mantoverde Operational Continuity Project	DIA	RCA N° 114/2014
Mantoverde Oxidized Minerals Exploitation	DIA	RCA N° 202/2016
Mantos Copper Mantoverde Development Project	EIA	RCA N° 16/2018
Optimization Supply Autonomy of Oxides Line	DIA	RCA N° 119/2018
Mantoverde Oxides Optimization Project	DIA	RCA N° 132/2021

EIA: Environmental Impact Assessment
DIA: Environmental Impact Declaration

20.6.2 Sectoral Permits

Mantos Copper has developed a Master Plan for Sectoral Permits required for the operation, the MVDP and for the Optimization Supply Autonomy of Oxides Line Project, to ensure that the correct documentation is provided to the regulatory authorities on time so that the permits are granted and maintained. This plan covers the following:

- Identify the permits that are required
- Identify the technical and administrative requirements before requesting the permit
- Prepare applications and send documentation to the authorities
- Receipt of approvals and authorizations
- Establish documentation and administration requirements for approvals granted.

The sectoral permits that have been granted cover potable water, sewage and sanitation, landfill, and closure planning. Specific sectoral permits have also been granted for open pit mining activities (see Table 20-5).

20.6.3 Permit Applications

It is estimated that at least 250 separate permits will be required for the MVDP. There is sufficient time between the date of this report and the dates that the required permits need to be in hand to prepare and submit the permit applications and to receive the permits. Mantoverde has reasonable prospects of obtaining the environmental and sectoral permits for the MVDP.

Table 20-5: Environmental Sectoral Permits for RCA 16/2018 and RCA 132/2021

Permit	RCA	Description
PAS 115	RCA 16/2018	Permission to introduce or discharge harmful or dangerous materials, energy or substances of any kind into the waters subject to national jurisdiction
PAS 119	RCA 16/2018	Permit to carry out research fishing
PAS 132	RCA 16/2018	Permission to make archaeological, anthropological and paleontological excavations
PAS 135	RCA 16/2018	Permit for the construction and operation of a tailings deposit
PAS 136	RCA 16/2018	Permission to establish a waste dump or mineral accumulation
PAS 137	RCA 16/2018	Permit for the new Closure Plan, due to modifications in the mine site
PAS 138	RCA 16/2018	Permit required for the construction of four sewage treatment plants
PAS 139	RCA 16/2018	Permit for the construction, repair, modification and expansion of a public or private work for the evacuation, treatment or final disposal of industrial or mining waste
PAS 140	RCA 16/2018	Permit for the construction, repair, modification and expansion of a garbage and waste treatment plant of any kind or for the installation of a place intended for the accumulation, selection, industrialization, trade or final disposal of garbage and waste of any kind
PAS 141	RCA 16/2018	Permit for the construction, repair, modification and expansion of the sanitary landfill
PAS 142	RCA 16/2018	Permit for any site for the storage of hazardous waste
PAS 146	RCA 16/2018	Permission to hunt or capture specimens of animals of protected species for research purposes, for the establishment of breeding centres or hatcheries and for the sustainable use of the resource
PAS 151	RCA 16/2018	Permission to cut, destroy or remove xerophytic formations
PAS 155	RCA 16/2018	Permit for the construction of hydraulic works
PAS 156	RCA 16/2018	Permission to make channel modifications
PAS 157	RCA 16/2018	Permission to carry out regularization or defence works for natural channels
PAS 160	RCA 16/2018	Permission to build outside the urban limits
PAS 136	RCA 132/2021	Permission to establish a waste dump or mineral accumulation
PAS 137	RCA 132/2021	Permit for the new Closure Plan, due to modifications in the mine site
PAS 156	RCA 132/2021	Permission to make channel modifications
PAS 157	RCA 132/2021	Permission to carry out regularization or defence works of natural channels
PAS 160	RCA 132/2021	Permission to build outside the urban limits

20.7 Closure Plan

The Mine Closure Plan was approved by SERNAGEOMIN on 19 December 2018 by Exempt Resolution N° 3544/2019. The estimated closure and post-closure cost is US$47.7 million for the existing installations. The Closure Plan was prepared following the requirements and guidelines of the Chilean mining safety standard, Supreme Decree No. 72/1985, Ministry of Mining, which was amended by Supreme Decree No. 132/2002, Law No. 20,551/2011, which regulates the closure of mining operations, and Supreme Decree No. 41/2015.

The Closure Plan follows the provisions of the RCAs for the Mantoverde operation and describes the measures that must be undertaken for closure and reclamation. However, it does not include the RCAs for the MVDP (RCA 16/2018), the Optimization Supply Autonomy of Oxides Line (RCA 119/2018) and the Mantoverde Oxides Optimization Project (RCA132/2021).

An update of the Closure Plan was submitted on 17 September 2020 and was approved in July 2021. This Closure Plan will need to be updated to incorporate new facilities and changes.

20.7.1 Physical and Chemical Stability

Closure measures regarding the physical stability consider the occurrence of seismic events of great magnitude and intense rainfall. Closure measures aim at stabilization, if necessary, by profiling part of the slope areas. For the physical stabilization of pits, dumps and piles, the final slopes from operation will be maintained and the slopes will be evaluated and controlled as mining activities end. For the tailings dam the integrity of the slopes will be monitored.

Access to each of the pits, dumps and heaps will be closed by construction of a berm or parapet, to prevent the entry of vehicles and people. In sites suitable for the growth of vegetation, impacted surfaces will be covered with at least 0.15 m of soil for natural re-vegetation.

In the closure stage, the mine and plant roads that will not be used during post-closure monitoring, will be blocked.

20.7.2 Closure Actions for Dismantling or Securing Stability

Closure measures will be required to dismantle or secure the stability of the infrastructure. Prior to dismantling and demolition the plan assumes removal of all powered infrastructure. Equipment, wiring and in general all the elements installed will be dismantled and removed. Concrete foundations that cannot be demolished will be covered and/or filled with a 0.5 m thick layer of granular material generated from earthworks and profiling works at each site. Buried elements (such as wiring and ducts) will be left in place, except for tanks and pipes used for fuel, acid and process solutions, which will be removed or dismantled after removing the fluids, washing and/or cleaning as required.

There will be no visible facilities, structures or equipment (except for the pits and dumps), with the exception of the facilities, structures or equipment that will be used for post-closure activities.

20.7.3 Contaminated Soil Management

Soils contaminated with hazardous substances will be identified and then removed and managed as hazardous waste in accordance with waste management plans.

20.7.4 Non-Contact Water Management

For non-contact water management, the berms, ditches and/or drains will be maintained to divert the run-off water from the dumps. The contour channel at the TSF will follow natural restitution through erosion and sediment accumulation.

20.7.5 TSF

Information is being collected during monitoring of ground water in the TSF area and progressive updates will be made to the current hydrogeological studies to improve the level of certainty and detail of the closure and post-closure activities.

A granular material cover with a minimum thickness of 15 cm on the surface of the tailings basin is planned to control dust emission. In addition, berms or windbreaks will be built of granular material evenly spaced within the basin, salt solutions or other measures may also be used to reduce dust emissions. A layer of granular material is considered for the wall including the crown.

20.7.6 Contact Water Management

Closure measures have been designed for the management of contact water, to intercept contact water and to prevent the water from altering the quality of the natural water. For the low-grade dump leach it is planned to build a waterproofed drain to lead any flows to the existing solution ponds which will remain until drainage ceases.

Contact water from the TSF will be controlled by evaporation. Drainage from the wall and foundations will be captured through the drains and directed to the collection pond for evaporation or pumped back to the TSF basin for evaporation. Water from the tailings in the TSF basin will be monitored in the wells located downstream of the TSF: if there are any changes in the quality of the ground water the water will be pumped and returned to the basin for evaporation.

20.7.7 Post-Closure

A series of monitoring and activities will be required after the closure of the mining site is complete;, these include topographic control of benches (in the pits) and slopes (at the dumps and TSF dam), ground water quality monitoring and PM10 monitoring, inspection and maintenance of the TSF dam and quality monitoring of leaks and infiltrations.

20.8 Social and Community Impacts

The closest town is El Salado, in the community of Chañaral, 15 km from the mine, plant and TSF area. Other towns of interest are located on the coast (Barquitos, Flamenco, Portofino, Las Piscinas and Torre del Inca), they are near common use roads and the desalination plant and pumping system. No communities belonging to Indigenous peoples recognized in Law No. 19,253 or Indigenous Law were identified and significant impacts on the population were ruled out in the MVDP EIA.

Mantoverde has committed to provide some of the desalinated water produced by the desalination plant (equivalent to an average monthly flow of 2 L/s, increasing to 3 L/s in the summer months, December to February) to Empresa Concesionaria de Servicios Sanitarios S.A. (Econssa Chile S.A.). Econssa will then be responsible for delivering this water to the communities.

21 Capital and Operating Costs

21.1 Introduction

Capital and operating costs presented in this section are for the MVDP, covering the extension of the oxide operations (to 2034) and incorporating mining and treatment of the sulphides through a flotation plant from 2023 to 2042. All capital and operating costs were estimated by Mantos Copper for the operation as a whole, without assigning separate costs to oxide and sulphide materials.

The heap leach and dump leach facilities have capacity for the current operations until 2024. A pre-feasibility study to extend the dump leach facility operation was performed by Minería & Servicios SpA (M&S) on behalf of Mantos Copper. This study estimated capital costs for from 2023 to 2035, at a pre-feasibility study level (-25% +30%).

The capital cost for the oxide material from 2021 and 2022 and for the oxide plant area for the Project life to 2029, was estimated by Mantos Copper as stay-in- business (SIB) capital for both cases.

The M&S study assumed the following modifications to the leach pads and waste rock storage facilities:

- Heap: Leach residue (ripios) dump expansion, and conversion of the on-off dynamic heap leach pad into a permanent multi-lift pad
- New waste rock storage facilities: Addition of two waste rock storage facilities, located to the north and south, as required for each of the two cases.

The M&S pre-feasibility study cost estimate was divided into the following areas, for the scope of heap leach and dump leach pads only, for initial capital and sustaining capital costs:

- Direct costs
- Indirect costs
- Construction contract incremental cost
- Contingency.

All construction activities were assumed to be completed by construction contractors by growth of existing construction contracts. No provision was included in the M&S estimate for Owner's costs, these were estimated by Mantos Copper. Indirect costs and contingencies were included in the M&S estimate.

21.2 Capital Cost Estimates

The MVDP will treat incremental oxide material in relation to the current oxide operation, because additional oxide material will become available as a result of mining the sulphide material.

The heap leach and dump leach pads will be expanded, and the on-off dynamic heap leach pad will be modified into a permanent multi-lift pad. The pads will be operated until 2029. In 2030 an additional pad expansion will take place to allow oxide operations to continue until 2034.

There will be three waste rock storage facilities, Dump Alternative N to the North, Dump Alternative 2 (option 2) to the North, and Dump Alternative 4 to the South.

The capital cost for the oxide material and the SX-EW plant area were included as SIB costs.

The pre-feasibility study for the oxide material (low-grade material) assumes that it will be processed in the current SX-EW plant; therefore, no costs for new infrastructure were considered. However, the SIB costs include the preparation of the dump leach area.

A new concentrator to treat the sulphide material was designed by Amec Foster Wheeler. Ausenco has been awarded an EPC lump sum turnkey contract to further develop the design and build the plant

The capital cost estimate was divided into initial (expansion) capital and sustaining capital.

21.2.1 Stay in Business Capital

Over the LOM, the sustaining capital cost is estimated to be US$476 M. Table 21-1 summarizes the sustaining capital by year divided into Mine Equipment and Other Fixed Assets (mining projects, desalination plant, oxide plant, leached waste dump (ripios) expansion, smaller projects, oxides SIB, sulphides SIB and long term SIB).

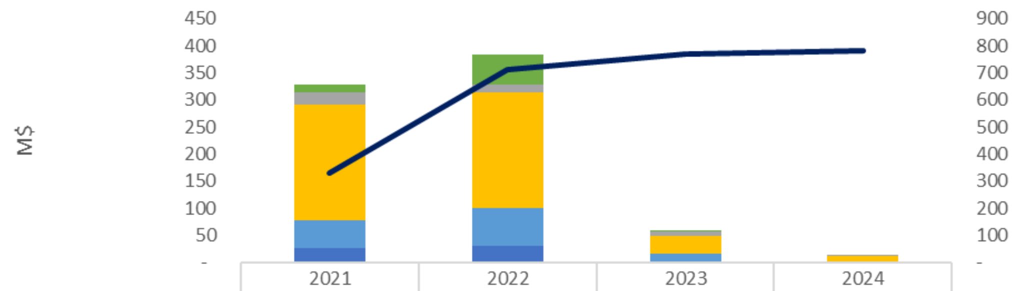
Table 21-1: Sustaining Capital Cost by Year

Year	Mine Equipment (US$M)	Other Fixed Assets (US$M)	Total SIB (US$M)	Cumulative Total SIB (US$M)
2021	-	37.8	37.8	37.8
2022	-	12.8	12.8	50.6
2023	-	18.2	18.2	68.8
2024	22.0	15.6	37.6	106.4
2025	30.6	24.0	54.6	161.0
2026	32.6	28.1	60.7	221.7
2027	3.7	19.4	23.1	244.7
2028	3.6	56.4	60.0	304.7
2029	-	12.4	12.4	317.1
2030	-	55.7	55.7	372.8
2031	-	11.2	11.2	384.1
2032	-	16.6	16.6	400.6
2033	-	22.8	22.8	423.4
2034	-	9.4	9.4	432.8
2035	-	6.2	6.2	439.0
2036	-	4.8	4.8	443.9
2037	-	5.0	5.0	448.9
2038	-	16.1	16.1	464.9
2039	-	3.8	3.8	468.7
2040	-	3.8	3.8	472.5
2041	-	3.8	3.8	476.2
2042	-	-	-	476.2
LOM	92.5	383.7	476.2	476.2

21.2.2 Expansion Capital

Expansion capital is estimated to be US$784 M between 2021 and 2024 and is divided in Mine Equipment, Land and Buildings, Pre-stripping, Other Fixed Assets and Tailings Facilities. The total expansion capital for mine equipment is US$140 M over the mine life. The expansion capital by year is summarized in Figure 21-1

Figure 21-1: Expansion Capital Expenditure by Year



	2021	2022	2023	2024
Prestripping	15	56	1	-
Other fixed assets	23	14	7	1
Land and buildings	213	213	32	12
Mine equipment	52	71	17	-
Tailings Facility	26	30	-	-
Cumulative	329	713	771	784

Note: Figure courtesy Mantos Copper, 2020

21.3 Operating Cost Estimates

Mantoverde has been in operation for over 25 years. Most of the information and assumptions for the operating cost estimates are derived from information from the past 24 months of operation. The input parameters for supplies that were used during estimation are listed in Table 21-2.

Table 21-2: Input Parameters for the Financial Evaluation

Item	Unit	2021	2022	2023	2024	2025	LT
Acid	US$/t	84.24	180.4	137.3	107.3	105.3	57.3
Diesel	US$/L	0.39	0.60	0.61	0.63	0.61	0.61
Power	US$/MWh	114.1	129.8	120.0	83.5	80.6	67.0

21.3.1 Mining Cost

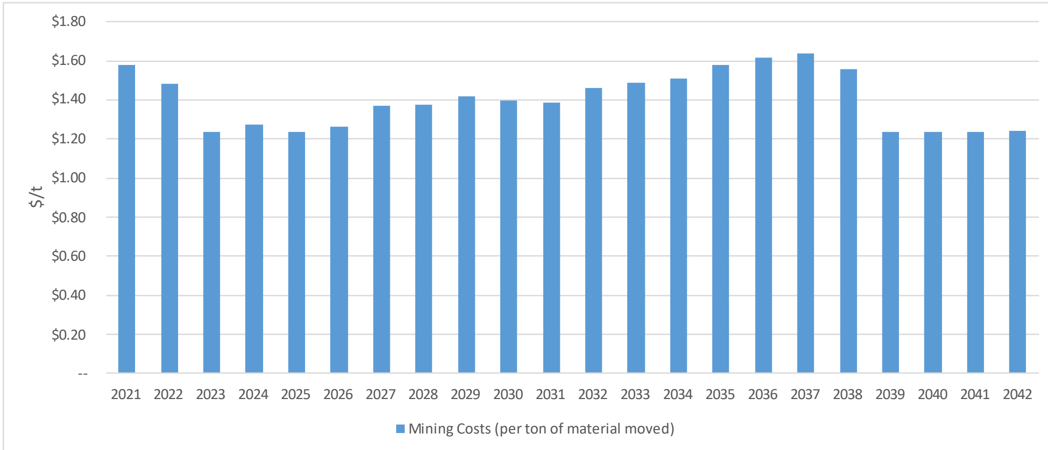
The basis of the estimate is that the open pit operation will be a combined owner and contractor operated mine. The average estimated mining cost is US$1.32/t for the life of mine and US$1.27/t for the first 5 years. The mine operating cost forecast is shown in Table 21-3. Mining costs by year are shown in Figure 21-2.

Table 21-3: Mining Costs

Item	Unit	LOM Total
Labour	US$M	417
Diesel	US$M	520
Explosives	US$M	232
Rock Movement by Contractor	US$M	169
Spares & Tires	US$M	514
Variable Services Contract	US$M	52
Fixed Services Contract	US$M	0
Pre-stripping*	US$M	-71
Other Variable Costs	US$M	190
Other Fixed Costs	US$M	484
Mining Costs	US$M	2,508
Mining Cost	US$/t Material Moved	1.43

*Note: Pre-stripping is excluded from total mining cost because it is considered to be part of the capital cost

Figure 21-2: Mining Cost by Year



Note: Figure courtesy Mantos Copper, 2020

21.3.2 Oxide and Sulphide Processing Costs

The total processing cost is estimated to be US$3,008 M. The average sulphide plant cost is estimated to be US$ 7.4/t processed and the average oxide plant cost is estimated to be USc132.6/lb of cathode produced. The process operating cost forecast by material is summarized in Table 21-4 and Table 21-5.

Table 21-4: Oxide Plant Processing Costs

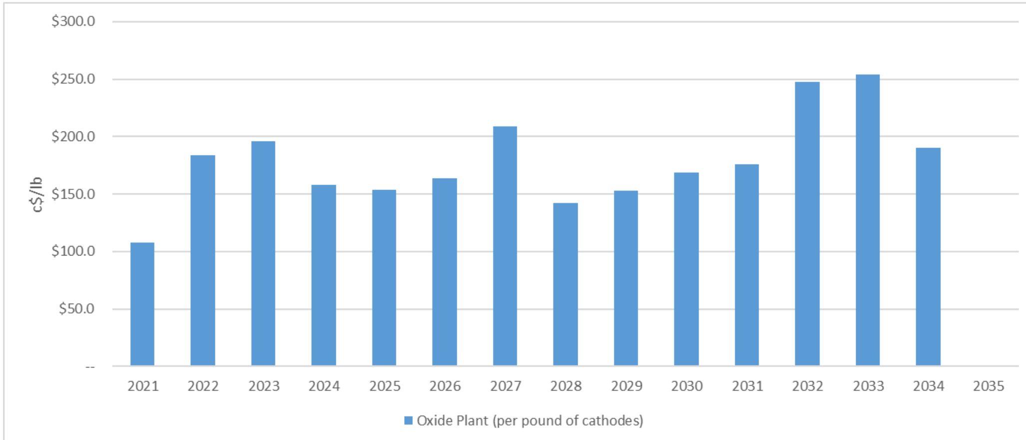
Item	Unit	LOM Total
Labour	US$M	114
Power	US$M	157
Acid	US$M	730
Water	US$M	0
Other Variable Costs	US$M	251
Other Fixed Costs	US$M	277
Oxide Plant Processing Costs	US$M	1,529

Table 21-5: Sulphide Plant Processing Costs

Item	Unit	LOM Total
Labour	US$M	87
Power	US$M	562
Grinding Media	US$M	297
Liners	US$M	100
Lime	US$M	45
Reagents	US$M	55
Water	US$M	-
Other Variable Costs	US$M	12
Other Fixed Costs	US$M	560
Sulphide Plant Processing Costs	US$M	1,717

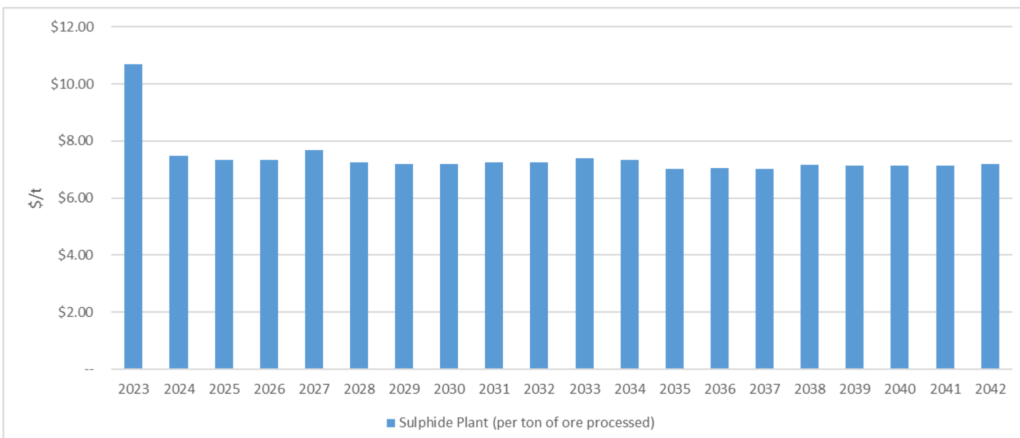
The estimated oxide and sulphide plant operating costs by year are shown in Figure 21-3 and Figure 21-4, respectively.

Figure 21-3: Oxide Plant Costs by Year



Note: Figure courtesy Mantos Copper, 2020

Figure 21-4: Sulphide Plant Costs by Year



Note: Figure courtesy Mantos Copper, 2020

21.3.3 G&A Costs

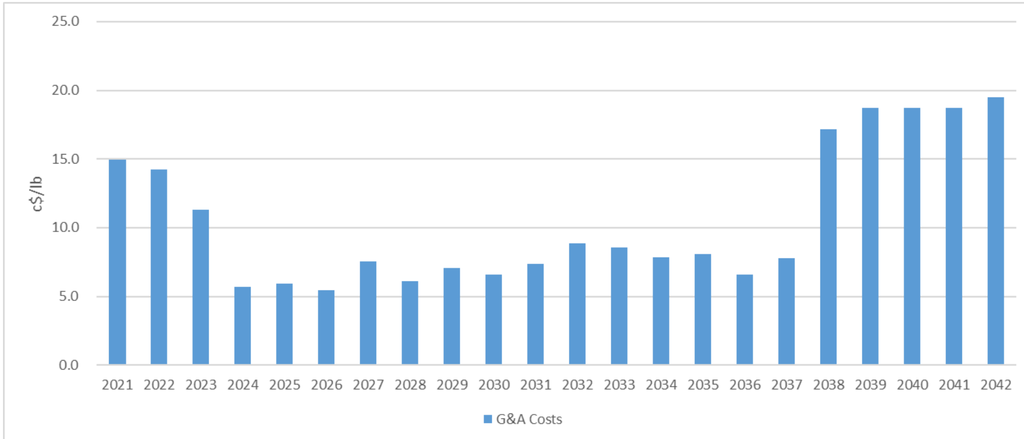
The G&A cost forecast is provided in Table 21-6. The estimated average cost is USc8.7/lb of Cu.

Table 21-6: G&A Costs

Item	Unit	LOM Total
Labour Costs	US$M	96
Other Fixed Costs	US$M	222
RCA Costs	US$M	-
G&A Costs	US$M	318

The detail of the estimated G&A costs by year are shown in Figure 21-5.

Figure 21-5: G&A Costs by Year



Note: Figure courtesy Mantos Copper, 2020

21.3.4 Other Operating Expenses

The other operating expenses forecast is summarized in Table 21-7.

Table 21-7: Other Operating Expenses

Item	Unit	LOM Total
Other Operating Income	US$M	0.0
Other Operating Expense	US$M	7.2
CAT IV Explorations	US$M	87.2
Other Operating Expenses	US$M	94.4

22 Economic Analysis

22.1 Cautionary Statement

Certain information and statements contained in this section are "forward looking" in nature. Forward-looking statements include, but are not limited to, statements with respect to the economic and feasibility-level parameters discussed for the Mantoverde Development Project; Mineral Reserve estimates; the cost and timing of any development of the Mantoverde Development Project; the proposed mine plan and the mining method; dilution and mining recoveries; processing method and rates, and production rates; projected metallurgical recoveries; infrastructure requirements; capital, operating and sustaining cost estimates; the projected life of mine and other expected attributes of the Mantoverde Development Project; the net present value (NPV), internal rate of return (IRR), and payback period of capital; capital; future metal prices; the timing of the environmental assessment process; changes to the configuration that may be requested as a result of stakeholder or government input to the environmental assessment process; government regulations and permitting timelines; estimates of reclamation obligations; requirements for additional capital; environmental risks; and general business and economic conditions.

All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this section, where applicable. In addition to, and subject to, such specific assumptions discussed in more detail elsewhere in this Report, the forward-looking statements in this section are subject to the following assumptions:

- There being no signification disruptions affecting the development and operation of the Mantoverde Development Project.
- Exchange rates being approximately consistent with the assumptions in the financial analysis.
- The availability of certain consumables and services and the prices for power and other key supplies being approximately consistent with assumptions in the financial analysis.
- Labour and materials costs being approximately consistent with assumptions in the financial analysis.
- Permitting and arrangements with stakeholders being consistent with current expectations.
- All environmental approvals, required permits, licences and authorizations will be obtained from the relevant governments and other relevant stakeholders within the expected timelines.
- Certain tax rates, including the allocation of certain tax attributes.
- The availability of financing for Mantos Copper's planned development activities.
- The timelines for development activities for the Project.

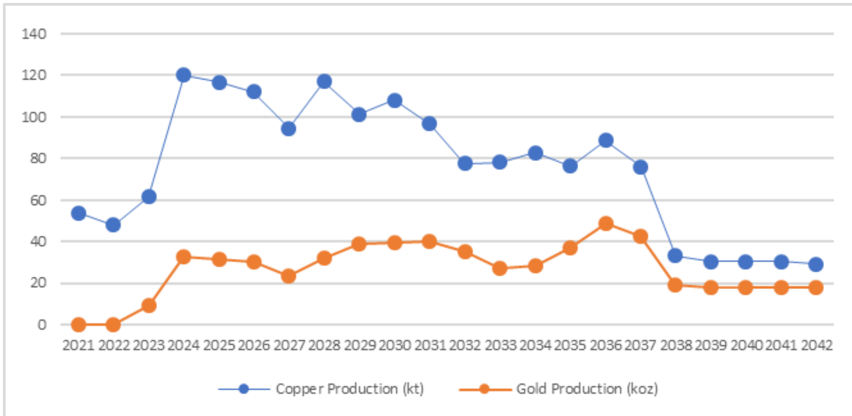
The production schedule and financial analysis annualized cash flow tables are presented with conceptual years. Years shown in these tables are for illustrative purposes only and are based on the anticipated project schedule.

22.2 Project Definitions

The financial analysis presented in this section includes the MVDP, which is primarily focused on extraction and treatment of sulphide material. The oxide operation will also be extended and operate to 2034 as part of the MVDP because there are additional oxide reserves that can be accessed when mining the sulphide reserves. The sulphide material will be treated through a new concentrator, starting operation in late 2023 and continuing until the permitted TSF storage capacity is reached in 2042.

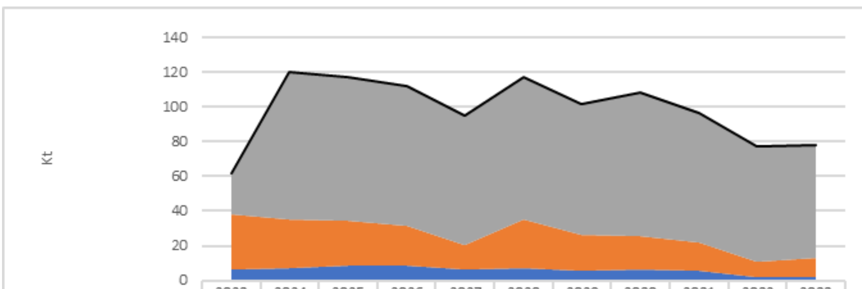
The projected copper and gold production over the life-of-mine is shown in Figure 22-1. Figure 22-2 shows the first 10 years of copper production from 2023, the average is 100.5 kt per year.

Figure 22-1: Projected Copper and Gold Production



Note: Figure courtesy Mantos Copper, 2020

Figure 22-2: Projected Copper Production, First 10 Years



	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Concentrate	23.6	85.2	82.1	80.6	74.1	81.8	74.8	82.6	74.9	66.7	64.9
Heap Leach	31.2	27.7	26.4	23.2	14.0	28.1	21.0	19.1	16.3	8.5	11.4
Dump Leach	6.7	7.1	8.3	8.3	6.4	7.1	5.4	6.4	5.5	2.2	1.9
Total MVDP	61.5	120.0	116.8	112.1	94.6	117.0	101.2	108.1	96.7	77.5	78.1

Note: Figure courtesy Mantos Copper, 2020

22.3 Methodology Used

The economic analysis was performed by Mantos Copper, using Excel models.

The Project was valued using a discounted cash flow (DCF) approach. Estimates were prepared by Mantos Copper for the individual elements of cash revenue and cash expenditures for ongoing operations using information from the following sources:

- Amec Foster Wheeler 2017 Feasibility Study, containing mainly the sulphide plant and tailings facility capital and operating costs
- M&S pre-feasibility study for the expansion/extension of the heap and dump leach facilities

- Mantos Copper Feasibility Mine Plan capital and operating costs
- Mantos Copper's data for heap and dump leach operations and other site costs derived from the current operations (oxides SIB capital cost, closure costs, SX-EW plant operating costs, general and administration costs, taxes, exploration costs and mine equipment lease costs).

Capital cost estimates have been prepared using 2021 as the initial year of the Project valuation, starting with concentrator construction activities and pre-stripping for the sulphides. The construction period extends into mid-2023. In addition to the initial capital for construction of facilities for the MVDP, ongoing sustaining capital is included from 2021 for the Oxide Plant, as well as from 2023 for the sulphide facilities in the MVDP. Additional details are provided for the capital and operating costs in Section 21.

Cash flows are assumed to occur at the middle of each annual period and are discounted for half a year to bring all flows to the start-of-year. The resulting net annual cash flows are discounted back to the date of valuation as of the start of year 2021. As an example, 2021 costs are discounted for half a year and 2022 costs are discounted for 1.5 years, and so on.

The currency used to document the capital and operating cost estimates is Q4 2020 US dollar, because the feasibility-level estimates for the mine and plant were prepared in the first half of that year. The cash flows are discounted to the beginning of 2021. The IRR is calculated as the discount rate that yields a zero NPV. The payback period is calculated as the time needed to recover the initial capital costs from the start of production, on both discounted and undiscounted cash flows.

22.4 Financial Model Parameters

22.4.1 Mineral Reserves and Mineral Life

The financial model uses the Mineral Reserve Estimate in Section 15 of this Report.

The mine plan corresponds to plant throughput rates of 30 ktpd for oxide material and 34 ktpd for sulphide material. Table 22-1 summarizes the material included (see the production schedule in Section 16.3). The production program includes a pre-stripping period of 23 months and a ramp-up period of 7 months until the full production rate is reached.

Table 22-1: Mine Production Plan Basis

Item	Unit	Sulphide	Oxide
Tonnage	kt	235,672	255,631
TCu Grade	%	0.60	0.32
Au Grade	g/t	0.11	-

22.4.2 Metallurgical Recoveries

The average recoveries for each of the payable metals over the proposed life of mine are provided in Table 22-2. Additional information on metallurgical testwork and projected recoveries is included in Section 13.

Table 22-2: Metallurgical Recoveries

	Feed (kt)	Grade	Recovery	Concentrate Grade
Cu Cathodes	255,631			-
Heap Leach	125,368	0.34%	76.43%	-
Dump Leach	130,263	0.15%	42.50%	-
Concentrate	235,672	-	-	-
Copper	-	0.60%	88.45%	27.44%
Gold	-	0.11 g/t	71.23%	4.03 g/t

22.4.3 Smelting and Refining Terms

Two products will be produced:

- Copper, in the form of cathodes and concentrates
- Gold in concentrate.

The payable gold considered in the LOM financial model is detailed as follow:

- 2021 – 2032: 90% according to current Boliden and MMC agreements
- 2033 – 2042: 93% according to current and MMC agreements.

The smelting and refining terms for copper concentrates were based on information provided by Mantos Copper and are summarized in Table 22-3. Sales costs used are described in Section19.

Table 22-3: Smelting and Refining Terms

Commodity	Pay Factor	Unit Deduction	Treatment Charge	Refining Charge
Copper	96.59% above 28.1%Cu in conc. 95.56% below 28.1%Cu in conc. Minimum deduction if below threshold	1.00%	84 (US$/dmt conc.)	0.83 US¢/payable lb
Gold	2021 – 2032: 90% 2033 – 2042: 93%	- -	- -	5 US$/payable oz

22.4.4 Metal Prices

This Report used the short, medium and long-term metal prices discussed in Section 19.

22.4.5 Capital and Operating Costs

The capital and operating costs are discussed in Section 21.

22.4.6 Royalties

The current financial model includes a royalty payment to Anglo American for a total of US$49 M.

No other royalties or encumbrances currently known on the Project are applied to the financial model other than the requirement to pay the Chilean mining tax.

22.4.7 Working Capital

A working capital allocation considering the receivables and the payables was included in the cash flow model. The allocation is shown in the cash flow tables as an increase/decrease in value for each of the years. Mantos Copper provided the working capital change figures for each year over the life of mine. It is assumed that all the working capital can be recovered at Project termination. Thus, the sum of all working capital variations over the life-of-mine should be zero; however, in practice there is a small residual value as a result of carrying through the outstanding working capital at the start of the Project.

22.4.8 Taxes

Depreciation

The capital investment was allocated via the straight-line depreciation method; therefore, a constant time based depreciation was assumed. The depreciation structure for the capital investment used the categories and timelines established by the Chilean Internal Revenue Service (Servicios de Impuestos Internos, SII) shown in Table 22-4.

Table 22-4: Depreciation Structure provided by SII

Extractive Industry (Mining)	Normal UL	Accelerated UL
1) General Equipment and machinery for heavy work in mines and beneficiation plants	9	3
2) Mine and beneficiation facilities	5	1
3) Tailing dams	10	3
4) Mine tunnels	20	6
Note: Mine development has specific depreciation allocations that are based on considerations relating to development and construction timing. UL = useful life		

Mining Specific and Corporate Income Taxes

Taxes were incorporated in the financial analysis by Mantos Copper and supported by their tax consultant (Fischer), who provided the following narrative of their analysis of taxation applicable to the Project.

(Start of tax consultant’s statement)

“Income Tax: Corporate Tax and Withholding Tax

“As a general rule, the corporate tax is assessed on the net taxable income determined under full accounting records, where income is defined as gross income minus the costs and expenses required to produce that income. The corporate tax rate differs depending on which of the two tax-regimes existing in Chile is adopted by the taxpayer.

There are two income tax-regimes in Chile: (a) an attributed regime that levies a 25% corporate tax on income and attributes such income to the partner or shareholder’s income tax base, irrespective of whether an actual dividend distribution is paid, and (b) a partially-integrated regime that levies a 27% corporate tax on income, where shareholders can defer their income taxes until such profits are actually distributed.

As a general rule, distributions abroad are subject to a 35% withholding tax, minus a tax credit equivalent to the rate of the corporate tax existing in the year of distribution (provided the relevant company’s tax credit ledger has not been exhausted). In the case of profit coming from companies *subject to the partially-integrated regime, the tax credit is capped at 65% of the corporate tax rate, unless the shareholder is a resident in a tax-treaty country, in which case the foreign shareholder enjoys 100% of the corporate tax credit [2] " When calculating the corporate tax's tax basis, the following should be considered:*

(i) In general, assets and liabilities are adjusted by domestic inflation (based on variations of the Consumer Price Index), which is termed 'monetary correction' and aims to reduce distortions caused by inflation. This occurs unless the company is authorised to use US Dollars, in which case the aforementioned correction is not deemed to be necessary;

(ii) Expenses incurred by the company should be deducted from its gross income, provided they are: (a) related to the entity's business (ordinary expenses); (b) necessary to produce taxable income by the entity, taking into consideration its nature and amount; (c) not previously deducted as part of the company's direct cost of goods or services; (d) incurred in the relevant taxable period, whether paid or accrued; and (e) supported with appropriate documentation. If any of these requirements is not met, the deducted expenses must be added to the net taxable income and, if it involves a withdrawal of cash or goods from the company, they are subject to a 40% surtax;

(iii) Imported or new fixed tangible assets may, under certain conditions, be depreciated in one-third of the normal useful life; and

(iv) Profit distributions between Chilean resident companies are not subject to the corporate tax.

If any of these requirements is not met, the deducted expenses must be added to the net taxable income and, if it involves a withdrawal of cash or goods from the company, they are subject to a 40% surtax."

"Mining Specific Taxes

A mining specific tax, also known as the mining royalty, applies on "mining operational taxable income" obtained by "mining operators".

For these purposes "mining operator" means any individual or legal entity engaged in the extraction of any kind of mineral that could be subject to a mining concession and that sells such minerals in any stage of their processing to a metal saleable product.

On the other hand, "mining operational taxable income" means the net income determined for corporate tax purposes, with some adjustments, such as: (a) the deduction of any gross income not directly related to the sale of mining products, (b) the addition of costs and expenses not directly connected to income from the sale of mining products, (c) the addition of the specific following expenses: (i) interests paid or accrued over owed amounts on the relevant tax period, (ii) carry forward losses, (iii) expenses related to the acquisition of the right to exploit a mine owned by a third party (i.e. leasing, usufruct, "avio"), (iv) the amount deducted for application of accelerated depreciation (only ordinary depreciation can be deducted), among other adjustments.

[2] Currently, Chile has tax treaties in force with Argentina, Australia, Austria, Belgium, Brazil, Canada, the Czech Republic, China, Colombia, Croatia, Denmark, Ecuador, France, Ireland, Italy, Japan, Malaysia, Mexico, New Zealand, Norway, Paraguay, Peru, Poland, Portugal, Russia, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand and the United Kingdom. Tax treaties with the United States and Uruguay have also been signed, but still have not entered into force.

The mining specific tax rate is progressive, pursuant to the taxpayer's sales of mining products expressed in metric tonnes of fine copper (MTFC), determined in accordance with the average price for Grade A Copper as registered during the relevant period in the London Stock Exchange.

Mining operators whose annual gross sales of mining products are equal to or less than the equivalent of 12,000 MTFC are exempt from the mining specific tax.

Mining operators whose annual gross sales of mining products are greater than the equivalent of 12,000 MTFC, but equal to or less than the equivalent of 50,000 MTFC, are subject to a progressive tax rate by brackets from 0.5% to 4.5%.

Mining operators whose annual gross sales of mining products are greater than the equivalent of 50,000 MTFC are subject to a progressive tax rate by brackets from 5% to 14%, which is determined in function of the "mining operational margin". This last concept corresponds to the result, multiplied by 100, from dividing the mining operational taxable income by the mining operational income (all income earned or accrued from the sale of mining products).

To determine the abovementioned applicable tax regimen, the related parties' sales of mining products must also be considered.

The foregoing is exposed in the following charts:

Mining operators with annual sales up to 50,000 MTFC	
Sales	Rate
0 – 12,000	0.0 %
12,000 – 15,000	0.5 %
15,000 – 20,000	1.0 %
20,000 – 25,000	1.5 %
25,000 – 30,000	2.0 %
30,000 – 35,000	2.5 %
35,000 – 40,000	3.0 %
40,000 – 50,000	4.5 %

Mining operators with sales over 50,000 MTFC	
Mining Operational Margin	Rate
Up to 35	5%
+ 35 to 40	8%
+ 40 to 45	10.5%
+ 45 to 50	13%
+ 50 to 55	15.5%
+ 55 to 60	18%
+ 60 to 65	21%
+ 65 to 70	24%
+ 70 to 75	27.5%
+ 75 to 80	31%
+ 80 to 85	34.5%
+ 85	14%

"Income Taxes and Mining Specific Tax in the Technical Report

For the Report, based on the assumptions of the Financial Model, the Project was subject to a corporate tax rate, a withholding tax rate and a mining specific tax rate as shown in the following table:"

Taxes	Unit	Value
Corporate tax rate	%	27%
Withholding tax (corporate tax credit available)	%	35%
Mining specific tax	%	5% - 5.76%

"

(End of tax consultant's statement)

In summary, the current Chilean tax law that is applicable from 1 October 2014 was used for the financial analysis. This law gives two options of tax treatment: a semi-integrated system or an attributed system. The semi-integrated system applies a 27% rate as a first-category tax rate. The attributed system applies 25% as a first-category tax rate. In addition, a 35% withholding tax will apply each year, even if no distribution of dividends will be made under the attributed system. The mining tax would still be payable. As a general rule, distributions abroad are subject to a 35% withholding tax, minus a tax credit. The tax rates effectively applied in the financial analysis by Mantos Copper for evaluation for income and/or revenue taxes are shown in Table 22-5.

Table 22-5: Tax Rates Applied

Taxes	Unit	Value
Corporate Income Taxes	%	27
Mining Specific Tax (royalty)	%	5.1*
*Note: Applicable royalty rate in the financial model ranges from 5.0% to 7.76%, with an average of 5.1%		

Resulting Taxes

The total income subject to the corporate income tax for the duration of the MVDP is US$4,803 M, assuming application of the semi-integrated system. The government taxes payable for the duration of the MVDP are estimated to be:

- US$1,220 M for corporate income tax
- US$298 M for mining tax or royalty.

Total income and mining taxes are for the MVDP are estimated to be $1,517 M for the life of the Project.

Tax figures correspond to real values, determined after applying inflation and exchange rate escalators to all cost items.

22.4.9 Closure Costs and Salvage Value

No salvage value has been allocated. A total of US$58.9 M is considered for decommissioning (closure costs) for the oxide and sulphide facilities in 2042.

These amounts are treated as negative flows, reported together with the capital cost estimate, but not subject to depreciation. No provisions have been made to accumulate these amounts over the life of the mine.

For determination of taxable income, deductions of closure costs are distributed over a period of 7 years at the end of the operation, according to provisions in the tax law. In order to deduct the expenses incurred in the closure of the mine, several requirements must be met, such as the fulfillment of environmental mitigation requirements contained in the RCAs.

22.4.10 Inflation

Following Mantos Copper's internal budgeting procedures, the financial analysis assumes escalation factors according to projected domestic and USA inflation rates and exchange rates. The escalation factors thus determined are applied to nominal costs to express them in real terms (constant dollars) (refer to discussion in Section 19.4).

In the Feasibility Study capital and operating costs were determined based on Q4 2020 US dollars, consistent with the period when this work was developed. An escalation to the Project start date is also applied in the cash flows.

22.5 Financial Results

The updated financial results from the financial analysis model created by Mantos Copper are summarized in this section.

The economic analysis uses a standard Mantos Copper-defined 8% discount rate. The economics were evaluated and presented as before-tax and after-tax for the purpose of NPV calculation.

Table 22-6 presents the pre-tax cumulative cash flows, on an undiscounted basis, and with the 8% discount rate applied, giving the NPV.

The resulting after-tax NPV is US$1,283M. The cumulative, undiscounted, incremental cash flow after-tax value for the Project is US$3,286 M (see Table 22-6)

Cash flow details over the LOM are provided in Table 22-7. These are undiscounted real values which include the escalation factors determined by Mantos Copper (refer to Section 22.4.10 and Section 19.4). The table includes production data, revenues and costs (operation, deductions, sales costs and non-operational costs), taxes and capital expenditures. As a result of all this information, the pre-tax and after-tax undiscounted values of cash are shown at the base of the table.

Table 22-8 shows the values of undiscounted and discounted annual cash flows. Full cash flow details on an annualized basis are provided in Table 22-9. The projected life-of-mine cash flows, annual and cumulative after-tax values are shown in Figure 22-3 (undiscounted flows) and Figure 22-4 (at 8% discount rate).

A summary of C1 cash costs in US$ per pound of copper recovered is presented in Table 22-10.

Table 22-6: LOM Cash Flow Summary

Item	Pre-Tax (US$M)	After-Tax (US$M)
Net Cash Flow, Cumulative, Undiscounted	4,803	3,286
Net Present Value at 8% Discount Rate (valuation start of year 2021)	1,973	1,283

Table 22-7: LOM Cash Flow Summary Statement

tem	Units	MVDP 2021-2042
Metal Price		
Copper (long term after fifth year)	US$/lb	3.45
Gold (long term after fifth year)	US$/oz	1,585
Metal in Concentrate		
Copper	M lbs	2,755
Gold	M oz	0.5905
Extracted Metal Value		
Copper (Cathodes)	US$M	3,324
Copper (Concentrate)	US$M	9,601
Gold		941
Hedge Revenue	US$M	-102
Total	**US$M**	**13,765**
Smelter Deduction		
Copper Deduction	US$M	348
Gold Deduction	US$M	81
Total	**US$M**	**429**
Treatment and Refining Charges	US$M	
Copper Concentrate (treatment)	US$M	380
Copper (refining)	US$M	222
Gold (refining)	US$M	2.7
Selling Cost (Sulphide)	US$M	329
Selling Cost (Oxide)	US$M	38
Total	**US$M**	**368**
Production Costs (Sulphide and Oxide)		
Mining	US$M	2,508
Oxide Plant	US$M	1,529
Sulphide Plant	US$M	1,717
G&A	US$M	318
Other Non-operating (exploration)	US$M	94
Total	**US$M**	**6,166**
Net Income before Tax		
Earnings before taxes, depreciation & amortization	**US$M**	**6,197**
Corporate Income and Mining Taxes		
Corporate Income Tax	US$M	1,220
Specific Mining Tax (Royalty)	US$M	298
Total Income Taxes and Royalty	**US$M**	**1,517**
Capital Expenditure		
Anglo American Payment	US$M	49
Mine Initial Capital	US$M	212
Plant Initial Capital	US$M	526
Other Fixed Assets	US$M	46
Sub-Total Initial Capital	US$M	833
Mine SIB	US$M	92.5
Sulphide Plant SIB	US$M	58
Oxide Plant SIB	US$M	194.9
Long Term SIB	US$M	126.5
Closure Costs	US$M	58.9
Total Capital Expenditure	**US$M**	1,363
Change in Working Capital	US$M	31
Total Undiscounted Cash Flow		
Pre-tax	US$M	4,803
After tax	US$M	3,286

Note: Totals may not sum due to rounding. SIB = stay in business. All costs in real terms.

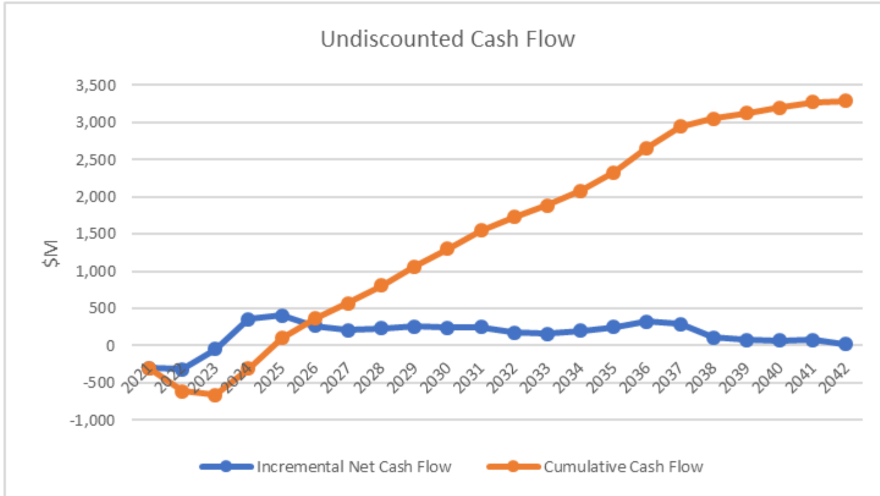
Table 22-8: After-Tax Annual Cash Flows

Year	After Tax Annual Cash Flow (US$M)	
	Undiscounted	Discounted (8%)
2021	-301	-290
2022	-316	-281
2023	-48	-39
2024	357	273
2025	404	286
2026	265	173
2027	208	126
2028	235	132
2029	258	134
2030	238	115
2031	245	109
2032	177	73
2033	160	61
2034	201	71
2035	246	81
2036	325	98
2037	287	81
2038	107	28
2039	74	18
2040	72	16
2041	75	16
2042	16	3
LOM	3,286	1,283

Table 22-9: Cash Flow Analysis, Mantoverde

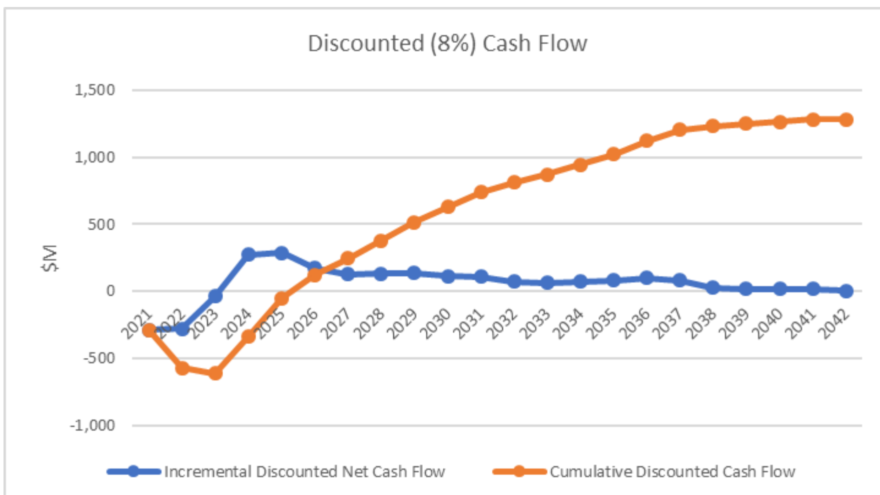
Year	Unit	Total / Avg.	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Production:																								
Total Material Moved	kt	1,753,255	56,219	52,809	128,915	138,956	140,315	143,222	139,312	142,950	130,462	123,523	123,717	104,322	90,550	75,401	49,540	23,753	29,049	12,100	12,091	12,124	12,091	11,834
Prestripping	kt	52,174	9,499	41,490	1,185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper: Heap Leach																								
Oxide Ore, Heap Leach	kt	125,368	10,700	10,750	10,800	10,850	10,907	10,900	6,327	10,727	7,613	9,931	8,935	3,471	5,479	7,977	-	-	-	-	-	-	-	-
Grade	%	0.34%	0.50%	0.48%	0.36%	0.34%	0.31%	0.29%	0.29%	0.35%	0.35%	0.26%	0.26%	0.31%	0.28%	0.29%	-	-	-	-	-	-	-	-
Recovery	%	76.4%	78.5%	79.0%	79.1%	75.8%	77.5%	73.4%	75.1%	75.0%	78.2%	73.1%	69.6%	79.5%	73.7%	76.9%	-	-	-	-	-	-	-	-
Heap Leach Copper Production	kt	328.0	42.2	40.9	31.2	27.7	26.4	23.2	14.0	28.1	21.0	19.1	16.3	8.5	11.4	18.0	-	-	-	-	-	-	-	-
Copper: Dump Leach																								
Oxide Ore, Dump Leach	kt	130,263	14,471	9,116	9,881	10,603	13,195	13,809	10,753	12,043	9,168	10,667	8,960	1,302	2,916	3,378	-	-	-	-	-	-	-	-
Grade	%	0.15%	0.19%	0.16%	0.15%	0.14%	0.14%	0.14%	0.13%	0.13%	0.13%	0.14%	0.13%	0.13%	0.13%	0.14%	-	-	-	-	-	-	-	-
Recovery	%	45.8%	41.8%	49.0%	46.2%	47.6%	44.2%	43.3%	45.3%	44.0%	46.3%	43.2%	45.6%	127.8%	47.7%	53.0%	-	-	-	-	-	-	-	-
Dump Leach Copper Production	kt	86.6	11.6	7.1	6.7	7.1	8.3	8.3	6.4	7.1	5.4	6.4	5.5	2.2	1.9	2.5	-	-	-	-	-	-	-	-
Total Copper Cathode Production	kt	414.6	53.9	47.9	37.8	34.8	34.7	31.5	20.4	35.2	26.5	25.5	21.8	10.8	13.2	20.5	-	-	-	-	-	-	-	-
Copper: Sulphide																								
Sulphide Ore, Plant	kt	235,672	-	-	3,245	12,214	12,436	12,455	11,606	12,097	12,576	12,566	12,540	12,346	11,692	11,845	12,544	12,644	12,628	12,100	12,091	12,124	12,091	11,834
Ore Copper Grade	%	0.60%	-	-	0.82%	0.78%	0.75%	0.74%	0.71%	0.76%	0.68%	0.74%	0.68%	0.61%	0.62%	0.59%	0.68%	0.79%	0.66%	0.31%	0.29%	0.29%	0.29%	0.30%
Copper Recovery	%	88.4%	-	-	88.6%	89.1%	87.9%	87.2%	89.4%	88.4%	87.4%	88.5%	87.8%	88.5%	89.8%	89.4%	89.6%	88.4%	90.5%	88.2%	87.6%	87.6%	87.6%	83.5%
Copper in Concentrate	**kt**	**1,248.9**	**-**	**-**	**23.6**	**85.2**	**82.1**	**80.6**	**74.1**	**81.8**	**74.8**	**82.6**	**74.9**	**66.7**	**64.9**	**62.3**	**76.4**	**88.8**	**75.9**	**33.3**	**30.5**	**30.6**	**30.5**	**29.3**
Total Contained Copper Production	**kt**	**1,663.5**	**53.9**	**47.9**	**61.5**	**120.0**	**116.8**	**112.1**	**94.6**	**117.0**	**101.2**	**108.1**	**96.7**	**77.5**	**78.1**	**82.8**	**76.4**	**88.8**	**75.9**	**33.3**	**30.5**	**30.6**	**30.5**	**29.3**
Total Payable Copper Production	**kt**	**1,618.2**	**53.9**	**47.9**	**60.7**	**117.1**	**114.0**	**109.4**	**92.0**	**114.2**	**98.7**	**105.3**	**93.7**	**75.1**	**75.7**	**80.4**	**73.7**	**85.7**	**73.4**	**31.8**	**29.1**	**29.2**	**29.1**	**28.1**
Gold Production:																								
Contained Gold Production	koz	590	-	-	9	33	32	31	23	32	39	40	40	35	27	29	37	49	43	19	18	18	18	18
Payable Gold Production	koz	539	-	-	8	29	29	27	21	29	35	36	36	32	25	27	34	45	40	18	17	17	17	16
Cash Flows:																								
Copper Revenue	$M	12,577.0	451.1	417.4	488.1	942.0	942.1	831.7	700.0	869.8	751.3	801.8	713.3	571.6	576.3	629.0	560.4	652.1	557.9	242.2	221.6	222.2	221.6	213.7
Gold Revenue	$M	857.5	-	-	14.4	49.2	46.9	43.4	33.3	46.0	55.2	56.5	56.8	50.3	40.0	42.1	54.4	71.7	62.7	28.2	26.7	26.8	26.7	26.1
Hedge Revenue	$M	-101.6	-38.9	-40.5	-16.1	-6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue	**$M**	**13,332.9**	**412.2**	**376.9**	**486.4**	**985.1**	**989.0**	**875.1**	**733.4**	**915.8**	**806.5**	**858.3**	**770.1**	**621.9**	**616.3**	**671.1**	**614.9**	**723.8**	**620.6**	**270.4**	**248.3**	**248.9**	**248.3**	**239.7**
TC/RC	$M	-602.0	-	-	-8.8	-34.2	-36.5	-37.7	-34.3	-39.1	-36.1	-39.5	-39.1	-32.7	-32.2	-31.0	-37.0	-41.9	-36.6	-18.3	-17.1	-17.1	-17.1	-15.8
Other	$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Net Revenue	**$M**	**12,731.0**	**412.2**	**376.9**	**477.6**	**950.9**	**952.6**	**837.3**	**699.1**	**876.7**	**770.4**	**818.8**	**731.0**	**589.3**	**584.1**	**640.1**	**577.9**	**681.9**	**584.1**	**252.0**	**231.2**	**231.8**	**231.2**	**223.9**
Mining Costs	$M	-2,507.8	-92.2	-88.2	-170.8	-189.1	-185.6	-192.9	-202.9	-207.4	-191.0	-172.7	-171.3	-152.3	-134.8	-113.8	-78.1	-38.5	-47.6	-18.9	-15.0	-15.0	-15.0	-14.7
Oxide Plant Processing Costs	$M	-1,529.3	-127.6	-194.4	-163.4	-121.0	-117.5	-113.4	-94.0	-110.6	-89.4	-94.9	-84.4	-58.8	-73.9	-86.0	-	-	-	-	-	-	-	-
Sulphide Plant Processing Costs	$M	-1,717.0	-	-	-34.7	-91.2	-91.2	-91.2	-89.1	-87.8	-90.6	-90.3	-91.0	-89.6	-86.4	-87.0	-88.1	-89.1	-88.8	-86.6	-86.4	-86.4	-86.3	-85.2
G&A Costs	$M	-317.5	-17.8	-15.0	-15.4	-15.0	-15.3	-13.6	-15.7	-15.7	-15.7	-15.7	-15.7	-15.2	-14.8	-14.4	-13.6	-12.9	-13.1	-12.6	-12.6	-12.6	-12.6	-12.6
Cathodes Freight & Port Costs	$M	-38.1	-4.9	-4.4	-3.5	-3.2	-3.2	-2.9	-1.9	-3.2	-2.4	-2.3	-2.0	-1.0	-1.2	-2.1	-	-	-	-	-	-	-	-
Concentrate Freight & Port Costs	$M	-329.5	-	-	-5.6	-21.2	-20.3	-19.7	-17.7	-20.7	-19.2	-20.9	-21.8	-17.5	-17.4	-16.8	-19.7	-22.0	-19.4	-10.5	-9.9	-9.9	-9.9	-9.0
Other Operating Expenses	$M	-94.4	-2.6	-2.7	-2.7	-6.3	-6.3	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9	-	-
Total Cash Cost	**$M**	**-6,533.6**	**-245.1**	**-304.7**	**-396.0**	**-447.1**	**-439.5**	**-438.6**	**-426.2**	**-450.4**	**-413.2**	**-401.8**	**-391.0**	**-339.3**	**-333.4**	**-325.0**	**-204.5**	**-167.4**	**-173.9**	**-133.5**	**-128.8**	**-128.9**	**-123.8**	**-121.5**
Other Non-Cash Items	$M	5.8	3.4	3.3	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	-6.7	-6.5	-6.2	-6.0	-5.8	-5.6	-5.4
EBITDA	**$M**	**6,203.2**	**170.5**	**75.5**	**84.8**	**507.1**	**516.3**	**401.8**	**276.0**	**429.5**	**360.4**	**420.1**	**343.2**	**253.2**	**253.9**	**318.2**	**376.5**	**507.8**	**403.7**	**112.3**	**96.3**	**97.1**	**101.8**	**97.1**
Depreciation	$M	-1,204.1	-21.9	-24.2	-22.2	-77.6	-137.8	-141.7	-142.2	-142.8	-101.8	-59.7	-61.0	-58.2	-49.6	-35.4	-26.1	-19.8	-15.1	-15.1	-14.4	-13.3	-14.6	-9.7
EBIT	**$M**	**4,999.1**	**148.7**	**51.3**	**62.6**	**429.5**	**378.5**	**260.2**	**133.8**	**286.8**	**258.6**	**360.4**	**282.2**	**195.0**	**204.3**	**282.8**	**350.4**	**488.0**	**388.6**	**97.3**	**81.9**	**83.8**	**87.2**	**87.4**
Non-Cash Cash Flows	$M	-5.8	-3.4	-3.3	-3.3	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	6.7	6.5	6.2	6.0	5.8	5.6	5.4
Chilean Royalty Tax	$M	-297.5	-9.5	-4.4	-3.7	-23.6	-18.8	-12.4	-6.4	-13.7	-12.3	-19.0	-13.8	-9.3	-9.7	-15.0	-25.1	-43.9	-32.5	-5.5	-4.5	-4.6	-4.9	-5.0
Cash Taxes Paid	$M	-1,219.6	-18.4	-10.1	-11.5	-62.9	-30.0	-73.9	-49.2	-97.5	-79.9	-95.4	-77.4	-56.3	-57.5	-74.6	-89.5	-121.2	-97.3	-25.9	-22.0	-22.5	-23.3	-23.3
Total Net Financial Charges	$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Changes in Working Capital	$M	-31.2	-33.0	23.6	-38.1	-10.1	-5.7	13.7	14.6	-19.9	6.2	-8.1	8.2	9.7	-0.9	-14.7	-6.2	-19.9	12.0	35.9	1.7	-0.3	-0.3	0.4
Cash Flow from Operations	**$M**	**4,649.0**	**106.1**	**81.3**	**28.2**	**407.3**	**458.6**	**326.1**	**231.9**	**295.3**	**271.2**	**294.5**	**256.9**	**194.2**	**182.6**	**210.7**	**252.4**	**329.5**	**292.4**	**123.1**	**77.5**	**75.5**	**79.0**	**74.6**
Sustaining Capex	$M	-471.9	-29.1	-12.8	-18.2	-37.6	-54.6	-61.2	-24.0	-60.7	-13.0	-56.2	-11.6	-16.8	-23.1	-9.7	-6.3	-4.9	-5.1	-16.1	-3.7	-3.7	-3.7	-
Expansionary Capex	$M	-783.5	-328.9	-384.2	-57.8	-12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure Costs	$M	-58.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-58.9
Anglo American Contingent Payment	$M	-49.0	-49.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash Flow from Investing	**$M**	**-1,363.4**	**-407.1**	**-397.0**	**-75.9**	**-50.2**	**-54.6**	**-61.2**	**-24.0**	**-60.7**	**-13.0**	**-56.2**	**-11.6**	**-16.8**	**-23.1**	**-9.7**	**-6.3**	**-4.9**	**-5.1**	**-16.1**	**-3.7**	**-3.7**	**-3.7**	**-58.9**
Unlevered FCF	**$M**	**3,285.6**	**-301.0**	**-315.7**	**-47.7**	**357.1**	**404.0**	**264.9**	**208.0**	**234.6**	**258.2**	**238.3**	**245.4**	**177.4**	**159.6**	**201.0**	**246.1**	**324.7**	**287.3**	**107.1**	**73.8**	**71.8**	**75.2**	**15.7**
Acumulated FCF			-301.0	-616.7	-664.4	-307.3	96.7	361.6	569.6	804.2	1,062.4	1,300.7	1,546.1	1,723.4	1,883.0	2,084.0	2,330.1	2,654.7	2,942.0	3,049.1	3,122.9	3,194.7	3,269.9	3,285.6
Mantoverde After-Tax NPV @ 8.00%	**$M**	**1,283.1**	**-289.6**	**-281.3**	**-39.4**	**272.8**	**285.7**	**173.5**	**126.1**	**131.7**	**134.3**	**114.7**	**109.4**	**73.2**	**61.0**	**71.1**	**80.6**	**98.5**	**80.7**	**27.8**	**17.8**	**16.0**	**15.5**	**3.0**

Figure 22-3: Undiscounted Cash Flow



Note: Figure courtesy Mantos Copper, 2020

Figure 22-4: Discounted Cash Flow



Note: Figure courtesy Mantos Copper, 2020

Table 22-10: C1 Cash Cost Summary

Item	C1 Cost (US$/lb)
Cash costs	
Mining	0.70
Process	0.91
G&A	0.09
Freight & Handling	0.10
TC/RC	0.17
Leasing Adjustment	-0.03
Sub-total	**1.95**
Credits	
By-product credits	-0.24
Deferred stripping credit	-0.15
Total	**1.56**

Notes:

- Gold credits are shown on a 100% basis. Refer to Section 19 for gold price assumptions
- Deferred stripping credit includes production phase capitalized stripping adjustment for 350 Mt for the life of mine and valued at an average US$ 1.36/t-mined

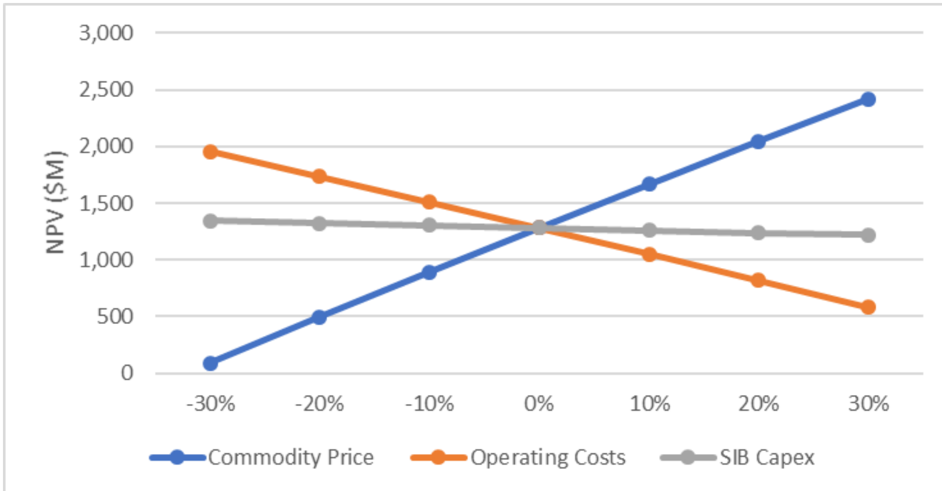
22.6 Sensitivity Analysis

A sensitivity analysis was performed considering variations in metal prices, operating costs and capital costs.

22.6.1 NPV

The results for NPV sensitivity to these variables are shown in Figure 22-5 and Table 22-11.

Figure 22-5: Sensitivity Analysis, After–tax Incremental NPV, Discounted at 8%



Note: Figure courtesy Mantos Copper, 2020

Table 22-11: Sensitivity Analysis, After–tax Incremental NPV, Discounted at 8%

Change in Factor	Factor		
	Commodity Price	Operating Costs	SIB Capex
-30%	88	1,954	1,345
-20%	497	1,734	1,323
-10%	893	1,509	1,302
0%	1,283	1,283	1,283
10%	1,665	1,050	1,260
20%	2,045	816	1,238
30%	2,421	578	1,217

22.6.2 Copper Grade

The grade sensitivity is not explicitly included because for the purposes of the sensitivity analysis Mantos Copper assumed that the sensitivity to changes in copper grades was mirrored by the sensitivity to changes in the copper price.

23 Adjacent Properties

This section is not relevant to this Report.

24 Other Relevant Data and Information

24.1 Project Execution Plan, Mantoverde Development Project Case

The proposed execution plan for the engineering, procurement and construction (EPC) for the new processing facilities required for the MVDP has been awarded to Ausenco Limited, a multi-national engineering, procurement and construction management company. Ausenco has broad experience in the design and construction of copper concentrator projects in the international market. It is expected that Ausenco will use industry-standard practices. The execution plan assumes that Mantos Copper would have an Owner's team working with the contractors during the execution phase.

The main EPC contracts include the following:

- CC01: Earth movement
- EPC01: Process plant and services
- EPC02: Truck shop, infrastructure, shovel yard
- EPC03: Power distribution
- EPC04: Camp, offices and construction warehouses
- EPC05: Tailings dam
- EPC06: Desalination plant.

Mantos Copper personnel will be responsible for work outside the EPC contractors' scope, including environmental permitting, community relations, mine development, fuel and power supply.

The EPC contractors will be responsible for the construction permitting.

24.2 MVDP Schedule

The MVDP schedule is based on the following key milestone dates:

- RCA approved: March 2018
- Start of Project construction: September 2020 Oxide Line, June 2021 Sulphide Line
- EPC01 Process plant and services mechanical completion: June 2023
- EPC06 Desalination plant mechanical completion: June 2023
- EPC05 Tailings dam mechanical completion: May 2023.

24.3 Mantoverde Phase II

Mantos Copper is analyzing an expansion of the concentrator (Phase II), adding a second ball mill and a pebble crusher to increase the concentrator capacity and increasing annual copper production from 2026.

The source of feed for this increased throughput is the already identified mineral inventory as a result of the pit optimization (Table 15-9). The current Mineral Reserves Estimate was constrained by the TSF capacity and therefore the pit shell obtained at a revenue factor of 0.7 was used as a guide for the final pit design. The difference between the pit shell obtained at revenue factor 1.0 and the potential production plan is 204.8 Mt of potential sulphide inventory available for Phase II.

Phase II will require an application for a new environmental permit for the expansion of the TSF. Several options are being assessed at a conceptual level to support a longer LOM. The Mantoverde technical team will also design and develop a Phase II production schedule, maintaining the life of mine at an increased throughput rate.

24.4 Potential Synergies with Santo Domingo Project

Geology: Mineralogy, ore, gangue and contaminants for oxides and sulphides are similar between the Santo Domingo and Mantoverde deposits (Cu, Fe, Au and Co), which favours metallurgical synergies, benchmarking and sharing of good process practices between the two projects.

Mining: Aligning mining equipment type with Mantoverde to share mine equipment, spare parts and maintenance. Use of current Mantoverde Caterpillar 789 trucks for Santo Domingo pre-stripping.

Processing: Santo Domingo oxide resources could be leached on site and the PLS transported to the Mantoverde SX-EW plant (Likelihood: High/Impact: High)

The cobalt plant at Santo Domingo is an upside, the sulphuric acid produced could supply Mantoverde (Likelihood: Low/Impact: High)

Power Supply/Transmission: Combined power purchase contract for three operations (Mantoverde, Santo Domingo and Mantos Blancos) could reduce Opex (Likelihood: Medium/Impact: High)

Desalination Plant: Mantoverde desalination plant could be expanded to provide Santo Domingo water requirements of 350 L/s reducing Capex and simplifying the permitting process. (Likelihood: Medium/Impact: High)

Port: If technically viable, eventually centralize Mantoverde and Santo Domingo to use one port location (Likelihood: High/Impact: High)

Project Execution Plan: Construction camp used by Mantoverde at El Salado could be shared with Santo Domingo with the potential Capex reduction (Likelihood: Medium/Impact: Low)

25 Interpretation and Conclusions

The QPs note the following interpretations and conclusions in their respective areas of expertise, based on the review of data available for this Report.

25.1 Mineral Resources

- The Mantoverde deposit is an example of an iron oxide–copper–gold (IOCG) deposit.
- The geological setting, style of mineralization and controls on mineralization are known sufficiently to provide useful guides for Mineral Resource estimation.
- Mantoverde has developed internal protocols and controls for data capture and QA/QC protocols and management that allow the use of such data with an adequate level of confidence in the construction of a Resource Model.
- The Mineral Resources were estimated using appropriate data, geological interpretation and estimation methodology that adequately reflect the current understanding of the deposit.
- The Mineral Resources have been classified into Measured, Indicated and Inferred Resource categories based on overall estimation error and production rates.
- The Mineral Resources were constrained within pit shells to establish reasonable prospects for eventual economic extraction.
- Mantoverde Mineral Resources have been estimated in conformity with CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (November 2019) and are reported in accordance with 2014 CIM Definition Standards.

25.2 Mineral Processing

- Three metallurgical testwork programs were conducted in support of the planned sulphide operation. The metallurgical testwork performed for the MVDP is sufficient to establish the preferred process route for the mineralization types, and the proposed processing is based on conventional technology. The testwork was performed on representative samples for the purposes of establishing an optimal process flowsheet.
- The metallurgical recoveries from testwork results were used to design the sulphide plant. The recoveries for the current mine plan and economic evaluation were obtained directly from the geometallurgical model estimates that were developed by independent consultant Geoinnova, with support from the Mantos Copper team.
- Geoinnova subsequently updated the Mixed material recoveries for Mantoverde and Manto Ruso/Celso in April 2018, using new metallurgical testwork data collected since the close-out date for data supporting the feasibility study.
- There is a portion of the block model that has had metallurgical recoveries estimated using OK, rather than from the metallurgical recovery formulae. This approach was taken because there was a sector of Mixed/Oxide materials that had insufficient data in the contact zone of the FMV and the Mixed/Oxide zone. This sector had low metallurgical recoveries, and therefore was estimated separately. Although the results are reasonably similar, the geometallurgical model should be updated to reflect the most recent metallurgical recovery assumptions.
- Average LOM recoveries were provided for use in the financial analysis.
- No significant levels of deleterious elements have been reported during the oxide operations or are expected from the treatment of the hypogene material.
- There is upside potential for the Project if a saleable iron concentrate can be generated from magnetite-bearing rocks. Iron content is not currently estimated in the Mineral Resource.

- There is upside potential for recovery of cobalt as a by-product. Detailed studies should be conducted to investigate this opportunity.
- The process flowsheet for treatment of oxide and sulphide materials is simple and based on proven technology.
- Oxide material will continue to be treated via the dynamic leach pad operation or the run-of-mine dump leaching process, these are well-known technologies for Mantoverde.
- Sulphide material will be treated through a conventional process plant using a crush–mill–float process to produce concentrates. The only new technology for Mantoverde is SAG milling which is a well-known technology in Chile.
- Tailings disposal will be conventional using a proven method to construct and raise the sand wall. A detailed water balance has been prepared to design the ancillary equipment to manage the water in the TSF.
- Infrastructure required to support current operations is in place and operational.
- The projected expansion will require some modifications to the existing plant and infrastructure. The following are the main modifications: a new TSF, expansion of the desalination plant and construction of a sulphide process plant.
- The MVDP is a brownfield expansion at an existing oxide operation to incorporate a new copper concentrator and tailings facility. The expansion of the existing plant and infrastructure will not present design challenges. Where expansion or additional facilities are considered, the designs are appropriate and the areas are available in and around the existing facilities.

25.3 Mineral Reserves

- Proven and Probable Mineral Reserves have been identified from Measured and Indicated Mineral Resources. Inferred Mineral Resources have been set to waste. Mineral Reserves are supported by a positive financial analysis.
- Factors that may affect the estimates include: changes to the metal price assumptions; changes to the estimated Mineral Resources used to generate the mine plan; changes in the metallurgical recovery factors; changes in the geotechnical assumptions used to determine the overall wall angles; changes to the operating cut-off assumptions for mill feed or stockpile feed; changes to the input assumptions used to derive the open pit outline and the mine plan that is based on that open pit design; ability to maintain social and environmental licence to operate; and changes to the assumed permitting and regulatory environment under which the mine plan was developed.
- A limiting factor for the Mineral Reserve Estimates and the mine plan is the TSF capacity because the final size of the open pit and the production rate that can be achieved are controlled by the TSF capacity. Upside potential for the Project remains if the tailings constraint can be removed.
- The MVDP will use conventional open pit mining methods and conventional equipment.
- The current mining operation is based on an owner and contractor loading and hauling fleet. The MVDP assumes integration with, and transition from, the current operation to use higher productivity heavy mining equipment to increase the mine capacity. The heavy mining equipment is assumed to be fully owned by Mantoverde when the operation reaches steady-state production.

25.4 Risks and Opportunities

The most significant risks evaluated in a risk review were:

- Schedule delays not identified for the MVDP
- Contractor engagement and price uncertainty
- Delay in mine equipment and supplies arrival due to the Covid 19 pandemic
- Increased equipment and labour costs.

The opportunities that were identified include:

- Increase of the concentrator processing capacity, adding an additional ball mill (Phase II) or adding a second line
- Increase the TSF capacity to release reserves restricted by the current TSF capacity
- Enhance recovery through further metallurgical testing
- Additional copper production from mineralized waste dumps
- Share infrastructure with other local companies/projects
- Produce a magnetite concentrate from sulphide tailings
- Recovery of cobalt from sulphide and oxide material
- Additional copper production from brownfield exploration around the property.

Risks and opportunities will be continuously assessed and reviewed throughout the various phases of the Project, in accordance with Mantos Copper's Risk Management Framework.

Mantos Copper considered the following mitigation steps to control the Capex and meet Project deadlines:

- Costs

  Periodically review the Project progress. At the time of issuing this Report, the costs of the major equipment purchases, pre-stripping and Owner's costs are aligned with the budget. For the EPC lump sum turnkey (LSTK) contract cost, 88% is associated with the contractor's fixed lump sum cost and delivery dates. There are appropriate controls that give confidence that the expected result will be achieved. The remaining 12% of cost is related to the TSF, this could have variations due to construction deviations on site, Mantoverde will hire an expert consultant to mitigate these deviations.

- Schedule

  - The schedule is under control and well advanced
  - The contractor has its own contingencies in the master schedule
  - There are 4 weeks associated with delays due to the Covid-19 pandemic
  - There is a US$6 M bonus if the ramp-up period is achieved early.

26 Recommendations

26.1 Mineral Resources

- Improve the geological understanding of gold mineralization and include this knowledge in the resource model to improve the confidence in the estimate.
- Continue the exploration program on surrounding Mantos Copper properties with recognized mineralization potential.
- Continue infill drilling to improve resource categorization and increase confidence of the currently defined Mineral Resources, and provide a better base for long-term mine planning. Table 26-1 shows the drilling costs for the recent years and the budget.

Table 26-1: Drilling Costs

US$M	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Infill	0.8	0.7	4.0		1.9	3.6	4.5	4.0	4.1	4.7
Exploration	1.7	2.2			1.1	1.2	1.5	5.6	5.8	6.1

Note: The costs indicated for the period 2022 to 2026 are approved in the budget

26.2 Mineral Processing

A review of the Geoinnova data indicates that the rougher recoveries for six of the samples used in the block model were derived from 20 minute rougher recovery results, not the 14 minute rougher recovery results that were the Project design basis. However, the review found that the values were not significantly different and should not impact the Project design criteria. It is recommended that the corrected data be used for the next block model update.

The recovery models for the oxide mineralization are based on metallurgical testwork conducted during pre-feasibility level investigations that were updated with the currently budgeted 5 year recovery expectations. The geometallurgical characteristics of the materials that are planned to be mined and treated through the oxide circuit after the currently budgeted 5 year recovery expectations should be reviewed on an annual basis, as per current practices, and if needed, testwork should be conducted to ensure that the future recoveries are in line with current Mantoverde experience.

Additional metallurgical testwork should be undertaken on the Oxide/Mixed material in the vicinity of the FMV that currently appears to have lower metallurgical recoveries. This will provide additional support for the metallurgical recovery assumptions for such material.

Concentrate filtration tests were undertaken on some of the metallurgical composites using three technologies: vacuum, press and ceramic filters. The results support the current interpretations. Howver, additional filtration tests should be undertaken with filter vendors, assuming the use of press filters.

It is recommended that the mill manufacturers be consulted to confirm that the 250% circulating load assumption is applicable to the final equipment selection.

This work is budgeted at US$300,000.

26.3 Mineral Reserves

The additional conversion of Mineral Resources into Mineral Reserves is constrained by the capacity of the TSF; an increase in size of the TSF will require a modification to the environmental permits. If the TSF capacity can be increased, an increase in Mineral Reserves can be realized by developing

Phase II and maintaining the same life of mine, or by maintaining the throughput rate at 11 Mt per year and extending the life of mine.

It is recommended that autonomous haulage system (AHS) be analyzed as the selected of fleet, this has been used successfully in other mines in Chile. The benefits of AHS are: smaller fleet, less fuel emissions, higher overall productivity (higher utilization and higher speeds) and lower labour requirement.

27 References and Units of Measure

27.1 References

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27.2 Units of Measure

Table 27-1: Units of Measure

Unit	Abbreviation
Above mean sea level	amsl
Ampere	A
Centimetre	cm
Cubic centimetre	cm^3
Cubic metre	m^3
Day	d
Days per week	d/wk
Days per year	d/y
Decibel adjusted	dBa

Unit	Abbreviation
Decibel	dB
Degree	°
Degrees Celsius	°C
Diameter	ø
Dry metric ton	dmt
Foot or feet	ft or ‘
Gram	g
Grams per litre	g/L
Grams per tonne	g/t
Greater than	>
Hectare (10,000 m^2)	ha
Hertz	Hz
Horsepower	hp
Hour	h
Hours per day	h/d
Hours per week	h/wk
Hours per year	h/y
Inch or inches	in or “
Kilo (thousand)	k
Kilogram	kg
Kilograms per cubic metre	kg/m^3
Kilograms per square metre	kg/m^2
Kilometre	km
Kilometres per hour	km/h
Kilovolt	kV
Kilovolt-ampere	kVA
Kilowatt	kW
Kilowatt hour	kWh
Kilowatt hours per tonne	kWh/t
Less than	<
Litre	L
Litres per second	L/sec
MegaVolt-Ampere	MVA
MegaWatt	MW
Metre	m
Metres above sea level	masl
Metres per second	m/s
Metric ton (tonne)	t
Micrometre (micron)	µm
Microsiemens	µS
Milliamperes	mA
Milligram	mg

Unit	Abbreviation
Milligrams per litre	mg/L
Millilitre	mL
Millimetre	Mm
Million	M
Million tonnes	Mt
Million years	Ma
Minute (time)	min
Month	mo
Ounce	oz
Parts per billion	ppb
Parts per million	ppm
Percent	%
Revolutions per minute	rpm
Second (plane angle)	"
Second (time)	s
Specific gravity	SG
Square centimetre	cm^2
Square kilometre	km^2
Square metre	m^2
Thousand tonnes	kt
Thousand tonnes per day	ktpd or kt/d
Tonne (1,000 kg)	t
Tonnes per day	tpd or t/d
Tonnes per hour	tph or t/h
Tonnes per year	tpy or t/y
Total dissolved solids	TDS
Total suspended solids	TSS
Troy Ounce	toz
Volt	V
Week	wk
Wet metric ton	wmt
Year	y

Table 27-2: Common Chemical Symbols

Element/Compound	Symbol
Aluminium	Al
Ammonia	NH_3
Antimony	Sb
Arsenic	As
Bismuth	Bi
Cadmium	Cd
Calcium	Ca

Element/Compound	Symbol
Calcium carbonate	$CaCO_3$
Calcium oxide	CaO
Carbon	C
Carbon monoxide	CO
Chlorine	Cl
Chromium	Cr
Cobalt	Co
Copper	Cu
Copper Sulphate	$CuSO_4$
Gold	Au
Hydrochloric acid	HCl
Hydrogen	H
Iron	Fe
Lead	Pb
Magnesium	Mg
Manganese	Mn
Molybdenum	Mo
Nickel	Ni
Nitrogen	N
Nitrogen oxide compounds	NOx
Oxygen	O_2
Potassium	K
Silver	Ag
Sodium	Na
Sodium hydroxide	NaOH
Sulphur	S
Sulphur dioxide	SO_2
Soluble Copper	SCu
Tin	Sn
Titanium	Ti
Total Copper	TCu
Zinc	Zn

Table 27-3: Abbreviations and Acronyms

Description	Abbreviation
Abrasion Index	AI
Adsorption, desorption and recovery	ADR
Acid base accounting	ABA
Acid rock drainage	ARD
All In Sustaining Cost	AISC
Alternating current	AC
Ammonium nitrate and fuel oil	ANFO

Description	Abbreviation
As low as reasonably possible	ALARP
Association for Advancement of Cost Engineering	AACE
Atomic Absorption Spectrometry	AAS
Automatic voltage regulators	AVR
Ball Mill Work Index	BWi
Canadian Electrical Manufacturers Association	CEMA
Closed circuit television	CCTV
Closed side settling	CSS
Comisión Regional del Medio Ambiente (Regional Environmental Commission)	Corema
Direct current	DC
Civil/Structural/Architectural Discipline	CSA
Coefficient of variation	CV
Corporación Nacional de Desarrollo Indígena (National Corporation for Indigenous Development)	Conadi
Corporación Nacional Forestal (National Forest Corporation)	Conaf
Crushing Work Index	CWi
Decreto Supremo (Supreme Decree)	DS
Detection limit	DL
Differential global positioning system	DGPS
Dirección General de Aguas (Water Authority)	DGA
Discounted cash flow	DCF
Distributed control system	DCS
Drop Weight Index	DWI
Engineering work station	EWS
Electro-winning	EW
Engineering, procurement and construction	EPC
Emergency Response Plan	ERP
Environmental, Health and Safety	EHS
Environmental impact assessment	EIA
Environmental Management Plan	EMP
Environmental Management System	EMS
Estimation unit	EU
Factory Mutual	FM
Feasibility Study	FS
Free on board	FOB
Front end loader	FEL
General and Administration Costs	G&A
Global positioning system	GPS
Greenhouse gases	GHG
Hazard Identification	Hazid
Hazardous Operations Study	Hazop
Health, Safety and Environmental	HSE

Description	Abbreviation
Heating, ventilation and air conditioning	HVAC
High density polyethylene	HDPE
High voltage	HV
Industrial Relations	IR
Information Technology	IT
Internal rate of return	IRR
International Standards Organization	ISO
Inverse distance squared	ID^2
Key performance indicator	KPI
Life of Mine	LOM
Light emitting diode	LED
Low Voltage	LV
Ministro de Medio Ambiente (Environmental Ministry)	MMA
Motor control centre	MCC
National Electrical Manufacturers Association	NEMA
National Fire Protection Association	NFPA
Nearest neighbour	NN
Net Acid Generating	NAG
Net position suction head	NPSH
Net position suction head available	NPSHA
Net present value	NPV
Occupational Safety and Health Administration	OSHA
Oil filled naturally cooled	ONAN
Open side setting	OSS
Ordinary Kriging	OK
Original equipment manufacturer	OEM
Overflow	O/F
Oversize	O/S
Particulate Matter 25/10	PM2.5, PM10
Plant control system	PCS
Potentially Acid Generating	PAG
Polyvinyl chloride	PVC
Pre-feasibility Study	PFS
Probable maximum precipitation	PMP
Process Control System	PCS
Process flow diagram	PFD
Programmable logic controller	PLC
Quality assurance	QA
Quality control	QC
Relative level	RL
Resolución de Calificación Ambiental (Environmental Approval)	RCA
Rock mass rating	RMR

Description	Abbreviation
Rock quality designation	RQD
Root mean square	RMS
Run of mine	ROM
Sectoral Environmental Permit	PAS
Sectoral Permit	PS
Sedimentable particulate matter	SPM
Selective mining unit	SMU
Secretaría Regional Ministerial (Regional Ministerial Secretariat)	Seremi
Servicio Nacional de Turismo (National Tourist Service)	Sernatur
Sistema de Evaluación Ambiental (Environmental Evaluation System)	SEA
Specific gravity	SG
Servicio Nacional de Geologia y Mineria (National Geology and Mining Service)	SERNAGEOMIN
Supervisory control and data acquisition	SCADA
System International	SI
Total cost of ownership	TCO
Total enclosed, fan cooled	TEFC
Underflow	U/F
Undersize	U/S
Uninterruptible power supply	UPS
United Nations Global Compact	UNGC
Variable frequency drive	VFD
Very high frequency	VHF
Voltage transformers	VT
Waste rock dump	WRD
Water treatment plant	WTP
Work breakdown structure	WBS
Workplace Hazardous Material Information System	WHMIS
Zona de Interés Turístico (Area of tourist interest)	ZOIT

28 Qualified Person Certificates

NCL Ingeniería y Construcción SpA.
General del Canto 230, office 401,
Providencia, Santiago, Chile.
Tel: +56 2 2651-0800
ncl@ncl.cl

CERTIFICATE OF QUALIFIED PERSON

I, Carlos Guzman, Qualified Person for the mineral reserve estimate certify that

I am Principal and Project director at NCL Ingeniería y Construcción SpA, General del Canto 230, office 401, Providencia, Santiago, Chile.

This certificate applies to the Technical Report titled "Capstone Mining Corp, Mantoverde Mine and Mantoverde Development Project, NI-43101 Technical Report, Chañaral/ Región de Atacama, Chile", with an effective date of 29 November 2021.

My qualifications and relevant experiences are that:

1. I am a Graduate of the Universidad de Chile and hold a Mining Engineer title (1995).
2. I am a practicing Mining Engineer and a Fellow Member of the Australasian Institute of Mining and Metallurgy (FAusIMM, N° 229036); and a Registered Member of the Chilean Mining Commission (RM CMC 0119).
3. Have worked as a mining engineer for a total of 26 years. My relevant experience for the purpose of the Technical Report is:
    - Review and report as a consultant on numerous explorations, mining operation and projects around the world for due diligence and regulatory requirements.
    - I have extensive experience in mining engineering. I have worked on mining engineering assignments.
4. I have read the definition of Qualified Person set out in Nation Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be a Qualified Person for the purposes of NI 43-101.
5. I have visited the Mantoverde site on November 10, 2021. I am responsible for the preparation of sections 1.6, 1.7, 1.10 through 1.15, 2, 3, 15, 16, 19 through 22, 24, 25.3, 25.4, 26.3 and 27 of the Technical Report.
6. I am independent of Mantos Copper Holding SpA and Capstone Mining Corp.
7. I not have had prior involvement with the property that is the subject of the Technical Report.
8. I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with that instrument.
9. As of the date of the certificate, to the best of my knowledge, information and belief, the Technical Report Summary contains all material scientific and technical information that is required to be disclosed to make the Technical Report Summary not misleading.

Dated:	**January 5, 2022**
Signature:	~~SIGNATURE ON FILE~~
Name:	**Carlos Guzmán** Mining Engineer, FAusIMM (229036), RM CMC (0119)

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Tel: +56 9 8289-5163
gustavo.tapia@gtmetallurgy.com

GT Metallurgy

CERTIFICATE OF QUALIFIED PERSON

I, Gustavo Tapia, Qualified Person for the mineral processing and metallurgical recovery, recovery methods and project infrastructure certify that:

I am Independent Process and Metallurgical Consultant at GT Metallurgy, Carmencita 130, apartment 92, Las Condes, Santiago, Chile.

This certificate applies to the Technical Report titled "Capstone Mining Corp, Mantoverde Mine and Mantoverde Development Project, NI-43101 Technical Report, Chañaral/ Región de Atacama, Chile", with an effective date of 29 November 2021.

My qualifications and relevant experiences are that:

1. I am a Graduate of the Universidad de Chile and hold a Civil Mining Engineer title (1981).
2. I am practicing my profession for 40 years. During this time, I have been directly involved in, and supervised operations, design of metallurgical testwork programs, pilot plant testing, designing process flowsheets, selection of mineral processing equipment and Due Diligence for new projects. I have been directly involved in operations, process engineering design and construction for copper projects in Chile; and a Registered Member of the Chilean Mining Commission (RM CMC 0436).
3. Have worked as a mining engineer for a total of 40 years. My relevant experience for the purpose of the Technical Report is:
    - Review and report as an executive of mining companies and independent consultant on numerous mining new business, mining operation and projects around the world for due diligence and regulatory requirements.
    - I have extensive experience in metallurgy and ore processing. I have worked on several metallurgical and ore processing assignments.
4. I have read the definition of Qualified Person set out in Nation Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements to be a Qualified Person for the purposes of NI 43-101.
5. I have visited the Property on 10th November 2021. I am responsible for the preparation of sections 1.4, 1.8, 1.9, 13, 17, 18, 25.2, 26.2 and 27.1 of the Technical Report.
6. I am independent of Mantos Copper Holding SpA and Capstone Mining Corp.
7. I have had earlier involvement with the property as former Executive of the Anglo American Group (2002-2010) but, I not have had prior involvement with the project that is the subject of the Technical Report.
8. I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with that instrument.
9. As of the date of the certificate, to the best of my knowledge, information and belief, the Technical Report contains all material scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated:	**January 5, 2022**
Signature:	SIGNATURE ON FILE
Name:	**Gustavo Tapia** Mining Engineer, RM CMC (0436)

GOLDER
MEMBER OF WSP

CERTIFICATE OF QUALIFIED PERSON

I, Ronald Turner, state that:

(a) I am a Senior Resource Geologist at:
Golder Associates S.A.
Magdalena 181, 3rd floor
Las Condes, Santiago, Chile

(b) This certificate applies to the technical report titled "Mantoverde Mine and Mantoverde Development Project NI 43-101 Technical Report Chañaral / Región de Atacama, Chile", with an effective date of: 29th, November 2021 (the "Technical Report").

(c) I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Universidad de Concepción with a Geologist title obtained on 1993 and MAusIMM CP(Geo). My relevant experience after graduation and over 21 years for the purpose of the Technical Report includes practice as a geologist in the fields of exploration, resource definition and estimation, and open pit mining at various stages of development (green-fields through to established operation) within Chile, Peru, Canada, and the USA. I have worked primarily with copper and gold deposits hosted within various geological environments.

(d) My most recent personal inspection of each property described in the Technical Report occurred on November 10th, 2021 and was for a duration of 01 days.

(e) I am responsible for Item(s) 1.1 through 1.3, 1.5, 4 through 12, 14, 23, 25.1, 26.1 and 27.1 of the Technical Report.

(f) I am independent of Capstone Mining Corp.

(g) I have not had prior involvement with the property that is the subject of the Technical Report.

(h) I have read NI 43-101, and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.

(i) At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the part of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Santiago, Chile this 05th of January 2022.

AusIMM
THE MINERALS INSTITUTE
CHARTERED PROFESSIONAL
GEOLOGY
Ronald Turner

Signature of Qualified Person

Ronald Turner, MAusIMM CP(Geo)