NI 43-101 TECHNICAL REPORT

CONSTANCIA MINE, CUZCO, PERU

MARCH 29, 2021, EFFECTIVE AS OF JANUARY 1, 2021

Prepared under the supervision of:

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HUDBAY

CAUTIONARY NOTE REGARDING FORWARD LOOKING INFORMATION

This National Instrument (“NI”) 43-101 Technical Report (this “Technical Report “) contains "forward-looking statements" and "forward-looking information" (collectively, "forward-looking information") within the meaning of applicable Canadian and United States securities legislation. All information contained in this Technical Report, other than statements of current and historical fact, is forward-looking information. Often, but not always, forward-looking information can be identified by the use of words such as “plans”, “expects”, “budget”, “guidance”, “scheduled”, “estimates”, “forecasts”, “strategy”, “target”, “intends”, “objective”, “goal”, “understands”, “anticipates” and “believes” (and variations of these or similar words) and statements that certain actions, events or results “may”, “could”, “would”, “should”, “might” “occur” or “be achieved” or “will be taken” (and variations of these or similar expressions). All of the forward-looking information in this Technical Report is qualified by this cautionary note.

Forward-looking information includes, but is not limited to, our objectives, strategies, intentions and expectations, production, cost, capital and exploration expenditure guidance and potential revisions to such guidance, anticipated production at our mines and processing facilities, expectations regarding the impact of the COVID-19 pandemic on our operations, financial condition and prospects, and our ability to effectively engage with local communities in Peru and other stakeholders, expectations regarding the timing of mining activities at the Pampacancha deposit and any additional delivery obligations under the Constancia stream agreement, the potential and our anticipated plans for advancing our mining properties surrounding Constancia and elsewhere in Peru, anticipated production at our Constancia mine and processing facilities and events that may affect Hudbay’s operations, anticipated improvements to metallurgical recoveries, anticipated cash flows from operations and related liquidity requirements, the anticipated effect of external factors on revenue, such as commodity prices, estimation of mineral reserves and resources, mine life projections, reclamation costs, economic outlook, government regulation of mining operations, and expectations regarding labour and community relations. Forward-looking information is not, and cannot be, a guarantee of future results or events. Forward-looking information is based on, among other things, opinions, assumptions, estimates and analyses that, while considered reasonable by us at the date the forward-looking information is provided, inherently are subject to significant risks, uncertainties, contingencies and other factors that may cause actual results and events to be materially different from those expressed or implied by the forward-looking information.

The material factors or assumptions that we identified and were applied by us in drawing conclusions or making forecasts or projections set out in the forward-looking information include, but are not limited to:

- our ability to continue to operate safely and at full capacity during the COVID-19 pandemic;
- the availability, global supply and effectiveness of COVID-19 vaccines, the effective distribution of such vaccines in the countries in which we operate, the lessening of restrictions related to COVID-19, and the anticipated rate and timing for each of the foregoing;
- our ability to achieve production and unit cost guidance;
- no significant interruptions to our operations or significant delays to our development projects in Manitoba and Peru due to the COVID-19 pandemic;
- the availability of spending reductions and liquidity options;
- the timing of development and production activities on the Pampacancha deposit;
- the timing for reaching additional agreements with individual community members and no significant unanticipated delays to the development of Pampacancha
- the successful renegotiation of collective agreements with the labour unions that represent certain of our employees in Manitoba and Peru;
- the success of mining, processing, exploration and development activities;
- the scheduled maintenance and availability of our processing facilities;
- the accuracy of geological, mining and metallurgical estimates;
- anticipated metals prices and the costs capital projects and production;

- the supply and demand for metals we produce;
- the supply and availability of concentrate for our processing facilities;
- the supply and availability of third party processing facilities for our concentrate;
- the supply and availability of all forms of energy and fuels at reasonable prices;
- the availability of transportation services at reasonable prices;
- no significant unanticipated operational or technical difficulties;
- the execution of our business and growth strategies, including the success of our strategic investments and initiatives;
- the availability of additional financing, if needed;
- the availability of personnel for our exploration, development and operational projects and ongoing employee relations;
- maintaining good relations with the labour unions that represent certain of our employees in Peru and no labour disruptions;
- maintaining good relations with the communities surrounding Constancia, including the neighbouring Indigenous communities and local governments;
- no significant unanticipated challenges with stakeholders at our various projects;
- no significant unanticipated events or changes relating to regulatory, environmental, health and safety matters;
- no contests over title to our properties, including as a result of rights or claimed rights of Indigenous peoples or challenges to the validity of our unpatented mining claims;
- no significant unanticipated litigation;
- certain tax matters, including, but not limited to current tax laws and regulations and the refund of certain value added taxes from the Peruvian government; and
- no significant and continuing adverse changes in general economic conditions or conditions in the financial markets (including commodity prices and foreign exchange rates).

The risks, uncertainties, contingencies and other factors that may cause actual results to differ materially from those expressed or implied by the forward-looking information may include, but are not limited to, the political situation in Peru, risks generally associated with the mining industry, such as economic factors (including future commodity prices, currency fluctuations, energy prices and general cost escalation), risks related to the new Constancia mine plan, risks related to the schedule for mining the Pampacancha deposit (including risks associated with COVID-19, with reaching additional agreements with individual community members and the impact of any schedule delays), dependence on key personnel and employee and union relations, risks related to political or social unrest or change, risks in respect of Indigenous and community relations, rights and title claims, operational risks and hazards, including unanticipated environmental, industrial and geological events and developments and the inability to insure against all risks, failure of plant, equipment, processes, transportation and other infrastructure to operate as anticipated, planned infrastructure improvements in Peru not being completed on schedule or as planned, compliance with government and environmental regulations, including permitting requirements and anti-bribery legislation, depletion of Hudbay's reserves, volatile financial markets that may affect our ability to obtain additional financing on acceptable terms, the failure to obtain required approvals or clearances from government authorities on a timely basis, uncertainties related to the geology, continuity, grade and estimates of mineral reserves and resources, and the potential for variations in grade and recovery rates, uncertain costs of reclamation activities, Hudbay's ability to comply with its pension and other post-retirement obligations, our ability to abide by the covenants in our debt instruments and other material contracts, tax refunds, hedging transactions, as well as the risks discussed under the heading "Risk Factors" in our most recent annual information form dated March 29, 2021.

Should one or more risk, uncertainty, contingency or other factor materialize or should any factor or assumption prove incorrect, actual results could vary materially from those expressed or implied in the forward-looking information. Accordingly, you should not place undue reliance on forward-looking information. We do not assume any obligation to update or revise any forward-looking information after the date of this Technical Report or to explain any material difference between subsequent actual events and any forward-looking information, except as required by applicable law.

Hudbay uses certain non-IFRS financial performance measures in its financial reports and in this 43-101 Technical Report. Cash cost and sustaining cash cost per pound of copper and ounce of gold produced are shown because the company believes they help investors and management assess the performance of its operations, including the margin generated by the operations and the company. Unit operating costs are shown because these measures are used by the company as a key performance indicator to assess the performance of its mining and processing operations. These measures do not have a meaning prescribed by IFRS and are therefore unlikely to be comparable to similar measures presented by other issuers. These measures should not be considered in isolation or as a substitute for measures prepared in accordance with IFRS and are not necessarily indicative of operating profit or cash flow from operations as determined under IFRS. Other companies may calculate these measures differently. For further details on these measures, including reconciliations of historical unit operating costs and cash costs per pound of copper produced to the most comparable IFRS measures, please refer to page 53 of Hudbay's management's discussion and analysis for the three and twelve months ended December 31, 2020 available on SEDAR at www.sedar.com.

This 43-101 Technical Report contains references to both United States dollars and Canadian dollars. All dollar amounts referenced, unless otherwise indicated, are expressed in constant Canadian dollars.

SIGNATURE PAGE

This Technical Report titled “NI 43-101 Technical Report, Constancia Mine, Cuzco, Peru”, dated March 29th 2021 and effective as of January 1st 2021, was prepared under the supervision and signed by the following author:

Dated this 29th day of March 2021.

/s/ Olivier Tavchandjian
Signature of Qualified Person

Olivier Tavchandjian, P. Geo.
Vice President, Exploration and Geology
Hudbay Minerals Inc.

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1. SUMMARY

This Technical Report has been prepared for Hudbay Minerals Inc. (“Hudbay”) to support the public disclosure of mineral resources and mineral reserves at Constancia mine as of January 1st, 2021. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects.

Hudbay is an integrated Canadian mining company with assets in North and South America, principally focused on the discovery, production, and marketing of base metals and precious metals. Hudbay’s objective is to maximize shareholder value through efficient operations, organic growth and accretive acquisitions, while maintaining its financial strength.

Hudbay’s operations at Constancia include the Constancia and Pampacancha pits, an ore processing plant, a waste rock facility, a tailings management facility and other ancillary facilities that support the operations.

As of the date of this Technical Report, the Constancia mine is in steady state production. The pre-stripping started in March 2014 and the concentrator ramp-up started in December 2014. Commercial production was achieved on April 30, 2015 and the operations continue in alignment with management’s expectations in terms of metal production and cost.

The Qualified Person (the “QP”) who supervised the preparation of this Technical Report is Olivier Tavchandjian, P. Geo. Mr. Tavchandjian is Vice-President Exploration and Geology of Hudbay.

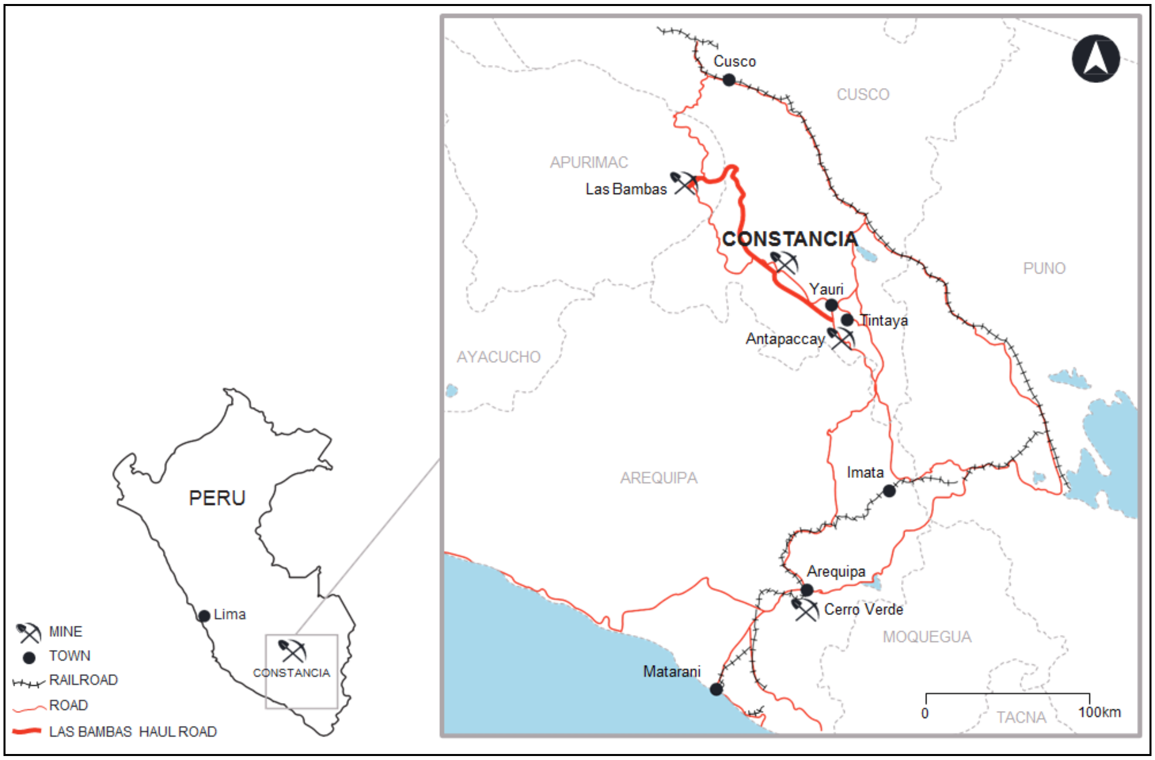
1.1. PROPERTY DESCRIPTION AND LOCATION

The Constancia mine is located approximately 600 km southeast of Lima in the south-eastern Andes of Peru, in the Chamaca, Livitaca and Velille districts, province of Chumbivilcas, department of Cusco, at approximately longitude 71°47´ and latitude 14°27´ south.

Hudbay owns an indirect 100% interest in the property, which consists of 36 mining concessions, all of them duly granted by the Peruvian State and recorded in the name of HudBay Peru S.A.C. (“Hudbay Peru”), a wholly-owned subsidiary of Hudbay. Figure 1-1, shows the location of Constancia.

The Constancia mine is accessible from Lima by air, via either Arequipa or Cusco, and then by vehicle over paved and gravel roads. The Constancia mine is located approximately 80 km from Yauri by road. Power for the Constancia mine is supplied from the new 220kV transmission line from Tintaya to Constancia that was built for and is owned by Hudbay but operated and maintained by a third party.

FIGURE 1-1: CONSTANCIA MINE LOCATION



1.2. GEOLOGICAL SETTING AND MINERALIZATION

CONSTANCIA

The Constancia deposit is a porphyry copper-molybdenum system which includes copper-bearing skarn mineralization. Multiple phases of monzonites and monzonite porphyry have intruded a sequence of sandstones, mudstones and micritic limestone of Cretaceous age.

The majority of the mineralization is associated with potassic alteration and quartz veining, occurring as chalcopyrite-(bornite)-molybdenite-pyrite mineralization in “A” and “B” type veinlets, and replacing ferromagnesian minerals or filling fractures. Copper grades are highest where fracture-filling style copper mineralization is superimposed on earlier disseminated copper mineralization. The higher-grade hypogene copper mineralization is hosted by a dense A-veinlet stockwork developed in an early porphyry phase. The pyrite/chalcopyrite ratio is typically below 2:1. Molybdenite commonly increases with depth in association to “B” veinlets. Bornite occurs sporadically especially at deeper levels, sometimes associated with some gold values.

Propylitic alteration is transitional to the potassic alteration and extends more than one kilometre from the porphyry intrusive contacts. The propylitic alteration mineral assemblage includes epidote-chlorite-calcite-pyrite-rhodochrosite. Subordinate chalcopyrite is also present, filling fractures or replacing mafic minerals. Sphalerite-galena veinlets and veins are distributed as a halo to the copper-molybdenum mineralization within the propylitic alteration zone up to 3 km away from the porphyry copper system.

Phyllic alteration forms a pervasive carapace surrounding and sometimes overprinting potassic alteration. The phyllic alteration accompanies almost complete destruction of primary rock textures; the mineral assemblage includes sericite-quartz-pyrite, limited amounts of chalcopyrite and associated occasional “D” veins and veinlets.

At the contact between intrusions and limestones, a magnetite garnet skarn develops, while a pyroxene–diopside (garnet–epidote) association is more common in calcareous sandstones and arkoses of the Chilloroya formation. Skarn mineralization is volumetrically much smaller, but grades are normally higher.

Structural deformation has played a significant role in concentrating the hydrothermal alteration and the copper-molybdenum-silver-gold mineralization, including skarn formation. Major inter and post mineral fracture systems in the deposit area strike northeast and include the Barite fault system. This is represented by a number of nearly parallel vein-faults carrying base metal sulphides and barite which have been exploited by artisanal workings throughout the property. A second important system strikes north-south. It appears to be more recent than the Barite system and controls part of mineralization and most of the silicified breccias (sometimes mineralized) in the system.

PAMPACANCHA

The Pampacancha deposit is a porphyry Cu-Mo-Au related Skarn system. Oligocene unmineralized basement diorite is intruded by the diorite porphyry cited as the source for skarn mineralization. This in turn is cut by intra-mineral monzonite intrusions which provide minor local increases in Cu-Au and also locally replaces skarn Cu-Au mineralization which is most developed at the upper and lower margins of the limestone body. Magnetite-chalcopyrite-pyrite skarn ranges to marginal less well mineralized garnet and pyroxene skarn, locally overprinted by epidote-bearing retrograde skarn.

Epithermal mineralization as low sulphidation quartz-sulphide Au + Cu style accounts for common supergene enriched Au anomalies along with other features such as hydrothermal alteration and veins typical of near porphyry locations.

1.3. EXPLORATION

Copper and gold exploration in the Constancia area dates back to the early 1990s. The San José prospect (now part of the Constancia Mine) was explored by Mitsui during the 1980s with a focus on delineation of high-grade ore amenable to process at the Katanga facility. Exploration consisted of detailed mapping, soil sampling, rock chip sampling, ground magnetic and IP surveys with several drilling campaigns, mainly located in the western and southern sides of the prospect.Rio Tinto expanded the exploration coverage in the Constancia area between 2003 and 2004.

Exploration activities between 2007 and 2011 were carried out by Norsemont Exploration Inc. and included geological mapping rock and stream sediment sampling and ground magnetic and IP surveys. From 2005 to 2010, Norsemont drilled 153,556m for infill, condemnation, metallurgical, geotechnical, hydrogeological and exploration, drilled by core and reverse circulation.

Following its acquisition of the Constancia Project in March 2011, Hudbay’s exploration activities focused on delineating the “new” Pampacancha deposit and understanding the district exploration upside. Since acquisition, Hudbay has completed over 45,000 m of drilling for resource definition, condemnation, metallurgical, geotechnical, hydrogeological and exploration drilling. These holes were drilled by core and reverse circulation.

From 2019 to 2020, additional exploration activities were carried out to the northwest of Constancia, between the northwest limit of the pit and the area known as Yanajaja. A succesful drill program was conducted over this area now referred to as Constancia Norte and the results have been incorporated in the updated mineral resource and mineral reserve estimates presented in this Technical Report.

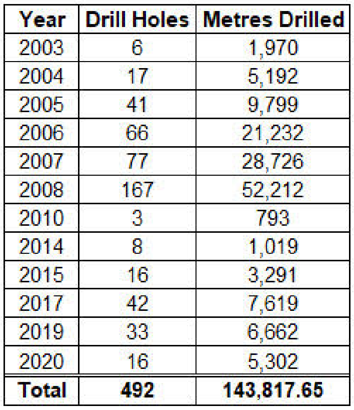
In December 2017, Hudbay completed the acquisition of a large, contiguous block of mineral rights including the Caballito, Maria Reyna and Kusiorcco concessions to explore for mineable deposits within trucking distance of the Constancia processing facility. Hudbay has made significant progress towards permitting, community relations and technical activities required to access and conduct drilling activities on these properties. Drilling started early in 2021 on the Quehuincha North target, a skarn prospect in a similar geological environment than Pampacancha and located approximately 10 km north of the Constancia mill. Exploration agreements with local communities are required before Hudbay can access and carry out exploration on the other satellite properties.

1.4. DRILLING

Extensive drilling has been conducted at the Constancia mine and the Pampacancha deposit by several successive property owners. The most recent drilling was done by Hudbay, with prior drilling campaigns completed by Rio Tinto and Norsemont.

Table 1-1 summarizes the drill holes used to estimate the current mineral resource estimate, with regional exploration holes excluded.

TABLE 1-1: DRILLING PROGRAMS BY YEAR (IN METRES DRILLED)



Year	Drill Holes	Metres Drilled
2003	6	1,970
2004	17	5,192
2005	41	9,799
2006	66	21,232
2007	77	28,726
2008	167	52,212
2010	3	793
2014	8	1,019
2015	16	3,291
2017	42	7,619
2019	33	6,662
2020	16	5,302
Total	**492**	**143,817.65**

1.5. SAMPLE PREPARATION, ANALYSES, AND DATA VALIDATION

Rio Tinto conducted its own internal Quality Control / Quality Assurance (QA/QC) program to independently evaluate the quality of the assays reported by ALS. Standards and blanks were systematically inserted in the sample stream.The core from the Norsemont drilling programs from 2005 to 2010 were transported to SGS and ALS Laboratories in Lima, Peru for preparation and analysis. Drill core samples across the Constancia deposit were also measured for specific gravity at ALS Chemex, Lima, Peru. Norsemont conducted its own internal QA/QC program to independently evaluate the quality of the assays reported by SGS and ALS. Duplicates, standards and blanks were systematically inserted in the sample stream.

During the Hudbay 2011 campaign, the samples were transported to the SGS laboratory in Lima, Peru for preparation and analysis while in 2014, the samples were transported to the SGS Constancia laboratory at the mine site for preparation. Once samples were pulverized, a 250 g subsample pulp was collected and air freighted to the SGS laboratory in Lima, Peru, for analysis. In 2015, the samples were transported to the SGS Constancia laboratory at the mine site for preparation and analysis and in 2017, for the twin hole drilling program, blanks and standards were inserted at site, prior to dispatching the core boxes to the Certimin laboratory in Lima for sample preparation followed by analysis at the Certimin and SGS laboratories in Lima. Since 2018, operation of the Constancia laboratory has been transferred to Bureau Veritas where all samples collected since have been sent for sample preparation. The pulps were then sent to the Bureau Veritas laboratory in Lima for ICP analysis. The SGS laboratory in Lima has been retained for external checks.

As part of Hudbay's QA/QC programs, samples were systematically introduced in the sample stream to assess adequate sub-sampling procedures, potential cross-contamination, precision, and accuracy.

A total of 2,166 samples from 292 drill holes were collected for specific gravity determinations and sent to ALS Chemex and SGS labs in Lima, Peru. Density measurements were done using immersed wax coated core. The drill core samples, 8 to 10 cm long, were taken every 50 m from half-split core.

An internal validation of the drillhole database against the original drill logs and assay certificate information was carried out by Hudbay in 2020. During this exercise, approximately 5% of the total database was entirely validated with the exception of 4 samples representing 0.09% of the total and therefore the database can be considered very reliable. A comparison with previous versions of the resource modelling database used between 2014 and 2019 highlighted that precision had been truncated to the second decimal place resulting in an under-estimation of the gold grade and with no significant impact on the other metals of economic significance. The correction of this truncation in 2020 has resulted in the elimination of a conservative bias in gold content of approximately 10% previously experienced and that had not been detected since at least 2014.

1.6. MINERAL PROCESSING AND METALLURGICAL TESTING

The ore types that are currently being processed in the concentrator were established during the Definitive Feasibility Study (DFS) as the hypogene, supergene, skarn, mixed and high zinc types. The metallurgical responses of these ores are acceptable in terms of treatment rate, recovery and molybdenum and copper concentrate grades. Metallurgical test work has been and continues to be performed at laboratory and plant levels to optimize the reagents, operating conditions, and flowsheet configuration for each ore type.

The process plant tonnage is based primarily on current and historical plant performance. Geometallurgical test work indicates that the Constancia ore hardness is increasing, but the softer Pampacancha ores allow for the deferral of the pebble crushing circuit, now scheduled for installation in 2023 and operation as of 2024. Basic engineering has been completed for the project, and the capital cost is estimated at $22 million.

Metal recovery from Constancia ores is estimated based on plant performance and geometallurgical testing. Current plant recovery is lower than design because of the coarser nominal grind size (150 µm) attributable to the increase in plant treatment capacity from 76,000 TPD to 90,000 TPD. A comprehensive recovery optimization program is scheduled for implementation in 2023, aimed at debottlenecking the regrind and cleaning circuit and increasing the recovery to design levels. The capital cost estimated for this project is $7.85 million.

The Pampacancha ore recovery and throughput assumptions when processed at the Constancia plant are based on prefeasibility level engineering and were updated for this technical report based on a feasibility level laboratory test program Table 1-2 shows the estimated copper and molybdenum recoveries estimated for the years of 2021 to 2037. Pampacancha recoveries are constant at 85%.

TABLE 1-2: COPPER PRODUCTION PER YEAR

Year	Cu [%]	Cu Recovery [%]	Mo [%]	Mo Recovery [%]
2021	0.306	84.8%	0.013	40.8%
2022	0.409	85.1%	0.010	44.4%
2023	0.441	84.7%	0.017	45.4%
2024	0.469	86.9%	0.011	45.5%
2025	0.340	85.7%	0.012	47.8%
2026	0.350	86.9%	0.009	46.8%
2027	0.335	86.4%	0.010	50.5%
2028	0.390	86.4%	0.010	48.1%
2029	0.301	86.4%	0.007	47.0%
2030	0.218	85.7%	0.009	48.3%
2031	0.201	86.0%	0.005	44.2%
2032	0.251	86.1%	0.006	46.9%
2033	0.254	85.7%	0.006	46.1%
2034	0.296	86.3%	0.005	45.2%
2035	0.291	83.7%	0.007	58.4%
2036	0.219	87.2%	0.006	47.4%
2037	0.248	86.5%	0.007	48.1%

1.7. MINERAL RESOURCE ESTIMATES

CONSTANCIA

The Constancia mineral resource estimate is effective as of January 1st, 2021.

The initial mineral resource and mineral reserve estimate for Constancia was completed by AMEC in 2012, on behalf of Hudbay, and published by Hudbay in a technical report dated October 15, 2012 and titled “National Instrument 43-101 Technical Report, Constancia Project, Province of Chumbivilcas, Department of Cusco, Peru”.

Additional work performed by Hudbay between 2012 and 2017 led to mineral resource and mineral reserve estimate updates supporting a technical report filed on the property by Hudbay in March 2018 (the “2018 Technical Report”).

After carrying out additional work between 2018 and 2020, Hudbay has completed a new mineral resource and mineral reserve estimate for Constancia, with an effective date of January 1st, 2021 which constitutes the basis for the updated mineral resource estimate presented in this Technical Report. A total of 143,917 m in 492 holes have been used in the construction of the resource model for the Constancia deposit.

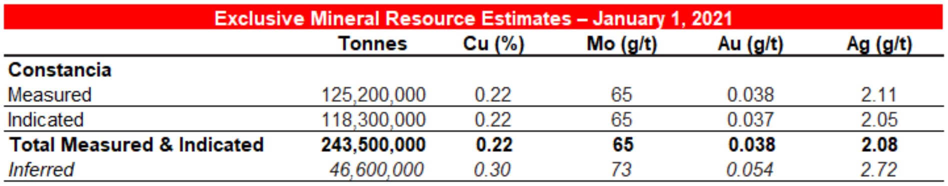
Resource modeling at Constancia is based on integrated geological and assay interpretations of information recorded from diamond core logging and assaying and is comprised of the following key steps: Construction of mineralized envelopes, Exploratory Data Analysis, Modelling (Composites, Variography and Interpolation) and Validations including a thorough assessment of the smoothing effect occurring during grade interpolation by domain with consistent drill spacing and statiscal distritbutions and correction for over-smoothing when required. This methodology is validated through reconciliation between mineral reserve estimates and mill credited production.

The Constancia geological model was developed from an initial interpretation of six lithology domains, six alteration types and five oxidation zones. The oxidation model is based on sequential copper formulation and logging codes. This geological framework was then used to model two continuous estimation domains hosting the mineralization grading above 0.1% Cu respectively in the supergene, hypogene and Northern skarn domains. Grade estimation was also conducted separately in post mineralization barren dykes cross-cutting the mineralization as well in the host rocks and in the oxidised/leach cap domain. Mineral resource and mineral reserve estimates are only reported from the supergene, hypogene and skarn domains.

For the three domains of hypogene, supergene and skarn mineralization, resource classification is based on the kriging slope of regression which is a function of drill spacing, the continuity of the mineralization and mining block geometry. This parameter has been found to provide a reliable resource classification criteria by Hudbay through quarterly and annual reconciliation between reserve estimates and mill credited production at its operating mines. The kriged regression slope for measured resources at Constancia is >80% and is between 60 and 80% for indicated resources. Some local adjustments were made to produce resource category domains that are smoother and more continuous.

The mineral resource estimates exclusive of mineral reserve estimates, which is consistent with the presentation in Hudbay's Annual Information Form, are reported in Table 1-3 at a US$6.14/tonne Net Smelter Return (NSR) cut-off and inside an economic pit shell demonstrating that they have reasonable prospects for economic extraction under the same economic assumptions as used for reserve reporting.

TABLE 1-3: CONSTANCIA MINERAL RESOURCE ESTIMATES EXCLUSIVE OF MINERAL RESERVES AS OF JANUARY 1ST, 2021



Exclusive Mineral Resource Estimates – January 1, 2021

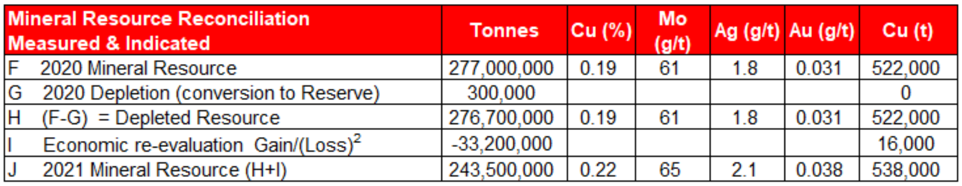
	Tonnes	Cu (%)	Mo (g/t)	Au (g/t)	Ag (g/t)
Constancia					
Measured	125,200,000	0.22	65	0.038	2.11
Indicated	118,300,000	0.22	65	0.037	2.05
Total Measured & Indicated	**243,500,000**	**0.22**	**65**	**0.038**	**2.08**
Inferred	*46,600,000*	*0.30*	*73*	*0.054*	*2.72*

Notes:

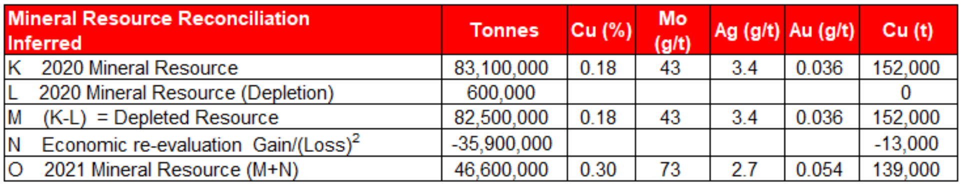
1. Totals may not add up correctly due to rounding.
2. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
3. Mineral resource estimates do not include factors for mining recovery or dilution.
4. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral resources.
5. Constancia mineral resources are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.
6. Mineral resources are based on resource pit designs containing measured, indicated, and inferred mineral resources.

The comparison between the January 1st, 2020 and January 1st, 2021 mineral resource estimates is presented in Table 1-4. The measured, indicated and inferred resource tonnages exclusive of mineral reserve estimates have been reduced in the 2020 estimates by 33Mt and 36Mt respectively due to resource to reserve conversion and the removal of low grade inferred resources in host rocks. The overall metal contained in mineral resource estimates has been maintained as the reduction in tonnage has been offset by an improvement in average grade for all metals for the most part due to the success of the drilling program at Constancia Norte which has resulted in the addition of high grade skarn mineralization not yet converted to reserves either due to lack of drilling or high strip ratio.

TABLE 1-4: COMPARISON BETWEEN THE JANUARY 1, 2020 AND JANUARY 1, 2021 MINERAL RESOURCE ESTIMATES FOR CONSTANCIA



Mineral Resource Reconciliation Measured & Indicated	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
F 2020 Mineral Resource	277,000,000	0.19	61	1.8	0.031	522,000
G 2020 Depletion (conversion to Reserve)	300,000					0
H (F-G) = Depleted Resource	276,700,000	0.19	61	1.8	0.031	522,000
I Economic re-evaluation Gain/(Loss)[2]	-33,200,000					16,000
J 2021 Mineral Resource (H+I)	243,500,000	0.22	65	2.1	0.038	538,000



Mineral Resource Reconciliation Inferred	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
K 2020 Mineral Resource	83,100,000	0.18	43	3.4	0.036	152,000
L 2020 Mineral Resource (Depletion)	600,000					0
M (K-L) = Depleted Resource	82,500,000	0.18	43	3.4	0.036	152,000
N Economic re-evaluation Gain/(Loss)[2]	-35,900,000					-13,000
O 2021 Mineral Resource (M+N)	46,600,000	0.30	73	2.7	0.054	139,000

Notes:

1. Totals may not add up correctly due to rounding.
2. Re-evaluation of economic viability.
3. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
4. Mineral resource estimates do not include factors for mining recovery or dilution.
5. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral resources.
6. Constancia mineral resources are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.
7. Mineral resources are based on resource pit designs containing measured, indicated, and inferred mineral resources.

PAMPACANCHA

Resource estimation at Pampacancha is based on a total of 140 holes (38,240 metres) with 28 of those being derived from reverse circulation drilling and the remaining 112 from HQ diameter diamond drilling. All holes were drilled from surface by Geotec. Core recovery is near 100% for all holes. There have been no change to the mineral resource model for Pampacancha since 2017.

The skarn unit hosts the vast majority of the copper-gold-silver-molybdenum mineralization.

The Pampacancha geological model was developed from an initial interpretation of a high grade and a low grade skarn domains and using a smooth grade envelope defined at a 0.1% Cu cut-off to limit grade smearing into the host rocks. No hard boundary was used for grade interpolation purposes between the low grade and high grade skarn sub-domains.

Similarly to Constancia, the regression slope values obtained from the kriging of the copper grade estimates were used as a basis for resource classification. 90% and 80% regression slope thresholds were used respectively to separate measured from indicated and indicated from inferred resources. Since the scale of the operation will be significantly smaller and no mining has yet occurred at Pampacancha, the threshold to report measured and indicated was set higher than at Constancia which used 80% and 60% thresholds, respectively on the kriging regression slope.

There has been no change to the mineral resource estimates for Pampacancha as of January 1, 2021. Pampacancha mineral resource estimates are reported at a US$6.14/tonne Net Smelter Return (NSR) and inside a pit shell demonstrating that they have reasonable prospects for economic extraction.

TABLE 1-5: PAMPACANCHA MINERAL RESOURCE ESTIMATES EXCLUSIVE OF MINERAL RESERVES AS OF JANUARY 1, 2021

Exclusive Mineral Resource Estimates – January 1, 2021					
	Tonnes	**Cu (%)**	**Mo (g/t)**	**Au (g/t)**	**Ag (g/t)**
Pampacancha					
Measured	11,400,000	0.41	101	0.245	4.95
Indicated	6,000,000	0.35	84	0.285	5.16
Total Measured & Indicated	**17,400,000**	**0.39**	**95**	**0.259**	**5.02**
Inferred	*10,100,000*	*0.14*	*143*	*0.233*	*3.86*

Notes:

1. Totals may not add up correctly due to rounding.
2. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
3. Mineral resource estimates do not include factors for mining recovery or dilution.
4. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral resources.
5. Mineral resources are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.
6. Mineral resources are based on resource pit designs containing measured, indicated, and inferred mineral resources.

1.8. MINERAL RESERVE ESTIMATES

Mineral Reserves estimates for the Constancia and Pampacancha deposits, which are presented in this Technical Report, were prepared by Hudbay. The Qualified person who supervised the preparation of this Technical Report is Olivier Tavchandjian, P.Geo. Mr. Tavchandjian is Hudbay’s Vice-President Exploration and Geology of Hudbay.

Hudbay has opted to use an NSR optimization model taking into account the Cu, Mo, Ag, and Au grades, mill recoveries, contained metal in concentrate, deductions and payable metal values, metal prices, freight costs, smelting and refining charges and royalty charges.

The 2020 Proven and Probable Reserve estimates at the Constancia mine total 532.5 million tonnes at a copper grade of 0.31% that supports a 17 year mine life. The mine plan is based on the capacity of the process plant, which in turn relies on the grinding circuit throughput. The plant has the capacity to process 31 Mtpy (90ktpd at 94% availability)

TABLE 1-6: CONSTANCIA AND PAMPACANCHA MINERAL RESERVES AS AT JANUARY 1ST, 2021

Mineral Reserve Estimates – January 1, 2021					
	Tonnes	**Cu (%)**	**Mo (g/t)**	**Au (g/t)**	**Ag (g/t)**
Constancia					
Proven	**436,500,000**	**0.29**	**83**	**0.041**	**2.88**
Probable	**56,100,000**	**0.25**	**69**	**0.045**	**3.09**
Total proven and probable	**492,600,000**	**0.29**	**82**	**0.042**	**2.90**
Pampacancha					
Proven	**32,400,000**	**0.59**	**178**	**0.368**	**4.48**
Probable	**7,500,000**	**0.62**	**173**	**0.325**	**5.75**
Total proven and probable	**39,900,000**	**0.60**	**177**	**0.360**	**4.72**
Total Mineral Reserve	**532,500,000**	**0.31**	**89**	**0.066**	**3.04**

Notes:

1. Totals may not add up correctly due to rounding.
2. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral reserves.
3. Mineral reserves are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.

A comparison of the December 31st, 2019 and December 31st, 2020 Mineral Reserve estimate is summarised in Table 1-7 for the Constancia pit. The January 1st, 2021 Constancia Reserve estimate shows an increase of 12% after substracting the mining depletion in the copper contained in the Mineral Reserves estimates at Constancia. The reserve addition at Constancia results from a successful drilling campaign at Constancia Norte and a revision and improvement of the mine design and mine plan.

TABLE 1-7: COMPARISON OF THE MINERAL RESERVE ESTIMATES AT CONSTANCIA BETWEEN JANUARY 1ST, 2020 AND JANUARY 1ST, 2021

Constancia Mine - January 1, 2021[1]

Mineral Reserve Reconciliation (Proven & Probable)	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
A 2020 Mineral Reserve	486,300,000	0.28	83	2.89	0.036	1,349,000
B 2020 Production / Depletion (from Reserve)	26,300,000	0.34	156	2.9	0.029	88,000
C (A-B) = Depleted Reserve	460,000,000	0.27	79	2.9	0.037	1,261,000
D Mine Planning & Exploration Gain/(Loss)	32,600,000	0.48	144	3.1	0.115	157,000
E 2021 Mineral Reserve (C+D) including stocks	492,600,000	0.29	83	2.9	0.042	1,418,000

Mineral Resource Reconciliation Measured & Indicated	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
F 2020 Mineral Resource	277,000,000	0.19	61	1.8	0.031	522,000
G 2020 Depletion (conversion to Reserve)	300,000					0
H (F-G) = Depleted Resource	276,700,000	0.19	61	1.8	0.031	522,000
I Economic re-evaluation Gain/(Loss)[2]	-33,200,000					16,000
J 2021 Mineral Resource (H+I)	243,500,000	0.22	65	2.1	0.038	538,000

Mineral Resource Reconciliation Inferred	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
K 2020 Mineral Resource	83,100,000	0.18	43	3.4	0.036	152,000
L 2020 Mineral Resource (Depletion)	600,000					0
M (K-L) = Depleted Resource	82,500,000	0.18	43	3.4	0.036	152,000
N Economic re-evaluation Gain/(Loss)[2]	-35,900,000					-13,000
O 2021 Mineral Resource (M+N)	46,600,000	0.30	73	2.7	0.054	139,000

Notes:

1. Totals may not add up correctly due to rounding.
2. Re-evaluation of economic viability.
3. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
4. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral reserves and resources.
5. Constancia mineral reserves and resources are estimated using a minimum NSR cut-off of US$6.14 per tonne.
6. Metallurgical recoveries are applied by ore type and assumed to be 85.8% on average for the life of mine.

The updated mineral reserve estimates are supported by reserve to mill credit reconciliation work conducted by Hudbay since 2017.

1.9. MINING METHODS

The Constancia mine is a traditional open pit operation using conventional truck and shovel mining. The Constancia ultimate pit design will measure approximately 1.6 km east to west, 1.7 km north to south, and have a maximum depth of around 705 m. The Pampacancha ultimate pit design will measure approximately 0.6 km east to west, 1 km north to south, and have a maximum depth of about 300 m. A primary waste rock facility (WRF), which is located to the south and east of the Constancia pit, is intended to be used for both deposits.

The processing facility is located approximately 1 km west of the Constancia Pit. A non-acid generating (NAG) stockpile for waste material is located at the south side while the tailings management facility (TMF) is located 3.5 km to the southwest of the Constancia pit.

MINE PHASES

Final pit limit designs have been created for Constancia and Pampacancha based on the selected pit shells from the pit optimization. Nine pit stages were developed for Constancia and two pit stages for Pampacancha Pit as described in Table 1-8 below. The minimum mining width for each phase is 60 metres which allows for operation of a shovel, trucks (in two lines) and a drill. The phased development strategy consists of extracting the highest metal grades along with minimum strip ratios during the initial years to maximize the economic benefits of the ore-body, while enabling smooth transitions in waste stripping throughout the life of the mine to ensure enough ore exposure for mill feed. The following Figure 1-2 shows the footprint of the ultimate pits for Constancia and Pampacancha at the end of the mine life.

Total ore reserves included in the final two pits is estimated to be 532.5 million tonnes and total waste material is estimated to be 569.4 million tonnes. Approximately 6.8 million tonnes of medium and low grade ore had been hauled to the temporary stockpiles as of the end of 2020. This material will be sent to and reclaimed from the stockpiles through the life of mine. At the end of the mine's life, the ore from these stockpiles will be reclaimed and processed.

FIGURE 1-2: CONSTANCIA AND PAMPACANCHA ULTIMATE PIT DESIGN

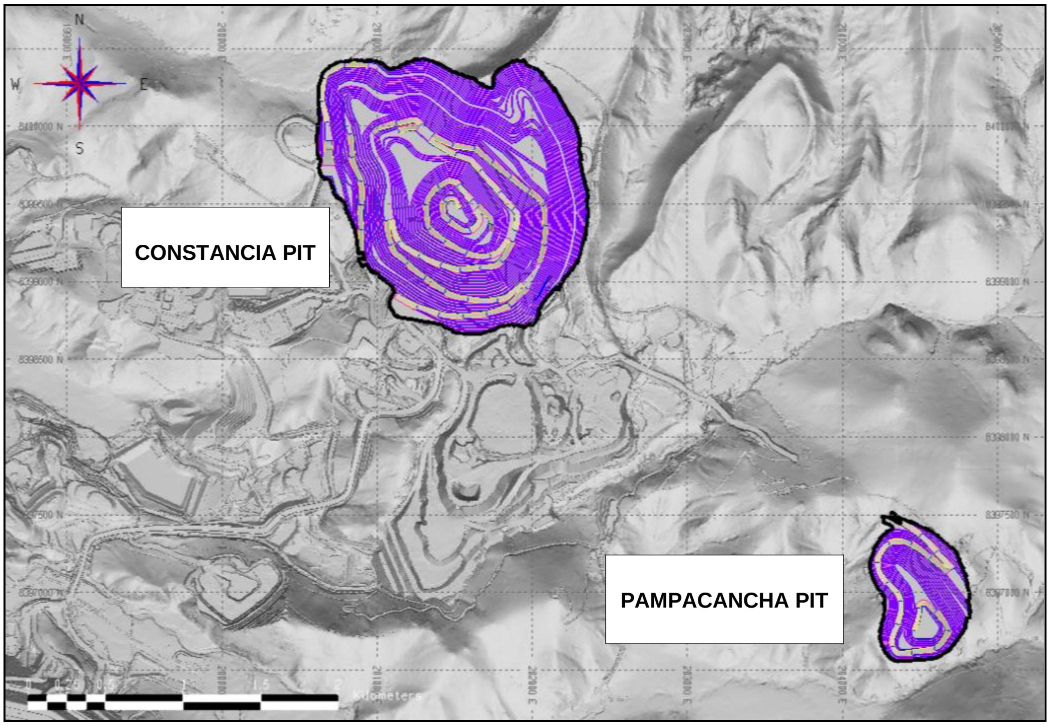


TABLE 1-8: CONSTANCIA AND PAMPACANCHA BREAKDOWN BY PHASES AS OF JANUARY 1^{ST}, 2021

PIT	Phases	Ore, Mt	Cu%	Mo%	Auppm	Agppm	Waste, Mt
Constancia	**02**	1.1	0.33	0.017	0.020	2.29	0.4
	04	53.8	0.31	0.011	0.040	2.81	27.8
	05	140.3	0.32	0.010	0.044	3.12	95.8
	06	59.2	0.33	0.008	0.039	3.65	98.4
	07						0.8
	08	50.7	0.32	0.005	0.033	3.41	113.5
	09	180.6	0.23	0.007	0.044	2.40	152.6
	Sub Total	**485.8**	**0.29**	**0.008**	**0.042**	**2.91**	**489.2**
Pampacancha	**PC01**	23.4	0.55	0.020	0.349	4.38	40.1
	PC02	16.5	0.66	0.014	0.376	5.20	40.1
	Sub Total	**39.9**	**0.60**	**0.018**	**0.360**	**4.72**	**80.2**
Stockpiles	**I - V**	**6.8**	**0.28**	**0.007**	**0.061**	**2.37**	
	TOTAL	**532.5**	**0.31**	**0.009**	**0.066**	**3.04**	**569.4**

MINE PRODUCTION SCHEDULE

The operating and scheduling criteria used to develop the mining sequence plans are summarized in Table 1-9 below.

TABLE 1-9: MINE PRODUCTION SCHEDULE CRITERIA

Annual Moved Production Base Rate (as max.)	**81.0 Mtonnes**
Annual Ore Production Base Rate	**30.9 - 31.4 Mtonnes**
Daily Ore Production Base Rate	90 - 94 ktpd
Process Plant yearly availability	94%
Operating Hours per shift	12
Operating Shifts per Day	2
Operating Days per Week	7
Scheduled Operating Days per Year	365 / 366
Number of Mine Crews	3

Pit and mine maintenance operations are being scheduled around the clock. Allowances for down time and weather delays have been included in the mine equipment and manpower estimations.

A variable cut-off grade strategy is implemented to bring forward the higher grade ore from the pit to the early part of the ore production schedule. Delivering higher grade ore to the mill in the early years will improve the net present value and internal rate of return of the project. Priority plant feed consists of higher grade material (NSR > 10$/t). The lower grade material is processed as needed or sent to long term ore stockpiles to be reclaimed at the end of mine life.

The mine production plan includes 569.4 Mt of waste and 532.5 Mt of ore (from both pits and stockpiles), yielding an average stripping ratio (waste/ore) of 1.1. An average yearly mining rate of 77.0 Mtpy, through the first 13 years, with a maximum of 81 Mtpy, is required to provide a nominal ore process feed rate of 31.3 Mtpy based on a variable throughput by ore type (90-94 ktpd and 94% availability). The ore production schedule for the operation presents step down trends with the Cu grade averaging 0.44% Cu from 2022 to 2024 when Pampacancha is at its peak production, then reducing to 0.34 % Cu from 2025 to 2029 with the preferential scheduling of higher grade mineralization from the Contancia pit and finally decreasing to 0.25% Cu to the end of the mine life. The LOM average grade is 0.311% Cu, 0.009% Mo, 0.065 g/t Au and 3.04 g/t Ag for the remaining 17 years of the mine life. The estimated plant feed schedule is summarized in Table 1-10.

WASTE ROCK FACILITY (WRF)

The final design geometry for the WRF incorporates the same slope profile as the original WRF: 20 m high benches with 1.4H:1V (36°) of bench slopes and 32 m wide benches. The overall slope of the stockpile will be about 3.0H:1V (18°). The current remaining capacity of the WRF is estimated at 413 Mt. and as such there is sufficient capacity to accommodate the waste rock needs for the revised LOM plan.

ORE STOCKPILES

The Constancia mine is planned to have four operational stockpiles, which will segregate the ROM material by ore type and grade range. The lift height of these stockpiles ranges between 12 and 20 meters. The planned maximum stockpiles capacities are:

- Stockpile 01 : 600 Kt
- Stockpile 02 : 500 Kt
- Stockpile 03 : 600 Kt
- Stockpile 04 : 5,000 Kt (stock located inside WRF, lift 4240, and used until 2025)
- Stockpile 05 : 2,000 Kt (a finger from stock 04 destinated for Pampacancha ore)
- Stockpile 06: 70,000 Kt (low-grade stock located at south from WRF)

TABLE 1-10 ORE PROCESSING PLAN 2021 – 2037 (TOTAL)

LOM		P21Jan																	TOTAL
Year		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
PRODUCTION	Tonnes to Cu Plant, kt	30,944	30,958	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,438	31,347	532,499
	Cu%	0.306	0.403	0.452	0.479	0.332	0.344	0.313	0.383	0.322	0.217	0.185	0.249	0.252	0.294	0.288	0.269	0.201	0.311
	Cu In Situ, Mlb	209	275	312	332	229	238	216	266	223	150	128	173	174	203	199	186	139	3,652
	Au (g/t)	0.07	0.15	0.14	0.19	0.05	0.05	0.04	0.05	0.04	0.03	0.03	0.05	0.05	0.04	0.05	0.04	0.03	0.07
	Ag (g/t)	2.97	3.20	3.81	3.93	3.24	3.74	3.15	3.79	2.85	3.25	2.05	2.49	2.59	2.71	2.59	2.71	2.56	3.04
	Tonnes to Mo Plant, kt	30,944	30,958	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,438	31,347	532,499
	Mo%	0.013	0.011	0.017	0.012	0.012	0.009	0.010	0.010	0.007	0.008	0.005	0.006	0.006	0.005	0.007	0.007	0.007	0.009
RECOVERIES	CuT Recovery, %	84.8%	84.2%	84.7%	86.7%	86.0%	86.7%	86.6%	86.5%	86.1%	85.8%	86.0%	86.0%	85.7%	86.3%	83.9%	87.0%	85.3%	85.8%
	Au (g/t) Recovery, %	61.6%	65.0%	65.9%	67.3%	52.2%	47.2%	45.7%	49.3%	45.1%	44.6%	45.3%	48.7%	46.5%	45.5%	46.0%	46.5%	48.0%	56.3%
	Ag (g/t) Recovery, %	66.8%	64.1%	67.7%	68.0%	66.8%	64.5%	65.6%	66.8%	62.9%	67.9%	65.6%	65.0%	64.5%	63.7%	60.1%	68.1%	65.1%	65.6%
	MoT Recovery, %	33.2%	43.1%	46.0%	46.5%	48.1%	46.0%	49.8%	48.5%	47.1%	47.7%	43.7%	47.4%	46.3%	44.7%	58.2%	51.1%	43.6%	46.2%
CONC. Cu	Conc. Tonnes	344,590	464,044	531,981	569,406	384,467	402,850	362,311	435,775	375,249	254,019	216,606	288,687	292,710	348,712	328,905	311,117	229,462	6,140,891
	Cu% into Conc.	23.3%	22.6%	22.6%	22.9%	23.3%	23.2%	23.4%	23.9%	23.2%	23.0%	23.0%	23.4%	23.2%	22.8%	23.1%	23.6%	23.4%	23.1%
	Au (g/t) into Conc.	4.1	6.5	5.5	7.0	2.2	1.9	1.7	1.8	1.5	1.6	1.9	2.9	2.3	1.7	2.2	2.1	2.2	3.2
	Ag (g/t) into Conc.	178.4	136.7	151.8	147.7	176.1	187.9	179.0	182.8	149.6	272.6	194.8	176.6	178.8	155.4	148.5	186.6	228.0	172.9
CONTAINED METAL IN CONC. Cu	Cu Pounds, Mlb	177.3	231.6	264.8	287.8	197.1	206.0	187.2	229.9	191.8	128.7	109.9	148.7	149.4	175.2	167.2	162.1	118.6	3,133
	Cu Fine, KTonnes	80.4	105.1	120.1	130.5	89.4	93.4	84.9	104.3	87.0	58.4	49.8	67.4	67.8	79.5	75.9	73.5	53.8	1,421
	Acum Cu Fine, KTonnes	80	185	306	436	526	619	704	808	895	953	1,003	1,071	1,139	1,218	1,294	1,367	1,421	
	Au Fine, KOunces	45	97	94	128	27	25	19	26	18	13	13	27	22	19	23	21	16	633
	Ag Fine, KOunces	1,977	2,039	2,596	2,704	2,177	2,434	2,086	2,561	1,805	2,226	1,357	1,639	1,683	1,743	1,570	1,867	1,682	34,145
CONC. Mo	Conc. Mo Tonnes	2,583	2,842	4,976	3,580	3,588	2,496	3,076	3,140	2,035	2,527	1,375	1,814	1,752	1,366	2,690	2,202	1,942	43,983
	Mo% into Conc. Mo	49.9%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
CONTAINED Mo	Mo Fine, KTonnes	1.3	1.4	2.5	1.8	1.8	1.2	1.5	1.6	1.0	1.3	0.7	0.9	0.9	0.7	1.3	1.1	1.0	22

MINE EQUIPMENT

There are several different rock types at the Constancia operation but for production estimation purposes, the weighted average of all rock types was used. Major loading and haulage equipment is equipped with electronic monitors which will ensure maximum loading. All production is reported in dry metric tonnes which is consistent with the reserve model. A moisture content ranging between 3.5 and 4.5 percent was measured, and 4.0 percent was used for haulage calculations.

Mine equipment requirements were developed based on the annual tonnage movements projected by the mine production schedule with bench heights of 15 metres, operating two twelve-hour shifts per day, 365 days per year. Productivity is based on current performance and material characteristics specific to the deposit. The fleet requirements also considered:

- production drilling;
- loading and hauling of sulfide ore to the primary crusher (located on the east side of the pit), and to the WRF and TMF areas;
- maintenance of mine haulage and access roads; and
- maintenance of the WRF areas, ore stockpiles, TMF and berms, and regrading of slopes and final surfaces.

MINE ENGINEERING

The pit slope angles used for pit optimization of the Constancia and Pampacancha pits are based on engineering studies conducted at pre-feasibility or higher levels of engineering. The pit slope design was developed by Golder, in December 2019 for Constancia and by TWP/Itasca in August 2013 for Pampacancha.

The predicted total dewatering rates for the Pit Expansion Design and the area of influence will be similar to the 180 L/s level approved in the Groundwater Use Licence. The design was partially driven by requirements for mine water supply but the main goal of the dewatering is to depressurize the pit wall to assure the overall pit slope stability.

1.10. RECOVERY METHODS

The process plant was designed, built and commissioned by Ausenco. The recent concentrator production rate is approximately 90,000 tpd with a 94% physical availability. The plant consists of the following areas: crushing, stockpiling, milling, bulk rougher flotation, regrinding, bulk cleaner flotation, concentrate thickening, molybdenum flotation, copper concentrate filtration, and tailings thickening. The final products are copper and molybdenum concentrates, which are shipped by road from site to the port of Matarani for shipment to customers.

Power supply is provided by the south national energy system in the highland sector (New Tintaya sub-station). Water for the process plant is provided by recirculation from the tailings thickeners, TMF, and pit dewatering wells.

For plant automation and process control, a distributed control system (DCS) is used for starting and stopping equipment and control of level, lubrication systems, flows, temperatures, and equipment protection, among others

1.11. PROJECT INFRASTRUCTURE

The infrastructure facilities that support the current operation including the WRF, TMF, water management, electric power supply and transmission, roads and the port.

The TMF is located on the south side of the Chilloroya River and has been designed to store 600 million tonnes (Mt) of tailings with a final design elevation of 4,190 masl. The TMF has two stages. The first designed by KP (engineering detail) to 4,160 masl and the second stage design by Golder (prefeasibility study) that rises from 4,160 to 4,190 masl without moving the previous footprint. The actual elevation of embankment is 4,097 masl, as approved by the authority for operations until 2019 with with two metres of freeboard. The design of the TMF includes a LLDPE geomembrane liner and underdrains for valleys. According to the LOM plan of the TMF, and as per water balance, construction periods will occur in 2021, 2023, 2025, 2027, 2029, 2031, 2033 and 2035. Optimization of the LOM to ensure sufficient quality rock from the pit for the TMF construction has been completed, such that the mining fleet is utilized for hauling, placement and compaction of structural fill over the downstream and upstream zone of the embankment.

Tailings have been deposited from designated off-take points from a distribution pipeline located along the upstream crest of the embankment at an elevation of 4,097m (spigotting system) and around the perimeter of the facility (discharge diffuser).

The Potentially Acid Generating and Non-Acid Generating Waste Rock Facilities (PAG & NAG WRF) are located in the Cunahuiri Valley east of the Constancia Pit and provide storage for 581 Mt. The facilities receive mine waste material from the operation of the Constancia pit and from the Pampacancha pit. Underdrain systems include groundwater underdrains to collect the water to WRF Retention pond.

The WRF Retention Pond is located downstream from the WRF in the Cunahuiri Valley and provides energy dissipation for surface water. The WRF Containment Pond is located downstream of the WRF Retention Pond to provide storage capacity for surface runoff, direct precipitation and seepage collected from the WRF and its contact diversion channels. Water management structures also include diversion channels, sediment ponds, water management ponds and main sediment pond. Hudbay Peru performed a site-wide process water balance for the final design phase of the Constancia mine based on the updated Mine Plan.

There are two camps on-site: Constancia is a permanent camp with a 2,930 people capacity and Fortunia is a pioneer camp and served as an overflow camp during the construction stages for 627 people. These camps have been designed with reference to the IFC standards for camp construction for mining activities.

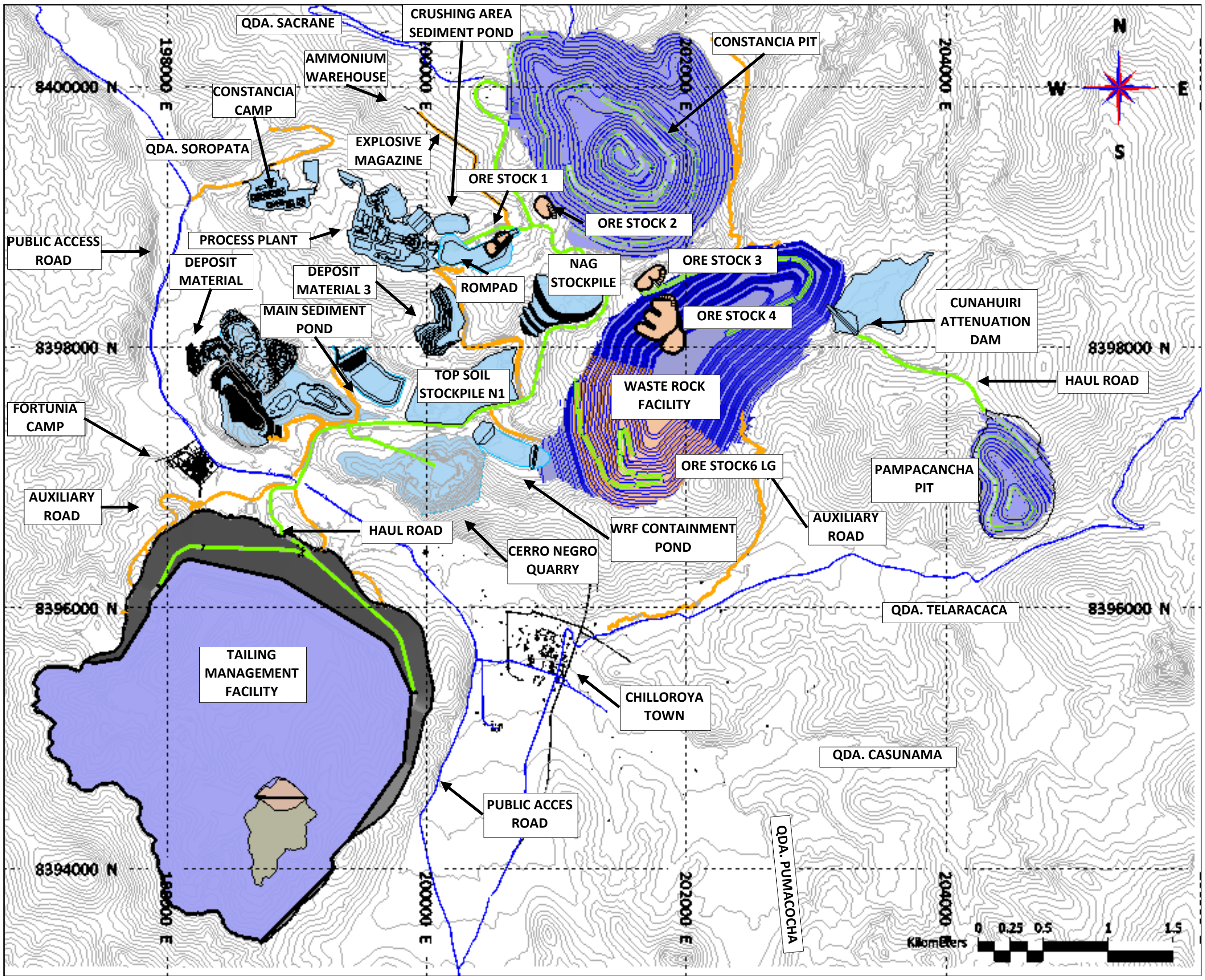
Power supply for the Constancia mine comes from the new 220kV transmission line from Tintaya to Constancia that was built for and owned by Hudbay, but is operated and maintained by a third party. This transmission line is connected to the Constancia electric substation that transforms 220kV to 23 kV. The electric control room manages the 23kV system that provides energy to the entire mine. In case of emergency, there are three generators that provide energy in a semi-automated way.

The primary road to site, consists of a 65 km road (National Route PE-3SG) from Coporaque to the Puente Bailey/Constancia. These roads (and bridges) have been upgraded as necessary, to meet the needs of construction and life of mine use. In order to ensure good road conditions, Hudbay performs maintenance as necessary due to heavy truck traffic and the transportation of concentrate and consumables.

Copper concentrate is transported from the Constancia mine to the Matarani port by trucks (485km). These trucks are equipped with a hydraulically operated covered-box hinged at the rear, the front of which can be lifted to allow the concentrate to be deposited in the concentrate shed assigned to Hudbay by TISUR, the port operator. Pier C has been assigned to Hudbay and has a 75 Kt capacity. A chute from the shed feeds a tubular conveyor into a ship loader system with a nominal capacity of 1,500 tons per hour. The same conveyor and ship loading equipment is shared with other copper concentrate exporters. Hudbay is the primary customer for Pier C that was designed to take concentrates by truck and railroad.

Figure 1-3 provides an overall site layout showing the location of the various storage facilities relative to the Constancia and Pampacancha pits and the mill.

FIGURE 1-3: CONSTANCIA SITE LAYOUT



1.12. MARKET STUDIES AND CONTRACTS

Constancia copper concentrate is a clean, medium grade concentrate containing small gold and silver by-product credits. It is a desirable feedstock for copper smelters in China which is the most geographically appropriate freight destination but is also suitable for processing by smelters in Europe, India and South America.

Constancia copper concentrate is sold directly to a variety of copper smelters in Asia, Europe and India as well as internationally recognized trading companies. Between 85% and 90% of sales are made pursuant to longer-term frame contracts which typically reference annual benchmark agreements between major concentrate producers and smelters for the purposes of fixing key terms such as treatment and refining charges. The balance of projected annual concentrate production has not been committed for sale in order to provide flexibility in the event of potential fluctuations in annual production and will be sold into the spot market each year at then-current market terms.

Production at Constancia is subject to a precious metals streaming agreement with Wheaton Precious Metals (Previously “Silver Wheaton (Caymans) Ltd.”) consisting of 50% of payable gold and 100% of payable silver. Hudbay will receive cash payments equal to the lessor of the market price and US$400 per ounce for gold and $5.90 per ounce of silver, subject to a 1% annual escalation starting three years after the completion date in 2016. Under the terms of the stream, gold recovery for the purposes of calculating payable gold will be fixed at 55% for gold mined from Constancia and 70% for gold mined from Pampacancha.

1.13. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

The Constancia Mine Environmental and Social Impact Assessment (ESIA) was approved by the Ministry of Energy and Mines (MINEM) in November 2010 and the first amendment to the ESIA (MOD I) was approved in August 2013 to increase the processing capacity and to match the Detailed Design Feasibility Study.

On April 2015, the second amendment to the ESIA (MOD II) was approved to increase reserves through the expansion of the Constancia Pit and inclusion of the Pampacancha deposit, and to expand the WRF and TMF, among other things.

In December 2020, the National Environmental Certification for Sustainable Investments Service (SENACE) began with the evaluation of the third amendment to the EISA (EISA MOD III), which includes the mining plan optimization of Constancia and Pampacancha pits, changes in the TMF, NAG waste deposit expansion, the addition of ore piles 3 and 4, as well as other updates to ensure the feasibility of these modifications.

Hudbay has secured all necessary permits and authorizations on time to start construction activities for Pampacancha and operate the mine. A summary of these permits is detailed in Section 20.

Constancia's closure plan was updated in 2015 to incorporate recent studies and technological changes that will reduce costs and financial guarantees that Hudbay must provide annually to the Peruvian government. The current closure plan was approved by the MINEM in June of 2016. This document provides updated measures of closure and post-closure of the mine, according to MOD I and MOD II.

The environmental and social impacts have been assessed and appropriate mitigation measures have been implemented. The ESIA and amendments comply with national regulation and have adopted the Equator Principles and International Finance Corporation's (IFC) Performance Standards. The Towards Sustainable Mining (TSM) standards of the Mining Association of Canada (MAC) have also been implemented.

Hudbay has engaged an Independent Project Review Board (IPRB) to conduct periodic reviews of the major earth structures on the mine with regular visits to site, as well as for monitoring the progress of construction of the TMF. This activity was initiated during the construction stage and now continues during operation. Design reviews and site visits have been carried out at critical junctures throughout the course of construction and mine operations to observe the performance of the structure and development of subsequent raises to the dam and the impoundment.

The hydrogeological report (Golder 2013), which led to a more refined hydrogeological model and plant water balance, provided clarity to three principal areas: (1) probability of hydrological connectivity between the open pit dewatering influence and neighboring distal reservoirs, (2) determined the impact of slope stability on the pit wall design; and (3) confirmed the availability of groundwater supply through the life of the mine.

The Hudbay water management strategy includes the following aspects:

- Zero water discharge to the environment from the plant, and PAG waste rock facility.
- Discharge from the TMF supernatant during the rainy season.
- Prioritization of water sources for the plant.
- Water available for compensation purpose for base flow of Chilloroya users and downstream community users.

The Constancia environmental monitoring program is summarized in the March 2016 Environmental Monitoring Plan (PLA-AMB-04: Plan de Monitoreo Ambiental). This plan covers monitoring of air, noise and vibration, surface water quality and flow, surface lake/reservoir levels, groundwater levels and quality, domestic water consumption and quality, effluent monitoring, topsoil, soil and sediment, biological (flora and fauna) monitoring and hydrobiological and meteorological data collection. During the operation phase, Hudbay is maintaining a joint environmental monitoring committee with the communities that are directly and indirectly influenced by the mine.

From a biodiversity point of view, Hudbay is working on specific management plans for wetlands, flora and fauna. Hudbay has developed a Biodiversity Action Plan (BAP), as generally anticipated and described in the ESIA and as required in the MAC TSM protocol and IFC performance standard N° 6.

Regarding social aspects, between February and April 2012 Hudbay reached agreements with the neighbouring communities of Uchucarco and Chilloroya for land required for the Constancia mine. These agreements were validated with support from two thirds of the community members. Both of these agreements have been recorded in the public land registry. A compensation plan was also prepared for the 36 landholding families from the lchuni area of Chílloroya. As a result of the Resettlement Action Plan (RAP) implementation, prepared in compliance with national laws and international provisions and standards in resettlement matters and in particular the IFC Performance Standards, the resettlement process was successfully completed in 2016.

In February 2020, the community of Chilloroya formally approved a surface rights agreement with Hudbay for the Pampacancha satellite deposit located near Constancia. Throughout the remainder of the year, Hudbay focused on negotiating individual agreements with those members of the Chilloroya community who made use of the Pampacancha lands. As of the date of this Technical Report, there is one remaining land-user family who needs to complete an agreement.

Specific social programs were designed for the mitigation and prevention of the identified impacts of the resetlement program, considering infrastructure, social, economic and strategic development and claims and dispute resolution.

Since 2015 Hudbay has obtained the ESIA MOD II and the mine closure plan, which are the required environmental certifications to support mining activities in Pampacancha.

The Ministry of Energy and Mines authorized the start of the exploitation activities for the Pampacancha pit in December 2020 (Directorial Resolution No. 790-2020-MINEM-DGM) This permit included the Prior Consultation process with the community of Chilloroya.

1.14. CAPITAL AND OPERATING COST

The LOM sustaining capital is estimated to be $898 million (excluding capitalized stripping) for Constancia and Pampacancha while the project capital is estimated to be $51 million. Capitalized stripping represents $350 million over the life of the mine (Table 1-11).

The total capital cost includes expenses required for major mining equipment acquisition, rebuilds, and major repair. The cost also includes site infrastructure expansion (tailings management facility, waste rock facility and others) and process plant infrastructure however they exclude all the cost related to mine closure. Project capex associated includes Pampacancha project development expenditures but excludes additional costs related to the remaining individual land user agreements.

TABLE 1-11: LIFE OF MINE CAPITAL EXPENDITURES (SUSTAINING AND GROWTH)

Sustaining Capital		2021	2022	2023	2024	2025	2026-2037	LOM
Constancia and Pampacancha[1]								
Equipment - Purchase	*US$'000s*	6,465	8,480	12,263	15,518	9,544	5,185	57,455
Equipment - Major Repair	*US$'000s*	15,696	13,987	29,884	18,014	35,573	206,015	319,169
HCW - Tailings Dam	*US$'000s*	43,920	5,123	45,016	6,875	37,191	200,990	339,116
HCW - Waste Rock Facility	*US$'000s*	4,047	-	3,094	-	1,054	2,922	11,117
HCW - Pit Dewatering	*US$'000s*	9,146	6,735	4,904	4,749	800	4,800	31,134
Mining - Other	*US$'000s*	8,655	1,550	750	4,750	1,000	1,500	18,205
Plant - Equipment & Spares	*US$'000s*	4,288	7,795	10,800	6,800	6,800	37,300	73,783
Plant - Tailings Pipeline	*US$'000s*	8,250	920	600	600	600	7,200	18,170
Plant - Other	*US$'000s*	1,800	3,230	10,500	1,000	1,000	12,000	29,530
Total (Before Capitalized Stripping)	***US$'000s***	**102,267**	**47,820**	**117,812**	**58,306**	**93,562**	**477,912**	**897,679**
Deferred Stripping	*US$'000s*	24,828	17,942	39,765	22,224	20,013	225,723	350,495
Total (After Capitalized Stripping)	***US$'000s***	**127,095**	**65,763**	**157,577**	**80,530**	**113,576**	**703,635**	**1,248,175**

Project Capital		2021	2022	2023	2024	2025	2026-2037	LOM
HCW - General & Other[2]	*US$'000s*	4,075	-	-	-	-	-	4,075
Mining - Other	*US$'000s*	-	-	-	-	16,717	-	16,717
Plant	*US$'000s*	-	-	29,850	-	-	-	29,850
Total Project Capital	***US$'000s***	**4,075**	**-**	**29,850**	**-**	**16,717**	**-**	**50,642**

Total Sustaining and Project Capital (Before Capitalized Stripping)	***US$'000s***	**106,342**	**47,820**	**147,662**	**58,306**	**110,279**	**477,912**	**948,321**
Total Sustaining Capital and Project Capital (After Capitalized Stripping)	***US$'000s***	**131,170**	**65,763**	**187,427**	**80,530**	**130,293**	**703,635**	**1,298,817**

[1] Includes capitalized stripping costs and Pampacancha capital after pre-stripping

[2] For 2021 includes Pampacancha project development expenditures but excludes additional costs related to the remaining individual land user agreements.

The operating costs at Constancia are developed annually as part of the site budget process. The operating costs are divided in three centers of importance: (i) mining, (ii) milling and (iii) G&A. The LOM operating costs are shown in Table 1-12.

TABLE 1-12: OPERATING COSTS

On-Site Operating Costs		2021	2022	2023	2024	2025	2026-2037	LOM
Unit Costs								
Mining[1]	$/t milled	3.62	3.54	3.86	3.91	4.13	3.06	3.28
Milling	$/t milled	5.39	5.33	5.31	5.37	5.29	4.81	4.96
G&A[2]	$/t milled	1.74	1.70	1.57	1.51	1.51	1.36	1.43
Total Operating Costs (Before Capitalized Stripping)	$/t milled	10.74	10.57	10.74	10.79	10.93	9.23	9.68
Total Operating Costs (After Capitalized Stripping)	$/t milled	9.94	9.99	9.47	10.09	10.29	8.63	9.02

[1] Before Capitalized Stripping

[2] Excludes profit sharing

1.15. ECONOMIC ANALYSIS

Pursuant to NI 43-101, producing issuers may exclude the information required for Section 22 Economic Analysis on properties in production, unless the technical report includes a material expansion of current production. As Hudbay is a producing issuer, it has excluded information required by Item 22 of Form 43-101F1 as the Pampacancha expansion does not represent a material expansion of the current production facilities at Constancia.

1.16. CONCLUSIONS

The Constancia mine has been in continuous operation since declaring commercial production on April 30, 2015. The mine has continually improved its performance indicators to a level supporting the projected throughput and forecasted results as outlined in this report with a processing plant capacity of 90,000 tpd producing both copper and molybdenum saleable concentrates. The resource and reserves stated for the Constancia and Pampacancha deposits are compliant to industry best practices as outlined in the Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards for Mineral Resources and Mineral Reserves (May 2014).

The Pampacancha satellite deposit provides higher copper equivalent mill feed where mining is planned to start in 2021 Q2, following the agreement reached with the local community of Chilloroya in 2020. Additional exploration concessions recently acquired by Hudbay within trucking distance of the processing plant offer potential opportunities to mine high grade skarn deposits in addition to their potential for finding a new large porphyry system.

Thorough reconciliations from mineral reserve estimates to mill credited production will continue to be closely monitored in order to continue to validate the performance of the reserve model. The updated mineral reserve estimates show an increase in total tonnage and in all metal content as result of the integration of successful drilling results from Constantia Norte, a refinement of the mine design, the correction of an under-estimation bias in gold grade in the resource modelling database and other minor adjustments to the modelling methodology. A reduction in the measured, indicated and inferred mineral resource tonnage is compensated by a material increase in grade in all resource categories. The lower tonnage and higher grade resource estimates result from the replacement of low grade maginal mineralization in host rocks mostly classified as inferred by high grade skarn mineralization mostly added from the positive drilling results at Constancia Norte. . The improved grade of the mineral resource estimates increases the potential for economic viability when the mineral reserve estimates are depleted.

Other than the risks described in this Technical Report, the general political and social risks associated with perating in Peru and the other risk factors described in Hudbay's most recent annual information form dated March 29th 2021, there are no known significant risks and uncertainties that could reasonably be expected to materially affect the potential development of the mineral reserve and resource estimates in this Technical Report.

1.17. RECOMMENDATIONS

Since 2017, Hudbay has consolidated a very prospective regional land package within trucking distance of the Constancia mining and milling infrastructures. Considerable progress has been made in concluding exploration agreements with certain of the local communities resulting in two exploration agreements being signed and obtaining a drill permit to test a skarn target at the Quehuincha Norte prospect. Additional community agreements and permits will be required to commence exploration activities on the other prospective lands.

A significant portion of the mineralization delineated during the Constancia Norte drill program is still classified as inferred resources and would be amenable to reserve conversion with infill drilling. In addition, some of the mimeralization not included in the open pitable resource may be amenable to production through a small satellite underground operations that will be further investigated through mining trade-off studies.

Recent metallurgical testing has helped validate the forecast model for mill throughput and metals recovery at Pampacancha and various process optimization projects have come to fruition and are now integrated in the life of mine plan supporting the updated mineral reserve estimates.. Optimization studies will continue with a focus on reducing levels of zinc and lead contanimants and increasing copper concentrate grades.

2. INTRODUCTION

This Technical Report has been prepared for Hudbay to support the public disclosure of mineral resources and mineral reserves at Constancia mine as at December 31, 2020.

Hudbay is an integrated Canadian mining company with assets in North and South America principally focused on the discovery, production, and marketing of base and precious metals. Hudbay's objective is to maximize shareholder value through efficient operations, organic growth and accretive acquisitions, while maintaining its financial strength.

Hudbay's operations at Constancia include the Constancia and Pampacancha pits, an ore processing plant, a Waste Rock facility, a Tailings Management facility and other ancillary facilities that support the operations.

At the date of this Technical Report, the Constancia mine is in steady production. The pre-stripping started in March 2014 and the concentrator ramp-up started in December 2014. Commercial production was achieved on April 30, 2015 and the operations continue with management's expectations in terms of ore, grade, recovery and cost.

2.1. QUALIFIED PERSON

This Technical Report has been prepared in accordance with NI Form 43-101 F1. The QP who supervised the preparation of this Technical Report is Olivier Tavchandjian, P.Geo., Vice-President Exploration and Geology of Hudbay.

Olivier Tavchandjian is not independent of Hudbay, and this is not an independent technical report, but Hudbay is a "producing issuer" as defined in NI 43-101. As such, this Technical Report is not required to be prepared by or under the supervision of an independent QP.

Mr. Tavchandjian has been directly involved on a regular basis with the exploration, geology, resource-modelling, mine planning as well as with the estimation of operating and capital costs for the Constancia mine and the Pampacancha deposit. Mr. Tavchandjian has visited the Constancia operation on a regular basis since September 2017 as well as the core storage facilities and the relevant internal and external laboratories and has directly overseen the mineral resource and reserve estimation process.

2.2. SOURCE OF INFORMATION

Geology and Mineral Resources sources of information are: drilling log and sample data, blast hole sample data and in-pit geology mapping.

Mineral Reserve sources of information are the Mineral Resources, actual production and monitoring data (since 2014), budget projections.

Metallurgy, processing, and economic sources of information are the actual operating data acquired since copper production commenced in 2014, operating budget estimates.

All other relevant information has been updated with information or reports provided and translated by senior site personnel.

Multiple participants have worked on this Techncail Report. Discussions were held with personnel from Hudbay and Hudbay Peru:

- Javier Del Rio, Vice- President South America Business Unit
- Javier Toro, Director – Technical Services
- Marc-Andre Brulotte, Manager – Resource Evaluation

- Jose Escudero, Director Social and community relations
- Carlos Castro, Director – Corporate Affairs and Social Responsibility
- Marcial Medina, Manager – Process Plant
- Engels Trejo, Manager – Technical Services
- Julio Roncal, Manager – Environmental
- Carlos Salazar, Manager – Exploration
- Richard Rodriguez, Superintendent – Mine Geology

Table 2-1 lists the participants to this Technical Report under Olivier Tavchandjian as QP:

TABLE 2-1: TECHNICAL REPORT PARTICIPANTS

Section	Description	Participants	Responsible
1	Summary	Javier Del Rio - Javier Toro	Olivier Tavchandjian
2	Introduction	Javier Del Rio - Javier Toro	Olivier Tavchandjian
3	Reliance on Other Experts	Javier Del Rio - Javier Toro	Olivier Tavchandjian
4	Property Description and Location	Julio Roncal	Olivier Tavchandjian
5	Accessibility, Climate, Local Resources, Infrastructure and Physiography	Julio Roncal	Olivier Tavchandjian
6	History	Carlos Salazar	Olivier Tavchandjian
7	Geological Setting and Mineralization	Richard Rodrigues - Carlos Salazar	Olivier Tavchandjian
8	Deposit Types	Richard Rodrigues - Carlos Salazar	Olivier Tavchandjian
9	Exploration	Carlos Salazar - Olivier Tavchandjian	Olivier Tavchandjian
10	Drilling	Carlos Salazar - Omar Bermudez	Olivier Tavchandjian
11	Sample Preparation, Analyses and Security	Omar Bermudez	Olivier Tavchandjian
12	Data Verification	Omar Bermudez	Olivier Tavchandjian
13	Mineral Processing and Metallurgical Testing	Peter Amelunxen	Olivier Tavchandjian
14	Mineral Resource Estimates	Omar Bermudez - Marc-Andre Brulotte - Olivier Tavchandjian	Olivier Tavchandjian
15	Mineral Reserve Estimates	Javier Toro - Engels Trejo - Eder Lagos	Olivier Tavchandjian
16	Mining Methods	Javier Toro - Engels Trejo - Eder Lagos	Olivier Tavchandjian
17	Recovery Methods	Peter Amelunxen	Olivier Tavchandjian
18	Project Infrastructure	Javier Toro - Engels Trejo - Eder Lagos	Olivier Tavchandjian
19	Market Studies and Contracts	Eugene Lee - Jon Douglas	Olivier Tavchandjian
20	Environmental Studies, Permitting and Social or Community Impact	Julio Roncal	Olivier Tavchandjian
21	Capital and Operating Costs	Javier Toro - Engels Trejo - Eder Lagos	Olivier Tavchandjian
22	Economic Analysis	Javier Del Rio - Javier Toro	Olivier Tavchandjian
23	Adjacent Properties	Olivier Tavchandjian - Carlos Salazar	Olivier Tavchandjian
24	Other Relevant Data and Information	Olivier Tavchandjian	Olivier Tavchandjian
25	Interpretation and Conclusions	Olivier Tavchandjian	Olivier Tavchandjian
26	Recommendations	Olivier Tavchandjian	Olivier Tavchandjian

2.3. UNIT OF MEASURE ABBREVIATIONS USED IN REPORT

- (%) - Percentage
- (g/t) - Grams per tonne
- (Mt) - Million tonnes
- μg/m3 - Micrograms per cubic meter
- Ha - Hectare
- Km - Kilometres
- kV - Kilovolts
- kWh/m3 - Kilowatt – hours per cubic meter
- kWh/t - Kilowatt per tonne
- m - Meter
- m3 - Cubic meter
- m3/day - Cubic meter per day
- m3/h - Cubic meter per hour
- m3/year - Cubic meter per year
- Mt/yr ore - Million tonnes per year of ore
- Mtpa - Million tonnes per annum
- MW - Megawatt
- MW-h/y – Mega watt hours per year
- MWhr - Mega watt hour
- ppb - Parts per billion
- Ppm - Parts per million
- sq-km - Square kilometres
- t - Tonne
- t / m3 - Tonne per cubic meter
- t/a - Tonnes per annum
- t/BCM - Tonnes per billion cubic metres
- t/Hole - Tonnes per hole
- t/m3. - Tonnes per cubic meter
- Tonne/Hr - Tonnes per hour
- Tpd - Tonnes per day
- US$/dmt - US dollars per dry metric tonne
- US$/oz - US dollars per ounce
- US$/wmt - US dollars per wet metric tonne
- (AAN) Andesite
- (AAS) Atomic Absorption Spectroscopy
- (AVRD) Absolute Value of the Relative Difference
- (BAP) Biodiversity Action Plan
- (CC-CR) Constancia Condemnation Drilling
- (CG) Constancia Geotechnical Drilling
- (CH) Constancia Hydrogeological Drilling
- (CM) Constancia Metallurgical Drilling
- (CO) Constancia Infill Drilling
- (CR) Reverse Circulation
- (CR) Reverse Circulation

2.4. ACRONYMS AND ABBREVIATIONS USED IN REPORT

- (CRMs) Certified Reference Materials
- (EIA) Environmental Impact Assessment
- (FEED) Front End Engineering and Design
- (GWI) Ground Water International Consulting Hydrogeologists
- (HA) Hectar
- (HG) High Grade Material
- (ICP-AES) Inductively Coupled Plasma – Atomic Emission Spectrometry
- (IP) Induced Polarisation
- (IRA) Inter-Ramp Angle
- (JV) Joint Venture
- (LG) Low Grade Material
- (LTEP) Long Term Equilibrium Prices
- (LTEP) Long Term Equilibrium Prices
- (MASL) Metres Above Sea Level
- (MCCs) Motor Control Center
- (MG) Medium Grade Material
- (MINEM) Peruvian Ministry of Energy and Mines
- (MMP)Micro Monzonite Porphyry
- (MP1) Monzonite Porphyry 1
- (MP2) Monzonite Porphyry 2
- (MR) Mining Royalty
- (Mt) Million tonnes
- (NAG) Non-Acid Generating Material
- (NI) National Instrument
- (PAG WRF) Potentially Acid Generating Waste Rock Facility
- (PAG) Potentially Acid Generating Material
- (PFS) Pre-Feasibility Study
- (PG) Pampacancha Geotechnical Drilling
- (PO, PR) Pampacancha Exploration-Infill Drilling
- (QC) The Quality Control
- (QMP) Quartz Monzonite Porphyry
- (RE) Relative Error
- (RMR) Rock Mass Rating
- (RQD) Rock Quality Designation
- (SD-EIA) Semi-Detailed Environmental Impact Assessment
- (SEIN) Peruvian National Interconnected Electric System
- (SMT) Special Mining Tax
- (SMU) Selective Mining Unit
- (SO, SR) Chilloroya South Exploration
- (SO, SR) Chilloroya South Exploration
- (TMF) Tailings Management Facility
- (UCS) Unconfined Compressive Strength
- (UEA) Unidad Economica Administrativa
- (UO) Uchucarco Exploration
- (WRF) Waste Rock Facility

3. RELIANCE ON OTHER EXPERTS

Hudbay has followed standard professional procedures in preparing the contents of this Technical Report. Data used in this Technical Report has been verified and the author has no reason to believe information has been withheld that would affect the conclusions made herein.

The information, conclusions, opinions, and estimates contained herein are based on:

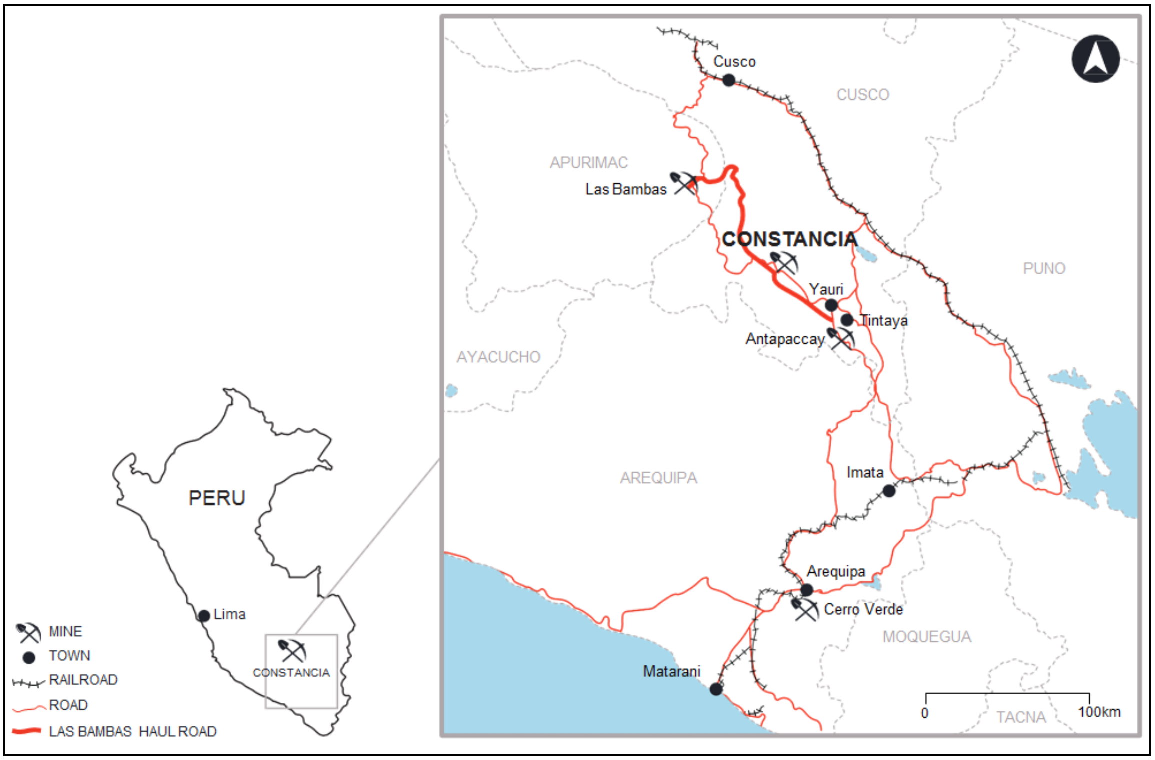
- Information available to Hudbay and the author at the time of preparation of this Technical Report; and
- Assumptions, conditions, and qualifications as set forth in this Technical Report.

4. PROPERTY DESCRIPTION AND LOCATION

4.1. THE PROPERTY LOCATION

The Constancia mine is located in the south-eastern Andes of Peru, in the Chamaca, Livitaca and Velille districts, province of Chumbivilcas, department of Cusco. The property is approximately 600 km southeast of Lima at elevations of 4,000 to 4,500 masl. Figure 4-1 shows the general Constancia mine location. Road access to the property is from Arequipa (7 hours by road) or Cusco (6 hours by road). Geographic coordinates at the centre of the property are longitude 71°47' west and latitude 14°27' south.

FIGURE 4-1: CONSTANCIA MINE LOCATION



4.2. MINERAL RIGHTS

4.2.1.PERUVIAN MINING LAW

The General Mining Law of Peru defines and regulates different categories of mining activities, from sampling and prospecting to commercialization, exploration, exploitation, general labour, processing and mining transportation (concessions granted by the Peruvian state are only required to conduct the latter five activities). Mining concessions (which grant the rights to explore and exploit mineral deposits) are granted using UTM coordinates to define areas generally ranging from 100 ha to 1,000 ha in size.

Mining concessions are irrevocable and perpetual, as long as the titleholder complies with two main mining obligations: (i) pay an annual validity fee ("Derecho de Vigencia"); and, (ii) achieve an annual minimum production level on the concessions.

The "Derecho Vigencia" or validity fee is an annual maintenance fee of $3/ha (for metallic mineral concessions at general regimen) for each concession actually acquired, or for a pending application (petitorio), payable by June 30th of each year. Non-compliance with this obligation for two (2) consecutive years results in the cancellation of the respective mining concession.

The General Mining Law of Peru sets a time limit within which the holder of the mining concession must comply with obtaining the minimum production level. If the established production is not met by the deadline, then the holder of the mining concession must pay a penalty.

There are currently two systems for calculating the amount to be paid as a penalty. Each of these regimes will be applicable depending on whether the mining concession analyzed was granted until 2008 or later. Each of these regimes is explained below:

(i) Old Regime - Concessions granted until 2008: The minimum production that the holder of the mining concession must reach in these concessions is US$ 100 per hectare per year, for a term of six years from the date of granting the title. If the holder of the mining concession does not comply with said production, he or she must pay a penalty equivalent to US$ 6.00 per year per hectare. This penalty will be increased to US$ 20.00 per year per hectare if the non-compliance persists after year twelve.

    Under this regime, if the holder of the mining concession fails to pay the penalty for two consecutive years, this will result in the cancellation of the respective concession. It should also be noted that the holder of the mining concession may be released from payment of the aforementioned penalty if he or she provides proof to the mining authority that he or she has made investments in the concession in question for an amount equivalent to ten times the amount of the applicable penalty.

(ii) New Regime - Concessions granted from 2009: The minimum production to be reached by the holder of the mining concession in these concessions is one Tax Unit (UIT) per hectare per year for metal concessions and 10% of the Tax Unit (UIT) per hectare per year for non-metallic concessions, for which it will have a term of 10 years from the date of granting the title. On January 5, 2017, Legislative Decree No. 1320 that modified articles 40 and 41 of the General Mining Law (modified previously by Legislative Decrees No. 1010 and No. 1054), established new terms and amounts to be paid as penalties for failure to reach the minimum production of the New Regime, applicable from January 1, 2019, as detailed below:

    (a) If the minimum production is not met by the tenth year after the mining concession was granted, a penalty of 2% of the value of the UIT per year and per hectare must be paid from the following year until the minimum production or minimum annual investment is reached.

    (b) If the minimum production is not met by the fifteenth year after the mining concession was granted, a penalty of 5% of the UIT value per year and per hectare must be paid until the minimum production or minimum annual investment is reached from the following year onwards.

    (c) If the minimum production is not met by the twentieth year after the mining concession was granted, a penalty of 10% of the UIT value per year and per hectare actually granted until the minimum production or minimum annual investment is reached from the following year onwards.

    (d) If the minimum production is not met within thirty years of the mining concession being granted, the concession expires, with no exceptions.

    (e) No penalty is required to be paid in each year if an investment of not less than ten times the applicable penalty amount is made.

As of January 1, 2021, the concessions of the new and old regimes that do not demonstrate compliance with the minimum production of the previous yearmust pay a penalty of 2% of UIT per year and per hectare granted for each concession, continuing in case of non-compliance in subsequent years, with the terms, penalty amounts, and conditions detailed in the previous paragraph.

The holder of a mining concession is entitled to all the protection available to all holders of private property rights under the Peruvian Constitution, the Civil Code, and other applicable laws. A Peruvian mining concession is a property-related right; distinct and independent from the ownership of land on which it is located, even when both belong to the same person. The rights granted by a mining concession are defensible against third parties, are transferable and chargeable, and, in general, may be the subject of any transaction or contract.

To be enforceable, any and all transactions and contracts pertaining to a mining concession must be entered into a public deed and registered with the Public Mining Registry. The holder of a mining concession must develop and operate his/her concession in a progressive manner, in compliance with applicable safety and environmental regulations and with all necessary steps to avoid third-party damages. The concession holder must permit access to those mining authorities responsible for assessing that the concession holder is meeting all obligations established in the applicable regulation.

4.2.2. MINING CONCESSIONS

Excluding the concessions included in the Transfer Agreement and the Transfer Option and Mining Assignment Agreements, subscribed by Hudbay Peru S.A.C. with Panoro Apurimac S.A. and a private Peruvian company respectively, in December 2017, Hudbay has a total of sixty-six concessions in the province of Chumbivilcas, in the department of Cusco which belong to the Constancia Mine. These sixty-six concessions occupy an area of 43,536.7769 Ha.

Most of the known mineralization of Constancia mine is located in the following concessions: Katanga J, Katanga Q, Katanga K, Peta 7, Peta 6, Constancias 13 and Constancias 8.

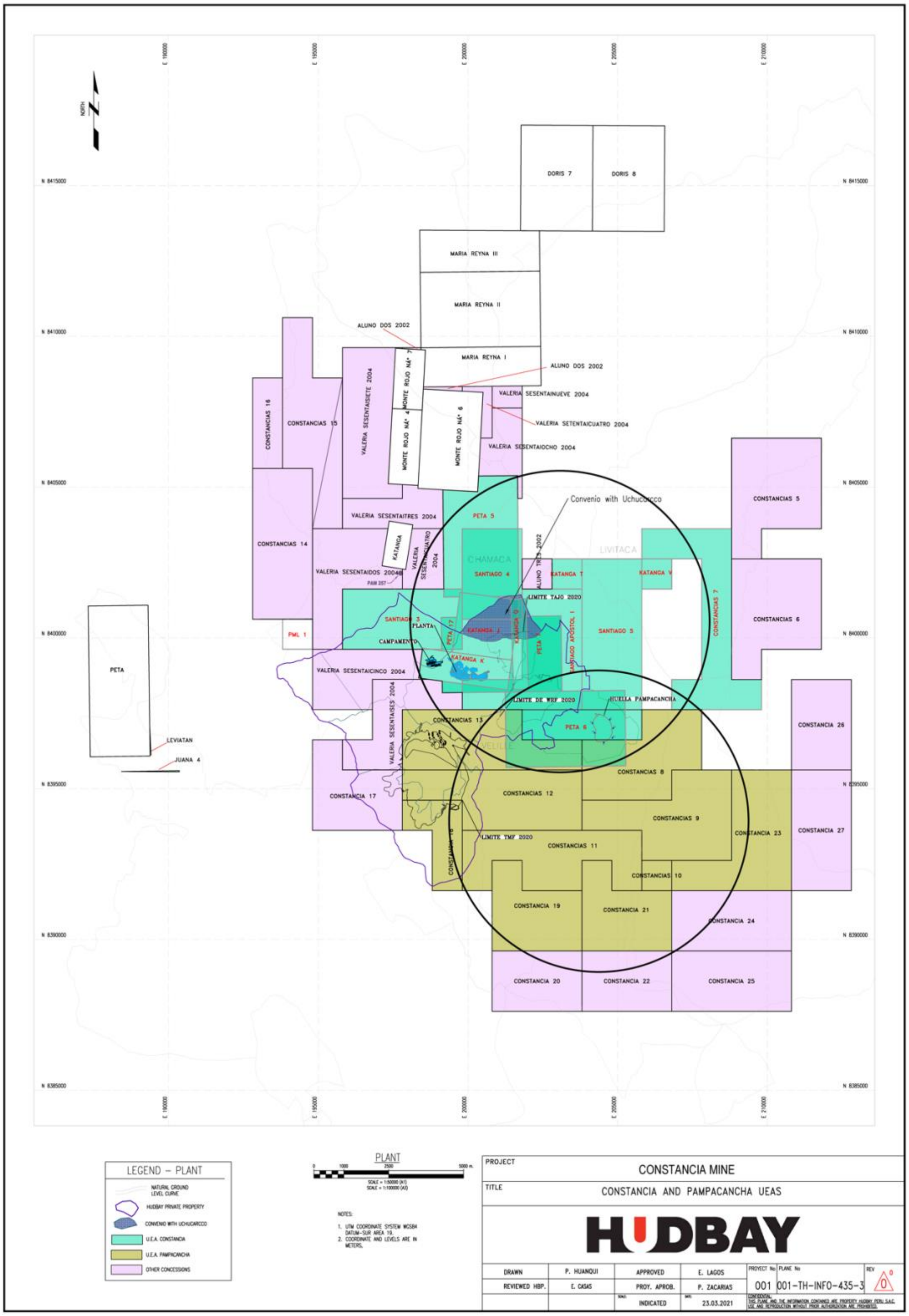
Figure 4-2 shows the concessions corresponding to the UEAs Constancia and Pampacancha and the concessions included in the Transfer Agreement and the Transfer Option and Mining Assignment Agreements.

Administrative Economic Units (“Unidad Económica Administrativa” – “UEA”)

Fourteen mining concessions out of the sixty-six concessions comprising the Constancia mine have been grouped together in an UEA called “Constancia”, while ten concessions have been grouped together in an UEA called Pampacancha.

UEAs are groups of two or more mining concessions of the same class and nature which allow the respective holder to work only in one or some of the concessions, instead of working simultaneously in all of those encompassing the UEA. However, the holder is obliged to obtain the minimum production levels corresponding to all the mining concessions comprising the UEA in those mining concessions which are exploited.

FIGURE 4-2: CONSTANCIA MINE CONCESSION BOUNDARIES

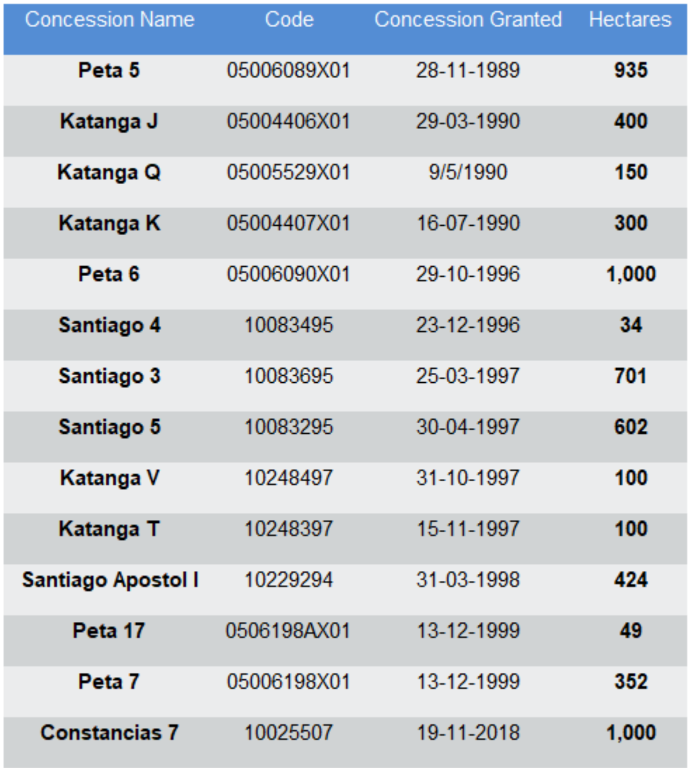


The UEA Constancia (code N° 01-00029-83-U) – previously called Katanga Este - was originally approved by Resolución Directoral No. 148/86-EM-DCM dated 1 September 1986 comprising only the “Katanga J” and “Katanga K” mining concessions. Through Resolución Jefatural N° 5404-2006-INACC/J issued on the 14th of December 2006, eleven mining concessions were added, bringing a total of 13 concessions to the UEA. On December 14, 2015, the name was changed to UEA Constancia. In December 2016, by Resolución de Presidencia No. 2207-2016-INGEMMET-PCD-PM one more concession was added to this UEA. The total of the area of this UEA is 6,146.6569 Ha.

Table 4-1 shows the names, codes, dates and areas of the concessions comprising the UEA Constancia. All the properties are located on the Livitaca (29-S) map sheet. The UEA Pampacancha (code 010002216U) was approved by Resolución de Presidencia No. 1899-2016-INGEMMET-PCD-PM on December 19, 2016. The total area of this UEA is 8,085.9011 Ha

Table 4-2 shows the names, codes, dates and areas of the concessions comprising the UEA Pampacancha.

TABLE 4-1: HUDBAY CONCESSIONS



Concession Name	Code	Concession Granted	Hectares
Peta 5	05006089X01	28-11-1989	**935**
Katanga J	05004406X01	29-03-1990	**400**
Katanga Q	05005529X01	9/5/1990	**150**
Katanga K	05004407X01	16-07-1990	**300**
Peta 6	05006090X01	29-10-1996	**1,000**
Santiago 4	10083495	23-12-1996	**34**
Santiago 3	10083695	25-03-1997	**701**
Santiago 5	10083295	30-04-1997	**602**
Katanga V	10248497	31-10-1997	**100**
Katanga T	10248397	15-11-1997	**100**
Santiago Apostol I	10229294	31-03-1998	**424**
Peta 17	0506198AX01	13-12-1999	**49**
Peta 7	05006198X01	13-12-1999	**352**
Constancias 7	10025507	19-11-2018	**1,000**

It is worth noting that all of the mining concessions involving the Constancia and Pampacancha UEAs have been titled and have also been recorded with the Public Registries in the name of Hudbay Peru S.A.C. Likewise, all of these concessions are currently in good standing and concession fees and applicable penalties have been paid for the calendar year 2020. All mining concessions are in good standing (i.e. the mining concessions are in full force and effect) as of January 1, 2021 and there are no foreseeable circumstances that could result in the mining concessions being cancelled by the Peruvian State.

TABLE 4-2: UEA PAMPACANCHA

Concession Name	Code	Concession Granted	Hectares
Constancia 8	10025607	15-12-2008	**584**
Constancia 9	10025707	15-12-2008	**1,000**
Constancia 11	10025907	19-11-2008	**1,000**
Constancia 12	10026007	19-11-2008	**1,000**
Constancia 13	10026107	15-12-2008	**702**
Constancia 18	10614807	21-04-2008	**400**
Constancia 10	10025807	18-12-2008	**100**
Constancia 19	10614907	12-05-2008	**700**
Constancia 21	10615107	12-05-2008	**700**
Constancia 23	10615307	18-04-2008	**1,000**

RECENTLY ACQUIRED MINING CONCESSIONS

In December 2017, Hudbay Peru S.A.C. executed a Transfer Agreement with Panoro Apurimac S.A. and a Transfer Option and Mining Assignment Agreements with a private Peruvian company. Through these agreements, Hudbay Peru S.A.C. acquired title over 24 mining concessions.

The Transfer Agreement was subscribed by Hudbay Peru S.A.C. and Panoro S.A. in December 28, 2017. This contract was subsequently entered in the Public Registries. The total area of the concessions mentioned in this agreement is 3,961.7457 Ha. Table 4-3 shows the names, codes, dates and areas of the concessions transferred by the aforementioned Agreement:

The Transfer Option and Mining Assignment Agreement was subscribed by Hudbay Peru S.A.C. and a private Peruvian company on December 14, 2017. This contract was subsequently entered in the Public Registries. The total area of the concessions mentioned in this agreement is 5970.3258 Ha. Table 4-4 shows the names, codes, dates and areas of the concessions transferred by the aforementioned Agreement:

TABLE 4-3: KUSIORCCO CONCESSIONS

Concession Name	Code	Hectares
Aluno Dos 2002	10170502	**17**
Aluno Tres 2002	10170802	**100**
Valeria Sesentaicinco 2004	10166804	**561**
Valeria Sesentaicuatro 2004	10166704	**245**
Valeria Sesentaidos 2004	10166504	**725**
Valeria Sesentainueve 2004	10167204	**73**
Valeria Sesentaiseis 2004	10166904	**569**
Valeria Sesetaisiete 2004	10167004	**842**
Valeria Sesentaitres 2004	10166604	**370**
Valeria Setentaicuatro 2004	10269204	**71**
Valeria Sesentaiocho 2004	10167104	**288**
PML1	10358414	**100**

TABLE 4-4: CABAILLITO AND MARIA REYNA CONCESSIONS

Concession Name	Code	Hectares
Doris 7	05005966X01	**840**
Doris 8	05005967X01	**840**
Juana 4	0505971AX01	**4**
Katanga	05000317X01	**120**
Leviatan	05003143X01	**2**
Maria Reyna I	05006511X01	**507**
Maria Reyna II	05006512X01	**1,000**
Maria Reyna III	05006513X01	**547**
Monte Rojo N° 4	05002684X01	**250**
Monte Rojo N° 6	05003144X01	**660**
Monte Rojo N° 7	05003235X01	**200**
Peta	05005892X01	**1,000**

As of January 1, 2021, these concessions are up to date in the payment of the “Derecho de Vigencia” and penalties.

4.2.3. SURFACE LEGAL RIGHT ACCESS

The Constancia mine area is located within six lands owned by Hudbay. For rights purposes, Norsemont previously purchased the Fortunia property that covers most of the main resource area.

On March 19, 2012, Hudbay and the Uchucarco Community entered into an agreement granting Hudbay a right to use 256.50 hectares located in the so-called “Sayhualoma” sector through the life of the mine. Likewise, one significant plot of 750 ha in the so-called “Ichuni” sector has been purchased by Hudbay from the Chilloroya Community on April 12th, 2012. Hudbay has also purchased two pieces of land of 1361.87 ha and 7.73 ha, respectively called “Quinsachata Sub Lote 1” and “Quinsachata Sub Lote 2” for relocation purposes. Through these agreements, Hudbay has secured all surface land rights required for the construction and development of the Constancia Mine.

On May 9, 2012, Hudbay entered into an agreement with the Chilloroya Community in order to access and use for exploration purposes 6,148 hectares covering the Pampacancha deposit. This agreement was in force until 2015.

On Sep 25th, 2018, Hudbay entered into an agreement with the Quehuincha community in order to access and use, for exploration purposes, 1,053 hectares covering the Quehuincha North Project.

During the first half of 2019, Hudbay successfully concluded the biennial review of LOM Agreements with both, Chilloroya and Uchucarcco communities, which allowed to the company starts the negotiation talks on Pampacancha and exploration targets of Caballito, Maria Reyna and Kusiorco.

On March 3rd, 2020, Hudbay signed an agreement with the Chilloroya community for the right of use of 474.32 hectares in Pampacancha area. Likewise, negotiations with individual landholders (possessors) are ongoing, having closed 28 of 29 agreements. Table 4-5 provides a summary of the land rights hold by Hudbay.

TABLE 4-5: SURFACE LEGAL ACCESS RIGHTS TABLE

LOCATION	AREA (hectares)	RIGHT HELD BY HUDBAY	CONSTANCI PAMPACANC
Rustic Property located in the District of Velille, Province of Chumbivilcas, Department of Cusco, named "*Chilloroya Lote B, San Antonio, Area Afectable*"	499.64	Owner	Constancia
Rustic Property located in the District of Velille, Province of Chumbivilcas, Department of Cusco, named "*Chilloroya Lote B, San Antonio, Area Inafectable*"	943	Owner	Constancia
Rustic Property located in the District of Velille, Province of Chumbivilcas, Department of Cusco, named "*Fortunia, Area Afectable*".	974.91	Owner	Constancia
Rustic Property located in the District of Velille, Province of Chumbivilcas, Department of Cusco, named "*Fortunia Area Inafectable*".	423.38	Owner	Constancia
Rustic Property located in the District of Velille, Province of Chumbivilcas, Department of Cusco, named "*Arizona*".	885.35	Owner	Constancia
Rustic Property located in the District of Velille, Province of Chumbivilcas, Department of Cusco, named "*Arizona – Moroccota*".	340.71	Owner	Constancia
Rustic Property located in the District of Coporaque, Province of Espinar, Department of Cusco, named "*Quinsachata Sub Lote 1*".	1,361.8670	Owner	Constancia
Rustic Property located in the District of Coporaque, Province of Espinar, Department of Cusco, named "*Quinsachata Sub Lote 2*".	7,7319	Owner	Constancia
Rustic Property located in the District of Livitaca, Province of Chumbivilcas, Department of Cusco, named "*Ichuni*".	750	Owner	Constancia
Rustic Property located in the District of Chamaca, Province of Chumbivilcas, Department of Cusco, named "*Sayhualoma*".	256.5	Right of use to carry out all types of mining activities during the entire useful life of the Constancia Mine	Constancia
Rustic Property located in the District of Livitaca, Province of Chumbivilcas, Department of Cusco, named "*Pampacancha*".	6148.70	Right of use to carry out all types of exploration activities during the 2012 – 2015 period.	Pampacancha

4.3. THE TERMS OF ANY ROYALTY OR PAYMENTS

Hudbay's mining concessions are free and clear of recorded liens, encumbrances or agreements except for a 0.5% Net Smelter Return ("NSR Royalty") that has been established over the sale of the mineral products obtained from the following concessions: Katanga Q, Peta 5, Peta 6, Peta 7 and Peta 17. Such NSR Royalty has been granted in favor of Compañia Minera Katanga S.A. ("Katanga") and Minera Livitaca S.A. ("Livitaca") up to a maximum amount of US$ 10,000,000 (ten million and 00/100 Dollars of the United States of America)., this has already been paid and the NSR Royalty has expired.

By virtue of the Mining Concessions Transfer Agreement dated December 31, 2008, and its addendum, dated February 19, 2009, both executed by and between Norsemont and Rio Tinto, a legal mortgage up to the amount of US $500,000 has automatically been established (and is currently registered) over the following mining concessions in order to secure the timely payment of the additional or contingent payment.

The Transfer Agreement subscribed with Panoro S.A. in December 28, 2017 establishes a lien in the form of a 2% Net Smelter Return ("NSR Royalty") over the sale of the mineral products obtained from the following concessions: Aluno Dos 2002, Aluno Tres 2002, Valeria Sesentaicinco 2004, Valeria Sesentaicuatro 2004, Valeria Sesentaidos 2004, Valeria Sesentainueve 2004, Valeria Sesentaiseis 2004, Valeria Sesentaisiete 2004, Valeria Sesentaitres 2004, Valeria Sesentaiocho 2004, PML1.

The Transfer Option and Mining Assignment Agreement subscribed with a private Peruvian company in December 14, 2017 establishes that in case Hudbay Peru S.A.C. exercises the transfer option, it must sign a Royalty Agreement for the following concessions: Doris 7, Doris 8, Katanga, Juana 4, Leviatan, Maria Reyna I, Maria Reyna II, Maria Reyna III, Monte Rojo No4, Monte Rojo No6, Monte Rojo No7 and Peta.

Hudbay has LOM agreements with the two local communities, Chilloroya and Uchucarco. These agreements were part of the land access and purchase agreements and they outline a commitment to sustainable development in the respective communities.

4.4. ENVIRONMENTAL PROPERTY LIABILITIES

During the preparation of the environmental baseline for the ESIA, Knight Piesold Consultores S.A. determined the existence of 21 mining environmental liabilities within the Constancia mine in the areas called Sacsa Orcco, the San José pit, Chilloroya and the Yanaccocha Lake.

Since these environmental liabilities were generated by former operations and titleholders, Hudbay is not obligated to undertake any measure for its reclamation or closure.

Additionally, as a result of the preparation of the environmental baseline of the first amendment of the ESIA, an extra mining environmental liability was identified in the San José area. Hudbay Peru S.A.C. declared it before the competent authority. This area of the San José pit is part of the final closure plan of the Constancia mine.

The Second amendment to the EISA, approved in 2015, is the currently environmental management instrument that incorporates the exploitation of the Pampacancha pit. After concluding with the land permits and the sectorial requirements, we obtained de exploitation start authorization on December 2020. Likewise, in 2019 and 2020 exploratory drilling was developed to the northwest of the Constancia pit.

A Third Amendment to the Eisa, that is Currently Under Final Review for Validation by the Environmental Authority Includes Additional Drilling to the Northeast of the Constancia Pit for 2022.Risk Factors Property

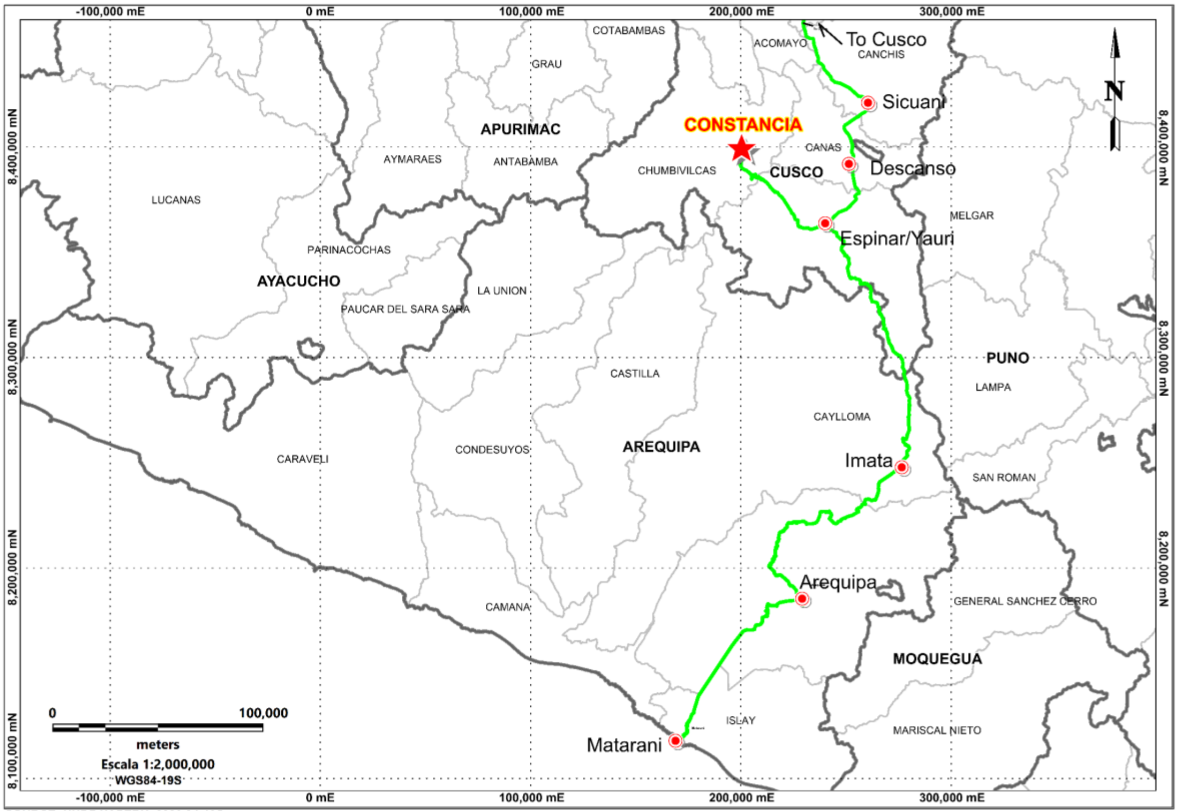
Hudbay has secured all legal rights on the mining concessions comprising the Constancia mine as well as on the lands required for the development of this mine. Considering that such rights have been registered before the Public Registries and are enforceable before the Peruvian state and third parties, Hudbay does not foresee any risk in losing its rights over the Constancia Mine, provided that the legal obligations applicable to keep such properties in full force and effect are duly complied with.

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

5.1. ACCESSIBILITY

The Constancia mine is located in Chamaca and Velille districts, Chumbivilcas province, Cusco region, an approximate distance of 634 km southeast from Lima, capital of Peru, with an altitude ranging between 4,000 and 4,500 metres. The mine is accessible from Lima by air, via either Arequipa or Cusco, and then by vehicle over paved and gravel roads. Figure 5-1 below shows the main route from Arequipa and Cusco to the mine.

FIGURE 5-1: LOCATION OF THE CONSTANCIA MINE



SOURCE: HUDBAY PERU, 2020 84-19S

The routes with approximate distances and driving times are shown in Table 5-1.

TABLE 5-1: APPROXIMATE DISTANCES AND DRIVING TIMES TO CONSTANCIA

From	Leg	Distance (km)	Time (hours)
Arequipa	Canahuasi	80	1.25
	Imata	63	0.75
	Yauri/Espinar	103	2.50
	Uchucarcco turnoff	68	2.00
	Project Site	20	0.50
	Total	**334**	**7.00**
Cusco	Sicuani (paved road)	140	2.00
	El Descanso	40	1.00
	Yauri/Espinar	45	0.75
	Uchucarcco turnoff	68	2.00
	Project Site	20	0.50
	Total	**313**	**6.25**

5.2. CLIMATE

Climate at the Constancia site can be classified as humid and seasonably cool with well-defined, rainy, and drier seasons. The majority of the precipitation typically occurs over the period of October to April and the summer months. Elevation and physiograpy also influence the climate. The length of the operating season is not affected by the climate and mitigation measures are in place to address the challenges presented by the rainy season.

Following is a list of important climatological data:

- Annual Precipitation:
- Annual average precipitation: 1,000 mm
- Annual maximum precipitation: 1,353 mm
- Annual minimum precipitation: 590 mm
- Average wet season (October to April) precipitation: 932 mm
- Average dry season (May to September) precipitation: 72 mm
- Air Temperature:
- Daily average maximum: between 13 and 16 °C
- Daily average minimum: between (-11 and 0°C)
- Average Annual Evaporation:
- Potential annual evaporation: 961 mm
- Annual evaporation from existing ground: 480 mm
- Evaporation from dry tailing: 455 mm
- Evaporation from wet tailing surface: 865 mm

342 different species of flora and 7 vegetation types were identified within the mining unit area (grassy brush, rock vegetation, very wet meadow, bog, rushes, bushes and high land vegetation). In total, there are

13 species that are within the conservation concern category in Peruvian legislation and 17 endemic species from Peru (4.97%).

5.3. LOCAL RESOURCE

The main economic activity in the area is subsistence agriculture and cattle farming. Food and basic supplies can be obtained in Yauri/Espinar (62,000 people). Cusco (population 367,000 people) and Arequipa (population 864,000 people) are the nearest major centers, 6 and 7 hours drive from the mine, respectively.

Several permanently flowing streams which supply good flows are present in the area. More significant water sources include the Apurimac or Chilloroya rivers.

Near the community of Chilloroya, the local population is engaged in the informal mining of superficial gold. The company and members of the community have raised concerns with Peruvian authorities regarding environmental and labour conditions related to the informal mining activities. For example, levels of mercury found in sediments near a rudimentary gold processing area exceed international standards for the protection of aquatic life.

5.4. INFRASTRUCTURE

Arequipa and Cusco are the nearest major centres, and both are over 300 km from the Mine site by road. A public, but privately managed, landing strip is located in Espinar, about 2 hours from the mine. The air strip is paved and maintained by Glencore, and Hudbay has authorization to use the strip. Small commercial and/or charter flights can use the air strip for daytime operations.

The road to Yauri (in the general vicinity of Glencore’s Antapaccay Mine) was upgraded to meet construction and life of mine transportation requirements. From Yauri, the road system is also currently used for supplies to several operating mines in the region. It is routed through the Arequipa area to the port at Matarani which is currently also used to ship copper concentrates from other mines in Southern Peru.

Power supply to Constancia is brought from a new 220kV transmission line 69 Km from Constancia that was built and is owned by Hudbay but operated and maintained by a third party.

Further details regarding the mine infrastructure can be found in Section 18 of this Technical Report.

5.5. PHYSIOGRAPHY

The Constancia region hosts fluvioglacial valleys, flood plains, hills and mountains with either moderate slopes or steep terrain.

Natural hazards in the area were identified through photo interpretation of the World View satellite image taken on June 19, 2012, with a spatial resolution of 0.5 m. The assessment identified six main geodynamic processes: karst geoshapes, rock falls, hillside erosion, river erosion, flood plains and soil saturation. In general, these processes occur locally; on the left and right margins of the Chilloroya river, in the Sacrane, Cunahuiri, Casanuma, Pumacocha, Huayllachane, Telaracaca, Ccatunhuaycco streams, and close to the lakes located northeast of the Mining Unit (Quesoccocha, Pincullune and Sillco).

According to the seismic hazard study conducted for the Constancia mine (Alva J. 2013), major earthquakes recorded intensities from VI to X on the Modified Mercalli scale (MM). Results of the probabilistic seismic analysis indicate that the value for the maximum horizontal acceleration for the OBE (Operating Basis Earthquake) is equal to 0.24 g, corresponding to a PGA (peak ground acceleration) for a return period of 475 years. The value of maximum horizontal acceleration for the MDE (Maximum Design Earthquake) is equal to 0.37 g, corresponding to a PGA for a return period of 2,475 years. The deterministic seismic analysis indicates that the largest acceleration for the Constancia Mining Unit area is 0.44 g, corresponding to the movement of the earth caused by the earthquake of intraplate deep subduction based on the average plus one standard deviation, called MCE (maximum credible earthquake)

6. HISTORY

6.1. EARLY HISTORY

Copper and gold were exploited at Katanga, located approximately 3km northwest of Constancia outside the Constancia property boundary from early last century to the early 1990s.

The Katanga deposit consists of narrow skarn bodies developed in the contact between marbles and monzonite stocks, with Cu, Ag and Au mineralization in hypogene sulphides.

6.2. PRIOR OWNERSHIP

The San José Prospect (now part of the Constancia Mine) was explored by Mitsui during the 1980s with a focus on locating more high-grade ore to add to the nearby Katanga mine operation. Exploration consisted of detailed mapping, soil sampling (1,949 samples), rock chip sampling (1,138 samples), ground magnetic and induced polarization (IP) surveys with several drilling campaigns. Drilling was mainly located in the western and southern sides of the prospect. Mitsui completed 24 drill holes (4,190.5m) and Minera Katanga completed 24 shallow close-spaced drill holes (1,239.8m) at San José.

In 1995, reconnaissance prospecting identified evidence for porphyry style mineralization exposed over an area 1.4 x 0.7 kilometres open in several directions, with some Cu enrichment below a widespread leach cap developed in both porphyry and skarn. Negotiations to acquire an interest in the property were unsuccessful at this time.

In May 2003, the area was revisited by Rio Tinto and the presence of a leached cap and potential for a significant copper porphyry deposit was confirmed. Negotiations with Mitsui, Minera Livitaca and Minera Katanga resulted in an agreement being signed on October 2003 with the underlying owners. The agreements included a joint venture (JV) option between Rio Tinto and Mitsui and Purchase Option Agreements with Minera Livitaca and Minera Katanga to acquire 100% interests in their property. Rio Tinto commenced exploration in December 2003.

The Rio Tinto exploration activities consisted of geological mapping, soil, and rock chip sampling, surface geophysics (magnetics and IP) and completed 24 diamond drill holes. In late 2004, Rio Tinto sought partners for the Constancia prospect, mostly because the property was thought to be too small.

Eventually, Norsemont entered into negotiations with Rio Tinto and these negotiations led to an agreement in early 2005. The first Norsemont geologists visited the property in June of 2005. By 2009, Norsemont had entered into a transfer agreement with Mitsui (November 2007) for the purchae of their 30% interest in the Constancia Project and had exercised the final option with Rio Tinto to acquire the remaining 19% interest in Constancia during 2008 providing 100% ownership of the Constancia Project.

During the period between 2005 and 2010 Norsemont's exploration activities were mainly focused on delineating the known Constancia and San José zones, although surface exploration of adjacent areas were also carried out, specifically focusing on the two new Cu-Au-Mo targets leading to the discovery of the Pampacancha porphyry-related skarn and Chilloroya South porphyry.

Norsemont got approval from the Environmental and Social Impact Assessment for the Constancia project by the Energy and Mines Ministry of Peru on November 24th, 2010.

6.3. HUDBAY OWNERSHIP AND PROJECT DEVELOPMENT

In March 2011, Hudbay acquired a 100% interest in the Constancia Project through its acquisition of all of the outstanding shares of Norsemont by way of a formal take-over bid.

Following the acquisition of the Constancia project in 2010, Hudbay's exploration activities focused on delineating the Pampacancha deposit.

From January to November 2011, there was a campaign of infill drilling and exploratory growth in Pampacancha, in order to define measured and indicated resources of Cu-Au-Mo. The most important was the identification at a north-western area of high grade skarn Cu-Au below post mineral rocks, which has meant a substantial increase in the amount of resources and the deposit grade.

On August 8, 2012, Hudbay's board of directors approved a US$1.5 billion investment to fund the development and construction of its Constancia project in Peru. Following substantial completion of the detailed engineering in the third quarter of 2013, the board approved a revised capital cost estimate for the project of US$1.7 billion.

Hudbay developed Environmental and Social Impact Assessment for the project that were approved by the Energy and Mines Ministry of Peru on August 20th, 2013 and April 15th, 2015.

Construction of the Mine-Milling complex of Constancia was completed on time and on budget at the end of 2014 with first ore mined in the fourth quarter of 2014.

6.4. PRODUCTION HISTORY

The start of 2015 brought substantial change to the Peru team with the transition from a construction project to operations. Constancia achieved commercial production in the second quarter of 2015, and subsequently ramped up to full production in the latter half of the year. Over the course of 2015, Constancia mine operations produced 105,897 tonnes of copper concentrate and 47,263 ounces of precious metals in concentrate.

The port expansion at Matarani was completed at the end of June 2016, which improved access to Hudbay's designated pier and reduced port costs.

Since 2015, Constancia mining operations and cost optimization continued as planned. The production performance over the past 5 years is summarised in Table 6-1 below. The reduction in copper, gold and silver production since 2016 is related to the planned transition from supergene high grade mineralization in the early phases of production to the lower grade deeper hypogene mineralization representing an increasing portion of the mill feed. This trend will be reversed and metal production will increase over the next 5 years due to the addition of the high grade mineralization from the Pampacancha deposit. The increase in molybdenum production is related to a significant improvement in both throughput and recoveries of the molybdenum concentrator.

TABLE 6-1: PRODUCTION PERFORMANCE

Metal	Unit	2016	2017	2018	2019	2020
Cu	t	133,432	121,781	122,178	113,825	73,150
Mo	t	188	454	904	1,272	1,204
Au	Oz	26,276	17,579	24,189	19,724	12,395
Ag	Oz	2,760,332	2,374,008	2,729,859	2,504,768	1,622,972

7. GEOLOGICAL SETTING AND MINERALIZATION

7.1. DISTRICT GEOLOGY

The oldest rocks in the area (Figure 7-1) correspond to a sequence of white, red, violet or grey medium-grained sandstones with intercalations of reddish mudstones of the Lower Cretaceous Chilloroya Formation (also referred to as the Murco Formation). The Arcurquina Formation discordantly overlies the Chilloroya Formation and correlates with the Upper Cretaceous Ferrobamba Formation. These rocks are exposed in a north-south trend, 15 km long by 5 km wide, comprising a sequence of limestones, calc-arenites and lenses of conglomerates.

These sedimentary formations have been intruded by plutonic rocks belonging to the Andahuaylas-Yauri Batholith of the Oligocene Age. The batholith composition grades in composition varies from dioritic to granodioritic in composition, with plagioclase and orthoclase feldspar, quartz, hornblende, biotite, apatite, zircon and sphene being the main rock-forming minerals. Small seams, veins and lenses of massive magnetite skarn related to the emplacement of the batholiths are common.

Several monzonitic stocks, dykes or laccoliths intrude and cross-cut all the lithologies mentioned above. Where these rocks have intruded limestones, it is common to find mineralized skarns, some of which contain Cu-Au-Ag mineralization such as those at the Katanga mine. Some of the stocks have characteristics typical of porphyry copper deposits such as at Constancia.

7.2. PROPERTY GEOLOGY

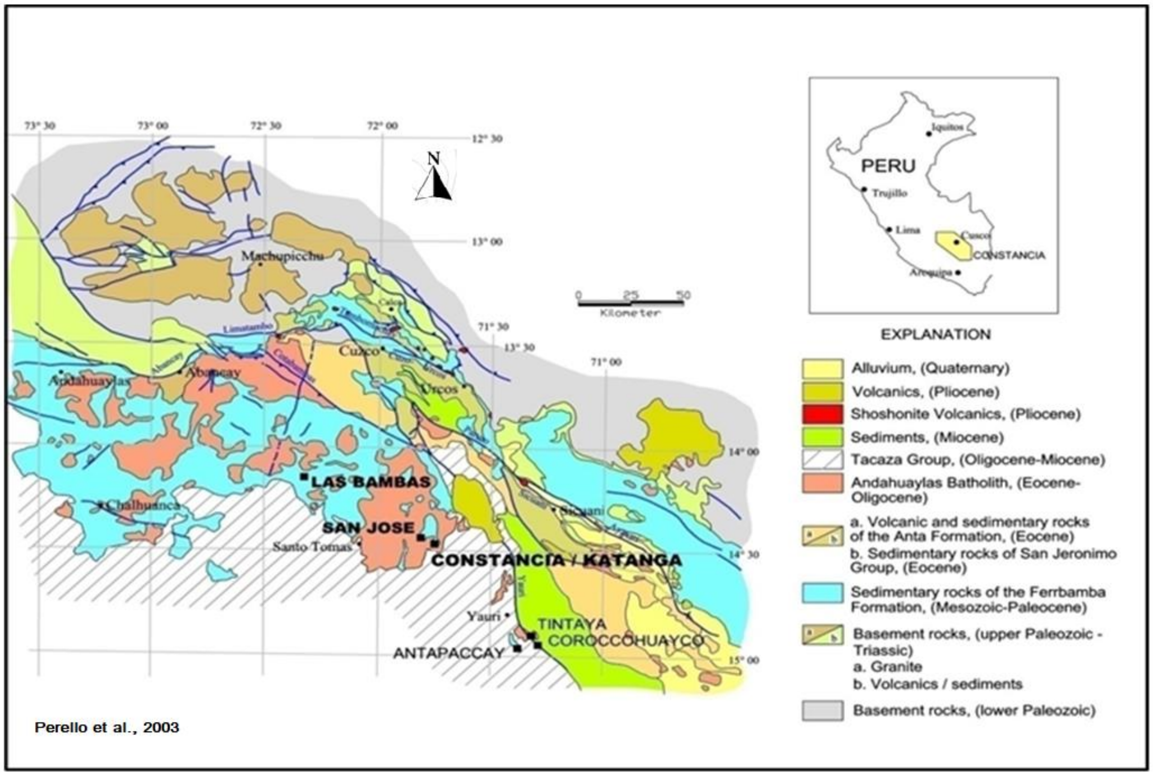
7.2.1. CONSTANCIA

The Constancia porphyry copper prospect is located on the eastern margin of the Andahuaylas- Yauri Batholith, approximately 3 km southeast of the old Katanga mine (Figure 7-2).

STRATIGRAPHY

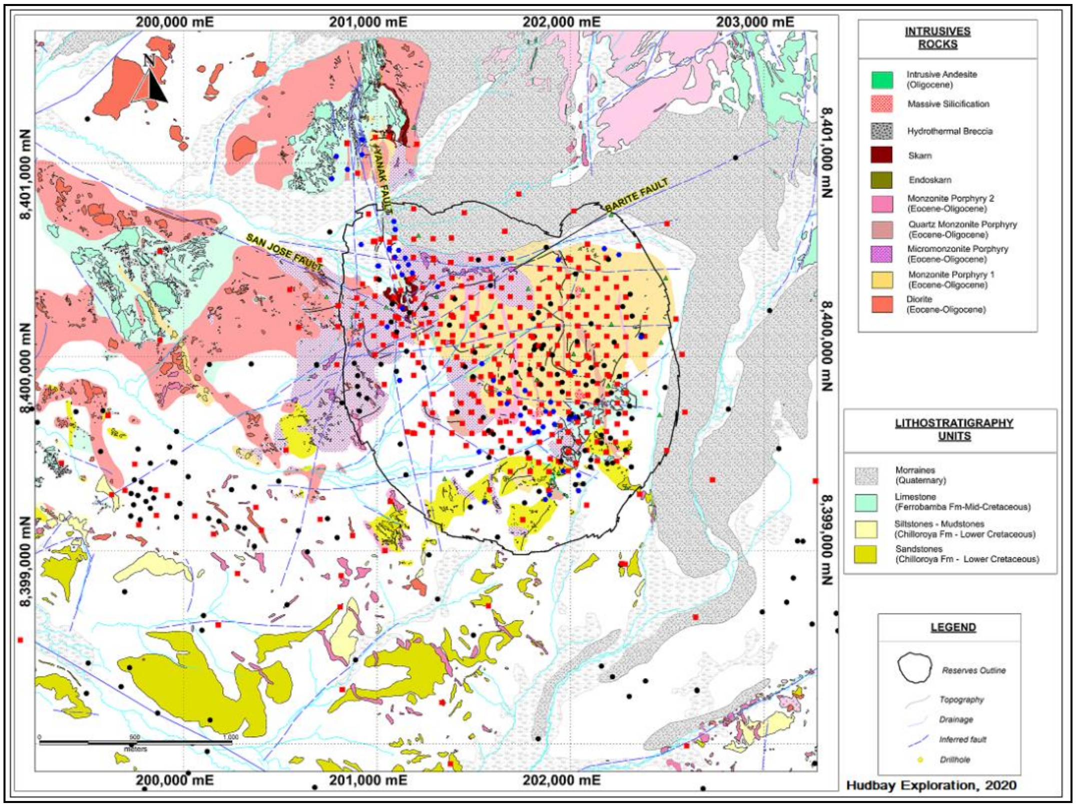
The oldest stratigraphic unit recognized on the prospect comprises clastic sediments corresponding to the Chilloroya Formation, consisting of a sequence of white, red, violet and grey medium-grained sandstones with intercalations of reddish mudstones. Immediately overlying this basal unit are massive, grey micritic limestones with minor intercalations of shales, which outcrop sporadically around the prospect and near the contacts with monzonite, sometimes occurring as roof pendants.

FIGURE 7-1: SIMPLIFIED GEOLOGY OF THE ANDAHUAYLAS YAURI AREA



Perello et al., 2003

FIGURE 7-2: GEOLOGICAL MAP OF THE CONSTANCIA DEPOSIT



Hudbay Exploration, 2020

This unit corresponds to the Arcurquina Formation (locally known as Ferrobamba Formation). When in contact with intrusive rocks, these alter to marble or pyroxene diopside-garnet-magnetite-epidote skarn, with or without sulphides. The limestones and skarns dip gently south-east, away from the principal monzonite in the southern part of the Constancia mineralized zone. The overall thickness of the sedimentary package is unknown.

The determination of the base of this limestone unit may be of importance at Constancia, as this potential contact seems to correlate with the favourable skarn horizon at the ex Tintaya Mine and elsewhere in the region. This contact may be found at depth south and east of the presently drilled area, if not intruded by the monzonite.

The underlying clastic sediments of the Murco Formation, and possibly the upper parts of the further underlying Hualhuani Formation (locally known as Soraya Formation), which lithologically consist of sandstones and siltstones, with occasional calcareous and quartzite horizons, are known to host copper mineralization in several copper systems within the belt. At Mitsui's Quechua deposit near Tintaya, and also at the Antillas porphyry copper deposit near Antabamba (north of Constancia), these rocks are the main host for the copper mineralization. The same style of mineralization occurs at Haquira (10 km south of Las Bambas), where Murco sediments are the host for most of the copper oxide resource of the system.

At Constancia, these types of clastic sediments, especially the Murco or Chilloroya Formation which is the host for the copper oxide mineralization at Haquira, have been identified in the southern sector of the property, around the Chilloroya village, where recent surface exploration has identified evidence of porphyry-related copper-gold-molybdenum mineralization associated with the sediments and altered porphyry rocks. Common to these clastic sediments is their iron-stained colouration, which comes from oxidation of former disseminated pyrite.

Glacial moraines cover the northern and eastern margins of the Constancia deposit. To the east these moraines entirely cover potentially important extensions of copper mineralization along broad east-west structural zones.

INTRUSIONS

Multiple phases of monzonite and monzonite porphyry characterize much of the surface area of the prospect, as well as dominating the rock types observed in the drilling to date.

At least four main phases of intrusion are recognized, with the second oldest being associated with the main mineralization event. From oldest to youngest they are:

Diorite: while not part of the intrusive event associated with mineralization, the Andahuaylas- Yauri Batholith forms the 'Intrusive Basement' to the Constancia deposit.

Monzonite Porphyry 1 (MP1): this unit outcrops as a large stock on the Constancia hill, extending west to San José. It hosts most of the porphyry-related mineralization. It is characterized by abundant plagioclase phenocrysts with hornblende in elongated crystals.

Micro Monzonite Porphyry (MMP): characterized by a fine-grained texture with plagioclase crystals, biotite and magnetite in the light gray matrix. This body outcrops as a stock in the south, but is more widespread west of the deposit, including the San José zone.

Quartz Monzonite Porphyry (QMP): this unit occurs mostly as wide, north- south to north-northwest trending dykes with dark, fine–grained chilled boundaries. Abundant plagioclase with tabular, well- formed hornblende crystals occur as phenocrysts in a greenish matrix. These vertical dykes are up to 60 m wide. There is no mineralization associated with the dykes.

Monzonite Porphyry 2 (MP2): this dyke-like monzonite porphyry outcrops between the Constancia and San José zones. It is characterized by abundant plagioclase phenocrysts sub-rounded in a whitish matrix with little magnetite and biotite. The monzonite porphyry occurs as dykes up to 150 m wide, which strike north-south with a steep easterly dip.

Andesite (AAN): dark-gray, aphanitic rock with plagioclase and hornblende phenocrysts. This occurs mainly as narrow dyke-like bodies, some of them close to the contacts with quartz monzonite porphyries.

STRUCTURAL GEOLOGY

As with most porphyry copper complexes, structural activity at Constancia has played the most significant role in preparing and localizing the hydrothermal alteration and accompanying copper- molybdenum-silver-gold mineralization, including skarn formation.

Major inter-mineral and post-mineral fracture systems in the deposit area strike northeast. One of the best known is the ‘Barite Fault’, formed by a number of nearly parallel vein-faults carrying base metal sulphides and barite. These veins have been exploited by artisanal workings throughout the property. This system is clearly visible in the ground magnetic maps, controlling major features including topographic and shear fabric changes in the San José zone.

A second important system strikes north-south. It seems to be more recent than the Barite system, controlling part of the San José deposit and most of the silicified breccias (some of them mineralized) in the system. It shares the same direction as the post-mineral dykes, and may have originated as tension gashes to the Barite direction.

Latest in the sequence is the north-northwest to south-southeast oriented fault system, with the Yanak Fault as the main example. These faults generate wide areas of gouge and milled rock, some of which show high hydraulic gradients.

7.2.2. PAMPACANCHA

STRATIGRAPHY

The main stratigraphic unit in the Pampacancha area is a massive, gray micritic limestone part of the Upper Cretaceous Ferrobamba Formation.

INTRUSIONS

The sedimentary sequence described above is intruded by dioritic porphyry, which is the phase that generated the magnetite skarn that hosts the economic Cu-Au-Mo mineralization. Other intrusive rocks present can be assigned to the unmineralized Oligocene basement dioritic batholiths. This diorite is also intruded by the mineralizing dioritic porphyry (described above). The younger intrusive phases include intra-mineral monzonite intrusions which provide minor local increases in Cu-Au and also locally cut the skarn Cu-Au mineralization.

Diorite (DIO): this unit is characterized by a faneritic texture and in composition shows abundant plagioclase phenocrysts with also hornblende and biotite diorite and limestone constitute the host rock of deposit.

Diorite Porphyry (PDI): this rock is characterized by a porphyritic texture with hornblende phenocrysts and sulfides (pyrite-chalcopyrite-molybdenite) disseminated and veinlets with quartz inside an aphanitic light green matrix.

Monzonite Porphyry 2 (MP2): This rock in Pampacancha occurs as lopolith stock in the middle west of deposits cutting all rock; it is characterized by K-feldspar, plagioclase phenocrysts, hornblende, biotite phenocrysts and magnetite inside a medium gray aphanitic matrix.

STRUCTURAL GEOLOGY

The structural geology of Pampacancha is a dominant factor for the emplacement of Cu-Mo porphyry-skarn and Au Veins mineralization. The occurrence of porphyry is associated to a NE-SW fault and shear zone system that contains three mineralized structural lineaments components NE-SW, NW-SE and NNE-SSW.

7.3. ALTERATION

7.3.1.CONSTANCIA

POTASSIC ALTERATION

The potassic alteration assemblage is characterized by secondary potassium-feldspar, and by variable amounts of hydrothermal biotite replacing earlier ferromagnesian minerals and rock matrix. Quartz veining is common; especially “A” and “B” type veinlets. Intensity of alteration is variable, ranging from weak to strong. Hydrothermal magnetite is also present as disseminations and associated with type veinlets in deeper sections. Anhydrite veinlets are also common. Within the potassic alteration zone, chalcopyrite-(bornite)-molybdenite-pyrite mineralization is present in A and B veinlets, and also replacing ferromagnesian minerals or filling fractures.

The high-grade (hypogene) copper mineralization is hosted by a dense A-veinlet stockwork developed in an early porphyry phase. Pyrite/chalcopyrite ratio is typically low and in the order of 1:1 to 2:1. Molybdenite also commonly increases with depth, related to “B” veinlets. Bornite occurs sporadically, especially at deeper levels, sometimes associated with gold values.

PROPYLITIC ALTERATION

Propylitic alteration is transitional to the potassic alteration and extends more than one kilometre from the porphyry intrusive contacts. The propylitic alteration mineral assemblage includes epidote-chlorite-calcite-pyrite-rhodochrosite. Subordinate chalcopyrite is also present, filling fractures or replacing mafic minerals. Sphalerite-galena veinlets and veins are distributed as a halo to the copper-molybdenum mineralization within the propylitic alteration halo, occurring at distances of up to 3 km away from the porphyry copper system.

PHYLLIC ALTERATION

Phyllic alteration forms a pervasive carapace surrounding and sometimes overprinting potassic alteration. This alteration accompanies almost complete destruction of primary rock textures. The phyllic alteration mineral assemblage includes sericite-quartz-pyrite, limited amounts of chalcopyrite and associated occasional “D” veins and veinlets.

7.3.2.PAMPACANCHA

SKARN ALTERATION

Pro-grade proximal magnetite-chalcopyrite-pyrite skarn grades to distal less well-mineralized garnet and pyroxene skarn which is locally overprinted by epidote-bearing retrograde skarn.

POTASSIC ALTERATION

Porphyry diorite and diorite show potassic alteration assemblage characterized principally by quartz veining with rims of K-feldspar stockwork and hydrothermal secondary biotite replacing earlier ferromagnesian minerals; the intensity of alterations is variable, ranging from weak to strong, and the best development of potassic alteration is shown in deep diorite very close to the deposit.

7.4. MINERALIZATION

7.4.1.CONSTANCIA

The Constancia deposit is a porphyry Cu-Mo-Ag system which includes copper-bearing skarn mineralization. This type of mineralization is common in the Yauri-Andahuaylas metallogenic belt where several porphyry Cu-Mo-Au prospects have been described but not exploited.

Five distinct mineral associations are found within the Constancia Project area, namely:

1) Hypogene, porphyry-style mineralization including disseminated, quartz-vein stockwork and fracture-controlled chalcopyrite-molybdenite mineralization in the intrusive;
2) Hypogene chalcopyrite, rare bornite, galena and sphalerite mineralization in skarns;
3) Supergene digenite-covellite-chalcocite (rare native copper) mainly hosted by intrusive rocks lying below the leach cap;
4) Transitional (mixed) including secondary copper sulphides/chalcopyrite in the monzonite (overlap of 1 and 3, above); and
5) Oxide copper, usually cuprite and tenorite appears at this zone associated to malachite-chrysocolla and rarely azurite.

Of these, the hypogene mineralization (Type 1) constitutes the bulk of the deposit. Skarn (Type 2) is volumetrically smaller, but grades are normally higher, and mineralization occurs at or near the surface. At the contact between the intrusive and limestones, magnetite - garnet skarn develops, while the pyroxene–diopside (garnet–epidote) association is more common in calcareous sandstones and of the Chilloroya Formation. Supergene enrichment (Type 3) occurs immediately beneath, and occasionally as remnants within, the leached cap. The highest copper grades in the Constancia porphyry are typically associated with this and with the skarn zone. The transitional or mix zone (Type 4) corresponds to the zone where the supergene and hypogene mineralization co-exist. Finally, oxide copper mineralization (Type 5) occurs in shallow levels and deeper along fractures.

Two areas of porphyry-style mineralization are known within the project area, Constancia and San José. At Constancia, mineralization is deeper than that observed at San José which occurs at surface. The mineralized zone extends about 1,200 m in the north-south direction and 800 m in the east-west direction. At the present time, both areas are part of the Constancia Pit.

Along the Yanak fault located at the northwestern part of the Constancia Pit, in recent exploration drilling, massive to semi-massive bodies of magnetite skarn with high-grade Cu-grade chalcopyrite mineralization have been identified in the footwall of the fault, the mineralization is related to mineralized porphyry dikes which have also mineralized the dioritic host rock and generated these high-grade skarn bodies.

7.4.2.PAMPACANCHA

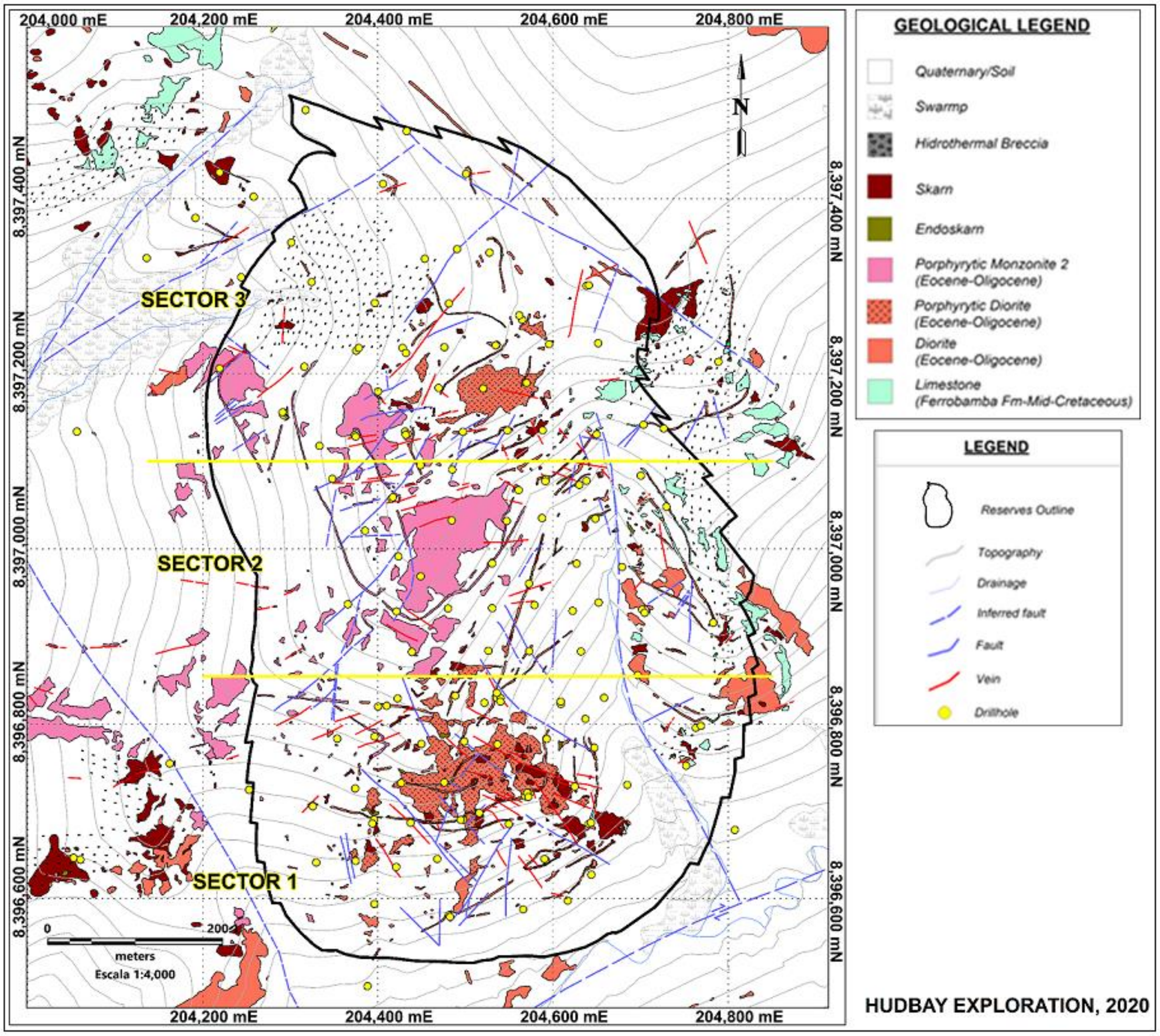
The Pampacancha mineralized body has been divided into three sectors, according to lithology and mineralization (Figure 7-3).

Sector 1 is characterized by the predominant magnetite skarn over calc-silicate skarn. Mineralization in sector extends from surface down to about 200m (true depth) with occasional deeper lenses. The skarn is intruded by potassic altered dioritic porphyry and fine-to-medium grained diorite (also exhibiting potassic alteration).

Sector 2 is located immediately north of Sector 1 and is characterized by the presence of a limestone bracketed between two main skarn layers, vertically extending from 70 m to about 250m. The shallower segment of the skarn shows alternations with thin limestone layers, all disrupted by the emplacement of diorite porphyry dikes and endoskarn.

Sector 3 extends immediately NW of Sector 2 and has the same characteristics as Sector 2, with a limestone body intercalated between two skarn layers, which pinch out northward, eastward and westward.

FIGURE 7-3: PAMPACANCHA



Epithermal mineralization of the low sulphidation quartz-sulphide Au + Cu style, accounts for common supergene enriched Au anomalies, along with other features such as hydrothermal alteration and veins typical of near porphyry settings.

8. DEPOSIT TYPES

The Constancia deposit is a porphyry Cu-Mo-Ag system which includes copper-bearing skarn mineralization. This type of mineralization is common in the Yauri - Andahuaylas metallogenic belt where several porphyry Cu-Mo-Au prospects have been described but not exploited.

The main porphyry deposits in the belt include Antapaccay (586 Mt @ 0.42% Cu, Glencore Resources and Reserves, as of Dec 2020 Report) and Quechua (~350 Mt @ 0.38% Cu, Mitsui Kinzoku press release, Nov 2015). Several other porphyry prospects are also being explored in the district.

Historically, the belt was better known for copper skarn deposits such as Las Bambas (copper skarn-porphyry) where MMG recently reported resources of 1,429 MT @ 0.63% Cu (MMG Mineral Resources and Ore Reserves Statement as of June 30, 2020). and Coroccohuayco (559 Mt @ 0.68% Cu, Glencore Resources and Reserves, as of Dec 2020 Report).

The Pampacancha deposit is a Cu-Mo-Au porphyry related skarn system, with copper-bearing skarn mineralization. As mentioned above, this type of mineralization is common in the Yauri-Andahuaylas metallogenic belt. As the sedimentary formations were intruded by dioritic and granodioritic batholiths, Cu-Au-Ag mineralization associated to magnetite developed in stockworks of seams, veins and lenses

The Constancia project area geology contains the classic characteristics typical of Andean porphyry copper deposits. The following generalized geological characteristics are the typical targets of exploration compilation efforts and support the classic genesis model of a copper porphyry:

- Associated to volcanic arc igneous assemblages.
- Ore bodies are associated with multiple intrusions and dikes of diorite to quartz monzonite composition with porphyritic textures.
- Breccia zones with angular or locally rounded fragments are commonly associated with the intrusives. The sulfide mineralization typically occurs between or within fragments.
- The deposits typically have an outer epidote - chlorite mineral alteration zone.
- Quartz - Sericite alteration zone typically occurs closer to the center and may overprint.
- A central potassic zone of secondary biotite and orthoclase alteration is commonly associated with most of the ore.
- Fractures are often filled or coated by sulfides, or by quartz veins with sulfides.
- Closely spaced fractures of several orientations are associated with the highest grade ore.
- The upper portions of porphyry copper deposits shows supergene enrichment with the metals in the upper portion being dissolved and carried down to below the water table, where they precipitate.

9. EXPLORATION

Copper and gold exploration in the Constancia area dates back to the early 1990s. The San José prospect (now part of the Constancia Mine) was explored by Mitsui during the 1980s with a focus on delineation of high-grade ore amenable to process at the Katanga facility. Exploration consisted of detailed mapping, soil sampling (1,949 samples), rock chip sampling (1,138 samples), ground magnetic and IP surveys with several drilling campaigns, mainly located in the western and southern sides of the prospect.

Mitsui completed 24 drillholes (4,190.5 m) and Minera Katanga completed 24 shallow, close-spaced drillholes at San José (1,239.8 m). Through a prospecting program carried out in 1995, an area of 1.4 km x 0.7 km (Constancia main) with porphyry-style mineralization was mapped and determined to be open in several directions.

Rio Tinto carried out exploration in the Constancia area between 2003 and 2004 including geological mapping, soil and rock chip sampling, and surface geophysics (magnetic; 20.3 lines-km and IP 12 lines-km). Rio Tinto completed 24 diamond drill holes for a total of 7,484.15 m.

Norsemont exploration activities between 2007 and 2011 in the district included the mapping of 11,444 hectares at the Constancia Project at several scales, including 1:1,000, 1:2,000 and 1:5,000. Of this, 8,905 hectares were mapped on Hudbay’s mining concessions, which represent 39% of Hudbay’s mining rights in the area. Additionally, 2,595 rock samples and 41 stream sediments samples were collected during this period. Ground magnetic and IP surveys cover all areas of Hudbay’s concessions (magnetic; 281 lines-km and IP 319,6 lines-km).

From 2005 to 2010, Norsemont drilled 153,556m for infill, condemnation, metallurgical, geotechnical, hydrogeological and exploration, drilled by core and reverse circulation.

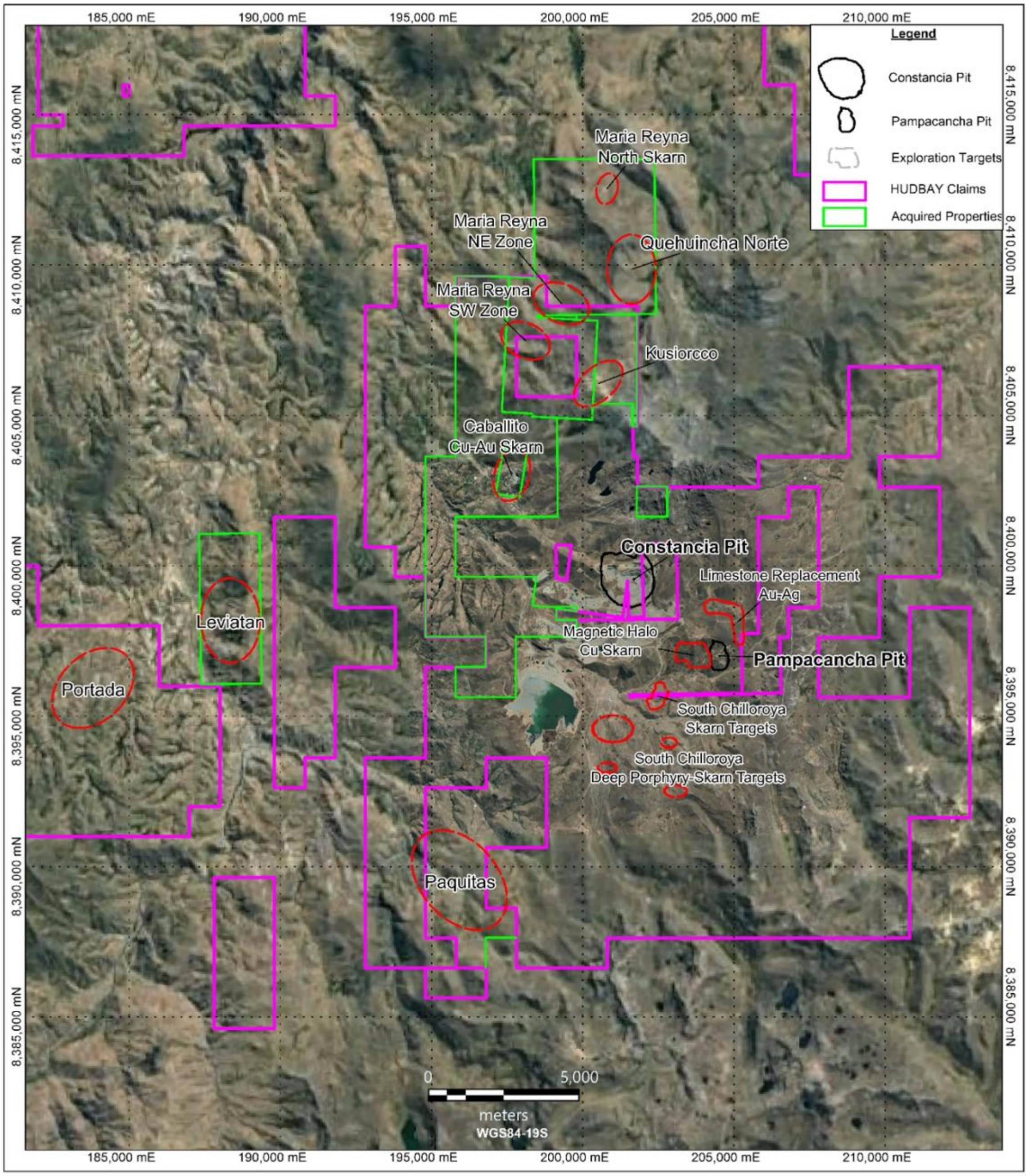
Following its acquisition of the Constancia Project in March 2011, Hudbay’s exploration activities focused on delineating the “new” Pampacancha deposit and understanding the district exploration upside. Since acquisition, Hudbay has completed over 45,000 m of drilling for resource definition, condemnation, metallurgical, geotechnical, hydrogeological and exploration drilling. These holes were drilled by core and reverse circulation. From 2012 to 2014 Hudbay also continued exploration through mapping of 10,703 hectares at 1:5,000 scale and collecting 756 rock samples and 124 stream sediments samples.

From 2019 to 2020, additional exploration activities were developed to the northwest of Constancia, between the northwest limit of the pit and the area known as Yanajaja, this after a review and interpretation of the results obtained in the initial explorations, detailed mapping at scale. 1: 2,000 was carried out in 185 Ha and 8,112.30 meters were drilled in 24 holes.

The author is of the opinion that the sampling methodologies and drill frequency is sufficient and that they are representative of the geology and deposits described.

In addition to the Constancia and Pampacancha prospects, other peripheral targets have been identified through prospecting, mapping, grab sampling and geophysics, including conventional IP and Titan 24 (38.4 km covering 8 lines, which was completed in 2011). The following Figure 9-1 shows a general view of the current Constancia district targets.

FIGURE 9-1: NEAR MINE CONSTANCIA EXPLORATION POTENTIAL



In January 2018, Hudbay announced the entering into of the following agreements to acquire mining properties in southern Peru near its Constancia mine (Figure 9-1): (i) an option agreement with a private Peruvian consortium to earn a 100% interest in the Caballito (formerly Katanga) and Maria Reyna mining properties; and (ii) an agreement to acquire from Panoro Minerals Ltd. 100% of the Kusiorcco mining properties.

CABALLITO

The Caballito property, located approximately three kilometres northwest of Constancia, is a 120-hectare (297-acre) concession block and is the site of the former Katanga mine, which was operated by Mitsui Mining & Smelting Co., Ltd. and Minera Katanga at different times between the late 1970s and early 1990s. The deposit at Caballito consists of narrow skarn bodies developed in the contact between limestone and monzonite porphyries with copper, silver and gold mineralization in hypogene sulfides. Reliable available data over this area is limited to aeromagnetic and radiometric maps.

MARIA REYNA

The Maria Reyna property, located within ten kilometres of Constancia, is a 5,850-hectare (14,456-acre) concession block. In 2010, diamond drilling by a previous optionee of the Maria Reyna property, intersected copper skarn, breccias and porphyry mineralization. Geophysical surveys and geological mapping have also been conducted on the property and Hudbay believes that the area remains very prospective for additional discoveries.

A summary of the historic drill results from Maria Reyna is contained in Table 9-1, however a qualified person has not independently verified this historical data or the quality assurance and quality control program that was applied during the execution of this drill program for Hudbay and, as such, Hudbay cautions that this information should not be relied upon by investors.

QUEHUINCHA NORTE

Quehuincha Norte target is located 11 kilometers to the north of Constancia Mine and 3 kilometers of the Kusiorcco area, within these block of concessions, was identified by the Hudbay exploration team. This area is coincident with the zone of aeromagnetic and radiometric anomaly identified in 2014.

Detail geological mapping at 1:2,000 scale was complete, 471 rock samples was collected for geochemical analisys, brown-green garnet prograde skarn area was mapping in the contact of porphyritic diorite with limestone of Ferrobamba Formation with an extension of 2 km, the mineralization is copper oxides, chalcopyrite in veinlets and quartz-sulfides structures, this area have active mining workers along the skarn area, an area of 500 x 500 meters of diorite porphyry with intense stock work with quartz and quartz-magnetite veinlets was mapped.

Geophysical data includes 56 kilometers of ground magnetic survey and 26,8 kilometers of IP survey in 13 lines, the chargeability sections show IP anomalies at the west along the skarn outcrop.

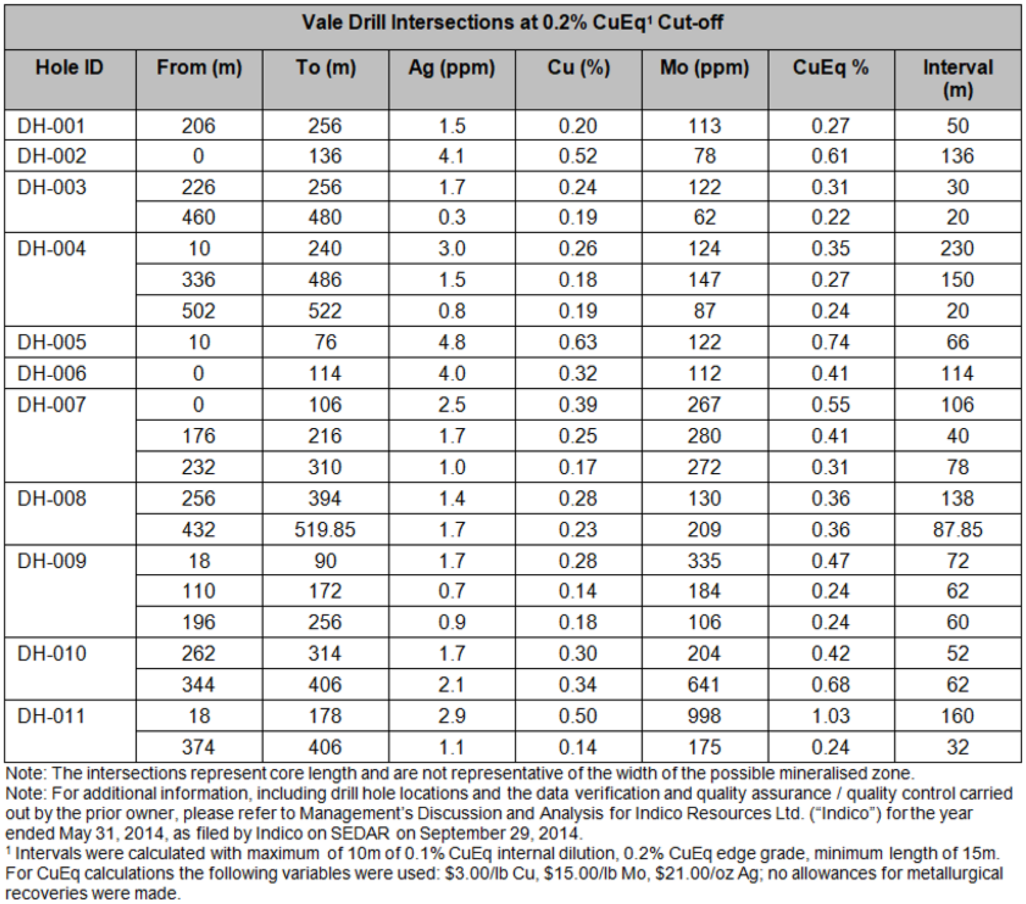
All permits have been obtained and the project is ready to drill.

KUSIORCCO

The Kusiorcco property is located within seven kilometres of Constancia and is nearby the Caballito and Maria Reyna properties. It consists of 10 concessions totalling 3,962 ha and hosts a large mineralized dacidic porphyry intrusive showing presence of quartz-sericite alteration, quartz stockwork and a leached cap. Geophysical data includes 24 kilometres of ground magnetic survey and 3 IP lines showing a coincident 1-km by 2-km induced polarization and resistivity anomalies overlying a 300m by 500m alteration zone.

Permitting and community relations work is ongoing to support exploration work on the Caballito, Maria Reyna and Kusiorcco properties.

TABLE 9-1: HISTORIC DRILL RESULTS FROM THE MARIA REYNA PROPERTY



Vale Drill Intersections at 0.2% CuEq[1] Cut-off							
Hole ID	**From (m)**	**To (m)**	**Ag (ppm)**	**Cu (%)**	**Mo (ppm)**	**CuEq %**	**Interval (m)**
DH-001	206	256	1.5	0.20	113	0.27	50
DH-002	0	136	4.1	0.52	78	0.61	136
DH-003	226	256	1.7	0.24	122	0.31	30
	460	480	0.3	0.19	62	0.22	20
DH-004	10	240	3.0	0.26	124	0.35	230
	336	486	1.5	0.18	147	0.27	150
	502	522	0.8	0.19	87	0.24	20
DH-005	10	76	4.8	0.63	122	0.74	66
DH-006	0	114	4.0	0.32	112	0.41	114
DH-007	0	106	2.5	0.39	267	0.55	106
	176	216	1.7	0.25	280	0.41	40
	232	310	1.0	0.17	272	0.31	78
DH-008	256	394	1.4	0.28	130	0.36	138
	432	519.85	1.7	0.23	209	0.36	87.85
DH-009	18	90	1.7	0.28	335	0.47	72
	110	172	0.7	0.14	184	0.24	62
	196	256	0.9	0.18	106	0.24	60
DH-010	262	314	1.7	0.30	204	0.42	52
	344	406	2.1	0.34	641	0.68	62
DH-011	18	178	2.9	0.50	998	1.03	160
	374	406	1.1	0.14	175	0.24	32

Note: The intersections represent core length and are not representative of the width of the possible mineralised zone.

Note: For additional information, including drill hole locations and the data verification and quality assurance / quality control carried out by the prior owner, please refer to Management's Discussion and Analysis for Indico Resources Ltd. ("Indico") for the year ended May 31, 2014, as filed by Indico on SEDAR on September 29, 2014.

[1] Intervals were calculated with maximum of 10m of 0.1% CuEq internal dilution, 0.2% CuEq edge grade, minimum length of 15m. For CuEq calculations the following variables were used: \$3.00/lb Cu, \$15.00/lb Mo, \$21.00/oz Ag; no allowances for metallurgical recoveries were made.

10. DRILLING

10.1. OVERVIEW

Extensive drilling has been conducted at Constancia since the early 2000's. The most recent drilling programs were completed by Hudbay, with prior drilling campaigns performed by Rio Tinto and Norsemont Mining (Table 10-1).

TABLE 10-1: DRILLING PROGRAMS BY YEAR (IN METRES DRILLED)

Company	PQ	HQ	NQ	RC	HOLES	TOTAL
Rio Tinto (2003-2004)		7,124	359		24	7,483
NOM 2005		9,799			41	9,799
NOM 2006		20,026	377		66	20,403
NOM 2007		23,863	5,197		77	29,060
NOM 2008	3,380	39,502	7,374	12,792	219	63,048
NOM 2009		4,487	113	409	33	5,009
NOM 2010		16,604	1,933	7,694	93	26,231
HB 2011		28,090	1,866	984	186	30,940
HB 2012		5,045	130	464	46	5,639
HB 2014 - 2015		4,353			26	4,353
HB 2017		8,750			46	8,750
HB 2019		6,662			33	6,662
HB 2020	484	7,046			26	7,530
GRAND TOTAL	3,864	181,351	17,349	22,343	916	224,907

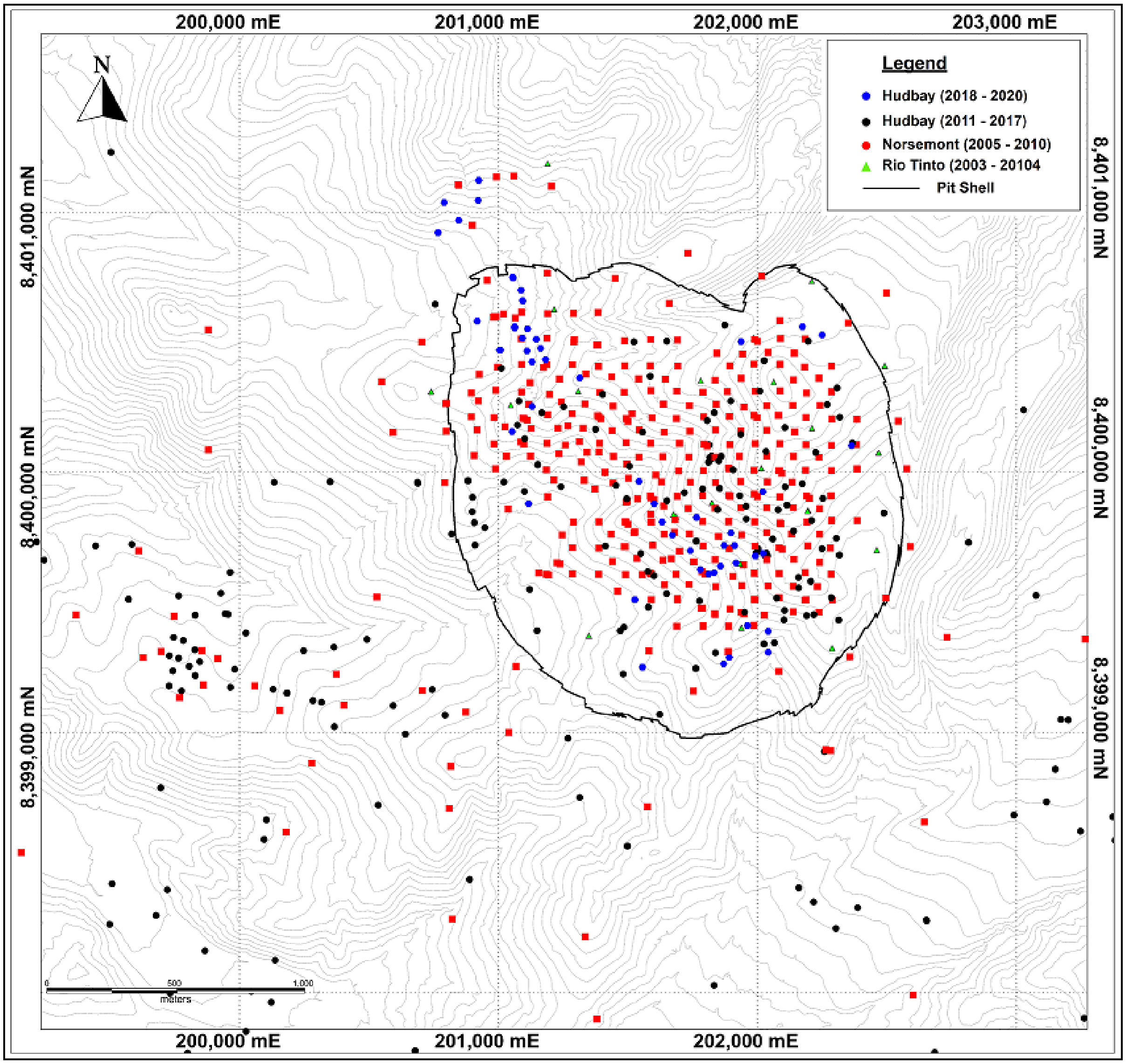
Exploration, infill, metallurgical, geotechnical, hydrogeological, condemnation and twin-hole drilling was conducted in order to adequately assess the deposit (Table 10-2).

TABLE 10-2: DRILLING PROGRAMS BY TYPE

PROGRAM	COMPANY	METERAGE	HOLES
Constancia Infill	Rio Tinto/Norsemont/Hudbay	115,204	348
Constancia - Condemnation	Norsemont/Hudbay	14,481	75
Constancia Metallurgical	Norsemont/Hudbay	5,091	31
Constancia - Geotechnical	Norsemont/Hudbay	16,377	193
Pampacancha - Geotechnical	Hudbay	727	3
Pampacancha - Hydrogeological	Norsemont/Hudbay	3,816	27
Pampacancha - Infill	Norsemont/Hudbay	40,427	144
Constancia - Exploration	Norsemont	12,812	38
Constancia - Exploration	Hudbay	8,112	24
Constancia Twin drilling	Hudbay	5,298	21
Constancia Hydrological	Hudbay	2,562	12
GRAND TOTAL		224,907	916

A map showing the location of the drill holes by company is provided in Figure 10-1 along with an outline of the mineral resource pit shell limits for the Constancia and Pampacancha deposits.

FIGURE 10-1: MAP OF DRILL HOLE LOCATION



10.2. RIO TINTO (2003-2004)

Rio Tinto drilled 24 diamond drill holes for a combined length of 7,483 m, using an average azimuth of 110° and average dip of 70°. The average depth is 312 m and the drill spacing is 300 m. Information for recovery is not available. Collar locations were surveyed with a hand-held GPS and certified by Horizons Consulting of Lima, Peru. Down hole surveying is not available for this campaign.

10.3. NORSEMONT MINING (2005-2010)

Norsemont Mining drilled a total of 529 holes for a combined length of 153,550 m, using an average azimuth of 150° and average dip of 78°. The average depth is 287 m and the drill spacing is 70x70 m. The overall core recovery was recorded as 95% in the original logging however further investigations of core pictures revealed that the recovery was measured on a length basis. Random checks conducted over several thousands of samples have shown that in reality half of the samples had a core recovery inferior to 85% when measured on a volumetric basis. This issue is quite common in the Peruvian porphyry deposits with intense alteration.

Collar locations were surveyed with a hand-held GPS and certified by Horizons Consulting of Lima, Peru. Down hole surveying was conducted on 30 m intervals (before 2007) and 50 m intervals (after 2007) using a combination of Flexit and Maxibor Survey instruments.

10.4. HUDBAY (2011-2020)

Hudbay acquired Constancia and conducted exploration, infill, metallurgical, geotechnical, hydrologeological, metallurgical and condemnation drilling between 2011 and 2020. A total of 742 drill holes were drilled using an average azimuth of 65° and average dip of 85°. Combining the Rio Tinto, Norsemont and Hudbay drilling, the average drill spacing is 80x80 m. Holes were usually collared with larger HQ-sized core as deeply as possible and finished with NQ-sized core if a reduction in core size was required due to ground conditions. For this drilling, it was also found that actual volumetric core recovery was inferior to the linear core recovery that had been recorded in the database.

In 2017, a twin-hole program of 21 holes was specifically conducted to assess the impact of material loss in previous drilling campaigns. Drilling was conducted with triple tube coring while using lubricants and minimizing fluid pressure. Volumetric core recovery significantly improved in this new campaign compared to the twinned historical Norsemont and Hudbay holes with the proportion of samples with core recovery over 85% increasing from 50 to more than 75%. The findings of the twin-hole study are discussed in more details in the 2017 technical report.

The final collar locations were recorded with a hand-held GPS. All measurements were recorded using UTM coordinates based on the Provisional South America 1956 (PSAD56) datum. Collar locations were surveyed and certified by Hudbay Peru.

Before 2014, the drilling azimuths were set up by marking the front and back sights using a Brunton compass. For the latest drill campaigns, the drilling azimuths were set up with a Differential GPS Trible R8 model 4 with a precision of 3 mm. The inclinations were measured with the drill rig inclinometer (typically, a digital inclinometer). Comparisons between the designed and downhole survey measurements at the base of the casings have shown negligibale variations.

Down hole surveys were measured every 30 m intervals using a hand-held GPS which measured inclination/dip and azimuth direction. For the latest drill campaign, down hole surveys were conducted on 30 m intervals using a Gyro Survey instrument which measured inclination/dip and azimuth direction.

At Pampacancha, down hole surveys were measured every 3 m intervals using a Maxibor 2 instrument which measured inclination/dip and azimuth direction.

There are no factors that could materially impact the accuracy and reliability of the drilling results.

11. SAMPLE PREPARATION, ANALYSES AND SECURITY

The sampling methodology, analyses and security measures used by the previous owners at Constancia have been documented in the 2018 Technical Report produced by Hudbay and available on SEDAR.

During the Hudbay 2011 campaign, the samples were transported to the SGS laboratory in Lima, Peru for preparation and analysis while in 2014, the samples were transported to the SGS Constancia laboratory at the mine site for preparation. Once samples were pulverized, a 250 g subsample pulp was collected and air freighted to the SGS laboratory in Lima, Peru, for analysis. In 2015, the samples were transported to the SGS Constancia laboratory at the mine site for preparation and analysis and in 2017, for the twin hole drilling program, blanks and standards were inserted at site, prior to dispatching the core boxes to the Certimin laboratory in Lima for sample preparation followed by analysis at the Certimin and SGS laboratories in Lima. Since September 2017, operation of the Constancia laboratory has been transferred to Bureau Veritas (Inspectorate) where all samples collected since have been sent for sample preparation. The pulps were then sent the Bureau Veritas laboratory in Lima for ICP analysis. The SGS laboratory in Lima has been retained for external checks.

As part of Hudbay's QA/QC programs, samples were systematically introduced in the sample stream to assess adequate sub-sampling procedures, potential cross-contamination, precision, and accuracy.

Sample preparation, analysis, and security procedures were reviewed by Olivier Tavchandjian, P. Geo. and Qualified Person of this Technical Report. The sampling methodology, analyses and security measures have been documented in great details already in past published technical reports on the Constancia property and will only be summarised in this document. Unless specified in the report, all the laboratories used for samples prepararation, analysis and security are independent of Hudbay.

11.1. CORE LOGGING

The drilling contractors thoroughly cleaned the drill core retrieved from the core tube before piecing all the segments together in the core boxes. Footage marker were inserted after each run to indicate the relative down-hole depth. Core boxes were labelled with the hole name, box number and from - to footage measurements before being closed with a tightly fitted lid and being delivered to the core processing areas at the Constancia. Private 24-hour per day security guards or Hudbay personnel controlled site access and oversaw sample security at each camp and drill site.

Prior to measuring the core recovery parametres and rock quality data (RQD), visual checks were performed for incorrect placement and orientation of core fragments. Discrepancies caused by mislabelled or misplaced block markers were resolved by consulting the drilling contractors. The drill core was marked with cut lines designed to provide the most representative split.

Standard parametres for core recovery and RQD for each drill run were measured by either the trained geotechnicians or geologists. All core logging was performed by experienced geologists. At the start of each drilling campaign, all geologists were provided with three days of training on the rock types, alterations, mineralization and structures found on the property.

Before 2014, all drill holes were logged on paper logs and later transferred into spreadsheets. Later, drill holes were logged directly on PC tablets. Drill cores are divided into sub-intervals based on the rock types observed by the geologists. Each interval was described for alteration, mineralization, and oxidation state of the primary sulfides. Any significant veins found were also logged along with identifiable structures.

11.2. SAMPLE SELECTION

Core samples for assaying were selected by the core logging geologist. The typical sample interval is 1 to 2 m long in mineralized rocks and 3 m in barren samples while being mindful of lithological contacts. Geologists were responsible for filling paper tags for each sample in the sampling book, with the hole name and sample interval. Sample tag numbers along with the sampled intervals were also entered into the core logging database. For core samples, two of the three tags were stapled into the core box at the starting point of each sample, one to remain there, and the second to accompany the sampled split in the sample bag. Lines were drawn on the core using a permanent marker to indicate the beginning and end of each sample. For QA/QC samples consisting of duplicates (analyses generated from the same interval from a coarse reject or a quarter split), two sets of sample tags were stapled into the core box, and a double line was drawn on the core. For other QA/QC samples (blanks, duplicates and standards), a single sample tag was stapled into the core box indicating the QA/QC sample's relative position in the sequence and the sample type.

11.3. CORE PHOTOGRAPHS

Logged core boxes with the sample intervals marked and sample tags inserted were photographed using a digital camera mounted to a tripod in natural light. All photos taken were loaded on to a laptop computer and reviewed by the on-site database manager. Any photos deemed unacceptable were retaken.

11.4. CORE SPLITTING

Prior to splitting core, the database manager printed a sample list for each drill hole that included the sample identification number, hole name, sample type and the start and end footage of each sample. This list was used to label sample bags. At the core splitting station, a bucket was lined with the correctly labelled sample bag and the corresponding core box was placed on to the work table next to the core saw. The core cutters separated one of the two sample tags stapled in the core box at the start of the sample and placed them in the sample bag. For quarter split, the second QA/QC sample tag was also placed in the same bag. Core was split along the cut line drawn by the geologist. In gouge and rubble intervals, an aluminium sampling scoop was used to separate the gouge into two halves in the core boxes. Completed sample bags were closed using the bag draw strings and secured at the neck using two zip ties. All saws and sampling buckets were rinsed with water after cutting each sample to prevent cross contamination.

11.5. SAMPLE DISPATCHING

A requisition form that listed the range of sample numbers, job order number, requested analytical codes and any special instructions was created. The requisition form were emailed to the preparation laboratory prior to sample shipment. QA/QC samples including blanks, duplicates and standards were prepared by the database manager prior to sample shipment. On the day of sample shipment, sample bags were cross-checked with the sample requisition list before packing.

11.6. SAMPLE PREPARATION

11.6.1. HISTORICAL

Table 11-1 presents the summary of the sample preparation method used for the drill campaigns conducted by the previous owners.

TABLE 11-1: SUMMARY OF THE SAMPLE PREPARATION METHOD BY COMPANIES

Company	**Mitsui and Minera Katanga**	**Rio Tinto**	**Norsemont**	**Norsemont**	**Norsemont**	**Norsemont**
Year	1970-1980	2003-2004	2005	2006-2007	2008-2009	2010
Core split	*unknown*	Yes	Yes	Yes	Yes	Yes
Laboratory	*unknown*	ALS Chemex, Lima	ALS Chemex, Lima	ALS Chemex, Lima	ALS Chemex/ SGS, Lima	SGS, Lima
ISO Certified	*unknown*	Yes	Yes	Yes	Yes	Yes
Drying	*unknown*	*Regular samples 110 °C*	*Regular samples 110 °C*	*Regular samples 110 °C*	*Regular samples 100 °C+/- 5°C*	*Regular samples 100 °C+/- 5°C*
Crushing	*unknown*	Jaw	Jaw	Jaw	Jaw	Jaw
Mesh size	*unknown*	-10 Mesh (2mm)	-10Mesh (2mm)	-10 Mesh (2mm)	-10 Mesh(2mm)	-10 Mesh (2mm)
Spitting	*unknown*	Riffle	Riffle	Riffle	Riffle	Riffle
Weight of sub-sample	*unknown*	250 g	250 g	250 g	250 g	250 g
Size of sub-sample	*unknown*	≥85% passing through -200 mesh (75 µm)	≥85% passing through -200 mesh (75 µm)	≥85% passing through -200 mesh (75 µm)	≥95% passing through -140 mesh (106 µm)	≥95% passing through -140 mesh (106 µm)
Grinding bowl	*unknown*	Steel /Chrome	Steel /Chrome	Steel /Chrome	Steel /Chrome	Steel /Chrome
Quartz wash	*unknown*	*unknown*	*Yes*	*Yes*	*Yes*	*Yes*
Assay charge	*unknown*	30 g	30 g	30 g	30 g	30 g
Storing of coarses and pulps rejects	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*

11.6.2. HUDBAY

Drill core samples were picked up at the core processing facilities and transported via from the camp site to Arequipa and ALS Chemex – SGS laboratories were weighed upon arrival, dried at 100°C, and crushed in jaw crushers to 90% passing through #10 mesh (2 mm). The entire crushed samples were homogenized, riffle split, and 250 g subsamples were pulverized to ≥95% passing through #140 mesh (106 µm) using steel/chrome grinding bowls. Jaw crushers, preparation pans, and grinding bowls were cleaned by brush and compressed air between samples. Cleaning with a quartz wash was conducted between jobs and between highly mineralized samples and, and finally from Arequipa to Lima, Peru. Samples. The remaining coarse and pulps rejects were sent for storage to Abil Corporation warehouse, located in Lima, Peru.

ALS Chemex and SGS have a quality system that is compliant with the International Standards Organization (ISO) 9001 Model for Quality Assurance and ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories.

As for the 2017 twin hole program, drill core samples were picked up at the core processing facilities and transported page via Transportes ACOINSA from camp site to Certimin laboratory located in Lima, Peru.

Upon arrival at Certimin laboratory, samples were relabelled, weighed and crushed in jaw crushers to 100% passing through #10 mesh (1.7 mm). The entire crushed samples (about 12 Kg) were homogenized and splitted via rotary splitter (about 500 gr). For every sample, one sub sample was kept while the other was pulverized to ≥85% passing through #200 mesh (74 µm) using Steel/Chrome grinding bowls. Jaw crushers, preparation pans, and grinding bowls were cleaned by brush and compressed air between samples. Cleaning with a quartz wash was conducted between jobs and between highly mineralized samples. The remaining coarse and pulps rejects are stored temporarily at Certimin facilities located in Lima, Peru, and after finishing all processes (metallurgical), will be transported to Constancia mine for final storage.

Pulp samples prepared at Certimin were dispatched to SGS Lima for ICP-EOS analysis. Upon arrival, samples were weighted and 4% were randomly selected from individual batches for granulometry analysis. If the pulp sample's granulometry failed to achieve ≥95% passing through #140 mesh (106 µm), the samples in the batch were pulverized to ≥85% passing through #140 mesh (106 µm) using steel/chrome grinding bowls. Grinding bowls were cleaned by brush and compressed air between samples. Cleaning with a quartz wash was conducted between jobs. The remaining pulps rejects were stored temporarily at SGS facilities, located in Lima, Peru. Once the assay program was completed, all the pulps reject were transported back to the Constancia mine for final storage.

Certimin (Lima, Peru) has a quality system that is compliant with the International Standards Organization (ISO) 9001 Model for Quality Assurance and ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories.

SGS (Lima, Peru) has a quality system that is compliant with the International Standards Organization (ISO) 9001 Model for Quality Assurance and ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories.

Since 2018, sample preparation has been conducted at the on-site laboratory in Constancia; one samples arrive to lab facilities,samples are weighed and crushed in jaw crushers to 100% passing through #10 mesh (1.7 mm). The entire crushed samples (about 12 Kg) are homogenized and splitted via rotary splitter (about 500 gr). For every sample, one sub sample is kept for QC purposes while the remaining sample is pulverized to ≥85% passing through #200 mesh (74 µm) using Steel/Chrome grinding bowls. Jaw crushers, preparation pans, and grinding bowls are cleaned by brush and compressed air between samples. Cleaning with a quartz wash is conducted between jobs and between highly mineralized samples. Pulps are delivered to Arequipa via Cruz del Sur (The official personnel transporting contractor).Once in Arequipa, samples are deliver to Lima by air cargo. Once samples are received by Bureau Veriats in Lima, they are assayed following the instructions provided by Mine Geology department (HUDBAY). The remaining coarse and pulps rejects are stored at Mine Geology facilities located in Constancia Mine.

The sample preparation, analysis, and security procedures are considered industry standard, adequate, and acceptable.

11.7. BULK DENSITY

11.7.1. HISTORICAL

A total of 2,166 samples from 292 drill holes were collected for specific gravity determinations and sent to ALS Chemex and SGS labs in Lima, Peru. Density measurements were done using immersed wax coated core. The drill core samples, 8 to 10 cm long, were taken every 50 m from half-split core.

At the laboratory, samples were dried at 80°C overnight (12 hours) and then allowed to cool to room temperature. The initial weight of the sample is determined using a top loading balance and recorded. Balances are calibrated using a 0.01 mg, and 0.001 mg calibration weight. The sample is immersed in a pan containing molten paraffin, immediately removed from the molten paraffin and shaken a few times to remove excess wax while hardening. The wax coated sample is re-weighed using the top loader and the weight is recorded. The standard water displacement method[1] is then used to calculate the specific gravity. In addition and following the same methodology, Norsemont re-analyzed 281 samples at SGS, Lima, Peru as part of its QC program. The results have shown that the SG values are accurate.

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[1] Density = W1 / (V1 – (W2 – W1/Density Wax))

11.8. ASSAY METHODOLOGY

11.8.1. RIO TINTO

Drill core samples were analyzed for 27 elements by Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES), with four acids digestion. Selected samples above the detection limit were analyzed by Atomic Absorption Spectroscopy (AAS). All the analysis was performed by ALS, Lima, Peru using the method ME-ICP61 and AA62 for Cu over-ranges.

Sequential copper data is not available. According to an exploration report from Rio Tinto Exploration (2004), limited Cu soluble analysis (CN leach) was performed over selected intervals when chalcocite was described as the main Cu-bearing mineral.

11.8.2. NORSEMONT

Drill core and RC samples were analysed by ALS Chemex for 27 elements using ME-ICP61 and by SGS for 41 elements using ICP40B with four acid digestions. Samples above detection limit were analysed by Cu_AA62 method.

11.8.3. HUDBAY

CONSTANCIA

Drill core samples were analyzed for 41 elements by Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES) with HNO3-HClO4-HF-HCl digestion and HCl Leach. Samples above detection limits were analyzed by AAS, while gold was analyzed by Fire Assay with AAS finish. Samples with copper concentrations above 2,000 ppm were systematically re-assayed by a sequential copper method (AAS73B).

As for the 2017 twin-hole program, drill core samples were analyzed for 41 elements by ICP-OES with HNO3-HClO4-HF-HCl digestion and HCl Leach and by AAS, while gold was analyzed by Fire Assay with AAS finish.

Since 2018, the drill core samples are analyzed for 41 elements by ICP-OES with HNO3-HClO4-HF-HCl digestion and HCl Leach and by AAS, while gold was analyzed by Fire Assay with AAS finish.

PAMPACANCHA

Samples were analysed by the SGS laboratory through Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES) after multi-acid digestion and gold was determined by fire assay with Atomic Absorption Spectroscopy (AAS). SGS is currently registered with ISO/IEC 17025 and ISO 9002 accreditation.

Samples were analyzed for 41 elements through ICP-OES (ICP40B Lab Code) after multi-acid digestion of a 0.20 g of sample. If silver, copper, iron, molybdenum, lead and zinc values were above upper reporting limit, then the element was re-assayed using AAS after multi- acid digestion of an 0.25 g of sample. Gold was analyzed by AAS after fire assay using 30 g of sample (FAA313 Lab Code) and values greater than 5000 ppb were re-assayed using a gravimetric finish. All analytical balances are certified annually by a third party. Check weights are used daily to verify calibration of balances. All metal standards used to make the calibration standards for the AAS and ICP are certified and traceable.

Samples with copper concentrations above 2,000 ppm were systematically re-assayed by a sequential copper method (AAS73B).

11.9. DATA VALIDATION

11.9.1. DRILL HOLE DATABASE

Hudbay built an entirely new drill hole database from all pre-Hudbay drilling and assaying information. The following subsections describe the process Hudbay used to build a completely new database of the drilling and assay values and the steps taken to verify the information. All non-Hudbay drill holes will hereby be referred to as “historical drill holes”. The author’s opinion is that the data verification is adequate for the purposes used in this Technical Report.

DRILL HOLE COLLARS

Drill hole collar coordinates of pre-Hudbay drilling were resurveyed and reported in a single grid system. The coordinates were converted to WGS 84 UTM Zone 19 using ArcGIS Software. The conversion was based on a best fit transformation using drill hole collars and corners from claim boundaries (approximately 800 points in total). This conversion was verified by plotting the converted coordinates against a drill hole collar compilation map prepared by Horizons South America in 2013, and the results are within an acceptable margin of error (+/- 0.07 m).

DOWNHOLE SURVEYS

Downhole survey files exist for 379 of the 463 historical drill holes. The majority of the downhole surveys were conducted by Geotec and Comprobe using survey methods that measured the drift angle and azimuth. The readings were generally recorded every 50 m for Flexit and every 3m for Maxibor. From the record sheets it cannot be determined if the azimuth recorded was adjusted for magnetic declaration, hence no further adjustments were made to these readings. However, of the 463 historical drill holes, 17 were drilled vertically.

Hudbay field-checked the collar positions and visually verified plans and the database for correctness. Down-hole surveys were checked by examining coarse changes in the variables. Check runs were done at regular intervals to check the consistency of the drilling data.

A random revision from the lithology and mineralization log data and assay certificates from 27 drill holes was performed. Discrepancies were not identified between the log data and assay certificates and the drill hole database used for the mineral resource estimate.

An internal validation of the Pampacancha drillhole database against the original drill logs and assay certificate information was carried out by Hudbay. No significant discrepancies were observed within the database.

DATA SECURITY

The historical assay database and the Hudbay assay database are administered by the database manager with working copies kept on the local drive of a secure computer and backups placed on a secure location on a Hudbay server. Any requests for edits to the database are made to the database manager who updates all the copies. All paper copies of the historical assay certificates and logs are available on the Hudbay’s server.

11.10. QUALITY ASSURANCE AND QUALITY CONTROL PROGRAMS

11.10.1. HISTORICAL

Table 11-2 displays the standard reference material used while Table 11-3 presents overviews of the quality control used.

TABLE 11-2: STANDARD REFERENCE MATERIAL

Company	Year	Reference material	Origin	Au ppm	Ag ppm	Cu ppm	Mo ppm	Zn ppm
NOM	2005	CDNCGS_6		0.266		3246	11	
NOM	2005	CDNCGS_7		0.963	3.59	10072	13	
NOM	2006	GQ601193	SGS			2452	86	
NOM	2006	GQ601194	SGS			5166	319	
NOM	2006	GQ601195	SGS			7384	65	
NOM	2006	GQ601196	SGS			12500	159	
NOM	2006	MV600011	SGS			2052	74	
NOM	2006	MV600013	SGS			5052	127	
NOM	2006	MV600014	SGS			7503	81	
NOM	2007	MV600015	SGS			24476	120	
NOM	2007	MV600038	SGS		5.9	1972	106	294
NOM	2007	MV600039	SGS		4	5039	76	751
NOM	2007	MV600040	SGS		3.3	7406	65	506
NOM	2007	MV600041	SGS		15.1	25013	121	2317
NOM	2009	NOM-STD-010	ACME LABS	0.019	1.3	2055	102	93
NOM	2009	NOM-STD-020	ACME LABS	0.066	2.4	5177	111	120
NOM	2009	NOM-STD-030	ACME LABS	0.079	5.8	9986	180	192
HB	2012	OREAS-501	ORE RESEARCH & EXPLORATION	0.204	0.84	2710	59.2	
HB	2012	OREAS-503	ORE RESEARCH & EXPLORATION	0.687	1.63	5660	390	
HB	2012	OREAS-504	ORE RESEARCH & EXPLORATION	1.48	3.13	11370	643	
HB	2017	BLANKS	ESDEL	0.02	0.3	50	20	50
HB	2017	HBSG-01	CHAPI			4560	1100	
HB	2017	HBSK-01	CHAPI	0.118	4.3	7140		
HB	2018	HBB-01	TARGET ROCKS	0.103	5.6	6110		
HB	2019	HDBY-04	TARGET ROCKS	0.046	2.9	3358	126	741
HB	2019	HBSK-01	CHAPI	0.118	4.3	7140		
HB	2019	BLANKS	ESDEL	0.02	0.3	50	20	50
HB	2020	OREAS 501C	ORE RESEARCH & EXPLORATION	0.221	0.461	2760	97	
HB	2020	OREAS503C	ORE RESEARCH & EXPLORATION	0.698	0.83	5380	318	
HB	2020	OREAS 503D	ORE RESEARCH & EXPLORATION	0.666	1.34	5240	348	
HB	2020	OREAS 504	ORE RESEARCH & EXPLORATION	1.48	3.13	11370	643	
HB	2020	OREAS 504B	ORE RESEARCH & EXPLORATION	1.61	3.07	11100	499	

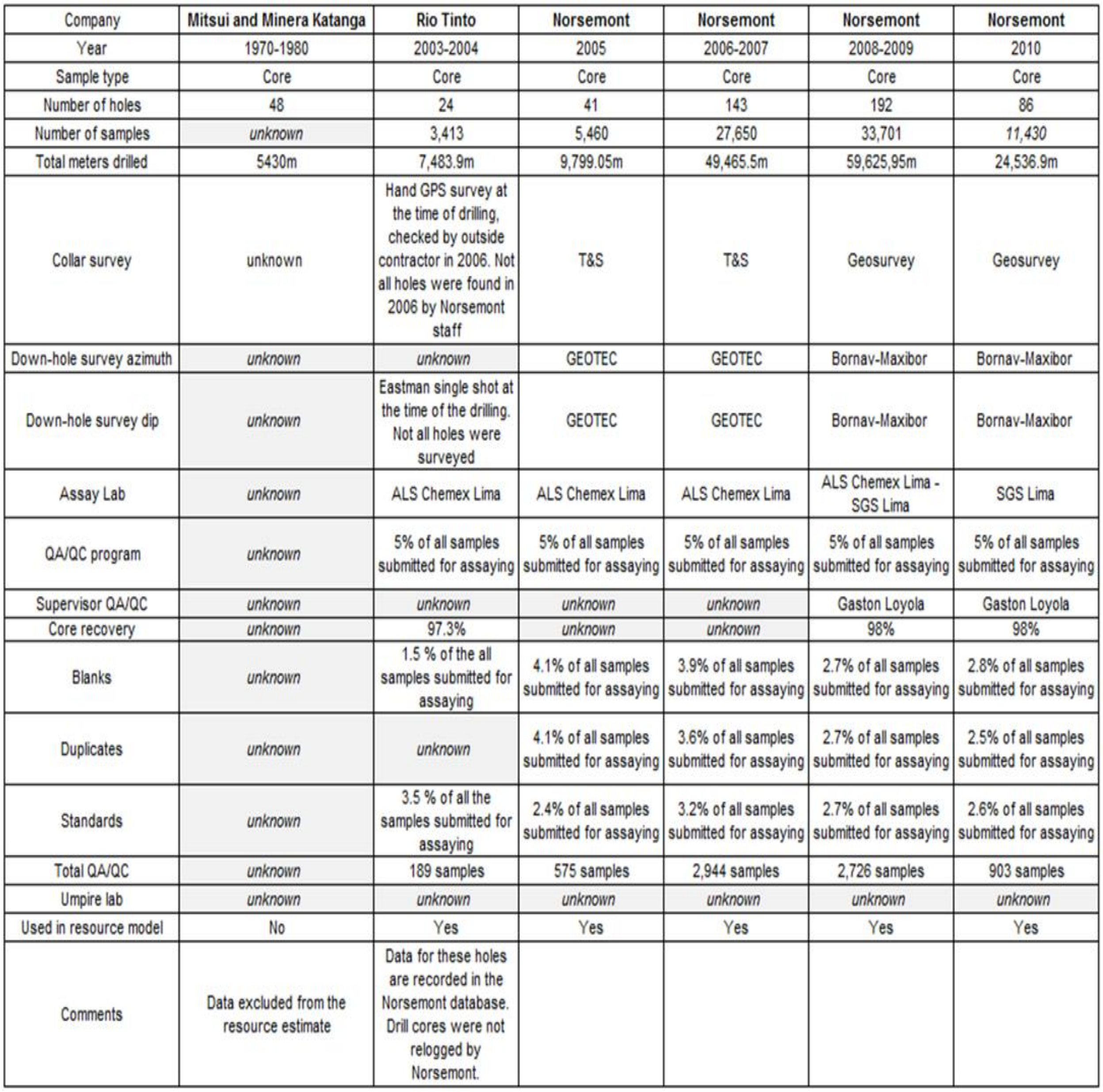
11.10.2. NORSEMONT

The Quality Control (QC) protocol during the Constancia exploration campaigns from 2006 to 2010 included the insertion of blanks, duplicates and standards using an insertion rate of one of each every 20 samples.

The field duplicates, coarse duplicates, coarse blanks and Certified Reference Materials (CRMs) were inserted on the drill site prior to submission to the laboratory. Furthermore, Norsemont used the additional controls listed below:

- Pulp duplicates were routinely analyzed by the laboratory to monitor the precision of the laboratory. They were not submitted as “blind” to the laboratory, so therefore their value is diminished. These were inserted every 20 samples.
- Coarse duplicates (or preparation duplicates) were taken after crushing to provide information in regards to the sub-sampling variance. They were not submitted to the same laboratory so therefore, their value is diminished. These duplicates were submitted in a proportion of one in every 20 samples.
- Check samples (pulp rejects) were submitted to an umpire laboratory (ACME and Inspectorate). These samples were used to estimate the accuracy of the assay results, along with the standards. These pulps duplicates were submitted in a proportion of one in every 20 samples.

TABLE 11-3: QUALITY CONTROL BY DRILLING CAMPAIGNS



Company	Mitsui and Minera Katanga	Rio Tinto	Norsemont	Norsemont	Norsemont	Norsemont
Year	1970-1980	2003-2004	2005	2006-2007	2008-2009	2010
Sample type	Core	Core	Core	Core	Core	Core
Number of holes	48	24	41	143	192	86
Number of samples	*unknown*	3,413	5,460	27,650	33,701	*11,430*
Total meters drilled	5430m	7,483.9m	9,799.05m	49,465.5m	59,625,95m	24,536.9m
Collar survey	unknown	Hand GPS survey at the time of drilling, checked by outside contractor in 2006. Not all holes were found in 2006 by Norsemont staff	T&S	T&S	Geosurvey	Geosurvey
Down-hole survey azimuth	*unknown*	*unknown*	GEOTEC	GEOTEC	Bornav-Maxibor	Bornav-Maxibor
Down-hole survey dip	*unknown*	Eastman single shot at the time of the drilling. Not all holes were surveyed	GEOTEC	GEOTEC	Bornav-Maxibor	Bornav-Maxibor
Assay Lab	*unknown*	ALS Chemex Lima	ALS Chemex Lima	ALS Chemex Lima	ALS Chemex Lima - SGS Lima	SGS Lima
QA/QC program	*unknown*	5% of all samples submitted for assaying	5% of all samples submitted for assaying	5% of all samples submitted for assaying	5% of all samples submitted for assaying	5% of all samples submitted for assaying
Supervisor QA/QC	*unknown*	*unknown*	*unknown*	*unknown*	Gaston Loyola	Gaston Loyola
Core recovery	*unknown*	97.3%	*unknown*	*unknown*	98%	98%
Blanks	*unknown*	1.5 % of the all samples submitted for assaying	4.1% of all samples submitted for assaying	3.9% of all samples submitted for assaying	2.7% of all samples submitted for assaying	2.8% of all samples submitted for assaying
Duplicates	*unknown*	*unknown*	4.1% of all samples submitted for assaying	3.6% of all samples submitted for assaying	2.7% of all samples submitted for assaying	2.5% of all samples submitted for assaying
Standards	*unknown*	3.5 % of all the samples submitted for assaying	2.4% of all samples submitted for assaying	3.2% of all samples submitted for assaying	2.7% of all samples submitted for assaying	2.6% of all samples submitted for assaying
Total QA/QC	*unknown*	189 samples	575 samples	2,944 samples	2,726 samples	903 samples
Umpire lab	*unknown*	*unknown*	*unknown*	*unknown*	*unknown*	*unknown*
Used in resource model	No	Yes	Yes	Yes	Yes	Yes
Comments	Data excluded from the resource estimate	Data for these holes are recorded in the Norsemont database. Drill cores were not relogged by Norsemont.				

11.10.3. HUDBAY

CONSTANCIA

Blanks

Blank material consisting of barren quartz certified by INS-1078 (Inspectorate) was introduced into the sampling stream (one every 30 samples) to monitor cross-contamination and samples swaps.

Standards

Two standard reference materials from Ore Research & Exploration (Table 11-4) were introduced into the sampling stream (one every 30 samples) to monitor the accuracy of the assay results.

TABLE 11-4: ORE RESEARCH AND EXPLORATION STANDARD REFERENCE MATERIALS

Reference material	Au ppm	Ag ppm	Cu ppm	Mo ppm	Zn ppm
OREAS-501	0.204	0.84	2710	59.2	-
OREAS-503	0.687	1.63	5660	390	-

Duplicates

Duplicate samples consisting of one in every 30 samples) were introduced into the sampling stream to monitor the precision of the assay results and to assess the homogeneity of the mineralization.

Check Assay

Since 2018 a rerun of randomly selected samples are assayed in two steps:

Coarse rejects: about 5% of coarse rejected samples were recalled (from Constancia Mine Geology facilities), re-labeled and sent to the on site lab for preparation and delivered to Bureau Veritas Lima Lab for assaying under the same methods of “originals”.

Pulp rejects: about 5% of remanent pulps were recalled from Bureau Veritas Lima lab; these samples were sent to SGS Lima, which acted as an Umpire Lab;; once samples arrived to SGS Lima facilities, samples were homogenized in order to avoid any segregation of sample. All samples were assayed following the same method used by the Bureau Veritas Lima lab. No check assays (i.e. pulp reruns) were analyzed through an umpire lab.

PAMPACANCHA

Blanks

Blank material consisting of barren quartz certified by three laboratories (INSPEC, CIMM, and SGS) was introduced into the sampling stream (one every 30 samples) to monitor cross contamination and samples swaps.

Standards

Three matrix match standard references consisting of rock from the Pampacancha deposit and certified by Acme labs, were introduced into the sampling stream (one every 30 samples) to monitor the accuracy of the assay results (Table 11-5).

TABLE 11-5: MATRIX MATCH STANDARD REFERENCE MATERIALS

Reference material	Au ppm	Ag ppm	Cu ppm	Mo ppm	Zn ppm
MV700041		15.1	25013	121	2317
NOM-STD-030	0.079	5.8	9986	180	192
OREAS-501	0.204	0.84	2710	59.2	
OREAS-503	0.687	1.63	5660	390	
OREAS-504	1.480	3.13	11370	643	

Duplicates

Duplicate samples consisting of quartered splits were introduced into the sampling stream (one every 30 samples) to monitor the precision of the assay results and to assess the homogeneity of the mineralization.

In the opinion of the Qualified Person, the sample preparation, security and analytical procedures fully meet best industry practices and the requirements of the CIM guidelines

11.11. SITE VISITS

Hudbay geologists have visited the Constancia and Pampacancha deposits to conduct site inspections to become familiar with conditions on the property, to observe the geology and mineralization, to perform core review and to verify the work completed on the property as part of the mineral resource estimation and technical report process since 2012.

12. DATA VALIDATION

Data verification was conducted under the supervision of Olivier Tavchandjian, a Qualified Person under the terms of the NI 43-101, and it is the opinion of the author that the quality of the data is suitable for use in resource and reserve calculations and that sampling to date is representative of the deposit. Data validation protocols and results already documented in details in previous technical reports issued by Hudbay for Constancia are summarised in this section together with details on new activities conducted since 2017.

12.1. CONSTANCIA

12.1.1. NORSEMONT QUALITY CONTROL PROTOCOL AND RESULTS

The Quality Control (QC) protocol during the Constancia exploration campaigns from 2005 to 2011 included the following insertions prior to dispatching samples to the laboratories:

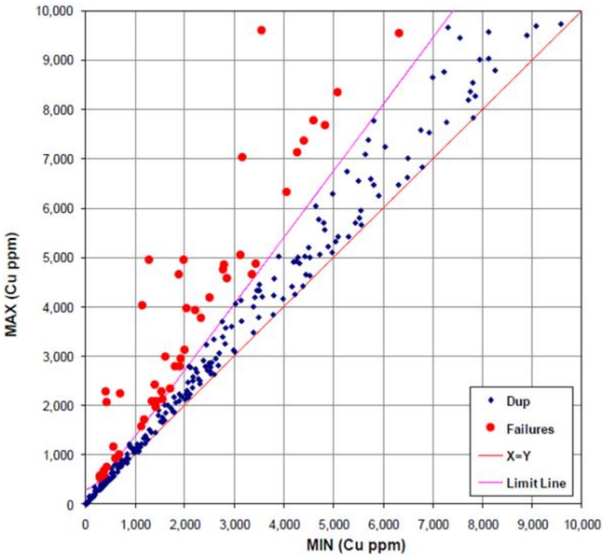
- Duplicate coarse and pulp samples: one in 20 samples;
- CRMs: one in 20 samples; four CRMs were inserted in alternate order; and
- Blanks: one in 20 samples.

Duplicate Samples

1,952 duplicate samples obtained by splitting half core samples, were inserted in the samples stream between 2005 and 2011. The sampling procedure is considered to be acceptable if the proportion of failures using the hyperbolic method does not exceed 10% using as a failure limit, the y2=m2x2+b2 hyperbola, evaluated for a 30% relative error1 (RE). The failure rates for Cu, Mo, Zn and Ag ranged between 7% and 16%.

Figure 12-1 represents the duplicate analysis scatter plot. This figure shows that several outliers are evidently occuring from sample mix-up which when excluded provide an acceptable rate of failure. Norsemont also inserted a total of 51 field duplicates from RC holes. The failure rates for Cu, Mo, Zn and Ag ranged between 0% and 8% which indicates that the sampling precision was reasonable.

FIGURE 12-1: CU IN DUPLICATE SAMPLES



Relative error: calculated as the absolute value of the pair difference divided by the pair average and expressed in percentage; also known as Absolute Value of the Relative Difference, or AVRD.

CRMs

Certified Reference Materials (CRMs) were prepared by SG and ACME Laboratories from coarse rejects from previous drilling campaigns at Constancia. The CRM dataset includes 1,807 assays from 18 different CRMs.

The analytical bias was calculates as follow:

Bias (%) = (AVeo / BV) – 1

Where AVeo represents the average recalculated after the exclusion of the outliers (AV±3*SD), and BV is the Best Value calculated as a result of round-robin tests.

For eleven out of twelve CRMs, biases were between -3.9% and 4.5% with low proportions of outliers. The twelveth CRM shows high biases of 9% and 6% respectively for Cu and Mo.

The author concludes that the Ag accuracy at the ALS Chemex during the 2005 to 2011 campaigns were very good.

Blanks

A total of 2,119 coarse blanks, made from barren material, were inserted in the samples streams. Possible contamination issues were investigated if the blank value exceeded five times the detection limit for the element, and/or if a definite, positive rapport was observed between the blank grade and the grade of the preceding sample.

The sample preparation process at ALS Chemex produced no significant Cu, Mo, Zn, and Ag contamination in most of the blanks evaluated. Only one blank showed failure rates which exceeded 10% for Cu and Mo. However, it is deemed that the failure rate was due to an inadequate sample blank preparation.

Check Samples

388 samples submitted for external control to ACME in 2007, which acted as a secondary laboratory for the 2006 and part of the 2007 campaigns were analyzed.

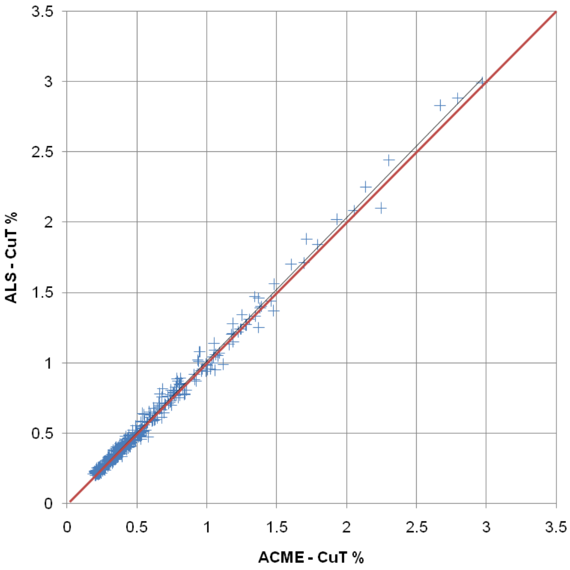
Reduced-to-Major-Axis (RMA) plots we used to assess the check samples. The RMA method offers an unbiased fit for two sets of pair values (original samples and checks sample) that are considered independent from each other. In this case, the coefficient of determination R2 between the two laboratories is determined, and the bias of the primary laboratory for each element as compared to the secondary laboratory is calculated as:

Bias (%) = 1- RMAS

Where RMAS is the slope of the RMA regression line of the secondary laboratory values versus the primary laboratory values for each element.

The RMA plot indicates good fits for Cu (0.988 R2), Mo (0.974 R2), Zn (0.994 R2) and Ag (0.92 R2) after the exclusion of four outliers for Mo (1.0%), two outliers for Zn (0.5%), and eight outliers for Ag (3.8%). Figure 12-2 represents the results.

FIGURE 12-2: CU IN CHECK SAMPLES – ACME VS ALS



12.1.2. HUDBAY QUALITY CONTROL PROTOCOL AND RESULTS

The Quality Control (QC) protocol included the insertion of the following control samples in the sample batches:

- Duplicate samples: Since 2018, 5% of coarse rejects are prepared and assayed at the same lab using the same methods; also 5% of pulp are recalled and reassayed at umpire lab under the same methodology.
- CRMs: one in every 20 samples, were four different CRMs are inserted in alternate order; and
- Blanks: two in every 20 samples.

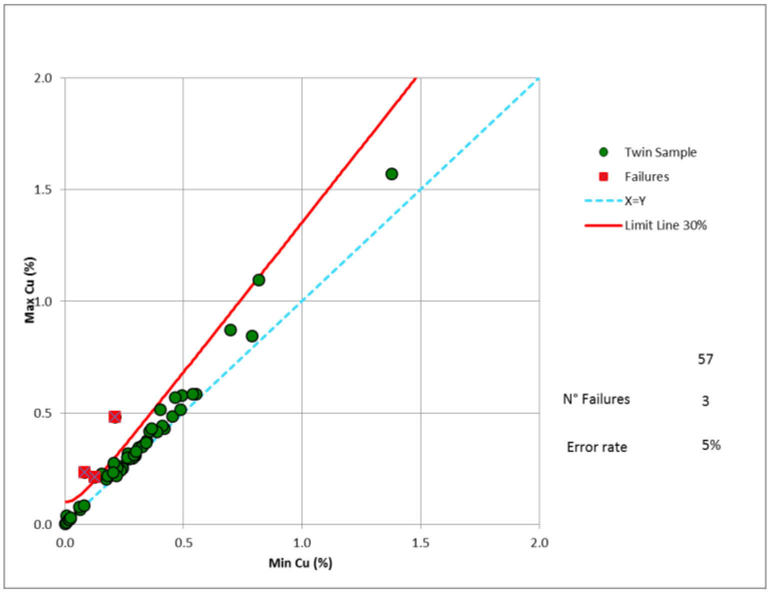
The coarse blanks and Certified Reference Materials (CRMs) are inserted at site prior to submission to the laboratory.

Duplicates Samples in 2015

Hudbay inserted 57 duplicate samples during the drill campaign in 2015. This data was processed using the hyperbolic method.

Figure 12-3 represents the precision evaluation for copper and confirms the absence of bias or any significant issue with sample swap.

FIGURE 12-3: PRECISION EVALUATION CUT – DUPLICATES SAMPLES



CRMs

Hudbay used Certified Reference Materials (CRMs) prepared by Target Rocks (6 laboratories round robin) using material coarse reject from the mine.

These standards were prepared using porphyry material. To evaluate the accuracy of the CRMs, Hudbay excluded the outliers and calculates the analytical bias.All elements present a bias (Bias (%) = (Mean / Best Value)-1) lower than 10%. Only one standard displayed a higher bias for %Mo.

Blanks

A total of 63 samples, prepared using barren material from the mine, were inserted with each batch submission. Their analysis indicated that the percentage of failures was acceptable for all the elements.

12.1.3. 2017 DRILL PROGRAM

A total of 2,132 core samples were sent for assaying at Certimin Lima (Main laboratory) and SGS Lima laboratories. Atomical Absortion (AA) and ICP methods were used at both laboratories. All the results were imported in to the mine geology database. For resource model purposes, Atomical Abortion results were prioritized over ICP result. Blanks and standards had an insertion rate of 25% and 6% respectively. The coarse duplicates, pulp duplicates, blanks and standards analyzed by Certimin were submitted as “blind” to SGS and to the umpire laboratory (Bureau Veritas Lima).

Certimin

Duplicate samples results have shown that all elements were inside a 20% accepted relative error, implying that the results from the laboratory are precise. Standards presented very low failure rates (mean+ 2SD) for all elements including copper (2.7%), implying that the results from the laboratory are accurate. Performance of the blanks using 10 times the detection limit as performance gates also demonstrated that there were no cross contamination or samples swaps issues at the laboratory.

SGS

All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<3%), implying that the results from the laboratory are accurate. The performance of the blanks using 10 times the detection limit as a threshold were also excellent, implying no cross contamination or samples swaps at the laboratory.

Bureau Veritas Umpire Lab

Bureau Veritas was used as an umpire lab in order to ensure that the results from Certimin and SGS were precise and accurate. 10% of the total samples analyzed by Certimin and SGS were randomly selected. Half of the samples were re-dispatched to their original labs and the other half was dispatched to Bureau Veritas for ICP-ES. A total of 30% quality control samples (coarse and pulp duplicates, blanks and standards) were inserted into the samples stream.

Duplicate samples results have shown that all elements were inside of 20% accepted relative error. All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<3%). The performance of the blanks using 10 times the detection limit also did not show any issue with respect to sample swaps or cross-contamination.

12.1.4. 2019 DRILL PROGRAM

A total of 1,887 core samples were sent for assaying at Bureau Veritas Lima laboratory. Blanks and standards had an insertion rate of 5% and 15% respectively. Samples were prepared at Bureau Veritas Constancia laboratory and sent to Lima for for ICP-ES assay. Finally coarse and pulp rejects were reclaimed and re-assay at Bureau Veritas Lima. Selected pulps we also dispatch to the Umpire lab (SGS Lima). The inserted the blanks and standards analyzed by Bureau Veritas and SGS were submitted as “blind”.

Bureau Veritas Lima

All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<3%), implying that the results from the laboratory are accurate. The performance of the blanks using 10 times the detection limit as a threshold were also excellent implying no cross contamination or samples swaps at the laboratory.

After finish the campaign, 6.35% of coarse rejects were randomly selected, re-labeled and resent to Bureau Veritas Lima Lab for ICP-ES. A total of 10% quality control samples (blanks and standards) were inserted into the samples stream.

Duplicate samples results have shown that all elements were inside of 20% accepted relative error. All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<3%). The performance of the blanks using 10 times the detection limit also did not show any issue with respect to sample swaps or cross-contamination.

SGS Umpire Lab

SGS Lima was used as an umpire lab in order to ensure that the results from Bureau Veritas were precise and accurate. 6.35% of the total samples analyzed by Bureau Veritas were randomly selected. These samples were re-dispatched to SGS Lima Lab. A total of 45% quality control samples (blanks and standards) were inserted into the samples stream.

Duplicate samples results have shown that all elements were inside of 10% accepted relative error. All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<1%). The performance of the blanks using 10 times the detection limit also did not show any issue with respect to sample swaps or cross-contamination.

12.1.5. 2020 DRILL PROGRAM

This program was executed by the Hudbay Peru exploration team which collected 3,734 core samples (there are 3 last holes not considered in this report); all the samples collected were prepared at Bureau

Veritas Constancia onsite laboratory and sent to Lima for for ICP-ES assaying. All the blanks and standards analyzed by Bureau Veritas Lima were submitted “blind”. to Bureau Veritas Lima laboratory. Duplicates, Blanks and standards were inserted at a rate of 3.43%, 3.05% and 3.43% respectively.

Bureau Veritas Lima

All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<3%); for Ag values are inside of mean +2SD calculated from all samples, implying that the results from the laboratory are accurate. The performance of the blanks using 10 times the detection limit as a threshold were also excellent, implying no cross contamination or samples swaps occurred at the laboratory with an exeption for Zn for which some samples presented some indications of cross contamination. This issue is under investigation by Hudbay but would not have any material impact on the mineral resource and mineral reserve estimates presented in this report.

Duplicate core samples results have shown that all elements were inside of 20% accepted relative error. All elements were within the performance gates of the standards (mean + 2SD) with low failure rates for copper (<5%).

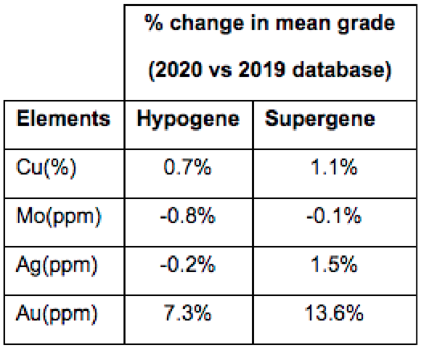
12.1.6. CORE RECOVERY

Prior to the 2017 DDH campaign, core recovery was measured via a linear method and the average core recovery was 95%. Further investigations and random checks of the core box pictures revealed that a significant proportion of these core samples had a volumetric recovery inferior to 85%. During the 2017 twin-hole program, core recovery was measured and compared via the volumetric method. For the 17 pairs of holes, the proportion of 2m composites with a volumetric core recovery higher than 85% increased from less than 50% to more than 75%. Since 2017, great care has been exercised during drillin campaigns to maximise volumetric core recovery.

12.1.7. DRILLING DATA BASE

An internal validation of the drillhole database against the original drill logs and assay certificate information was carried out by Hudbay in 2020. 24 holes (randomly selected) from 492 holes used for the construction of the 2020 resource block model, representing approximately 5% of the total, were randomly selected to be checked against the original laboratory certificates. This validation was conducted for all the elements of importance for mine planning including: Cu, Ag, Au, Mo, Pb, Zn, CuCn and CuSS. From the 4089 samples tested, only 4 samples were found to have different values than in the original certificates representing 0.09% of the total and therefore the database can be considered very reliable. However, a comparison with previous versions of the resource modelling database used between 2014 and 2019 highlighted that precision had been truncated to the second decimal place in the MInesight database in the past. Table 12-1 below presents the differences between the 2020 drillhole database and the 2019 database, confirming a negative bias on gold in the 2019 database and minimum differences for the other metals of economic significance.

TABLE 12-1: COMPARATIVE SUMMARY OF THE 2019 AND 2020 DRILLHOLE DATABASES (BIAS RESULTS FROM TRUNCATION DURING IMPORTING PROCESS BETWEEN THE DATASHED AND MINESIGHT SOFTWARES)



	% change in mean grade (2020 vs 2019 database)	
Elements	**Hypogene**	**Supergene**
Cu(%)	0.7%	1.1%
Mo(ppm)	-0.8%	-0.1%
Ag(ppm)	-0.2%	1.5%
Au(ppm)	7.3%	13.6%

Based on the work conducted during this review, the 2020 drillhole database used to construct the long-term model LT20-V2 is deemed very reliable and following all NI 43-101 requirements to support resource and reserve estimation and reporting. The correction of a truncation during the importing process has resulted in the elimination of a bias in gold content previously experienced and that had not been detected since at least 2014.

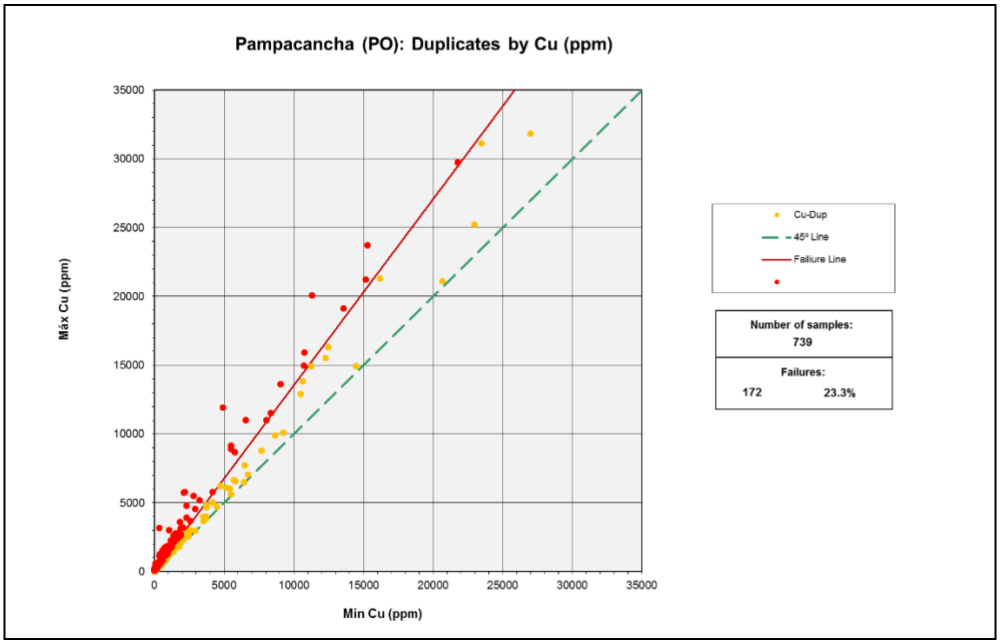
12.2. PAMPACANCHA

12.2.1. QUALITY ASSURANCE / QUALITY CONTROL

Hudbay submitted a total of 15,932 samples from 110 drill holes to the SGS’s laboratory for analysis. In addition to these samples, 739 duplicate samples, 471 coarse blanks, 336 reference standards were also submitted. The author’s opinion is that the results of the QAQC program at Pampacancha validate the use of the assaying information for resource modeling.

The rate of failure observed on Figure 12-4 is deemed to be related to the fact that quartered core samples were used as duplicates. Given the high variability of the mineralization, it is recommended that future duplicates from core samples be taken from crushed, homogenized and split samples, rather than using quartered split core.

FIGURE 12-4: PRECISION CU (PPM) – DUPLICATE SAMPLES



Standards

A total of 548 copper standards were submitted as a mean to monitor the accuracy of the laboratory results. Out of these, 113 of the assays fell outside the average +/- two standard deviations. However the bias in all cases is acceptable: 36 failures from 548 in copper (7% of failures), 31 from 548 in silver (6% of failures), 17 from 548 in gold (3%), 18 from 548 in molybdenum (3% of failures) and 11 from 308 in zinc (2% of failures).

Blanks

A total of 720 barren samples prepared from mined rocks were inserted in the submission batches in order to monitor cross-contamination or samples swaps. Results are acceptable for all blanks except for Molybdenum. Failures in Molybdenum indicate a high level of contamination. While this is a concern, it is not considered a material impact to the resultant resource statement.

Drilling Database

An internal validation of the drillhole database against the original drill logs and assay certificate information was carried out by Hudbay. The validation included 100% of the assay values from the Pampacancha drilling. No significant discrepancies existed within the database and it is believed to be accurate and suitable for mineral resource estimation.In the opinion of the Qualified Person, the data validation procedures followed for both the Constancia and Pampacancha database to support the mineral resource and mineral reserve estimates presented in this report fully meet best industry practices and the requirements of the CIM guidelines

13. MINERAL PROCESSING AND METALLURGICAL TESTING

The Constancia mill is now an operating plant running at steady state and, as a result, several of the initial metallurgical testing and assumptions are no longer relevant. As such, the metallurgical forecasts have been updated to reflect the operating experience and performance of the plant since commissioning and ramp-up.

This section will first briefly describe some of the optimization tests that have been conducted while processing the Constancia ore types to adjust their milling recovery formulae followed by a recap in more details of the metallurgical test work done during the pre-feasibility study for the Pampacancha deposit that is planned to start feeding the mill in 2021Q2.

It is believed that the metallurgical test samples collected are representative of the various types and styles of mineralization found at the Constancia and Pampacancha deposits as a whole".

Table 13-1 summarizes the annual average copper and molybdenum recoveries estimated for the life of the mine between 2021 and 2037 for the combined feed from the two deposits.

TABLE 13-1: COPPER AND MOLYBDENUM RECOVERY

Year	Cu [%]	Cu Recovery [%]	Mo [%]	Mo Recovery [%]
2021	0.306	84.8%	0.013	40.8%
2022	0.409	85.1%	0.010	44.4%
2023	0.441	84.7%	0.017	45.4%
2024	0.469	86.9%	0.011	45.5%
2025	0.340	85.7%	0.012	47.8%
2026	0.350	86.9%	0.009	46.8%
2027	0.335	86.4%	0.010	50.5%
2028	0.390	86.4%	0.010	48.1%
2029	0.301	86.4%	0.007	47.0%
2030	0.218	85.7%	0.009	48.3%
2031	0.201	86.0%	0.005	44.2%
2032	0.251	86.1%	0.006	46.9%
2033	0.254	85.7%	0.006	46.1%
2034	0.296	86.3%	0.005	45.2%
2035	0.291	83.7%	0.007	58.4%
2036	0.219	87.2%	0.006	47.4%
2037	0.248	86.5%	0.007	48.1%

Section 13.1 describes the metallurgical testing and optimization work used to derive the recovery estimates above.

13.1. PLANT TREATMENT CAPACITY

Since 2012, considerable efforts were made by Ausenco and Hudbay to re-evaluate the actual throughput capacity of the processing facilities. The plant has now demonstrated its capacity to process approximately 90 ktpd of ore (31 Mtpa at 94% plant availability) from the Constancia and Pampacancha pit. Its processing capacity is higher than the original Ausenco design based on the following:

(i) While the process design criteria were 76,000 t/d at 91.3% availability, it has been demonstrated that 94% total run time (utililization * availability) can be achieved with good maintenance and operating practice.

(ii) It was thought that the SAG mill throughput would initially be constrained by the hardness of the hypogene ore, however further reviews showed that most of this domain had very low rock quality (RQD). Therefore, SAG milling requires less energy per tonne, thus increasing the overall throughput.

(iii) The grind size was increased for the hypogene ore, from P80 of 106 to 150 µm. There has been an impact on the copper recovery; however, this will be mitigated by implementing a series of flotation upgrades that together comprise the recovery optimization program described in Section 17.

(iv) There was no extra capital expense required to increase the throughput as it was already within the considered design factors.

Mill throughput predictions for future ores are derived based on a combination of mill sampling campaigns and hardness test work on drill core samples representing the ores that will mined and processed in the future. The is:

1) Perform sampling and mass balance studies around grinding circuit
2) Measure the hardness parameters of the ore processed during the time of the surveys
3) Compare the model-predicted specific energy with measured specific energy
4) Calibrate the model to the plant
5) Apply the calibrated model to future ore hardness parameters to estimate plant capacity

Table 13-2 shows the SAG mill circuit surveys collected at the time of reporting and the calculated correction factors for the SAG mill specific energy model. Table 13-3 shows the ball mill survey rsults to date and the calculated correction factors for the ball mill specific energy model. Test work on future ores is presented in Section 17.

TABLE 13-2: SUMMARY OF SAG MILL SURVEYS AND MODEL CALIBRATION

Survey No.	Grinding Line	Ore Type	Date	Feed Size F80 [in]	SGI [min]	SAG/AG Throughput [t/h]	SAG Mill Product P80 [microns]	SAG Specific Energy, Shell Model [kWh/t]	SAG Specific Energy, Shell Plant [kWh/t]	SAG Correction Factor
1	1	Hypogene	6/27/2017	2.6	76	1,843	1,834	7.5	7.7	**1.03**
2	2	Hypogene	6/27/2017	2.3	73	1,931	1,223	8.1	6.9	**0.85**
3	1	Supergene	6/28/2017	1.8	34	2,025	1,138	5.5	5.8	**1.07**
4	2	Supergene	6/28/2017	1.9	32	2,023	614	6.3	5.4	**0.87**
5	1	Hypogene	6/29/2017	1.9	61	1,841	1,504	7.0	7.5	**1.07**
6	2	Hypogene	6/29/2017	1.9	74	1,772	1,068	8.5	7.7	**0.90**
7	1	Hypogene	1/17/2018	2.2	62	1,973	1,246	7.4	7.3	**0.99**
8	2	Hypogene	1/17/2018	2.1	61	1,923	1,178	7.5	7.7	**1.03**
9	1	Supergene	1/19/2018	2.5	30	2,087	1,216	5.0	5.7	**1.13**
10	2	Supergene	1/19/2018	2.4	32	2,224	795	5.8	5.4	**0.93**
11	1	Hypogene	3/14/2020	2.9	101	1,530	918	10.5	9.9	**0.94**
12	2	Hypogene	3/14/2020	2.8	95	1,351	1,155	9.6	11.4	**1.19**
13	1	Hypogene	9/12/2020	2.5	102	1,432	1,198	9.8	10.9	**1.11**
14	2	Hypogene	9/12/2020	2.9	122	1,382	1,567	10.1	11.2	**1.11**
		Average		**2.3**	**68.21**	**1810**	**1190**	**7.8**	**7.9**	**1.01**

TABLE 13-3: SUMMARY OF BALL MILL SURVEYS AND MODEL CALIBRATION

Survey No.	Grinding Line	Ore Type	Date	Bond Wi [kWh/t]	Ball Mill Product P80 [microns]	Ball Mill Sp. Energy Model [kWh/t]	Ball Mill Sp. Energy Plant [kWh/t]	Ball Mill Correction Factor
1	1	Hypogene	6/27/2017	16.8	192	8.1	7.8	**0.96**
2	2	Hypogene	6/27/2017	16.9	195	7.2	7.0	**0.97**
3	1	Supergene	6/28/2017	11.0	154	5.5	7.2	**1.30**
4	2	Supergene	6/28/2017	10.5	156	4.1	7.0	**1.69**
5	1	Hypogene	6/29/2017	15.2	186	7.1	7.8	**1.10**
6	2	Hypogene	6/29/2017	16.4	188	6.8	7.7	**1.12**
7	1	Hypogene	1/17/2018	17.4	172	8.2	7.5	**0.92**
8	2	Hypogene	1/17/2018	16.2	183	7.1	7.0	**0.99**
9	1	Supergene	1/19/2018	11.6	161	5.7	7.1	**1.25**
10	2	Supergene	1/19/2018	11.7	175	4.6	6.3	**1.37**
11	1	Hypogene	3/14/2020	18.8	126	10.4	10.0	**0.96**
12	2	Hypogene	3/14/2020	18.3	115	11.5	11.2	**0.97**
13	1	Hypogene	9/12/2020	15.6	137	8.7	10.3	**1.18**
14	2	Hypogene	9/12/2020	17.8	121	11.5	10.3	**0.89**
		Average		**15.29**	**161**	**7.6**	**8.2**	**1.12**

13.2. PLANT RECOVERY

The original Constancia plant feasibility study characterized the metallurgical response of the five ore types—hypogene, supergene, skarn, mixed, and high zinc—in terms of throughput capacity, metallurgical recovery and concentrate quality. Locked cycle testing achieved copper grades in the final concentrate higher than 24%, with relatively low levels of contaminant elements, while the molybdenum concentrate produced grades were over 50% Mo with low contents of copper, lead and iron.

Since commissioning of the plant, various changes have been made to the originally designed operating parameters. For example, the annual throughput capacity was increased from 25.3 milltion to 31.4 million tonnes per year, while the primary grind size was increased from 106 µm to 155 µm (nominal). Changes were also made to the mill liner and lifter configurations, ball sizes, flotation reagents, flocculants, and other parameters as part of the normal optimation and continuous improvement program. To quantify the impact of these changes, numerous sampling campaigns and process audits have been (and continue to be) conducted on both the grinding and the flotation circuits. The audits provide a metric of the plant performance at the time of sampling, and also allow for the calibration of phenomenological models for use in debottlenecking and metallurgical optimization. The calibrated phenomenological models can then be applied against detailed metallurgical test programs undertaken on samples representing the future ores of Constancia and Pampacancha. The results, together with the historical performance of concentrator facility, are used to derive the throughput and recovery models described below.

The following sections describe the procedure. Section 13.2.1. provides a concise description of the grouping criteria applied to the ore zones. Section 13.2.2 describes the empirical recovery models derived for each ore type, and Section 2.2.2 describes the simulation models developed for extrapolation to future ores and plant configurations.

13.2.1. ORE TYPES

The Constancia deposit is a Cu-Mo-Ag porphyry with some of the copper occurring as mineralized skarn. For metallurgical predictive purposes, five ore types were identified based on their dominant metallurgical responses:

- Hypogene zone with primary porphyry mineralization. It represents the largest portion of the deposit, including disseminated, quartz veins in stock work and fractures containing chalcopyrite-molybdenite that run below the 3,900 masl. Molybdenum is present as molybdenite and is mostly un-oxidized.
- Supergene enrichment zone which occurs lower, made up by secondary ores of digenite copper, covellite, chalcocite (rare native copper) deposited under a leached layer.

- Mineralized skarn zone, smaller in volume, but with higher grades of chalcopyrite, hypogene, rare bornite, galena and sphalerite with mineralization occurring close to the surface. The skarn contains lower levels of molybdenum. The zinc, as sphalerite, concentrates higher in skarn and in the hypogene adjacent to skarn. Lead is present as galena in close relation to sphalerite.
- Mixed, or transition zone ore corresponds to the zone where the supergene and hypogene mineralisation mix or co-exist.
- High zinc skarn zone, which corresponds to skarn zones with higher total zinc to copper ratios.

13.2.2. EMPIRICAL RECOVERY MODELS

The empirical recovery models are based on plant performance between June 2018 and June 2019. Production data was grouped by period during which ore from each of the ore types was processed and statistical regression was performed to derive equations relating the recovery and concenterate grades to the observed feed grades. The equations were then checked against data through June 2020 and found to be valid. Note that the equations are baseline estimators of plant performance for the current plant configuration and ore characteristics. They have been used to forecast the near-term plant performance when processing Constancia ores; i.e., for 2021 and 2022. The equations are summarized below.

Plant recovery forecasts for alternative plant configurations, including when processing Pampacancha ores, are based simulations as described in Section 13.2.2.

The following abbreviations are used in the equations presented below:

- CuT is the total copper grade of the feed, in units of percent
- CuSS is the total copper soluble in sulfuric acid grade of the feed, in percent
- Zn is the total zinc grade of the feed, in units of percent
- Pb is the total lead grade of the feed, in units of percent
- Fe is the total iron grade of the feed, in units of percent
- P80 is the 80% passing size of the flotation feed, in micrometers

13.2.2.1. HYPOGENE ORES

The following formula describe the copper recovery and concentrate grades:

- Cu Recovery (%)=88.73 -0.02*P80 +13.19*(CuT)-30.87*(Zn +Pb)
- Cu in Conc (%)=22.84+9.40*CuT-17.48*Zn-0.30*Fe

13.2.2.2. MIXED AND SUPERGENE ORES

The following formula describe the copper recovery and concentrate grades:

- Cu Recovery (%)=88.73 -0.02*P80 +13.19*(CuT)-30.87*(Zn +Pb)
- Cu in Conc (%)=24.35+5.05*CuT-8.45*Zn-0.42*Fe

13.2.2.3. SKARN AND HI ZINC ORES

The following formula describe the copper recovery and concentrate grades:

- Cu Recovery (%)=88.73 -0.02*P80 +13.19*(CuT)-30.87*(Zn +Pb)

- Cu in Conc (%)=23.06+4.60*CuT-5.64*Zn-0.17*Fe

13.2.3. FLOTATION CIRCUIT SIMULATION

Flotation circuit simulations are conducted using state-of-the art phenomenalogical modeling methods. The models are based on mineral-specific flotation kinetics measured in the laboratory and validated with plant sampling campaigns and mass balances. The following plant surveys were used for model validation:

- 14 Apr 2016, Hypogene mineralization [Aminpro Survey]
- 16 Apr 2016, Skarn mineralization [Aminpro Survey]
- 18 Dec 2017, Hypogene mineralization [Aminpro Survey]
- 18 Jan 2018, Hypogene mineralizaiton [Aminpro Survey]
- 29 Oct 2020, Hypogene mineralization [Constancia Survey]

The results of the flotation circuit survey work, including mineralogy and flotation test work, model validation, and results are described in the following reports and presentations:

- Aminpro Peru S.A.C., 2015, “Optimización de Circuito de Flotación Colectivo.” Document P2015-087 Informe Final Rev 0.pdf
- Aminpro Peru S.A.C., April 2018, “Constancia Benchmarking.” Document P2017-105 Informe Final rev5.docx
- Hudbay Corporate Technical Services, Dec 2020, “Constancia Bulk Survey Results and Recommendations.” Document Bulk Survey Results.pptx

Note that the flotation circuit simulation studies are used to derive the net effect of a significant change in flotation equipment type or operation, circuit configuration, or ore type. The net effect, or delta, is then overlayed on the empirical recovery model in order to produce the recovery estimated shown in Table 13-1.

13.3. TEST WORK

13.3.1. CONSTANCIA ORE BODY

13.3.1.1. DFS TEST WORK

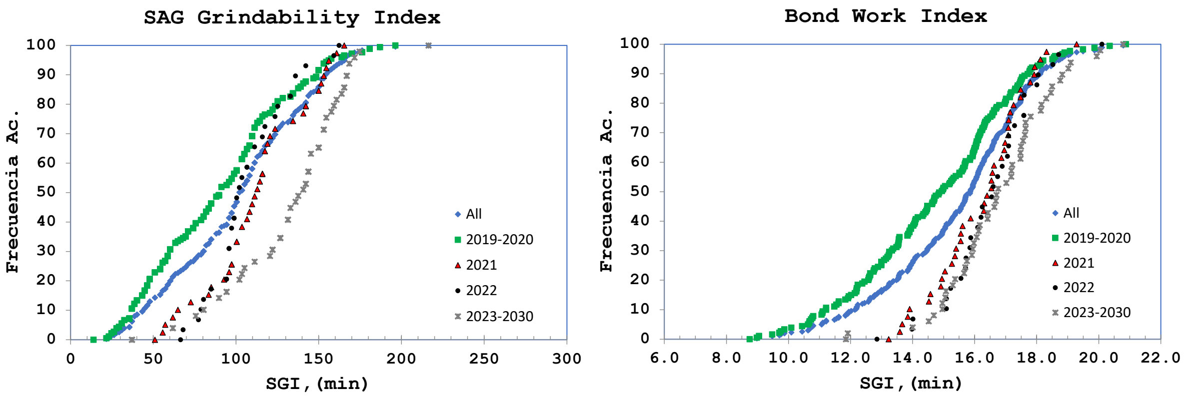
The original DFS test work was performed prior to 2009. It consisted of extensive laboratory testwork to evaluate metallurgical performance of the Constancia deposit at a DFS level of detail. In addition, a 25t pilot campaign was conducted to provide concentrate for molybdenum flotation evaluation, settling, regrind and filtration tests. The sample collection and testwork were directed by GRD Minproc with assistance from Transmin Metallurgical Consultants (Lima). The results and interpretation of the test program are described at length in the publicly available DFS Technical Report dated September 28, 2009 and for brevity will not be reviewed here.

13.3.1.2. POST-PRODUCTION TEST WORK

Following startup, various test programs were undertaken by both the internal metallurgy and operations team and by external consultants and third-party laboratories. Between 2016 and 2018, two hardness testing programs were commissioned at two different Peruvian laboratories, and approximately 150 to 200 samples were tested (depending on the test type) for SAG Grindability Index (SGI) and Bond Work Index (BWI).

In 2020 a hardness testing program was completed, with 300 samples representing current and future Constancia ores submitted for SGI and Bond Work Index tests at a Chilean lab. As part of this study, a quality control and assurance program was implemented, in which 15 standard duplicate samples were sent to each of the three labs (the two from the 2016-2018 work, plus the Chilean lab) to ensure that all labs used for prior studies were validated. The results of the 2020 study are shown by the cumulative distribution graphs shown in Figure 13-1, indicate that the Constnacia ores will be progressively harder, particularly after 2023.

FIGURE 13-1: CUMULATIVE DISTRIBUTION OF SGI (LEFT) AND BOND WI (RIGHT), CONSTANCIA



In 2021, a hardness test program was commissioned to improve the understanding of future ore hardness and to further refine the timing of the pebble crushing project (see Section 3.5.1), currently scheduled for implementation in 2023

The most significant flotation study is the recent rougher variability test program performed on samples of future ore from Constancia. The test program was performed in 2020 and early 2021 using the standard Constancia pulp chemistry scheme and new, more selective reagent scheme.

The results, presented below, were used to derive the collection zone kinetics parameters for each test. These were related to head grade and grind size using regression curve fitting techniques. The resulting models were then used to derive the recovery forecast present in Table 13-1using the methodology described in Section 13.2.2

TABLE 13-4: HEAD GRADES OF VARIABILITY SAMPLES TESTED FOR ROUGHER FLOTATION KINETICS

Head Grade

Test	Sample	Reagent Scheme	% Sol [%]	pH	P80 [µm]	Au Fd [g/t]	Ag Fd [g/t]	Cu Fd [%]	Mo Fd [%]	Zn Fd [%]	Pb Fd [%]	Fe Fd [%]	S Fd [%]
P1.xlsm	C_MV_Hyp	Selective	32.5	9.1	169	0.010	1.1	0.12	0.007	0.02	0.01	2.73	1.43
P2.xlsm	D_MV_Hyp	Selective	32.5	9.1	151	0.030	1.1	0.15	0.013	0.02	0.01	2.94	1.96
P3.xlsm	A_MV_Hyp	Selective	32.5	9.0	172	0.023	1.6	0.19	0.014	0.09	0.04	3.63	2.54
P4.xlsm	I_MV_Hyp	Selective	32.5	9.1	142	0.063	3.6	0.20	0.007	0.05	0.30	3.77	2.12
P5.xlsm	N_MV_Hyp	Selective	32.6	9.1	138	0.029	1.4	0.22	0.009	0.02	0.01	2.80	0.93
P6.xlsm	J_MV_Hyp	Selective	32.7	9.1	135	0.024	1.4	0.20	0.009	0.01	0.01	2.98	1.69
P7.xlsm	B_MV_Hyp	Selective	32.3	9.0	165	0.013	2.6	0.21	0.015	0.06	0.07	2.99	2.22
P8.xlsm	L_MV_Hyp	Selective	32.4	9.1	143	0.026	1.1	0.23	0.014	0.01	0.01	3.00	1.81
P9.xlsm	M_MV_Hyp	Selective	32.6	9.1	143	0.051	3.3	0.26	0.014	0.07	0.05	3.14	1.31
P10.xlsm	K_MV_Hyp	Selective	32.7	9.1	154	0.014	2.6	0.25	0.014	0.05	0.03	2.83	1.89
P11.xlsm	F_MV_Hyp	Selective	32.5	9.0	156	0.015	1.8	0.27	0.024	0.03	0.01	2.55	1.63
P12.xlsm	G_MV_Hyp	Selective	32.4	9.0	155	0.022	2.2	0.34	0.023	0.04	0.02	3.86	2.39
P13.xlsm	O_MV_Hyp	Selective	32.7	9.1	141	0.045	1.8	0.34	0.015	0.02	0.01	2.50	1.07
P14.xlsm	H_MV_Hyp	Selective	32.7	9.1	139	0.040	3.4	0.40	0.029	0.04	0.02	2.17	1.33
P15.xlsm	LL_MV_Hyp	Selective	32.4	9.1	161	0.032	2.4	0.38	0.013	0.01	0.01	2.36	1.35
P16.xlsm	E_MV_Hyp	Selective	32.1	9.1	176	0.035	4.2	0.49	0.019	0.06	0.02	3.45	2.07
P17.xlsm	P_MV_Hyp	Selective	32.7	9.1	140	0.056	4.1	0.62	0.018	0.05	0.02	3.42	1.46
P18.xlsm	Q_MV_Sup	Selective	32.6	9.1	145	0.031	3.4	0.56	0.009	0.04	0.06	2.95	1.59
P19.xlsm	R_MV_HIZN	Selective	32.4	9.1	152	0.034	2.2	0.11	0.004	0.25	0.08	5.09	3.68
P20.xlsm	S_MV_HIZN	Selective	32.2	9.1	163	0.025	4.7	0.30	0.012	0.36	0.14	6.15	3.23
P21.xlsm	C_MV_Hyp	Standard	32.7	11.0	190	0.011	1.1	0.11	0.006	0.02	0.01	2.67	1.47
P22.xlsm	D_MV_Hyp	Standard	32.7	11.0	158	0.011	1.1	0.14	0.012	0.02	0.01	2.64	1.93
P23.xlsm	A_MV_Hyp	Standard	32.9	11.1	172	0.025	2.4	0.18	0.013	0.09	0.04	3.40	2.65
P24.xlsm	I_MV_Hyp	Standard	32.6	11.1	151	0.049	3.0	0.19	0.008	0.05	0.33	3.79	2.35
P25.xlsm	N_MV_Hyp	Standard	32.9	11.1	137	0.027	1.2	0.19	0.008	0.02	0.01	2.69	0.94
P26.xlsm	J_MV_Hyp	Standard	32.9	11.1	141	0.013	1.1	0.20	0.010	0.01	0.01	2.85	1.74
P27.xlsm	B_MV_Hyp	Standard	32.7	11.0	160	0.013	2.4	0.20	0.014	0.06	0.08	2.98	2.21
P28.xlsm	L_MV_Hyp	Standard	32.8	11.1	138	0.024	1.1	0.21	0.013	0.01	0.01	2.81	1.82
P29.xlsm	M_MV_Hyp	Standard	32.8	11.1	127	0.055	2.8	0.24	0.014	0.07	0.05	3.03	1.36
P30.xlsm	K_MV_Hyp	Standard	32.8	11.0	160	0.020	2.1	0.25	0.012	0.05	0.03	2.95	1.82
P31.xlsm	F_MV_Hyp	Standard	32.6	11.1	159	0.021	1.9	0.27	0.025	0.03	0.01	2.55	1.69
P32.xlsm	G_MV_Hyp	Standard	32.6	11.0	174	0.027	4.1	0.47	0.020	0.06	0.02	3.42	2.12
P33.xlsm	O_MV_Hyp	Standard	32.8	11.1	129	0.045	1.8	0.33	0.013	0.02	0.01	2.50	1.03
P34.xlsm	H_MV_Hyp	Standard	32.8	11.1	140	0.029	3.3	0.38	0.028	0.04	0.02	2.15	1.32
P35.xlsm	LL_MV_Hyp	Standard	32.7	11.1	161	0.042	1.8	0.39	0.014	0.01	0.01	2.36	1.44
P36.xlsm	E_MV_Hyp	Standard	32.9	11.1	153	0.028	1.9	0.32	0.022	0.04	0.03	4.01	2.41
P37.xlsm	P_MV_Hyp	Standard	32.7	11.1	142	0.055	4.0	0.60	0.017	0.04	0.02	3.40	1.54
P38.xlsm	Q_MV_Sup	Standard	32.9	11.1	150	0.021	2.9	0.51	0.008	0.04	0.05	2.94	1.68
P39.xlsm	R_MV_HIZN	Standard	32.7	11.1	147	0.018	2.5	0.10	0.005	0.25	0.07	5.29	3.33
P40.xlsm	S_MV_HIZN	Standard	32.8	11.0	160	0.026	4.2	0.28	0.012	0.36	0.11	6.01	3.11
Average			32.6	10.1	152	0.029	2.4	0.28	0.014	0.06	0.05	3.24	1.89

TABLE 13-5: ROUGHER RECOVERY OF VARIABILITY SAMPLES

Recovery														
Test	Sample	Reagent Scheme	% Sol [%]	pH	P80 [µm]	Au Recovery [%]	Ag Recovery [%]	Cu Recovery [%]	Mo Recovery [%]	Zn Recovery [%]	Pb Recovery [%]	Fe Recovery [%]	S Recovery [%]
P1.xlsm	C_MV_Hyp	Selective	32.5	9.1	168.7	47.6	43.5	78.2	50.9	46.0	54.9	30.73	42.4
P2.xlsm	D_MV_Hyp	Selective	32.5	9.1	151.4	48.0	75.2	86.5	64.9	53.4	54.8	51.21	68.5
P3.xlsm	A_MV_Hyp	Selective	32.5	9.0	171.8	35.4	90.4	81.1	59.9	81.4	68.0	17.17	17.9
P4.xlsm	I_MV_Hyp	Selective	32.5	9.1	141.8	79.0	69.5	88.2	54.9	56.6	65.3	34.92	50.0
P5.xlsm	N_MV_Hyp	Selective	32.6	9.1	138.3	68.6	80.6	84.5	54.2	58.2	51.3	31.86	64.5
P6.xlsm	J_MV_Hyp	Selective	32.7	9.1	134.6	39.2	62.6	84.1	54.6	33.5	42.5	38.74	61.1
P7.xlsm	B_MV_Hyp	Selective	32.3	9.0	164.7	91.3	93.0	89.0	64.9	81.2	79.4	57.75	80.9
P8.xlsm	L_MV_Hyp	Selective	32.4	9.1	142.8	61.1	66.5	86.4	67.6	38.5	40.4	51.54	80.0
P9.xlsm	M_MV_Hyp	Selective	32.6	9.1	142.6	78.0	87.3	90.3	70.6	81.1	81.0	39.36	67.8
P10.xlsm	K_MV_Hyp	Selective	32.7	9.1	154.2	67.9	69.6	84.7	52.7	57.1	58.7	37.55	47.2
P11.xlsm	F_MV_Hyp	Selective	32.5	9.0	155.8	61.9	81.4	84.9	73.3	68.6	59.3	56.67	78.2
P12.xlsm	G_MV_Hyp	Selective	32.4	9.0	155.2	66.4	74.8	86.4	66.3	75.0	64.7	49.04	74.0
P13.xlsm	O_MV_Hyp	Selective	32.7	9.1	141.3	70.0	81.6	89.4	69.4	64.4	50.5	31.96	51.7
P14.xlsm	H_MV_Hyp	Selective	32.7	9.1	139.0	64.5	79.9	90.7	77.4	79.1	68.9	55.74	86.7
P15.xlsm	LL_MV_Hyp	Selective	32.4	9.1	160.7	71.1	64.7	83.3	66.5	52.5	57.0	52.97	91.5
P16.xlsm	E_MV_Hyp	Selective	32.1	9.1	175.5	48.3	83.3	86.4	55.9	78.8	59.2	40.63	57.4
P17.xlsm	P_MV_Hyp	Selective	32.7	9.1	139.5	63.3	80.9	90.8	65.9	72.4	68.2	42.24	84.2
P18.xlsm	Q_MV_Sup	Selective	32.6	9.1	144.6	61.1	82.3	88.8	53.2	62.3	32.9	55.34	92.7
P19.xlsm	R_MV_HIZN	Selective	32.4	9.1	151.7	40.8	64.2	80.1	47.7	84.0	53.9	25.92	34.0
P20.xlsm	S_MV_HIZN	Selective	32.2	9.1	163.2	52.3	66.7	81.6	53.5	86.7	54.1	27.58	42.9
P21.xlsm	C_MV_Hyp	Standard	32.7	11.0	189.7	71.5	45.9	79.5	52.1	46.9	45.7	42.43	62.3
P22.xlsm	D_MV_Hyp	Standard	32.7	11.0	157.7	60.0	56.5	83.5	59.8	46.4	42.2	26.42	26.9
P23.xlsm	A_MV_Hyp	Standard	32.9	11.1	171.6	75.2	63.7	84.7	58.9	79.2	64.8	50.41	63.8
P24.xlsm	I_MV_Hyp	Standard	32.6	11.1	150.8	84.9	60.3	84.9	50.9	44.0	54.9	26.37	28.1
P25.xlsm	N_MV_Hyp	Standard	32.9	11.1	137.1	64.6	72.1	85.8	58.6	48.9	49.2	30.68	56.6
P26.xlsm	J_MV_Hyp	Standard	32.9	11.1	141.5	78.9	74.9	85.3	55.0	35.5	44.6	36.03	44.9
P27.xlsm	B_MV_Hyp	Standard	32.7	11.0	160.5	89.4	82.4	87.2	59.0	70.6	63.0	37.90	45.7
P28.xlsm	L_MV_Hyp	Standard	32.8	11.1	138.1	48.4	67.6	84.9	65.4	35.4	37.7	27.75	30.7
P29.xlsm	M_MV_Hyp	Standard	32.8	11.1	127.0	90.0	80.4	89.3	66.6	73.2	67.9	36.65	59.2
P30.xlsm	K_MV_Hyp	Standard	32.8	11.0	160.0	58.8	62.8	81.2	56.1	48.4	51.5	31.37	36.1
P31.xlsm	F_MV_Hyp	Standard	32.6	11.1	158.8	49.3	70.5	85.6	61.0	63.5	55.9	53.73	72.4
P32.xlsm	G_MV_Hyp	Standard	32.6	11.0	174.0	56.4	80.2	82.9	45.3	68.1	53.1	43.46	60.8
P33.xlsm	O_MV_Hyp	Standard	32.8	11.1	128.6	82.7	70.6	87.9	64.2	52.7	49.7	39.07	67.9
P34.xlsm	H_MV_Hyp	Standard	32.8	11.1	140.5	67.1	74.3	87.6	72.1	76.2	61.9	45.17	63.6
P35.xlsm	LL_MV_Hyp	Standard	32.7	11.1	160.7	74.4	72.1	80.4	59.5	52.3	52.5	42.08	58.3
P36.xlsm	E_MV_Hyp	Standard	32.9	11.1	152.9	49.8	73.6	85.6	57.4	67.5	53.0	33.59	45.7
P37.xlsm	P_MV_Hyp	Standard	32.7	11.1	142.1	55.0	84.6	89.9	57.9	68.8	65.2	41.22	76.6
P38.xlsm	Q_MV_Sup	Standard	32.9	11.1	150.1	80.1	88.8	87.3	54.4	63.6	39.3	59.09	98.3
P39.xlsm	R_MV_HIZN	Standard	32.7	11.1	147.3	40.4	45.8	68.3	50.6	82.3	49.0	15.44	18.3
P40.xlsm	S_MV_HIZN	Standard	32.8	11.0	160.5	55.2	51.7	67.3	51.6	65.4	46.2	22.07	25.2
Average				10.1	152.2	63.7	71.9	84.6	59.5	62.5	55.3	39.2	57.9

13.3.2. PAMPACANCHA ORE BODY

Pampacancha is a resource that was delineated during the Constancia feasibility study phase but with the metallurgical test work at a pre-feasibility study stage of engineering. It was planned that the Constancia plant, process and reagents would be used to treat the Pampacancha ore. However, the mineralization and rock types at Pampacancha are different and consequently, it was necessary to develop a different regime for this deposit. Rougher Recovery of Variability Samples

13.3.2.1. ORE TYPES

Pampacancha is a skarn deposit, and hence the same broad ore type definitions of the Constancia deposite were applied to Pampacancha. These are:

- Skarn Supergene, which constitutes approximately 17% of the deposit
- Skarn Mixed, approximately 42% of Pampacancha
- Skarn Hypogene, 34% of the deposit, and
- Skarn Hi Zinc, the least abundant, approximately 7% of the deposit.

For descriptions, refer to Section 13.2.1.1.

13.3.2.2. METALLURGICAL TESTS

The metallurgical test programs are divided into three phases, these are:

- Phase 1 – Scoping level tests conducted before startup of Constancia
- Phase 2 – Prefeasibility level level tests, also conducted prior to Constancia startup.
- Phase 3 – Feasibily level tests, conducted during 2020 and early 2021, with some work ongoing.

The results of the test programs are summarized below.

13.3.2.2.1. PHASE 1 – SCOPING TESTS

Preliminary metallurgical tests on the Pampacancha samples were performed by SGS in 2012. The objective of this Phase 1 testwork was to provide comminution and flotation design information for the Pampacancha resource. Phase 1 included mineralogical analysis through SGS Chile and comminution and flotation tests at SGS Peru. Phase 1 involved head assay, specific gravity, natural pH determination, preliminary rougher flotation reagent screening and pH on flotation performance. Locked cycle tests were also conducted using the standard Constancia regime with some optimization tests.

The core samples selected for the Pampacancha metallurgical testwork were fresh quarter core samples collected from diamond drill holes drilled from 2008 to 2011. Samples with skarn and hypogene lithologies were considered representative of the Pampacancha deposit. There was some concern about the age of the samples as oxidation of the samples may impact flotation results. Three master composites for comminution testing and two additional master composites for flotation testing were produced.

Comminution

Preliminary comminution test, SAG Power Index (SPI), Abrasion Index (Ai) and Bond Ball Work Index (BWi), were conducted by SGS Peru, results are shown in Table 13-6

TABLE 13-6: PHASE 1: PAMPACANCHA COMMINUTION RESULTS

Comminution Parametres	Unit	Value
SAG Power Index	Min	59.3 - 93.6
Bond Abrasion Index	g	0.0772 – 0.1160
Bond Ball Work Index	kW-h/t	12.1 – 13.0

Locked Cycle Test

Revised conditions for two composites at a primary grind of P80 of 106 µm, used a collector dosage of 30 g/t A-3302 and 10 g/t A-404 at a pH of 9.5 for a rougher flotation time of 10 min, a regrind P80 of 25 µm and three stages of cleaning at a pH of 11. Locked cycle test results are shown in Table 13-7. Concentrate grade from 19.6 to 21.6% Cu with a recovery from 78.6 to 79.2% Cu were achieved.

TABLE 13-7: PHASE 1: PAMPACANCHA LOCKED CYCLE TEST RESULTS – REVISED CONDITIONS

Composite	Grade									
	Cu %	Fe %	Au g/t	Ag g/t	S %	Cu %	Fe %	Au %	Ag %	S %
PMC01	20	25	10	174	23	79	2.4	61	62	56
PMC02	22	24	18	207	25	79	2.9	73	68	61

Flotation Variability Test

Using the optimal rougher conditions, fifteen samples were floated to determine the effect of the variability on rougher flotation. The head grades ranged from 0.36 to 1.89% Cu. The variability flotation test was a kinetic flotation for 0, 1, 2, 4, 8, 12 and 18 min. The results of the variability test are shown in (Table 13-8). Rougher concentrate recoveries were in the range from 81.2 to 93.5% Cu, 7.85 to 21.1% Fe, 75.8 to 93% Au and 65.9 to 88.4% Ag.

TABLE 13-8: PHASE 1: ROUGHER VARIABILITY TESTING RESULTS

ID	Head Calculated				Rougher Grade				Rougher Recovery				Mass
Sample	Cu %	Au g/t	Ag g/t	Fe %	Cu %	Au g/t	Ag g/t	Fe %	Cu %	Au g/t	Ag g/t	Fe %	Pull%
PMS-01	1.19	0.53	4.4	35.7	5.91	2.71	19.7	26.8	84.7	86.7	76.7	12.8	17.1
PMS-03	0.68	0.25	3.92	11.3	2.96	1.13	14.1	11.8	88.2	90.2	72.7	21.1	20.1
PMS-04	0.88	0.33	8.91	33.7	3.71	1.37	34.3	25.6	91.1	88.3	83.2	16.4	21.6
PMS-05	0.49	0.42	8.2	12.8	2.13	1.73	33	11.2	90.1	84.8	83.5	18.2	20.7
PMS-06	0.72	1.03	7.93	35.6	4.07	6.03	40.7	26.3	89.8	93	81.3	11.7	15.8
PMS-07	1.05	0.22	6.23	39	4.44	0.83	22	29.5	88	78.1	73.7	15.7	20.8
PMS-08	1.89	0.89	6.2	41.4	9.38	4.05	23.9	30.5	90.9	83.2	70.7	13.5	18.3
PMS-09	0.93	0.34	2.65	48.6	7.18	2.42	15	32.9	89.5	81.7	65.9	7.85	11.6
PMS-10	0.93	0.3	13.1	36.1	5.56	1.49	70.5	28.1	92.4	76.5	83.4	12.1	15.5
PMS-11	0.36	0.26	2.98	12.2	1.58	1.1	10.9	10.6	81.2	77.5	68.3	16.3	18.7
PMS-13	0.83	1.1	21.2	21.8	3.42	4.71	83	19.4	89.6	92.8	85.2	19.4	21.7
PMS-15	0.62	0.57	9.26	17.4	2.48	2.29	35.3	15.5	86	86.2	81.6	19.1	21.4
PMS-16	0.84	0.42	4.36	32	4.64	2.19	20.5	20.8	93.5	88.2	80	11	17
PMS-17	0.92	0.39	6.47	24	3.63	1.35	20.5	21.6	87.3	75.8	70	19.9	22.1
PMS-18	0.72	0.46	5.29	17.9	3.37	1.98	23.8	15.4	91.2	84.6	88.4	16.9	19.6
AVERAGE	**0.87**	**0.5**	**7.4**	**28**	**4.3**	**2.36**	**31.2**	**21.7**	**88.9**	**84.5**	**77.6**	**15.5**	**18.8**

Mineralogy

A PMA QemSCAN, analysis was conducted on the Locked Cycle Test (LCT) head stream for the two composites to determine the mineral assemblage. The copper occurrence in both cases was dominated by chalcopyrite (70-73%), bornite (22-28%) with minor chalcocite (1%) and enargite - tennantite (2%). Table 13-9 reports the QemSCAN modal analysis results.

TABLE 13-9: PHASE 1: MINERALOGICAL ANALYSIS (MINERAL MASS %)

Minerals	PMC-01	PMC-02
Chalcopyrite	11.2	10.29
Chalcocite/Covellite	0.23	0.48
Bornite	2.81	1.98
Enargite/Tennantite	0.11	0.29
Pyrite	4.66	3.64
Pyrrhotite	0.16	0.08
Molybdenite	0.03	0.69
Sphalerite	1.23	1.41
Galena	0.35	0.45
Quartz	9.75	13.32
Plagioclase	0.73	1
K-Feldspar	3.39	3.91
Biotite	4.61	2.99
Amphibole	3.11	4.24
Pyroxene	1.39	1.26
Tourmaline	0.88	1.15
Other Silicates	0.09	0.08
Muscovite/Sericite	0.86	1.32
Chlorite	10.31	5.04
Albite	0.06	0.23

Minerals	PMC-01	PMC-02
Epidote	0.16	0.19
Clays	0.26	0.59
Calcite	15.75	16.24
Ankerite	6.64	10.59
Anhydrite/Gypsum	1.74	1.51
Rutile	0.13	0.21
Ilmenite	0.01	0.02
Fe Oxides	18.88	15.2
Sphene	0.07	0.07
Siderite	0.08	1.19
Apatite	0.23	0.21
Others	0.11	0.13
Total	100	100

13.3.2.2.2. PHASE 2 – PREFEASIBILITY TESTS

During 2012, the SGS Laboratory in Lima, Peru conducted a test program using drill core rejects from the 2011 program. The main objective of Phase 2 was to obtain the metallurgical response of mineralized material from the Pampacancha deposit to the Constancia mill flotation conditions. Phase 2 involved head assay, specific gravity, natural pH determination, a locked cycle test to approximate plant metallurgical results and variability flotation conditions. Samples from the skarn and hypogene lithologies were considered representative for the Pampacancha deposit. Three master composites were produced and designated for each sector of the Pampacancha deposit.

Locked Cycle Test

The Constancia project flotation conditions for the locked cycle tests are shown in Table 13-10

TABLE 13-10: PAMPACANCHA LOCKED CYCLE TEST CONDITIONS

Stage	Reagents, g/t			Grind	Time, min	Time, min	
	CaO	A-3302	AF-65	P80, µm	Cond.	Flot.	pH
Grinding	Req	15		106			
Conditioning	Req	15	Req				10
Rougher						10	
Regrinding				25	2		
Cleaner 1	Req					4	11.5
Conditioning							
Scavenger						8	11.5
Cleaner 2	Req					3	11.5
Cleaner 3	Req					3	11.5

Locked cycle test results in Table 13-11 show that a concentrate grade from to 14.9 to 25.3% Cu with a recovery from 67.8 to 80.6% Cu was achieved.

TABLE 13-11 PAMPACANCHA PHASE 2: LOCKED CYCLE TEST RESULTS

Composite	Grade				Recovery			
	Cu, %	**Fe, %**	**Au, g/t**	**Ag, g/t**	**Cu, %**	**Fe, %**	**Au, %**	**Ag, %**
PMC-03	21.1	22.4	9.7	188.5	76.3	2.2	62.2	63.1
PMC-04	25.3	24.7	11.3	151.1	67.8	1.7	53.8	56.5
PMC-05	14.9	21.1	6.7	165.8	80.6	2.4	61.3	70.3

Flotation Variability Test

A variability test was performed on 30 skarn and hypogene samples (Table 13-12). The sample head grades were in the range from 0.21 to 1.29% Cu. The variability flotation test was a kinetic flotation for 0, 1, 2, 4, 8, 12 and 18 min. The results of the variability test including, cumulative recovery and grade until flotation completion (18 min), are shown in Table 13-12. Rougher concentrate recoveries obtained were in the range of 75.3 to 95.7% Cu, 8.6 to 36.5% Fe, 54.7 to 91.8% Au and 54.1 to 95.1% Ag.

TABLE 13-12: PHASE 2: ROUGHER VARIABILITY TESTING RESULTS

Samples	Head Calculated				Rougher Grade				Rougher Recovery				Mass %
	Cu %	**Fe %**	**Au g/t**	**Ag g/t**	**Cu %**	**Fe %**	**Au g/t**	**Ag g/t**	**Cu %**	**Fe %**	**Au %**	**Ag %**	
PRS-01	0.31	19.9	0.13	0.76	1.37	12.2	0.55	2.54	90	12.5	89.8	68.3	20.3
PRS-02	1.26	2.6	0.55	6.81	5.47	26.7	2.27	28.3	90	13	85.1	86.3	20.8
PRS-03	0.43	32.1	0.14	6.58	1.78	22	0.55	23	89.9	14.8	82.9	75.3	21.5
PRS-04	1.3	33.3	0.62	6.8	4.45	28.4	1.63	19.9	90.3	22.4	69	77.1	26.3
PRS-07	0.31	28.1	0.13	1.85	1.03	20.2	0.43	5.67	86.9	18.5	84.2	79.1	25.8
PRS-11	0.22	3.76	0.11	2.79	0.55	3.96	0.23	6.18	87.6	36.5	74.3	76.6	34.7
PRS-12	0.6	26.9	0.26	3.73	1.92	20.2	0.81	11.2	85.2	19.8	82.1	79.1	26.4
PRS-15	0.38	13.4	0.12	1.51	1.38	11.5	0.43	5.3	86.6	20.7	88.2	84.4	24
PRS-16	0.46	30.2	0.17	3.36	2.25	21.3	0.84	15.4	89	13	91.8	84.7	18.5
PRS-18	0.39	24.8	0.34	10.5	1.2	20.1	0.9	28.7 72.7	84.2	22	72.7	74.4	27.2
PRS-19	1.24	41.1	0.63	11.2	4.9	32.8	3.12	41.2	85.5	17.3	72.8	79.9	21.7
PRS-20	1	21.1	0.69	29	2.62	18.4	1.59	71.5	88.7	29.3	77.6	83	33.7
PRS-21	0.64	25.2	0.19	5.02	2.05	17.5	0.59	14.7	88.7	19.3	84.1	81.1	27.8
PRS-22	0.35	41.2	0.19	5.23	1.51	29.9	0.09	18.6	89.2	14.8	86.9	72.3	20.3
PRS-23	0.33	14.3	0.26	5.13	0.97	12.1	0.68	13.4	83.8	24.5	74.8	75.5	28.9
PRS-24	0.27	11.5	0.21	5.65	0.73	12.4	0.47	9.24	90.2	35.6	73.6	54.1	33.1
PRS-27	0.37	15.5	0.16	2.38	1.02	12.3	0.4	6.25	84.5	24.7	80.5	81.5	31
PRS-30	0.6	43	0.18	2.9	2.86	29.7	0.78	10.4	90.6	13.1	83.1	68.1	18.9
PRS-31	0.64	18.2	0.17	6.14	1.78	15.4	0.47	15.5	93.2	28.3	89.3	84.6	33.5
PRS-32	1.08	39.6	0.42	7.01	3.82	29.6	1.24	16.1	75.3	16	63.6	68.9	21.4
PRS-34	0.46	13.2	0.6	9.84	1.45	11.3	1.6	29.8	89.7	24.4	75.8	86.5	28.6
PRS-35	0.74	7.55	0.62	23.5	1.77	7.61	2.59	90.7	82	23.4	85.9	79	20.5
PRS-36	0.65	15.1	0.098	14.4	2.17	14	0.31	47.9	95.7	26.6	89.1	95.1	28.7
PRS-37	0.48	28.8	0.31	6.59	2.46	19.2	1.41	32.2	84.9	10.9	75.5	80.4	16.5
PRS-39	0.52	16.7	0.16	13.1	2.19	18.9	0.52	52.3	92.1	24.8	69.9	87.8	22
PRS-40	0.49	31.9	0.13	2.61	2.45	21.2	0.61	10.5	88.3	11.8	84.1	71.6	17.8
PRS-42	0.5	22.2	0.19	11.3	1.68	16.9	0.52	35.7	84.9	19	67.5	78.9	25
PRS-43	0.37	14.5	0.16	6.42	1.26	11.9	0.48	21.6	88.7	21.6	81.5	88.3	26.2
PRS-46	0.8	40.1	0.32	6.33	4.04	24	1.61	31.4	91.8	10.8	90.5	89.6	18.1
PRS-49	0.45	29.3	0.17	6.35	2.75	16.7	0.61	34.4	92.9	8.56	54.7	81.5	15.1

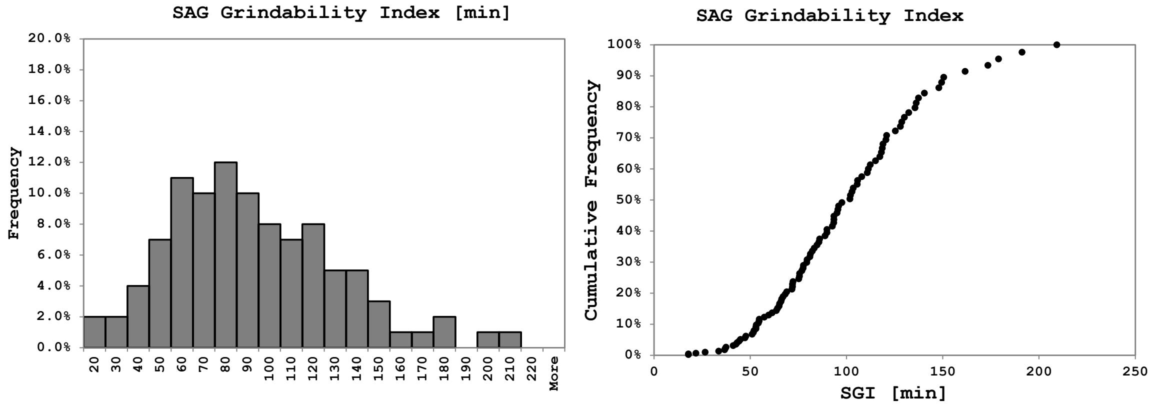
13.3.2.2.3. PHASE 3 – FEASIBILITY TESTS

The Pampacancha feasibility study is ongoing at the time of reporting. It consists of

- 100 variability samples submitted for hardness tests
- 10 Rougher flotation kinetics tests conducted on composites of each of the four major ore types
- 9 Cleaner flotation kinetics tests conducted on a composite of the Pampacancha deposit
- 40 Rougher variability kinetics tests on samples from each of the four major ore types

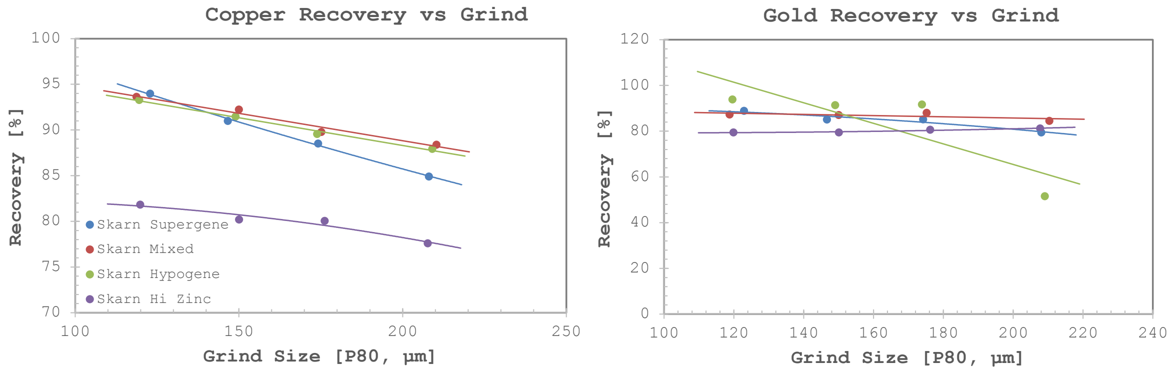
The SGI results confirm the Phase 1 comminution results, and show that Pampacancha is moderately softer than Constancia with a mean SGI of approximately 85 minutes.

FIGURE 13-2: DISTRIBUTION OF SAG GRINDABILITY INDEX IN PAMPACANCHA



Rougher flotation kinetics tests were performed under a range of pH, percent solids, and P80 conditions. The results show that the copper recovery is expected to be above 90% at nominal 150-micron grind size, with the exception of HI Zinc, which is only 7% of Pampacancha ores, approximately. Gold recovery is expected to be above 80% for all ore types.

FIGURE 13-3: ROUGHER RECOVERY OF GOLD AND COPPER



Cleaner tests were also conducted on laboratory-produced sample of rougher concentrate floated from a master composite of all ore types. The tests were conducted at a range of typical cleaner percent solids, pH, and regrind size. The results, shown in Table 13-13, indicate expected cleaner recoveries of 99% for copper and 94% for gold, very similar to current plant performance for these elements.

Given the above rougher and cleaner recoveries, there are no major concerns related to the metallurgical performance of the Pampacancha ores; indeed, the fixed recoveries of 85% Cu and 70% Au appear to be conservative in light of these results.

TABLE 13-13: CLEANER RECOVERY AS A FUNCTION OF % SOLIDS, PH, AND P80

Test	Sample	% Sol [%]	pH	P80 [µm]	Au Recovery [%]	Ag Recovery [%]	Cu Recovery [%]	Mo Recovery [%]	Zn Recovery [%]	Pb Recovery [%]	As Recovery [%]	Fe Recovery [%]	S Recovery [%]
P1.xlsm	Conc. Ro Bulk_2 g/t	19.6	11.0	47	93.8	95.69	99.2	99.0	96.9	93.9	80.3	63.4	71.7
P2.xlsm	Conc. Ro Bulk_5 g/t	20.5	11.0	48	95.0	96.81	99.4	99.4	97.2	95.8	90.1	68.6	87.5
P3.xlsm	Conc. Ro Bulk_20 g/t	20.5	11.0	49	95.8	98.04	99.5	99.4	97.4	97.2	98.3	72.8	98.8
P4.xlsm	Conc. Ro Bulk_pH 10	19.7	10.0	48	93.5	96.47	99.1	98.2	96.6	95.9	89.3	66.5	96.0
P5.xlsm	Conc. Ro Bulk_pH 12	20.3	12.0	48	95.3	95.05	99.0	98.5	96.7	92.0	77.0	62.8	65.4
P6.xlsm	Conc. Ro Bulk_% Sol 10%	10.2	11.5	52	94.0	94.92	99.0	97.8	96.0	90.3	66.1	49.6	58.6
P7.xlsm	Conc. Ro Bulk_% Sol 15%	15.6	11.5	55	92.1	95.44	99.0	98.5	96.2	91.0	74.5	53.4	63.2
P8.xlsm	Conc. Ro Bulk_30 um	18.8	11.5	43	91.3	96.19	99.0	98.7	96.5	91.2	71.3	55.9	64.1
P9.xlsm	Conc. Ro Bulk_20 um	18.6	11.5	37	95.9	96.70	99.3	98.8	97.1	93.3	79.2	61.2	73.3
Average		18.2	11.2	47.3	94.1	96.1	99.2	98.7	96.7	93.4	80.7	61.6	75.4

discussion of the Zn/Pb issues we have from time to time based on ore types. If this is not in tech report, consider including.

13.4. CONCENTRATE QUALITY

Although concentrate quality is adequate when treating most of the ores associate with the Constancia deposit, post-start up some ores have demonstrated higher levels of zinc and lead in the concentrates, primarily a result of the feed grade characteristics. These ores constitute a very small percentage of the Constancia deposit and have, to date, been mitigated by a combination of factors, including:

- ores that are uneconomical due to higher zinc and lead, but low grades of economic minerals are sent to waste stockpiles, and
- ores that are marginally economical due to zinc and lead ratios are sent to stockpiles and, subsequently, fed to the mill in a controlled manner in order to manage the concentrate quality.

The impact of the foregoing on Constancia's operating costs and reserves is considered in the scope of this document. Not considered is the ongoing work aimed at improving the metallurgical deportment of these ores in the process plant, in order to reduce the costs associated with the additional handling and/or the impact on reserves estimation. These include:

- use of a more selective primary collector to reduce zinc and lead hydrophobicity in the flotation circuit, currently in Phase 2 plant trials.
- Active control of cleaner pulp potential, such as by aeration/oxygenation of the cleaner feed, currently in phase 1 lab trials
- use of amine-based depressants in the cleaning circuit, currently in phase 1 lab trials, and
- reconfiguration of the column flotation cells to operate in serial configuration instead of parallel configuration, as currently configured, currently in conceptual engineering.
- Pampacancha ores do not have significant lead and zinc, but have low to moderate arsenic, although not at levels that would trigger penalties.

14. MINERAL RESOURCES ESTIMATES

14.1. CONSTANCIA MINE

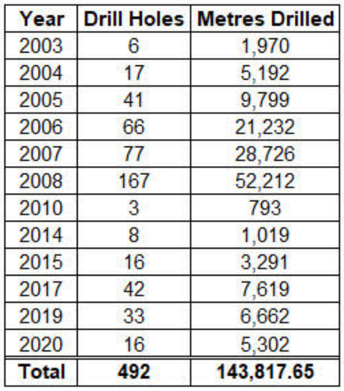
Hudbay prepared an update of the Constancia mine resource model using Leapfrog® version 4.5 and MineSight® version 13.10, two industry standard commercial geological and mining softwares. The construction of this 3D resource model and the estimation of mineral resources were performed by Hudbay personnel following Hudbay procedures in compliance with best industry standards and the CIM guidelines. The work was supervised and validated by Olivier Tavchandjian, P.Geo., Vice-President Exploration and Geology of Hudbay.

There are no known factors that could materially affect the mineral resource estimates for the Constancia mine.

MODELING DATABASE

As shown in Table 14-1, 492 drillholes totaling approximately 143,817 m were included in the Constancia database to support the mineral resource estimate. Amongst these, 34 holes were drilled in 2019 and 2020 to define extension of skarn and porphyry mineralization to the North of the Constancia deposit along the Yanak fault.

TABLE 14-1: DRILLING DATA BY YEAR



Year	Drill Holes	Metres Drilled
2003	6	1,970
2004	17	5,192
2005	41	9,799
2006	66	21,232
2007	77	28,726
2008	167	52,212
2010	3	793
2014	8	1,019
2015	16	3,291
2017	42	7,619
2019	33	6,662
2020	16	5,302
Total	**492**	**143,817.65**

The drillhole database was exported from MineSight Torque® and provided in Microsoft Excel® format with a cut-off date for mineral resource estimate purposes of October 26th, 2020. In parallel, the drillhole database was also imported in Leapfrog® for additional and independent comparison and validation. No significant differences in the projection of the drillhole traces were found between the two datasets.

MODELING OF THE MINERALIZED DOMAINS

The Constancia deposit trends approximately along an azimuth of N150° with a general dip of 70° to the East. Geologically, Constancia is a Cu-Mo porphyry deposit with small bodies of Cu-Au skarn located at the contact between the porphyry intrusions and the sediments. The Constancia deposit is continuous along a strike length of 3.0 km east-west, 3.0 km north-south and to a vertical depth of approximately 900 m.

Constancia displays the typical porphyry alteration zonation: argillic in the upper part, phyllic and potassic in the centre, with propylitic alteration surrounding the deposit. High grade mineralization is well correlated with the phyllic and potassic alteration zones. Oxidation levels of the deposit have been modelled using the total copper to acid soluble copper (sulphuric and cyanide) ratio following the formulas presented in Table 14-2.

TABLE 14-2: OXIDATION ZONE FORMULATION

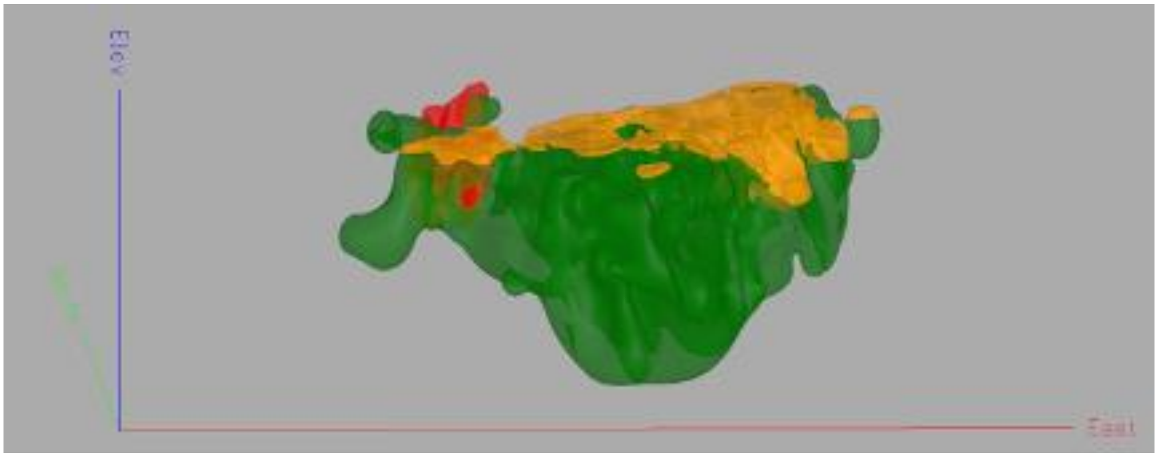
Oxidation Levels	Criteria
Oxide	(CuSS / CuT) > 40%
Supergene	(CuSS + CuCN / CuT) > 70%
Mix	70 ≥ (CuSS + CuCN / CuT) > 30%
Hypogene	(CuSS + CuCN / CuT) ≤ 30%

Wireframes were constructed via 3D explicit modelling in Leapfrog as follow:

- Domain 1: a hypogene domain dominated by primary sulphide (mostly chalcopyrite) and including most of the skarn mineralization
- Domain 2: a supergene domain dominated by secondary sulphide (mostly chalcocite)
- Domain 3: a barren domain that includes sediments, intrusive stocks and intrusive dykes
- Domain 4: skarn bodies identified at Constancia North Zone related to Yanak fault
- Domain 5: copper oxides and leached zone.

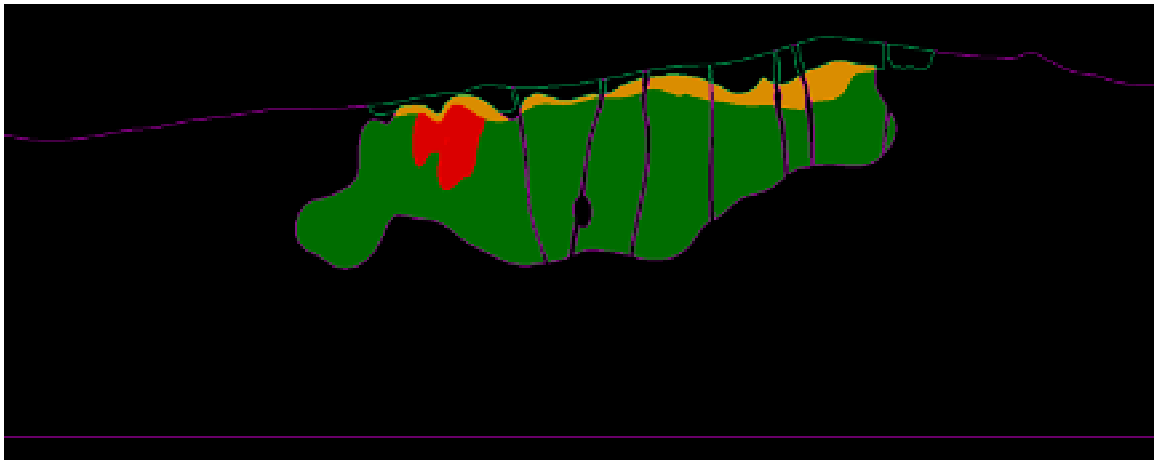
In a final validation step, these domains were loaded into MineSight® in order to ensure proper tagging of the solids to actual drillhole locations. The mineral domains were used as hard boundaries in all cases for grade interpolation purposes. Wireframes of the mineralized domains are shown in Figure 14-1 and Figure 14-2

FIGURE 14-1: 3D VIEW OF CONSTANCIA DOMAINS



Note: Domain 1 in green, Domain 2 in orange and domain 4 in red. Domain 3 and 5 (waste material) are not shown

FIGURE 14-2: CROSS SECTION OF CONSTANCIA DOMAINS



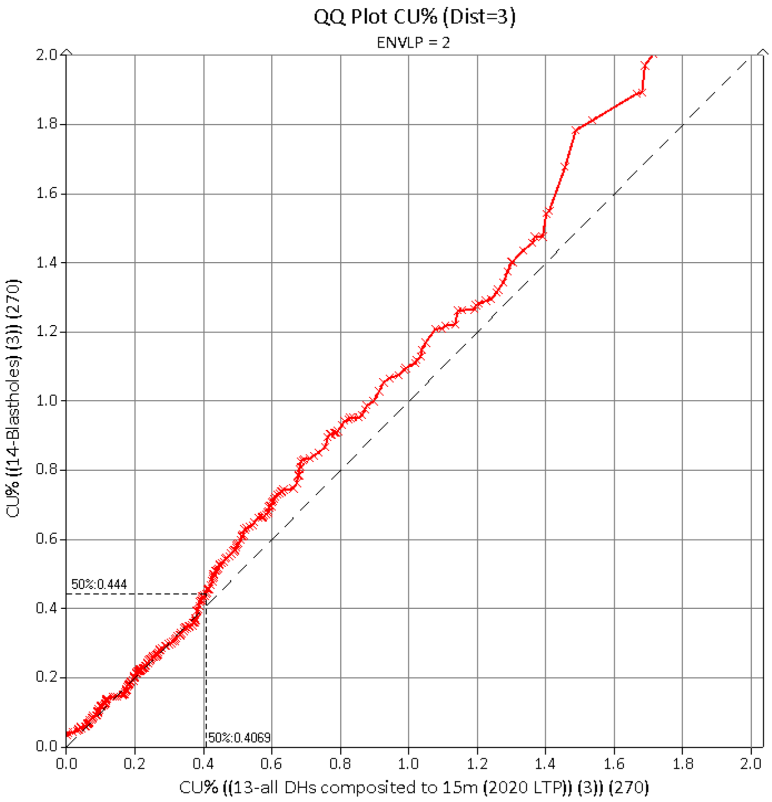
Note: Domain 1 in green, Domain 2 in orange and domain 4 in red. Domains 3 and 5 (waste material) are not shown

CORRECTION FACTORS

As discussed in the previous NI 43-101 technical report, correction factors for copper in the supergene zone were applied based on the 2017 twin-holes study in order to circumvent the apparent low bias in the diamond drillholes. Since then, a significant number of blastholes have been drilled, providing additional information on the low bias affecting the diamond drillholes.

A paired analysis between the blastholes and the drillholes has been performed in 2020 in order to develop a correction factor as close to reality as possible. Figure 14-3 presents the QQ plot of copper in the supergene domain.

FIGURE 14-3: PAIR ANALYSIS BETWEEN BLASTHOLES AND DRILLHOLES IN SUPERGENE DOMAIN



Based on this analysis, the low bias of copper in the diamond drillholes can be corrected by applying a correction factor of +12% when the copper grade is between 0.4% and 1.3%.

A similar low-grade bias was also identified for lead which constitutes a deleterious elements for the mill. Using the same methodology; the following correction factors were developed to correct the issue:

- A correction factor of +8% in ENVLP = 1 when Pb% < 0.05
- A correction factor of +7% in ENVLP = 1 when 0.05 ≤ Pb% < 0.5
- A correction factor of +8% in ENVLP = 2 when Pb% ≥ 0.1

These corrections were applied to the drillhole database prior to drillhole compositing and grade interpolation.

SPECIFIC GRAVITY

Density values generated from multi regression formulas are based on 1,849 measurements. When geochemical results were not available, baseline values were attributed based on the average value of the domain. The predicted density values were validated through comparisons against the measured density to ensure the predictive models performed adequately.

COMPOSITING

Assay intervals were regularized by compositing drillhole data within each interpreted domain. Although most of the drillholes were assayed on 2m interval, a composite length of 7.5 m was selected as more appropriate to conduct interpolation into the 20m x 20m x 15m block size.

Compositing over a longer interval than the original assay results in a loss of details and resolution in the downhole grade distribution but does not impact the quality of the block estimates with a 15 m height. Composites with a length lower than 3.75 m were added to the previous interval. Compositing was weighted by specific gravity which has a material impact only for iron, zinc and arsenic grade.

The compositing process was validated by comparing total length, density and length weighted average grade for each metal of the 7.5m composites to the original assays.

EXPLORATORY DATA ANALYSIS

Exploratory data analysis (EDA) includes basic statistical evaluation of the composites for copper (Cu), molybdenum (Mo), silver (Ag), gold (Au), zinc (Zn), lead (Pb), and density (SG). The EDA was conducted separately for each mineralized domain. Within each mineral domain, the EDA also aimed to identify sub-domains that did not support the use of hard contacts for grade interpolation purposes but that justified being used for the purpose of block model validation, smoothing assessment and correction and resource classification. Capping analysis and smoothing assessment were also conducted separately in each domain.

The 7.5 m composite statistics for Cu, Mo, Ag, Au, Zn, Pb and calculated SG are summarized in in the grade estimation validation section. Overall, the statistics of the composites indicate high coefficient of variation and skewness suggesting that the kriging interpolation will be expected to introduce smoothing even in areas of dense drilling coverage and that a thorough smoothing assessment and post-processing of the initial interpolation is warranted to produce unbiased grade-tonnage curves and mineral resource and mineral reserve estimates.

GRADE CAPPING

Capping of gold and silver was applied via the Parrish method due to the skewed nature of the frequency distributions. This method considers capping when the last decile of the population contains more than 40% of the metal and that the last percent contains more than 10% of the metal. Based on this method, gold was capped at 0.8 PPM in ENVLP=1, 0.35 PPM in ENVLP=2 and 1 PPM in the northern skarn, while silver was capped at 18 PPM in ENVLP=1, 25 PPM in ENVLP=2 and 40 PPM in the northern skarn.

VARIOGRAPHY

Down-hole and pairwise directional variograms were created for each individual domain using the MineSight data analysis software. The major, semi-major and minor axis were built in order to fit the attitude of each mineral domain. A linear combination of a nugget and two nested spherical models were adjusted in all cases. Once generated, a systematic visual check was conducted to ensure that the search ellipsoid would be correctly oriented with respect to the geometry of the mineral domains. The variogram parameters modelled by envelope are shown in Table 14-3.

TABLE 14-3: VARIOGRAM PARAMETERS (SPHERICAL MODELS)

ENVLP = 1	Nugget	Sill1	Major	Semi-Major	Minor	Sill2	Major	Semi-Major	Minor	Rotation 1	Rotation 2	Rotation 3
0	0.13	0.19	55	25	60	0.15	350	205	260	150	-35	-90
0	0.17	0.25	50	20	35	0.3	275	170	215	150	-35	-90
0	0.13	0.22	35	30	30	0.12	440	260	245	150	-35	-90
Au	0.13	0.2	60	30	35	0.16	350	210	350	150	-35	-90

ENVLP = 2	Nugget	Sill1	Major	Semi-Major	Minor	Sill2	Major	Semi-Major	Minor	Rotation 1	Rotation 2	Rotation 3
Cu	0.12	0.24	35	60	25	0.15	105	315	90	0	0	0
Mo	0.15	0.29	40	55	25	0.24	160	210	80	0	0	0
Ag	0.11	0.18	70	60	30	0.16	170	280	90	0	0	0
Au	0.11	0.18	75	70	25	0.2	210	210	100	0	0	0

ENVLP = 4	Nugget	Sill1	Major	Semi-Major	Minor	Sill2	Major	Semi-Major	Minor	Rotation 1	Rotation 2	Rotation 3
Cu	0.15	0.4	43	44	20	0.26	280	175	80	148	30	-65
Mo	0.23	0.25	35	65	35	0.3	160	120	50	148	30	-65
Ag	0.16	0.3	54	25	20	0.2	240	120	50	148	30	-65
Au	0.24	0.24	40	25	25	0.2	240	130	50	148	30	-65

GRADE ESTIMATION AND INTERPOLATION METHODS

The block model consists of regular blocks (20 m along strike by 20 m across strike by 15 m vertically). The block dimensions were selected to match the long-term smallest mining unit (SMU) at Constancia mine. To date, the mine has been using a more selective approach with a SMU size of 10mx10mx15m and this higher level of selectivity is planned to continue until the operation reaches an elevation of 3,930m. The change in SMU size over time is handled through the smoothing assessment/correction step as a post-processing of the kriged estimates. Where a block was intersected by two domains, majority assignment was performed.

Grade interpolation used a strict composite and block matching system based on the domains codes. For example, only composites coded as domain 1 were used to estimate the grade of the block that were assigned to domain 1. Both nearest neighbour (NN) and ordinary kriging (OK) grade interpolations were completed on the uncapped and capped grades, using three passes with increasing minimum information requirements (Table 14-4). The search passes were selected to ensure best local estimates recognizing that OK has a smoothing effect but making no attempt during interpolation to reduce this smoothing as it would negatively impact the quality of the local estimates. Over-smoothing is addressed through the post-processing of the model described in the smoothing assessment sub section of this report.

TABLE 14-4: SEARCH ELLIPSE PARAMETERS

	Min # of Comps	Max # of Comps	max # of Comps per hole	Declustering	max Comps per Quadrant	Search ellipse
Pass #1	1	32	6	*no*	-	150% of variogram ranges
Pass #2	16	32	6	yes	8	75% of variogram ranges
Pass #3	16	32	6	yes	8	50% of variogram ranges

The NN interpolation is solely used to validate that there is no global bias and to assess the level of grade smoothing in the OK interpolation for the selected SMU dimension.

GRADE ESTIMATION VALIDATION

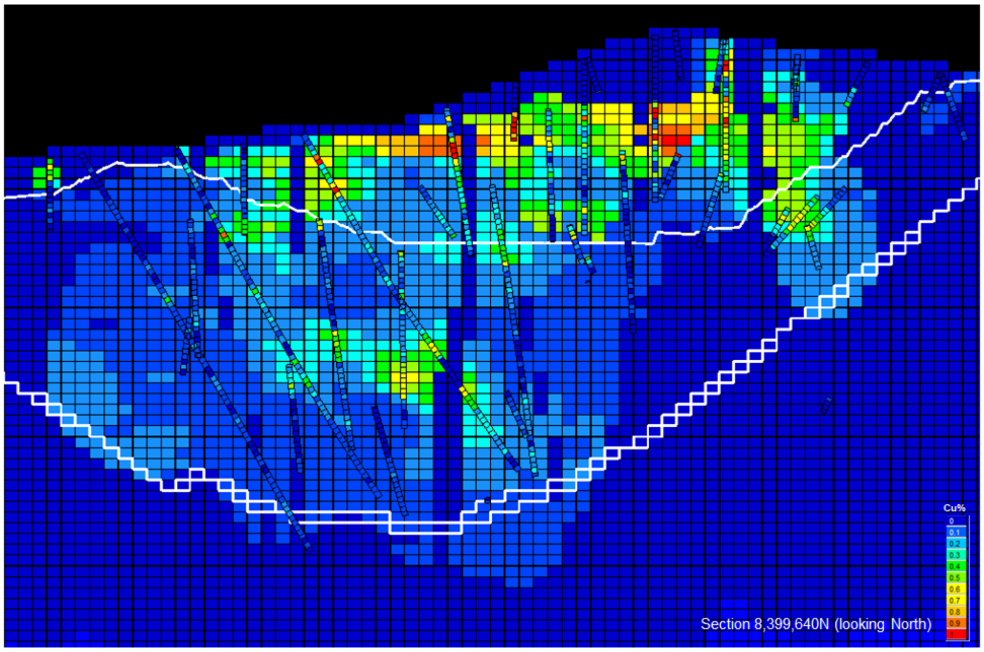
The grade estimation process was validated for each domain to ensure appropriate honouring of the input data and subsequent unbiased resource reporting and use of the model for reserve estimation through the following steps:

- Visual checks of appropriate honouring of the input data but acknowledging that some natural smoothing should occur between samples as the grade of a sample in the middle of a block is not the average grade of the block;
- Absence of global bias by comparing the mean grade estimated by kriging to the original composite average grade and to a declustered grade obtained from a nearest neighbour interpolation; and
- Assessment of the level of smoothing in the model for the selected selective mining unit (SMU) dimensions considered for resource and reserve reporting.

VISUAL INSPECTION

Visual inspection of block grade versus composited data was systematically conducted in section and plan views. This check confirmed a good reproduction of the data by the model. As an example, a cross-section (looking North) of the copper grade is presented in Figure 14-4.

FIGURE 14-4: VISUAL VALIDATION OF THE COMPOSITES VS THE BLOCK GRADE



GLOBAL BIAS CHECKS

This validation step consists in comparing the global average grade of each element (after capping for gold and silver) between the original composites, the kriged block estimates and the nearest neighbour estimates. This investigation was conducted not only by domain but also for each individual sub-domain.

A nearest neighbour interpolation is equivalent to the declustered statistics of the composites based on weighting each composite by its polygon of influence. The average grade obtained from this method is a useful benchmark but not a perfect one as it fails to incorporate the nugget effect measured by the variogram. The higher the nugget effect, the closer the average grade should be to the mean of the composites. Ordinary kriging is in fact the best method of declustering.

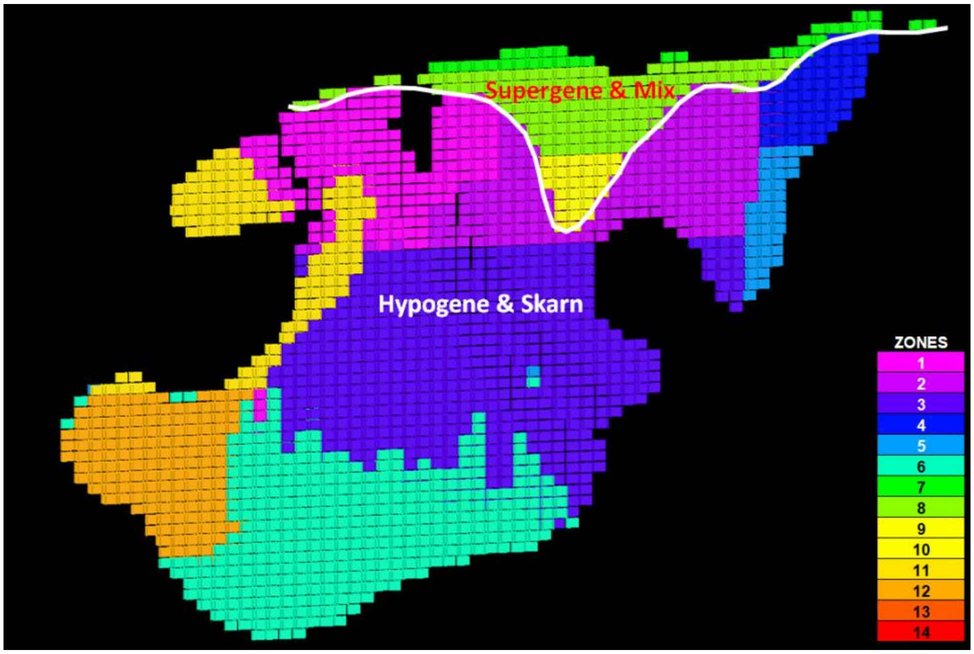
A global check was performed to verify that the kriged mean block estimate was located between the mean of the composites and the mean of the nearest neighbour model. Differences between the 7.5 m composites, the NN and OK grades are acceptable in all the sub-domains within each domains. The comparison of the mean and variance for each metal between the 7.5 m composites, the NN and OK models. No significant issues for any of the interpolated variables were observed.

SMOOTHING ASSESSMENT

The visual validation conducted in section and plan views confirmed that the block grade interpolation was consistent with the supporting composite data. The larger number of composites used for grade estimation in the block model significantly improves the individual block grade estimates but, at the same time results in a much smoother model requiring a careful assessment and in many cases a post-processing of the OK estimates.

The extent of grade ‘over-smoothing’ in the model was investigated separately by sub domains based on material differences in grade distribution and/or drilling density as illustrated in Figure 14-5. The mean and variance of the kriged estimates were compared to the variance of the composites after declustering (obtained from a nearest neighbour interpolation). The expected true variance between SMUs was calculated from the variogram models.

FIGURE 14-5: EXAMPLE OF SMOOTHING SUBZONES



Over-smoothing is a normal outcome of a sound interpolation method when the drill spacing is not sufficient to address the short-range variability in the metal grade distribution. Smoothing will gradually reduce as additional infill drilling is performed during the definition drilling phases.

In a few cases, the smoothing ratios were high (>3), reflecting the erratic nature of the distribution of the metals in these sub-domains usually characterized by highly skewed histograms and outliers contributing to a large proportion of the total variance.

SMOOTHING CORRECTION

Using the smoothed OK estimates results in an erroneous grade-tonnage curve and reporting resources or reserves at a cut-off grade different than 0% would produce biased estimates, usually over-estimating tonnes and under-estimating grade.

An indirect log-normal correction was used to perform a change of support on the kriged models in order to obtain unbiased grade tonnage curves. This correction is only valid globally and provides poorer local estimates than the smoothed OK model but does not materially alter the global average grade within each zone and provides the correct grade-tonnage curve for the variogram models fitted on the drillhole data. It is an appropriate method to predict the recoverable tonnage and grade such as the volume mined over three months of production which should be a realistic aim for a long-term reserve model based on exploration drilling.

For some of the elements, the correction did not fully attain the targeted variance reflecting that the log-normal model does not perfectly fit these elements. However, the targeted variance was reached within very close limits in most cases, as illustrated in Table 14-5

TABLE 14-5: SUMMARY OF THE APPLIED SMOOTHING CORRECTIONS FOR COPPER

Zone	OK Mean	NN model variance	OK model variance	Theoritical variance between 20m x 20m x 15m blocks	Corrected Mode Variance for 20m x 20m x 15m blocks	Theoritical variance between 10m x 10m x 15m blocks	Corrected Mode Variance for 10m x 10m x 15m blocks
1	0.423	0.1458	0.0282	0.078	0.080	0.086	0.089
2	0.222	0.0377	0.0110	0.020	0.021	0.022	0.023
3	0.235	0.0312	0.0087	0.017	0.016	0.018	0.018
4	0.169	0.0157	0.0028	0.008	0.008	0.009	0.009
5	0.199	0.0282	0.0051	0.014	0.016	0.016	0.019
6	0.210	0.0208	0.0040	0.011	0.011	0.012	0.013
7	0.431	0.1759	0.0592	0.089	0.090	0.102	0.102
8	0.601	0.2712	0.0725	0.138	0.123	0.157	0.137
9	0.550	0.1256	0.0259	0.064	0.061	0.073	0.069
10	0.188	0.0440	0.0076	0.023	0.026	0.026	0.029
11	0.453	0.2619	0.0607	0.139	0.141	0.154	0.156
12	0.314	0.0825	0.0138	0.044	0.042	0.049	0.046
13	0.377	0.3273	0.0686	0.162	0.145	0.202	0.173
14	0.597	0.5210	0.1639	0.257	0.220	0.321	0.252

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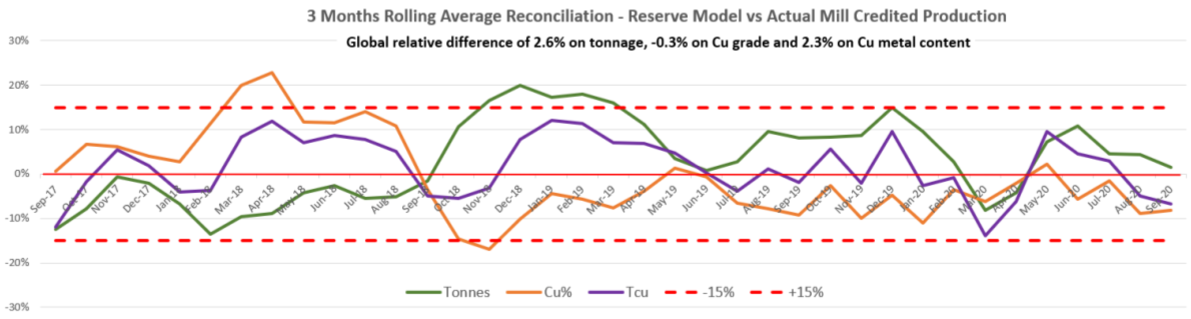
RECONCILIATION

In order to validate the resource model, tonnes and grade reported at the operating cut-off for the areas that have been mined between July 2017 2018 and October 2020 were compared against the credited mill production. The results presented in Figure 14-6 confirm that the quarterly production is almost always predicted within +/-15% on a quarterly basis both for tonnes, grade and metal content which constitutes the threshold used corporately by Hudbay to report measured resources/proven reserves. Overall the model present no significant bias for neither tonnes, grade or metal content and as such constitutes a reliable to develop a life of mine plan for Constancia mine. The SMU dimensions adopted for this reconciliation work are 10mx10mx15m as per the current operating practice.

FIGURE 14-6: MONTHS ROLLING AVERAGE RECONCILIATION BETWEEN THE RESERVE MODEL AND MILL CREDITED PRODUCTION OF THE MINE COMPARED AT SAME OPERATIONAL CUT-OFF



CLASSIFICATION OF MINERAL RESOURCE

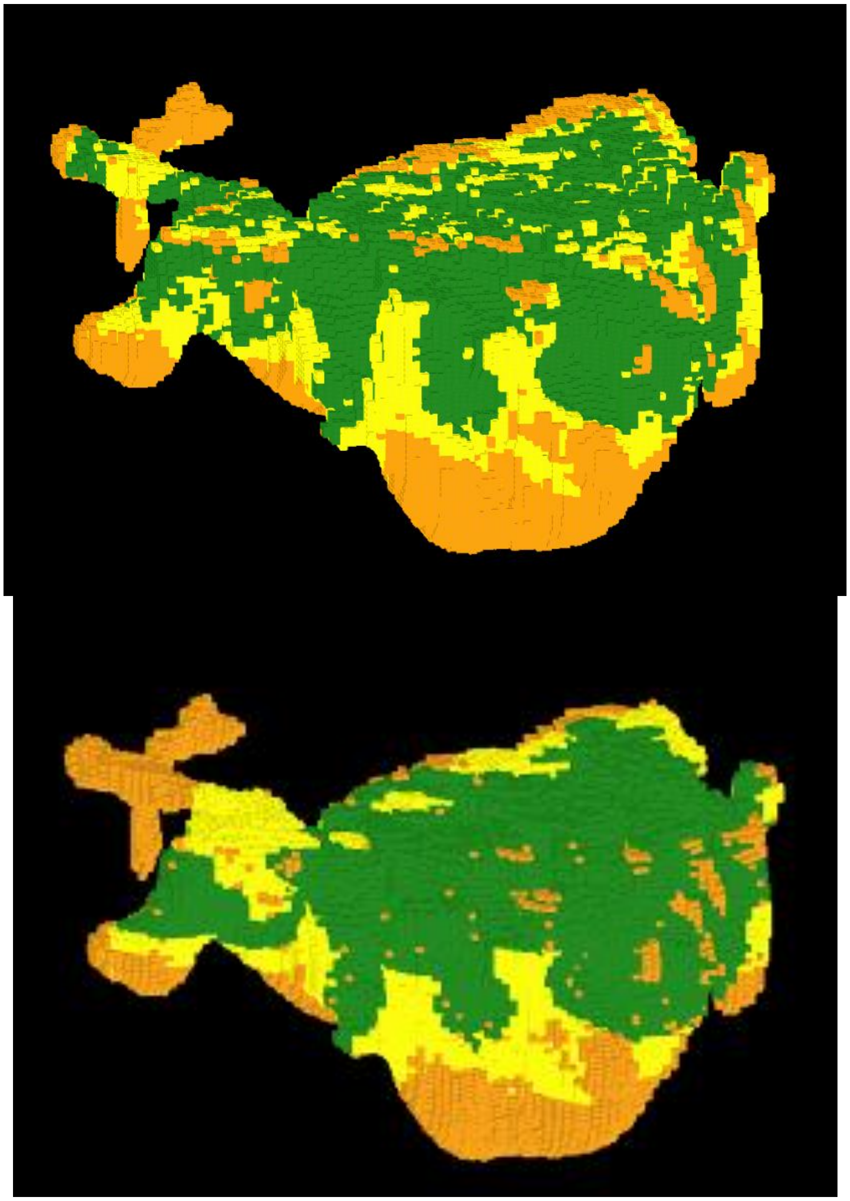
Classification of mineral resource estimates at Constancia was conducted in full compliance with the 2014 CIM definition standards.

During the interpolation process, a number of control parameters were recorded for each block, e.g. number of samples, number of holes, the distance to the nearest sample and the average distance to all the samples used for the interpolation as well as the number of quadrants with samples, the kriging variance and the regression slope of kriging for each individual block estimate.

The regression slope values obtained from the kriging of copper grade estimates was used as the primary criteria for resource classification with 80% and 60% regression slope thresholds used respectively to separate measured from indicated and from inferred resources. From detailed reserves to mill reconciliations exercises conducted by Hudbay at its operating mines, including Constancia, this criteria was found to be a reliable first pass measure of quarterly and annual performance in tonnes and grade prediction.

The block by block coding assignation was then smoothed to remove isolated blocks of one category within another. Proportions of measured, indicated and inferred category blocks were not changed significantly through this process. Figure 14-7 illustrates the classification before and after smoothing.

FIGURE 14-7: RESOURCE CLASSIFICATION (RAW & SMOOTHED)



Note: the top insert presents the block by block resource classification (Measured in green, Indicated in yellow and Inferred on orange) based on the regression slope of copper while the insert at the bottom presents the final classification.

The reconciliation results reported in the previous section from the rolling quarterly estimates confirm the validity of the classification scheme used by Hudbay at Constancia. The error on metal, tonnes and grade is within the +/-15% range on a quarterly basis with a 90% level of confidence as a mining industry benchmark to report measured resources. Measured resources constitute the vast majority of the material mined during the period.

REASONABLE PROSPECTS OF ECONOMICS EXTRACTION AND MINERAL RESOURCE ESTIMATES

The component of the mineralization within the block model that meets the requirements for reasonable prospects of economic extraction was based on the application of the Lerchs-Grossman (LG) algorithm. The mineral resources are therefore contained within a computer generated open pit geometry.

Mineral Resource Statement

Mineral resource estimates are reported exclusive of reserve estimates for Constancia and include the inferred mineral resource estimates located inside the pit design used to report mineral reserve estimates as well as the measured, indicated and inferred mineral resource estimates located outside of the mineral reserve pit and inside the mineral resource pit shell. Resource estimates are reported by applying the same NSR formula as the one used for reserve reporting and described in Section 15 of this Technical Report. This NSR formula models the combined benefit of producing copper, molybdenum and silver in addition to mine operating, processing and off-site costs.

The mineral resources, classified as Measured, Indicated and Inferred, are summarized in Table 14-6.

TABLE 14-6: CONSTANCIA MINERAL RESOURCE ESTIMATES EXCLUSIVE OF MINERAL RESERVES

Exclusive Mineral Resource Estimates – January 1, 2021

	Tonnes	Cu (%)	Mo (g/t)	Au (g/t)	Ag (g/t)
Constancia					
Measured	125,200,000	0.22	65	0.038	2.11
Indicated	118,300,000	0.22	65	0.037	2.05
Total Measured & Indicated	**243,500,000**	**0.22**	**65**	**0.038**	**2.08**
Inferred	*46,600,000*	*0.30*	*73*	*0.054*	*2.72*

Notes:

1. Totals may not add up correctly due to rounding.
2. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
3. Mineral resource estimates do not include factors for mining recovery or dilution.
4. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral resources.
5. Constancia mineral resources are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.
6. Mineral resources are based on resource pit designs containing measured, indicated, and inferred mineral resources.

14.2. PAMPACANCHA

The following summarize the method used for Pampacancha mineral resource model developed by Hudbay's in 2017. There have been no changes to the resource model of Pampacancha since 2017.

There are no known factors that could materially affect the mineral resource estimates for the Pampacancha deposit.

MODELING DATABASE

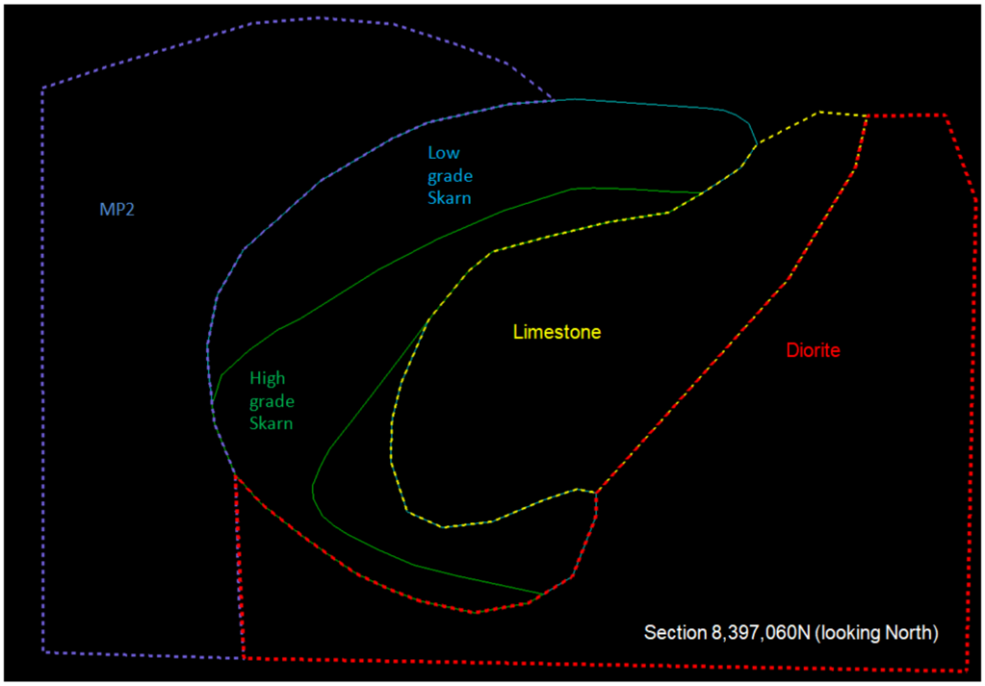
There have been no changes to the Pampacancha resource model since the 2018 Technical Report, which is filed on SEDAR.

140 drill holes totalling approximately 38,240 metres were used for the construction of the resource model. All drill holes have full chemistry obtained from ICP analysis while approximately 14% were also analysed for sequential copper, i.e. sulphuric (CuSS) and cyanide (CuCN) soluble copper.

MODELING OF THE MINERALIZED DOMAINS

The skarn mineralization is located at the contact between a limestone, a semi-circle shaped diorite and a monzonite porphyry (MP2) and strikes approximately N160. Porphyry diorite dikes are interpreted as the source of the copper mineralization. A smooth and continuous envelope of the skarn mineralization generally grading above 0.1% Cu was used for grade estimation purposes. The diorite and limestone interpreted bodies were used as a guide to limit the skarn mineral envelope on all sides (Figure 14-8). A high-grade skarn envelope was also modelled but was used only for the smoothing correction only.

FIGURE 14-8: SIMPLIFIED GEOLOGICAL FRAMEWORK FOR THE 2017 LONG TERM MODEL



SPECIFIC GRAVITY

Specific Gravity (SG) was measured for 633 samples or approximately 2% of the total sampled length. A stochiometric formula used to assign SG to the samples 2013 resource model was checked and validated against the actual SG measurements in the skarn mineralized domain, which is the only zone hosting significant mineralization. The SG calculated from the stochiometric formula presents a very strong linear correlation with %Fe and a simple linear regression from the iron grade, which can be easily be used to ensure a SG value was assigned to all the samples located within the mineralized envelope used for grade interpolation.

COMPOSITING

In order to normalize the weight of influence for each sample, assay intervals were regularized by compositing the drill hole data into equal length intervals using domain boundaries to break composites. The compositing length was set to 7.5m when considering the envisaged mining block height of 15 m. Compositing was weighted by specific gravity which has a material impact for most of the elements in the skarn mineralized envelope. Weighting by specific gravity has a very significant impact on the Cu, Fe and As grade with a reduced impact on most of the other elements.

GRADE CAPPING

Capping was considered due to the skewed nature of the frequency distributions. The approach to define an appropriate amount of metal at risk was based on Constancia, on defining a population of outliers as the highest grading of 1% for each metal. For these outliers, the mean and median values were compared and the natural breaks in the cumulative histogram of the outliers were checked to identify natural slope changes. For all the elements, the outliers represent less than 10% of the total metal content and the metal at risk was deemed low and no capping was applied for the modeling of Pampacancha.

VARIOGRAPHY

Pairwise relative variograms were calculated for each element within the mineral envelope. A linear combination of a nugget effect and two exponential (spherical, in the case of Fe) structures were fitted.

GRADE ESTIMATION AND INTERPOLATION METHODS

A block model prototype with cells 20 m x 20 m x 15 m was created in order to entirely fill the mineralized domain. The block size was chosen such that geological contacts are reasonably well reflected and to support a large-scale mining scenario while taking into consideration the DDH spacing. The interpolation plan was completed on the composites, 7.5 m in length, via ordinary kriging (OK). All the OK grade estimates were weighted by specific gravity. Grade estimation used a composite and block matching scheme based on the envelope code which is treated as a hard boundary for grade interpolation purposes.

The interpolation process used a nested search strategy with three passes of increasing ellipsoid radius. The composite selection parametres for grade estimation in each domain (minimum, maximum and, maximum number of composites per hole) were selected to minimize bias.

This first interpolation pass is restricted to a minimum of 16 composites and a maximum of 32 composites (without a maximum of six composites per hole) with quadrant declustering. For the blocks that did not meet this criteria, a second interpolation pass is restricted to a minimum of 16 composites and a maximum of 32 composites (with a maximum of six composites per hole) and quadrant declustering but with a search radius increased by 50% in all directions. Finally, in a third pass, the blocks not yet estimated were interpolated inside a search ellipsoid with a radius doubled from the second search (3 x the initial search) with a minimum of one composite and a maximum of 32 composites (with a maximum of six composites per hole) without quadrant declustering.

GRADE ESTIMATION VALIDATION

The final block model was validated to ensure:

- appropriate honouring of the input data but acknowledging that some natural smoothing should occur between samples and that the grade of a sample in the middle of a block is not the average grade of the block;
- absence of global bias by comparing the mean grade estimated by kriging to the original composite average grade and a declustered grade obtained from a nearest neighbour interpolation; and
- assessment of the level of smoothing in the model for the selected Selective Mining Unit (SMU) dimensions considered for reserve reporting.

VISUAL INSPECTION

Systematic visual inspection of block grade versus composited data was conducted in section and plan view. This check confirmed a good reproduction of the data by the model.

GLOBAL BIAS CHECKS

This validation step consists of comparing the global average grade of each between the original composites, the kriged block estimates and the nearest neighbour estimates.

Global checks for each element revealed no significant issues for any of the interpolated variables. The impact of declustering has a significant impact on the mean grade for most of the economic metals associated with the sulphide mineralization and also for CuSS and CuCN. This is a fairly common result as higher grade zones tend to be over sampled compared to lower grade zones.

Smoothing Assessment and correction

The extent of grade 'over-smoothing' in the model was investigated separately in two separate zones in order to take into consideration domains with material differences in grade distribution. The mean and variance of the kriged estimates were compared separately in each zone with the variance of the composites after declustering. This exercise was repeated for all the elements used for mine planning including Cu, Au, Ag, Mo, Fe, Zn, Pb, As, CuSS and CuCN.

An indirect log-normal correction was used to perform a change of support on the kriged model in order to obtain unbiased grade tonnage curves within the future pit. For some of the elements, the correction did not fully attain the targeted variance reflecting that the log-normal model does not perfectly fit these elements. However, for Cu which is the main element of economic interest, the targeted variance was reached within a very close limit

CLASSIFICATION OF MINERAL RESOURCE

Similarly to Constancia, the regression slope values obtained from the kriging of the copper grade estimates were used as a basis for resource classification. 90% and 80% regression slope thresholds were used respectively to separate measured from indicated and indicated from inferred resources. Since no mining has yet occurred at Pampacancha, the criteria for defining measured and indicated resources is higher than at Constancia which used 80% and 60% thresholds respectively on the kriging regression slope. In a second pass, a smoothing algorithm was applied to remove isolated blocks of measured within areas of mostly indicated category or isolated indicated blocks within areas of mostly measured category blocks. Proportions of measured and indicated category blocks were not changed significantly by this smoothing process.

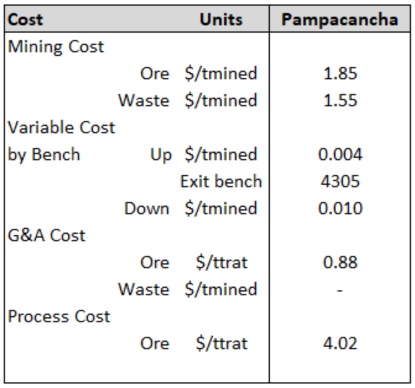
REASONABLE PROSPECTS OF ECONOMICS EXTRACTION AND MINERAL RESOURCE ESTIMATES

The component of the mineralization within the block model that meets the requirements for reasonable prospects of economic extraction was based on the application of the Lerchs-Grossman (LG) cone pit algorithm. The mineral resources are therefore contained within a computer generated open pit geometry.

1) The following assumptions were applied to the determination of the mineral resources:
2) Economic benefit was applied to measured, indicated and inferred classified material within the resource cone.
3) A constant 45 degree pit slope was used for the resource estimate.
4) A haulage increment or bench discounting was applied to the blocks above (+ $0.004) and below (+ $0.01) RL 4305.
5) The resource estimate was not limited by any property or permit constraints.

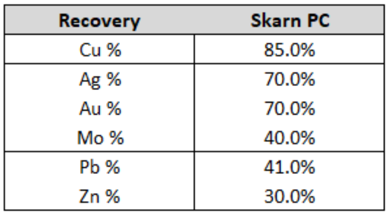
The cost and recovery assumptions summarized in Table 14-7 and Table 14-8, and are specific for Pampacancha. The reporting of the mineral resource by Net Smelter Return (NSR) within the LG pit shell reflect the combined benefit of producing copper, molybdenum, silver and gold as per the following equations based on ore grades, recoveries, grade of concentrate, payable metals, deductions and royalties, in addition to mine operating and processing costs.

TABLE 14-7: COST INPUTS FOR PIT SHELL CONSTRUCTION



Cost		Units	Pampacancha
Mining Cost			
	Ore	$/tmined	1.85
	Waste	$/tmined	1.55
Variable Cost			
by Bench	Up	$/tmined	0.004
		Exit bench	4305
	Down	$/tmined	0.010
G&A Cost			
	Ore	$/ttrat	0.88
	Waste	$/tmined	-
Process Cost			
	Ore	$/ttrat	4.02

TABLE 14-8: RECOVERY VS MATERIAL ASSUMED FOR PIT SHELL CONSTRUCTION



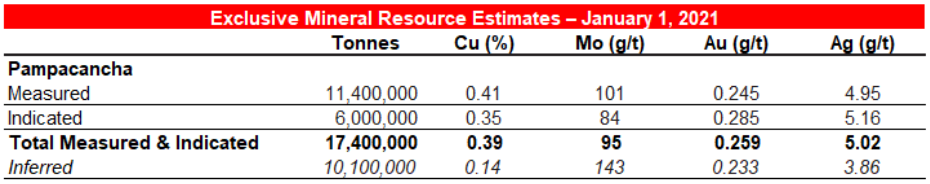
Recovery	Skarn PC
Cu %	85.0%
Ag %	70.0%
Au %	70.0%
Mo %	40.0%
Pb %	41.0%
Zn %	30.0%

14.3. MINERAL RESOURCE STATEMENT

Mineral resources for the Pampacancha deposit were classified under the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves[2] by application of a NSR that reflects the combined benefit of producing copper, molybdenum and silver in addition to mine operating, processing and off-site costs.

The mineral resources, classified as Measured, Indicated and Inferred are summarized in Table 14-9. The QP for the mineral resource estimate is Olivier Tavchandjian, P. Geo, Vice-President Exploration and Geology of Hudbay. The mineral resources are reported using the long-term metal price assumptions and have an effective date of January 1st, 2021.

TABLE 14-9: PAMPACANCHA MINERAL RESOURCE ESTIMATES EXCLUSIVE OF MINERAL RESERVES



Exclusive Mineral Resource Estimates – January 1, 2021

	Tonnes	Cu (%)	Mo (g/t)	Au (g/t)	Ag (g/t)
Pampacancha					
Measured	11,400,000	0.41	101	0.245	4.95
Indicated	6,000,000	0.35	84	0.285	5.16
Total Measured & Indicated	**17,400,000**	**0.39**	**95**	**0.259**	**5.02**
Inferred	*10,100,000*	*0.14*	*143*	*0.233*	*3.86*

Notes:

1. Totals may not add up correctly due to rounding.
2. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
3. Mineral resource estimates do not include factors for mining recovery or dilution.
4. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral resources.

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[2] Ontario Securities Commission web site (http://www.osc.gov.on.ca/en/15019.htm)

5. Mineral resources are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.
6. Mineral resources are based on resource pit designs containing measured, indicated, and inferred mineral resources.

15. MINERAL RESERVES

The Mineral Reserves are contained within two open-pit deposits (Constancia and Pampacancha) and, to a minimum extent, surface stockpiles. Proven and Probable Mineral Reserves for the two deposits as of December 31st, 2020 are estimated to be 532.5 Mt grading 0.31% Cu with a 17 year mine life. A complete mine plan has been developed to update the mineral reserve estimates starting with the resource models described in Section 14. Detail pit designs were optimised based on the application of Net Smelter Return values incorporating mining, processing, and economic parameters.

These Mineral Reserve estimates are reported following NI 43-101 and the classifications adopted by CIM (2014). NI 43-101 defines a Mineral Reserve as “the economically mineable part of a Measured and/or Indicated Mineral Resource”.

There are no other mining, metallurgy, permiting or other relevant factors that could materially affect the mineral reserve estimates presented in this section.

15.1. PIT OPTIMIZATION

Pit optimization of multi-element revenues at Constancia and Pampacancha was performed and nine pit stages were selected for the Constancia pit (San José is the third Stage) and two pit stages for the Pampacancha pit.

RESOURCE MODELS

The resource models used for the Mineral Reserve Estimation are described in details in Section 14, with a Selective Mining Unit (SMU) ranging from 10x10x15 meters in the upper part of the deposit to 20x20x15 meters below 3,930 m where the mine plans to operate in a less selective manner due to the more consistent and uniform nature of the mineralization.

The approach used to construct the resource model describes in section 14 ensures all necessary internal and external dilution has been already included in the grade estimation process within each SMU. There is not additional mining dilution or mining recovery factor applied when the mineral resource estimates are included in the life of mine plan and production profile to be converted to mineral reserve estimates. These assumptions have been validated through on-going mineral reserve estimates to mill credit reconciliation.

NET SMELTER RETURN

Mine Design and Reserve estimation for Constancia and Pampacancha pits used an NSR value calculation stored in each block in the resource models. The NSR calculation takes into account the Cu, Mo, Ag, and Au grades, deleterious element concentration such as Zn, Pb, Fe, and Cu oxide content and mill recoveries, contained metal in concentrate, deductions, and payable metal values, metal prices, freight costs, smelting, refining and royalty charges. The following points detail the NSR calculation:

- In-situ NSR is the net value of metals (in dollars) contained in a concentrate produced from an ore block after smelting and refining. Using the concentrator recovery of the metals into the concentrate and the grade of the concentrate produced the mass pull of each block in the resource model expressed in terms of tonnes of concentrate per tonne of ore processed is first estimated.
- The value of the payable metals in the concentrate is calculated based on copper, gold, silver and molybdenum metal content in the concentrate subject to deductions with smelters and roasters.
- From the value of the payable metals, the selling costs, which include the marketing costs, transport costs, port charges, insurance costs, shipping costs, and smelting charges expressed in $/dmt concentrate and other deductions like the refining charges and price participation defined in $/payable metal are taken out as well as applicable royalties.

- The in-situ NSR of each block in the resource model is the sum of the in-situ NSR value from the copper concentrate and the molybdenum concentrate to be sold.
- Only measured and indicated resource blocks with NSR values greater than their processing costs are considered to be potential ore. Inferred resources are reported as waste.
- Copper, silver, gold, molybdenum, zinc, and lead grades in the copper concentrate and in the molybdenum concentrate are estimated based on the test work detailed in Section 13.

The operating cost, and metal recoveries used for pit optimization are showed in Table 15-1 and Table 15-2.

TABLE 15-1: OPERATING COST

Cost	Units	Constancia	Pampacancha
Base Mining Cost			
Ore	$/tmined	1.35	1.85
Waste	$/tmined	1.30	1.55
Variable Cost by Bench			
Base Elevation	-	4,185	4,305
Up	$/tmined	0.004	0.004
Down	$/tmined	0.010	0.010
G&A Cost			
Ore	$/tmill	1.60	1.60
Waste	$/tmined	-	-
Process Cost			
Ore	$/tmill	4.54	4.54

TABLE 15-2: METAL RECOVERIES

CU RECOVERIES & GRADE CONCENTRATES	
Cu Recovery	
All Otypes CS	= 88.73% - 0.02%*P80 + 13.19*Cu% - 30.87*(Zn%+Pb%) - 36.00*(CuSS%/Cu%)
All Otypes PC	= 85%
Cu Concentrate grade	
Hypogene	= 22.84% + 9.40*Cu% - 17.48*Zn% - 0.30*Fe%
Supergene & Mixed	= 24.35% + 5.05*Cu% - 8.45*Zn% - 0.42*Fe%
Skarn & HiZinc & Pampa	= 23.06% + 4.60*Cu% - 5.64*Zn% - 0.17*Fe%

OTHER METALS' RECOVERIES

Mo Recovery

Hypogene = [1.65*CuRec% + 43.32*(Mo%/Zn%) - 96.93%]*0.66
Supergene = [1.65*CuRec% + 43.32*(Mo%/Zn%) - 96.93%]*0.66
Skarn = [1.65*CuRec% + 43.32*(Mo%/Zn%) - 96.93%]*0.40
Skarn Pampa = [1.65*CuRec% + 43.32*(Mo%/Zn%) - 96.93%]*0.20
Mixed & HiZn = 0

Ag Recovery

All Otypes CS = 1.30*CuRec% - 5.30*(Zn%+Fe%)/Ag(g/t) - 37.52%
All Otypes PC = 70%

Au Recovery

All Otypes CS = 0.54*CuRec% + 99.94*Au(g/t) + 69.55*Pb% - 46.21*Zn% - 3.01
All Otypes PC = 70%

Zn Concentrate

All Otypes = 21.92*(Zn%/Cu%) - 0.88

Pb Concentrate

All Otypes = 10.6*(Pb%/Cu%) + 0.187

Ag Concentrate

All Otypes = Ag ozs*31.1034/Cu Conc tonnes

Au Concentrate

All Otypes = Au ozs*31.1034/Cu Conc tonnes

Zn Recovery

All Otypes = Cu%*CuRec%*Zn%Conc / Cu%Conc.*Zn%

Pb Recovery

All Otypes = Cu%*CuRec%*Pb%Conc / Cu%Conc.*Pb%

OPTIMIZATION RESULTS

The Whittle software was used to create incremental economic pit-shells using the Lerchs-Grossman (LG) algorithm to calculate the optimum pit limit. This optimization relies on the block's NSR value to find each mining block that can be mined with a profit. The optimum economic shell generated by Whittle is then used as a guide for mine design.

Pit shell for Constancia was generated at a 0.73 revenue factor and contained approximately 473 Mt of Ore and 432 Mt of Waste. The pit shell captures close to 99.0% of the Net Cash flow of the 1.00 revenue factor pit shell.

Pit shell for Pampacancha was generated at a 0.85 revenue factor and contained approximately 42 Mt of ore and 75 Mt of waste. The pit shell captures about 100% of the net cash flow of the 1.00 revenue factor pit shell.

PIT DESIGN CRITERIA

The pit design parameters for Constancia and Pampacancha are summarised in Table 15-3, and the final pit extents are illustrated on Figure 15-1 and Figure 15-2.

TABLE 15-3: PIT DESIGN PARAMETERS

CRITERIA	UNIDS.	Constancia	Pampacancha
Slope Angles	-	2019, Golder	2013, TWP/Itasca
Ramp Width	m	32	32
Ramp Gradinet	%	10%	10%
Berm Width	m	8.0 - 12.2	7.5 - 8.5
Bench Height	m	15	15
Wide-Berm Access Width	m	12	12
Wide-Berm Width	m	20	-
Max. N° Benches without Ramp	bancos	8	-
Min. Phase Width	m	60	50
Target Phase Width	m	60-100	50-80
Switchback Radius	m	32	32
Switchback Radius Gradient	%	0	0
Min. Spacing between ramps in "Y"	m	70	-
Min. Spacing between ramps in "X"	m	80	-

FIGURE 15-1: CONSTANCIA ULTIMATE PIT DESIGN

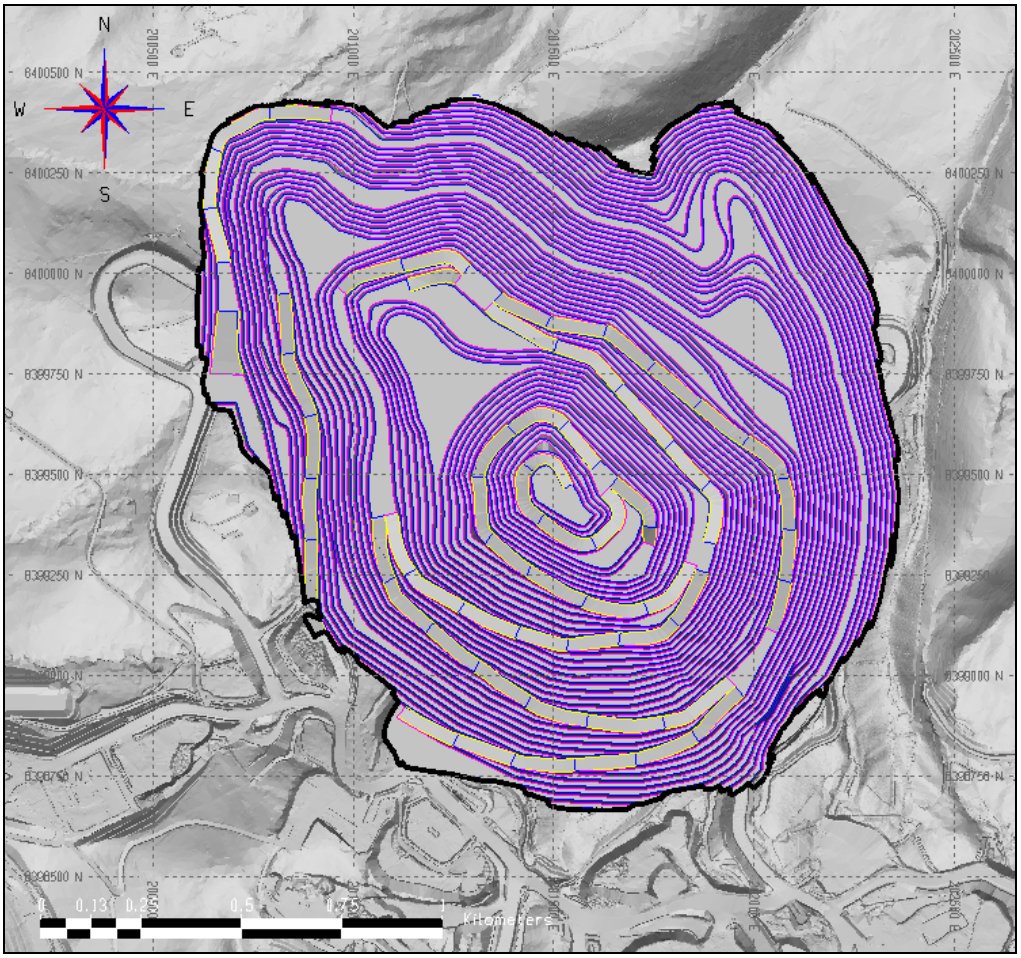
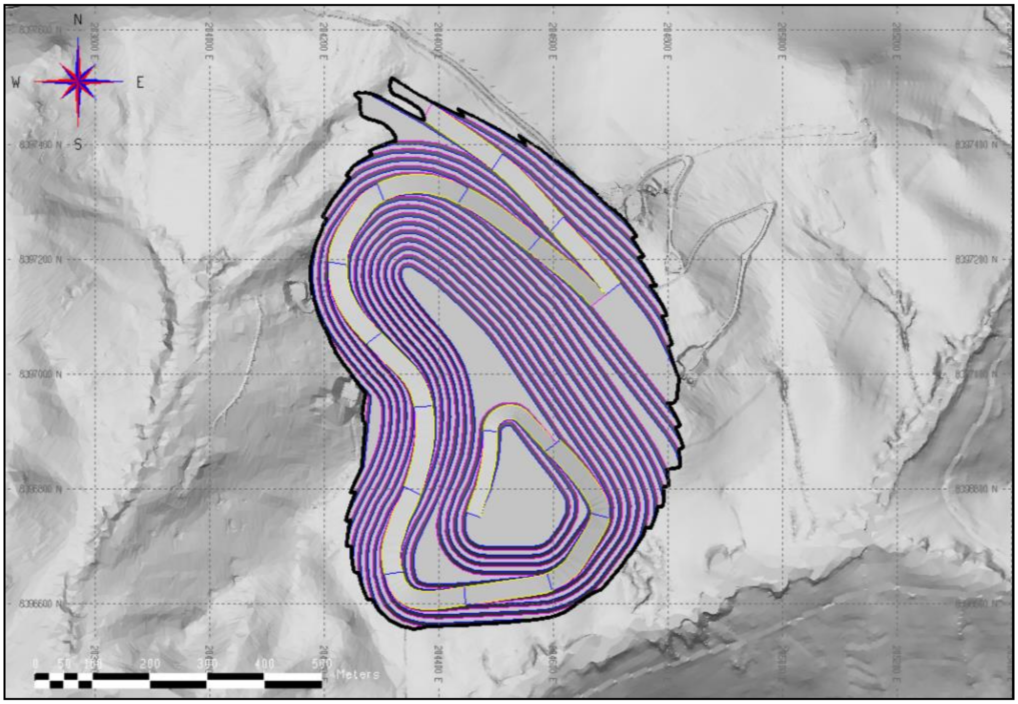


FIGURE 15-2: PAMPACANCHA ULTIMATE PIT DESIGN



15.2. MINERAL RESERVES

The mine plan is based on the capacity of the process plant, which in turn relies on the grinding circuit throughput.

The plant has the capacity to process 31 Mtpy (90ktpd at 94% availability), with a mining rate of 81.0 Mtpy as maximum (ore plus waste). Table 15-4 presents Constancia and Pampacancha Mineral Reserves at December 31st, 2020.

TABLE 15-4: CONSTANCIA AND PAMPACANCHA MINERAL RESERVE ESTIMATES AS AT JANUARY 1, 2021

Mineral Reserve Estimates – January 1, 2021					
	Tonnes	Cu (%)	Mo (g/t)	Au (g/t)	Ag (g/t)
Constancia					
Proven	436,500,000	0.29	83	0.041	2.88
Probable	56,100,000	0.25	69	0.045	3.09
Total proven and probable	492,600,000	0.29	82	0.042	2.90
Pampacancha					
Proven	32,400,000	0.59	178	0.368	4.48
Probable	7,500,000	0.62	173	0.325	5.75
Total proven and probable	39,900,000	0.60	177	0.360	4.72
Total Mineral Reserve	532,500,000	0.31	89	0.066	3.04

Notes:

1. Totals may not add up correctly due to rounding.
2. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral reserves.
3. Mineral reserves are estimated using a minimum NSR cut-off of $6.14 per tonne and assuming metallurgical recoveries (applied by ore type) of 85.8% on average for the life of mine.

A comparison of the December 31st, 2019, and December 31st, 2020 Mineral Reserve estimate is summarised in Table 15-5 for the Constancia pit for the Pampacancha pit. The December 31st, 2020 Constancia Reserve estimate shows an increase of 10% in the copper contained after subtracting the 2020 mining depletion in the Mineral Reserves estimates at Constancia. The increase in tonnes and metal content at Constancia results from the extension of the deposit to the North through successful exploration efforts, improvements in the resource modeling process and a re-optimization of the pit design and mining sequence. There has been no change between 2019 and 2020 the Pampacancha reserve estimates.

TABLE 15-5: COMPARISON OF THE MINERAL RESERVE ESTIMATES AT CONSTANCIA AS AT DECEMBER 31, 2019 AND AS AT JANUARY 1, 2021

Constancia Mine - January 1, 2021[1]

Mineral Reserve Reconciliation (Proven & Probable)	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
A 2020 Mineral Reserve	486,300,000	0.28	83	2.89	0.036	1,349,000
B 2020 Production / Depletion (from Reserve)	26,300,000	0.34	156	2.9	0.029	88,000
C (A-B) = Depleted Reserve	460,000,000	0.27	79	2.9	0.037	1,261,000
D Mine Planning & Exploration Gain/(Loss)	32,600,000	0.48	144	3.1	0.115	157,000
E 2021 Mineral Reserve (C+D) including stocks	492,600,000	0.29	83	2.9	0.042	1,418,000

Mineral Resource Reconciliation Measured & Indicated	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
F 2020 Mineral Resource	277,000,000	0.19	61	1.8	0.031	522,000
G 2020 Depletion (conversion to Reserve)	300,000					0
H (F-G) = Depleted Resource	276,700,000	0.19	61	1.8	0.031	522,000
I Economic re-evaluation Gain/(Loss)[2]	-33,200,000					16,000
J 2021 Mineral Resource (H+I)	243,500,000	0.22	65	2.1	0.038	538,000

Mineral Resource Reconciliation Inferred	Tonnes	Cu (%)	Mo (g/t)	Ag (g/t)	Au (g/t)	Cu (t)
K 2020 Mineral Resource	83,100,000	0.18	43	3.4	0.036	152,000
L 2020 Mineral Resource (Depletion)	600,000					0
M (K-L) = Depleted Resource	82,500,000	0.18	43	3.4	0.036	152,000
N Economic re-evaluation Gain/(Loss)[2]	-35,900,000					-13,000
O 2021 Mineral Resource (M+N)	46,600,000	0.30	73	2.7	0.054	139,000

Notes:

1. Totals may not add up correctly due to rounding.
2. Re-evaluation of economic viability.
3. Mineral resources are exclusive of mineral reserves and do not have demonstrated economic viability.
4. Metal prices of $3.10 per pound copper, $11.00 per pound molybdenum, $1,500 per ounce gold, and $18.00 per ounce silver were used to estimate mineral reserves and resources.
5. Mineral reserves and resources are estimated using a minimum NSR cut-off of US$6.14 per tonne.
6. Metallurgical recoveries are applied by ore type and assumed to be 85.8% on average for the life of mine.

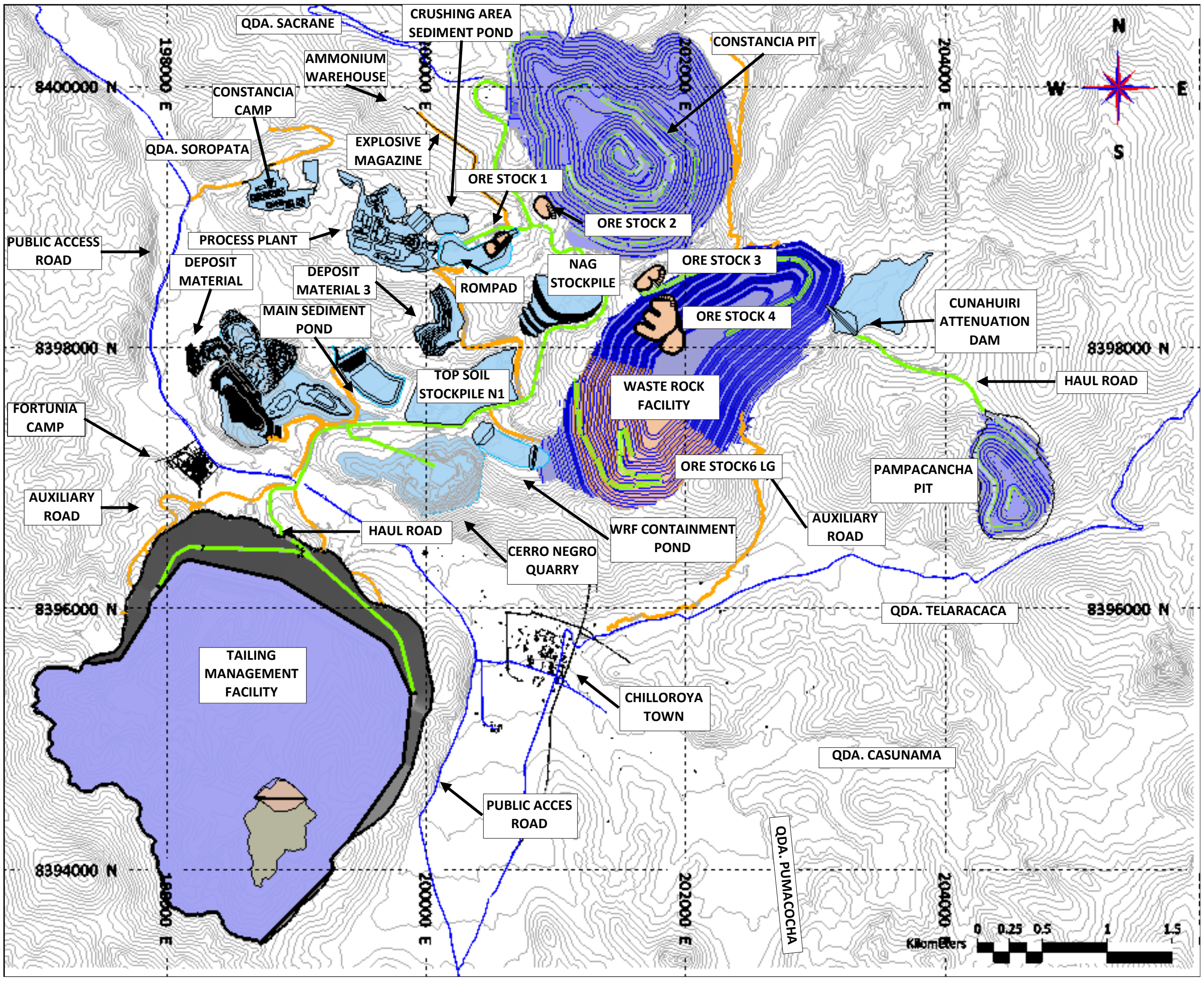
16. MINING METHODS

16.1. MINE OVERVIEW

The Constancia mine is an open pit mining operation relying on conventional trucks and shovels. The Constancia ultimate pit design will measure approximately 1.6 km east to west, 1.7 km north to south, and have a maximum depth of around 705 m. The Pampacancha ultimate pit design will measure approximately 0.6 km east to west, 1 km north to south, and have a maximum depth of about 300 m. A primary waste rock facility (WRF), which is located to the south and east of the Constancia pit, is intended to be used for both deposits.

The processing facility is located approximately 1 km west of the Constancia Pit. The NAG waste rock is deposited south of the Constancia pit, while the tailings management facility (TMF) is located 3.5 km southwest of the Constancia pit. The general layout of the Constancia Operations site is shown in Figure 16-1

FIGURE 16-1: CONTSTANCIA SITE LAYOUT



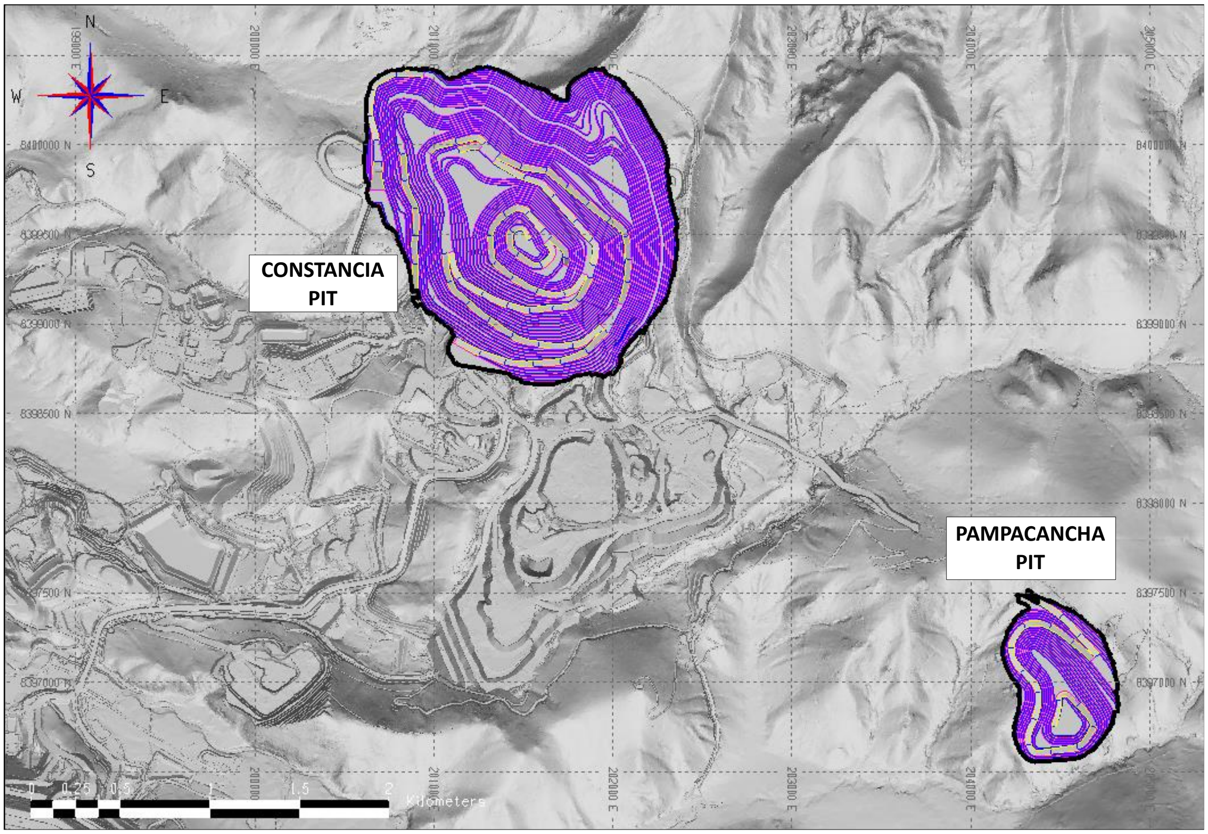
16.2. MINE PHASES

16.2.1. DESIGN CRITERIA

Final pit limit designs have been created for Constancia and Pampacancha based on the optimized pit shells. Constancia is mined in nine stages and a two stage pit is planned at Pampacancha. The minimum mining width for each phase is 60 meters; this will allow a shovel, trucks (in two lines) and a drill to work safely and simultaneously.

The haul roads at Constancia and Pampacancha have been designed with a 10% grade and 32 m width for double lane haul roads and 24 m for single lane haul roads. Figure 16-2 presents the ultimate pit footprint for Constancia and Pampacancha.

FIGURE 16-2: CONSTANCIA AND PAMPACANCHA ULTIMATE PIT DESIGN



PIT SLOPE GUIDANCE

The pit slope angles used for pit optimization for Constancia and Pampacancha are based on engineering studies conducted at pre-feasibility or feasibility levels of engineering. The pit slope design was updated by Golder in December 2019 for Constancia and designed by TWP/Itasca in August 2013 for Pampacancha. The following figures and tables present the design parameters for Constancia (Figure 16-3, Table 16-1, Figure 16-4 and Table 16-2) and Pampacancha (Figure 16-5 and Table 16-3).

FIGURE 16-3: CONSTANCIA PIT STRUCTURAL DOMAINS

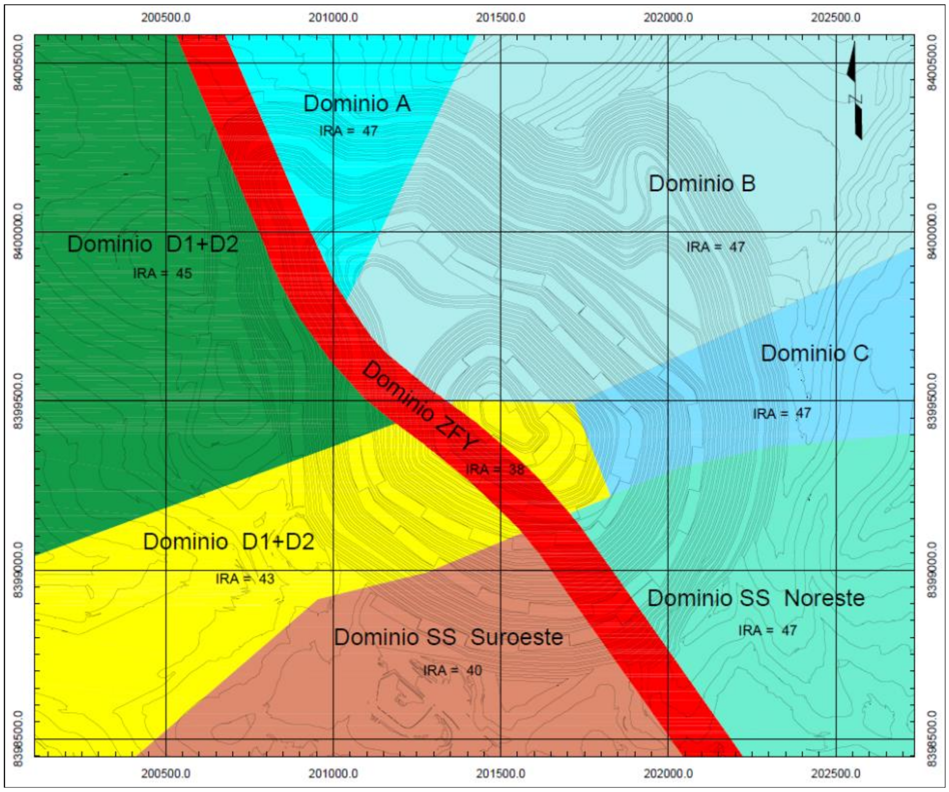
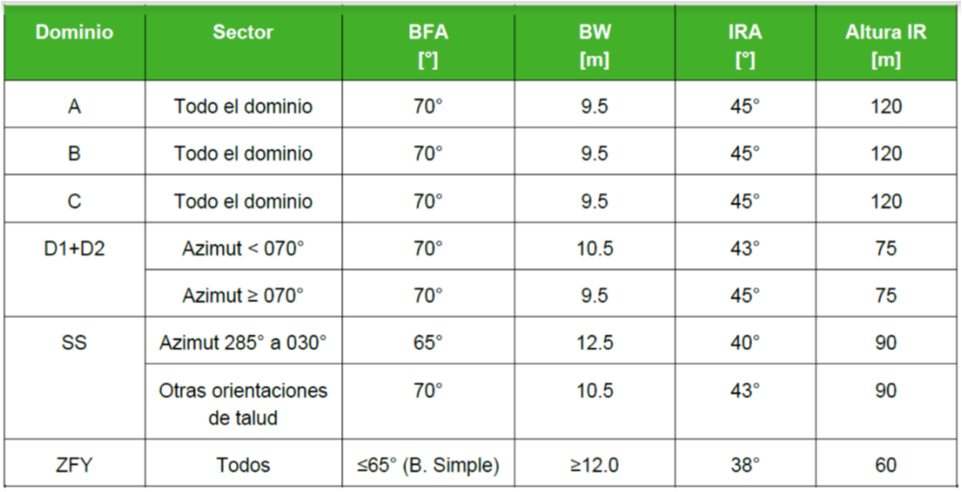


TABLE 16-1: RECOMMENDED PIT SLOPE ANGLES BY STRUCTURAL DOMAINS



Dominio	Sector	BFA [°]	BW [m]	IRA [°]	Altura IR [m]
A	Todo el dominio	70°	9.5	45°	120
B	Todo el dominio	70°	9.5	45°	120
C	Todo el dominio	70°	9.5	45°	120
D1+D2	Azimut < 070°	70°	10.5	43°	75
	Azimut ≥ 070°	70°	9.5	45°	75
SS	Azimut 285° a 030°	65°	12.5	40°	90
	Otras orientaciones de talud	70°	10.5	43°	90
ZFY	Todos	≤65° (B. Simple)	≥12.0	38°	60

FIGURE 16-4: CONSTANCIA PIT SLOPE SECTORS

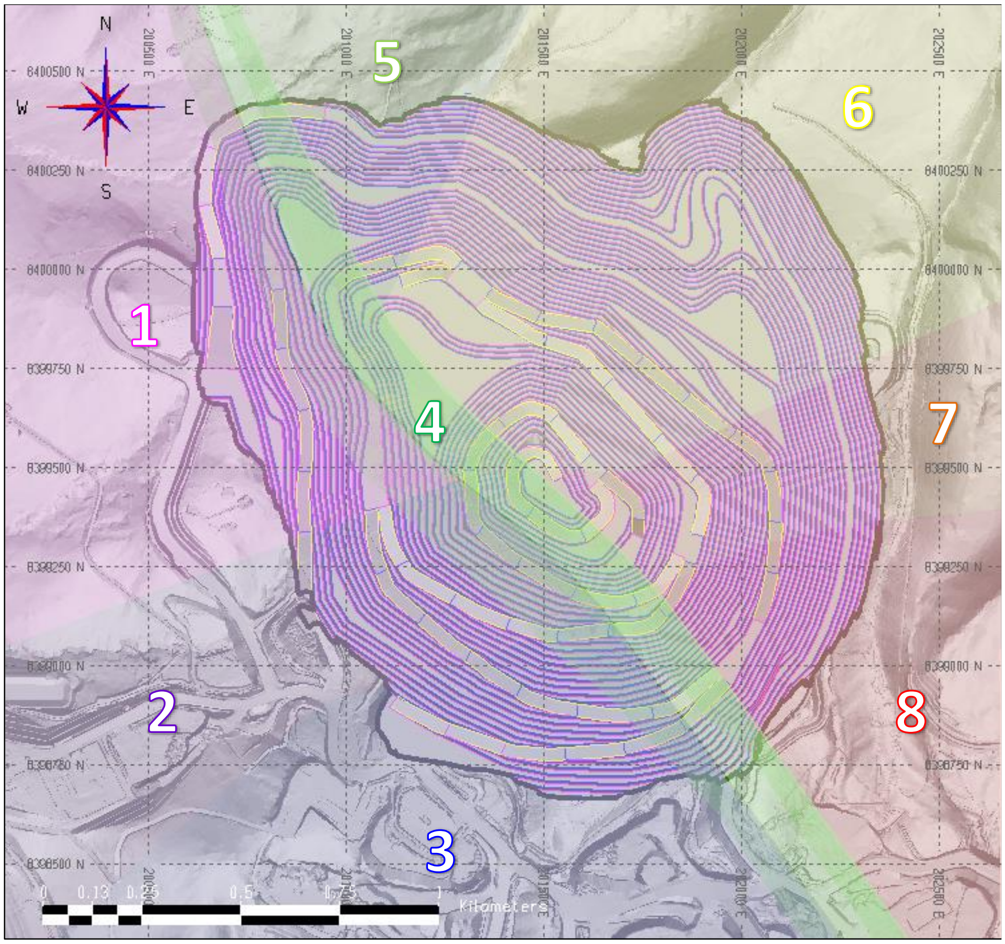


TABLE 16-2: CONSTANCIA, RECOMMENDED PIT SLOPE ANGLES

Geotechnical Sector	Code	Bench Face Angle, °	Inter-Ramp Angle, °	Berm Width, m	Overall Slope Angle °
D1+D2 (1)	1	65	45	8.0	42
D1+D2 (2)	2	65	43	9.1	40
SS2	3	65	40	10.9	37
YF	4	65	38	12.2	35
A	5	70	47	8.5	44
B	6	70	47	8.5	44
C	7	70	47	8.5	44
SS1	8	70	47	8.5	44

FIGURE 16-5: PAMPACANCHA PIT SLOPE SECTORS

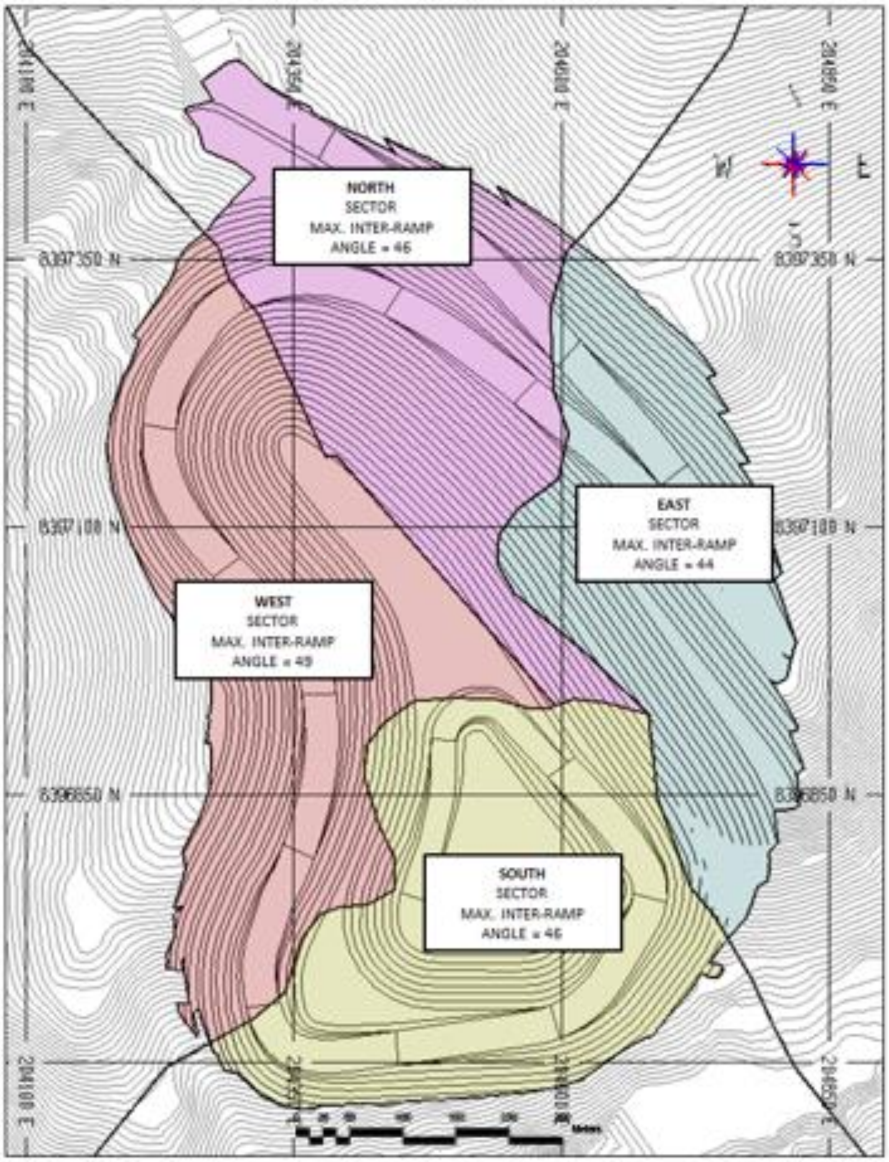


TABLE 16-3: PAMPACANCHA, RECOMMENDED PIT SLOPE ANGLES

Pit Design Sector	Geological domain	Bench Face Angle (º)	Bench Height	Bench Width	Inter-ramp Angle	Max. Inter-ramp Slope Height
			(m)	(m)	(º)	(m)
North	Domain II	65	15	7.5	**46**	42
East	Domain I	65	15	8.5	**44**	40
South	Domain III	65	15	7.5	**46**	40
West	Domain II	70	15	7.5	**49**	44

16.2.2. MINE PHASES AND ULTIMATE PIT

The extraction sequence is defined by nine mining phases at Constancia and two mining phases at Pampacancha. In parallel, seven pushbacks are planned for ore exposure purposes and optimal sequencing at Constancia with one pushback for waste and construction purposes. The phase development strategy consists of extracting the highest metal grades along with minimum strip ratios during the initial years to maximize the economic benefits while enabling smooth transitions in waste-stripping throughout the life of the mine to ensure sufficient ore exposure. The NSR cut-off grade to report Mineral Reserves has been defined at a 6.14 $/t cut-off for both Constancia and Pampacancha. Marginal material is treated as waste. The extraction sequence by phase is illustrated for Constancia on Figure 16-6 and for Pampacancha on Figure 16-7.

FIGURE 16-6: CONSTANCIA PHASE DESIGN, SECTION VIEW SN

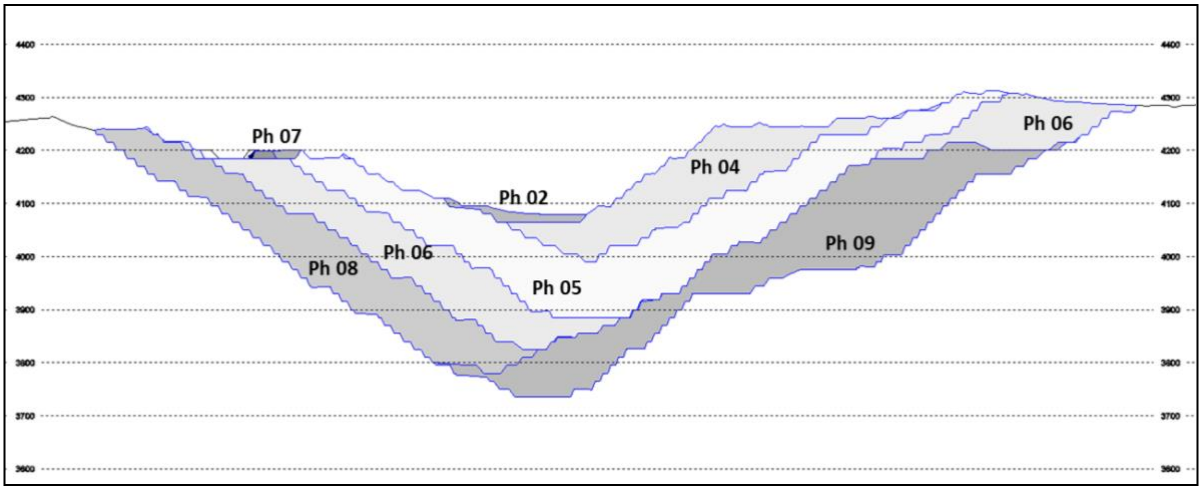
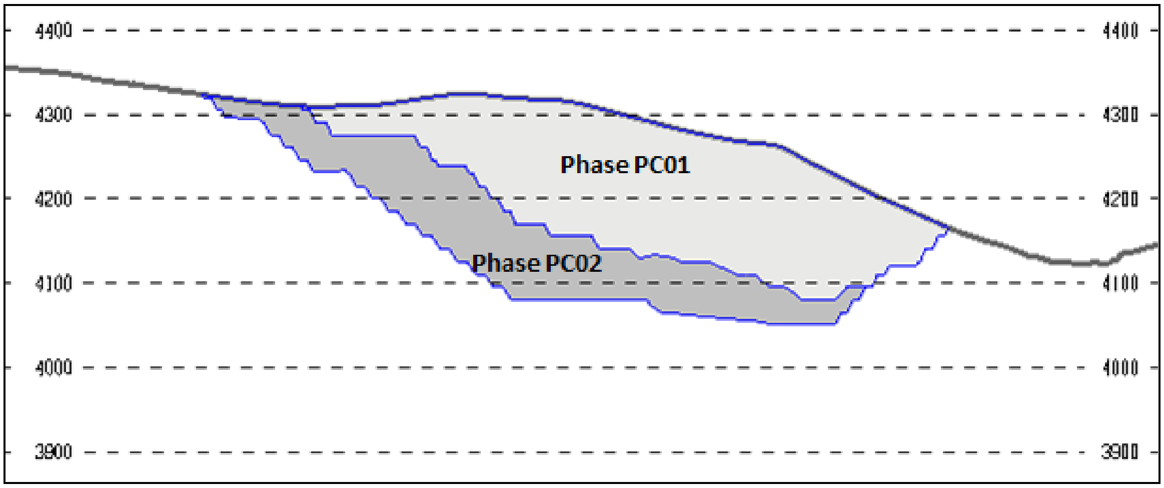


FIGURE 16-7: PAMPACANCHA PHASE DESIGN, SECTION VIEW NS



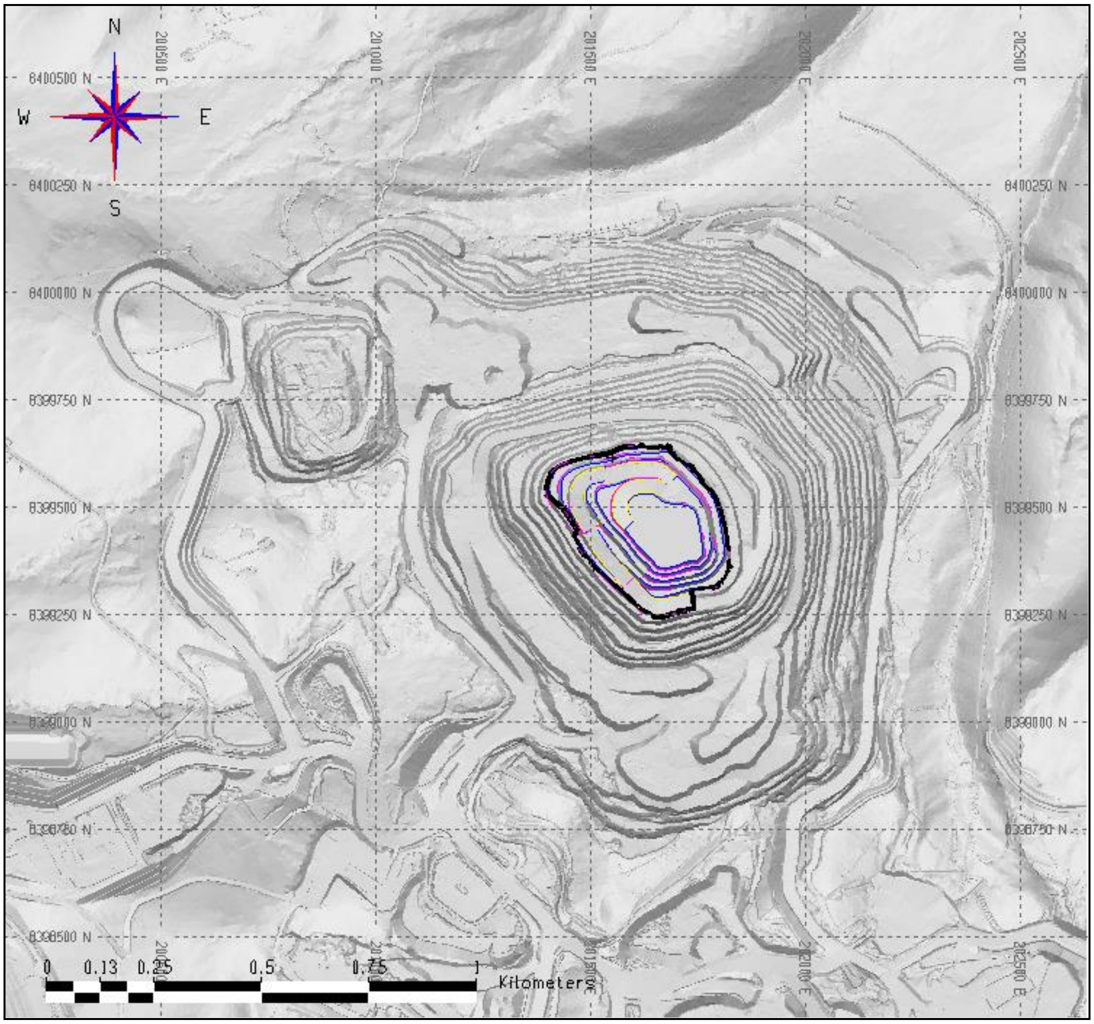
CONSTANCIA – MINE PHASE 1

Phase 1 of mining has been completed in 2018 and is not discussed in this Technical Report as it does not impact the future sequence of extraction.

CONSTANCIA - MINE PHASE 2

Phase 2, mined since 2014, corresponds approximately to the Lerchs-Grossman pit shell defined by a \$0.60/lb Cu price (20% of base metal price sensitivity case). This pit is located about 2,000 meters east of the primary crusher and ranges in elevation from 4,440 to 4,035 masl. The phases were approximately 1,100 meters wide east-west and 1,170 meters north-south. This phase is actually being completed. Remainings of Phase 2 will produce around 1.1 million tonnes of ore at a stripping ratio of 0.38:1 (tonnes of waste per tonnes of total ore). Figure 16-8 presents Phase 2.

FIGURE 16-8: CONSTANCIA PIT PHASE 2



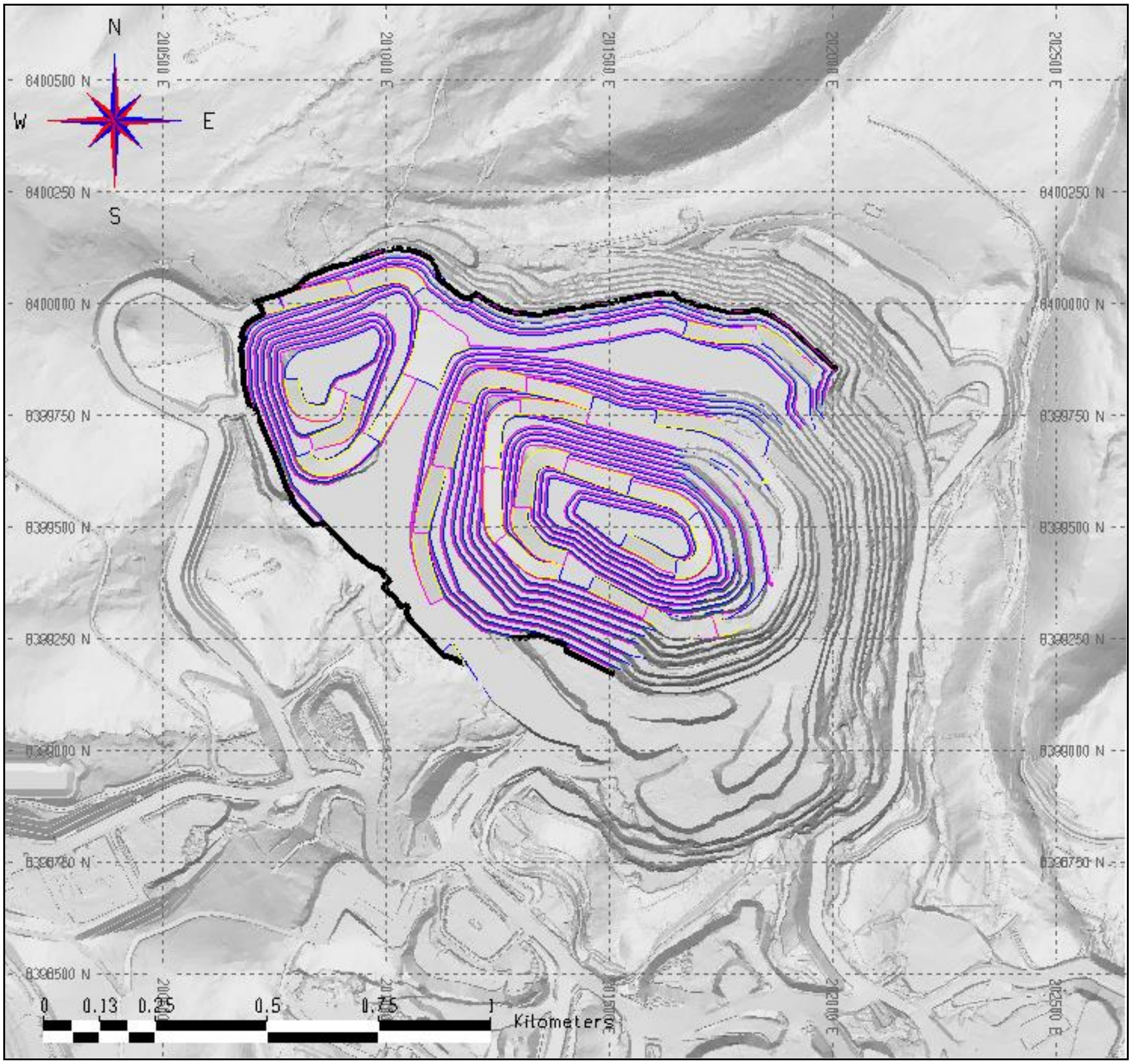
CONSTANCIA - MINE PHASE 3

Phase 3 of mining has been completed in 2016 and is not discussed in this Technical Report as it does not impact the future sequence of extraction.

CONSTANCIA - MINE PHASE 4

Phase 4, mined since 2018, corresponds approximately to the Lerchs-Grossman pit shell defined by a $1.20/lb Cu price (40% of base metal price sensitivity case). This pit ranges from 4,410 to 3,990 masl in elevation. The phase is approximately 1,400 meters wide east-west and 1,250 meters north-south. Phase 4 will produce approximately 53.8 million tonnes of ore at a stripping ratio of 0.52:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 4 pit is shown in Figure 16-9.

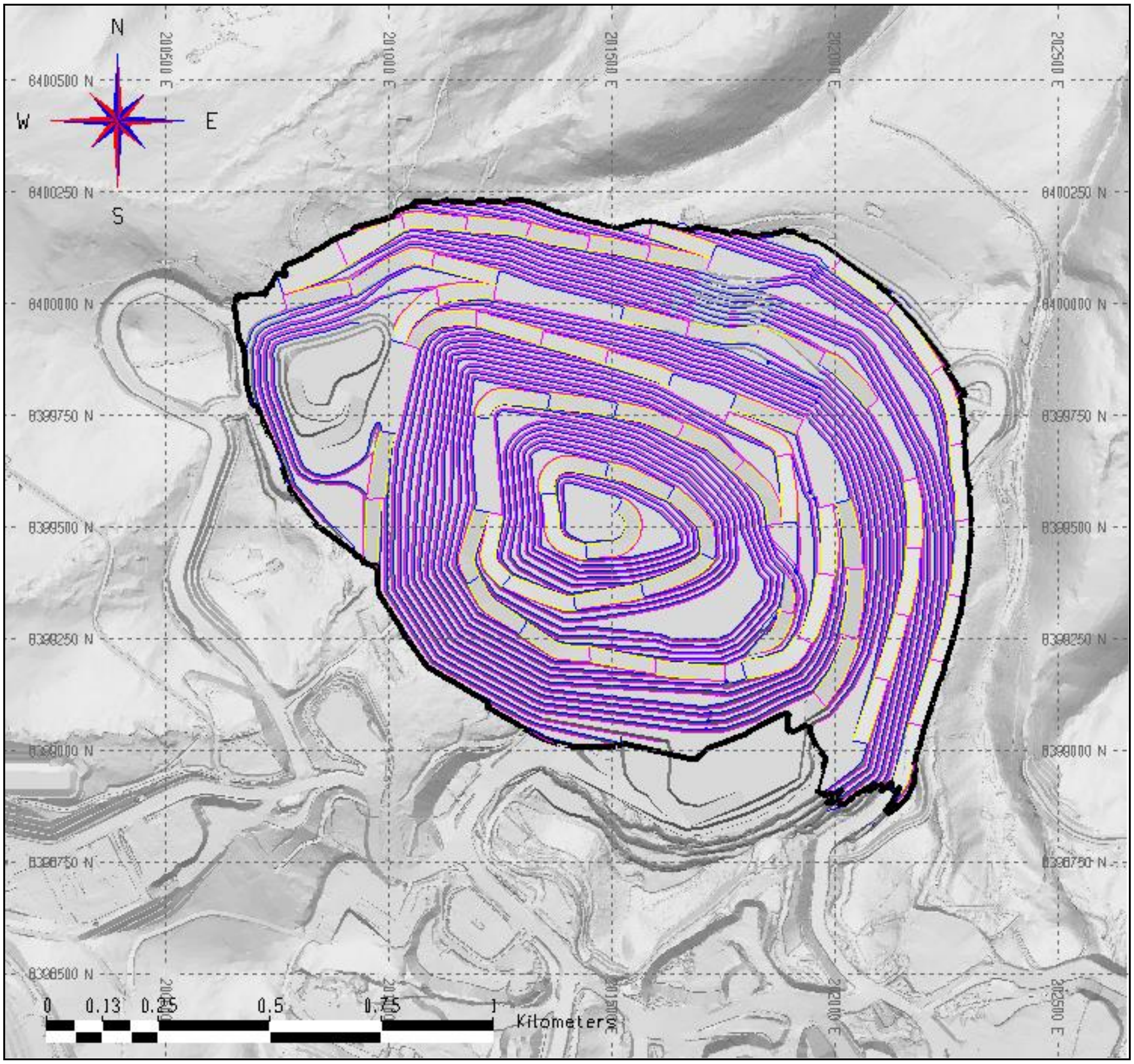
FIGURE 16-9: CONSTANCIA PIT PHASE 4



CONSTANCIA - MINE PHASE 5

Mining in Phase 5 starts in 2020 and will correspond approximately to the Lerchs-Grossman pit shell defined by a $1.38/lb Cu price (46% of base metal price sensitivity case). This pit will range from 4,440 to 3,885 masl elevation. The phase is approximately 1,600 meters wide east-west and 1,300 meters north-south. Phase 5 will produce about 140.3 million tonnes of ore at a stripping ratio of 0.68:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 5 pit is displayed in Figure 16-10.

FIGURE 16-10: CONSTANCIA PIT PHASE 5



CONSTANCIA - MINE PHASE 6

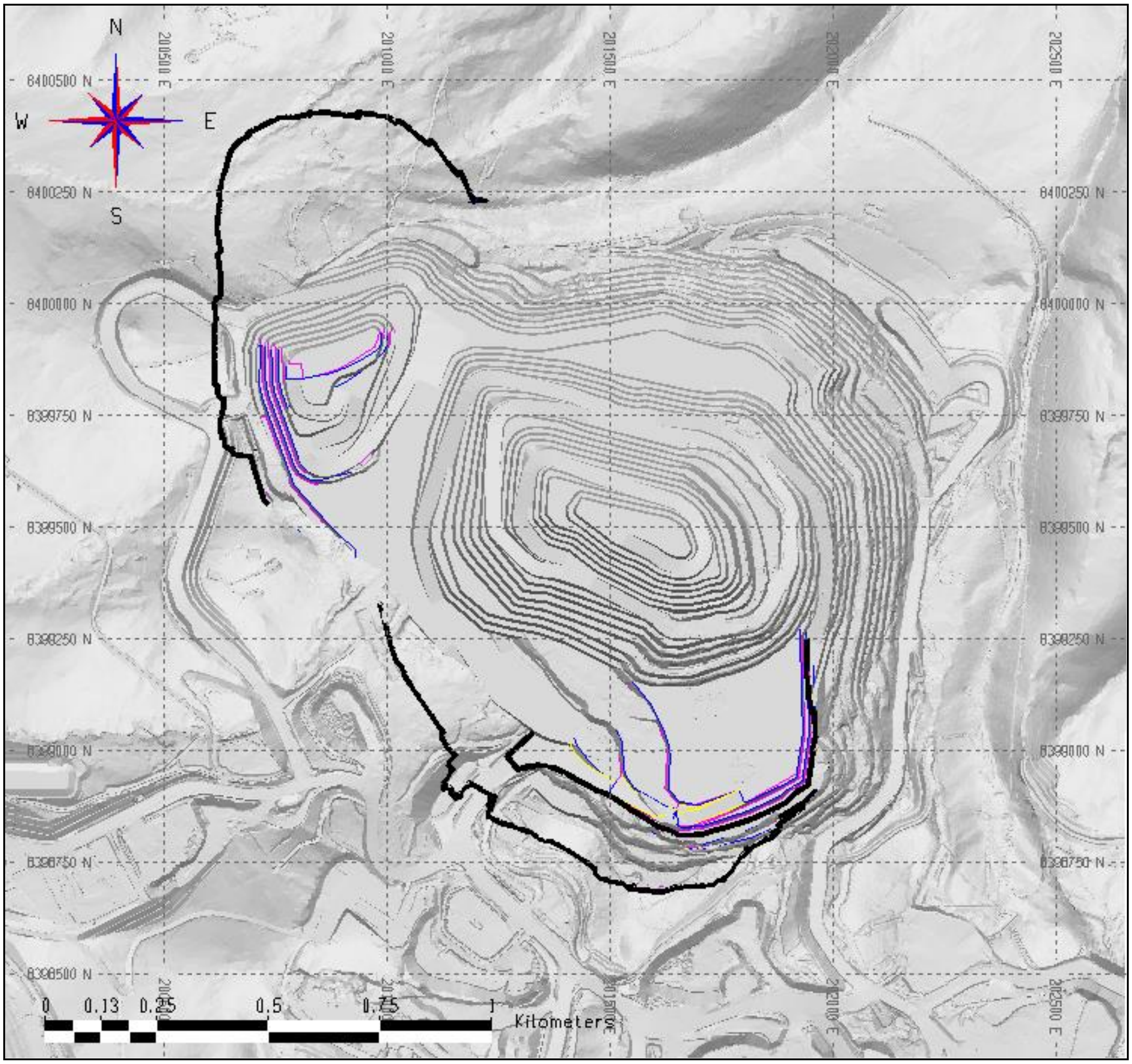
Mining in Phase 6 will start in 2025 and will correspond approximately to the Lerchs-Grossman pit shell defined by a $1.68/lb Cu price (56% of base metal price sensitivity case). This pit will range from 4,320 to 3,825 masl in elevation. The phase is approximately 1,650 meters wide east-west and 1,700 meters north-south. Phase 6 will produce about 59.2 million tonnes of ore at a stripping ratio of 1.66:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 6 pit is displayed in Figure 16-11.

FIGURE 16-11: CONSTANCIA PIT PHASE 6

CONSTANCIA - MINE PHASE 7

Phase 7 will finish mining in 2021. The waste material from this phase will be primarily used for the Tailing Management Facility (TMF). The phase is approximately 800 meters wide east-west and 400 meters north-south. Remainings of Phase 7 will produce approximately 0.8 million tonnes of waste. An illustration of the Phase 7 pit is displayed in Figure 16-12. The pit entrance is at 4,230 masl.

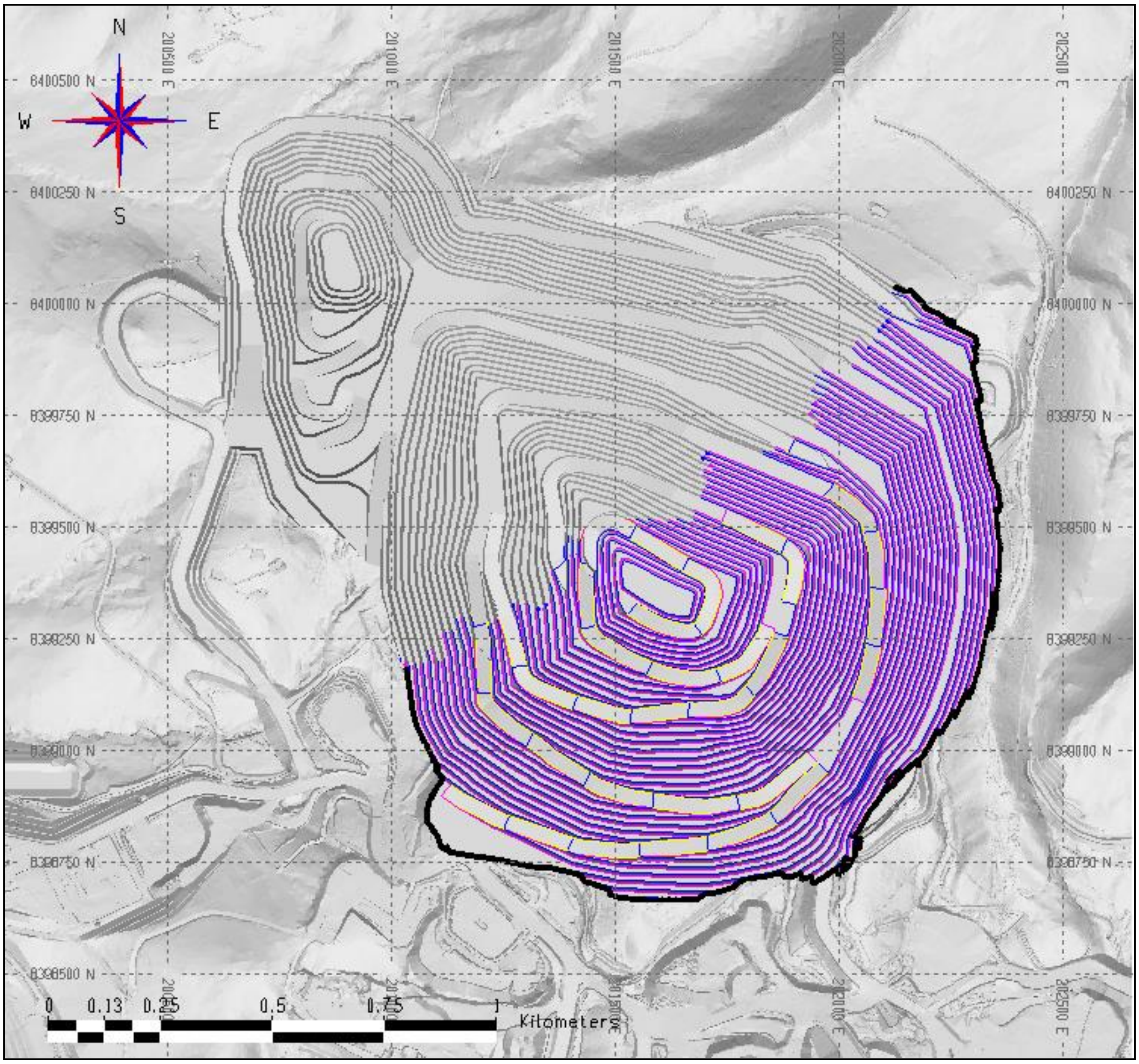
FIGURE 16-12: CONSTANCIA PIT PHASE 7



CONSTANCIA - MINE PHASE 8

Mining in Phase 8 will start in 2027 and will correspond approximately to the Lerchs-Grossman pit shell defined by a $1.92/lb Cu price (64% of base metal price sensitivity case). This pit will range in elevation from 4,410 to 3780 masl. The phase is approximately 1,300 meters wide east-west and 1,300 meters north-south. Phase 8 will generate about 50.7 million tonnes of ore at a stripping ratio of 2.24:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 8 pit is presented in Figure 16-13.

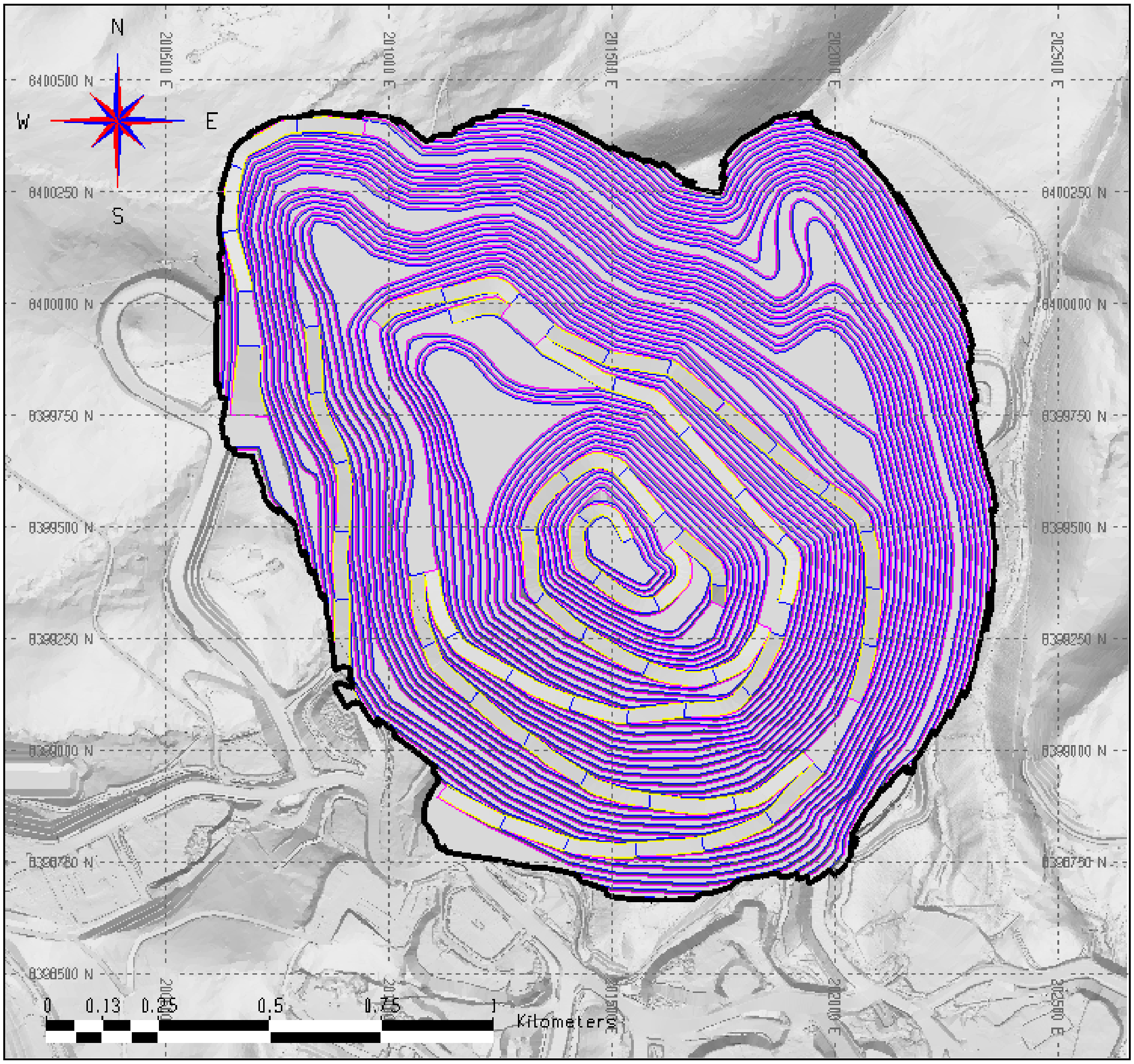
FIGURE 16-13: CONSTANCIA PIT PHASE 8



CONSTANCIA - MINE PHASE 9

Mining the final pushback, Phase 9 will start in 2028 and will correspond approximately to the Lerchs-Grossman pit shell defined by a $2.19/lb Cu price (73% of base metal price sensitivity case). This pit elevation will range from 4,440 to 3,735 masl. The phase is approximately 1,500 meters wide east-west and 1,400 meters north-south. Phase 9 will produce about 180.6 million tonnes of ore at a stripping ratio of 0.84:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 9 pit is shown in Figure 16-14.

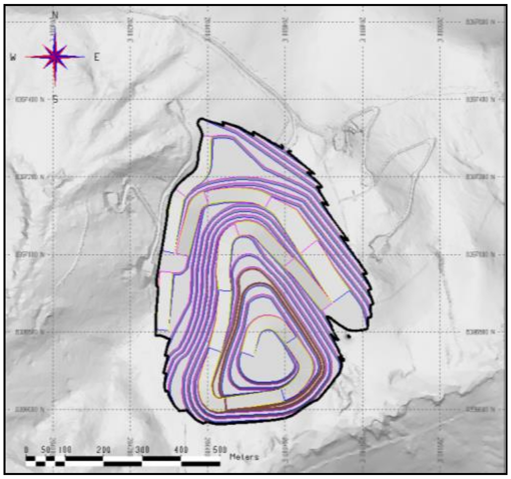
FIGURE 16-14: CONSTANCIA PIT PHASE 9



PAMPACANCHA - MINE PHASE 1

Mining in Phase 1 will start in 2021 and correspond approximately to the Lerchs-Grossman pit shell defined by a $0.24/lb Cu price (24% of base metal price sensitivity case). This pit is located about 5,700 meters east of the primary crusher, and the elevation ranges from 4,320 to 4,080 masl. The phase is approximately 570 meters wide east-west and 800 meters north-south. Phase PC01 will produce about 23.4 million tonnes of ore at a stripping ratio of 1.71:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 1 pit is shown in Figure 16-15.

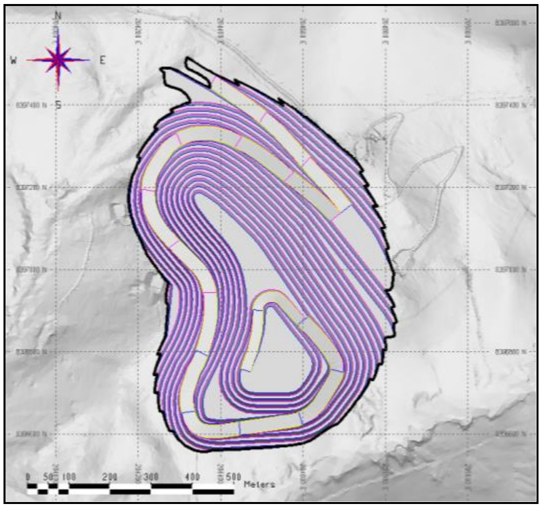
FIGURE 16-15: PAMPACANCHA PIT PHASE 1



PAMPACANCHA - MINE PHASE 2

The mining of the final pushback during Phase 2 will start in 2023 and correspond approximately to the Lerchs-Grossman pit shell defined by a $2.55/lb Cu price (85% of base metal price sensitivity case). This phase will range in elevation from 4,350 to 4,050 masl. The phase is approximately 650 meters wide east-west and 1000 meters north-south. Phase 2 will produce about 16.5 million tonnes of ore at a stripping ratio of 2.44:1 (tonnes waste per tonnes of total ore). An illustration of the Phase 2 pit is shown in Figure 16-16.

FIGURE 16-16: PAMPACANCHA PIT PHASE 2



Total ore reserves included in the final two pits are estimated to be 532.5 million tonnes and 569.4 million tonnes of waste material. Approximately 6.8 million tonnes of medium and low grade ore have been hauled to the temporary stockpiles at the end of 2020. This material will be sent to and reclaimed from the stockpiles through the life of mine. At the end of the mine's life, the ore from these stockpiles will be reclaimed and processed. Table 16-4 presents the Mineral Reserves estimates breakdown by Phases.

TABLE 16-4: CONSTANCIA AND PAMPACANCHA BREAKDOWN BY PHASES AS OF DECEMBER 31ST, 2020

PIT	Phases	Ore, Mt	Cu%	Mo%	Auppm	Agppm	Waste, Mt
Constancia	**02**	1.1	0.33	0.017	0.020	2.29	0.4
	04	53.8	0.31	0.011	0.040	2.81	27.8
	05	140.3	0.32	0.010	0.044	3.12	95.8
	06	59.2	0.33	0.008	0.039	3.65	98.4
	07						0.8
	08	50.7	0.32	0.005	0.033	3.41	113.5
	09	180.6	0.23	0.007	0.044	2.40	152.6
	Sub Total	**485.8**	**0.29**	**0.008**	**0.042**	**2.91**	**489.2**
Pampacancha	**PC01**	23.4	0.55	0.020	0.349	4.38	40.1
	PC02	16.5	0.66	0.014	0.376	5.20	40.1
	Sub Total	**39.9**	**0.60**	**0.018**	**0.360**	**4.72**	**80.2**
Stockpiles	**I - V**	**6.8**	**0.28**	**0.007**	**0.061**	**2.37**	
	TOTAL	**532.5**	**0.31**	**0.009**	**0.066**	**3.04**	**569.4**

16.3. MINE PRODUCTION SCHEDULE

16.3.1. PRODUCTION SCHEDULING CRITERIA

The operating and scheduling criteria used to develop the mining sequence plans are summarized in Table 16-5. Pit and mine maintenance operations are scheduled around the clock. Allowances for downtime and weather delays have been included in the mining equipment and workforce estimations.

TABLE 16-5: MINE PRODUCTION SCHEDULE CRITERIA

Annual Moved Production Base Rate (as max.)	81.0 Mtonnes
Annual Ore Production Base Rate	**30.9 - 31.4 Mtonnes**
Daily Ore Production Base Rate	90 - 94 ktpd
Process Plant yearly availability	94%
Operating Hours per shift	12
Operating Shifts per Day	2
Operating Days per Week	7
Scheduled Operating Days per Year	365 / 366
Number of Mine Crews	3

16.3.2. MILL FEED AND CUT-OFF GRADE STRATEGY

The mine plan criteria are summarized in Table 16-6.

TABLE 16-6: MINE PLAN CRITERIA

SOURCE	INFO	COMMENT
1. Planning	Mine Plan	Yearly plan from 2021 to 2037. Ore restrictions: Hy + Skm : CuOx% < 20% & Zn%/Cu% < 34% & Fe ≤15.0%. Sp + Mx : CuOx% < 20% & Zn%/Cu% < 34% & Fe ≤15.0%.
	Survey	Actual Topography from Jan 1st, 2021
	CutOff	Constancia: NSR > 6.14 $/t Pampacancha: NSR > 6.14 $/t
	Phases / Designs	Constancia: PH02, PH04, PH05, PH06, PH07, PH08, PH09 (Update 2020) Pampacancha: PC01 & PC02 (Update 2017)
	Productivity	EX5600 shovel: 3,400 tph 994 loader: 1,800 tph
2. Maintenance	Equipment	# Shovel: 03 (Availability by Maintenance) # Loader: 01 - Only Stocks (Availability by Maintenance) # Trucks: 22-32 Trucks (Availability by Maintenance)
3. Geotech	Pit geometric parameters	Slope angle: 65 - 70 degrees IRA angle: 38 - 47 degrees (according with last Geotechnical Design)
	Dump geometric parameters	WRF Design (Update 2020)
		According to Geotech recommendations.
4. Geology	Geological model	Constancia Model: LTP CS Model 2021Q1_20x20x15 Pampacancha Model: LTP PC Model 2017_v4_20x20x15
	Recoveries	Metallurgical recoveries through Formula (Dec 2020) supplied by the process team
	Grades	Cu, Mo, Au, Ag, etc
5. Metallurgy	Metallurgical parameters	Keep grades (range 0.3% - 0.8%) Concentrate constraints (Pb<2%, Zn<5.0% and Pb+Zn<7.0%)
	Tonnage to Plant	be considered a production of 90,000 t/d & mechanical availability of 94% (84,600 t/d)

A variable cut-off grade strategy was implemented to bring forward the higher grade ore from the pit. Delivering higher-grade ore to the mill in the early years will improve the net present value and internal rate of return of the operations.

Priority plant feed consists of high grade material (NSR grade above 10 $/t). The lower grade material (NSR below 10 $/t) is being fed as needed or otherwise sent to the long term stockpile to be reclaimed at the end of mine's life.

The blending of ore is needed for plant fed in order to reach contaminants levels below the maximum allowed, for Zinc <5% and Lead <2%. Rejected Ore, by contaminant levels, also sent to long-term stockpile to be reclaimed in further years with fewer contaminants.

16.3.3. OVERBURDEN STRIPPING REQUIREMENTS

Mineral reserve tabulations by bench, phase, and mine production scheduling program (MSSO and MSReserves, modules from MineSight® software) are used to analyze long-term stripping requirements for the Constancia Operations. Elevation and phase order dependencies and sinking rate controls are used in conjunction with mill ore production targets and an internal NSR cutoff of 6.14 $/t to simulate open pit mining. The program, through successive iterations, allows the user to examine waste stripping rates over the life of the mine and their impact on ore exposure and mill head grades.

The analysis determined a production stripping requirement of approximately 32 - 48 million tonnes of waste and 32 million tonnes of ore by year. About 75.8 million tonnes of ore will also be mined and stockpiled during this period and will be reclaimed when the plant feed requirements exceed the daily mine production.

16.3.4. MINE PLAN

The mine production plan includes 569.4 Mt of waste and 532.5 Mt of ore (from both pits and stockpiles), yielding an average stripping ratio (waste/ore) of 1.1. An average yearly mining rate of 77.0 Mtpy, through the first 13 years, with a maximum of 81 Mtpy, is required to provide a nominal ore process feed rate of 31.3 Mtpy based on a variable throughput by ore type (90-94 ktpd and 94% availability). The ore production schedule for the operation presents step down trends with the Cu grade averaging 0.44% Cu from 2022 to 2024 when Pampacancha is at its peak production, then reducing to 0.34 % Cu from 2025 to 2029 with the preferential scheduling of higher grade mineralization from the Contancia pit and finalizing decreasing to 0.25% Cu to the end of the mine life. The average LOM average grade is 0.311% Cu, 0.009% Mo, 0.065 g/t Au and 3.04 g/t Ag for the remaining 17 years of the mine life.

The destination flowsheet of Constancia operations is shown in Figure 16-17 while Table 16-7 presents the distances in km between the Mine Phases and the main facilities. The mine schedule drawings for the life of mine are shown in Figure 16-18 to Figure 16-23.

FIGURE 16-17: DESTINATION FLOWSHEET

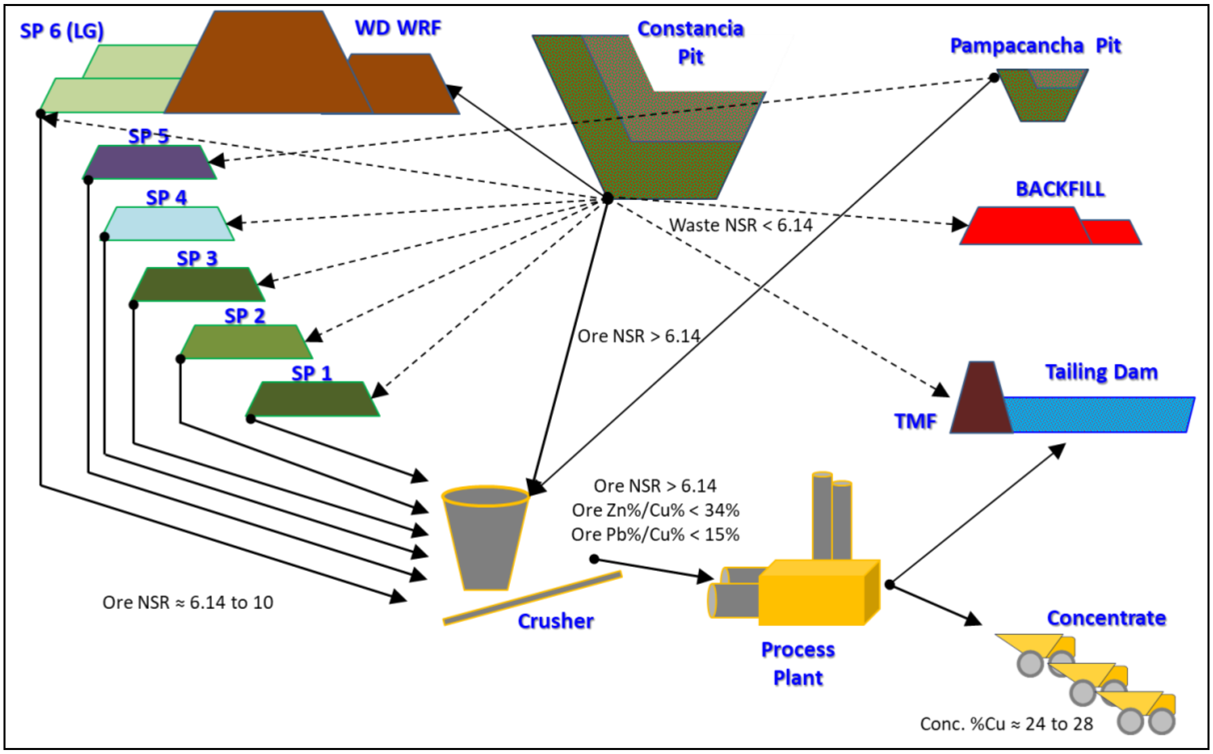


TABLE 16-7: DISTANCES BETWEEN PHASES AND FACILITIES

Phase	Destination	Distances(km)
PH02	WRF1	4.5
	CRUS	4.3
	SP04	4.4
Ph04	CRUSHER	3.6
	STOCK 4	4.2
	STOCK 6	4.4
	WRF1	4.1
	TMF2	7.9
Ph05	CRUSHER	3.7
	STOCK 1	3.1
	STOCK 3	3.5
	STOCK 4	4.0
	STOCK 6	3.7
	WRF1	3.8
	TMF1	7.7
	TMF2	7.8
	BFPC	7.8
PhP2	Crusher	7.0
	WRF	4.4
	Stock 05	5.7
PH08	CRUSHER	4.5
	STOCK 1	4.0
	STOCK 3	4.5
	STOCK 4	5.2
	STOCK 6	4.8
	WRF1	4.7
	TMF1	7.3
	TMF2	8.5
	BFPC	4.3
Ph09	CRUSHER	3.9
	STOCK 1	3.2
	STOCK 3	3.9
	STOCK 4	4.6
	STOCK 6	3.7
	WRF1	5.0
	TMF1	8.6
	TMF2	8.9
	BFPC	5.0
PhP1	Crusher	7.0
	WRF	4.6
Ph06	CRUSHER	4.4
	STOCK 1	1.9
	STOCK 3	3.1
	STOCK 4	3.8
	STOCK 6	3.7
	WRF1	3.9
	TMF1	7.3
	TMF2	7.7
	BFPC	6.7
PH07	WRF1	3.1
	TMF1	6.0
	SP04	3.0
Stock 01	Crusher	1.0
Stock 02	Crusher	1.1
Stock 03	Crusher	2.3
Stock 04	Crusher	2.6
Stock 05	Crusher	3.0
Stock 06	Crusher	2.6

FIGURE 16-18: MINE PLAN OF PERIODS 2021 AND 2022

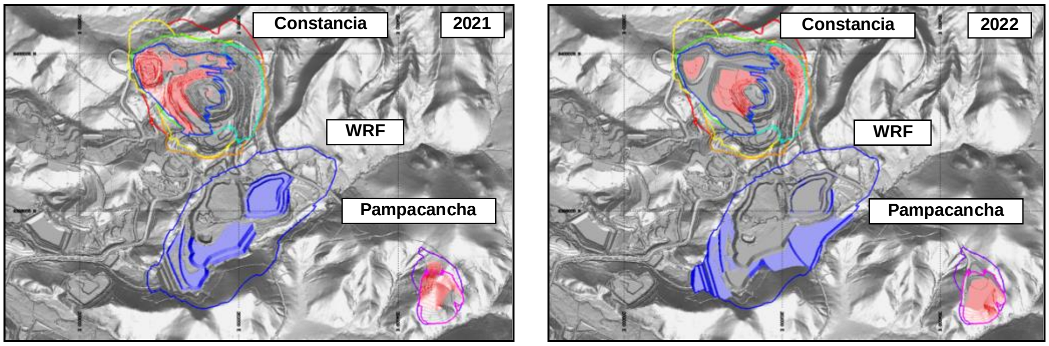


FIGURE 16-19: MINE PLAN OF PERIODS 2023 AND 2024

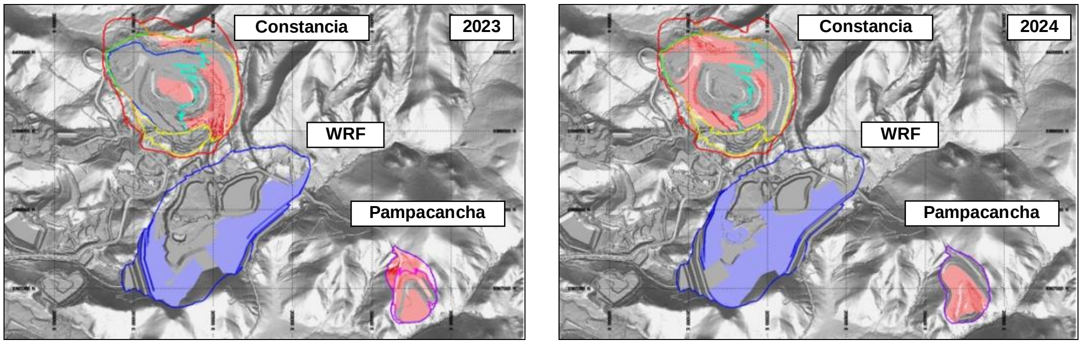


FIGURE 16-20: MINE PLAN OF PERIODS 2025 AND 2026

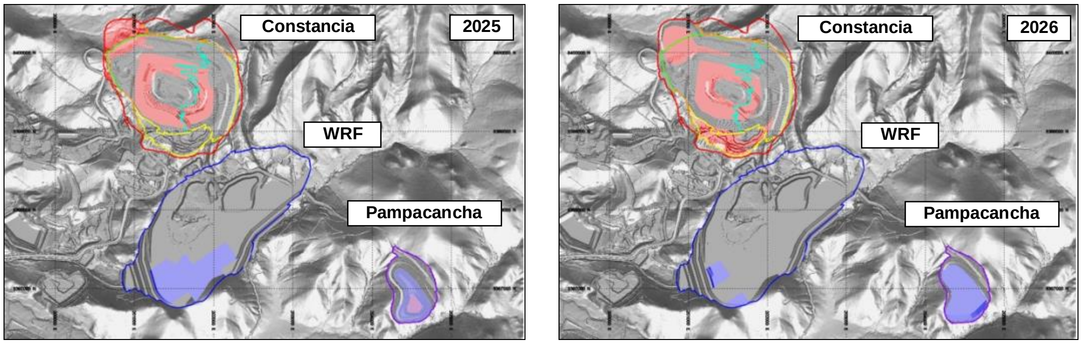


FIGURE 16-21: MINE PLAN OF PERIODS 2027 TO 2030

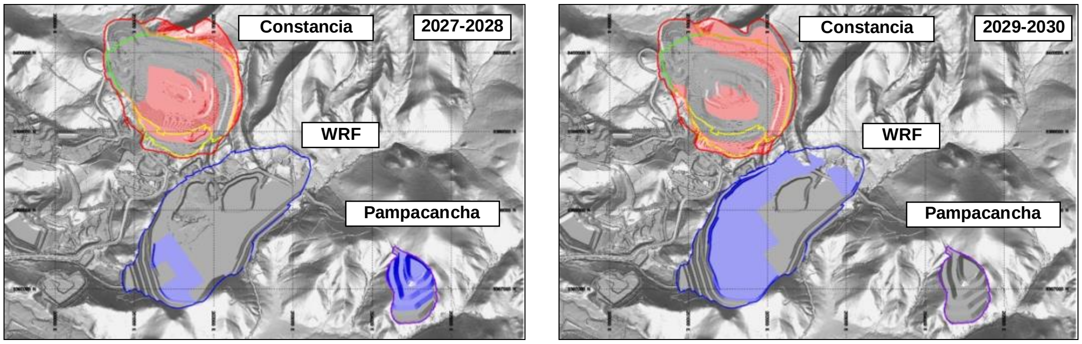


FIGURE 16-22: MINE PLAN OF PERIODS 2031 TO 2034

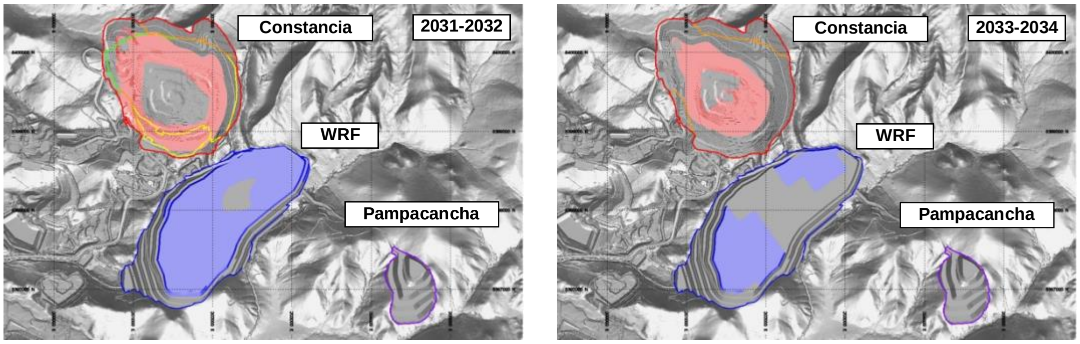
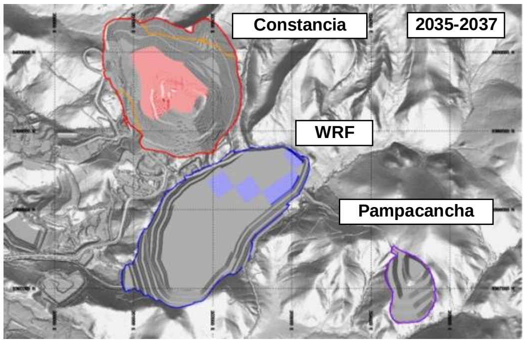


FIGURE 16-23: MINE PLAN OF PERIODS 2035 AND 2037



The Mine schedule details for the total annual movement by destination and by phases, stripping ratios, mill feed by ore type and by phases are presented in Table 16-8 and Figure 16-24 to Figure 16-26.

TABLE 16-8: CONSTANCIA OPERATIONS MINE PLAN AT JANUARY 1, 2021

Year	Days	Pits / Zones	Moved, Mt	Mined, Mt	Waste, Mt	Ore Pit to Stocks, Mt	Ore Pit to MILL, Mt	Ore Stock to MILL,	Ore MILLED , Mt	Cu%	Mo%	Au ppm	Ag ppm	Fe%	Ratio CuOx	Ratio Zn/Cu	NSR, $/t
2021	**365**	Constancia	53.0	53.0	24.9	4.9	23.2		23.2	0.31	0.011	0.034	2.78	3%	3%	15%	17.9
		Pampacancha	20.4	20.4	14.7		5.7		5.7	0.27	0.019	0.247	3.32	19%	15%	26%	21.3
		Stockpiles	2.1					2.1	2.1	0.32	0.010	0.045	4.16	5%	11%	50%	15.9
		SubTotal	**75.5**	**73.4**	**39.6**	**4.9**	**28.8**	**2.1**	**30.9**	**0.31**	**0.013**	**0.074**	**2.97**	**6%**	**6%**	**19%**	**18.4**
2022	**366**	Constancia	35.6	35.6	13.6	4.0	18.0		18.0	0.35	0.010	0.043	3.15	5%	2%	24%	19.5
		Pampacancha	30.2	30.2	21.1		9.2		9.2	0.55	0.013	0.397	3.03	20%	14%	15%	37.9
		Stockpiles	3.8					3.8	3.8	0.30	0.009	0.057	3.84	6%	6%	71%	14.7
		SubTotal	**69.6**	**65.8**	**34.6**	**4.0**	**27.2**	**3.8**	**31.0**	**0.40**	**0.011**	**0.150**	**3.20**	**9%**	**7%**	**24%**	**24.4**
2023	**365**	Constancia	39.3	39.3	22.5	2.8	14.0		14.0	0.43	0.013	0.037	3.00	4%	4%	18%	25.0
		Pampacancha	36.5	36.5	24.4		12.1		12.1	0.58	0.027	0.300	5.23	22%	9%	22%	38.6
		Stockpiles	5.2					5.2	5.2	0.22	0.006	0.054	2.67	4%	6%	34%	11.2
		SubTotal	**81.0**	**75.8**	**46.9**	**2.8**	**26.1**	**5.2**	**31.4**	**0.45**	**0.017**	**0.141**	**3.81**	**11%**	**7%**	**21%**	**27.9**
2024	**365**	Constancia	48.2	48.2	28.0	2.2	18.0		18.0	0.30	0.014	0.028	2.71	3%	4%	34%	18.0
		Pampacancha	31.0	31.0	19.4		11.6		11.6	0.82	0.011	0.454	6.33	22%	11%	11%	53.1
		Stockpiles	1.9					1.9	1.9	0.15	0.002	0.076	0.87	2%	6%	19%	8.8
		SubTotal	**81.1**	**79.2**	**47.4**	**2.2**	**29.5**	**1.9**	**31.4**	**0.48**	**0.012**	**0.188**	**3.93**	**10%**	**8%**	**19%**	**30.4**
2025	**365**	Constancia	78.3	78.3	40.0	9.0	29.3		29.3	0.31	0.012	0.038	3.18	4%	4%	30%	18.7
		Pampacancha	2.0	2.0	0.6		1.4		1.4	0.61	0.018	0.309	3.64	20%	13%	16%	39.2
		Stockpiles	0.7					0.7	0.7	0.71	0.013	0.114	4.98	9%	4%	49%	40.3
		SubTotal	**81.0**	**80.3**	**40.6**	**9.0**	**30.7**	**0.7**	**31.4**	**0.33**	**0.012**	**0.051**	**3.24**	**5%**	**4%**	**30%**	**20.0**
2026	**366**	Constancia	78.3	78.3	38.2	10.0	30.1		30.1	0.35	0.009	0.053	3.65	6%	3%	29%	20.8
		Stockpiles	1.2					1.2	1.2	0.25	0.010	0.049	6.08	6%	5%	184%	15.2
		SubTotal	**79.5**	**78.3**	**38.2**	**10.0**	**30.1**	**1.2**	**31.4**	**0.34**	**0.009**	**0.053**	**3.74**	**6%**	**3%**	**34%**	**20.6**
2027	**366**	Constancia	72.0	72.0	40.7	5.0	26.3		26.3	0.33	0.011	0.041	3.05	4%	2%	28%	19.8
		Stockpiles	5.0					5.0	5.0	0.22	0.006	0.051	3.70	5%	5%	83%	13.2
		SubTotal	**77.0**	**72.0**	**40.7**	**5.0**	**26.3**	**5.0**	**31.3**	**0.31**	**0.010**	**0.042**	**3.15**	**4%**	**3%**	**34%**	**18.7**
2028	**366**	Constancia	70.2	70.2	33.7	7.0	29.6		29.6	0.39	0.010	0.044	3.69	4%	3%	35%	23.0
		Stockpiles	1.9					1.9	1.9	0.32	0.008	0.165	5.42	5%	3%	17%	22.4
		SubTotal	**72.1**	**70.2**	**33.7**	**7.0**	**29.6**	**1.9**	**31.4**	**0.38**	**0.010**	**0.052**	**3.79**	**4%**	**3%**	**34%**	**23.0**
2029	**366**	Constancia	75.5	75.5	44.7	5.0	25.9		25.9	0.34	0.007	0.038	2.89	5%	3%	36%	19.8
		Stockpiles	5.5					5.5	5.5	0.22	0.007	0.040	2.63	3%	7%	17%	13.5
		SubTotal	**81.0**	**75.5**	**44.7**	**5.0**	**25.9**	**5.5**	**31.4**	**0.32**	**0.007**	**0.039**	**2.85**	**5%**	**3%**	**34%**	**18.7**
2030	**366**	Constancia	74.5	74.5	44.8	4.8	24.9		24.9	0.23	0.009	0.033	3.70	4%	5%	34%	14.5
		Stockpiles	6.5					6.5	6.5	0.17	0.006	0.018	1.55	4%	6%	33%	10.1
		SubTotal	**81.0**	**74.5**	**44.8**	**4.8**	**24.9**	**6.5**	**31.4**	**0.22**	**0.008**	**0.030**	**3.25**	**4%**	**5%**	**34%**	**13.6**
2031	**366**	Constancia	69.0	69.0	49.4	0.2	19.3		19.3	0.21	0.005	0.035	2.24	3%	5%	21%	12.7
		Stockpiles	12.0					12.0	12.0	0.15	0.005	0.019	1.75	4%	6%	62%	8.8
		SubTotal	**81.0**	**69.0**	**49.4**	**0.2**	**19.3**	**12.0**	**31.3**	**0.18**	**0.005**	**0.029**	**2.05**	**3%**	**5%**	**34%**	**11.2**
2032	**366**	Constancia	75.0	75.0	44.8	1.1	29.2		29.2	0.25	0.006	0.056	2.32	3%	4%	16%	15.3
		Stockpiles	2.3					2.3	2.3	0.30	0.007	0.042	4.81	8%	3%	196%	16.6
		SubTotal	**77.3**	**75.0**	**44.8**	**1.1**	**29.2**	**2.3**	**31.4**	**0.25**	**0.006**	**0.055**	**2.49**	**3%**	**4%**	**32%**	**15.4**
2033	**366**	Constancia	61.2	61.2	29.8	0.2	31.2		31.2	0.25	0.006	0.045	2.56	4%	4%	34%	15.3
		Stockpiles	0.1					0.1	0.1	0.30	0.004	0.522	11.43	12%	3%	40%	30.6
		SubTotal	**61.3**	**61.2**	**29.8**	**0.2**	**31.2**	**0.1**	**31.4**	**0.25**	**0.006**	**0.047**	**2.59**	**4%**	**4%**	**34%**	**15.4**
2034	**366**	Constancia	56.4	56.4	17.6	8.1	30.7		30.7	0.30	0.005	0.040	2.70	5%	3%	34%	17.1
		Stockpiles	0.6					0.6	0.6	0.20	0.007	0.052	3.31	3%	4%	19%	10.8
		SubTotal	**57.0**	**56.4**	**17.6**	**8.1**	**30.7**	**0.6**	**31.3**	**0.29**	**0.005**	**0.040**	**2.71**	**5%**	**3%**	**34%**	**17.0**
2035	**366**	Constancia	46.3	46.3	9.6	8.0	28.7		28.7	0.26	0.008	0.045	2.14	3%	2%	9%	16.0
		Stockpiles	2.7					2.7	2.7	0.58	0.002	0.102	7.47	15%	2%	154%	31.1
		SubTotal	**49.0**	**46.3**	**9.6**	**8.0**	**28.7**	**2.7**	**31.3**	**0.29**	**0.007**	**0.050**	**2.59**	**4%**	**2%**	**34%**	**17.3**
2036	**366**	Constancia	31.1	31.1	6.3	2.4	22.5		22.5	0.29	0.008	0.044	2.77	3%	2%	10%	17.7
		Stockpiles	9.0					9.0	9.0	0.21	0.005	0.043	2.57	4%	3%	115%	12.3
		SubTotal	**40.1**	**31.1**	**6.3**	**2.4**	**22.5**	**9.0**	**31.4**	**0.27**	**0.007**	**0.044**	**2.71**	**3%**	**2%**	**34%**	**16.2**
2037	**366**	Constancia	11.0	11.0	0.8		10.2		10.2	0.31	0.009	0.049	2.68	1%	2%	6%	19.1
		Stockpiles	21.1					21.1	21.1	0.15	0.006	0.025	2.51	3%	5%	80%	8.9
		SubTotal	**32.1**	**11.0**	**0.8**	**0.0**	**10.2**	**21.1**	**31.3**	**0.20**	**0.007**	**0.033**	**2.56**	**3%**	**3%**	**43%**	**12.3**
TOTAL			**1,177**	**1,095**	**569**	**74.6**	**451.0**	**81.5**	**532.5**	**0.31**	**0.009**	**0.066**	**3.04**	**5%**	**5%**	**30%**	**18.8**

FIGURE 16-24: TOTAL MOVEMENT BY DESTINATION

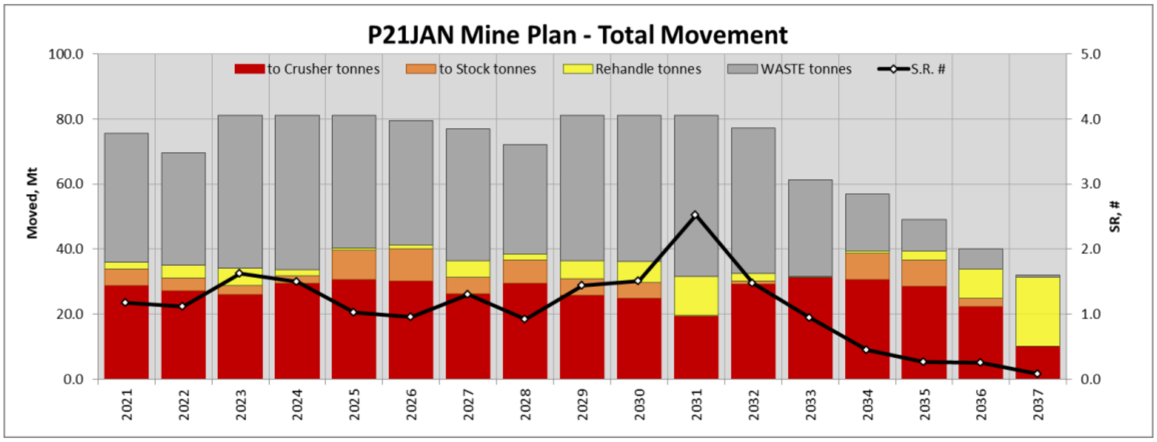


FIGURE 16-25: TOTAL MOVEMENT BY PHASE

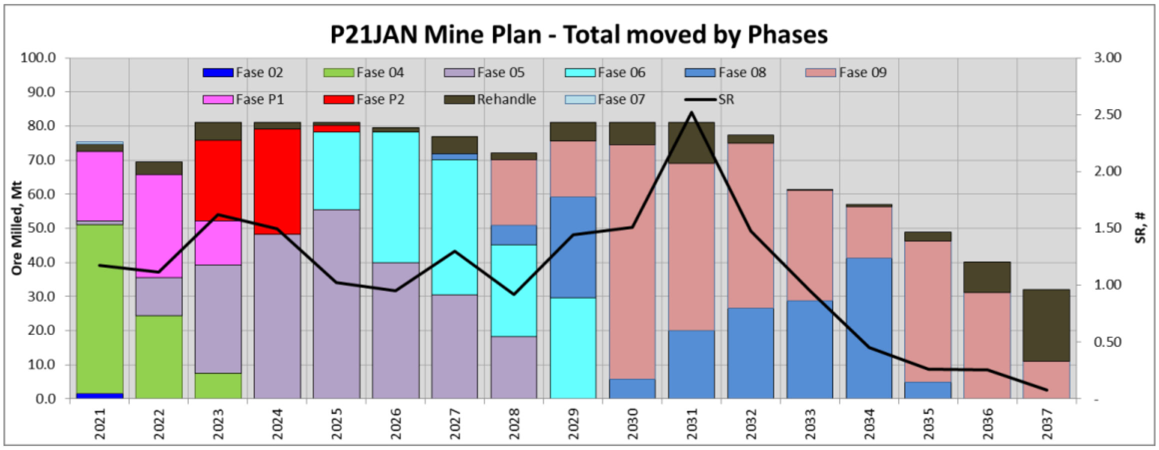
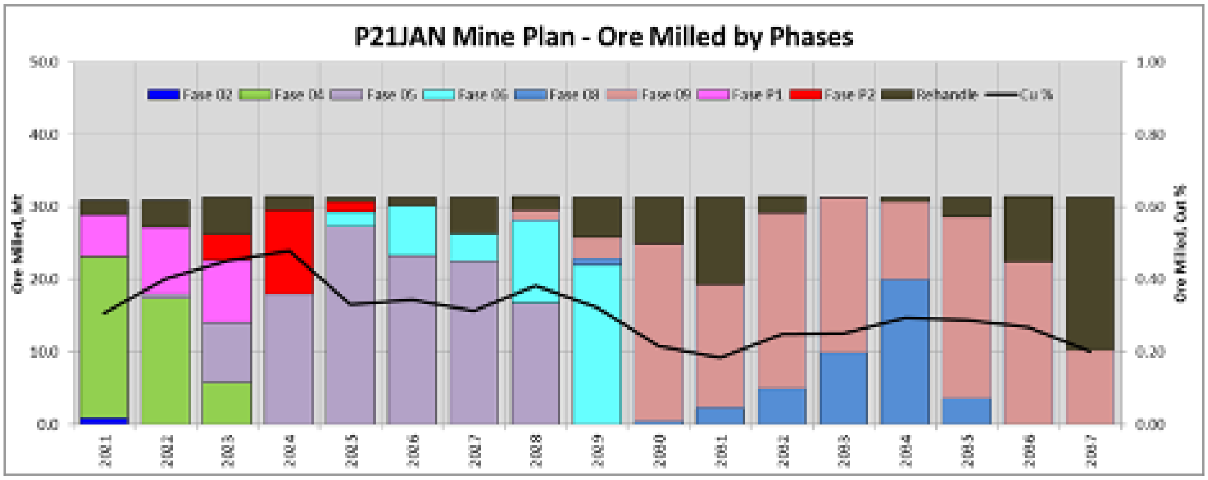


FIGURE 16-26: ORE TONNAGE MILLED BY PHASE



The processing schedule corresponding to the combined LOM plans of Constancia and Pampacancha is illustrated in Figure 16-27 and in Table 16-9 to Table 16-11.

FIGURE 16-27: TOTAL COPPER PRODUCTION (2021 – 2037) IN CONCENTRATE

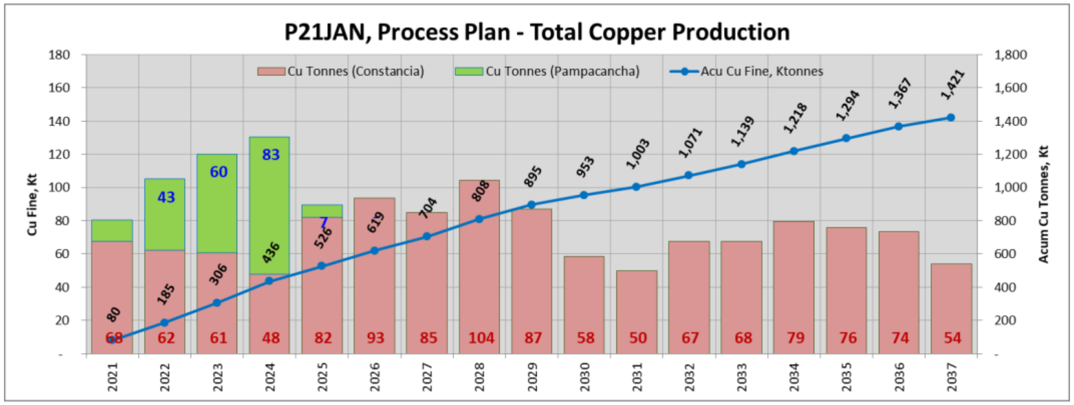


TABLE 16-9: CONSTANCIA ORE PROCESSING PLAN 2021 – 2037

LOM		P21Jan - CONSTANCIA																	TOTAL
Year		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
PRODUCTION	Tonnes to Cu Plant, kt	25,283	21,784	19,241	19,859	29,976	31,350	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,438	31,347	**492,603**
	Cu%	0.32	0.34	0.37	0.28	0.32	0.34	0.31	0.38	0.32	0.22	0.18	0.25	0.25	0.29	0.29	0.27	0.20	**0.29**
	Cu In Situ, Mlb	**176**	**164**	**158**	**124**	**211**	**238**	**216**	**266**	**223**	**150**	**128**	**173**	**174**	**203**	**199**	**186**	**139**	**3,127**
	Au (g/t)	0.03	0.05	0.04	0.03	0.04	0.05	0.04	0.05	0.04	0.03	0.03	0.05	0.05	0.04	0.05	0.04	0.03	**0.04**
	Ag (g/t)	2.90	3.27	2.91	2.53	3.22	3.74	3.15	3.79	2.85	3.25	2.05	2.49	2.59	2.71	2.59	2.71	2.56	**2.90**
	Tonnes to Mo Plant, kt	25,283	21,784	19,241	19,859	29,976	31,350	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,438	31,347	**492,603**
	Mo%	0.011	0.010	0.011	0.013	0.012	0.009	0.010	0.010	0.007	0.008	0.005	0.006	0.006	0.005	0.007	0.007	0.007	**0.008**
RECOVERIES	CuT Recovery, %	84.8%	83.6%	84.5%	85.2%	86.1%	86.7%	86.6%	86.5%	86.1%	85.8%	86.0%	86.0%	85.7%	86.3%	83.9%	87.0%	85.3%	**85.7%**
	Au (g/t) Recovery, %	48.2%	46.9%	47.2%	45.1%	45.9%	47.2%	45.7%	49.3%	45.1%	44.6%	45.3%	48.7%	46.5%	45.5%	46.0%	46.5%	48.0%	**46.7%**
	Ag (g/t) Recovery, %	66.0%	61.8%	65.1%	65.1%	66.6%	64.5%	65.6%	66.8%	62.9%	67.9%	65.6%	65.0%	64.5%	63.7%	60.1%	68.1%	65.1%	**65.1%**
	MoT Recovery, %	35.0%	42.4%	45.4%	46.7%	48.3%	46.0%	49.8%	48.5%	47.1%	47.7%	43.7%	47.4%	46.3%	44.7%	58.2%	51.1%	43.6%	**46.7%**
CONC. Cu	Conc. Tonnes	282,808	268,060	251,223	203,224	351,808	402,850	362,311	435,775	375,249	254,019	216,606	288,687	292,710	348,712	328,905	311,117	229,462	**5,203,525**
	Cu% into Conc.	23.9%	23.3%	24.1%	23.5%	23.4%	23.2%	23.4%	23.9%	23.2%	23.0%	23.0%	23.4%	23.2%	22.8%	23.1%	23.6%	23.4%	**23.4%**
	Au (g/t) into Conc.	1.5	1.7	1.5	1.4	1.5	1.9	1.7	1.8	1.5	1.6	1.9	2.9	2.3	1.7	2.2	2.1	2.2	**1.8**
	Ag (g/t) into Conc.	170.9	164.1	145.0	161.3	182.5	187.9	179.0	182.8	149.6	272.6	194.8	176.6	178.8	155.4	148.5	186.6	228.0	**178.8**
CONTAINED METAL IN CONC. Cu	Cu Pounds, Mlb	**149.0**	**137.4**	**133.4**	**105.4**	**181.3**	**206.0**	**187.2**	**229.9**	**191.8**	**128.7**	**109.9**	**148.7**	**149.4**	**175.2**	**167.2**	**162.1**	**118.6**	**2,681**
	Cu Fine, KTonnes	**67.6**	**62.3**	**60.5**	**47.8**	**82.2**	**93.4**	**84.9**	**104.3**	**87.0**	**58.4**	**49.8**	**67.4**	**67.8**	**79.5**	**75.9**	**73.5**	**53.8**	**1,216**
	Acum Cu Fine, KTonnes	68	130	190	238	320	414	499	603	690	748	798	866	933	1,013	1,089	1,162	1,216	
	Au Fine, KOunces	**14**	**15**	**12**	**9**	**17**	**25**	**19**	**26**	**18**	**13**	**13**	**27**	**22**	**19**	**23**	**21**	**16**	**309**
	Ag Fine, KOunces	**1,554**	**1,414**	**1,171**	**1,054**	**2,065**	**2,434**	**2,086**	**2,561**	**1,805**	**2,226**	**1,357**	**1,639**	**1,683**	**1,743**	**1,570**	**1,867**	**1,682**	**29,910**
CONC. Mo	Conc. Mo Tonnes	1,987	1,775	1,901	2,438	3,362	2,496	3,076	3,140	2,035	2,527	1,375	1,814	1,752	1,366	2,690	2,202	1,942	**37,877**
	Mo% into Conc. Mo	49.9%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	**50.0%**
CONTAINED Mo	Mo Fine, KTonnes	**1.0**	**0.9**	**1.0**	**1.2**	**1.7**	**1.2**	**1.5**	**1.6**	**1.0**	**1.3**	**0.7**	**0.9**	**0.9**	**0.7**	**1.3**	**1.1**	**1.0**	**19**

TABLE 16-10: PAMPACANCHA ORE PROCESSING PLAN 2021 - 2037

LOM		P21Jan - PAMPACANCHA																	TOTAL
Year		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
PRODUCTION	Tonnes to Cu Plant, kt	5,661	9,174	12,109	11,578	1,374													39,896
	Cu%	0.27	0.55	0.58	0.82	0.61													0.60
	Cu In Situ, Mlb	**33**	**111**	**155**	**209**	**19**													526
	Au (g/t)	0.25	0.40	0.30	0.45	0.31													0.36
	Ag (g/t)	3.32	3.03	5.23	6.33	3.64													4.72
	Tonnes to Mo Plant, kt	5,661	9,174	12,109	11,578	1,374													39,896
	Mo%	0.019	0.013	0.027	0.011	0.018													0.018
RECOVERIES	CuT Recovery, %	85.0%	85.0%	85.0%	87.5%	85.0%													86.0%
	Au (g/t) Recovery, %	70.0%	70.0%	70.0%	70.0%	70.0%													70.0%
	Ag (g/t) Recovery, %	70.0%	70.0%	70.0%	70.0%	70.0%													70.0%
	MoT Recovery, %	28.2%	44.2%	46.3%	46.2%	45.2%													43.2%
CONC. Cu	Conc. Tonnes	61,783	195,984	280,758	366,182	32,659													937,365
	Cu% into Conc.	20.7%	21.8%	21.2%	22.6%	21.9%													21.9%
	Au (g/t) into Conc.	15.9	13.0	9.1	10.0	9.1													10.7
	Ag (g/t) into Conc.	212.8	99.1	157.9	140.1	107.3													140.5
CONTAINED METAL IN CONC. Cu	Cu Pounds, Mlb	**28.3**	**94.2**	**131.4**	**182.4**	**15.8**													452
	Cu Fine, KTonnes	**12.8**	**42.7**	**59.6**	**82.8**	**7.2**													205
	Acum Cu Fine, KTonnes	13	56	115	198	205													
	Au Fine, KOunces	**32**	**82**	**82**	**118**	**10**													323
	Ag Fine, KOunces	**423**	**625**	**1,425**	**1,649**	**113**													4,235
CONC. Mo	Conc. Mo Tonnes	596	1,067	3,075	1,142	226													6,106
	Mo% into Conc. Mo	50.0%	50.0%	50.0%	50.0%	50.0%													50.0%
CONTAINED Mo	Mo Fine, KTonnes	**0.3**	**0.5**	**1.5**	**0.6**	**0.1**													3

TABLE 16-11: ORE PROCESSING PLAN 2021 - 2037 (TOTAL)

LOM		**P21Jan**																	**TOTAL**
Year		**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	
PRODUCTION	Tonnes to Cu Plant, kt	30,944	30,958	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,438	31,347	**532,499**
	Cu%	0.306	0.403	0.452	0.479	0.332	0.344	0.313	0.383	0.322	0.217	0.185	0.249	0.252	0.294	0.288	0.269	0.201	**0.311**
	Cu In Situ, Mlb	**209**	**275**	**312**	**332**	**229**	**238**	**216**	**266**	**223**	**150**	**128**	**173**	**174**	**203**	**199**	**186**	**139**	**3,652**
	Au (g/t)	0.07	0.15	0.14	0.19	0.05	0.05	0.04	0.05	0.04	0.03	0.03	0.05	0.05	0.04	0.05	0.04	0.03	**0.07**
	Ag (g/t)	2.97	3.20	3.81	3.93	3.24	3.74	3.15	3.79	2.85	3.25	2.05	2.49	2.59	2.71	2.59	2.71	2.56	**3.04**
	Tonnes to Mo Plant, kt	30,944	30,958	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,437	31,350	31,350	31,350	31,438	31,347	**532,499**
	Mo%	0.013	0.011	0.017	0.012	0.012	0.009	0.010	0.010	0.007	0.008	0.005	0.006	0.006	0.005	0.007	0.007	0.007	**0.009**
RECOVERIES	CuT Recovery, %	84.8%	84.2%	84.7%	86.7%	86.0%	86.7%	86.6%	86.5%	86.1%	85.8%	86.0%	86.0%	85.7%	86.3%	83.9%	87.0%	85.3%	**85.8%**
	Au (g/t) Recovery, %	61.6%	65.0%	65.9%	67.3%	52.2%	47.2%	45.7%	49.3%	45.1%	44.6%	45.3%	48.7%	46.5%	45.5%	46.0%	46.5%	48.0%	**56.3%**
	Ag (g/t) Recovery, %	66.8%	64.1%	67.7%	68.0%	66.8%	64.5%	65.6%	66.8%	62.9%	67.9%	65.6%	65.0%	64.5%	63.7%	60.1%	68.1%	65.1%	**65.6%**
	MoT Recovery, %	33.2%	43.1%	46.0%	46.5%	48.1%	46.0%	49.8%	48.5%	47.1%	47.7%	43.7%	47.4%	46.3%	44.7%	58.2%	51.1%	43.6%	**46.2%**
CONC. Cu	Conc. Tonnes	344,590	464,044	531,981	569,406	384,467	402,850	362,311	435,775	375,249	254,019	216,606	288,687	292,710	348,712	328,905	311,117	229,462	**6,140,891**
	Cu% into Conc.	23.3%	22.6%	22.6%	22.9%	23.3%	23.2%	23.4%	23.9%	23.2%	23.0%	23.0%	23.4%	23.2%	22.8%	23.1%	23.6%	23.4%	**23.1%**
	Au (g/t) into Conc.	4.1	6.5	5.5	7.0	2.2	1.9	1.7	1.8	1.5	1.6	1.9	2.9	2.3	1.7	2.2	2.1	2.2	**3.2**
	Ag (g/t) into Conc.	178.4	136.7	151.8	147.7	176.1	187.9	179.0	182.8	149.6	272.6	194.8	176.6	178.8	155.4	148.5	186.6	228.0	**172.9**
CONTAINED METAL IN CONC. Cu	Cu Pounds, Mlb	**177.3**	**231.6**	**264.8**	**287.8**	**197.1**	**206.0**	**187.2**	**229.9**	**191.8**	**128.7**	**109.9**	**148.7**	**149.4**	**175.2**	**167.2**	**162.1**	**118.6**	**3,133**
	Cu Fine, KTonnes	**80.4**	**105.1**	**120.1**	**130.5**	**89.4**	**93.4**	**84.9**	**104.3**	**87.0**	**58.4**	**49.8**	**67.4**	**67.8**	**79.5**	**75.9**	**73.5**	**53.8**	**1,421**
	Acum Cu Fine, KTonnes	80	185	306	436	526	619	704	808	895	953	1,003	1,071	1,139	1,218	1,294	1,367	1,421	
	Au Fine, KOunces	**45**	**97**	**94**	**128**	**27**	**25**	**19**	**26**	**18**	**13**	**13**	**27**	**22**	**19**	**23**	**21**	**16**	**633**
	Ag Fine, KOunces	**1,977**	**2,039**	**2,596**	**2,704**	**2,177**	**2,434**	**2,086**	**2,561**	**1,805**	**2,226**	**1,357**	**1,639**	**1,683**	**1,743**	**1,570**	**1,867**	**1,682**	**34,145**
CONC. Mo	Conc. Mo Tonnes	2,583	2,842	4,976	3,580	3,588	2,496	3,076	3,140	2,035	2,527	1,375	1,814	1,752	1,366	2,690	2,202	1,942	**43,983**
	Mo% into Conc. Mo	49.9%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	**50.0%**
CONTAINED Mo	Mo Fine, KTonnes	**1.3**	**1.4**	**2.5**	**1.8**	**1.8**	**1.2**	**1.5**	**1.6**	**1.0**	**1.3**	**0.7**	**0.9**	**0.9**	**0.7**	**1.3**	**1.1**	**1.0**	**22**

16.4. MINE FACILITIES

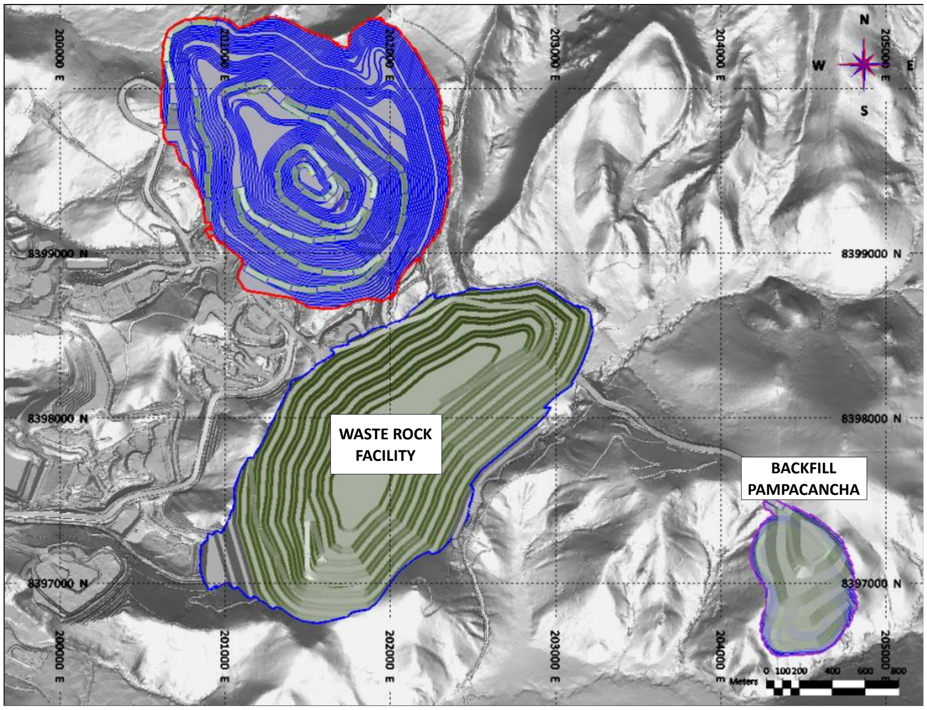
16.4.1. WASTE ROCK FACILITY (WRF)

The final design geometry for this facility incorporates the same slope profile as the original WRF: 20 m high benches with 1.4H:1V (36°) of bench slopes and 32 m wide benches. The overall slope of the stockpile will be about 3.0H:1V (18°). The current remaining capacity of the WRF is estimated at 413 Mt. The waste material balance is shown in Table 16-12 and the Waste Rock Facility is represented in Figure 16-28.

TABLE 16-12: CONSTANCIA, WASTE MATERIAL BALANCE

Waste	Mt
Waste to WRF, until 2020	197
WRF capacity, tonnes	610
Remaining Capacity WRF	413
Waste to TMF, tonnes	138
Waste to BackFill PC, tonnes	81
Total Waste, tonnes	570
Waste to WRF, tonnes	351
Difference, tonnes	**62**

FIGURE 16-28: WASTE ROCK FACILITY



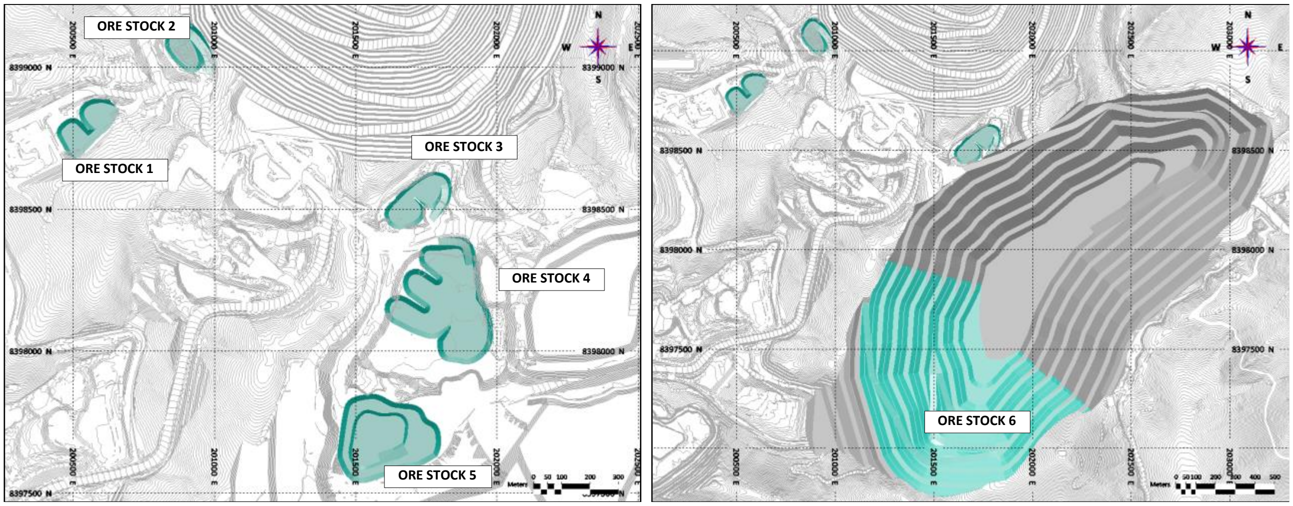
16.4.2. ORE STOCKPILES

The Constancia mine is planned to have four operational stockpiles (Figure 16-29), which will segregate the ROM material by ore type and grade range. The lift height of these stockpiles ranges between 12 and 20 meters. The planned maximum stockpiles capacities are:

- Stockpile 01 : 600 Kt

- Stockpile 02 : 500 Kt
- Stockpile 03 : 600 Kt
- Stockpile 04 : 5,000 Kt (stock located inside WRF, lift 4240, and used until 2025)
- Stockpile 05 : 2,000 Kt (a finger from stock 04 destinated for Pampacancha ore)
- Stockpile 06: 70,000 Kt (low-grade stock located at south from WRF)

FIGURE 16-29: LOCATION OF ORE STOCKPILES



16.4.3. TAILINGS MANAGEMENT FACILITY (TMF)

The Tailings Management Facility (TMF) area is where mill tailings are placed behind waste rock containment buttresses. The buttresses' material will come throughout the life of the mine, from mining operations and quarries. The TMF area is located southwest of the mining facilities area. The design for the TMF includes ramps access to the lower and upper levels for the regular mining fleet (240 tonnes trucks) and a smaller fleet called HCW, which has been used since October 2015 to send NAG material from the Constancia pit to the TMF area.

At the end of the impoundment, the final dam crest elevations will be:

- Tailings Dam equal to 4,190 masl
- Saddle Dam equal to 4,190 masl, where the height of the saddle dam will be 12 m, with 4 m of minimum freeboard.
- The average dry density of deposited tailings for this expansion was considered 1.45 gr/cm3 and will be evaluated at the next level of study.

Hudbay is managing the planning, construction and operation of the Tailings Management Facility (TMF) and the Waste Rock Facility (WRF) with design and engineering support from Knight Piésold, also an Engineer of Record (EOR) of those structures.

The TMF Stacking Plan is illustrated in Table 16-13 and the final TMF design is presented in Figure 16-30.

FIGURE 16-30: TMF – CONSTANCIA – FINAL CONFIGURATION

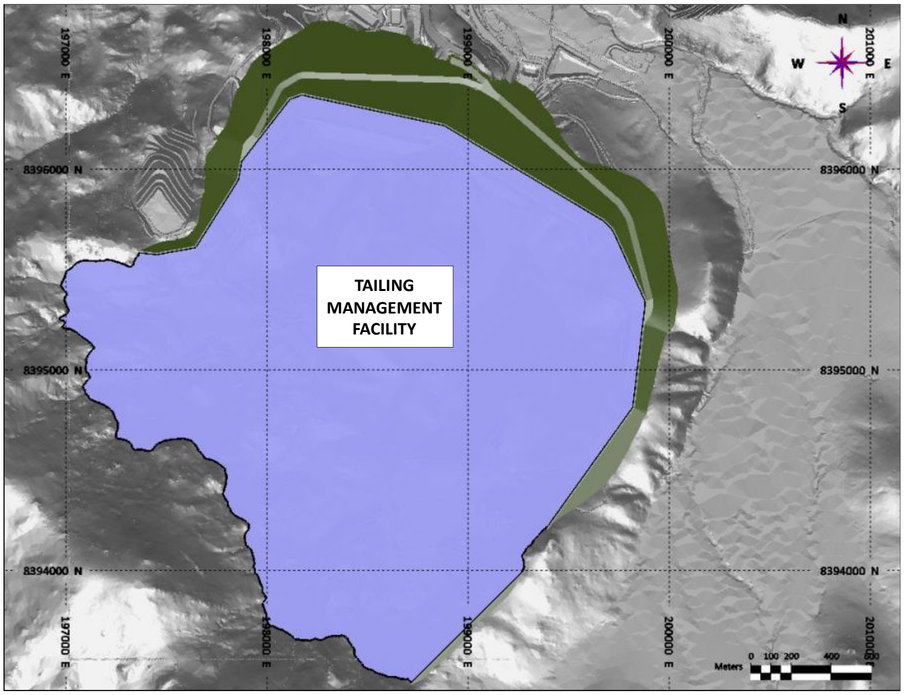


TABLE 16-13: TAILING MANAGEMENT FACILITY (TMF) STACKING PLAN

TMF Stacking plan		Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Total
Mining Fleet	Down stream / HCW	Mtonnes	4.5	3.1	2.5	7.6	6.0	13.4	4.9	14.0	8.7	15.8	10.4	0.0	5.7	0.0	3.3	
	Up stream	Mtonnes	3.2	0.0	2.2	0.0	4.2	0.0	4.9	0.0	5.4	0.0	7.3	0.0	4.5	2.0	4.7	
	Sub total	Mtonnes	7.7	3.1	4.7	7.6	10.2	13.4	9.8	14.0	14.1	15.8	17.7	0.0	10.2	2.0	8.0	138.3

16.5. MINE EQUIPMENT

EQUIPMENT OPERATING PARAMETER

Mine equipment was selected based on the production requirements as shown in Table 16-15 and Table 16-16. At the mine site, three crews operate with two twelve-hour shifts per day, 365 days of the year. No significant weather delays are expected and the mine will not be shut down for holidays.

The parameters used to determine productivity are listed in Table 16-14. There are several different rock types at Constancia; however, for production estimation, the weighted average of all rock types was used. Significant loading and haulage equipment is equipped with electronic monitors which optimize loading time. The production is reported in dry metric tonnes, which is consistent with the reserve model. Moisture content is expected to range between 3.5 and 4.5 percent. Haulage calculations relied on a 4.0% moisture content.

TABLE 16-14: MATERIAL CHARACTERISTICS

In Situ Bulk Density	2.4 cubic meter per tonnes
Material Swell	25 Percent
Loose Density	1.9 cubic meter per tonnes
Moisture Content	4.0 Percent

MINE EQUIPMENT CALCULATION

Mine equipment requirements were developed based on annual tonnage movements from the mine production schedule based on 15 meter bench heights, two twelve hour shifts per day, 365 days per year operation, manufacture machine specifications and material characteristics specific to the deposit (Figure 16-31 Truck Study Results).

- A summary of fleet requirements by period is shown in Table 16 13 and Table 16 14. This equipment is considered necessary to perform the following tasks:
- production drilling;
- loading and hauling ore to the primary crusher (located on the east side of the pit), waste rock facility (WRF) and to the tailings dam (TMF);
- maintaining mine haulage and access roads; and
- maintaining the waste rock facility (WRF) areas, ore stockpiles, tailings management facility (TMF), and berms and regrading of slopes and final surfaces.

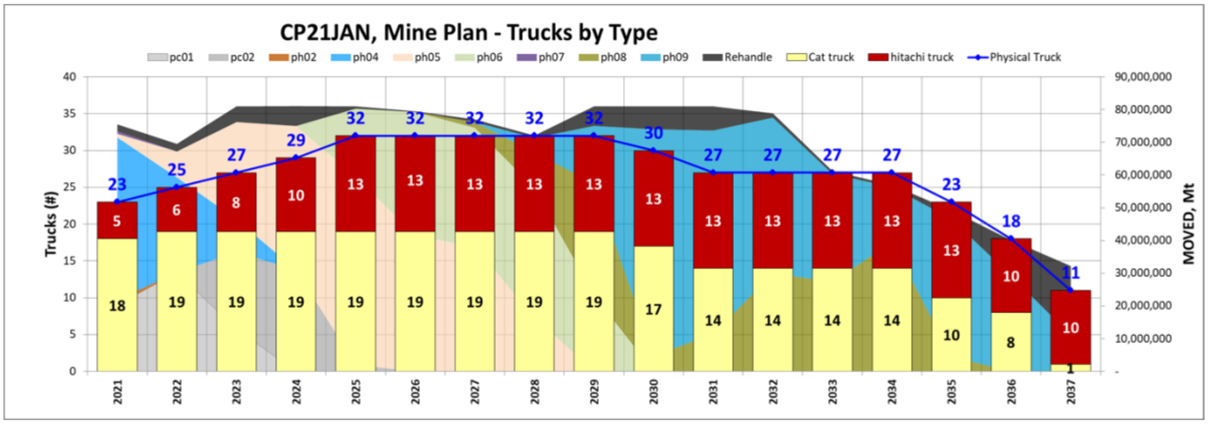
TABLE 16-15: MINE EQUIPMENT 2021 – 2029

Year		2021	2022	2023	2024	2025	2026	2027	2028
MOVED	Mtonnes	75.5	69.6	81.0	81.1	81.0	79.5	77.0	72.1
Waste	Mtonnes	39.6	34.6	46.9	47.4	40.6	38.2	40.7	33.7
Ore	Mtonnes	33.8	31.1	28.9	31.8	39.7	40.1	31.3	36.6
Rehandle	Mtonnes	2.1	3.8	5.2	1.9	0.7	1.2	5.0	1.9
Shovels	#	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Loaders	#	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Trucks	#	**23**	**25**	**27**	**29**	**32**	**32**	**32**	**32**
Drills	#	4	4	4	4	4	4	4	4
Bulldozers	#	6	6	6	6	6	6	6	6
Whelldozers	#	2	2	2	2	2	2	2	2
Graders	#	3	3	3	3	3	3	3	3
Water trucks	#	2	2	2	2	2	2	2	2

TABLE 16-16: MINE EQUIPMENT 2030 – 2037

Year		2029	2030	2031	2032	2033	2034	2035	2036	2037
MOVED	Mtonnes	81.0	81.0	81.0	77.3	61.3	57.0	49.0	40.1	32.1
Waste	Mtonnes	44.7	44.8	49.4	44.8	29.8	17.6	9.6	6.3	0.8
Ore	Mtonnes	30.9	29.7	19.6	30.3	31.4	38.8	36.7	24.9	10.2
Rehandle	Mtonnes	5.5	6.5	12.0	2.3	0.1	0.6	2.7	9.0	21.1
Shovels	#	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**
Loaders	#	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Trucks	#	**32**	**30**	**27**	**27**	**27**	**27**	**23**	**18**	**11**
Drills	#	4	4	4	4	3	3	2	1	1
Bulldozers	#	5	5	5	5	4	3	3	2	2
Whelldozers	#	2	2	2	2	2	2	2	1	1
Graders	#	3	3	3	3	2	2	1	1	1
Water trucks	#	2	2	2	2	2	2	1	1	1

FIGURE 16-31: TRUCK STUDY RESULTS



16.6. MINE OPERATIONS

Open pit mining at the Constancia operation is based on conventional open pit mining techniques. The Constancia operation consists of two pits, Constancia and Pampacancha. The Constancia pit operation started in 2014, while Pampacancha will begin in 2021.

The mine production plan contains 569.4 Mt of waste and 532.5 Mt of ore (from pit and stockpiles), yielding a stripping ratio (waste/ore) of 1.1 to 1. An average yearly mining rate of 77.0 Mtpy, through the first 13 years, with a maximum of 81 Mtpy, is required to provide a nominal ore process feed rate of 31.3 Mtpy based on a variable throughput by ore type (90 to 94ktpd and 94% available). LOM average grades are 0.311% Cu, 0.009% Mo, 0.065 g/t Au and 3.04 g/t Ag, where the mine's life is 17 years.

The priority to feed the process plant will involve optimizing the net value based on NSR ($/t), where high value material (HG) is provided first. The low value material (LG) will be fed as needed, sent to stockpiles, or will otherwise be sent to the waste rock facility (WRF).

16.6.1. DRILLING

For primary drilling production, single-pass 270 mm diameter (or 10 5/8”) drills are used. After evaluating equipment dimensioning, three drill rigs PV-271 were selected to achieve the production rate. The drilling ratio of the drill rig is approximately 45 m/h. Pre-split drilling is done with a Smart Rock D65 drill (downhole). Equipment used to improve the stability of the slopes and optimize the design of the phases.

DRILL PATTERNS AND PARAMETERS

Drill patterns were designed only for ore and waste material, based on geomechanical characterization, Bond Work Index (BWI) and Sag Power Index (SPI) range. Table 16-17 presents the parameters for the drilling production.

TABLE 16-17: PARAMETERS FOR DRILLING PRODUCTION

Parameter	Unit	Ore	Waste
Burden	m	7.3	7.5
Spacing	m	7.3	7.5
Bench Height	m	15	15
Over Drilling	m	0.5	0.5
Density	**t/BCM**	**2.5**	**2.5**
Tonnage to remove	**t/hole**	**1,998**	**2,109**

16.6.2. BLASTING

For wet holes, Heavy ANFO 73 (70% of Emulsion and 30% of ANFO) and dry hole, Heavy ANFO 55 (50% emulsion and 50% of ANFO) is used. Based on the evaluation of productivity, powder factors are estimated to be about 0.40 Kg/t for ore and 0.30 Kg/t for waste. The estimated blast design, explosive type, and powder factors for the Constancia operation are based on the mine operation results. The overview of blasting practices includes the supply and transportation of explosives to the hole, loading, stemming, tie-in, evacuation of work and blast areas, and the ignition of the blast.

16.6.3. LOADING

Two 27 m3 (Hitachi EX5600-6) shovels and a 19 m3 (CAT 994H) loader are used to excavate blasted materials. The loader provides flexibility for blending purposes. Pampacancha is expected to enter into production in 2019, and will require a loader at the start of the mining activities.

All phases have been designed to achieve high productivity, taking advantage of double-side loading and working at faces around ~60 meters in width.

16.6.4. HAULING

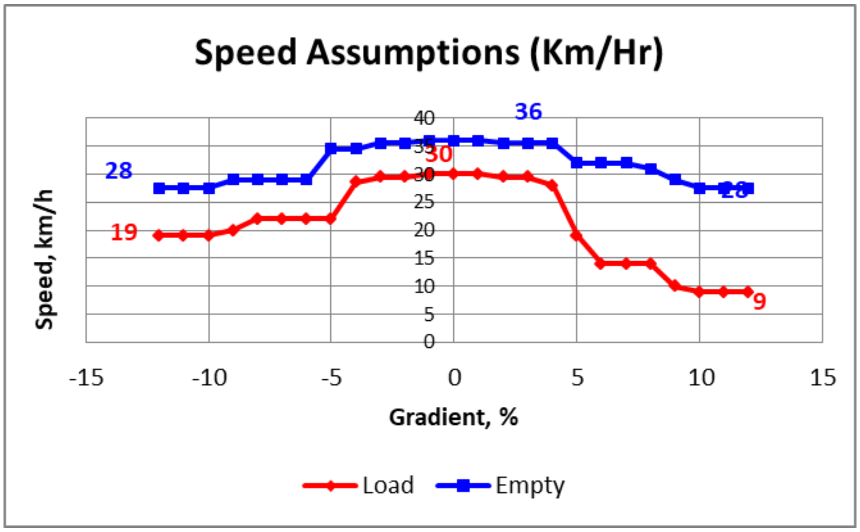
For life of mine, ore and waste will be transported by 240-tonne capacity haul trucks (CAT 793F). The use of this class of trucks minimizes road congestion, labor requirements, and operating costs. 240-tonne trucks require a minimum haulage road width of 32 meters. Haulage routes were designed to improve productivity and the operating hours needed per year. Table 16-18 and Figure 16-32 show parameters used in the truck & shovel study.

TABLE 16-18: TRUCK FIXED TIME

Load (min)	
Shovel	5.6
Loader	6.2

Dump (min)	
Crusher	2.3
WRF	1.3
TMF-AB	1.9
TMF-AR	1.9

FIGURE 16-32: TRUCK SPEED BY GRADIENT



16.6.5. SUPPORT EQUIPMENT

Major support equipment includes mine equipment that is not directly responsible for production but which is used on a regular basis to maintain pit and ex pit haul roads, pit benches, WRF and TMF and to perform miscellaneous construction work as needed. Mine support fleet equipment includes:

- Crawler dozers, D10T2 class;
- Rubber-tired dozers, 824K – 854K class;
- Motor graders, 32M – 16M class; and
- Water truck, 777G class.

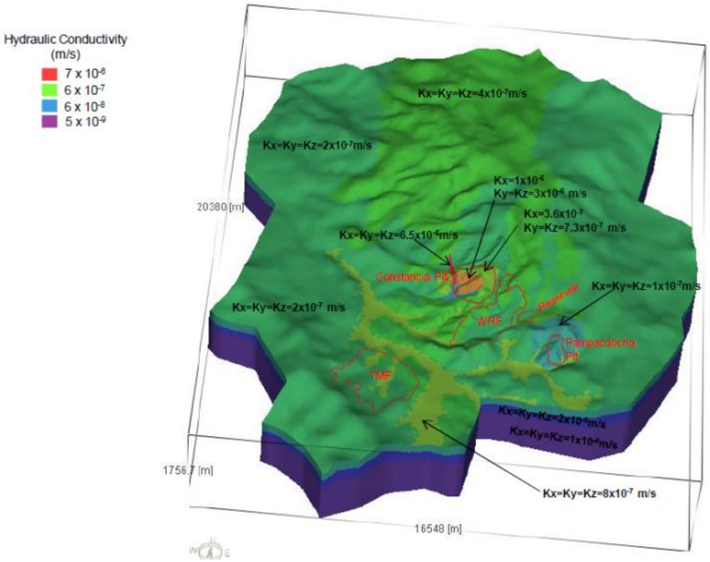
In general, the rubber-tired 854 and 824K-class dozers are used in the pit to clean up around the primary loading units, while the track dozers are used for haul road construction, pit development, WRF and TMF management, and final re-grading requirements. The graders and water trucks are used respectively to maintain roads and control dust.

16.7. MINE ENGINEERING

16.7.1. HYDROGEOLOGICAL PARAMETERS

A regional map of the estimated hydraulic conductivities covering both the Constancia and Pampacancha pits is presented in Figure 16-33.

FIGURE 16-33: PREDICTED HYDRAULIC CONDUCTIVITIES IN CONSTANCIA AND PAMPACANCHA PITS



CONSTANCIA PIT

The Constancia pit will operate from 2021 to 2037. At the end of mine life, the pit footprint at the surface will be approximately 15% larger, and the ultimate pit floor will be around 30 m deeper than the previous pit design (3,750 m elevation versus 3780 m elevation).

Predicted total dewatering rates for the Pit Expansion Design and the influence area should be close to 180 L/s as approved in the Groundwater Use Licence. The design was partially driven by the requirement for mine water supply. However, the main goal of dewatering is to depressurize the pit wall to assure the overall pit slope stability. Although the pit is slightly larger in the expanded design, the depressurization targets are expected to be less than the 100 m distance. Assuming the bedrock hydraulic conductivity at depths below 250 m is greater than 1 x 10-8 m/s, pit dewatering using a combination of vertical dewatering wells and/or horizontal drain holes should be feasible. Since limited hydraulic conductivity tests have been conducted below this depth, vertical wells and horizontal drain holes could be less effective if the hydraulic conductivities are inferior to10-8 m/s.

Suppose horizontal drain holes are used to achieve depressurization in targeted sections of the pit. In that case, it is expected that the drain hole spacing will range between 10 and 15 m (assuming a bedrock hydraulic conductivity of 1 x 10-8 m/s to 1 x 10-7 m/s). In the weak upper zones where higher hydraulic conductivities were observed, the spacing could be somewhat larger (~30 m) and the installation of vertical dewatering wells could be more applicable. The final spacing and length of the drain holes would be established and refined during operation by the phased installation of the drain hole system.

The number of vertical dewatering wells required to achieve depressurization would likely range between 15 and 50, based on the 2013 hydrogeological assessment and the subsequent recognition of reduced depressurization requirements. The actual number of wells will depend on the amount of depressurization required for slope stability and the hydraulic conductivity of the bedrock below 250 m depth. It is assumed that horizontal drain holes will likely be required below depths of 250 m. If in-pit wells are used, depending on the mine plan, wells may need to be progressively moved and replaced as the pit is widened and deepened. As mining progresses, optimization of the dewatering system will likely be necessary based on hydrogeological data collected from dewatering wells and the network of piezometers.

In practice, a staged approach to dewatering is applied where geological, structural, and hydrogeological information that is gathered at each stage of mine development is used to refine and optimize the dewatering activities. The staged approach focuses on dewatering efforts in areas of identified concern (i.e., poorly draining slopes with low factors of safety), and selecting the most appropriate method to mitigate high pressures, if present. This staged approach requires detailed monitoring of the dewatering progress, dewatering well-pumping rates, and pit inflows.

Dewatering progress is typically assessed by observations gathered from multi-level piezometers and monitoring wells that are installed at critical locations behind the pit walls. Monitoring of water levels in pumping wells is typically not sufficient for monitoring dewatering progress since well inefficiencies can cause the water level in the pumping well to be different from correct groundwater elevations near these installations.

PAMPACANCHA PIT

The hydrogeological model enabled the planning of the pit drainage strategy. As a result, the construction of five perimeter wells, which are to be implemented before mining, is required. These wells will be adapted to the requirements and geometry of the pit design.

Besides, in the first year of mining (2021), the two existing wells, constructed during the Feasibility Study and located inside the pit, will be used, contributing to the start of the draining process.

The expected flow rate will be increased as mining and pit exploitation progresses until a maximum speed of approximately 30 liters per second (L/s) is achieved. Based on the modeling undertaken, it is estimated that each well will have approximate flow rates varying between 5 – 12 L/s, depending on the local geology of each well.

To monitor the advancement of pit dewatering activities, it is recommended that three additional piezometers be installed to complement the network of existing piezometers already within the pit area.

17. RECOVERY METHODS

17.1. INTRODUCTION

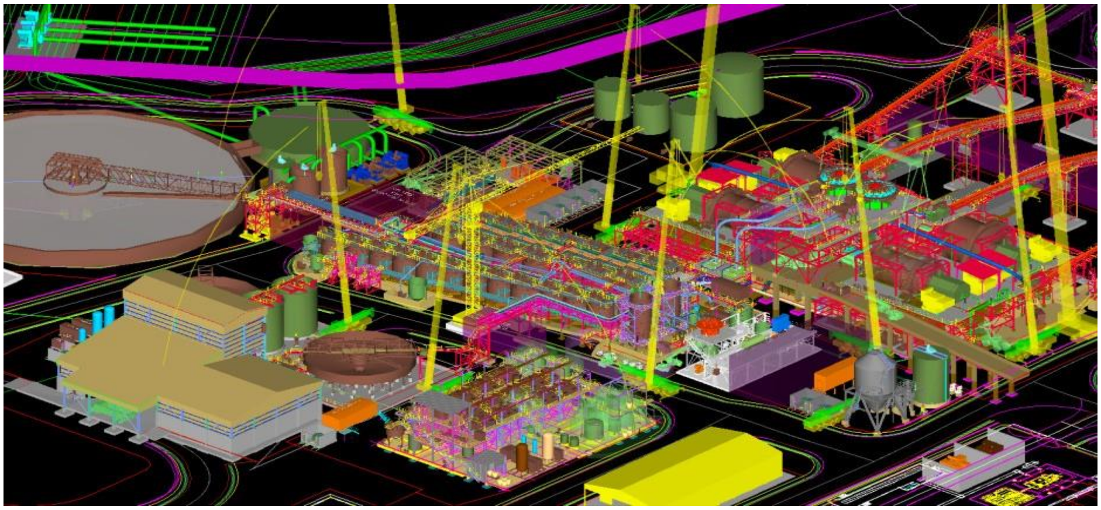
17.1.1. GENERAL LAYOUT AND FACILITY DESCRIPTION

The process plant and facilities have been designed by Ausenco (Australia, Canada and Peru regional offices). The design was based on the GRDMinproc DFS design, with one phase of optimization of the comminution circuit, followed by front end engineering and design (FEED), and detailed engineering as part of the EPCM contract.

The mine is located on mountainous terrain. The plant site was selected as being the closest site available to the mine that is both economical and practical to develop, but significant earthworks were required to establish a multi-tiered pad. The crushing facility is located on the hillside in order to minimize expensive ROM pad construction. The layout allows the crushing facility to be free-draining, hence limiting the amount of ground work maintenance during the rainy season.

The primary crusher, belt conveyors, thickeners, tanks, flotation cells, mills and other equipments are located outdoors without buildings or enclosures. To facilitate the appropriate level of operation and maintenance, the molybdenum concentrate bagging plant, copper concentrate filters and concentrate storage are housed in clad steel buildings. A 3D view of the plant in 3D is shown on Figure 17-1.

FIGURE 17-1: 3D VIEW OF THE CONCENTRATOR



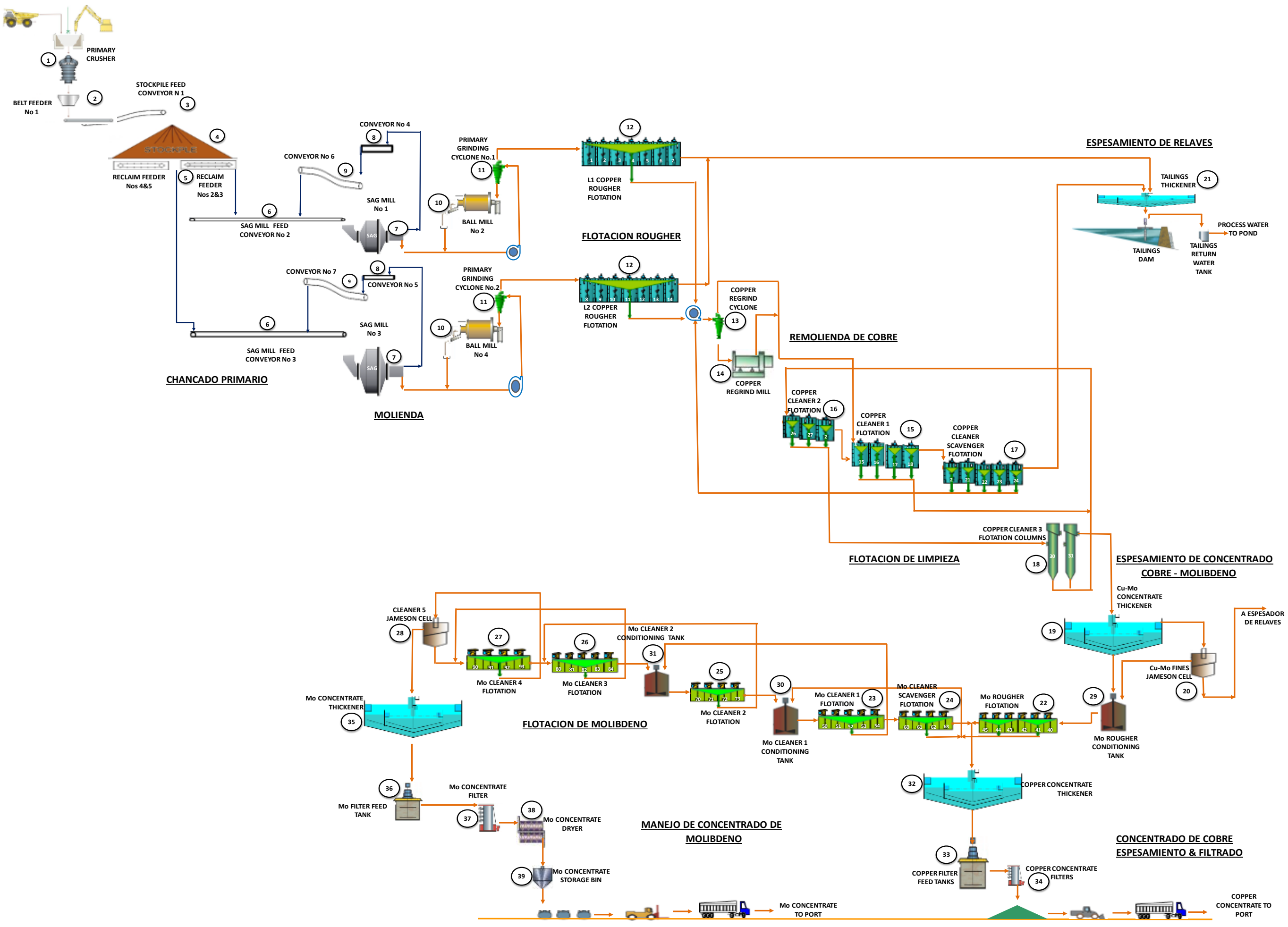
Ausenco designed the processing facilities according to the process design criteria presented in Table 17-1.

TABLE 17-1: KEY PROCESS DESIGN CRITERIA

Plant Design capacity	**Mt/a**	**30.8**
Copper feed grade	Max, Cu %	0.79
Copper feed grade	Average, Cu %	0.39
Molybdenum feed grade	Max, Mo g/t	202
Molybdenum feed grade	Average, Mo g/t	105
Primary crushing availability	%	75
Grinding availability	%	94
Design Bond Ball Work Index	kW-h/t	15.9
Primary crusher size	Inches kW	63 x 118 600
SAG mill size	Feet kW	36 x 26.5 16,000 x 2
Ball mill size	Feet kW	26 x 41 16,000 x 2
Rougher flotation cells	m³, nominal Number	300 14
Flotation cleaning column	Stages	2 Column Cells
Bulk concentrate thickener diameter	m	24
Copper concentrate thickener diameter	m	24
Molybdenum concentrate thickener diameter	m	4
Tailings thickener diameter	m	24

The process flowsheet for the Constancia recovery process, as represented in Figure 17-2, is similar to other major Copper-Molybdenum plants in Latin America.

FIGURE 17-2: CONSTANCIA PROCESS FLOWSHEET



LEYENDA			
Nro	CANTIDAD	DESCRIPCION	POTENCIA
1	1	**Primary Crusher** FLSmith 63´x118´	1000 kW
2	1	**Belt Feeder 01** - Largo : 22.080m - Ancho: 94"	300 kW
3	1	**Stockpile Feed Conveyor 01** - Largo : 480 m - Ancho: 1.8 m - Capcidad: 6000t/h	355 Kw x 2
4	1	**Stockpile** - Capacidad viva: 50 000t - Capacidad Total: 200 000t	No Aplica
5	4	**Aprom Feeders** - Long. Horizontal: 8.98m - Ancho de Placas: 1.8m	185 kW c/u
6	2	**Conveyor SAG Mill Feed (Nrs. CV2 & CV3)** - Largo : 650 m - Ancho: 1.6 m - Capcidad: 2300t/h	200kW c/u
7	2	**SAG Mill (Nrs. Mill 01 & Mill 03)** - Diametro: 36ft. - Largo: 26.5ft.	8 000 Kw (c/mill tiene 2 motores)
8	2	**Conveyor of Pebles (Nrs. CV4 & CV5)** - Largo : 229 m - Ancho: 1.05 m - Capacidad: 550t/h	37 kW c/u
9	2	**Conveyor of Pebles (Nrs. CV6 & CV7)** - Largo : 76 m - Ancho: 1.05 m - Capacidad: 550t/h	11 Kw c/u
10	2	**Ball Mill (Nrs. Mill 022 & Mill 04)** - Diametro: 26.5ft. - Largo: 41ft.	8 000 Kw (c/mill tiene 2 motores)
11	2	**Nest of primary cyclones (Nrs. 1 & 2)** - Cada nido conformado por 17 hidrociclones FLSmith Krebs. - Diametro: 26"	No Aplica
12	2	**Lines of flotation Rougher (L1 & L2)** - Cada banco conformada por 7 celdas Outotec 300m3 c/u	250kW
13	1	**Nest of cyclones of regrinding** - Nido conformado por 8 ciclones.	No Aplica
14	1	**Mill isamill** Isamill 1600L Capacidad: 331t/h	3 000kW
15	4	**Cells of the first cleaner** N° Cells: 4 - Capacidad por celda: 130m3	160kW
16	3	**Cells of the second cleaner** N° Cells: 3 - Capacidad por celda: 130m3	160kW
17	5	**Cells cleaner Scavenger** N° Cells: 5 - Capacidad por celda: 130m3	160kW
18	2	**Cells Column of third cleaner** - Diametro: 5m - Altura: 14m	No Aplica
19	1	**Cu-Mo Concentrate Thickener** - Diametro: 24m - Capacidad: 88.4t/h	15kW
20	1	**Cu-Mo Fines Jameson Cell** - Volumen de Operacion: 4m3	No Aplica
21	1	**Tailings Thickener** - Diametro: 75m - Capacidad : 3467t/h	45kW
22	6	**Cells WEMCO of Mo Rougher Flotation** - Capacidad: 28.3m3	55kW
23	5	**Cells WEMCO of Mo Cleaner 1 Flotation** - Capacidad: 14.2m3	30kW
24	4	**Cells WEMCO of Mo Cleaner Scavenger Flotation** - Capacidad: 14.2m3	30kW
25	4	**Cells WEMCO of Mo Cleaner 2 Flotation** - Capacidad: 14.2m3	30kW
26	5	**Cells WEMCO of Mo Cleaner 3 Flotation** - Capacidad: 8.5m3	22kW
27	4	**Cells WEMCO of Mo Cleaner 4 Flotation** - Capacidad: 4.3m3	15kW
28	1	**Cell Jameson Cleaner 5 of Mo** - Capacidad: 4m3	No Aplica
29	1	**Molybdenum Rougher Conditioning Tank** - Capacidad: 32.7m3	5.5kW
30	1	**Molybdenum Cleaner 1 Conditioning Tank** - Capacidad: 58m3	15kW
31	1	**Molybdenum Cleaner 2 Conditioning Tank** - Capacidad: 30.4m3	5.5kW
32	1	**Copper Concentrate Thickener** - Diametro: 24m - Capacidad: 88.4 t/h	15kW x 2
33	1	**Copper Filter Feed Tank**	45kW
34	1	**Copper Concentrate Filters (LAROX Filter)** - Numero de placas: 18 to 24	Prensado aire: 75kW Secado aire: 336kW
35	1	**Molybdenum Concentrate Thickener** - Diametro: 3.5m - Capacidad: 0.85t/h	55kW
36	1	**Mo Filter Feed Tank**	3kW
37	1	**Mo Concentrate Filters (LAROX Filter)** - Numero de placas: 3 to 4	Prensado aire: 13kW Secado aire: 56kW
38	1	**Mo Concentrate Dryer** - Capacidad: 12 t/h	2.2kW
39	1	**Mo Concentrate Store BIN** - Capacidad: 24ton.	No Aplica

HUDBAY	**FLOW SHEET PLANTA CONCENTRADORA CONSTANCIA**	Elaborado por:	**MICHAEL APARICIO/JESUS BONILLA**
		Revisado por:	**OSCAR ALVAREZ**
		Aprobado por:	**HUGO GRANADOS**

17.1.2. BUILDINGS

The following buildings were constructed as part of the facilities:

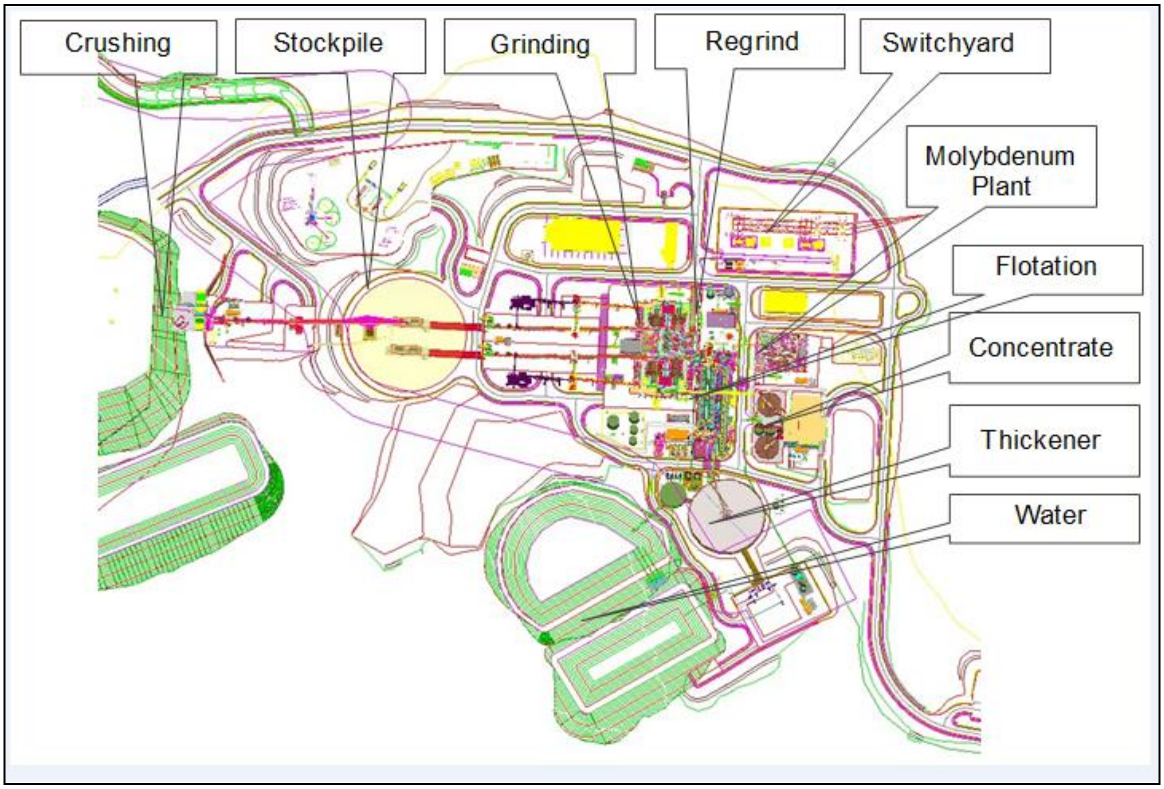
1) Office building – originally the EPCM offices on site. These were converted for general administrative offices.
2) Warehouse and workshop – the building shell was constructed as part of the original construction with services running to the building; however, completion was deferred to a later date. Process plant maintenance is working out of the construction shops originally set up for the SMP contractor. Warehousing is managed within a fenced platform near the process plant using construction structures put in place for commissioning.
3) A plant office building with a control room, server room, a DCS engineering station and a shift boss office.
4) A combined chemical and metallurgical laboratory building.
5) A crusher control room.
6) A combined copper concentrate filtration and storage building.
7) A molybdenum concentrates packing shed.

17.2. PROCESSING PLANT

17.2.1. GENERAL

The general layout of the processing plant is shown in Figure 17-3.

FIGURE 17-3: PROCESSING PLAN LAYOUT



The processing plant has been laid out in accordance with established industry best practices for traditional grinding and flotation plants. The major objective was to make the best possible use of the natural ground contours to minimize pumping requirements by using gravity flows and to reduce the height of steel structures.

To optimize the cost of the major footings for the SAG mill, the height of the SAG mill above grade was minimized by situating the cyclone feed sump as low as possible. The mill cyclones have been located so that the cyclone overflow can gravitate into the rougher conditioning tank.

At the tailing end of the flotation bank, the copper tailings thickener has also been situated to facilitate gravity flow and eliminate the requirement for another large set of pumps.

Due consideration has been given to the layout of the molybdenum plant to facilitate good housekeeping and occupational health and safety requirements. The potentially hazardous nature of the molybdenum bearing froth very often results in difficult housekeeping conditions within the work area. To this effect, the use of sodium hydrogen sulphide (NaHS) for copper depression and separation from molybdenum concentrate has the potential to generate hydrogen sulphide (H2S) gas.

The copper and molybdenum plants are independent of each other and separated by a reasonable distance. Furthermore, the molybdenum concentrator is located downwind of major high occupancy plant areas (prevailing wind on site is from the north). Similarly and given the fact that reagents can release hazardous gases, the storage facility is also located downwind of high occupancy plant areas, but close enough to the flotation area to avoid long runs of piping.

Due to these considerations the molybdenum plant is fenced out to strictly control personnel access. Similarly, a thorough training program has been put in place to educate anyone entering the plant about the hazards and safety procedures.

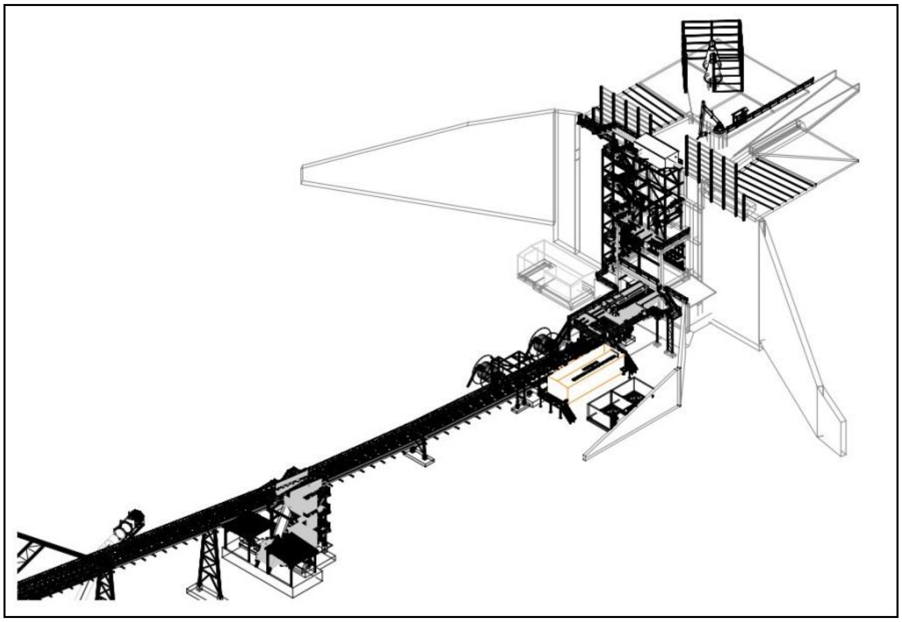
Rainwater runoff and general spillages from the processing plant are fully contained and directed to the process plant sediment pond. Again, the natural topography of the site is used to direct the flow to the pond, located at the western end of the site to avoid the need for pumps.

Wherever possible, the major substations and motor control centre (MCCs) have been located as close as possible to the electrical drives to minimize cable run lengths.

17.2.2. PRIMARY CRUSHING

A 63” x 118” gyratory crusher receives ROM of up to 1 m in size and reduces it to less than 125 mm (Figure 17-4). A variable speed belt feeder delivers ore from the crusher chamber to the coarse ore stockpile feed conveyor. The site mobile crane is used for major crusher maintenance. A drive-in dump pocket makes it possible to clear the crusher with a small FEL or bobcat.

FIGURE 17-4: PRIMARY CRUSHER ISOMETRIC VIEW

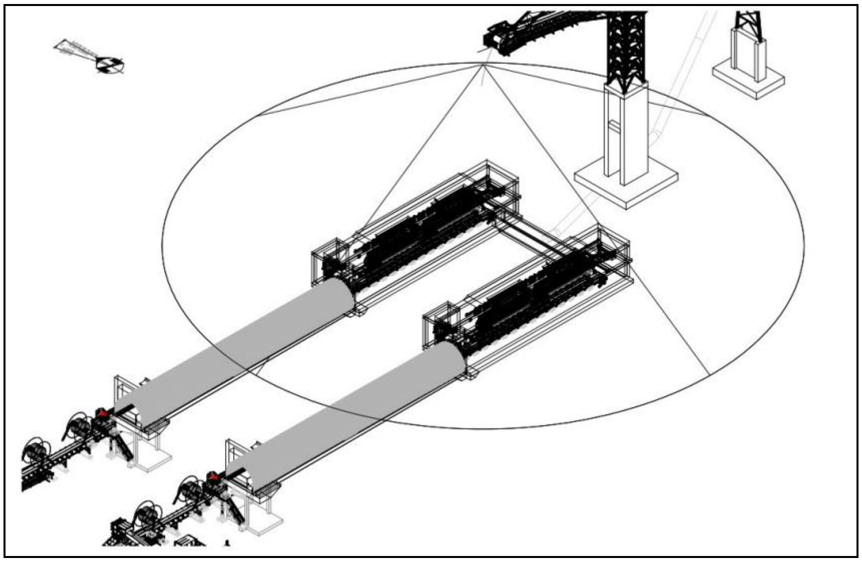


The crusher is an FLSmidth 63” x 118” gyratory crusher with a 1000 kW motor. This is likely to be under-utilized for most of the highly fractured ore, but will ensure throughput when processing an area of competent rock. The ROM bin and crusher surge pocket has the volume to hold 1.6 truck loads

17.2.3. CRUSHED ORE STOCKPILE AND RECLAIM SYSTEM

The grinding circuit requires two SAG mill feed conveyors (Figure 17-5). Dual reclaim chambers (near-parallel) are used to house a total of four apron feeders that draw ore from the crushed ore stockpile to the SAG mill feed conveyors. A secondary egress or emergency tunnel is provided through the connection of the two reclaim chambers.

FIGURE 17-5: COARSE ORE STOCKPILE ISOMETRIC VIEW



17.2.4. GRINDING

The grinding circuit consists of two trains of grinding mills, each train identical, treating 1875 t/h (Figure 17-6). Each train consists of a single FLSmidth semi-autogenous grinding (SAG) mill, a ball mill and a potential addition of a pebble crusher (SABC). The ball mills are operated in closed circuit with a FLSmidth (Krebbs) cyclone cluster to produce a product from the grinding circuit of 80% passing until 130 µm.

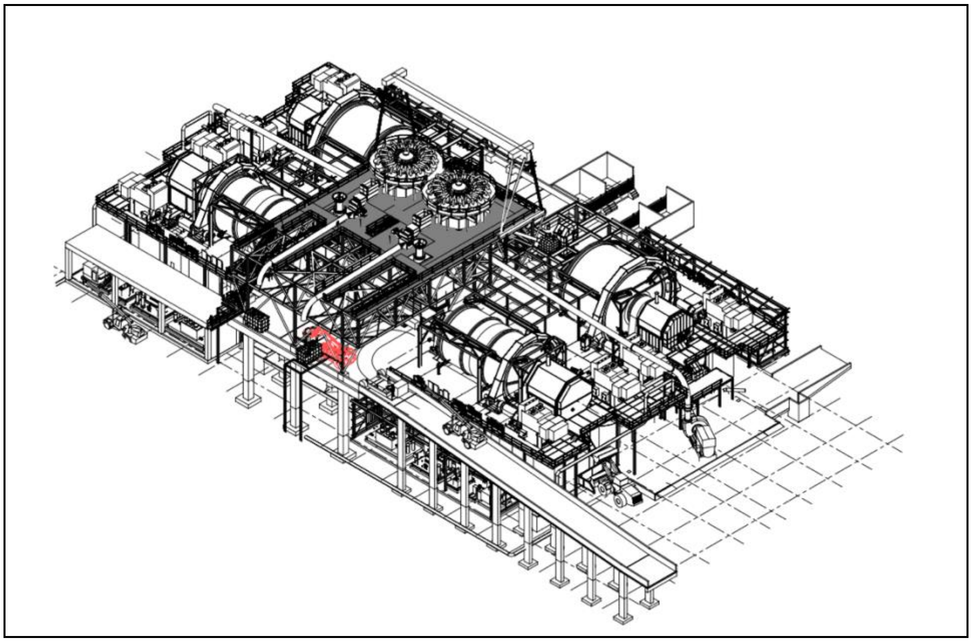
The SAG mills are fitted with a dual pinion drive system and are driven by a variable-speed drive comprised of a SER hyper-synchronous drive. The SAG mills are 11 m (36') dia, 7.3 m EGL (26.5'). Each SAG mill is driven by two 8 MW motors. The 16 MW, twin pinion, SAG mills were selected over the equivalent GMD to reduce both capital and commissioning costs.

The two 16 MW ball mills selected are fitted with twin pinion drives operated at fixed speed. The mills are 7.9 m (26.5') dia, 12.4 m EGL (41'). Like the SAG mills, each ball mill is driven by two, 8 MW motors. Each of the eight mill motors are interchangeable, and started using conventional liquid resistant starter circuits (although once started, the SAG mill SER system takes over control enabling limited variable speed control). The commonality of motors reduces the number of maintenance spares required to be held on site.

As a result of the processing of softer ores from Pampacancha during the 2021 through 225 period, the installation of the pebble crushers, originally contemplated for year 6, has been deferred until at least 2023. The pebble crushing system originally considered two hydrocone or shorthead pebble crushers with 600 kW drives each; however, the exact type and sizing of the equipment is under review based on current plant performance and may change during the early works engineering period.

Each grinding train was originally configured with a single (duty only), 1.5 MW Warman 650 MCR M200 variable speed cyclone feed pump but since commissioning a larger-capacity Excellence ESH-650MU was installed as a trial unit on grinding line 1. Pending successful results, the other line will be upgraded. A full spare assembly is held on site and changed out when required. The layout allows for the flexibility to recycle cyclone underflow to the SAG mills; a single "drive-on" grinding floor; a simple cyclone tower; clear access to the wet end pumps; and clear access to scats clean-up from the ball mill.

FIGURE 17-6: GRINDING CIRCUIT ISOMETRIC VIEW



The capital cost was reduced by not installing standby cyclone feed pumps. Spare units can be installed in approximately six hours. Easy access by mobile cranes is provided and it is possible to only change the wet end of the pump which minimized downtime.

17.2.5. CU-MO BULK FLOTATION

The function of the copper flotation area (Figure 17-7) is to recover copper and molybdenum into a bulk concentrate, while rejecting coarse non-sulphide gangue to the rougher tailings and rejecting zinc, lead and iron sulfides to the cleaner scavenger tailings stream.

Slaked lime is added in the grinding circuit to ensure the rougher circuit pH is maintained at its set value. Cyclone overflow from each of the primary grinding hydrocyclone batteries, comprised of Weir-Vulco Cavex CVX13 hydrocyclone, reports via gravity to the corresponding bulk rougher circuit. The bulk flotation consists of two copper rougher flotation banks, each consisting of seven Outotec 300 m3 forced air mechanical flotation cells, operated at a pH of approximately 10. These produce a low-grade rougher concentrate containing copper, silver, gold, molybdenum and other nonvaluable sulfide and gangue minerals, which reports to the regrind hydrocyclone feed sump. The bulk tailings flow by gravity to the tailings thickener for water recovery and eventual disposal at the TMF. Spillage and clean-up water are removed by two rougher flotation area floor sump pumps.

The bulk rougher concentrate is pumped to a hydrocyclone cluster. The coarse hydrocyclone underflow is pumped to the bulk cleaner regrind mill, consisting of a 3 MW Glencore Technologies M10,000 IsaMill.

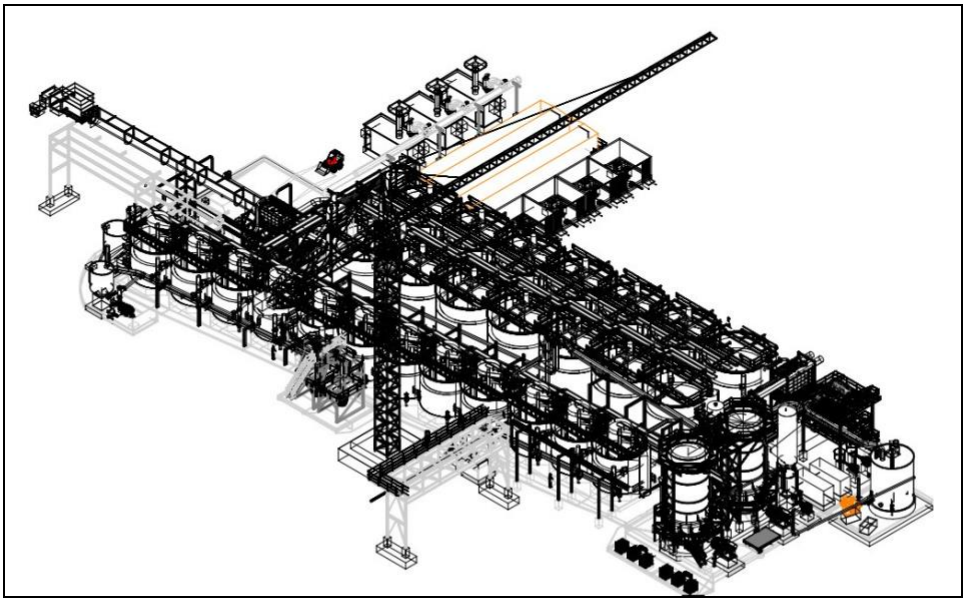
The regrind mill discharge is combined with the hydrocyclone overflow and pumped to the first bulk cleaner flotation cell. In the bulk cleaner circuit, the pH is increased to 11.0 with slaked lime.

The copper cleaner circuit consists of three stages of cleaner and one stage of cleaner-scavenger flotation cells. The first cleaner stage consists of four Outotec 130 m3 forced air flotation cells. The second consists of three Outotec 130 m3 forced air flotation cells, and the cleaner-scavenger consists of six Outotec 130 m3 cells. The third cleaners are comprised of two Eriez CPT column flotayion cells, each 4.88m diameter by 12m tall and equipped with wash water.

The flowsheet is as standard counter-current configuration with scavenging. Intermediate concentrate from the first cleaner reports to the second cleaner feed sump, while the tails report to the cleaner-scavenger stage. Cleaner-scavenger concentrate returns to the regrind and cleaner-scavenger tails combines with the rougher tails and reports to the tailings thickener. Concentrate from the second cleaner reports to the third cleaners, and concentrate from the third cleaners reports to the 24.0m diameter bulk concentrate thickener. Third cleaner tails report to the second cleaner and second cleaner tails report to the first cleaner.

The column cells are supplied with dedicated high-pressure forced air and the mechanical flotation cells are supplied with low pressure air from dedicated low pressure air blowers.

FIGURE 17-7: CU-MO FLOTATION CIRCUIT ISOMETRIC VIEW



17.2.6. CU-MO FLOTATION ARRANGEMENT

The cleaning circuit, consisting of 1st, 2nd and scavenger flotation stages is arranged in a counter current arrangement, whereby the largest flow, the tails, flows by gravity from one stage to the next. All cells are the same size. The concentrate launders and pumps are all arranged on the outside of the plant to allow for easy maintenance access. This arrangement also allows for the number of cells in each stage to be modified, with some minor pipework changes, during operations.

To reduce capital costs and improve the overall plant, the volume held in each sump has been minimized.

Under normal operating conditions, the slurry that is collected under the flotation areas is composed of concentrate overflowing from the top of the cells. This is collected and pumped from the sump pump area back into the process.

During routine shutdowns or power failures, the mechanical cells can stop and do not need to be drained. For maintenance, it will be occasionally necessary to dump the contents of the flotation cells.

Since the value of the slurry in each rougher cell is low, the sump is not designed to contain an entire cell. In a typical maintenance shutdown the slurry dumped from the rougher cells is expected to be pumped to tails by the rougher area sump pump. In exceptional cases, i.e. emergencies, if this pump fails or if there is no power, then the rougher slurry will overflow the sump and runs along a channel to the plant run off pond.

In the case of the 3rd cleaner columns, the sump has enough volume to hold one of the two columns. When the plant is down for more than three to four hours then the columns will need to be drained. If the sump pump is down then the sump will over flow into the 2nd cleaner sump.

17.2.7. MOLYBDENUM SEPARATION

The function of the molybdenum flotation area (Figure 17-8) is to recover molybdenum into a molybdenum concentrate and reject copper to the tailings as a copper concentrate. The stages of molybdenum flotation are: rougher, 1st to 5th stage cleaners and cleaner scavengers.

Underflow from the copper-molybdenum concentrate thickener is pumped to a 38 m3 agitated molybdenum rougher conditioning tank. NaHS is added to the conditioning tank to inhibit the flotation of copper, with promoter (diesel emulsion) also added to enhance the flotation of molybdenum. From there the overflow flows to the ten 10 m3 molybdenum rougher flotation cells. The tailings from the rougher cells form a portion of the copper concentrate and are pumped, with the molybdenum cleaner scavenger tailings, to the copper concentrate thickener. The molybdenum rougher concentrate reports to the molybdenum 1st cleaner flotation cells.

All of the molybdenum cells, other than the final cleaner, will be WEMCO type self aspirating cells from FLSmidth.

The molybdenum cleaner circuit consists of five stages of cleaning and one bank of cleaner scavenger flotation cells. The molybdenum 1st stage cleaner consists of six 28.3 m3 mechanical flotation cells. From these, a concentrate containing molybdenum values is recovered and flows to the molybdenum 2nd stage cleaner flotation cells for further upgrading. The tailings from the molybdenum 1st stage cleaner flow to the four 14.2 m3 molybdenum cleaner scavenger flotation cells.

The molybdenum 2nd stage cleaner flotation consists of four 14.2 m3 flotation cells. From the flotation cells the concentrate reports to the molybdenum 3rd stage cleaner flotation cells for further upgrading. The tailings from the molybdenum 2nd stage cleaner flotation cells reports to the molybdenum 1st stage cleaner flotation cells.

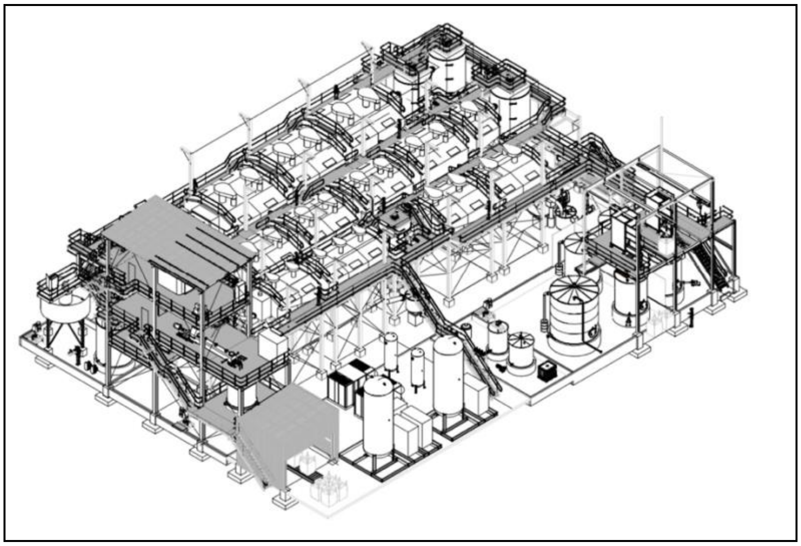
The molybdenum 3rd stage cleaner flotation consists of five 8.5 m3 flotation cells. From the cells, the concentrate reports to the molybdenum 4th stage cleaner flotation cells for further upgrading. The molybdenum 3rd stage cleaner tailings report to the molybdenum 2nd stage cleaner flotation cells.

The molybdenum 4th stage cleaner flotation consists of four 4.3 m3 flotation cells. The cells produce molybdenum concentrate which reports to the molybdenum 5th stage cleaner flotation cells. The tailings from the molybdenum 4th stage cleaner cells reports to the molybdenum 3rd stage cleaner flotation cells.

The molybdenum 5th stage cleaner flotation consists of a single 4 m3 Xstrata Jameson flotation cell. The cell produces the final molybdenum concentrate. The tailings from the molybdenum 5th stage cleaner cell reports to the molybdenum 4th stage cleaner flotation cell.

The molybdenum cleaner scavenger consists of four 14.2 m3 mechanical flotation cells. A low-grade concentrate is recovered and is pumped back to the copper/molybdenum feed conditioner tank. The tailings from the molybdenum cleaner scavenger are pumped to the copper concentrate thickener. Spillage and water are removed by a sump pump in the flotation building.

FIGURE 17-8: CU-MO SEPARATION CIRCUIT ISOMETRIC VIEW

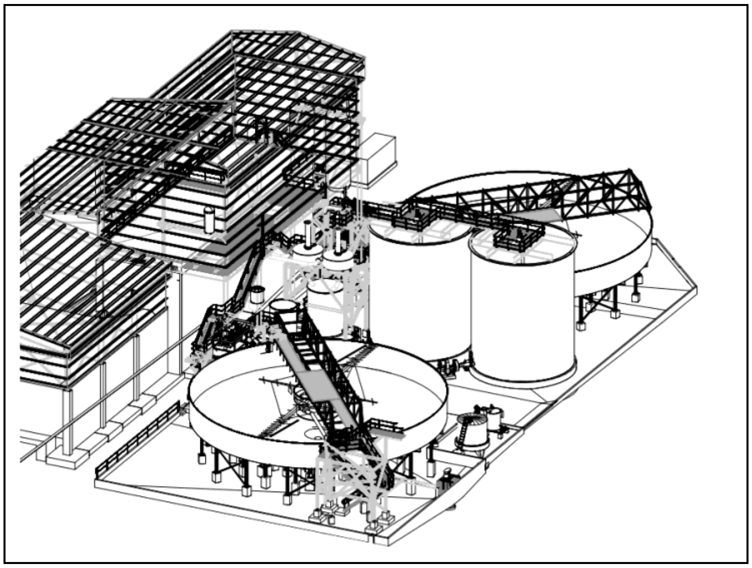


17.2.8. COPPER CONCENTRATE THICKENING AND FILTRATION

The tailings from the molybdenum flotation roughers and molybdenum cleaner scavengers report to a 24m diameter copper concentrate thickener (Figure 17-9), via a static screen to remove tramp material. Flocculent is added to enhance settling. The clarified thickener overflow reports to the process water pond, to be pumped to the process water tank. The thickener underflow is removed at 60% solids via duty/standby peristaltic pumps.

The thickened and de-tramped slurry is stored in two 860 m3 agitated tanks. These provide a 24 hour surge capacity, allowing filter maintenance to be conducted without affecting mill throughput. The filter feed is pumped to one of two LAROX horizontal plate pressure filters with a combined maximum filtration rate of 91.2 t/h. The filters operate with a total cycle time of 9.8 min and are designed to produce a filter cake of less than 8.5% moisture. The filter cake is dropped to the floor and then transferred to the concentrate storage pile by a front-end loader. Filtrate, cloth wash, and flushing water are returned to the copper concentrate thickener.

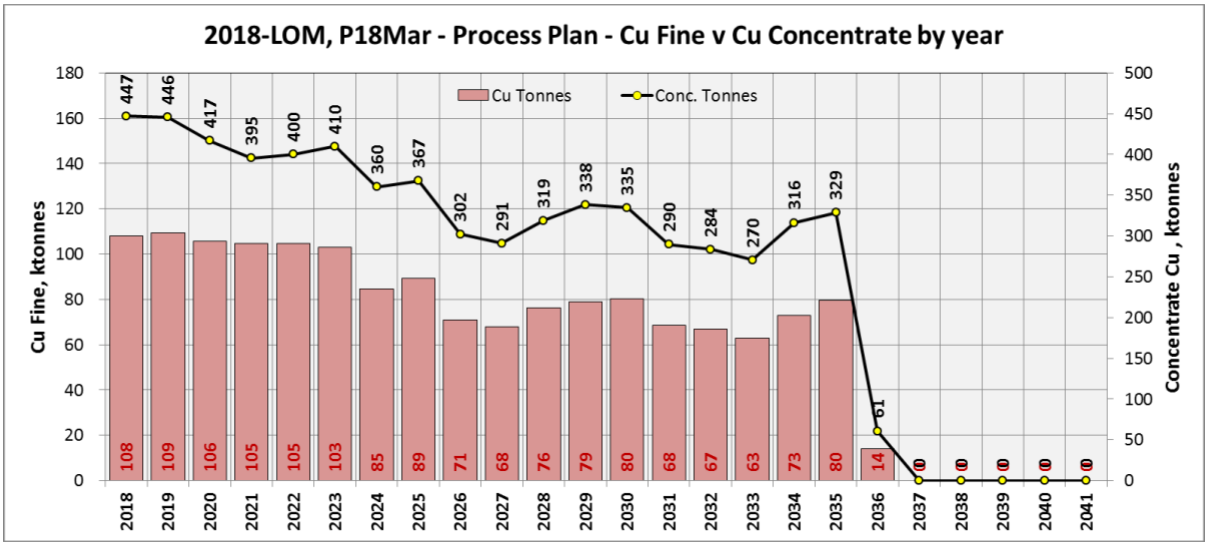
FIGURE 17-9: CU CONCENTRATE THICKENING AND FILTRATION AREA ISOMETRIC VIEW



17.2.9. COPPER CONCENTRATE STORAGE AND LOADOUT

Annual concentrate production rates are showed at Figure 17-10

FIGURE 17-10: LOM COPPER CONCENTRATE PRODUCTION



After filtering, the copper concentrate is transferred to a copper concentrate product storage stockpiles by front end loader inside the copper concentrate and load-out building. The building contains a live stockpile with capacity for seven days production (12,000 t).

A fleet of approximately 140 tractor trailers, each with 36 t hauling capacity, are used to transport the concentrate to the port. A single front-end loader is used to collect concentrate as it falls from the filters and either load it directly onto the trucks or temporarily store it in the same building. The trailers are fully enclosed units with pneumatically operated lids. Locks and security seals are applied at site. A truck scale weighs each truck before leaving site and upon arrival in Matarani. One primary contractor is used for the base load with surge capacity being made up with several smaller contractors.

The trucks have a two day round trip from site to the port and back, depending upon road conditions. Rigorous control procedures are applied during transport including separate escorts, GPS tracking and monitoring, controlled resting periods for the drivers, and secure stopping points en route. The position and velocity of every convoy is monitored continuously from the security control center in Constancia.

17.2.10. MOLYBDENUM CONCENTRATE THICKENING, FILTRATION AND LOADOUT

The molybdenum concentrate gravitates to a 4 m diameter thickener where it is thickened to 60% solids. The thickener overflow reports to the molybdenum process water tank, where it is used as process water in the molybdenum flotation circuit. The thickened concentrate is pumped to an agitated 48 m3 molybdenum surge tank, which has a residence time of 24 hours and acts as surge capacity for filtration.

The slurry is then pumped to a pressure filter to produce a filter cake of approximately 15% moisture, the next stage is the drying stage where we can obtain concentrate of 5% moisture. Filter cake is conveyed by a bobcat to the molybdenum bulk bagging plant. Molybdenum concentrate is bagged into 1 m3 bulk bags. The bulk bags are loaded onto trucks using forklifts.

The filtrate from the filter reports to the tailings thickener. The thickener overflow flows by gravity to the process water tank.

17.2.11. TAILINGS DISPOSAL

The copper tailings flow by gravity from the two copper rougher tailings lines, and by pumps from the cleaner scavenger tailings line, to a 75 m diameter tailings thickener, where it is thickened to 58% solids. Thickened underflow is then pumped to the tailings dam. The thickener overflow gravitates to the process water tank where it is used in the grinding and copper roughing circuits.

The tailings pumping system consists of five centrifugal pumps in series with an HDPE lined steel pipe that crosses the Chilloroya valley. The pumping station at the plant site is designed to take tailings thickener underflow and dilution water and pump the mixture to the tailings dam on the other side of the valley. The pipeline follows the haul road route to save costs, increase maintenance access and reduce land disturbance. The road is built at low slope angles, typically less than 10%. The tailings pipeline has a maximum inclination of 12%. This is less than the angle of repose of the settled solids in the slurry, which is 15°. Consequently, if there is an un-programmed shutdown, for example a power outage, the slurry can sit in the line without having to be discharged or flushed. To reduce the risk of plugs during startup, all of the pumps in the pump station are fitted with variable speed drives.

The tailings pumping train can operate with as few as three pumps in operation allowing for extended maintenance times and coordinating with mill liner changes to minimize downtime. Under a normal scheduled stoppage, process water will be used to flush the solids from the line into the tailings dam.

17.2.12. REAGENTS

The reagents area is located to the west of the grinding and flotation areas.

Coarse lime and flocculent are delivered as solids to the reagents area by road trucks and stored in the reagents building.

A packaged flocculent mixing plant prepares flocculent for storage in an agitated tank for distribution. Other powdered reagents are mixed in agitated tanks before storage in tanks for distribution.

Liquid flotation collector and frother are received in one cubic meter iso-containers that are stored in the reagent store and taken by forklift to the reagent dosing area as required. The use of iso-containers also allows for placement in the grinding or flotation areas for flexibility in reagent dosing and plant scale testing.

Reagents are distributed by duty/standby pumps or multiple peristaltic metering pumps along flexible small diameter tubing (or by gravity in the case of temporary dosage by placing iso-containers within the grinding and flotation areas). Spillage and water are removed by the reagents area sump pump to tailings.

A diesel/fuel oil emulsion preparation facility allows addition of small doses of this reagent for molybdenum promotion while assuring even dosing in the slurry.

Lime silo and attrition mills prepare milk of lime for pH adjustment. Lime is distributed by a lime ring to the dosing points. Spillage and water are removed by a lime slaking area sump pump.

Nitrogen for blanketing the molybdenum separation cells is supplied by a pressure swing adsorption plant on site.

Carbon dioxide that will be used for pH regulation in the molybdenum plant is supplied in tanks.

NaHS is delivered as a concentrated liquid by tanker. It is diluted with water onsite for dosing. The decision to not have solid NaHS preparation facilities onsite was made to reduce CAPEX, reduce safety risks and reduce the working capital and management issues of storing solid NaHS.

Hydrogen sulphide gas that comes from the NaHS is extremely toxic. Sensors and suitable engineering controls have been designed in order to use NaHS safely in the plant.

17.3. TYPICAL OPERATING PARAMETERS

The current level of reagent, power, water and grinding media consumption rates are shown in Table 17-2

TABLE 17-2: OPERATING PARAMETERS

Item	Section	Item	Value	Unit
Reagent	Grinding	Quicklime	1000	g/t fresh feed.
Addition	Cu Flotation Cu	Primary Collector (Matcol 251M) Secondary Collector (D101) Frother (RE-100) Depressant	17 12 30	g/t fresh feed. g/t fresh feed. g/t fresh feed.
	Flotation Mo	(NaHS) Promoter (Diesel Emulsion) Carbon Dioxide	6500 10 36	g/t circuit feed. g/t circuit feed. g/t circuit feed.
	ConcentrateThickeners	Flocculant (Superfloc A-130)	10	g/t thickener feed
	Tailings Thickener	Flocculant (Ixofloc 1070 and Matfloc 100M)	18	g/t thickener feed
Power Consumption	Plant	Electrical Load	636,000	MW-h/y
	Raw Water	Annual Average Flow	0.88	Mm3
Water	Requirement	Planned Average Flow	98	m3/h
		Instantaneous Flow	107	m3/h
Grinding Media	Grinding	SAG mill media	315	g/t
		Ball mill media	500	g/t
		Regrind media	63	g/t

17.4. METALLURGICAL ACCOUNTING AND CONTROL

The plant normally runs in automatic mode whereby all major units are monitored and maintained by the DCS system logic.

The plant operations are monitored and controlled from a central control room that is located between the grinding, flotation and regrinding areas. This control room has CCTV views of different plant areas and DCS views of all the plant equipment, valves and instrumentation. DCS interfaces have also been placed in the crusher control room, molybdenum plant control room, and the flotation deck. In 2019, a centralized control room was installed at the main camp, and control room operators were moved there. The onsite control rooms remain operational for redundancy.

Plant operations are facilitated by two online stream analysers (Outotec Couriers with stream multiplexers). These units constantly measure the principal streams for elements of interest and transmit the results to the operations and metallurgical staff for plant control.

Metallurgical accounting is achieved by shift composite sample analysis in the site laboratory. The samples are taken from the cyclone overflow, rougher tailings, cleaner scavenger tailings and overall tailings.

Flows are accounted for by weightometres on the SAG mill feed conveyors and flow metres on the concentrate and tailings flows.

Final concentrate tonnage is controlled by weigh bridges that weigh trucks as they leave site and arrive at the port. A weightometer on the ship loading conveyor measures the concentrate weight loaded onto the ships.

17.5. OPTIMIZATION PROJECTS

17.5.1. PEBBLE CRUSHING

Prior to operations, it had been identified that the ore hardness would progressively increase, and the installation and commissioining of the pebble crushing system was originally scheduled for 2021. However, with the addition of softer Pampacancha ores, the installation of the pebble crushing systems is now scheduled for 2023 (commissioning in 2024). The timing will be further refined pending completion of ongoing geometallurgical studies. The pebble crushers, shown in Figure 17-11, are expected to cost approximately $23 million (

Table 17-3).

FIGURE 17-11: 3D RENDER OF THE PEBBLE CRUSHER INSTALLATION

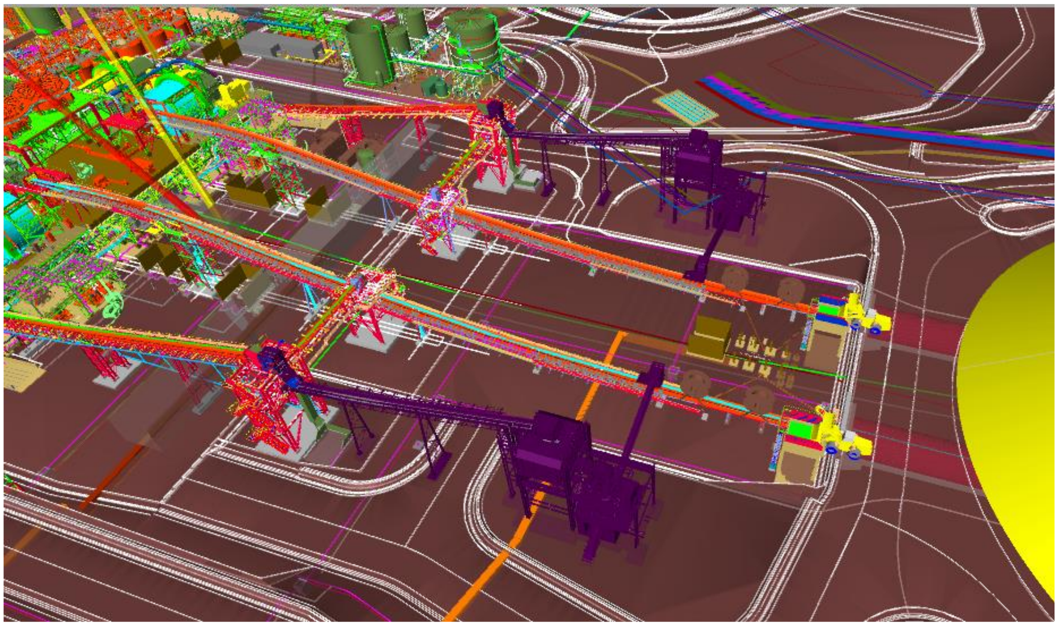


TABLE 17-3: CAPITAL COST SUMMARY FOR PEBBLE CRUSHING

PEBBLE CRUSHER BUDGET		
DESCRIPTION		**AMOUNT**
Direct Costs:	**$**	**12,034,576**
Civil	$	378,872
Structural	$	760,828
Mechanical	$	6,533,775
Plate Work	$	700,245
Piping	$	982,899
Electrical	$	264,543
Instrumentation	$	6,497
Other	$	2,406,917
Indirect Costs:	**$**	**4,555,947**
Project Prelims	$	1,083,112
Camp Operating Costs	$	584,537
EPCM	$	2,888,298
Contingency - 40% directs + indirects:	**$**	**6,636,209**
Total Budget - Pebble Crushers:	**$**	**23,226,732**

17.5.2. GRINDING

Optimization work around the grinding circuit is ongoing, focused primarily on throughput and grind optimization, process control integration, and SAG and ball mill configuration. Current or near-future optimization projects include:

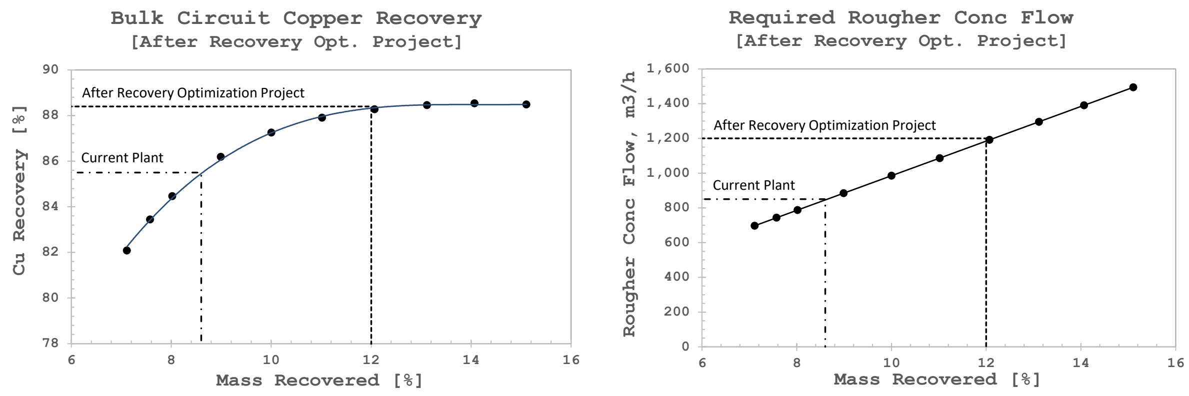
- Geometallurgical hardness characterization of the Constancia deposit, including 500 samples tested for SAG Grindability Index and Bond Work Index. The 500 samples represent the near term (5 years) ores and will be used to optimize the engineering and installation of the pebble crushing systems and better inform the decisions around SAG mill discharge system configuration and ball size.
- Geometallurgical hardness characterization of the Pampacancha deposit, including 100 samples tested for SAG Grindability Index and Bond Work Index.
- Conversion of the SAG mill discharge system to fully curved pulp lifter design with 60mm grates, including Growth recommendation of liner and discharge cone configuration. The proposed discharge system was modelled extensively by Molycop, Growth, and third-party consulting firms.
- Completion of CiDRA PST system install and tuning and the extension of the advanced process control system to include smart cyclone selection.
- Integration of Advanced Process Control system (Expert System) in the ball mill circuit, including hydrocyline feed flow and pressure control and SAG mill throughput permissives based on ball mill circuit constraints.
- Implementation of the shell-mounted LoadIQ smart mill load system on the second grinding line (it has been installed succesfuly on one grinding line).

17.5.3. BULK FLOTATION

17.5.3.1. COPPER RECOVERY

The flotation optimization project derives from the simulation work (described in Section 13.2.2) and consists of a series of upgrade projects that will allow for an increase in the volumetric flow capacity of the of the rougher concentrate. The higher rougher mass recovery will allow for an increase the copper recovery equivalent to almost 3% at nominal feed grade and tonnage/grind conditions of the plant, as shown in Figure 17-12. To achieve this nominal recovery uplift, rougher mass recovery will be increased from approximately 8.5% to approximately 12% for nominal head grades (mass recovery fluctuates with head grade, grind size, and mineralogy).

FIGURE 17-12: ROUGHER MASS RECOVERY VERSUS COPPER RECOVERY (LEFT) AND VERSUS ROUGHER CONCENTRATE MASS FLOW (RIGHT)


Bulk Circuit Copper Recovery [After Recovery Opt. Project]

Required Rougher Conc Flow [After Recovery Opt. Project]

The upgrade projects include:

- Installation of froth crowders and center launders in the first four rougher cells of each row
- Upgrade or twin the concentrate pumping system as required and permittable
- Upgrade the regrind cyclone feed pump as required and permittable
- Upgrade the regrind cyclone to allow for higher treatment capacity
- Increase the power draw of the regrind mill
- Bypass cleaner-scavenger concentrate to 1st cleaner
- Evaluate and, if required, upgrade the 1st cleaner and cleaner-scavenger dart valves
- Installation of froth crowders and center launders on the cleaner-scavenger cells
- Conversion of the column cells to operate in serial configuration with concentrate cleaning
- Install froth dearation system ahead of the column feed pump to eliminate air locking

The estimated capital budget for the recovery projects is $7.85 million, Table 17-4.

TABLE 17-4: CAPITAL BUDGET FOR RECOVERY PROJECTS

Item	Project	Year	CAPEX (000 USD)
P-04	Rougher Launders	2021	1,500
P-05	Cleaner-Scav Launders	2021	1,530
P-06	Rougher/Cleaner Pumps	2021	2,340
P-07	Regrind Cyclones	2021	1,330
P-08	Isamill spacers & power upgrade	2021	150
P-09	Splitters - WPM Sampling	2022	1,000
	Subtotal		**7,850**

17.5.3.2. COPPER CONCENTRATE QUALITY

Current work on concentrate quality is focused on reducing levels of zinc and lead contanimants and increasing copper concentrate grades. This includes:

- Evaluation of alternative, more selective reagents that will improve the effectiveness of depressants in the cleaners, reduce the pH and lime consumption, and increase the molybdenite recovery. At the time of writing, the study is currently in the Phase 2 plant trial stage.
- Reduce the regrind size by increasing the Isamill power draw, improving the separation efficiency of the regrind hydrocyclones, and balancing the mass split to the regrind mill and hydrocyclones. This will reduce the mass of contaminants that are recovered due to locking with chalcopyrite.
- Evaluation of lead and zinc depressants in the cleaning circuit. At the time of writing, the work is in the Phase 1 laboratory testing phase.

17.5.4. COPPER/MOLYBDENUM SEPARATION

Current work in the moly flotation circuit is focused on increase molybdenum recovery from copper concentrate, improving molybdenum concentrate quality, and reducing operating costs by minimizing the consumption of sodium hydrosulfide, energy, and other consumables. Projects include:

- Installation of improved forced-air agitation mechanisms in the roughing cells, completed early 2021. The new mechanisms will allow for a much greater degree of fine level control at the low operating gas rates necessary in moly separation circuits.
- Installation of improved forced-air agitation mechanisms in the 1st cleaning and cleaner-scavenging stage, scheduled for completion during the first half of 2021
- Implementation of automatic density control in bulk, copper and molybdenum thickening stages to improve water recovery and usage in the moly plant and thereby reduce sodium hydrosufilde consumption
- Installation of a new, upgraded nitrogen plant to reduce sodium hydrosulfide consumption
- Review flowsheet and potential flowsheet modifications, pending survey and simulation program after completion of agitator upgrade project.

17.5.5. OTHER PROJECTS

Other ongoing projects focused on improving the economic performance of the Constancia operation include:

- Shovel-based XRF ore sorting pilot trial program to evaluate potential of bulk ore sorting. Phase 1 and Phase 2 have been completed and the technology has shown that, in principal, it has the potential to significantly improve the economic returns by upgrading the head grade to the . Ongoing studies are focused on developing a pilot-scale technical demonstration onsite and further quantifying the additional capital and operating costs associated with the face and truck sorting operations.
- Various ongoing geometallurgical characterization projects, including flotation charactization and optimization of the Constancia and Constancia Norte deposits

18. PROJECT INFRASTRUCTURE

The project infrastructure facilities include the Waste Rock Facility (WRF), Tailings Management Facility (TMF), the water management facility, electric power supply and transmission, and improvements to the roads and the port. Hudbay is in charge of these facilities' planning and operation (excepting the roads and port) and is working with different consultants for the engineering, construction and quality control/quality assurance (QA/QC) for their expansion.

An overall site layout is provided on Figure 16-1 showing the various storage facilities' locations relative to the Constancia and Pampacancha mines and the mill.

18.1. TAILINGS, WASTE AND WATER STORAGE

Hudbay is managing the planning, construction and operation of the Tailings Management Facility (TMF) and the Waste Rock Facility (WRF) with design and engineering support from Knight Piésold , also as Engineer of Record (EOR) of those structures.

18.1.1. TAILINGS MANAGEMENT FACILITY (TMF)

The TMF has been developed behind an east to west aligned, zoned landfill and rockfill cross-valley embankment dam that is expected to be raised in stages over the mine's life and has sufficient capacity to accommodate the tailings generated over the current LOM plan. The tailings are expected to be impounded behind the south side of the embankment in a basin that contains two natural valleys running north to south that is separated by a central ridge. The TMF is located on the south side of the Chilloroya River and has a final design elevation of 4,190 masl. The TMF has two stages. The first was designed by KP (engineering detail) at 4,160 masl and the second stage design by Golder (pre-feasibility study) that rises from 4,160 to 4,190 masl without moving the previous footprint.

Tailings have been deposited from designated off-take points from a distribution pipeline located along the upstream crest of the dam and around the perimeter of the facility, and are delivered through drop-bar pipes running down the upstream face of the embankment and down the valley perimeter slopes into the TMF. The points of active deposition have been frequently rotated to form a thin layered, drained, and well-consolidated beach that will slope away from the dam towards the south side of the TMF basin. Initially, the surface pond was located against the embankment in the east valley and has been displaced progressively upward and to the south by the development of the tailings beach. The surface pond will vary in size throughout the life of mine depending on the season, precipitation, and operational requirements.

The design of the TMF includes a LLDPE geomembrane liner and underdrains. The liner is intended to cover the base of the entire eastern valley and a majority of the western valley to provide containment in areas where the surface water pond will contact the bottom at any time over the life of mine. The liner will also be extended up the embankment's upstream face to the top of the downstream constructed raise. Underdrain systems include groundwater underdrains beneath the liner, tailings underdrains, and an embankment toe drain.

Water collected by the underdrains is conveyed to sumps located immediately downstream of the embankment in both the east and west valleys. The groundwater underdrain and tailings underdrain outlet pipes in each valley were installed in reinforced concrete encasements under the embankment. At the sumps, monitoring and control systems allow for automated water quality and flow rate determinations to be made prior to pumping back to the surface water pond. Basin roads are constructed to support basin grading activities, liner installation and anchorage, and tailings pipeline construction and access.

Instrumentation was installed in the TMF to monitor the structure throughout the life of the facility. Settlement and deformation monuments have been installed on the downstream embankment face and on the embankment crest during each major stage of construction. Additionally, vibrating wire piezometres have been installed within the embankment. The vista data vision system (VDV) and the Sensemetric system to monitor the main instruments on-line and in real time were both upgraded in 2020.

According to the LOM plan of the TMF, and as per water balance, construction periods will occur in 2021, 2023, 2025, 2027, 2029, 2031, 2033 and 2035. Optimization of the LOM to ensure sufficient quality rock from the pit for the TMF construction has been completed, such that the mining fleet is utilized for hauling, placement and compaction of structural fill over the downstream and upstream zone of the embankment.

18.1.2. WASTE ROCK FACILITY (WRF), TOPSOIL AND PONDS

The Potentially Acid Generating and Non Acid Generating Waste Rock Facilities (PAG & NAG WRF) are located in the Cunahuiri Valley east of the Constancia Pit and provide storage for the PAG and NAG waste based on the updated mine plan developed in 2017. The facilities receive mine waste material from the operation of the Constancia pit and from the Pampacancha pit. Underdrain systems include groundwater underdrains to collect the water to WRF Retention

The Waste Rock Facility Retention Pond is located downstream from the WRF in the Cunahuiri Valley. The pond provides energy dissipation for surface water reporting to the downstream WRF Containment Pond via overland flows and the contact diversion channels and protects the WRF Containment Pond from possible falling waste rock and sedimentation. A Waste Rock Facility Containment Pond is located downstream of the WRF Retention Pond in the same Valley. The pond provides storage capacity for surface runoff, direct precipitation and seepage collected from the WRF and its contact diversion channels. The pond also stores Acid Rock Drainage (ARD) water, which is pumped to a lime neutralization facility at the process plant prior to its eventual use in the process plant. A foundation grout curtain has been incorporated into the embankment foundation to minimize seepage. In order to accommodate the maximum operational volume and additional storage to accommodate the 100-yr/24-hr storm event. The capacity of these ponds may be reassessed during the last years of the operation due to the potential expansion of the WRF.

Non-Contact Channels have been sized to accommodate the 200-year/24-hour (200-yr/24-hr) storm event with an additional freeboard for a 500-yr/24-hr storm event with no allowance for a freeboard. There are three Non-Contact Channels on operations: NC1, NC2 and NC3.

A pumping system between the WRF Containment Pond and the treatment plant is designed to pump ARD water from within the pond to the lime neutralization facility. This pumping rate is such that the WRF Containment Pond water level will be maintained at or below the maximum operational water level.

A topsoil stockpile is located in the Cunahuiri Valley downstream of the WRF Containment Pond and has a design storage capacity of 4.7 milion m3. This stockpile stores topsoil excavated during construction activities. Topsoil is used throughout operations for progressive closure of various facilities.

The Non-PAG Waste Rock Facility has a design storage capacity of 27 Mt (14 Mm3 at 1.9 t/m3). Non-PAG waste rock is used for the construction of various access roads, and haul roads as well as the Tailings Management Facility (TMF) embankment. Excess Non-PAG waste can also be placed within a temporary stockpile located 1 km southwest of the Constancia Pit.

18.1.3. WATER MANAGEMENT

Hydrologic and hydraulic analyses, including a detailed water balance, were completed to determine the frequencies and quantities of flows as well as the types of flow, location, and resulting sizes of the water management structures required to contain or convey them. Water was divided into process and non-process water, i.e. water that is not associated with the process plant and typically consists of stormwater runoff from areas within the mine site. The non-process water was further divided into contact or potentially acid generating (PAG) runoff water and non-PAG runoff water.

Structures directly associated with the site water management include the following:

- Diversion Channels – These structures divert both contact and non-contact water around the mine site to the sediment or water management ponds, or to natural drainages down-gradient of the planned mine facilities (Constancia pit, WRF, etc.).

- Sediment Ponds – These structures typically accept diverted contact water and control the release of sediments down-gradient of the mine site by settling the sediments out of the discharged water. The sediment ponds for the Constancia site are identified as Main Sediment Pond, Road Sediment Pond No.1, Road Sediment Pond No.2, TMF Sediment Pond No.1, TMF Sediment Pond No. 2, Plant Construction Sediment Ponds (which work as sediment ponds just during construction phase), and Crusher Sediment Pond (construction phase as well).
- Water Management Ponds – These structures typically deal with temporary water storage and may include both process and non-process water structures. The water management ponds for the Constancia mine are identified as the TMF Ponds (east and west), Plant Process Pond, Plant Contact Pond, Crusher Pond, Main Sediment Pond, and WRF Containment Pond.
- Water Balance – Hudbay Peru performed a site-wide process water balance for the final design phase of the Constancia mine based on the current Mine Plan with the support of Piteau on the basis of the original KP design. Based on the analysis of the water balance model, enough water exists in the system for average climatological conditions to operate at the proposed mining and milling rates and no additional water sources are required for operation. As required, water accumulating in the sediment pond can be sent to the TMF for use in the process.

18.2. ON SITE CAMPS

Constancia is a remote site with restricted road access from the nearest significant town 1 ½ hours away. Currently there are two camps; Constancia; a permanent camp and Fortunia that was a pioneer camp and served as an overflow camp during the construction, Currently Fortunia is for practical purposes mainly being used for construction and specific contractors such as Heavy Civil Works, Security and Community-Relations. The camp facilities have been designed with reference to the IFC standards for camp construction for mining activities.

This camp was the previous construction camp. It´s located at the north side of the mine. This permanent camp was developed to provide accommodations for operating personnel and necessary support personnel. The camp is divided into three pads. The first has the dining room, laundry, parking zone, warehouse and administrative offices. The second and the third pads have the housing modules with capacity for 2,335 people. The camp has a potable water treatment plant with 365 m3 per day capacity, a residual water treatment plant with 600 m3 per day capacity, a power house with three (standby) gen-sets of 500 kW each for emergency power and a gas storage capacity of 20,000 gallons. The main medical attention center is across this camp.

18.3. ELECTRIC POWER SUPPLY AND TRANSMISSION

18.3.1. POWER SUPPLY

Power supply for the Constancia mine is brought from the new 220kV transmission line from Tintaya to Constancia that was built for and owned by Hudbay but is operated and maintained by a third party.

18.3.2. POWER TRANSMISSION

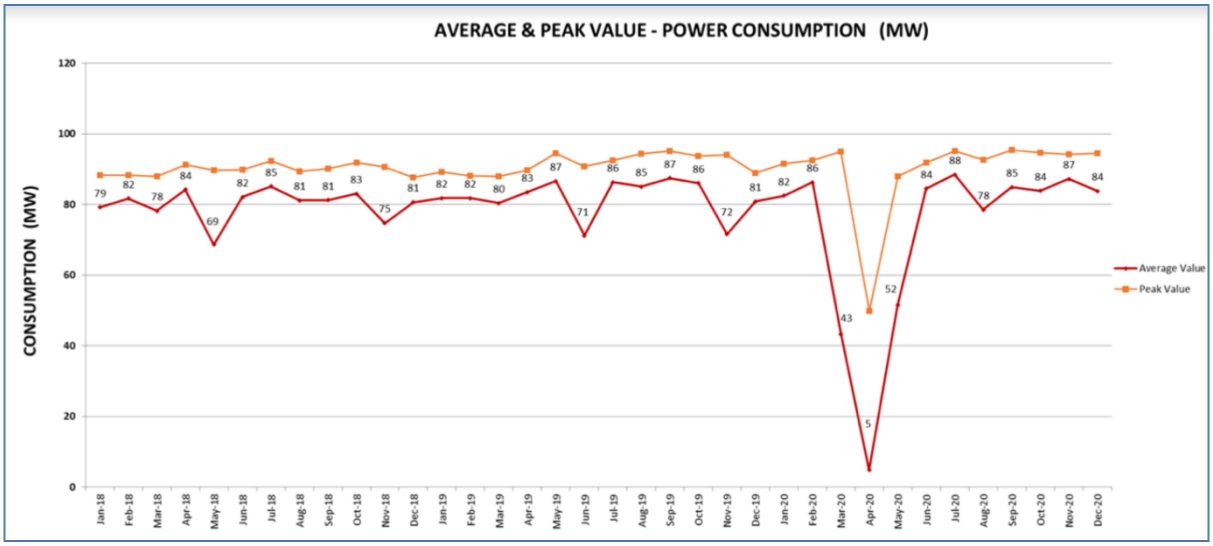
This transmission line is connected to the Constancia electric substation that transforms 220kV to 23 kV. The switching area (220kV / 23kV) with its transmission line arrival cells, harmonic filters, power transformers, and an electrical control room are located within this substation.

The electric control room manages the 23kV system that provides energy to the entire mine. In case of emergency, there are three generators that provide energy in a semi-automatic way. The diesel powered engines generate 1,500 kW of electricity at 23 kV and are connected to 23 kV system.

18.3.3. CURRENT STATUS

While the Constancia Substation and the 220Kv power line was built, and is maintained and operated by a contractor, this infrastructure and the land on which it was built will remain under the ownership of Hudbay The historical average and peak power consumptions are shown in Figure 18-1.

FIGURE 18-1: AVERAGE POWER CONSUMPTION



18.4. ROADS AND PORT

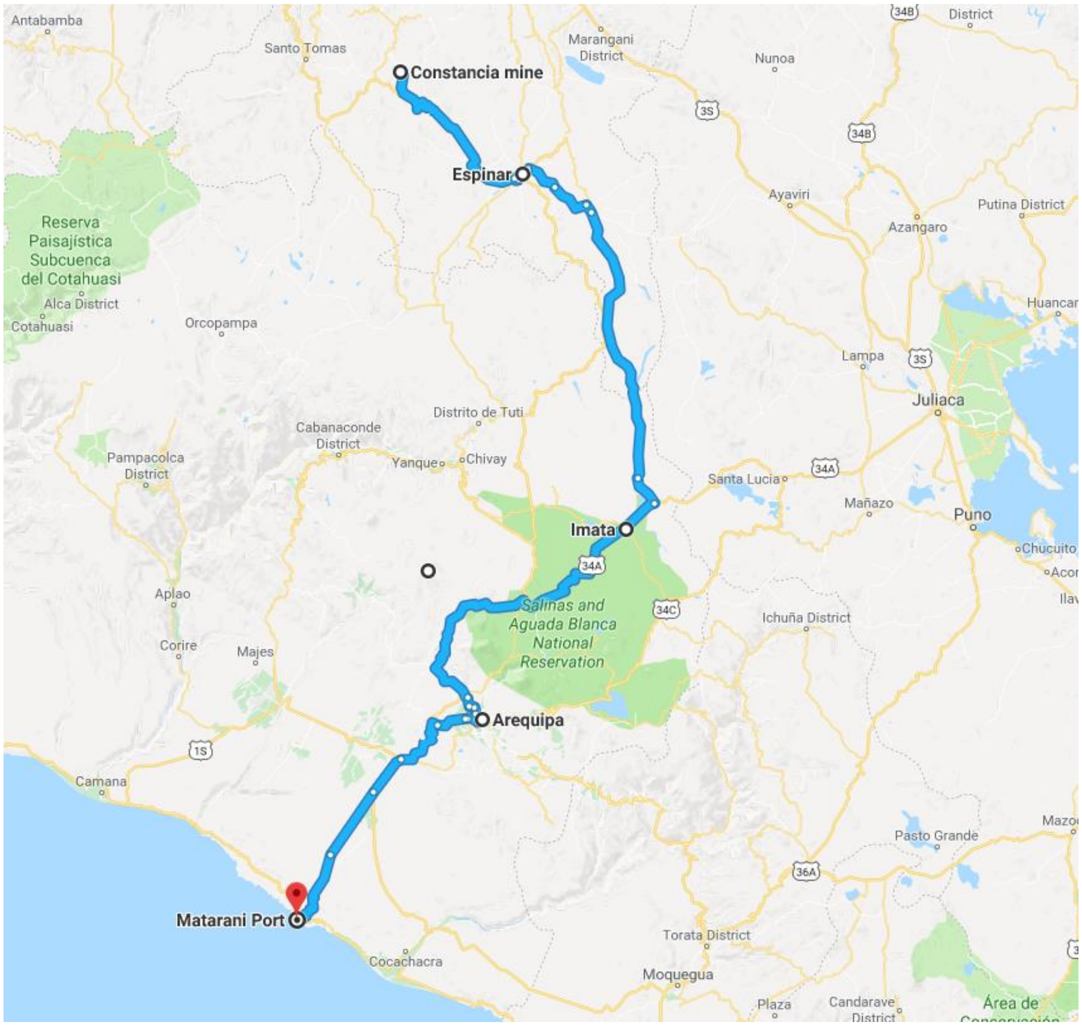
18.4.1. ROADS

The primary road to the site, consists of a 6,516 km compacted dirt road and 49 km of a bitumen surface roadway (National Route PE-3SG) from Coporaque to the Puente Bailey/Constancia (Figure 18-2). These roads (and bridges) have been upgraded, as necessary, to meet the needs of construction and life of mine use.

1) The access road from Coporaque to Constancia consists of:
2) Coporaque District Road running from Coporaque to Puente Kero (4.97 Km)
3) Provias National Road running from Puente Kero to Desvio Livitaca (48.7 Km)
4) Velille District Road running from Desvio Livitaca to Constancia (10.83 Km)

The section of road between Yauri and the Mine is classified as a National Class 3 road (less than 400 vehicles per day). In order to maintain the access road in good condition, it is necessary for Hudbay to intervene and maintain the road as necessary due to the heavy truck traffic – concentrate & consumables transport. The most difficult section is the National road passing over Huallyapacheta pass at an elevation of 4,689 masl. Due to heavy rains and traffic counts, the bitumen surface quickly failed soon after the start of operations and the road was converted into a compacted dirt roadway. This was done to improve transitability and lower costs to Hudbay whom has assumed 100% of the routine maintenance. Hudbay has engineered an alternative 7.4 km road that will connect Constancia traffic to the Las Bambas HHR within 20 km of Constancia. This will allow for safer passage of the Constancia heavy haul traffic on a roadway designed & constructed in anticipation of this type of traffic. The plan is for Hudbay to continue maintaining this current roadway until the connection to the Las Bambas HHR is permitted & constructed. Hudbay has a checkpoint at Yauri for control of trucks travelling to and from site.

FIGURE 18-2: PERU – CONSTANCIA SITE TO PORT ACCESS ROADS



18.4.2. PORT

Copper concentrate is shipped from the Constancia mine via road (~485km) and arrives at the Matarani port by trucks (Figure 18-3).

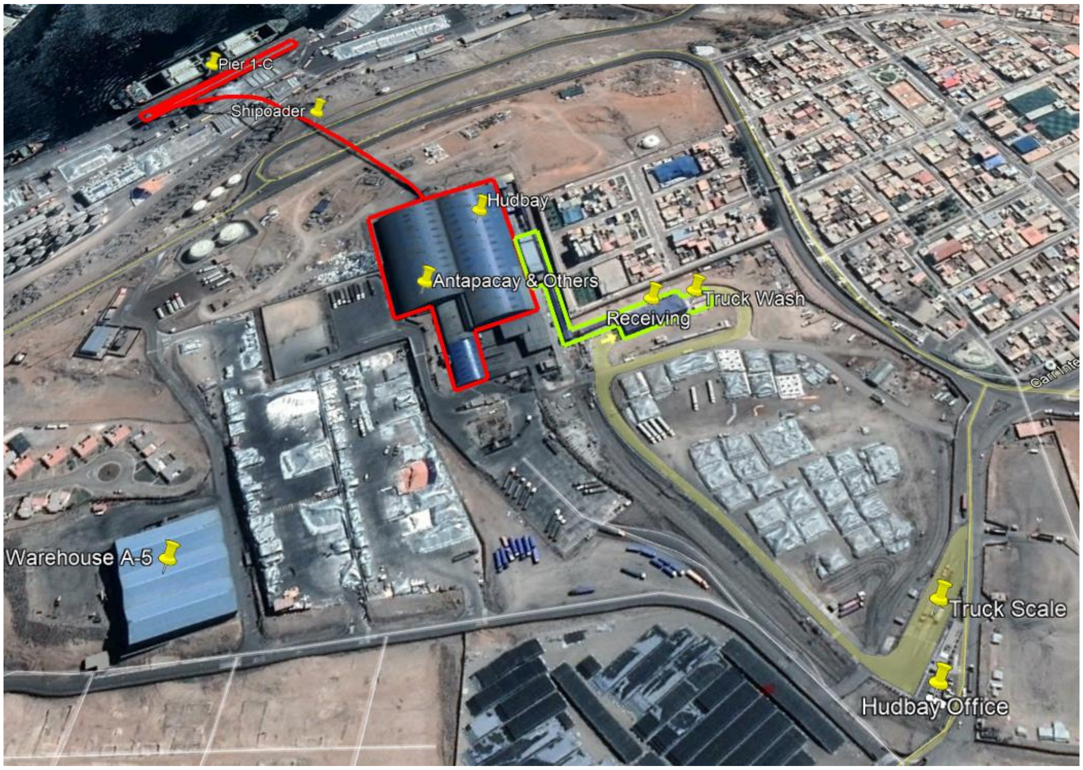
This receiving system is designed to handle 350 tph, (2) trucks can dump simultaneously the concentrate in a covered building. The system includes, screen hoppers, feeders and conveyor system that feeds the concentrate into an existing stock pile stacking system inside the warehouse. This covered installation also includes a dust control system, inspection and sampling platforms and a truck wash system. This installation has been commissioned in October 2020 and is for the exclusive use of Hudbay. (Figure 18-4)

Pier C has been assigned to Hudbay and has a 75 Kt capacity. A chute from the shed feeds a tubular conveyor into a ship loader system. The same conveyor and ship loading equipment is shared with other copper concentrate exporters.

The ship loading feeder conveyor is tubular to avoid concentrate losses and to comply with Peruvian regulations. The design, installation and operation of the port is by TISUR. Hudbay pays for its use on a per metric tonne basis.

FIGURE 18-3: MATARANI PORT

FIGURE 18-4: RECEIVING SYSTEM, WAREHOUSE C AND SHIP LOADER (AERIAL VIEW)



19. MARKET STUDIES AND CONTRACTS

19.1. CONCENTRATE MARKETING

COPPER CONCENTRATES

Constancia copper concentrate is a clean, medium grade concentrate containing small gold and silver by-product credits. It is a highly desirable feedstock for copper smelters in China which is the most geographically appropriate freight destination but is also suitable for processing by smelters in Europe, India and South America. Constancia copper concentrate is an average quality concentrate containing gold and silver by- product credits which is delivered and sold directly to a variety of copper smelters in Asia and Europe as well as to internationally recognized trading companies. Up to 60% of sales are made pursuant to longer term frame contracts, which typically reference annual benchmark agreements between major concentrate producers and smelters for the purposes of fixing key terms such as treatment and refining charges. The balance of projected annual concentrate production has not been committed for sale for a number of reasons including: (1) uncommitted production may be a potential source of financing and (2) to provide flexibility in the event of fluctuations in annual production. Unsold production will be marketed and sold into the spot market each year at then-current market terms.

Constancia copper concentrate is trucked from the Constancia mine to the Matarani port facility in Southern Peru where it is loaded onto ocean vessels in lots of 10,000 or 20,000 mt for delivery to customers.

MOLYBDENUM CONCENTRATE

The Constancia metallurgical facility is equipped with a molybdenum flotation plant which produces a Mo concentrate which are delivered to customers in Asia and South America, in 1.5 mt bags in lots of approximately 20 mt. Roasting fees are generally estimated to be up to 13% of the contained value of molybdenum in concentrate.

19.2. CONTRACTS

Production at Constancia is subject to a precious metals streaming agreement with Wheaton consisting of 50% of payable gold and 100% of payable silver. Hudbay will receive cash payments equal to the lessor of the market price and US$400 per ounce for gold and $5.90 per ounce of silver, subject to a 1% annual escalation starting 3 years after the completion date in 2016. Under the terms of the stream, gold recovery for the purposes of calculating payable gold will be fixed at 55% for gold mined from Constancia and 70% for gold mined from Pampacancha.

For operations and the assured supply of goods and services, standard contracts are place as well as policies and procedures for contracts execution and closure.

Hudbay has a marketing division that is responsible for establishing and maintaining all marketing and sales administrations of concentrates and metals. As well, Hudbay conducts ongoing research of metal prices and sales terms as part of normal business and long range planning process to achieve market terms. Contract terms used in the Constancia financial evaluation are based on this research and the author has reviewed these results and they support the assumptions made in this technical report.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1. ENVIRONMENTAL

20.1.1. LEGAL FRAMEWORK

The mine was designed to comply with all legislation applicable to the development of mining projects in Peru including mines, roads, port and transmission lines. In addition, the mine complies with regulation regarding archaeological areas of significance, endangered and protected species as well as community relations and public disclosure programs. The main applicable regulation and international standards are detailed below:

- Peruvian Political Constitution, 1993
- Environmental General Law, 2005
- Private Investment Growth Law, 1991
- Environmental Impact for Works and Activities Evaluation Law, 1997
- Sustainable Use of Natural Resources Organic Law, 1997
- Environmental Impact Assessment National System Law, 2001
- Law on the Right of Indigenous Peoples to Prior Consultation, 2011
- Environmental Protection and Management Regulation for mining, Benefit, General Labor, Transportation and Mining Storage Activities, 2014
- Water Resources Law, 2009
- Water Quality National Standards, 2017
- Air Quality National Standards, 2017
- Noise Quality National Standards, 2003
- Soil Environmental Quality Standards, 2017
- Health Law, 1997
- Environmental Management National System Law, 2004
- Cultural Heritage Protection Law, 2004
- Solid Waste Law, 2016
- Forestry and Wildlife Protection Law, 2011
- Mines Closure Law, 2003
- Public Participation Regulations, 2008
- Maximum Permissible Levels for Liquid Effluents from Mining – Mineral Processing Activities, 2010
- IFC/World Bank Social and Environmental Performance Standards.
- Towards Sustainable Mining (TSM) Protocols of the Mining Association of Canada (MAC)

20.1.2. LOCAL AND REGIONAL CONTEXT

The Constancia mine is located in the districts of Chamaca, Livitaca, and Velille – all of which are in the Province of Chumbivilcas, Region of Cusco. It includes 5,452.41 ha of land purchased from private owners and the community of Chilloroya (District of Velille), as well as 256.50 ha of surface land granted in use by the community of Uchucarco (Chamaca District) and 473.7 ha by the community of Chilloroya (Livitaca District).

The area has a mining history that dates back 50 years to when Mitsui operated a copper-zinc mine in Katanga near the community of Uchucarco. Mitsui sold the mine to a Peruvian company which abandoned the mine in the late 1970s, leaving a legacy of environmental contamination. Tailings were discharged into the river basin, and the open pits and waste dumps were never reclaimed.

Near the community of Chilloroya, the local population has been traditionally engaged in artisanal and informal mining of superficial gold and copper. Concerns have been raised by both Hudbay and the community to Peruvian authorities regarding environmental and labour conditions related to this activity and levels of mercury found in nearby water bodies exceeding international standards for the protection of aquatic life.

20.1.3. ENVIRONMENTAL SETTING

The surface water quality of the Chilloroya River and its different tributaries (micro watersheds) are generally within the established national standards for water quality. However, due to natural factors (mineralization of the area, water erosion, water runoff) and anthropogenic factors (environmental liabilities, artisanal mining and community activities) some values are above national standards. These were identified during the Environmental Baseline.

The pH of the Chilloroya River and its main tributaries varies in the wet and dry season; during the wet season the pH varies from neutral to slightly alkaline (6.5 to 8.5) and in the dry season the pH varies from slightly alkaline to alkaline (8.0 to 9.5). In most of the monitoring stations, pH showed characteristics with alkaline tendency, even exceeding national standards. There were also some isolated values with slightly acidic characteristics, below the lower pH limit.

The total metals concentrations in ravines and the Chilloroya River are normally below the national standards However, some total metal concentrations exceeded national standards, these exceedances usually happen during the wet season. Total metals that registered high concentrations were copper, lead, manganese, molybdenum nickel, aluminium and zinc. On the other hand, isolated values of aluminium, mercury and iron also exceeded national standards. These exceedances would be associated with the sediments dragging, environmental liabilities and several activities of informal mineral extraction.

The microbiological parametres (Escherichia coli, fecal and total coliforms). along the Chilloroya River increased compared with the Environmental Baseline, reporting values above the national standards. This increase is directly related to livestock activities and non-controlled discharges of domestic wastewater treatment systems from Juan Velasco Alvarado village.

Regarding air quality, maximum concentrations of particles (PM-10 and PM-2.5), were measured in the towns of Uchucarco, Juan Velasco Alvarado and Urazana. All values were below national standards for 24 hours, except for some cases. Also, maximum concentrations of lead, arsenic and copper were recorded below national standards. Gas concentrations are mainly due to their own local emissions from light and heavy vehicle traffic surrounding the monitoring stations. None of the recorded values for gases exceeded the national standards. In general, air quality parametres, have been consistent with seasonality except for gases. Results showed higher concentrations during the dry season (August) than during the wet season (February and April).

342 different species of flora and 7 vegetation types were identified within the mining unit area (grassy brush, rock vegetation, very wet meadow, bog, rushes, bushes and high land vegetation). In total, there are 13 species that are within the conservation concern category in Peruvian legislation and 17 endemic

species from Peru (4.97%). In addition, 256 species of fauna have been recorded including 21 species of mammals, 59 species of birds, 4 species of amphibians, 2 species reptiles and 170 species of arthropods. In total, 15 species are of conservation concern: four mammal species, 9 species of birds, and 2 species of amphibians, including only one endemic species, the mammal calomys sorellus (reddish evening mouse).

A detailed hydrobiological evaluation of aquatic environments located within the mine area, was conducted. 6 species of fish were identified, 1 exotic (trout) and 5 native fish belonging to the "catfish" family, from these the trichomycterus rivolatus is in the category of "near threatened" as determined by the IUCN (2013).

An archaeological survey was completed in the areas directly affected by Constancia mine facilities and activities. A total of 46 archaeological sites were identified in the area of the mine. The certificate of non-existence of archaeological remains of significance (CIRA) was approved by the MC (Ministry of Culture) in September 2011. Hudbay has obtained a CIRA for (i) all the area comprised by the Constancia mine (excluding the archaeological sites as established in that same Certificate); (ii) for the route covered by the power transmission line (excluding the identify archaeological sites); and (iii) for an area for agricultural and forestry training. Later, as part of investigations into the Pampacancha sector, three archaeological sites and five cultural isolated elements were identified on the surface of Pampacancha. Following that, the corresponding Certificate of Nonexistence of Archaeological Remains was obtained in December 2015.

20.1.4. ENVIRONMENTAL CERTIFICATIONS

Constancia Mine Environmental Impact Assessment (ESIA) was approved by the Ministry of Energy and Mines (MINEM) on November 24, 2010, by Directoral Resolution (DR) No 390-2010-MEM-AAM, to conduct mining activities, with an average ore processing capacity of 55,000 tons per day for a period of 15 years.

The first amendment to the ESIA (EISA MOD I) was approved by MINEM on August 20, 2013, through DR. 309-2013-MEM/AAM, to increase the processing capacity to 81,900 tonnes per day, and to reduce the useful mine life to 11 years. The purpose of this amendment was to present changes stemming from engineering development. Additionally, Hudbay obtained the approval of an Environmental Technical Report by DR. No. 454-2013-MEM-AAM for the inclusion of auxiliary components necessary to complete construction activities on schedule.

The second amendment to the ESIA (EISA MOD II) was approved by MINEM on April 17, 2015, through DR. 168-2015-MEM-DGAAM, to increase reserves through the expansion of the Constancia pit, inclusion of the Pampacancha deposit, and the Waste Rock Facility (WRF) and the Tailings Management Facility (TMF) expansion, among others. A 17-year useful life of the mining operations was approved through this amendment.

Additionally, in 2015 and 2016, Hudbay obtained the approval of three Environmental Technical Reports (ITS) for the MOD II. The first one, approved by DR. No. 516-2015-MEM-AAM, included the relocation of auxiliary components. The second one, approved by DR. N° 63-2016-SENACE/DCA, included the modification, replacement and addition of auxiliary components, considering the optimization and usage change of existing components, and the use of areas enabled during mine construction. The third approved by DR. N° 120-2019-SENACE-PE/DEAR, included the modification of TMF design parameters and the type of material to be used in the dam construction, as well as other modifications to existing auxiliary components.

In December 2020, the National Environmental Certification for Sustainable Investments Service (SENACE) began with the evaluation of the third amendment to the EISA (EISA MOD III), which includes the mining plan optimization of Constancia and Pampacancha pits, changes in the TMF, NAG waste deposit expansion, the addition of ore piles 3 and 4, as well as other updates to ensure the feasibility of these modifications

20.1.5. ENVIRONMENTAL MANAGEMENT

Environmental and social impacts have been assessed and appropriate mitigation measures have been implemented. The EISA and amendments comply with national regulation and have adopted the Equator Principles and International Finance Corporation’s (IFC) Performance Standards. The Towards Sustainable Mining (TSM) Standards of the Mining Association of Canada (MAC) are currently being implemented.

The hydrogeological report (Golder 2013) and its update, made by Amphos in 2019, which led to a more refined hydrogeological model and plant water balance, addressed three principal concerns related to the detailed design of the mine and plant water systems: (1) to confirm the relation between the pit dewatering area and reservoir with the springs in Cunahuiri area ; (2) determine the impact of slope stability on the pit wall design; and (3) to confirm availability of groundwater supply through life of mine.

Hudbay has engaged an Independent Project Review Board (IPRB) to conduct periodical reviews of the major earth structures on the mine, with regular visits to the site, as well as, for monitoring the progress of construction of the TMF. The plan for such review was developed during the construction stage, and is now in operation. Design reviews and site visits have been carried out at critical junctures throughout the course of construction and mine operations to observe the performance of the structure and development of subsequent raises to the dam and the impoundment.

- The water management strategy includes the following:
- Zero water discharge to the environment from the plant, and PAG waste rock facility.
- Discharge from the TMF supernatant from the end 2023 in the rainy or dry season
- Our prioritization of water sources for the plant is as follows:
    1) Use of process water or water in contact with PAG infrastructures as pit sinkwater, WRF drainage water and TMF supernatant water in the process plant.
    2) Use of water in contact with Non-PAG Infrastructure main sediment pond (MSP), and four other small sediment ponds. This type of water with sediments can be discharged in compliance with the Peruvian maximum allowable limit (LMP).
    3) Use of pit dewatering groundwater for the process plant and dust control.
- The MSP and the NC2 channels are used for water flows mitigation purposes, in particular they use water supply to mitigate any reduced river flow or water supply potential impacts of pit dewatering during dry season (27.4L/s), and the 10 L/s based on an agreement with the Chilloroya community.

The Constancia environmental monitoring program was updated in January 2018 Environmental Monitoring Plan (PLA-AMB-04: Plan de Monitoreo Ambiental). This plan covers monitoring of air, noise and vibration, surface water quality and flow, surface lake/reservoir levels, groundwater levels and quality, domestic water consumption and quality, effluent monitoring, topsoil, soil and sediment, biological (flora and fauna) monitoring, hydrobiological and meteorological data collection.

During the operation phase, Hudbay is maintaining a joint environmental monitoring committee with the communities of direct and indirect influence.

From a biodiversity stand point specific management plans for wetlands, flora and fauna are being executed; Hudbay has also developed a Biodiversity Action Plan (BAP), as generally anticipated and described in the EISA and as required in the MAC TSM protocol and IFC performance standard N° 6. The BAP considered the consolidation of commitments and effort regarding biodiversity.

During 2017, Hudbay obtained the certification of the ISO 14001: 2004 and OHSAS 18001: 2007 standards. In March 2017 the certification audit process was carried out in compliance with the International Organization for Standardization (ISO) ISO 14001: 2004 standard and the OHSAS 18001: 2007 standard, resulting in zero non-conformances and 15 observations that have already been corrected.

In 2018, the External Audit for migration process to ISO 14001: 2015 and the first Follow-up Audit of compliance with OHSAS 18001: 2007 will be carried out.

In 2020, the recertification of ISO 14001:2015 was obtained and the migration from the OHSAS 18001_2007 standard to ISO 45001:20018 of our Integrated Management System was achieved

20.1.6. MINE CLOSURE PLAN

The Constancia closure plan, describing the closure activities for the mine components aligned with the EISA, was approved through Resolution No. 286-2012-MEM-AAM dated September 4th, 2012.

Constancia's closure plan was updated to incorporate recent studies and technological changes that will reduce costs and provide financial guarantees that Hudbay must provide annually to the Peruvian government. The updated plan was approved by the Ministry of Energy and Mines in June of 2015 by Directorial Resolution No. 255-2015-MEM-AAM. This document updated measures of closure and post closure of the mine, according to the EISA MOD I and EISA MOD II.

The approved updated plan estimates a closure cost of $209.2M at the end of mine life. The cost guarantees provided to the Peruvian Government from Hudbay Peru SAC account for the discounted cost as calculated per Peruvian legislation for the reclamation of actual disturbed mining activity.

The Ministry of Energy and Mines started the evaluation of the Second Update of the Mine Closure Plan in September 2020. It includes new components, the closure schedule updating and amount guarantees updating

20.2. PERMITTING

Hudbay has obtained several permits for the construction and operation of the Constancia mine. All of these permits were supported by the environmental background provided by the ESIA and amendments.

- The Constancia mine has secured all necessary permits and authorizations to conduct construction and operation activities at the mine. A summary of these permits is detailed below:
- ESIA. - Besides being an environmental background and requirement for other permits, ESIA allows the construction and operation of certain facilities that do not have a specific construction and operation permit, for instance, camps and stockpiles. As mentioned in previous sections, an ESIA for the Constancia mine was approved in 2010, and to date it has two amendments and three Environmental Technical Reports (ITS).
- Certificate of Non-Existence of Archeological Remains (CIRA).- On October 6th, 2011, Hudbay obtained a CIRA certificate for the area comprised by the Constancia mine, excluding identified archeological sites. In 2014 and 2015, Hudbay obtained five more CIRA certificates.
- Beneficiation concession - A beneficiation concession allows its titleholder to process, purify and refine minerals by using chemical and/or physical procedures in process plants. In June 2012, Hudbay was granted the authorization to construct the process plant, including the TMF and water collection pond. Subsequent amendments have allowed Hudbay to raise the elevation of the TMF dam. After the construction of the process plant, Hudbay obtained the operation licence. This resolution allows Hudbay to operate the two lines of the process. Additionally, Hudbay has two Mining Technical Reports (ITM) approved in 2017 and 2018 regarding auxiliary components.
- Underground Water License (pit dewatering). - In 2014, Hudbay obtained the underground water license. This permit authorizes the use of groundwater from wells installed for the pit dewatering. This license was later modified to authorize the use of up to 5,676,000 m3 of groundwater from the pit dewatering.
- Surface Water License. – In 2015, Hudbay obtained a surface water license, which authorizes the use of surface water in the area of the mine for mining purposes, for an annual volume of up to 22,780,000 m3.
- Mine Permit. - In 2012, Hudbay obtained authorization to start mining exploitation activities. This Resolution approved the mining plan and authorizes the exploitation activities in the Constancia

and San Jose pits. Subsequent amendments were approved between 2013 and 2014 to authorize the development and subsequent expansions of the waste rock facility and auxiliary services.

20.3. COMMUNITY RELATIONS

Between February and April 2012, Hudbay reached agreements with the neighboring communities of Uchucarco and Chilloroya for the land required for the Constancia mine. These agreements were validated in a meeting with support from two thirds of the community members. Both of these agreements have been recorded in the public land registry.

A compensation plan was prepared for the 36 landholding families from the Ichuni area of Chilloroya, taking into account the needs of each family with respect to restructuring their working activities and adapting to relocation. The purpose of the plan was to cover all aspects a family needs to live a sustainable life. To this end, an approach was developed where the compensation plan established general criteria that should be adjusted in the individual negotiation process with each family, to reach an agreement that satisfied both parties. As the impact on each family was different, the Resettlement Action Plan (RAP) sought to ensure that each affected family was compensated fairly. This criterion was prepared in compliance with national laws and international provisions and standards in resettlement matters and in particular the IFC performance standards. As a result of the RAP implementation, the resettlement process was successfully completed in 2016.

A Community Relations Plan has been developed taking into account the following requirements:

- Final determination of the Direct and Indirect Areas of Influence of the mine, based on the outcomes of the Social Impact Analysis as mentioned above.
- The needs in the construction and operation phases, as determined in the Social Impact Analysis.
- The State's requirements, as expressed in the Community Relations Guidelines of the MINEM and the Prior Commitment Act (DS-042-2003-EM).
- The requirements of international financial institutions, taking into account as main references the Equator Principles, IFC Performance Standards, United Nations Environment Programme's APELL (Awareness and Preparedness for Emergencies at Local Level) for Mining, and supplementary social management standards.

Specific social programs were designed for the mitigation and prevention of identified impacts. Generally, these programs addressed the following key topics:

Communication and consultation

- Participatory monitoring
- Infrastructure
- Social development
- Economic development
- Strategic development
- Claims and dispute resolution.

Stakeholder mapping has been undertaken and is periodically updated, identifying the two principal stakeholder groups in the direct area of influence as the communities of Uchucarco and Chilloroya. There are three well-defined groups in each of the communities, namely:

- Community assembly: people from the community.
- Artisanal miners: from the community and who also possess land in the community (but do not possess title to the land).

- Youth Groups: (in the case of Chilloroya and Uchucarco, represented through the Youth Association) have higher education than the rest of the local residents and the experience of having lived in other cities; however, they own no land and possess no economic capital.

Benefits from the artisanal mining activities in Chilloroya are not distributed evenly across the population, but are primarily collected by those members of the population who possess the land where the illegal mining activities occur.

Uchucarco has a greater number and variety of organisations inside its community structure; some of which have duties that are independent from the Governing Board, these include: JAAS, the Committee of Water Users ("Comité de Regantes"), among others. In addition, Uchucarco is the most active community in the District of Chamaca, and has more relationships with district and private institutions.

In Chilloroya and Uchucarco, the political strength of the Governing Board is solid and the different associations within the community are not well organised. Although there is an array of organisations, many are focused on specific tasks and have little political presence, as in the case of women's and parents' organizations.

PAMPACANCHA

Since 2015 Hudbay has obtained the ESIA MOD II and the mine closure plan, which are the required environmental certifications to support mining activities in Pampacancha. In parallel, Hudbay started a negotiation process with the Chilloroya community to acquire rights over the Pampacancha surface. .

In February 2020, the community of Chilloroya formally approved a surface rights agreement with Hudbay for the Pampacancha satellite deposit located near Constancia. Throughout the remainder of the year, Hudbay focused on negotiating individual agreements with those members of the Chilloroya community who made use of the Pampacancha lands. As of the date of this Technical Report, there is one remaining land-user family who needs to complete an agreement.

The Ministry of Energy and Mines authorized the start of the exploitation activities for the Pampacancha pit in Decembre 2020 (Directorial Resolution No. 790-2020-MINEM-DGM) This permit included the Prior Consultation process with the community of Chilloroya. Hudbay has also received approval for one of the three stages of Pampacancha pit drainage permits; the next stage will be evaluated by the National Water Authority in March 2021. Currently, the explosives permit has been under evaluation since January 2021.

21. CAPITAL AND OPERATING COSTS

21.1. CAPITAL COSTS

The LOM sustaining capital is estimated to be $898 million (excluding capitalized stripping) at Constancia and Pampacancha while the project capital is estimated to be $51 million. All capital items are reported in real 2021 $USD.

The total includes capital required for major mining equipment acquisition, rebuilds, and major repair. The cost also includes site infrastructure expansion (tailings management facility, waste rock facility and others) and process plant infrastructure however they exclude all the cost related to mine closure. Project capital includes Pampacancha project development expenditures but excludes additional costs related to the remaining individual land user agreements.

The capital costs for Constancia are developed and revised on an annual basis as part of the budget cycle. The LOM capital plan is shown in Table 21-1.

TABLE 21-1: LIFE OF MINE CAPITAL EXPENDITURES (SUSTAINING AND GROWTH)

Sustaining Capital		2021	2022	2023	2024	2025	2026-2037	LOM
Constancia and Pampacancha[1]								
Equipment - Purchase	*US$'000s*	6,465	8,480	12,263	15,518	9,544	5,185	57,455
Equipment - Major Repair	*US$'000s*	15,696	13,987	29,884	18,014	35,573	206,015	319,169
HCW - Tailings Dam	*US$'000s*	43,920	5,123	45,016	6,875	37,191	200,990	339,116
HCW - Waste Rock Facility	*US$'000s*	4,047	-	3,094	-	1,054	2,922	11,117
HCW - Pit Dewatering	*US$'000s*	9,146	6,735	4,904	4,749	800	4,800	31,134
Mining - Other	*US$'000s*	8,655	1,550	750	4,750	1,000	1,500	18,205
Plant - Equipment & Spares	*US$'000s*	4,288	7,795	10,800	6,800	6,800	37,300	73,783
Plant - Tailings Pipeline	*US$'000s*	8,250	920	600	600	600	7,200	18,170
Plant - Other	*US$'000s*	1,800	3,230	10,500	1,000	1,000	12,000	29,530
Total (Before Capitalized Stripping)	***US$'000s***	**102,267**	**47,820**	**117,812**	**58,306**	**93,562**	**477,912**	**897,679**
Deferred Stripping	*US$'000s*	24,828	17,942	39,765	22,224	20,013	225,723	350,495
Total (After Capitalized Stripping)	***US$'000s***	**127,095**	**65,763**	**157,577**	**80,530**	**113,576**	**703,635**	**1,248,175**

Project Capital		2021	2022	2023	2024	2025	2026-2037	LOM
HCW - General & Other[2]	*US$'000s*	4,075	-	-	-	-	-	4,075
Mining - Other	*US$'000s*	-	-	-	-	16,717	-	16,717
Plant	*US$'000s*	-	-	29,850	-	-	-	29,850
Total Project Capital	***US$'000s***	**4,075**	**-**	**29,850**	**-**	**16,717**	**-**	**50,642**

Total Sustaining and Project Capital (Before Capitalized Stripping)	***US$'000s***	**106,342**	**47,820**	**147,662**	**58,306**	**110,279**	**477,912**	**948,321**
Total Sustaining Capital and Project Capital (After Capitalized Stripping)	***US$'000s***	**131,170**	**65,763**	**187,427**	**80,530**	**130,293**	**703,635**	**1,298,817**

[1] Includes capitalized stripping costs and Pampacancha capital after pre-stripping

[2] For 2021 includes Pampacancha project development expenditures but excludes additional costs related to the remaining individual land user agreements.

21.2. OPERATING COSTS

The operating costs at Constancia are developed annually as part of the site budget process and based on past performance and planned operational improvements. All operating costs are reported in real 2021$ USD. The operating costs are divided in three categories: mining, milling and G&A. The LOM operating costs are shown in Table 21-2.

TABLE 21-2: ON SITE OPERATING COSTS

On-Site Operating Costs		2021	2022	2023	2024	2025	2026-2037	LOM
Unit Costs								
Mining[1]	$/t milled	3.62	3.54	3.86	3.91	4.13	3.06	3.28
Milling	$/t milled	5.39	5.33	5.31	5.37	5.29	4.81	4.96
G&A[2]	$/t milled	1.74	1.70	1.57	1.51	1.51	1.36	1.43
Total Operating Costs (Before Capitalized Stripping)	$/t milled	10.74	10.57	10.74	10.79	10.93	9.23	9.68
Total Operating Costs (After Capitalized Stripping)	$/t milled	9.94	9.99	9.47	10.09	10.29	8.63	9.02

[1] Before Capitalized Stripping

[2] Excludes profit sharing

The mining operating costs are estimated for each activity, i.e. drilling, blasting, loading, haulage, auxiliary and indirect cost with the haulage activity having the highest impact on the total mining operation cost. For each activity, the volume of consumables and manpower requirements are calculated from the details of the life of mine plan. A breakdown of the mining operating costs by activity and component are shown in Table 21-3 and Table 21-4.

TABLE 21-3: OPERATING COSTS – OPEX – MINING/ACTIVITY

Operating Costs (Unit Cost)		2021	2022	2023	2024	2025	2026-2037	LOM
Mining	*$/t moved*	**1.48**	**1.58**	**1.49**	**1.52**	**1.60**	**1.46**	**1.48**
Drilling	*$/t moved*	0.07	0.05	0.06	0.05	0.06	0.05	0.05
Blasting	*$/t moved*	0.19	0.19	0.18	0.18	0.19	0.18	0.18
Loading	*$/t moved*	0.21	0.22	0.22	0.20	0.20	0.20	0.20
Haulage	*$/t moved*	0.51	0.61	0.56	0.60	0.67	0.65	0.63
Auxiliary	*$/t moved*	0.23	0.21	0.22	0.22	0.22	0.18	0.19
Indirect	*$/t moved*	0.28	0.29	0.25	0.26	0.26	0.20	0.22
Total Operating Costs	*$/t moved*	1.48	1.58	1.49	1.52	1.60	1.46	1.48

TABLE 21-4: OPERATING COSTS – OPEX – MINING/COMPONENTS

Operating Costs (Unit Cost)		2021	2022	2023	2024	2025	2026-2037	LOM
Mining	*$/t moved*	**1.48**	**1.58**	**1.49**	**1.52**	**1.60**	**1.46**	**1.48**
Direct	*$/t moved*	1.18	1.23	1.17	1.20	1.27	1.22	1.22
Labour	*$/t moved*	0.22	0.19	0.17	0.19	0.20	0.19	0.19
Diesel	*$/t moved*	0.40	0.47	0.44	0.48	0.51	0.50	0.49
Maintenance	*$/t moved*	0.39	0.42	0.40	0.37	0.39	0.38	0.39
Explosives	*$/t moved*	0.17	0.17	0.16	0.16	0.17	0.15	0.16
Indirect	*$/t moved*	0.31	0.34	0.32	0.32	0.33	0.24	0.26
Total Operating Costs	*$/t moved*	1.48	1.58	1.49	1.52	1.60	1.46	1.48

Operating Costs (Unit Cost)		2021	2022	2023	2024	2025	2026-2037	LOM
Mining	*$/t moved*	**1.48**	**1.58**	**1.49**	**1.52**	**1.60**	**1.46**	**1.48**
Direct	*$/t moved*	1.18	1.23	1.17	1.20	1.27	1.22	1.22
Labour	*$/t moved*	0.22	0.19	0.17	0.19	0.20	0.19	0.19
Diesel	*$/t moved*	0.40	0.47	0.44	0.48	0.51	0.50	0.49
Maintenance	*$/t moved*	0.39	0.42	0.40	0.37	0.39	0.38	0.39
Explosives	*$/t moved*	0.17	0.17	0.16	0.16	0.17	0.15	0.16
Indirect	*$/t moved*	0.31	0.34	0.32	0.32	0.33	0.24	0.26
Total Operating Costs	*$/t moved*	1.48	1.58	1.49	1.52	1.60	1.46	1.48

The operating costs in the process plant are divided into seven main components, with power having the greatest impact on the process plant cost. The G&A cost includes all administrative areas at site as well the main office in Lima. A breakdown of milling and G&A costs are show in Table 21-5.

TABLE 21-5: OPERATING COSTS – OPEX – MILLING AND G&A

Operating Costs (Unit Cost)		2021	2022	2023	2024	2025	2026-2037	LOM
Milling	***$/t milled***	**5.39**	**5.33**	**5.31**	**5.37**	**5.29**	**4.81**	**4.96**
Labour	*$/t milled*	0.43	0.36	0.36	0.40	0.40	0.40	0.40
Services	*$/t milled*	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Misc Materials	*$/t milled*	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Travel & Accommodation	*$/t milled*	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Maintenance (services & spares)	*$/t milled*	0.79	0.76	0.75	0.75	0.75	0.75	0.75
Chemical lab	*$/t milled*	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Reagents	*$/t milled*	0.67	0.81	0.85	0.88	0.73	0.67	0.70
Fuel (diesel)	*$/t milled*	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Liners & other consumables	*$/t milled*	0.40	0.36	0.39	0.35	0.41	0.37	0.37
Steel (balls)	*$/t milled*	0.94	0.88	0.83	0.85	0.85	0.85	0.85
Power	*$/t milled*	1.93	1.91	1.89	1.92	1.91	1.54	1.65
G&A	***$/t milled***	**1.74**	**1.70**	**1.57**	**1.51**	**1.51**	**1.36**	**1.43**
Total Milling and G&A	*$/t milled*	**7.13**	**7.03**	**6.88**	**6.88**	**6.80**	**6.17**	**6.40**

Waste stripping operating costs that provide future economic benefits are capitalized when strip ratios in a given year are above the average strip ratio for a total pit phase (capitalized stripping). Operating costs that are expected to be capitalized as stripping are summarized in Table 21-6.

TABLE 21-6: CAPITALIZED STRIPPING (TOTAL ESTIMATE AND UNIT COSTS)

Capitalized Stripping Costs		2021	2022	2023	2024	2025	2026-2037	LOM
Capitalized Stripping	*$'000s*	24,828	17,942	39,765	22,224	20,013	225,723	350,495
Capitalized Stripping	*$/t moved*	0.33	0.26	0.49	0.27	0.25	0.29	0.30
Capitalized Stripping	*$/t milled*	0.80	0.58	1.27	0.71	0.64	0.60	0.66

Cash costs and sustaining cash costs per pound of copper are summarized in Table 21-7. Cash costs include mining, milling, G&A, off-site costs and TCRCs. Sustaining cash costs also include sustaining capital and royalties (but exclude Pampacancha project capex). Both cash costs and sustaining costs include the impact of capitalized stripping are reported net of by-product credits (calculated at reserves prices) including the impact of the precious metal streams.

TABLE 21-7: OPERATING COSTS AND SUSTAINING COSTS PER POUND

Operating Costs (Unit Cost)		2021	2022	2023	2024	2025	2026-2037	LOM
Cash Cost[1]	$/lb Cu	1.37	0.97	0.80	0.74	1.48	1.59	1.38
Sustaining Cash Cost[1]	$/lb Cu	2.30	1.39	1.44	1.05	2.08	1.98	1.83

[1] Cash cost and sustaining cash cost, net of by-product credits per pound of copper contained in concentrate. By-product credits are calculated using the gold and silver deferred revenue drawdown rates in effect on December 31, 2020 and the following commodity prices:
Gold: $1,800/oz for 2021, $1,700/oz for 2022, $1,650/oz for 2023, $1,600/oz for 2024 and $1,500/oz long-term
Silver: $25/oz for 2021, $23/oz for 2022, $20/oz for 2023, $19/oz for 2024 and $18/oz for long-term
Molybdenum: $11/oz for 2021 and $10/oz for 2022 and long-term

22. ECONOMIC ANALYSIS

Pursuant to NI 43-101, producing issuers may exclude the information required for Section 22 Economic Analysis on properties in production, unless the technical report includes a material expansion of current production.

As Hudbay is a producing issuer, it has excluded information required by Item 22 of Form 43-101F1 as the Pampacancha expansion does not represent a material expansion of current production at the Constancia mine.

23. ADJACENT PROPERTIES

There are no relevant adjacent properties to the Constancia and Pampacancha deposits.

24. OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information material to the Constancia mine that is necessary to make this Technical Report not misleading.

25. CONCLUSIONS

The Constancia mine operation has been mining ore and waste since March 2014 and began commercial production in April 2015. Since that time the mine has run relatively uninterrupted and consistently achieved improved performance with regards to metallurgical recovery and throughput. The deposit represents what is considered by industry standards a low grade copper porphyry with the principal mineralized ore type being hypogene in nature. The plant has proven to produce a marketable clean concentrates for both molybdenum and copper.

As of December 31st, 2020 the mineral resource estimate is distributed in two open pit shells, Constancia and Pampacancha. The Hudbay internal peer reviews and validation processes including a thorough reconciliation between the reserve model and the past 2.5 years of operations have confirmed that the models are constructed utilizing industry best practices and sound QAQC principles.

The economic and design parametres modelled, assumed and stated provide for economic extraction of reserves from the stated resource.

The resource and reserve estimate meet the criteria outlined in industry best practices such as Canadian institute of Mining, Metallurgy and Petroleum Definition Standards for mineral Resources and Mineral Reserves (May 2014).

The production and compilation of this Technical Report was performed by the capable and professional management and staff of the corporate office of Hudbay and at the Constancia mine. The supervision, revision and approval of the assembly of this report is by the QP, Olivier Tavchandjian, P.Geo,, Vice-President Exploration and Geology of Hudbay.

- The resulting mine plans account for feed restrictions as stipulated by the processing plant with regards to feed grade and ratios of zinc, iron, oxide and mineral type.
- The current performance of the operation supports the position that the plant is capable of 90,000 tonnes per day average production, including consideration for maintenance.
- Ongoing sustaining capital reported, sufficiently outlines the material capital requirements for mine fleet, plant maintenance and tailings expansion.
- Separate project capital outlined adequately accounts for development of the Pampacancha satellite deposit.
- Relevant mining permits and land title are in good standing excluding the required surface rights for the Pampacancha deposit exploitation.
- The Pampacancha pit provides for higher grade than what remains available in the Constancia open pit.
- Other than the risks described in this report, the general political and social risks associated with operating in Peru and the other risk factors described in Hudbay’s most recent annual information form, there are no known significant risks and uncertainties that could reasonably be expected to materially affect the potential development of the mineral reserve and resource estimates in this report.

26. RECOMMENDATIONS

Since 2017, Hudbay has consolidated a very prospective regional land package within trucking distance of the Constancia mining and milling infrastructures. Considerable progress has been made in concluding exploration agreements with the communities of Uchucarco, Anahuichi, Quehuincha and Collana-Velille resulting in 2 exploration agreements being signed and the obtention of a drill permit to test a skarn target at Quehuincha Norte. Hudbay will continue to very actively pursue this significant upside exploration potential that could prove that Constancia was only the first step in the creation of a large scale modern mining district in the region.

In 2020, the reserve pit has been extended by approximately 300m to the North to include the mineralization identified through the Constancia Norte drill program conducted in 2019-2020. A significant portion of the mineralization delineated during this program is still classified as inferred resources and would be amenable to reserve conversion with infill drilling. In addition, some of the mimeralization not included in the open pitable resource may be amenable to production through a small satellite underground operations that will be further investigated through trade-off studies in 2021.

Hudbay has a regional annual exploration operating budget of approximately $10 millions to cover the cost of these drilling program planned for Constancia Norte and other regional targets.

Thorough reconciliations from mineral reserve estimates to mill credited production will continue to be closely monitored in order to continue to validate the performance of the new reserve model.

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