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NI 43-101 TECHNICAL REPORT

El Metalurgista Concession – Pasco, Peru

For: Cerro de Pasco Resources Inc.

Report Nº R175.2021
Report Date: 15 March 2021
Effective Date: 31 August 2020

Qualified Persons
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Report prepared for

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Certificates of Qualification

Certificate of Qualification of Co-Author – Adrian Martinez Vargas, PhD., P.Geo.

I, Adrian Martinez Vargas, PhD., P.Geo. (ON, BC), do hereby certify that:

- I am employed as a Senior Resource Geologist with the firm of CSA Global Consultants Canada Limited, an ERM Group company, located at Suite 401, 15 Toronto Street, Toronto, Ontario, M5H 2V1, Canada.
- I graduated with a degree in Bachelor of Science, Geology, from the Instituto Superior Minero Metalurgico de Moa (ISMM), 2000. I have a Postgraduate Specialization in Geostatistics (CFSG) MINES ParisTech, 2005, and a PhD on Geological Sciences, Geology, from the ISMM in 2006.
- I am a Professional Geoscientist (P.Geo.) registered with the Association of Professional Geoscientists of Ontario (APGO, No. 2934) and the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC, No. 43008).
- I have worked as a geologist since my graduation 19 years ago, I have experience with precious and base metals mineral projects, including Mineral Resource estimation.
- I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that because of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I have visited the El Metalurgista Concession.
- I am a co-author of the technical report titled: "NI 43-101 Technical Report - El Metalurgista Concession, Pasco, Peru" for Cerro de Pasco Resources Inc., Effective Date 31 August 2020 (the "Technical Report"). I am responsible for Sections 1 to 9 to 12, 14.1, 14.3 to 14.5, and 15 to 19.
- I have no prior involvement with the Property and Issuer.
- As of the Effective Date of the Technical Report (31 August 2020), to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
- I am independent of the Issuer applying all the tests in section 1.5 of NI 43-101.
- I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

DATED this 15th day of March 2021 in Toronto, Canada

["SIGNED AND SEALED"]

{Adrian Martinez Vargas}

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Adrian Martinez Vargas, PhD., P. Geo.

Certificate of Qualification of Co-Author – Andrew Willis Sharp BEng (Mining), FAusIMM, P.Eng.

I, Andrew Willis Sharp, BEng (Mining), FAusIMM, P.Eng.(BC) do hereby certify that:

- I am currently employed as Principal Mining Engineer with CSA Global Consultants Canada Limited, an ERM Group company, with an office at 1111 W Hastings Street, 15th Floor, Vancouver, B.C., V6E 2J3, Canada.
- I am a Professional Engineer (P.Eng.) registered with the Engineers and Geoscientists of British Columbia (No. 209436).
- I am a graduate from the University of Curtin, Kalgoorlie (1987). I have been involved or associated with the mining industry since 1987, in Australia, Malaysia, Ghana, Mexico, Papua New Guinea and Canada in production roles for 28 years and five years in consulting. In particular, in relation to the Cerro de Pasco, I have more than 15 years in open cut mining in planning and operational roles and more than five years involved in mining and processing of base metals and precious metals deposits. I joined CSA Global in 2019 as Principal Mining Engineer.
- I have read the definition of "Qualified Person" set out in National Instrument 43-101 ("NI 43-101") and certify that because of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for the purposes of NI 43-101.
- I have not visited the El Metalurgista Concession.
- I am a co-author of the technical report titled: "NI 43-101 Technical Report - El Metalurgista Concession, Pasco, Peru" for Cerro de Pasco Resources Inc., Effective Date 31 August 2020 (the "Technical Report"). I am responsible for Sections 1, 13, 14.2, 17, and 18.
- I have no prior involvement with the Property and Issuer.
- As of the Effective Date of the Technical Report (31 August 2020), to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
- I am independent of the Issuer applying all the tests in section 1.5 of NI 43-101.
- I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

DATED this 15th day of March 2021 in Vancouver, Canada

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{Andrew Willis Sharp}

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Andrew Willis Sharp, BEng (Mining), FAusIMM, P.Eng.

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1 Summary

1.1 Introduction

Cerro de Pasco Resources Inc. (“CDPR”, “the Issuer” or “the Company”) is a Canadian-based resource management company incorporated in the province of Quebec and is currently primarily focused on the potential production of metals through the treatment and reprocessing of dumps, tailings and mining waste at Cerro de Pasco, Peru.

CDPR holds a 100% interest in the El Metalurgista mining concession (“the Property”) incorporating mineral rights for parts of the Excelsior Stockpile and the Quiulacocha Tailings Storage Facility (“TSF”) (“the Excelsior Project” or “the Project”). A Mineral Resource estimate (“MRE”) is reported in this Technical Report for that part of the Excelsior Stockpile within the El Metalurgista concession, but not for Quiulacocha TSF. CDPR is currently in talks with Peruvian authorities to acquire the surface rights and concessions covering those parts of the Excelsior Stockpile and the Quiulacocha TSF outside the El Metalurgista boundary and to obtain rights to reprocess these deposits. Potential processing of Excelsior and Quiulacocha materials, if future studies show this to be economically feasible, might be completed at the Cerro de Pasco Mining Unit of Volcan Compañía Minera S.A.A. (“Volcan”); however, there is no such agreement in place as of the Report Effective Date of 31 August 2020.

On 5 February 2020, CDPR engaged CSA Global Consultants Canada Limited (“CSA Global”), an ERM Group company, to complete an independent third-party review, audit and update of the MRE for the Project and, if adequately supported, to classify these estimates in accordance with Canadian Institute of Mining, Metallurgy and Petroleum (“CIM”) guidelines. CSA Global was also engaged to prepare a National Instrument 43-101 (“NI 43-101”) Technical Report with the primary purpose of disclosing the Excelsior Stockpile Mineral Resources at the Project.

1.2 Project Description and Location

CDPR holds a 100% interest in the Excelsior Project located within its El Metalurgista mining concession at 10°41'26”S, 76°16'22”W, approximately 175 km north-northeast of Lima in the region of Pasco, Peru. The Project is accessible by regional asphalt road from Lima to La Oroya, then from La Oroya to Cerro de Pasco (315 km), or via route Auxiliary Panamericana North Highway from Lima followed by a largely paved road to Cerro de Pasco (total distance 275.4 km). A railroad from Lima to Cerro de Pasco via La Oroya is used to transport concentrates to Lima and supply the mine with some of its consumables.

The Project is located in the central highlands of Peru at an elevation of approximately 4,330 metres above sea level (masl) on the eastern side of the Western Sierra of the Andes Mountains. The climate is classified as tundra with low year-round temperature and moderate precipitation.

The city of Cerro de Pasco was built around the Cerro de Pasco mine. There is longstanding support for the mining industry by the local population who possess various expertise related to mining operations. The city possesses all amenities and services such as electric power, railway, water service, modern hotels, two hospitals, and restaurants. All goods and services required for the Project can be procured locally or in the capital Lima and the province of Callao, both accessible by paved road and/or train.

The Excelsior Project comprises one mining concession (El Metalurgista) with a total effective area of 95.74 ha. The Project is overlain by Volcan’s Acumulación Cerro mining concession which includes the Cerro de Pasco mine and infrastructure. The El Metalurgista concession was staked in 1972 and the title was granted in 1989 under Legislative Decree No. 109, the former Peruvian Mining Law, which had a different licensing system to the one currently in use. The title under the previous system included the “dumps, tailings and slag located within the area of the mining concession”. This is in contrast to the current system in which the mining concession grants only the right to exploit "metallic" or "non-metallic" minerals. The El Metalurgista mining concession only allows for the surface mining of tailings and stockpiles within its boundaries; Volcan's overlapping Acumulación Cerro concession allows for the exploitation of any mineral found under the Quiulacocha tailings and Excelsior Stockpile both within and outside of the El Metalurgista concession.

The surface rights over the Excelsior stockpile and land that surrounds the Quiulacocha TSF is owned by Activos Mineros S.A.C. ("AMSAC") with the rest of the surface land owned by the community of Quiulacocha. AMSAC is fully owned by the Peruvian Government and its main objective is the remediation of environmental liabilities. CDPR has entered negotiation with the Ministry of Energy and Mines ("MINEM") to acquire the surface rights from AMSAC.

The former titleholder of the El Metalurgista concession retains a 2% Net Smelter Return ("NSR") royalty on production from the concession which can be bought back by CDPR on initiation of commercial production by paying a consideration of US$3 million by the end of the second year, or US$3.5 million by the end of the third year, or US$4 million by the end of the fourth year.

1.3 History

1.3.1 Cerro de Pasco History

The Cerro de Pasco deposit lies outside the Project's El Metalurgista mining concession but is the source of the material present in the Excelsior Stockpile and Quiulacocha TSF within the Project area.

Surface pit and near-surface underground mining of silver took place at Cerro de Pasco between 1630 and 1784, with a total of 85 small mines in production under various owners. In the early 1900s, the Cerro de Pasco Investment Company (renamed the Cerro de Pasco Copper Corporation in 1915) was formed and funded the development of the Cerro de Pasco Mine. The first copper production was recorded in 1905 and a copper concentrator plant entered production in January 1921 with tailings deposited directly into the Quiulacocha lagoon. Subsequently, the lagoon was used to store tailings from the processing of zinc-lead mineralization in the Paragsha and San Expedito process plants until 1992 and is now known as the Quiulacocha TSF.

Construction of the Paragsha process plant was completed in 1942 and by 1943 the plant was producing copper and zinc-lead concentrates. With the start of mining of zinc-lead-silver mineralization from the McCune open pit in 1956 (now known as the Raúl Rojas open pit), zinc and lead-silver concentrates started to replace copper concentrates as the main output, and copper production at Paragsha ceased in 1963.

In 1974, the Cerro de Pasco Corporation was nationalized and incorporated into a new government agency called Empresa Minera del Centro del Perú S.A. ("CENTROMIN"). In 1996, CENTROMIN expanded the Paragsha process plant to a capacity of 6,700 tpd.

In 1999, Volcan acquired the Cerro de Pasco mining operation during the privatization of CENTROMIN assets. Volcan put the Raúl Rojas open pit and underground mines into care and maintenance in 2012 and 2015, respectively. In 2014, the oxide plant started to treat low tonnages of oxide stockpile material before reaching full capacity of 2,500 tpd in 2015. Mining of in-situ oxide in the Santa Rosa open pit started in 2019 and the current feed has only minor contribution from stockpiles. Low grade zinc, lead, silver sulphide material from surface stockpiles has fed the Paragsha and San Expedito process plants since 2015.

Baumgartner et al. (2008) estimated production prior to 1950 at about 1,200 Moz of silver, 2 Moz of gold, and about 50 Mt at 2% Cu. Detailed production records from 1978 to 2019 for the combined open pit and underground mine operations, including stockpiles mined after 2014, document mining of 93,720,313 tonnes at an average grade of 86.31 g/t Ag, 2.44% Pb, and 6.59% Zn.

1.3.2 *Excelsior Stockpile History*

The Excelsior Stockpile is estimated to contain approximately 70 Mt of broken rock of which 38 Mt lies within the El Metalurgista concession. The stockpile was in use between approximately 1970 and 1996 to store what was then considered uneconomic/low-grade mineralization from the open pit.

Higher metal prices, advances in metallurgy and increased throughput in the Paragsha process plant resulted in Volcan's reassessment of the Cerro de Pasco deposit stockpiles as Mineral Resources or potential mineralization targets. Volcan completed minor surface grab sampling and the drilling of six diamond drillholes in 2004 in the northwest sector of the stockpile. In 2008, Volcan excavated 157 test pits, and in 2009, drilled 74 reverse circulation ("RC") drillholes totaling 4,374 m over the entire stockpile area.

1.3.3 *Quiulacocha Tailings Storage Facility History*

The Quiulacocha TSF covers approximately 115 ha with tailings deposited from 1921 to 1992. Approximately 57 ha of the Quiulacocha TSF lies within the El Metalurgista mining concession. The tailings are comprised of processing residues from the Raúl Rojas open pit and underground mine. The main period of tailings deposition at Quiulacocha came after 1943 when the Paragsha plant was put into commission. According to historical records, the Cerro de Pasco mine processed approximately 70 Mt of zinc-lead-silver ore between 1952 and 1996 from the open pit and underground workings with average historical grades of 7.41% Zn, 2.77% Pb and 90.33 g/t Ag.

In 2004, Cory Gold Mining S.A.C. completed a program of auger sampling of the Quiulacocha TSF. A total of 268 samples were taken from 105 vertical auger holes drilled to depths ranging from 2.0 m to 13.6 m. The survey covered approximately a third of the TSF surface area, and perhaps a quarter to a sixth of the depth of the TSF deposit (approximately 5–10% of the TSF volume).

In 2012, Cerro de Pasco Resources S.A. completed a program of 31 auger holes to verify the data collected in 2004.

The historical drilling on the Quiulacocha TSF does not inform the Excelsior Stockpile MRE disclosed in this Report.

1.4 Geological Setting and Mineralization

The Excelsior Stockpile is a large stockpile located southwest of the Raúl Rojas pit with dimensions approximately 1.3 km north-south, 0.8 km east-west, and up to 90 m deep. It is estimated to contain approximately 70 Mt of broken rock of which 38 Mt lies within the El Metalurgista. It was filled with mainly unprocessed low-grade carbonate-hosted zinc-lead-silver mineralized material excavated from the Cerro de Pasco Raúl Rojas pit and underground mine over many years since the 1970s, but it also includes some oxides containing lead-zinc-silver mineralization, volcanic rocks, and pyrite-type material with low grade copper and gold mineralization. However, for the purpose of the MRE, it was assumed that all the mineralization is lead-zinc-silver, termed MINTYPE 1.

The upper northwest part of the stockpile contains mostly volcanics from the waste stripping of the west wall of the Raúl Rojas pit, and only a few drillholes were completed in this area of the stockpile. The upper northeast and southern parts came mostly from limestones mined from the east wall of the pit and were drilled in more detail.

As the material stored in the Excelsior Stockpile is derived from the Cerro de Pasco deposit, its geological setting, local geology and mineralization are summarized below.

The Project lies within the Western Cordillera region formed during the Mesozoic to Cenozoic evolution of the Central Andes and largely made up of Mesozoic-Tertiary age rocks, dominated by the Coastal Batholith which consists of multiple intrusions ranging from Lower Jurassic to Upper Eocene in age. The belt is up to 65 km across by 1,600 km long running sub-parallel to the Pacific coast, extending north into Ecuador and south into Chile.

The oldest exposed rocks in the Cerro de Pasco district are the weakly metamorphosed shale, phyllite, and quartzite of the Devonian Excelsior Group, unconformably overlain by sandstone and conglomerate of the Permo-Triassic Mitu Group. The Mitu Group is overlain by a lower Jurassic platform carbonate sequence of the Pucará Group, principally composed of thick-bedded, dark-coloured limestone and dolostone with local shale interbeds.

From the Eocene to lower Miocene, crustal uplift and multiple deformation events affected the Excelsior, Pucará, and the Mitu Group rocks. Folds developed with broadly north-south axial direction and accompanied by west-verging thrust faults. Igneous activity affected the region In the Middle Miocene and, in the Cerro de Pasco district, consisted of an early phase of explosive volcanism represented mainly by a dacitic diatreme breccia known locally as Rumiallana Agglomerate, emplaced along the trend of the regional north-south fault zone. The diatreme event was followed by multiple dacitic porphyritic domes and quartz-monzonite porphyry dikes intruded at 15.4–15.1 Ma (Baumgartner, 2007). The diatreme and host rocks are cut by vertical breccia bodies with angular clasts of Pucará carbonate rocks in a northeast-southwest trending corridor. The end of the phreatomagmatic and magmatic activity is marked by the emplacement of numerous 20 cm to 3 m-wide, east-west trending fluidized breccia dikes occurring in various parts of the diatreme-dome complex, which was followed by the main stage of mineralization.

Mineralization took place in three distinct main stages. During Stage A, generally steeply plunging pyrrhotite pipes with polymetallic rims characterised by high-iron sphalerite were formed mainly in the eastern contact zone of the diatreme complex and potentially localised by phreatomagmatic breccia pipes. This was followed by Stage B development of the extensive pyrite-quartz replacement body developed in the contact zone of the diatreme and the Pucará carbonates which carries significant grades of copper, gold, and silver. Stage C mineralization consists of a set of east-west trending copper-silver-(gold-zinc-lead) enargite-pyrite veins that overprint the pyrite body and the diatreme breccia and are of high-sulphidation epithermal affinity. The large, zoned zinc-lead-(bismuth-silver-copper) replacement orebodies in the Pucará carbonates in the eastern part of the deposit are also assigned to Stage C and are characterized by low-iron sphalerite that may overprint iron-rich sphalerite and galena from the previous Stage A.

1.5 Exploration and Drilling

CDPR has conducted only limited exploration on the Project since acquisition. Sampling and drilling have been completed by previous operator, Volcan.

CDPR has not undertaken any drilling programs on the Property but has evaluated data from Volcan drillholes and test pits completed on the Project.

1.6 Sample Preparation, Analyses and Security

Volcan's 2004, 2008 and 2009 sample preparation, analytical techniques, and security protocols and procedures were provided to the Qualified Person and appear to be generally well documented. Volcan did not implement a sample quality assurance and quality control ("QAQC") program until 2010, therefore there is no QAQC data for assay results for these sample programs other than check duplicates completed at an independent commercial laboratory for RC drill samples collected in 2009. Given the limited QAQC, an independent assessment cannot be made of the analytical quality of the Excelsior sample results used to inform the MRE. The Qualified Person is however of the opinion that the pre-2010 data is of sufficient quality to provide the basis of Mineral Resource estimation and the conclusions and recommendations reached in this Report, based on the fact that extensive historical mining at Cerro de Pasco has relied on the data generated at the same laboratory and that QAQC subsequent to 2010 has returned adequate results. Some degree of risk is however associated with the historical data, hence it has only been used to estimate Inferred Mineral Resources.

Future sampling programs must implement a robust QAQC program.

1.7 Data Verification

CSA Global has completed verification and validation checks on the database which informs the MRE contained in this Technical Report, including sample assays, geological logs, density measurements, and analytical QAQC. CSA Global has also audited work completed by third parties, including data verification, interpolation parameters, and geological modelling assumptions.

CDPR provided the Excelsior Stockpile block model, the informing data used for interpolation, relevant wireframes with geological interpretations and topographic surfaces, and the accompanying reports with the assumptions and parameters used for interpolation. CSA Global completed a set of validations on the models, informing data, geological interpretations and estimation domains, interpolation parameters and assumptions.

Dr Adrian Martinez Vargas completed a site inspection and familiarization with the Project and the Cerro de Pasco area from 25 to 27 February 2020 and a visit to the CDPR offices in Lima on 21 February 2020. The data verification activities conducted during the site inspection consisted of:

- Observation of the mineralization in surface outcrops in the open pit, stockpiles, and TSF
- Observation of Volcan's on-site assay laboratories, and sample storage facilities
- Observation of Volcan's geological logging procedures, and review of the drillhole database
- Observation of Volcan's operation, including mining, and transportation
- Review of supporting documentation of the historical data
- Review of Volcan's sampling and QAQC procedures documentation.

Based on the assessment, the Qualified Person considers that the geological understanding and models, drillhole information and data, and Project database integrity are of sufficient quality for the geological interpretations and support of the MRE at an Inferred classification presented in this Technical Report.

1.8 Mineral Processing and Metallurgical Testing

CDPR has conducted no significant mineral processing and metallurgical testing of mineralization at the Excelsior Project.

Given the production at Volcan's Paragsha and San Expedito sulphide plants from carbonate-hosted lead-zinc-silver mineralization (MINTYPE 1) and especially the recent production from stockpiles of similar low-grade material to the Excelsior Stockpile, the current recoveries of these plants are presented as a proxy for documented mineral processing and metallurgical testwork and an indication of recoveries expected for MINTYPE 1. This has been incorporated into the Excelsior Stockpile MRE parameters and the assessment of "reasonable prospects for eventual economic extraction".

1.9 Mineral Resource Estimates

A summary of the Excelsior Stockpile MRE is provided in Table 1-1.

The MRE was completed by independent Qualified Person, Dr Adrian Martínez Vargas, P.Geo., Senior Resource Geologist and employee of CSA Global.

CDPR provided the block model, the informing data used for interpolation, relevant wireframes with geological interpretations and topographic surfaces, and the accompanying reports with the assumptions and parameters used for interpolation. Validations were completed by CSA Global on the model, informing data, geological interpretation and estimation domains, and interpolation parameters and assumptions. CSA Global also updated the density, topography and net smelter return ("NSR") cut-off used for reporting.

Table 1-1: Summary MRE of the Excelsior Stockpile with the Effective Date of 31 August 2020

Classification	NSR cut-off (US$/t)	Tonnes (kt)	NSR (US$/t)	Grade			Contained metal		
				Ag (g/t)	Pb (%)	Zn (%)	Ag (koz)	Pb (kt)	Zn (kt)
Inferred	11	30,100	22	44	0.6	1.5	42,900	184	437

Notes:

- *The resource model for the Excelsior Stockpile was prepared by Adam Wheeler in 2009. The model was reviewed and updated and the MRE reported by Dr Adrian Martinez Vargas, Ph.D., P.Geo, an employee of CSA Global. Dr. Martinez Vargas is the Qualified Person for the estimate.*
- *The Mineral Resource have an Effective Date of 31 August 2020.*
- *Numbers have been rounded to reflect the precision of a Mineral Resource estimate, therefore numbers may not total.*
- *The reporting cut-off is calculated as the marginal NSR that equals total mining, processing, and administration costs. The NSR formulas and cut-off were developed by Andrew Sharp, P.Eng., an employee of CSA Global, assuming metallurgical extraction with multiple stage flotation and cyanidation in a Merrill-Crowe circuit for silver and gold recovery. Metal prices are lead US$2,125/t, zinc US$2,650/t, and silver US$16/oz. Mining costs were assumed US$1/t for stockpiles. Processing cost was assumed US$8/t for sulphide lead-zinc-silver style mineralization. Administration cost was assumed US$2/t for sulphide lead-zinc-silver mineralization. Metallurgical processing recoveries were modelled using test work and production data provided to CDPR by Volcan, from its current operations at Cerro de Pasco which are processing similar material to that within the Excelsior Stockpile.*
- *A bulk density of 1.98 t/m3 is used.*
- *Block model grade interpolation was undertaken using ordinary kriging.*
- *The average grade estimates reflect in-situ resources and does not include modifying factors such as external dilution, mining losses and process recovery losses. However, resources were reported based on a regularized model that included dilution with low-grade material.*
- *The Mineral Resource estimate for the surface stockpile is constrained by the vertical lateral limits of the El Metalurgista concession boundaries and the limits of the stockpile surfaces within the concession.*
- *Mineral Resources are estimated and classified in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves, adopted by the CIM Council on May 10, 2014 using the Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines, adopted by the CIM Council on November 29, 2019.*
- *Mineral Resources are not Reserves and, as such, do not have demonstrated economic viability.*
- *One troy ounce (oz) equals 31.10348 g.*

Dr Martínez has completed sufficient work to validate and update the Wheeler and Volcan block models and report the MRE. Andrew Sharp, P.Eng., full-time employee of CSA Global and Qualified Person, defined the processing and mining assumptions used to develop the NSR cut-off used for reporting Mineral Resources. The assumptions used to calculate NSR cut-off are based on 2016 to 2020 Volcan production data and metallurgical testwork provided to CDPR, relating to similar stockpile material to Excelsior, and collaborated by information from similar operations in the region.

The MRE has been estimated and classified in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves, adopted by the CIM Council on 10 May 2014 ("CIM Definition Standards") and CIM Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines adopted by the CIM Council on 29 November 2019 ("CIM Guidelines"). The MRE has an effective date of 31 August 2020, which is based on the date of the survey data used for depleting resources.

The stockpiled mineralization is amenable to exploitation by open-pit mining methods and processing by standard floatation methods currently performed at the Paragsha plant.

Factors which may affect the MRE include:

- Metal price assumptions
- Changes to the assumptions used to estimate contained metal (e.g. bulk density and grade model estimation methodology)
- Geological interpretation (revision of mineralized domains)

- Changes to process plant recovery estimates if the metallurgical recovery in certain locations is lesser or greater than currently assumed
- Environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues can potentially affect the MRE; however, as of the Report date, the Qualified Person is not aware of any such issues that are not discussed in this Report.

It is the Qualified Persons' opinion, based on assessment of all available information and data, that the reasonable prospects for eventual economic extraction of the Mineral Resource is not materially impacted by these factors.

1.10 Conclusions

The MRE in this Technical Report is based on historical drilling test pit sampling of the Excelsior Stockpile from 2004 to 2009. The quantity and quality of the data collected and compiled in the drillhole database are sufficient to support the MRE. The reporting cut-off is calculated as the marginal NSR based on total mining, processing, and administration costs, recoveries, and averaged metal prices. Processing cost and recovery were modelled using existing Volcan testwork and production data.

The MRE has been estimated and classified in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves. Mineral Resources are not Reserves and, as such, do not have demonstrated economic viability.

1.10.1 Risks

- Environmental, permitting, legal, title, taxation, socio-economic, marketing, and political or other relevant issues could potentially materially affect access, title, or the right or ability to perform the work recommended in this report. However, at the time of this report, the Qualified Persons are unaware of any such potential issues affecting the Project and work programs recommended in this report.
- Generally, no downhole deviation data is available for historical drillholes; however, most holes are relatively short in length and deviation is not anticipated to be a significant issue.
- Except for limited external laboratory check samples, the MRE is not supported by adequate QAQC procedures therefore Mineral Resource has been classified as Inferred.
- Metal price assumptions may change due to macroeconomic factors.
- Changes to the assumptions used to estimate contained metal (e.g. bulk density and grade model estimation methodology) may result from additional data acquisition and improved geological understanding but is unlikely to be material at the level of resource classification.
- Geological interpretation (revision of mineralized domains) may alter the estimate but is unlikely to be material at the level of resource classification.
- Changes to process plant recovery estimates if the metallurgical recovery in certain domains is lesser or greater than currently assumed; this will be evaluated through geometallurgical modeling which is expected to improve process optimisation.

1.10.2 Opportunities

- Infill drilling and more detailed sampling in stockpile mineralization will allow more granularity in the Mineral Resource and may enable the delineation of higher-grade domains and potentially allow for upgrading of classifications.
- Negotiations with AMSAC may provide access to the portion of the Excelsior Stockpile not within CDPR's 100% owned El Metalurgista mining concession.

- Investigate potential for reprocessing of the Quiulacocha tailings.
- Metal price assumptions may be conservative.
- Detailed metallurgical test programs and a geometallurgical model may improve potential recovery.

1.11 Recommendations

The authors recommend that CDPR undertake short to medium-term programs required to better understand the Project's potential, potentially increase the Mineral Resource base and improve its classification, develop a geometallurgical model, and undertake additional testwork to improve metallurgical recoveries.

The Project contains legacy data from work completed by previous operators. The Qualified Person recommends completing a database compilation and a program to verify the data from previous operators. This would include re-assaying archived drillhole sample intervals (if available) for verification purposes, verifying drillhole logging, re-assaying archived samples (if available) with known QAQC issues to evaluate any potential bias. Strategy for further exploration work on the Excelsior Stockpile, including RC drilling, depends on the outcome of negotiations with AMSAC for surface use rights.

CDPR has proposed a work with costs, summarised in Table 1-2. All assaying would be supported by QAQC programs. The schedule and budget in Table 1-2 may vary depending on permit approvals and other variables.

The details of Phase 2 will be contingent on the outcomes of the work completed in Phase 1. At this time, a Phase 2 work program has only been planned for the Quiulacocha TSF to extend the resource estimation if Phase 1 drilling, resource estimation and metallurgical studies provide favourable results.

The authors have reviewed the proposed work programs and agree with the planned work.

Table 1-2: Proposed Phase 1 and Phase 2 work programs budget

Description		**Estimated duration**	**Estimated cost (US$)**
PHASE 1			
Excelsior Stockpile Work Program – Phase 1			
Excelsior Stockpile – data verification program	Data verification program, re-assaying 10% of original samples + QAQC inserts (approximately 525 assays)	3 months	$18,000
	Centralise all geological data using appropriate GIS and set up database through server	3 months	$10,000
Subtotal			**$28,000**
Quiulacocha Tailings Work Program – Phase 1			
Quiulacocha tailings drill program	Permitting	4 months	$5,000
	40-borehole program (100 m borehole spacing, 800 m of drilling) and assaying at independent laboratory	3 months	$400,000
	Independent resource estimation	1 month	$39,500
Subtotal			**$444,500**
Quiulacocha Tailings Metallurgical Testwork Program – Phase 1			
Quiulacocha tailings metallurgical test program	Mineralogical characterization	3 months	$16,000
	Flotation test program	2 months	$20,000
Subtotal			**$36,000**
PHASE 1 – TOTAL			**$508,500**
PHASE 2			
Quiulacocha Tailings Work Program – Phase 2			
Quiulacocha tailings drill program	Permitting	6 months	$35,000
	40-borehole program (100 m borehole spacing, 800 m of drilling) and assaying at independent laboratory	3 months	$410,000
	3D geological modelling of Quiulacocha tailings and internal MRE	1 month	$35,000
Subtotal			**$480,000**
Quiulacocha Tailings Metallurgical Testwork Program - Phase 2			
Quiulacocha tailings metallurgical test program	Mineralogical characterization	2 months	$16,000
	Flotation test program	2 months	$20,000
Subtotal			**$36,000**
PHASE 2 – TOTAL			**$516,000**
PHASE 1 AND PHASE 2 – GRAND TOTAL			**$1,024,500**

2 Introduction

2.1 Issuer

CDPR is a Canadian-based resource management company incorporated in the province of Quebec, Canada and headquartered at Unit 203, 22 Lafleur Ave, Saint-Sauveur, Quebec J0R 1R0. The Company's Peruvian office is located at Av. Santo Toribio, No. 115, Of. 702, San Isidro, Lima. The Company trades on the CSE (CDPR), OTCMKTS (GPPRF) and Frankfurt (N8HP) exchanges and is currently focused on the potential production of metals through the treatment and reprocessing of dumps, tailings and mining waste at Cerro de Pasco, Peru ("the Excelsior Project" or "the Project").

The Excelsior Stockpile covers a surface area of 67.92 ha and contains approximately 70 Mt of material mined primarily from the open pit at the world-renowned Cerro de Pasco mine, approximately between the years 1952 and 1996. Waste and low-grade polymetallic material were stockpiled as it was, at the time, considered to be uneconomic. The in-situ Cerro de Pasco deposit, operated by Volcan Compañía Minera S.A.A., comprises a substantial polymetallic Cordilleran epithermal and carbonate-replacement mineral system (zinc-lead-silver-gold-copper-bismuth) which has been a centre of mining for more than 400 years. Although substantial open cut and underground mining has occurred, significant resource potential remains in-situ as well as within the tailings and waste dumps at the site.

Cerro de Pasco Resources S.A. ("Cerro"), a corporation incorporated under the laws of Peru, was formed in 2012, when it acquired mining rights related to tailings and the portion of the Excelsior Stockpile located within the El Metalurgista concession at Cerro de Pasco. In October 2018, Genius Properties Ltd. ("Genius") changed its name to Cerro de Pasco Resources Inc. on completion of the acquisition of Cerro, and the spin-out of all other assets previously held by Genius into a new company. The transaction was accomplished by merging Cerro with a fully owned Peruvian branch of CDPR, Cerro de Pasco Resources Sucursal del Peru ("CDPRS"), constituted in Peru on 8 June 2018. According to Peruvian regulations, CDPRS has legal status, but it is an establishment through which the parent company CDPR develops its activities in Peru. In that sense, the CDPRS corporate body is the same as the parent company in Canada and CDPRS does not need to have independent General Shareholders or Directors. Notwithstanding, CDPRS has permanent legal representation and management autonomy in Peru, related to the activities assigned by the parent company, in accordance with the powers of attorney granted to CDPRS representatives.

The proposed transaction with Cerro was initially announced by Genius in November 2017 at which time Cerro's main asset was an option to acquire a 100% interest in the El Metalurgista Concession which covers part of the Quiulacocha Tailings and Excelsior Stockpile at Cerro de Pasco. The surface area of the portion of the Excelsior Stockpile lying within the El Metalurgista concession is approximately 35 ha and contains approximately 38 Mt of broken rock. In January 2018, Cerro exercised this option and became the exclusive 100% titleholder of the El Metalurgista Concession. CDPR acquired this title through the acquisition of Cerro in October 2018.

CDPR subsequently entered a share purchase agreement with Volcan Compañía Minera S.A.A. (BVL:VOLCABC1) and its subsidiaries (collectively, "Volcan") on 27 November 2019 to acquire the Cerro de Pasco deposit through acquisition of all issued shares of Oxidos de Pasco S.A.C. ("Oxidos"), Empresa Administradora de Cerro S.A.C ("Cerro S.A.C.") and Remediadora Ambiental S.A.C. (the "Transaction"). Glencore International AG ("Glencore") is 55.028% controlling owner of Volcan Class A shares. The arm's length Transaction would have provided CDPR ownership and operation of the polymetallic epithermal and carbonate-replacement mineral system, and all mining and processing assets in Cerro de Pasco, Central Peru, including a precious metal leach plant and a base and precious metals concentrator.

Following multiple extensions, the Company announced on 2 November 2020 that the Transaction had expired. Volcan, Glencore and CDPR continue to engage proactively to reach an agreement that is satisfactory to both parties and beneficial to the local communities.

2.2 Terms of Reference

On 5 February 2020, in anticipation of the now expired Transaction, CDPR engaged CSA Global to complete an independent third-party review and audit of Cerro de Pasco Mineral Resource estimates, including the 2009 Excelsior Stockpile estimate (Wheeler, 2009). On 11 January 2021, CDPR engaged CSA Global to prepare a NI 43-101 technical report on the Excelsior Stockpile Mineral Resource within CDPR's 100%-owned El Metalurgista concession at Cerro de Pasco. CSA Global, in collaboration with the Cerro de Pasco technical team, completed a review and update of the Wheeler (2009) Excelsior Stockpile Mineral Resource.

CSA Global is a geological, mining and management consulting company with more than 35 years' experience in the international mining industry, headquartered in Perth, Western Australia. The company has eight offices located in Australia, Canada, the United Kingdom, Ireland, South Africa, and Indonesia. CSA Global services cover all aspects of the mining industry from project generation to exploration, evaluation, resource estimation, studies, development, operations, and corporate advice. CSA Global has undertaken the geological assessment and mineral resource estimation for the Project, including the site inspection, and a review of the sustained mineral production and processing maintained by CDPR since its acquisition of the Project.

This Technical Report is specific to the standards dictated by NI 43-101 Standards of Disclosure for Mineral Projects (30 June 2011), Companion Policy 43-101CP, and Form 43-101F1. The MRE reported in this Technical Report has been prepared in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves (10 May 2014) ("2014 CIM Definition Standards") and CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (29 November 2019). Only Mineral Resources are estimated – no Mineral Reserves are defined. The Report is intended to enable the Issuer and potential partners to reach informed decisions with respect to the Project.

The Issuer reviewed draft copies of this report for factual errors. Any changes made because of these reviews did not include alterations to the interpretations and conclusions made. Therefore, the statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this Report.

2.3 Sources of Information

This Report is based on historical internal company technical reports, data, testwork results, maps, published government reports and public information, in addition to items listed in Section 19 (References) of this Report. The various studies and reports have been collated, reviewed and integrated into this Report by the authors, assisted by CDPR personnel. Reports, plans, sections, databases and documents referred to in this report are securely stored on the CDPR server. The authors have taken reasonable steps to verify the information provided. The MRE was audited, updated, and reported by Dr Adrian Martinez Vargas of CSA Global.

The authors also had discussions with the Volcan site geology team and with the management and consultants of the Issuer, including:

- Mr Shane Whitty (CDPR Vice-President Exploration and Technical Services), regarding the geology and tenure of the Property
- Mr Neil Ringdahl (CDPR President), regarding the potential for economic extraction
- Mr Steven Allen Zadka (Executive Chairman), on company structure and corporate history
- Manuel Lizandro Rodriguez Mariategui Canny (Managing Director), on legal issues, legal due diligence, and concession status

- Edwin Mitchell (Vice-President Safety, Health, Environment and Community), on environmental, community and health and safety requirements.

This Report includes technical information that requires calculations to derive subtotals, totals and weighted averages, which inherently involve a degree of rounding and, consequently, introduce a margin of error. Where this occurs, the authors do not consider it to be material.

2.4 Qualified Persons

This Report was prepared by the Qualified Persons listed in Table 2-1.

Table 2-1: Qualified Persons – report responsibilities

Section	Qualified Person
Section 1: Summary	All authors
Section 2: Introduction	Adrian Martinez Vargas
Section 3: Reliance on Other Experts	Adrian Martinez Vargas
Section 4: Property Description and Location	Adrian Martinez Vargas
Section 5: Accessibility, Climate, Local Resources, Infrastructure and Physiography	Adrian Martinez Vargas
Section 6: History	Adrian Martinez Vargas
Section 7: Geological Setting and Mineralization	Adrian Martinez Vargas
Section 8: Deposit Types	Adrian Martinez Vargas
Section 9: Exploration	Adrian Martinez Vargas
Section 10: Drilling	Adrian Martinez Vargas
Section 11: Sample Preparation, Analyses and Security	Adrian Martinez Vargas
Section 12: Data Verification	Adrian Martinez Vargas,
Section 13: Mineral Processing and Metallurgical Testing	Andrew Sharp
Section 14: Mineral Resource Estimates	Adrian Martinez Vargas (14.1, 14.3 to 14.5), Andrew Sharp (14.2)
Section 15: Adjacent Properties	Adrian Martinez Vargas
Section 16: Other Relevant Data and Information	Adrian Martinez Vargas
Section 17: Interpretation and Conclusions	All authors
Section 18: Recommendations	All authors
Section 19: References	Adrian Martinez Vargas

The authors are Qualified Persons (”QPs”) as defined in NI 43-101, with the relevant experience, education, and professional standing for the sections of the Report for which they are responsible.

CSA Global conducted an internal check to confirm that there is no conflict of interest in relation to its engagement in this Project or with CDPR and that there is no circumstance that could interfere with the Qualified Persons’ judgement regarding the preparation of the Technical Report.

2.5 Qualified Person Property Inspection

As noted in Section 2.2, in anticipation of the now expired Transaction, CDPR engaged CSA Global to complete an independent third-party review and audit of Cerro de Pasco MREs including the Wheeler (2009) Excelsior stockpile estimate. As part of the review and audit, CSA Global Qualified Person and Report author, Dr Adrian Martinez, conducted a three-day property visit at the Cerro de Pasco Project site from 25 to 27 February 2020 as detailed in Section 12.1. One day was also spent at the Lima office of CDPR on 24 February 2020. The data verification activities conducted by the author during the site inspection included:

- Observation of the mineralization in surface outcrops in the open pits, stockpiles, and TSF

- Observation of the on-site Volcan assay laboratories, and sample storage facilities
- Observation of the Volcan geological logging procedures, and review of the drillhole database
- Observation of the Volcan operation, including mining, and transportation
- Review of supporting documentation of the historical data
- Review of Volcan sampling and QAQC procedures documentation.

The authors consider Dr Martinez Vargas' site visit current under section 6.2 of NI 43-101.

2.6 Effective Date

The Effective Date of this Technical Report is 31 August 2020. This date reflects the day upon which all technical and financial conditions are based.

2.7 Units, Currency and Abbreviations

The Metric or SI System is the primary system of measure and length used in this Report and is generally expressed in kilometres (km), metres (m) and centimetres (cm); volume is expressed as cubic metres (m^3), mass expressed as metric tonnes (t), area as hectares (ha), and zinc, copper and lead grades as percent (%) or parts per million (ppm). The precious metal grades are generally expressed as grams/tonne (g/t) but may also be in parts per billion (ppb) or parts per million (ppm). Conversions from the SI or Metric System to the Imperial System are provided below and quoted where practical. Metals and minerals acronyms in this report conform to mineral industry accepted usage (see Appendix B).

Silver grade is frequently reported in troy ounces per tonne (Ag oz/t), an unconventional reporting format, but the historical reporting method at the Cerro de Pasco mine. However, for the purpose of reporting the Mineral Resource estimates, silver is reported in grams per tonne (Ag g/t). Gold is reported in grams per tonne (Au g/t). Base metals, zinc (Zn %), lead (Pb %) and copper (Cu %), are reported in percentage (%). Conversion factors utilised in this report include:

- 1 troy ounce/tonne = 31.1035 grams/tonne
- 1 gram/tonne = 0.0322 troy ounces/tonne
- 1 troy ounce/short ton = 34.2857 grams/tonne
- 1 gram/tonne = 0.0292 troy ounces/short ton
- 1 troy ounce = 31.1035 grams
- 1 gram = 0.0322 troy ounces

The term gram/tonne or g/t is expressed as "gram per tonne" where 1 gram/tonne = 1 ppm (part per million) = 1,000 ppb (part per billion). Other abbreviations include ppb = parts per billion; ppm = parts per million; oz/t = ounce per tonne; oz/st = ounce per short ton; Moz = million ounces; Mt = million tonne; t = tonne (1,000 kilograms); st = short ton (2,000 pounds) and, SG = specific gravity.

Other abbreviations include UTM = Universal Transverse Mercator; PSAD56 = Provisional South American Datum of 1956; WGS = World Geodetic System.

Unless otherwise mentioned, all coordinates in this Report are provided in UTM Zone 18 South projection, WGS84 datum. The informing data provided for the Mineral Resource estimates are in local mine coordinates described in Section 14.3. All images and coordinates in Section 14 refer to local grid coordinates (metres).

All currencies are expressed in U.S.A. Dollars (US$), unless otherwise stated. As of the Effective Date of this Report, the Bank of Canada exchange rate between the US$ and Canadian dollar (CA$) and the US$ and Peruvian Sol (PEN) was approximately US$ 1.00 = CA$ 1.36 = PEN 3.46.

3 Reliance on Other Experts

With respect to claim tenure information in Section 4, the authors and CSA Global have relied on the Mining Transfer and Assignment Option Agreement for the El Metalurgista concession dated 14 February 2017 and the exercise of the El Metalurgista agreement dated 12 January 2018 as provided by CDPR.

The Qualified Persons and CSA Global have relied upon CDPR and its management for information related to underlying contracts and agreements pertaining to the acquisition of the mining claims and their status and technical information not in the public domain (Section 4). The Property description presented in this Report is not intended to represent a legal, or any other opinion as to title.

4 Property Description and Location

4.1 Property Location

The Excelsior Project is located approximately 175 km north-northeast of the city of Lima in the region of Pasco, Peru. The Project is located immediately to the west of the city of Cerro de Pasco at latitude 10°41'26"S, longitude 76°16'22"W and an elevation of approximately 4,335 masl (Figure 4-1). It is located approximately 1 km west of the southwest end of Volcan's Raul Rojas open pit.

Figure 4-1: Location of the Excelsior Project

Source: CDPR, 2021

4.2 Mineral Tenure

Under Peruvian legislation, mining concessions grant the titleholder the right to conduct exploration activities and exploitation of metallic and non-metallic materials within a determined area for indefinite terms (subject to compliance with the applicable obligations), and the ownership of extracted minerals is vested in the holders of mining concessions. A beneficiation concession grants the right to concentrate, smelt or refine minerals already mined. Notwithstanding, to execute those mining and beneficiation rights, it is necessary to obtain the permits and authorizations required by law, from appropriate authorities.

An overview of the Peruvian Mining Law and regulations is presented in Appendix A (Overview of Mining and Environmental Law and Regulations in Peru). This appendix should be read if the reader is not familiar with Peruvian Mining and Environmental Law.

CDPR holds a 100% interest in the Excelsior Project which comprises one mining concession (El Metalurgista) with a total area of 95.74 ha. The El Metalurgista concession was staked in 1972 and the title was granted in 1989 under Legislative Decree No. 109, the former Peruvian Mining Law, which had a different licensing system relative to the one currently in use. The title under the previous system included the “dumps, tailings and slag located within the area of the mining concession”. This is in contrast to the current system in which the mining concession grants only the right to exploit “metallic” or “non-metallic” minerals. The El Metalurgista mining concession therefore only allows for the surface mining of tailings and stockpiles within its boundaries; Volcan’s overlapping Acumulación Cerro concession allows for the exploitation of any mineral found under the Quiulacocha tailings and Excelsior stockpile both within and outside of the El Metalurgista concession.

On 12 January 2018, Cerro de Pasco Resources S.A. exercised its option to acquire a 100% interest in the El Metalurgista concession and executed the public deed whereby it formally acquired title over the concession and paid its former titleholder, Mr Victor Freundt Orihuela, the balance of the US$853,700 purchase price. CDPR acquired 100% of the El Metalurgista concession in October 2018 through acquisition of Cerro de Pasco Resources S.A.

Figure 4-2 shows the location of the El Metalurgista mining concession, and its position relative to Volcan’s overlapping Acumulación Cerro mining concession. Figure 4-3 shows the concession’s coverage of portions of the Excelsior Stockpile and Quiulacocha TSF. The surface area of the portion of the Excelsior Stockpile lying within the El Metalurgista concession is approximately 35 ha and contains approximately 38 Mt of broken rock. The approximate centre coordinates of the El Metalurgista concession are: 360,805 mE and 8,817,950 mN (UTM Zone 18S, WGS84 datum) or Longitude 76°16’22” and Latitude 10°41’26”.

The El Metalurgista concession is in good standing and is recorded in file No. 20002396 of the Mining Rights' Registry of Huancayo. As per the information obtained from the Public Registry, the registered title holder of the Concession is Cerro de Pasco Resources S.A. and the Concession is free and clear of recorded encumbrances (including securities on movable goods). As per the information available in Instituto Geológico Minero y Metalúrgico (“INGEMMET”, the agency of the Ministry of Energy and Mines responsible for regulation of mineral rights), there are no outstanding debts regarding the validity fees and minimum production penalties have been paid for 2019 and 2020.

All holders of mining concessions are required to pay good standing fees, called validity fees. These fees are calculated based on the concession area and paid on an annual basis to INGEMMET[1]. Failure to pay validity fees for two years results in the cancellation of the mining concession. Validity fees paid in 2020 on CDPR’s El Metalurgista mining concession total US$287.22 (Table 4-1).

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[1] The current validity fee is US$3 per hectare per year.

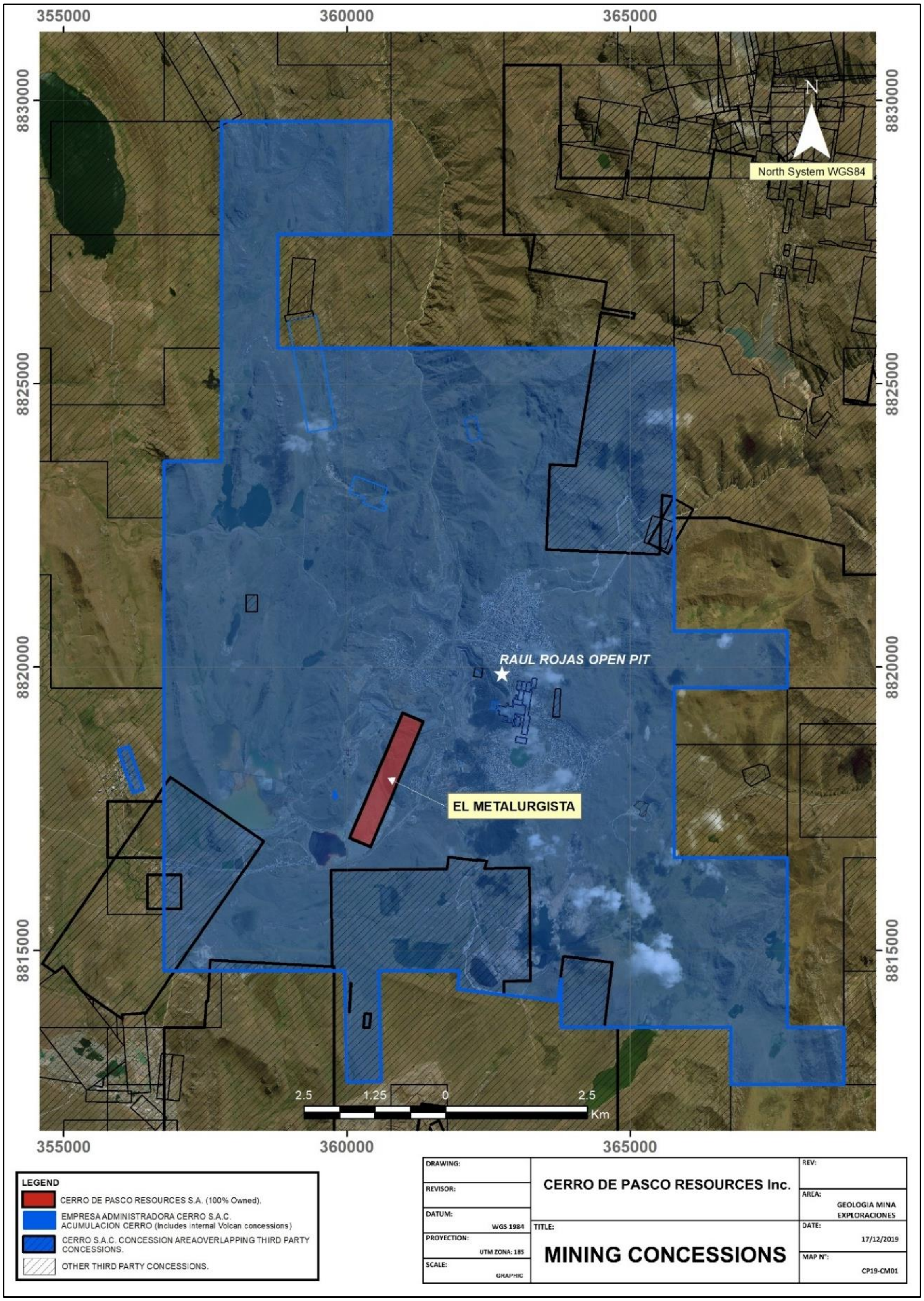

Figure 4-2: Plan view of CDPR's 100% owned El Metalurgista mining concession overlain by Volcan's Acumulación Cerro mining concession

Source: CDPR, 2021

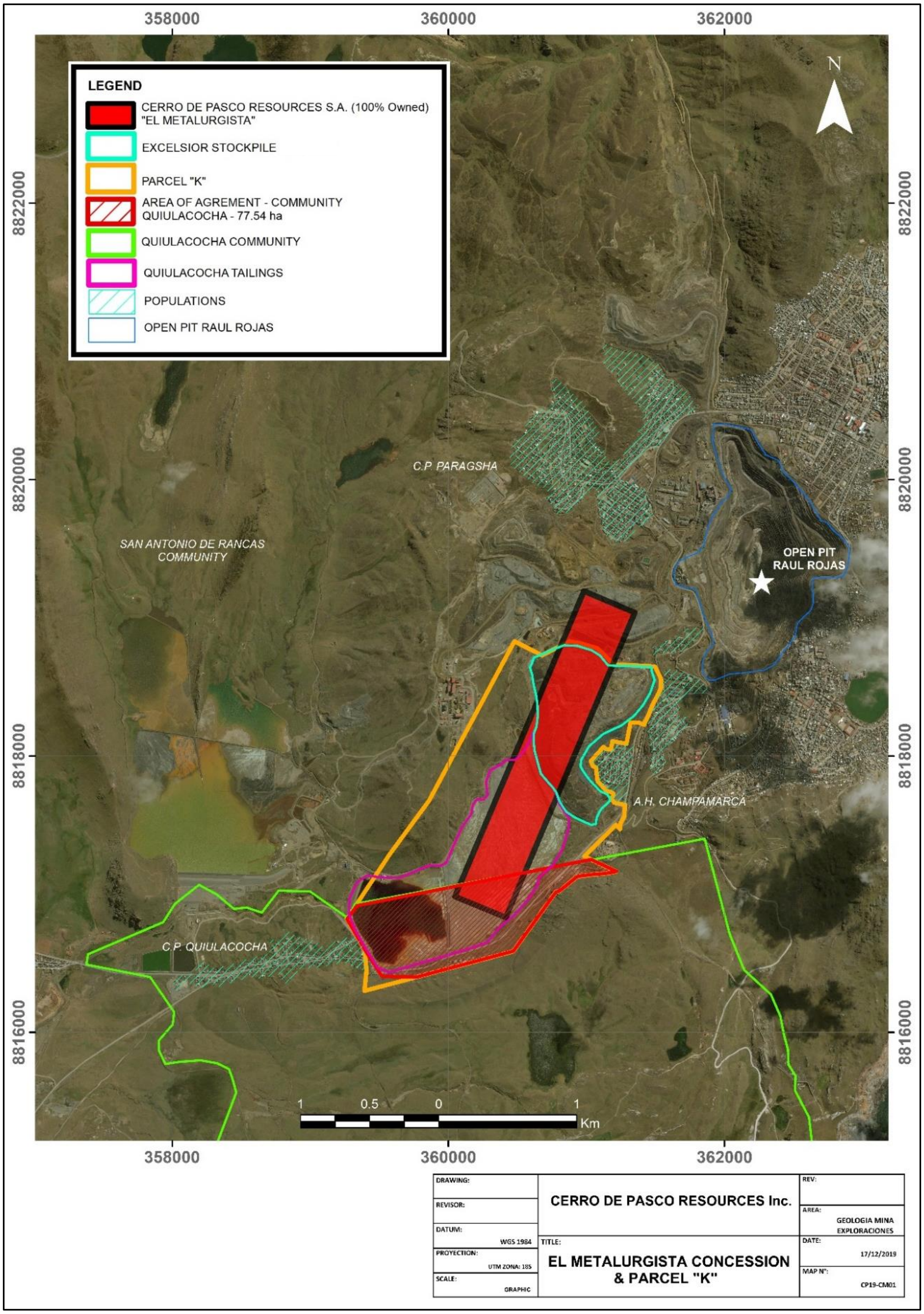

Figure 4-3: CDPR's El Metalurgista concession location relative to Quiulacocha TSF, Excelsior Stockpile and Parcel "K" surface rights owned by AMSAC

Source: CDPR, 2020

Table 4-1: CDPR mining concessions

Concession	Code	Date issued	Granted area (ha)	Effective area (ha)	Registered titleholder	Public Registry file	Validity fees (US$) 2020	Production penalties (US$) 2020
El Metalurgista	04012094X01	1989-07-03	95.74	95.74	Cerro de Pasco Resources S.A.	20002396 (Huancayo)	287.22	2,234.53

In addition to the annual validity fees, holders of mining concessions must achieve a minimum production levels of at least one Tax Unit per hectare per year[2] within a 10-year term following the year in which the respective mining concession title was granted. If such minimum production is not reached within the term, the mining titleholders shall pay a penalty equivalent to: 2% of the minimum production (between year 11 and 15), 5% of the minimum production (between year 16 and 20) and 10% of the minimum production (between year 21 and 30). Titleholders of mining concessions have a 30-year term to achieve the minimum production levels set by law. If minimum production is not reached within this term, the relevant mining concession is cancelled. In principle, the 30-year term is counted from the year following granting of the mining concession title. However, for those concessions granted before 31 December 2008, the term is counted as from January 2009. The penalty fee paid in 2020 on CDPR's El Metalurgista mining concession totals US$2,234.53 (Table 4-1).

4.3 Taxes, Royalties and Other Agreements

As of 2011, producing mining companies are required to contribute to the following fiscal regimes: Corporation Income Tax ("CIT"), Modified Mining Royalty ("MMR") levy on the quarterly sales revenues from metallic and non-metallic mineral resources (Law No. 29788), Special Mining Tax ("SMT") levies on the operating profit of metallic resources (Law No. 29789) and the Special Mining Contribution ("SMC") applicable to entities that have entered into tax stability agreements with the government (Law No. 29790). Table 4-2 shows the tax rates as indicated by SUNAT (Superintendencia Nacional de Administración Tributaria - National Superintendency of Tax Administration).

Table 4-2: Taxes

Name	Tax base	Tax rate	Authority
CIT	Profit before tax	28%	SUNAT
MMR	Operating income	1–12% depending on operating margin (minimum 1% of sales; deductible from CIT)	SUNAT
SMT	Operating income	2–8.4% depending on operating margin (deductible from CIT)	SUNAT
SMC	Operating income	4–13.12% depending on operating margin (deductible from CIT)	SUNAT

Source: SUNAT

All payments of mining royalties, SMT and SMC contributions are deductible expenses for income tax purposes. Further, as an incentive for mining investment, an early recovery regime of Value Added Tax applies for mining entities in the exploration stage, as well as special tax depreciation for all mining companies with a stability agreement or in general for mining equipment and machinery.

The former titleholder, Mr Victor Freundt Orihuela, retains the right to receive a 2% NSR royalty on the products obtained from the concession. This royalty can be bought back entirely by CDPR as of initiation of commercial production in the concession, by paying a consideration of US$3 million if the royalty is bought back by the end of the second year, US$3.5 million if bought back by the end of the third year, or US$4 million if bought back by the end of the fourth year.

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[2] Reduced minimum production requirements are applicable for non-metallic concessions and for artisanal and small mining producers.

4.4 Surface Rights and Land Usage Agreements

Mining rights are independent from surface rights. Hence, the holders of mining rights may be different parties to those holders or owners of the coinciding lands. The holder of a mining concession must respect the landowner's property or rights of an occupier. A holder of mining rights cannot trespass on such property or use surface lands without the landowner's or occupier's consent.

Mining concession holders may acquire or purchase lands, real estate properties, easements, rights of way, and/or other surface rights owned or held by third parties. If the owner or holder of such properties or rights is a local community, then such community's approval is required and, generally, an agreement must be negotiated with the community addressing their expectations in respect of the mining development.

The surface rights over the Excelsior Stockpile and the Quiulacocha TSF (Parcela K) are owned by Activos Mineros S.A.C. ("AMSAC") with the rest of the land owned by the community of Quiulacocha (Figure 4-3). AMSAC, created in June 2006, is fully owned by the Peruvian Government. The main objective of this company is the remediation of environmental liabilities. CDPR has entered negotiation with the Ministry of Energy and Mines ("MINEM") to acquire the surface rights from AMSAC. In separate negotiations with the community of Quiulacocha, a land usage agreement was signed (effective 16 October 2019) whereby, for a period of two years, a monthly payment of US$10,000 is made to the community in return for access to all surface land for exploration activities (see Table 4-3).

Table 4-3: Annual payments to communities

Community	**Agreement**	**Duration**	**Start date**	**End date**	**Annual payment (US$)**
Rural Community of Quiulacocha	Agreement for the surface rights of land between CDPR and the rural community of Quiulacocha (laydown area for drilling program and temporary offices etc., 77.54 ha in total)	2 years	16 Oct 2019	16 Oct 2021	120,000

Figure 4-3 shows the surface rights (Parcela K) owned by AMSAC along with the two-year surface rights agreement area that CDPR has negotiated with the community of Quiulacocha in relation to the El Metalurgista concession.

4.5 Water Rights

CDPR does not own water rights in the Project area. Water rights cannot be purchased in Peru, but they are commonly granted by the National Water Authority for industrial or mining purposes. In Peru, obtaining water permits is a prerequisite prior to any drilling or development being undertaken.

4.6 Environmental and Permitting Considerations

The mining regulations which are linked to environmental regulations are described in Appendix A (Overview of Mining and Environmental Law and Regulations in Peru). This appendix should be read if the reader is not familiar with Peruvian Mining and Environmental Law.

4.6.1 Environmental Liabilities

There is an expectation of environmental liabilities associated with historical mining and exploration activity. Under Law No. 28271, the responsibility for the remediation of environmental liabilities lies with the person or company that generated the liability. In the case of historical liabilities where the entity or person who generated the liability is unknown or no longer exists, the state-owned company, AMSAC is charged with remediation on behalf of the government.

The MINEM's Inventory of Mining Environmental Liabilities (2018) identifies two mining environmental liabilities over the El Metalurgista concession area: Excelsior Stockpile (Depósito de Desmonte Excelsior) and the Quiulacocha TSF (Depósito de Relaves Quiulacocha).

When the Cerro de Pasco Mining Unit, then part of state-owned Empresa del Centro del Perú ("CENTROMIN"), entered the privatization process in September 1999, both the Excelsior Stockpile and the Quiulacocha TSF, which were part of the original mine infrastructure, were transferred as an option to Volcan for a one-year period. Volcan continued to use the Excelsior Stockpile to deposit waste and low-grade rock from the Raul Rojas mine until September 2000. At that time, Volcan returned both deposits to CENTROMIN which then assumed responsibility for environmental remediation of these areas. Access to the material within the El Metalurgista concession has since been acquired by CDPR (Section 4.2). In 2009, responsibility for closure plans and environmental remediation of CENTROMIN and other state-owned companies passed to AMSAC. The surface rights (Parcela K) and the requirement to remediate still belongs to AMSAC.

CDPR are reviewing options with the Peruvian State on how both areas can be remediated through reprocessing of the mineralization that remains within each of these liabilities.

Excelsior Stockpile (Depósito de Desmonte Excelsior)

By means of Directorial Resolution No. 253-2012-MEM/AAM, dated 7 August 2012, a Mining Environmental Liability Closure Plan (Plan de Cierre de Pasivos Ambientales, "PCPAM") for the Excelsior Stockpile was approved. The company responsible for the closure of this mining environmental liability is AMSAC. To date, AMSAC has not completed closure of the Excelsior Stockpile.

Quiulacocha Tailings Storage Facility (Depósito de Relaves Quiulacocha, Quiulacocha TSF)

The MINEM Inventory states that the company responsible for the closure of the Quiulacocha TSF mining environmental liability is AMSAC; however, no PCPAM has been approved or submitted for its remediation. The CDPR concession El Metalurgista covers the majority of the Quiulacocha TSF. CDPR is negotiating with the Peruvian authorities to acquire the surface rights to the tailings along with the remaining part of the concession that falls within the tailings facility that is owned by AMSAC. CDPR believes that it will be successful in its negotiations with the Peruvian Government to acquire the surface rights to the TSF as its business case is to reprocess the tailings which will result in the removal of the liability.

4.6.2 Permitting in Progress

Environmental studies for outstanding permits for exploration of the Quiulacocha tailings deposit commenced in 2020. Coordination with the General Directorate of Environmental Mining Affairs ("DGAAM") of the MINEM for the approval of an Environmental Impact Declaration ("DIA") for exploration is ongoing. A list of environmental instruments that are pending approval is provided in Table 4-4.

Table 4-4: Environmental instruments under evaluation by regulatory authorities (as of 16 September 2020)

Environmental instrument	Relevant regulations	Regulatory authority	Expected approval date	Objective	Status
Environmental Impact Declaration (DIA)	D.S. No. 020-2008-EM	DGAAM	April 2021	Obtain approval for 40 drill platforms for the exploration of the El Metalurgista concession within the Quiulacocha tailings deposit	Under review by DGAAM

4.7 Social Licence Considerations

CDPR recognizes that the communities and the environments in which it operates are interdependent and that it may be held accountable for any effects and potential consequences. Therefore, CDPR is totally committed to having leading industry programs for: protection of the environment; providing safe workplaces for its employees and contractors; responsibly and ethically managing relationships with Project stakeholders; and ensuring that CDPR is a company that readily accepts and promotes itself as following the principles of corporate social responsibility ("CSR").

For CDPR, a key focus is the environmental remediation of stockpiles and waste generated by previous mining activities, by re-processing to extract the remaining economic minerals and re-depositing the waste in an environmentally and socially acceptable way.

The Prior Consultation Law (Consulta Previa, introduced April 2012) and its regulations approved by Supreme Decree No. 001-2012-MC requires prior consultation with any indigenous communities as determined by the Ministry of Culture, before any infrastructure or projects, in particular mining and energy projects, are developed in their areas. CDPR is unaware of the existence of any communities in the Project area that meet the specific criteria as documented by the Ministry of Culture.

4.8 Other Risks

As noted in Section 4.4, mining rights are independent from surface rights. CDPR will require permission from AMSAC to drill the Quiulacocha tailings facility once the DIA is approved. This is a staged process and CDPR do not envisage any problem in receiving permission from the relevant government agencies to drill the tailings. As the Project advances, CDPR may need to acquire additional surface access through purchase of surface rights or negotiated agreement with third parties. Such purchase and negotiations may take extended periods of time and could impact Project timelines.

The Qualified Person is unaware of any other significant risks which could affect access, title, or the right or ability to perform work planned or recommended in this Report for CDPR's mining and beneficiation concessions.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Access to Property

The Excelsior Project is located immediately west of the town of Cerro de Pasco, 175 km north-northeast of the city of Lima. The Property can be reached by one of two principal routes (Figure 5-1):

- Route 1 – Highway 22 from Lima to La Oroya, then by the 3N road from La Oroya to Cerro de Pasco. Total distance is 315 km and driving time is approximately 7 hours and 20 minutes. This route is also used by the train that transports consumables from Lima to the mine and concentrate from the mine to Lima.
- Route 2 – Auxiliary Panamericana North highway from Lima followed by the 1N road to Cerro de Pasco. Total distance is 275.4 km and driving time is approximately 5 hours and 40 minutes. This route is currently being upgraded by the Peruvian national government.

Route 1 is the principal access route used by CDPR to move people and material up to the Project. CDPR will evaluate if there is a logistics/cost benefit to using Route 2 after upgrades are completed.

In addition to the road and rail access, the Project is close to two national airports located in Jauja (District of Huancavelica) and Huanuco (District of Huanuco), 215 km and 125 km by road from Cerro de Pasco, respectively. An airstrip in Cerro de Pasco, located 30 minutes from the mine, can support small charter aircraft only (Figure 5-1).

5.2 Climate

The Project is located on the western flank of the Andes Mountains in the physiographic province of the central highlands of Peru. The climate is a tundra climate classified as ET by Köppen and Geiger with low year-round temperatures (https://en.climate-data.org/south-america/peru/pasco/cerro-de-pasco-28094/#climate-table). The main influence on the climate is the altitude, which at 4,330 masl has an impact on rainfall, evaporation, relative humidity, and temperature.

Total average annual rainfall is 999 mm. Rainfall is seasonal, occurring mostly between October and April during which time approximately 85% of the total annual rainfall occurs. In March, precipitation reaches its peak, with an average of 153 mm. The driest month is June with an average of 14 mm precipitation.

The average annual temperature in Cerro de Pasco is 5.5°C. December is the warmest month with an average daily temperature of 6.4°C. June is the coldest month with an average daily temperature of 4.3°C. Temperature shows a strong variation between day and night and this is most notable during the winter months with temperature at night frequently falling below 0°C.

The autumn and winter seasons have lower humidity (65–72%). There are several lagoons close to the Project (Yanamate, Antaloma, Cuchis, Quilcamachay, Junín, and Patarcocha). These lagoons act as climate regulators, forming microclimates within their immediate areas. Evaporation is influenced by high solar radiation and high winds that occur mainly in the afternoon.

Mineral exploration and mining operate on a year-round basis in the region.

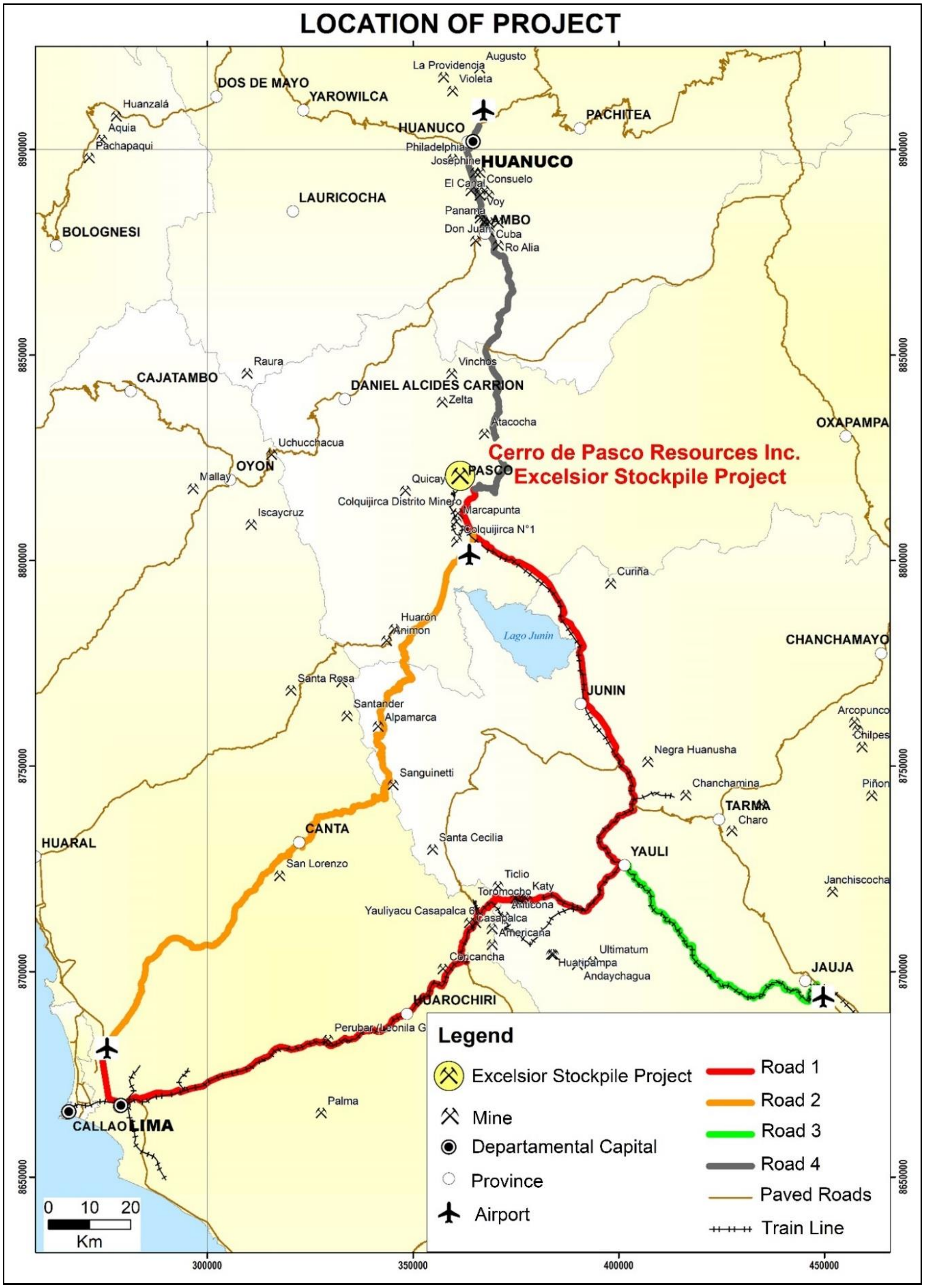


Figure 5-1: *Location and access to the Cerro de Pasco Project*

Source: CDPR 2020

5.3 Local Resources and Infrastructure

5.3.1 Local Resources

Cerro de Pasco (population 66,300, http://poblacion.population.city/peru/cerro-de-pasco/) is a mining city built around the development of the Cerro de Pasco zinc-lead-silver-copper deposit that has been in mechanized production for more than a century. There is longstanding support for the mining industry by the local population which possesses various expertise related to mining operations. All goods and services required for the Project can be procured locally or in the capital Lima and the province of Callao, both accessible by paved road and/or train.

The Daniel Alcides Carrión National University ("UNDAC") is located in the heart of Cerro de Pasco and provides instruction in geology, environmental engineering, civil engineering, mine engineering, metallurgy, and other subjects associated with the mining industry.

The city possesses all amenities and services such as electric power, railway, water service, modern hotels, two hospitals (one of which includes an intensive-care unit) and restaurants.

5.3.2 Infrastructure and Adequacy of Property Size

The Project currently has no supporting infrastructure other than the portions of the Excelsior Stockpile and Quiulacocha TSF lying within the boundaries of the El Metalurgista mining concession.

At this time, CDPR holds sufficient concession rights necessary for proposed exploration activities at the Property when permits are obtained. Given the limited size of the El Metalurgista concession, it is anticipated that material from the Excelsior Stockpile could provide feed to third-party base and precious metals concentrators located outside of the concession. However, no such agreements have yet been negotiated.

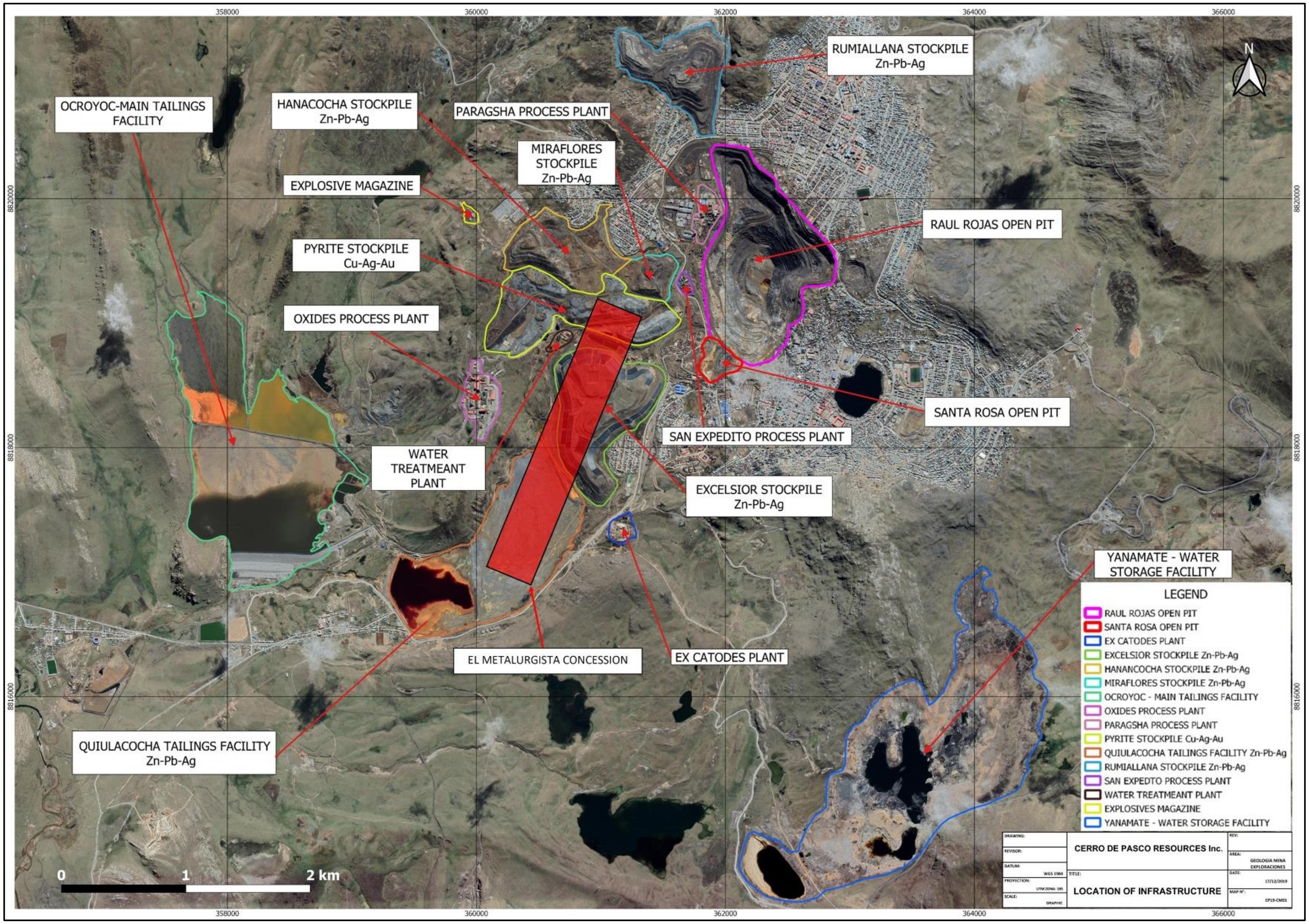


Figure 5-2: Location the El Metalurgista concession relative to adjacent third-party (Volcan) infrastructure

Source: CDPR, 2021

Excelsior Stockpile in foreground with Pyrite and Miraflores stockpiles in background and Rumiallana stockpile in far-left background (looking northeast)

Quiulacocha TSF, potential reprocessing target (looking southwest)

Figure 5-3: Views of the Excelsior Stockpile and Quiulacocha TSF at the El Metalurgista concession

Source: Cerro S.A.C., 2020

5.4 Physiography

The Project is located on the Bombón plateau, an extensive cold high-altitude plain or "altiplano" in the "Sierra" (highlands) in Pasco Province of west-central Peru. The altiplano is flanked by the Western and Eastern Cordilleras that extend south into the Junín region. The altiplano has been sculpted by glaciers which flattened the terrain, formed valleys, and deposited moraines. After the retreat of the glaciers, a series of depressions were initially filled by glacial meltwater and are now recharged by rainfall and seepages from the surrounding lands.

Pasco Province is the site of the Nudo de Pasco, a high Andean plateau and the most important watershed divide in the country, located at the convergence of the Western, Central and Eastern Cordilleras of the Peruvian Andes, and dividing the northern and southern Andean Mountains.

The Project area has a topographic relief of approximately 150 m, from a low of approximately 4,210 masl at the Quiulacocha TSF to a high of approximately 4,360 masl at the top of the Excelsior Stockpile.

5.5 Fauna and Flora

Fauna and flora are not abundant nor varied in the Peruvian altiplano, including that of the Cerro de Pasco area. Animal species include grey deer of the Andes, vicuña, vizcacha, condor, taruca, and guinea pig in addition to domestic livestock such as llamas and sheep.

Grass and small stands of quenuales are present in the region. Grasses such as ichu and chiligua predominate. No vegetation is present on the El Metalurgista concession as it is occupied by the Excelsior Stockpile and the Quiulacocha TSF.

6 History

6.1 El Metalurgista Concession Ownership

6.1.1 Previous Ownership

The El Metalurgista mining concession was staked in 1972 by Mr Victor Freundt with title granted in 1989. It is possible that the area may have been staked prior to this date but no records can be found to show ownership prior to 1972.

The El Metalurgista concession was staked under a different mining concession system relative to the one currently in use. The title under this previous system includes the “dumps, tailings and slag located within the area of the mining concession”. The El Metalurgista title therefore contrasts with the title rights of more recent concessions of the current system, in which the mining concession grants only the right to exploit “metallic” or “non-metallic” minerals.

In 1999, Volcan received a one-year transfer option from CENTROMIN for use of the surface rights of both the Excelsior Stockpile and Quiulacocha Tailings Facility. Volcan used Excelsior to dump sub-marginal mineralization from the Raúl Rojas open pit until September 2000 at which time Volcan elected not to exercise the surface right option and returned the Excelsior Stockpile and Quiulacocha Tailings Facility to CENTROMIN. Volcan drilled the Excelsior Stockpile on two occasions in 2004 and 2009 to assess value but did not proceed with actions to purchase the surface or mineral rights.

In 2009, the surface rights in Parcela K within and outside the El Metalurgista concession passed from CENTROMIN to AMSAC.

6.1.2 Cerro de Pasco Resources Inc.

On 12 June 2017, Genius Properties Ltd (“Genius”) and Cerro de Pasco Resources S.A. (“Cerro”) entered into a Letter of Intent whereby Genius would acquire all the issued and outstanding shares of Cerro. This was followed on 9 November 2017 by a merger agreement that set out the terms and conditions of the merger.

On 12 January 2018, before closing the Genius transaction, Cerro, through public deed, formally acquired 100% title over the concession El Metalurgista from Mr Victor Freundt Orihuela (see Section 4.2).

Genius closed the following transactions on 5 October 2018:

- As part of the Merger Transaction and prior to the Merger, Genius transferred all of its assets and liabilities, including all of its Canadian mining properties, to Genius Metals Inc. in consideration for 9,797,790 common shares which were issued prior to issuing securities to the Cerro de Pasco Resources S.A. Shareholders.
- The acquisition by Genius of all the issued and outstanding shares and thereby all the rights, titles and interests of Cerro de Pasco Resources S.A., on the terms and subject to the conditions set out in the Merger Agreement dated 9 November 2017, as amended on 28 February 2018.
- Genius issued 176,360,134 shares to the former security holders of Cerro de Pasco Resources S.A. pursuant to the Merger which are held in escrow by Computershare Investor Services Inc. and are automatically released from escrow based on the schedule provided in Table 6-1.

Subsequent to the merger transaction, Genius changed its name to “Cerro de Pasco Resources Inc.” (“CDPR”) in the English version and “Ressources Cerro de Pasco Inc.” in the French version. Its ticker symbol on the Canadian Securities Exchange also changed to “CDPR”.

Table 6-1: Schedule for release of Genius escrow shares to security holders of Cerro de Pasco Resources S.A.

Release dates	Percentages to be released	No. of shares to be released	Insiders no. of shares to be released
1 Nov 2018	2%	3.5 M	2.6 M
1 Feb 2019	5%	8.8 M	6.4 M
1 Aug 2019	15%	26.5 M	19.3 M
1 Feb 2020	15%	26.5 M	19.3 M
1 Aug 2020	15%	26.5 M	19.3 M
1 Feb 2021	15%	26.5 M	19.3 M
1 Aug 2021	15%	26.5 M	19.3 M
1 Feb 2022	The remaining escrowed securities	31.5 M	23.3 M

6.2 Exploration History

6.2.1 General History of Cerro de Pasco Deposit Area

Although the Cerro de Pasco deposit lies outside the Project’s El Metalurgista mining concession, a brief discussion of its history is presented here since it is the source of the material present in the Excelsior Stockpile and Quiulacocha TSF within the Project area.

The history of the Cerro de Pasco deposit spans four centuries with the date of discovery generally accepted as 1630. Surface pit and near-surface underground mining of silver took place from 1630 to 1784 with a total of 85 small mines in production over the period under various owners.

From 1784 to 1886, silver production was supervised by the Lima mint which recorded production of 164,540,808 ounces of silver.

In the early 1900s, A.W. McCune and James Ben Ali Haggin started to purchase individual mining concessions in Cerro de Pasco and in 1902 formed the Cerro de Pasco Investment Company with shareholders including historical figures such as Henry Clay Frick, Michael P. Grace, Phoebe Hearst, Darius Ogden Mills, J.P. Morgan, and Hamilton McKown Twombly. The Cerro de Pasco Investment Company funded the purchase and operation of several mines, hydroelectric plants, railway and agriculture projects in Peru including the development of the Cerro de Pasco mine. In 1915, the company changed its name to the Cerro de Pasco Copper Corporation.

The first copper production at Cerro de Pasco was recorded in 1905. Early processing of copper was through hand-sorting. A copper concentrator plant located on the eastern side of the Quiulacocha lagoon entered production in January 1921. The tailings from the concentration process were deposited directly into the lagoon for disposal. Subsequently, the same area was used to store tailings from the processing of zinc-lead mineralization in the Paragsha and San Expedito process plants. The area has since become known as the Quiulacocha TSF with deposition of tailings in the facility ceasing in 1992.

Construction of the Paragsha process plant (located on the west wall of the existing open pit) was completed in 1942 and by 1943 the plant was producing copper and zinc-lead concentrates. With the start of mining of zinc-lead-silver mineralization from the McCune open pit in 1956 (now known as the Raúl Rojas open pit), zinc and lead-silver concentrates started to replace copper concentrates as the main output, and copper production at Paragsha ceased in 1963.

Early underground mining operations produced little waste rock on surface as most waste was used as backfill in the mining process. This changed with the start of mining from the open pit with several areas close to the mine used as waste/low-grade stockpiles.

In 1968, the military government of Juan Velasco Alvarado was installed in Peru and by 1974 the Cerro de Pasco Corporation was nationalized and incorporated into a new government mining company, CENTROMIN. In 1996, CENTROMIN expanded the Paragsha process plant to a capacity of 6,700 tpd.

In 1999, Volcan acquired Empresa Minera Paragsha S.A.C from CENTROMIN during the privatization of CENTROMIN assets. The acquisition included the Cerro de Pasco mining operation which became Volcan´s flagship operation.

In 2011, Volcan formed subsidiary, Cerro S.A.C., to hold the open pit and underground mines, the Paragsha and San Expedito process plants, the Ocroyoc tailings facility, and all infrastructure, mining concessions and land associated with the mine operations. In 2015, Volcan formed another subsidiary called Oxidos de Pasco S.A.C. to process silver-gold oxide material from the Santa Rosa open pit (the southern extension of the Raúl Rojas open pit). The combined operations of Cerro S.A.C. and Oxidos are referred to as the Cerro de Pasco Mining Unit.

Volcan put the Raúl Rojas open pit and underground mines into care and maintenance in 2012 and 2015, respectively. The Raúl Rojas open pit is approximately 1.8 km long, 1.5 km wide and 340 m deep in its central point. Since 2015, mining has been restricted to extraction of oxide silver-gold mineralization from the Santa Rosa open pit and low-grade zinc, lead, silver sulphides from surface stockpiles.

Historical Production

Baumgartner et al. (2008) estimated production prior to 1950 at about 1,200 Moz of silver, 2 Moz of gold, and about 50 Mt at 2% Cu (estimate based on data of Jiménez, 1924; geological staff of Cerro de Pasco Corporation, 1950; Einaudi, 1977; Fischer, 1977; Baumgartner, 2007). Post-1950 to present, production plus resources were estimated as more than 175 Mt at 7% Zn, 2% Pb, and 3 oz/t Ag (Baumgartner et al., 2008; Einaudi, 1977; geological staff of Cerro de Pasco, 2019). A Qualified Person has not done the work necessary to verify these historical reports.

Detailed production records from 1978 to 2019 for the combined open pit and underground mine operations, including stockpiles mined after 2015, document mining of 93,720,313 tonnes at an average grade of 86.31 g/t Ag, 2.44% Pb and 6.59% Zn. A Qualified Person has not done the work necessary to verify the historical estimates as current estimates under NI 43-101. CDPR is not treating the historical estimates as current Mineral Resource or Reserve estimates; they are presented for historical informational purposes only.

6.2.2 Excelsior Stockpile (zinc, lead, silver)

Higher metal prices, advances in metallurgy and increased throughput in the Paragsha process plant resulted in Volcan’s reassessment of the Cerro de Pasco deposit stockpiles as Mineral Resources or potential mineralization targets. About 2004, Volcan began exploration of the stockpiles to evaluate potential for economic extraction. Volcan began processing some of the stockpiles in 2015.

The Excelsior Stockpile covers a surface area of 67.92 ha and contains approximately 70 Mt of broken rock. The stockpile was in use between approximately 1970 and 1996 to store what was then considered uneconomic/low grade mineralization from the open pit. The surface area of the Excelsior Stockpile lying within the El Metalurgista concession is approximately 35 ha and contains approximately 38 Mt of broken rock.

Volcan completed minor surface grab sampling and the drilling of six diamond drillholes in 2004 in the northwest sector of the stockpile. In 2008, Volcan excavated 157 test pits, and in 2009, drilled 74 RC drillholes totaling 4,374 m over the entire stockpile area. RC sample chips were logged and assayed on 2 m intervals. All samples were analysed in the Paragsha analytical laboratory.

6.2.3 Quiulacocha Tailings Storage Facility

The Quiulacocha TSF covers approximately 115 ha with tailings deposited from 1921 to 1992. The tailings are comprised of processing residues from the Raúl Rojas open pit and underground mine. Research indicates that tailings were first deposited on the eastern side of the TSF from January 1921 and were derived from processing of high-grade copper-silver-gold ore, with reported historical head grades of up to 10% Cu, 4 g/t Au and over 300 g/t Ag, sourced from east-west striking veins in the underground mine. The main period of tailings deposition at Quiulacocha came after 1943 when the Paragsha plant was put into commission, first treating copper ore and later processing zinc-lead-silver ore. According to historical records, the Cerro de Pasco mine processed approximately 70 Mt of zinc-lead-silver ore between 1952 and 1996 from the open pit and underground workings with average historical grades of 7.41% Zn, 2.77% Pb and 90.33 g/t Ag. The surface area of the Quiulacocha TSF lying within the El Metalurgista concession is approximately 57 ha, approximately 50% of the total TSF surface area.

2004 Sampling Program

In 2004, Cory Gold Mining S.A.C. completed a program of auger sampling of the Quiulacocha TSF. A total of 268 samples were taken from 105 vertical auger holes drilled to depths ranging from 2.0 m to 13.6 m. The majority (>80%) of the samples were 2 m long. The survey covered approximately a third of the TSF surface area, and perhaps a quarter to a sixth of the depth of the TSF deposit (approximately 5–10% of the TSF volume). Samples were assayed by independent ISO-certified laboratory CIMM Peru, (now Certimin Peru). Recorded sample information included assays for gold, silver, copper, lead and zinc, moist weight, dry weight, recovery, bulk density, sample length, date, and UTM coordinates.

Based on information from 256 samples, the average wet bulk density of the TSF material was 2.35 g/cm^3 and the average dry bulk density was calculated as 1.90 g/cm^3.

Sampling was divided into a northern zone and a southern zone which were separated by an area of approximately 350 m wide where no samples were taken. Silver, lead, copper, and zinc were analyzed by atomic-absorption spectrometry after multi-acid (“ore-grade”) digestion. Gold was analyzed by fire assay with an atomic-absorption finish. Results for silver and zinc assays were similar for both the northern and southern sample areas with silver values ranging from 32 g/t to 50 g/t for the northern zone and 37 g/t to 60 g/t for the southern zone, and zinc values ranging from 0.9% to 2.25% for the northern zone and 1.03% to 2.4% for the southern zone.

The assay results for lead in the Quiulacocha TSF are not as consistent as those for zinc and silver. Lead samples in the northern zone ranged from 0.4% to 0.8% and 0.8% to 1.73% in the southern zone. The grade difference cannot be explained based on available information.

Copper assays were low grade, from 179 ppm to 772 ppm Cu (0.018% to 0.077% Cu). Gold assays range from below detection limit (<5 ppb) for four samples to between 9 ppb and 282 ppb for the remainder of the sample population. It is interpreted that the auger holes did not penetrate the overlying lead-zinc-silver tailings to encounter the underlying copper-silver tailings which are also expected to have higher gold values.

2012 Sampling Program

In 2012, Cerro de Pasco Resources S.A. completed a program of 31 auger holes to verify the data collected in 2004. Samples were collected in 2 m lengths and all samples in each hole were combined to form individual representative samples. A total of 31 individual representative samples were submitted for analysis at the independent ALS Chemex laboratory in Lima for silver and base metals by four-acid total digestion and ICP-AES (inductively coupled plasma - atomic emission spectrometry) finish and for gold by fire assay (50 g charge) with atomic-absorption finish. Determinations of the moisture content and the apparent specific gravity were carried out on 10 samples. The auger drilling samples returned values ranging between 40 g/t and 74 g/t Ag, 0.94% and 3.67% Zn, 0.55% and 2.33% Pb, 230 ppm and 830 ppm Cu, and 0.030 ppb and 0.078 ppb Au.

Sampling methods were different between 2004 (80% of samples were 2 m intervals) compared to 2012 (composite sample from each auger hole). A comparison of the assay results was undertaken which showed that average 2012 assay results were slightly higher than those taken in 2004, but not substantially (Table 6-2).

Table 6-2: Comparison of average 2004 to 2012 tailings sample grades

	2004 Average grade	2012 Average grade
Au	0.031 ppm	0.043 ppm
Ag	45.2 ppm	52 ppm
Cu	391 ppm	426 ppm
Pb	0.92%	1.02%
Zn	1.72%	1.80%

6.3 Historical Resource and Reserves

6.3.1 Excelsior Stockpile

In 2009, Volcan retained external consultant Adam Wheeler to complete an internal unpublished MRE of the entire Excelsior Stockpile (Table 6-3).

Table 6-3: Summary of historical Resources for the Excelsior Stockpile (Wheeler, 2009) classified as Indicated and Inferred for Zn+Pb wt.% cut-offs of 0, 2 and 2.5 respectively

Cut-off (Pb+Zn wt. %)	Class	Tonnes	Zn (%)	Pb (%)	Ag (oz/t)
0	Indicated	34,800,000	1.54	0.65	1.61
0	Inferred	41,700,000	1.36	0.60	1.44
2	Indicated	19,800,000	1.87	0.72	1.63
2	Inferred	19,000,000	1.73	0.73	1.43
2.5	Indicated	9,700,000	2.20	0.78	1.63
2.5	Inferred	7,600,000	1.95	0.85	0.60

Wheeler (2009) did not specify if the MRE was classified in accordance with JORC or CIM reporting codes. Wheeler reported resources at multiple cut-off grades which is not in accordance with 2014 CIM Definition Standards and NI 43-101.

The informing data used to create the resource model consisted of six diamond drillholes completed in 2004 and generally sampled at approximately 2 m intervals, 74 RC holes drilled from in 2009, and sampled at 2 m intervals, and composite samples collected from 6 m deep test pits (trenches). In addition, a set of surface grab samples collected prior to 2009 was used only for geological modelling. A total of 2,555 samples were used for Mineral Resource estimation: 2,191 from RC drillholes, 207 from diamond drillholes, and 157 from test pits. RC drill samples were assayed for copper, lead, zinc and bismuth in percent, and silver in g/t. Basic database validation included using plan and section view plots, check of From-To intervals, and range check of grade fields.

A Qualified Person has not done the work necessary to verify the historical estimates as current estimates under NI 43-101. CDPR is not treating the historical estimate as a current MRE; it is presented for historical informational purposes only. The 2009 MRE methodology and results were critically reviewed by CSA Global including geological, modelling and estimation assumptions and formed the basis for the 2020 Excelsior Stockpile MRE presented in Section 14 of this Report, which supersedes the 2009 estimate.

6.3.2 Quiulacocha Tailings Storage Facility

Two MREs were carried out for the Quiulacocha TSF in 2012. The first estimate was undertaken by John A. Brophy and documented in the report entitled “Metalurgista Zn-Pb-Ag Project, West-Central Peru Resource Estimate for Part of the Quiulacocha Tailings of the Cerro de Pasco Mine”. This report has not documented the resource estimation process in the detail required for public disclosure.

The second estimate was undertaken by Tomas Guerrero Mendez and Jorge Paredes Angeles of BO Consulting, with the intention to report a MRE in accordance with the JORC Code that could be used for a listing on the Lima Stock Exchange, which did not occur. The work was documented in the report entitled “Informe JORC – Estimado de recursos minerales de los relaves Quiulacocha – JORC Report – Mineral Resource Estimate of the Quiulacocha Tailings”. This report did not document the resource estimation process in the detail required for public disclosure.

The Qualified Person is of the opinion that the two Quiulacocha TSF estimates are not suitable for public disclosure due to insufficient informing data which together with estimation methodologies do not meet 2014 CIM Definition Standards. However, the available supporting exploration data is still relevant and has been documented in Section 6.2 of this Report.

7 Geological Setting and Mineralization

The Instituto Geológico Minero y Metalúrgico ("INGEMMET"), part of the Peruvian MINEM, has conducted extensive geological work in the region since the 1980s. Geological maps are available for download on the INGEMMET website (www.ingemmet.gob.pe). The Cerro de Pasco Project is covered by regional geological map sheet 22-k Cerro de Pasco at 1:100,000 scale, as well as more detailed geological maps sheets 22-k I to IV at 1:50,000 scale. The 22-k map sheet is accompanied by an INGEMMET geological report: "Geology of Cerro de Pasco, Bulletin N° 144, series A" (Rodríguez et al., 2011).

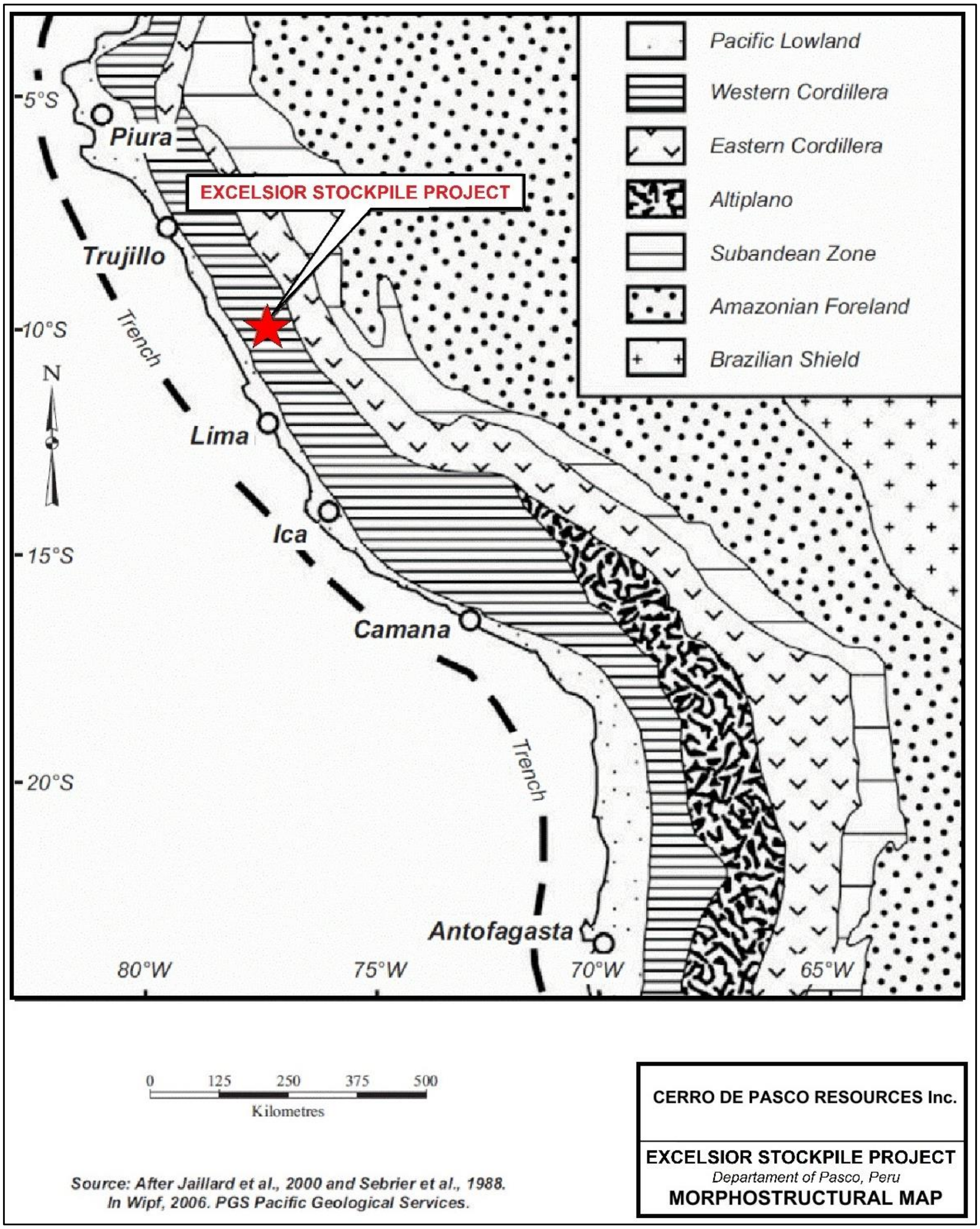
7.1 Regional Geology

The geology of Peru, from the Peru-Chile Trench in the Pacific to the Brazilian Shield, is divided into three major parallel regions from west to east (Figure 7-1):

1) The Western Cordillera is made up of Mesozoic-Tertiary age rocks, dominated by the Coastal Batholith which consists of multiple intrusions ranging from Lower Jurassic to Upper Eocene in age. The belt is up to 65 km across by 1,600 km long running sub-parallel to the Pacific coast, extending north into Ecuador and south into Chile.
2) The Altiplano is a high internally drained plain situated at a mean elevation of almost 4,000 m, slightly below the average altitudes of the Western and Eastern Cordillera. It is 150 km wide and 1,500 km long, extending from northern Argentina to southern Peru.
3) The Eastern Cordillera was uplifted during the Cenozoic era and forms a 4,000 m high and 150 km wide plateau.

All three of these regions formed during Mesozoic-Cenozoic evolution of the Central Andes. The Project lies within the Western Cordillera (10°41'S, 76°16'W) on the Andean plateau, at an elevation of approximately 4,300 masl. It is located in the flat-slab subduction segment of the Peruvian Andes, corresponding to the Nazca ridge subduction since the mid-Miocene (Rosenbaum et al., 2005) which causes the gap of the present-day volcanism (Barazangi and Isacks, 1976; Hasegawa and Selwyn, 1981; Pilger, 1981; Gutscher et al., 2000; Rosenbaum et al., 2005). Recent studies (Rosenbaum et al., 2005; Hampel, 2002, Gutscher et al., 1999) attempted a kinematic reconstruction for the Nazca ridge and Inca plateau for the Miocene (15–5 Ma) and concluded that the arrival of the Nazca ridge at the subduction zone occurred in the mid Miocene (15 Ma; Rosenbaum et al., 2005). This timing may correspond approximately to the period of magmatic and related hydrothermal activity at Cerro de Pasco which places the deposit within sector XXIC (Miocene gold-silver epithermal and polymetallic deposit with epithermal overprint) of the Peruvian metallogenic map (Figure 7-2).

Peruvian metallogenic map sector XXI (Miocene gold-silver epithermal and polymetallic deposit with epithermal overprint) is controlled in the north by northwest-southeast faults that change to west-northwest to east-southeast trend moving toward the Cajamarca deflection, and then north-south when moving toward the Huancabamba deflection. In the centre-north sector (10°S to 13°30'S), its main controls are Conchao-Cocachacra and Chonta northwest-southeast fault system, Cerro de Pasco-Ayacucho and La Oroya-Huancavalica north-south fault system, and Abancay-Andahuaylas-Totos-Chinchoraos-Licapa east-west fault system. In the southern sector, the belt is controlled by Cincha-Lluta, Incapuquio, Abancay-Condoroma Caylloma, and Cusco-Lagunillas-Mañazo northwest-southeast faults systems. This belt comprises high, low, and intermediate sulfidation epithermal gold-silver (lead-zinc-copper) deposits which, based on their mineralization ages, are subdivided in two metallogenic epochs of 18–13 Ma and 12–8 Ma. In central Peru, the second lead-zinc (silver) mineralization pulse is represented by Cerro de Pasco (12.4–10.9 Ma; Baugartner et al., 2006) and mineralization of the Colquijirca district.



Source: After Jaillard et al., 2000 and Sebrier et al., 1988. In Wipf, 2006. PGS Pacific Geological Services.

Figure 7-1: Morpho-structural map of Peru

Source: Jaillard et al., 2000 in Wipf 2006 PGS Pacific Geological Services

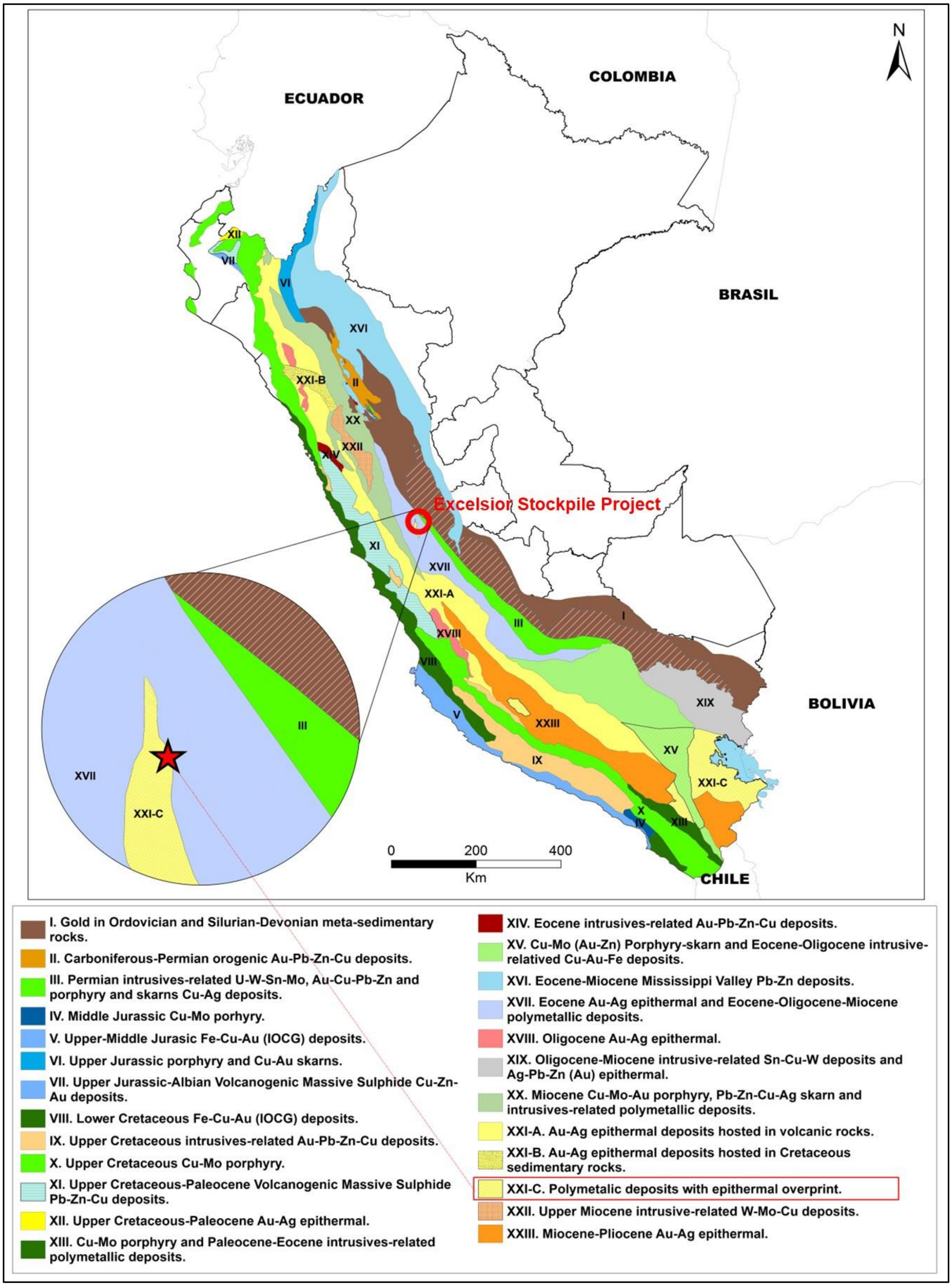


Figure 7-2: Metallogenic belts of Peru

Source: INGEMMET, 2018

7.2 District Geology

The oldest exposed rocks in the district are weakly metamorphosed shale, phyllite, and quartzite of the Devonian Excelsior Group. This Group is overlain in angular unconformity by Permo-Triassic Mitu Group sandstone and conglomerate with pebbles of quartz and Excelsior-type argillaceous clasts (McLaughlin, 1924; Jenks, 1951). Outcrops of the Mitu Group are rare in the Cerro de Pasco district and become more widespread in the Colquijirca district to the south (Figure 7-3).

In the eastern half of the Cerro de Pasco district, the Mitu Group is covered by a thick (up to 3,000 m) Upper Triassic to Lower Jurassic carbonate sequence of the Pucará Group (Angeles, 1999; Rosas et al., 2007). This carbonate sequence is principally composed of thick-bedded, dark-coloured limestone and dolostone with local horizons of bituminous limestones. In the western part of the Cerro de Pasco district, the Pucará Group is only 200 m thick and consists of thin-bedded, light-coloured limestone (Jenks, 1951).

There is a large exposure of Eocene Pocobamba Formation limestones, marls, and siliciclastic sediments in the Colquijirca district south of Cerro de Pasco (Figure 7-3). The Pocobamba Formation is the youngest of the sedimentary sequences in the district and has been intruded by a phreatomagmatic breccia at Colquijirca, similar to the phreatomagmatic breccia in the diatreme complex at Cerro de Pasco.

From the Eocene to lower Miocene, crustal uplift and multiple deformation events affected the Excelsior, Pucará, and the Mitu Group rocks. Folds developed with broadly north-south axial direction and accompanied by west-verging thrust faults.

In the Middle Miocene, magmatic activity affected the region (Silberman and Noble, 1977; Bendezú et al., 2003; Baumgartner, 2007; Bendezú, 2007). In the Cerro de Pasco district and nearby Colquijirca district, the Middle Miocene magmatism consisted of an early phase of explosive volcanism, represented mainly by a dacitic diatreme breccia (known locally as Rumiallana Agglomerate). The diatreme event was followed by multiple dacitic porphyritic domes dated at 15.4 Ma (Baumgartner, 2007) and quartz-monzonite porphyry dikes intruded at 15.4–15.1 Ma (Baumgartner, 2007).

Figure 7-3 shows a plan of the district geology which includes the Cerro de Pasco and Colquijirca deposits, and Figure 7-4 shows a detailed stratigraphic column of the district geology.

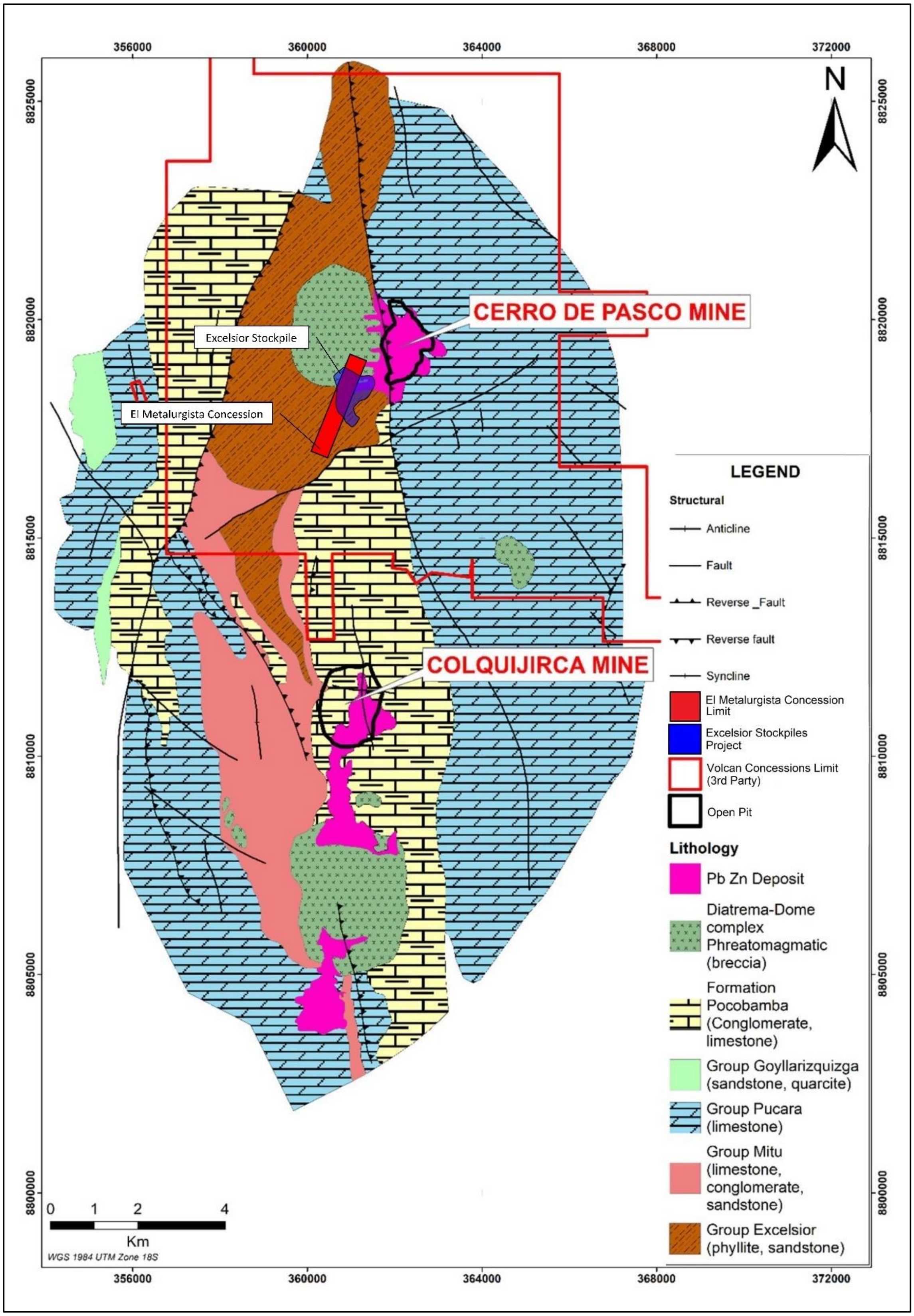


Figure 7-3: Cerro de Pasco and Colquijirca districts geological map

Source: CDPR, 2020 (modified from Bendezu et al., 2008)

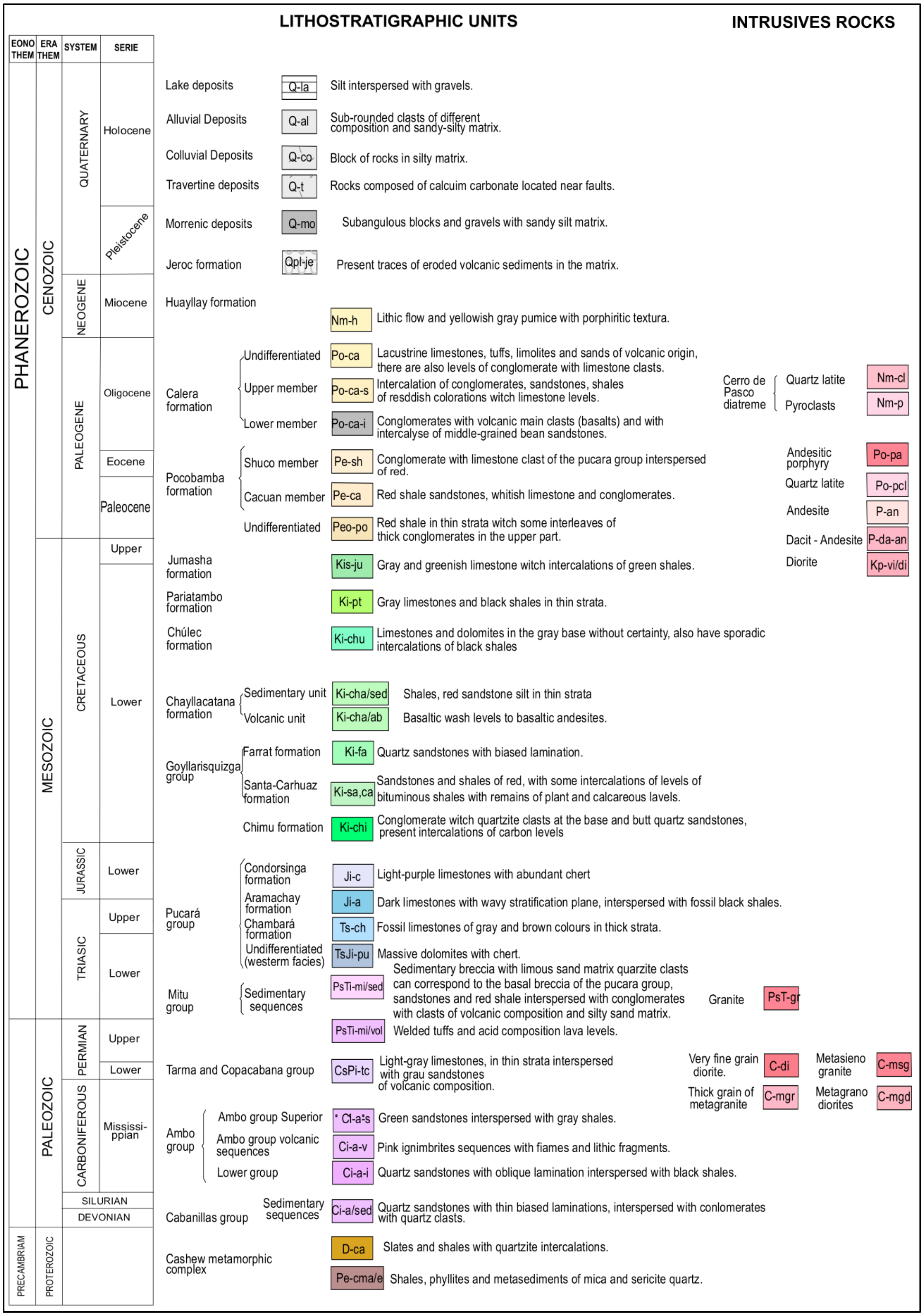


Figure 7-4: Stratigraphic column – district geology

Source: Carlotto V., and Cardenas J., 2010

7.3 Project Geology

7.3.1 Excelsior Stockpile

Excelsior is a large stockpile located to the southwest of the Raúl Rojas pit (Figure 4-1). Its dimensions are approximately 1.3 km north-south, 0.8 km east-west, and up to 90 m depth. It was filled with mainly unprocessed low-grade carbonate-hosted zinc-lead-silver mineralized material excavated from the Cerro de Pasco Raúl Rojas pit and underground mine over many years since the 1970s, but it also includes some oxides containing lead-zinc-silver mineralization, volcanic rocks, and pyrite-type material with low-grade copper and gold mineralization. However, for the purpose of the MRE, it was assumed that all the mineralization is lead-zinc-silver, termed MINTYPE 1.

The upper northwest part of the stockpile contains mostly volcanics from the waste stripping of the west wall of the Raúl Rojas pit, and only a few drillholes were completed in this area of the stockpile. The upper northeast and southern parts came mostly from limestones mined from the east wall of the pit and were drilled in more detail.

As the material stored in the Excelsior Stockpile is derived from the Cerro de Pasco deposit, its geology and mineralization are described in the following Sections 7.3.2 to 7.3.4.

7.3.2 Cerro de Pasco Deposit Geology

The following description of the Cerro de Pasco deposit geology has largely been sourced from Baumgartner et al. (2008). The Cerro de Pasco Geology Department provided information to Baumgartner for her dissertation at the University of Geneva.

The weakly metamorphosed shale, phyllite, and quartzite of the Devonian Excelsior Group forms a north-south striking and north-plunging anticline, named the Cerro anticline on the western side of the Cerro de Pasco diatreme-dome complex (Figure 7-5 and Figure 7-6). Permo-Triassic Mitu Group sandstone and conglomerate with pebbles of quartz and Excelsior-type argillaceous clasts (McLaughlin, 1924; Jenks, 1951) is observed at the south end of the Santa Rosa open pit (Figure 7-6).

A thick sequence (up to 1,000 m) of carbonate rocks of the Late Triassic Chambará Formation, part of the Pucará Group, includes mainly massive limestone with locally sandy intercalations, dolostone, black bituminous limestone, and beds with chert nodules. In the east wall of the open pit, the unit is principally composed of thick-bedded, dark-coloured limestone and dolostone with local shale interbeds and siliceous concretions. A regional north-south fault (the Longitudinal Fault) juxtaposes the Excelsior Group metamorphic rocks against the Pucará Group sedimentary rocks. In the Cerro de Pasco mine area, the Longitudinal Fault is interpreted to be represented by high-angle, N 15° W-striking reverse faults (Figure 7-6).

West of the fault, a 2.5 km diameter Middle Miocene diatreme-intrusive dome complex was built up by a succession of magmatic, phreatomagmatic, and phreatic events. An early phase of explosive activity produced a diatreme-breccia known locally as Rumiallana agglomerate, which is the most common lithology in the magmatic complex. The Lourdes Fragmental unit to the southeast of the diatreme breccia at the Lourdes Shaft is considered as the first volcanic event.

The phreatomagmatic activity was followed by emplacement of dacitic to rhyodacitic lava-dome complexes along the western margin of the diatreme. East-west trending quartz-monzonite porphyry dikes cut the diatreme breccia and the magmatic domes. The dacitic porphyritic domes and quartz-monzonite porphyry dikes were emplaced between 15.4 Ma and 15.1 Ma (Baumgartner, 2007). The dikes do not propagate into the Excelsior shales west of the diatreme-dome complex; to the east, they locally crosscut the carbonate sequence.

Vertical breccia bodies, including the Cayac Norurga breccia and San Alberto breccia, cut the sedimentary sequence and contain angular clasts of Pucará carbonate rocks several centimetres in size and carbonate rockflour matrix. These breccia bodies follow a northeast-southwest trending corridor in the San Alberto area and can also be recognized in the north-south trending large pyrite-quartz body (Figure 7-6 and Figure 7-7).

The end of the phreatomagmatic and magmatic activity at Cerro de Pasco is marked by the emplacement of numerous, 20 cm to 3 m wide, east-west trending, milled-matrix fluidized breccia dikes, occurring in various parts of the diatreme-dome complex.

Erosion removed part of the diatreme-dome complex, as well as the overlying rocks, as shown by the presence of collapse blocks of Mitu and Pucará Group rocks inside the diatreme and the absence of these rocks outside the diatreme. The total erosion from the middle Miocene to the present is estimated to be on the order of 500 m, as indicated by the fact that the pre-diatreme erosion surface in the Santa Rosa area is preserved below ~100 m of outflow deposits and by the diatreme size (Figure 7-6 and Figure 7-7).

The major north-south trending Longitudinal Fault was probably already active during the deposition of the Pucará Group, which thickness is c. 3,000 m east of the fault and 300 m in the west. The Upper Cretaceous to Eocene Shuco member of the Pocobamba Formation occurs as breccia and conglomerate with Pucará clasts along the Longitudinal Fault, providing additional evidence for protracted fault movement.

A complex set of faults is prominent in the Pucará carbonate rocks in the Raúl Rojas open pit. The first set strikes N 120° E, dips 70° to 80° S and is present in the eastern part of the open pit (Figure 7-7). The second set strikes N 170° E, dips vertically, and is mainly present in the southern part of the deposit. The third fault set strikes N 35° E, dips 80° E, and is present in the northern open pit. The three fault sets are dextral and/or sinistral strike-slip faults and formed by compression in the later stages of folding.

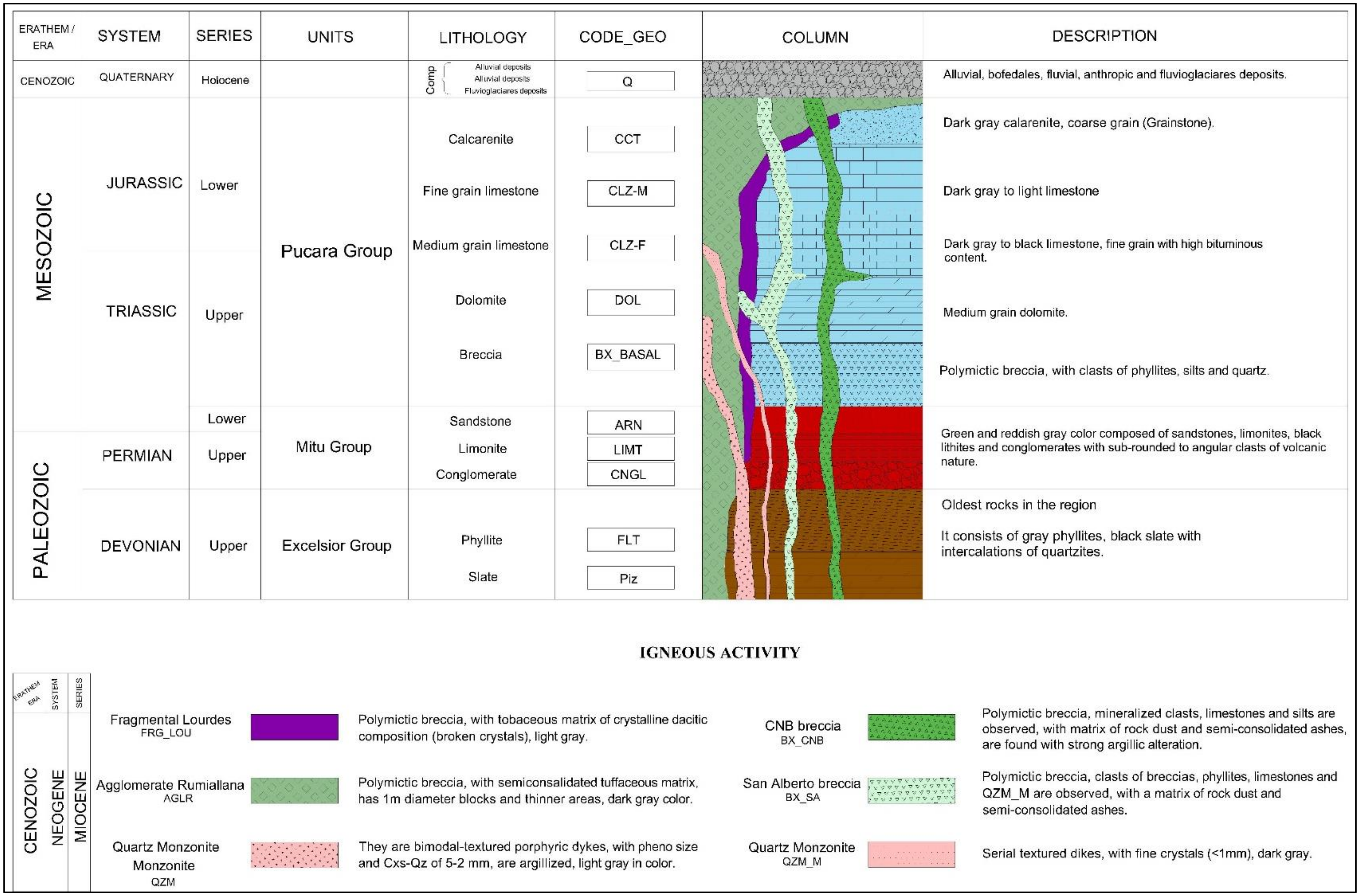


Figure 7-5: Stratigraphic column – local geology

Source: CDPR, 2020

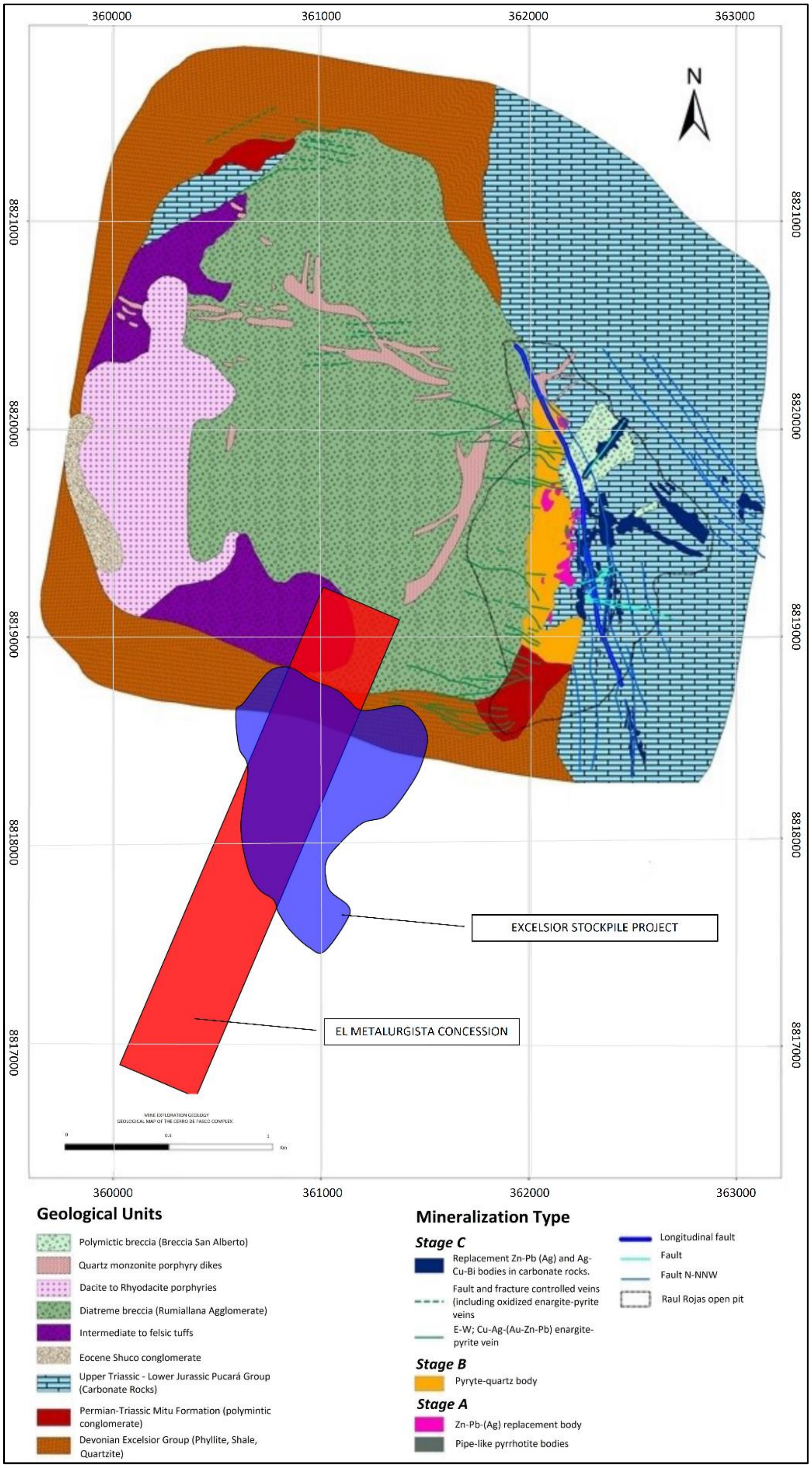


Figure 7-6: *Geological map of the diatreme-dome complex at Cerro de Pasco*

Source: CDPR, 2020 (modified from Baumgartner et al., 2008)

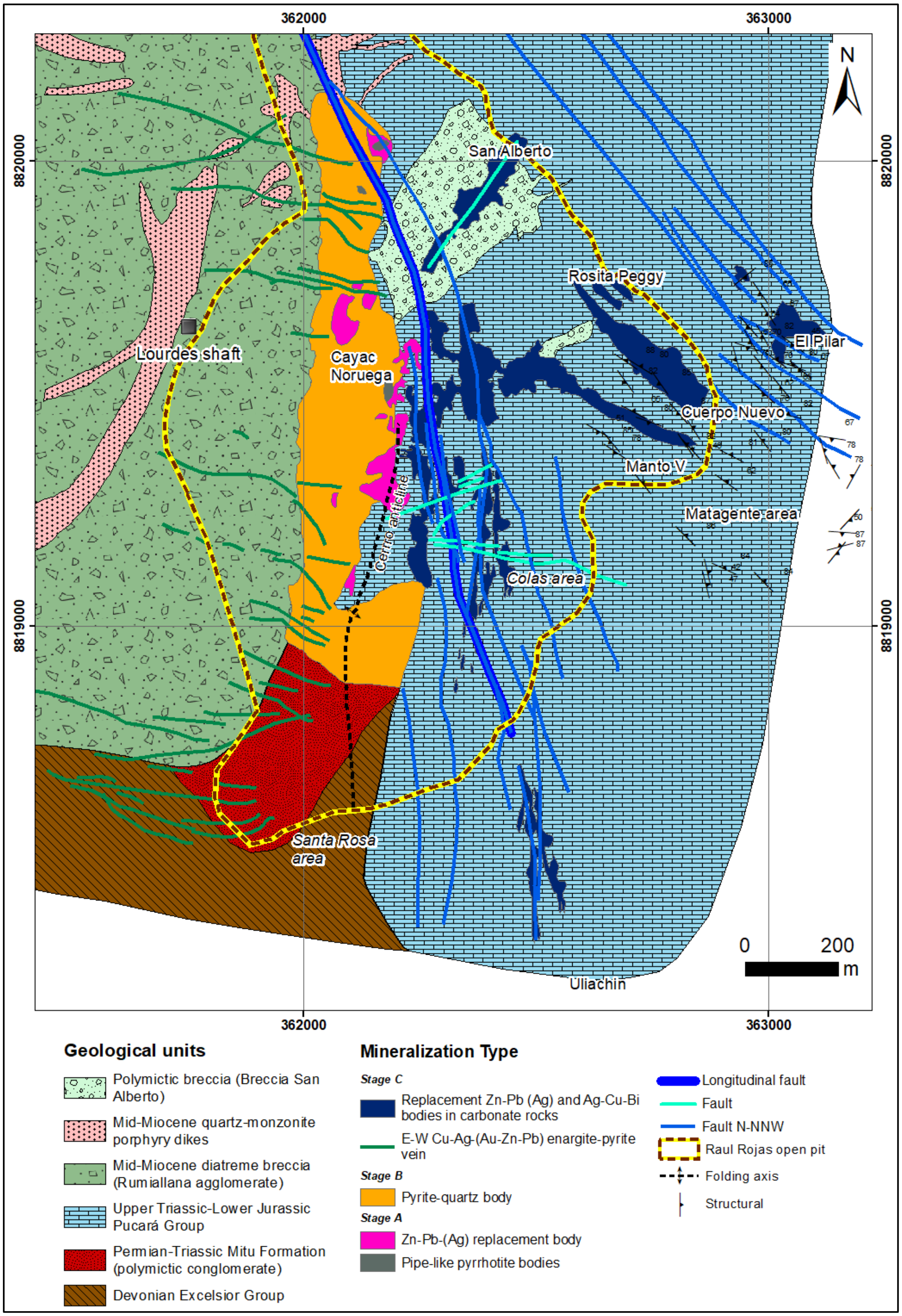


Figure 7-7: *Geological map of the Raúl Rojas open pit showing the rock units, structure, and different mineralization stages*

Source: CDPR, 2020 (modified from Baumgartner et al., 2008)

7.3.3 Description of Cerro de Pasco Deposit Igneous Rocks

The following description of igneous rocks has been largely sourced from Baumgartner et al. (2009). The Cerro de Pasco Geology Department provided information to Baumgartner for this paper and concur with the description.

The Rumiallana agglomerate forms the largest component of the Cerro de Pasco diatreme complex (Figure 7-6). It is a heterolithic breccia with 1–100 mm sized angular to subrounded clasts of Excelsior phyllite, Mitu sandstone, Pucará limestone, tuff, minor altered porphyritic igneous rocks, and a and a juvenile clast component.

Dacitic lapilli tuff with crossbedding crops out in the northwestern part of the complex and has been interpreted as a base surge deposit. It contains 0.2–0.5 cm diameter rim-type accretionary lapilli with a core of coarse-grained ash surrounded by a fine-grained rim. The tuff deposits are laterally discontinuous and have been interpreted as blocks of subaerial ring tuff collapsed into the diatreme, similar to the large collapse blocks of Mitu and Pucará Group wall rock found in the northwestern part of the diatreme.

In the Santa Rosa area in the southern part of the open pit, there is a remnant of the Mitu Group (oxidized siltstones and conglomerate) cut by phreatic and hydrothermal breccias.

Dacite to rhyodacite porphyritic domes are emplaced at the southwestern and northern margins of the diatreme (Figure 7-6). Flow bands define domal geometry with local sub-horizontal flow foliation. The domes have medium grain sized phenocrysts of plagioclase (0.2–0.5 cm), biotite, resorbed quartz, and minor amphibole. The fine-grained groundmass is composed of the same minerals with zircon and apatite as common accessories. Within altered domes, plagioclase is replaced by calcite and sericite, whereas amphibole and biotite are replaced by rutile and chlorite.

The diatreme-dome complex is cut by east-west trending dikes and irregular bodies of quartz monzonite porphyry (Figure 7-6) that also cut the Pucará carbonate rocks. They are medium to fine-grained with large phenocrysts of sanidine, partly resorbed quartz, plagioclase, biotite, and scarce amphibole, with accessory sphene, apatite, and zircon in the groundmass. In their central parts, they host abundant xenoliths (Lacy, 1949). In the vicinity of the pyrite-quartz body, the dikes are altered to sericite-pyrite and are thus considered pre-mineralization.

Post-mineralization albitized quartz monzonite porphyry dikes that cut the late-stage east-west trending enargite-pyrite veins have also been described in the underground mine. They have phenocrysts of orthoclase and blocky plagioclase and less abundant quartz and biotite than in the pre-mineralization quartz monzonite porphyry. Biotite is frequently chloritized or altered to muscovite.

7.3.4 Cerro de Pasco Deposit Hydrothermal Alteration and Mineralization

The following description of the hydrothermal alteration and stages of mineralization has been mostly sourced from Rottier et al. (2016a). The Cerro de Pasco Geology Department provided information to Rottier for this paper and concur with the description. Einaudi (1977) provided an earlier detailed description of the Cerro de Pasco deposit, focused on the early breccia-hosted and replacement pyrite- and pyrrhotite-rich mineralization.

The end of the phreatomagmatic and magmatic activity at Cerro de Pasco is marked by the emplacement of numerous, 20 cm to 3 m-wide, east-west trending, milled-matrix fluidized breccia dykes, occurring in various parts of the diatreme-dome complex. The main phase of polymetallic mineralization followed this event, mainly in carbonate rocks along the eastern margin of the diatreme complex (Einaudi, 1977; Baumgartner et al., 2008).

Rottier et al. (2016, 2018) provided a description of the staged development of the deposit integrating previous studies. The main change from the previous interpretation of Baumgartner et al. (2008) is that the pyrrhotite pipes are interpreted to predate the massive pyrite-quartz replacement body and not to cut it. This revised interpretation was based on detailed mineralogical and textural studies and supported by interpretation of hydrothermal fluid evolution.

Stage A mineralization consists of more than five structurally controlled pipe-like bodies of pyrrhotite with up to 150 m horizontal and up to 650 m vertical extent which grade outward into massive iron-rich sphalerite and galena replacement bodies (Figure 7-7, Figure 7-8). The pipes occur within the pyrite-quartz body and the Pucará carbonate rocks and locally crosscut the diatreme breccia. The pipe plunge shallows with depth. The pipe core is formed by massive pyrrhotite and quartz with traces of wolframite and cassiterite and is surrounded by a zone of pyrrhotite, quartz, iron-rich sphalerite, chalcopyrite, and stannite and an outermost zone of pyrrhotite, iron-rich sphalerite, arsenopyrite, chalcopyrite, and quartz. Galena content increases progressively outward to c. 10 vol.% and is silver bearing with inclusions of silver-rich tetrahedrite, argentite and polybasite.

Stage B1 mineralization consists of narrow centimetre-scale quartz-pyrite veins with minor amounts of chalcopyrite, hematite, magnetite, moderate-iron sphalerite, galena, and tetrahedrite-tennantite crosscutting the diatreme-dome complex. Stage B2 forms the largest volume of mineralization, the large, north-trending, funnel-shaped massive pyrite-quartz replacement body developed along the contact of the diatreme breccia with the Pucará carbonate rocks. It extends c. 1.5 km in strike, 250 m wide, and more than 550 m deep, replacing mainly the Pucará carbonate rocks. The iron-rich sphalerite-galena zones around the pyrrhotite pipes within the body show complex pyrite-replacement textures.

Stage C is characterized by two types of mineralization that are believed to be broadly contemporaneous, high- to intermediate-sulphidation zinc-lead-(bismuth-silver-copper) carbonate replacement orebodies (Stage C1) in the carbonate rocks in the western part of the deposit; and east-trending copper-silver-(gold-zinc-lead) enargite-pyrite ± quartz veins (Stage C2) in the diatreme-dome complex. The zinc-lead-(bismuth-silver-copper) replacement orebodies form large irregular pipe-like bodies, vary in diameter from 50 cm to 50 m, and can be up to 400 m long. They are typically zoned from a core with famatinite, pyrite, kaolinite and alunite through a zone with pyrite, tetrahedrite, bismuth and silver-bearing sulfosalts, to an outer zone of iron-poor sphalerite (up to 90%), galena and kaolinite, with outermost magnetite, hematite, and iron-magnesium-zinc carbonates.

The copper-silver-(gold-zinc-lead) enargite-pyrite veins overprint and crosscut mineralization of stages A and B. The veins are mainly subvertical with a northeast to east strike and steep dips. Vein thickness varies from a few centimetres to 2.5 m and vertical extent has been estimated at more than 760 m (Baumgartner et al., 2008).

The Stage C enargite-pyrite veins have been dated at 14.54 ± 0.08 and 14.41 ± 0.07 Ma (Ar-Ar on alunite; Baumgartner et al., 2009). Temperatures of formation during the different mineralizing events have been constrained by fluid inclusion studies (Rottier et al., 2015). Fluid temperatures range between 220°C and 280°C for Stage A and Stage B, and between 140°C and 295°C for Stage C. Fluid salinities vary from 20 wt.% to 3 wt.% NaCl equivalent for Stage A and Stage B, and from 19 wt.% to 1.05 wt.% NaCl equivalent for Stage C. Mineralization of Stage A and Stage B was formed by magmatic-dominated fluid according to oxygen isotopic signatures of hydrothermal quartz (Baumgartner et al., 2008). In contrast, based on stable isotope analyses of alunite and kaolinite, Stage C is characterized by mixing of magmatic and meteoric waters (Baumgartner et al., 2008).

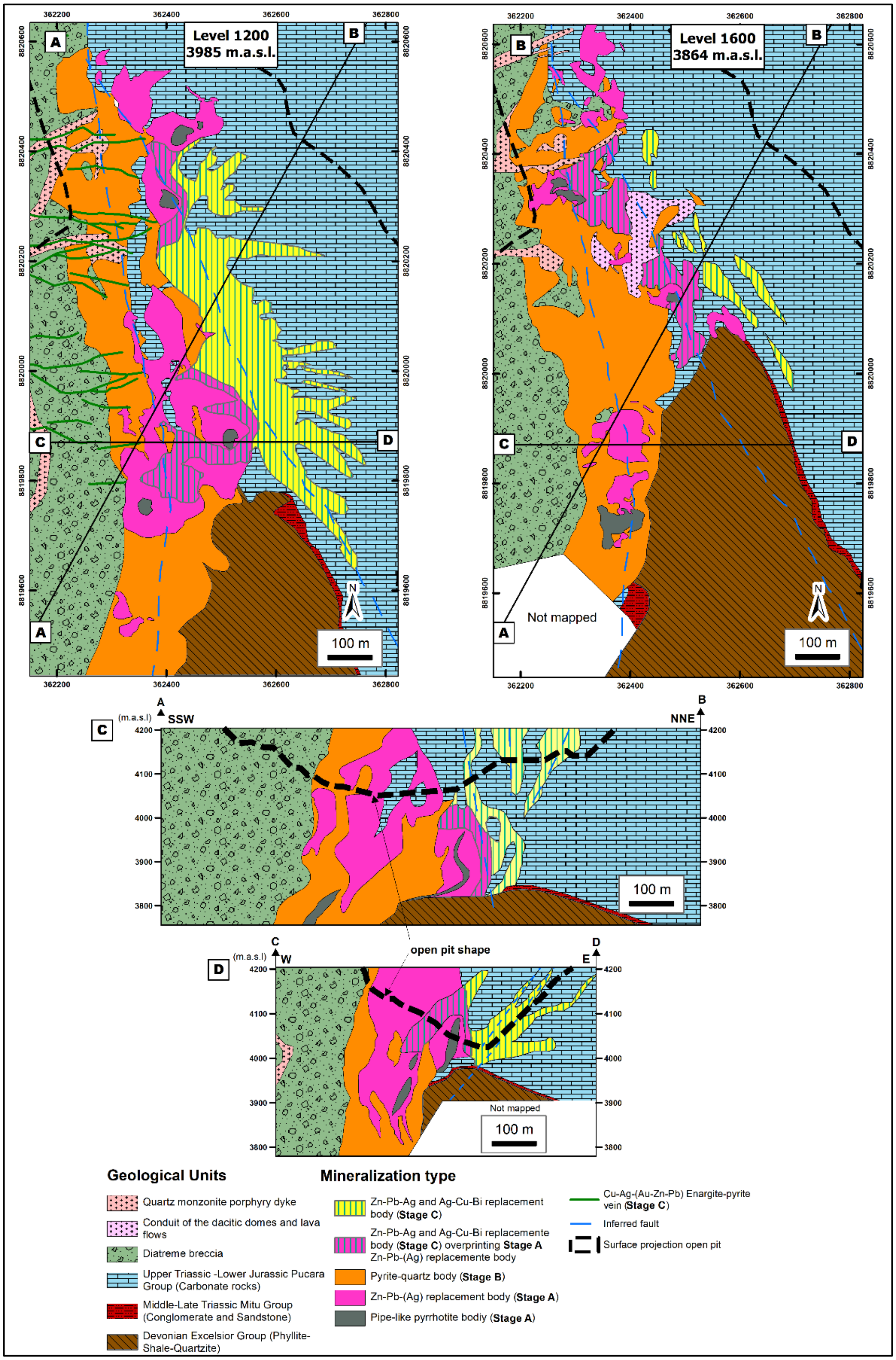


Figure 7-8: A) Geological plan map of 1200 level; B) Geological plan map of 1600 level; C) Southwest-northeast cross section along A-B profile; D) East-west cross section along C-D profile

Source: CDPR, 2020 (Modified from Rottier et al., 2016a)

Stage A – Pyrrhotite Pipes and their Rims

The massive pyrrhotite, high-angle, pipe-like bodies extend vertically up to 650 m and have horizontal diameters of up to 150 m. The pipes are structurally controlled, mainly by the north-northwest to south-southeast longitudinal fault corridor, and subordinately by N 35° and N 120° fault directions. In the deeper part of the mine (levels 3600 and deeper, Figure 7-8C), they are lithologically controlled by the bedding of the folded sedimentary sequence (Einaudi, 1977). The dip of the pipes flattens to the south in the northern part and toward the north in the southern part of the deposit. Iron-rich sphalerite-galena rims form broadly concentric bodies centred on the pyrrhotite pipes. The iron-rich sphalerite and galena rims extend laterally from the pyrrhotite pipes typically several tens of metres and up to 600 m in places above level 3800.

1) Pyrrhotite pipes and their rims show a strong upward and outward zonation (Figure 7-9) with five zones defined (Einaudi, 1968, 1977; Baumgartner et al., 2008).
2) The pipe core (Zone 1) is formed by massive pyrrhotite and quartz, hosting numerous inclusions of wolframite, cassiterite, and rutile, up to 100 µm in size.
3) An intermediate zone (Zone 2) is composed of pyrrhotite, quartz, iron-rich sphalerite, chalcopyrite, and stannite. Iron-rich sphalerite and chalcopyrite are present as small anhedral crystals and as blebs (up to 300 µm large) in pyrrhotite, making up to 5% and up to 2% of the sulphides, respectively. Rare stannite occurring mainly as blebs in chalcopyrite was described by Einaudi (1977). Quartz represents less than 10% of the intermediate zone and forms small euhedral grains of 0.5 mm to 1 mm, containing numerous, up to 100 µm, large inclusions of apatite and rutile.
4) The external zone of the pipes (Zone 3) consists of pyrrhotite, iron-rich sphalerite, arsenopyrite, chalcopyrite, and quartz. This zone differs from the intermediate zone mainly by the presence of arsenopyrite, locally up to 10%.
5) The transitional zone between the pipes and their rims (Zone 4) is characterized by progressive increase of iron-rich sphalerite and decrease of pyrrhotite and arsenopyrite. Galena occurs in small amounts (up to 5%) and forms anhedral crystals.
6) The outer part of the rim (Zone 5) consists mainly of iron-rich sphalerite, up to 90% of the total volume. Galena content increases progressively outward but remains below 10% of the total volume. Numerous, up to 50 µm, inclusions of silver-rich tetrahedrite, argentite, and polybasite are present in galena. Pyrite appears locally; it forms anhedral to subhedral crystals and can reach up to 5% of Zone 5. Quartz grains up to 4 mm in size represent less than 10% of Zone 5 and host small inclusions (<100 µm) of apatite, rutile, and anatase.

Locally, an outermost zone occurs and is characterized by massive magnetite (up to 70% of the total volume), iron-rich sphalerite, galena, iron-manganese-zinc carbonate, and chlorite.

Alteration that could be attributed to the emplacement of the pyrrhotite pipes and their rims is not observed in the carbonate sequence owing to later overprinting but strong chloritization spatially associated with the pyrrhotite pipes and their rims is observed in the phreatomagmatic breccia.

Figure 7-10 shows Stage A in a sketch of time and space evolution of the polymetallic mineralization.

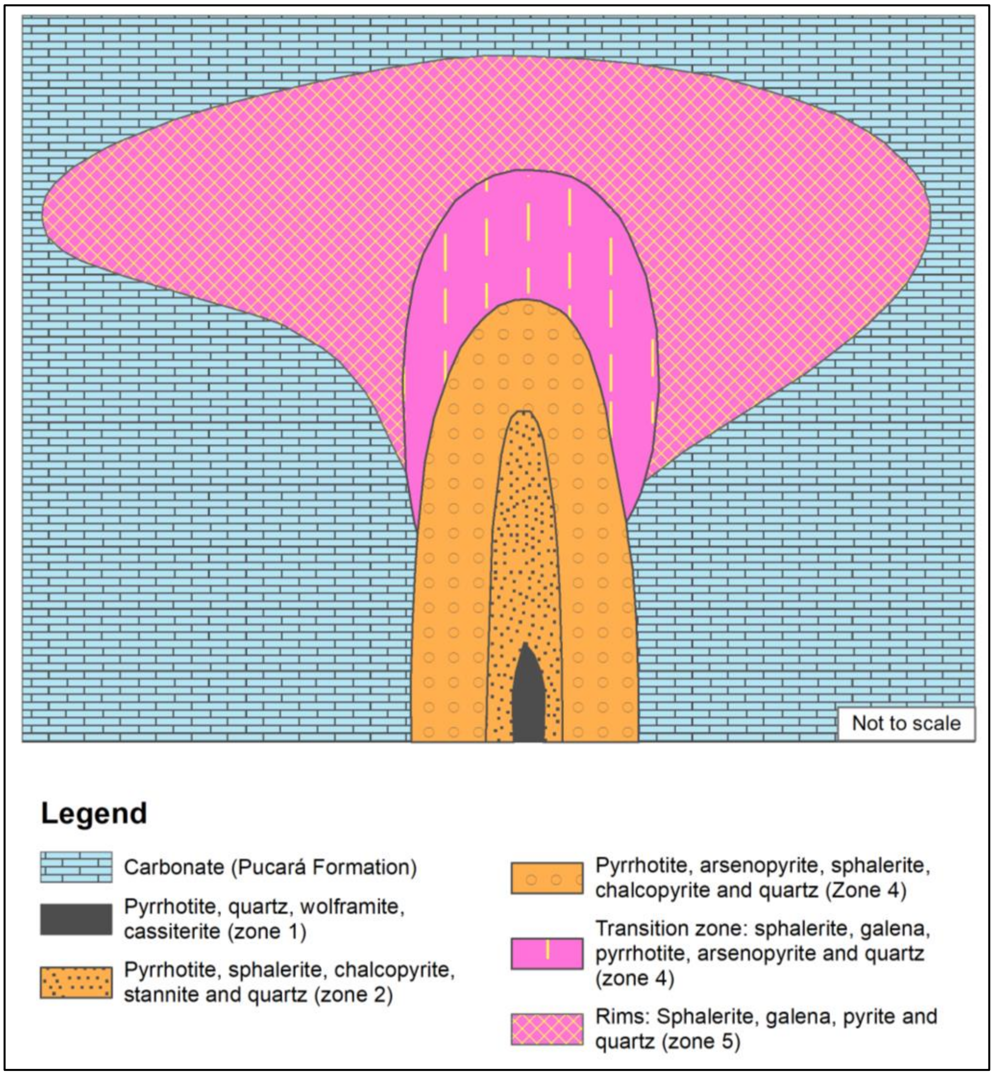


Figure 7-9: Idealized mineral zoning of the Stage A pyrrhotite pipes and their zinc-lead rims

Source: CDPR, 2020 (based on Einaudi 1977, Baumgartner et al., 2008, and Rottier et al., 2016a)

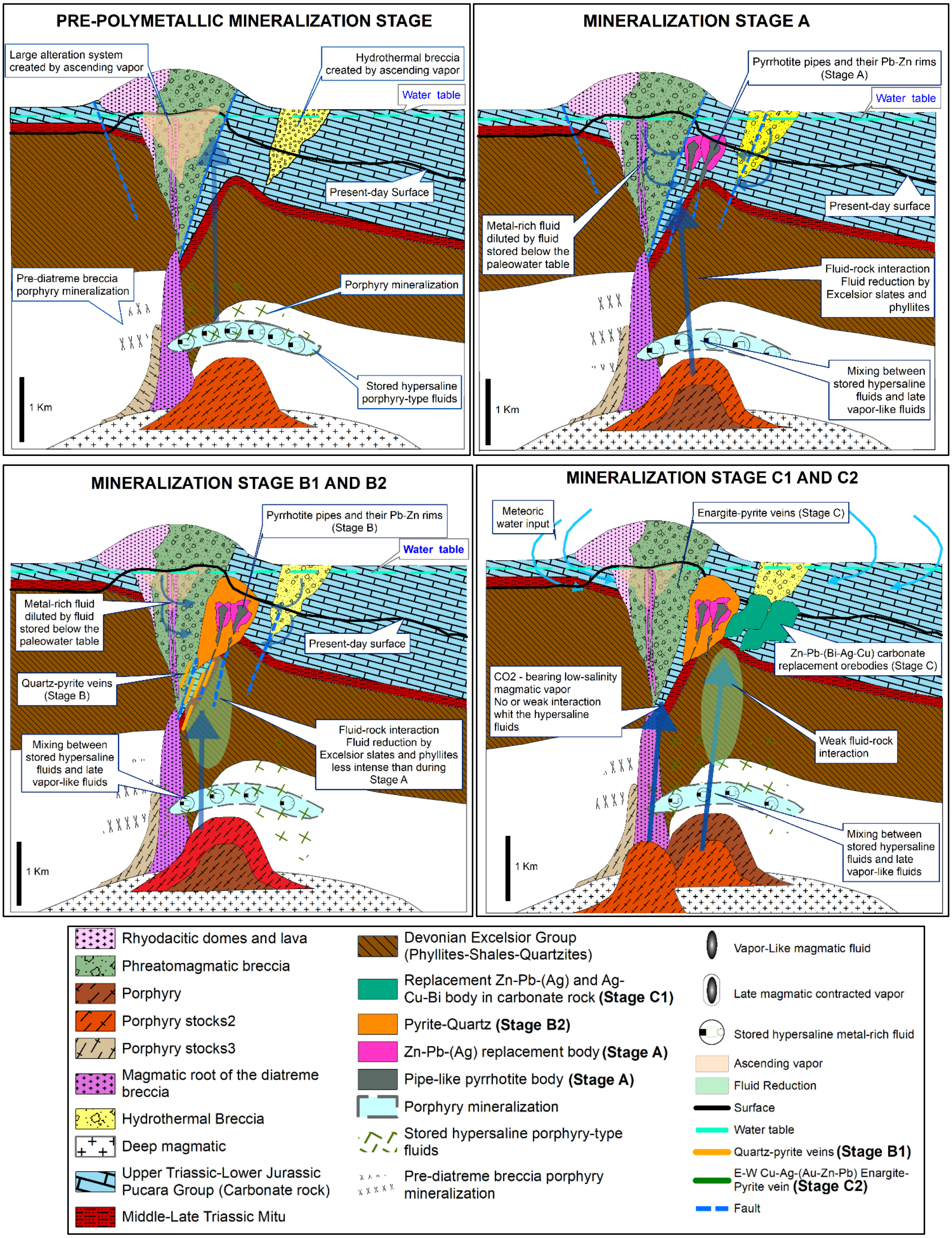


Figure 7-10: Sketch of time and space evolution of the polymetallic mineralization at Cerro de Pasco

Source: Rottier et al., 2016a

Stage B – Pyrite-Quartz Body

Deep quartz-pyrite veins (Stage B1) and a funnel-shaped massive replacement body of pyrite-quartz (Stage B2) with quartz-sericite ± kaolinite alteration was emplaced after Stage A (Figure 7-10). The quartz-pyrite veins are interpreted as feeders of the pyrite-quartz body and crosscut the root of the diatreme dome complex from 3,350 masl to 3,750 masl. Interpretated dimensions of the quartz-pyrite veins are 50–450 m long, 0.20–2.0 m wide, extend a cumulative 400 m vertical, and are open to depth.

The massive pyrite-quartz body is 1.5 km long, 50–270 m wide, 650 m vertical and is open to depth. It mainly replaces Pucará carbonate rocks, with remnant sedimentary textures and local remnant pods of carbonate rock up to 100 m wide (Einaudi, 1968). Locally, the diatreme breccia is also replaced by massive pyrite-quartz. A sericite-quartz-pyrite alteration halo was developed within the diatreme-dome complex extending up to 50 m from the contact (Einaudi, 1968; Baumgartner et al., 2008).

Following the contour of the pyrite-quartz body and up to a distance of 50 m surrounding it, a sericite-quartz-pyrite alteration halo was developed within the diatreme-dome complex (Einaudi, 1968; Baumgartner et al., 2008). Pyrite constitutes more than 90% of the pyrite-quartz body as anhedral and euhedral (octahedral and occasionally cubic) grains up to 2 cm. In the inner part of the pyrite grains, numerous inclusions of pyrrhotite and chalcopyrite (<150 µm) are present. Up to 200 µm wide sphalerite inclusions are also common in the inner part of the pyrite grains. Sphalerite inclusions locally show chalcopyrite disease. Arsenopyrite and stannite inclusions have also been reported (Einaudi, 1977; Baumgartner et al., 2008). Rutile, hematite, and stibnite inclusions are locally found in the outer rim of the pyrite grains. indicating an increase of $fO2$ (oxygen fugacity). Massive black and red hematite-bearing chalcedony and euhedral, up to 1 cm long, quartz grains are also common in the pyrite-quartz body. Quartz contains rutile, anatase, hematite, and apatite inclusions up to 100 µm in size.

Stage C – Zinc-Lead-(Bismuth-Silver-Copper) Carbonate Replacement and Polymetallic Veins

Stage C (Figure 7-10) is characterized by two types of mineralization considered to be roughly contemporaneous: high- to intermediate-sulphidation zinc-lead-(bismuth-silver-copper) carbonate replacement bodies (Stage C1) and, in the diatreme-dome complex, a set of east-trending copper-silver-(gold-zinc-lead) enargite-pyrite ± quartz veins (Stage C2). The Stage C1 zinc-lead-(bismuth-silver-copper) replacement bodies were formed in the western part of the deposit in carbonate rocks of the Pucará Group, mainly following regional N35°, N120°, and N170° structures. They form large irregular upward-flaring pipe-like bodies plunging toward the west between 25° and 60°; their diameters vary from 50 cm to 50 m, and they can be up to 400 m long (Baumgartner et al., 2008).

The carbonate-replacement bodies show the following mineralogical zoning:

- A core zone consisting of famatinite, pyrite, kaolinite, and alunite
- An intermediate zone characterized by pyrite, tetrahedrite, bismuth- and silver-bearing sulfosalts, kaolinite, alunite, and aluminium phosphate-sulphate (“APS”) minerals
- An outer zone composed of iron-poor sphalerite (up to 90%), galena, kaolinite, and rare APS minerals
- An outermost zone containing magnetite, hematite, iron-manganese-zinc carbonates, and traces of sphalerite, galena, and pyrite.

The copper-silver-(gold-zinc-lead) enargite-pyrite veins overprint and crosscut Stage A and B mineralization. The veins are mainly subvertical with a strike of N70°-90°E, following structures different from those of Stage C1, because the regional faults that controlled the latter were obliterated by the diatreme breccia that hosts the Stage C2 veins. Vein thickness varies from a few centimetres to 2.5 m and average strike length of principal mined veins was 600 m. The Excelsior (Cleopatra) vein extended up to 1.2 km. The vertical vein extent has not constrained but it is more than 760 m (Baumgartner et al., 2008).

Three mineral assemblages are recognized in the Stage C2 veins (Baumgartner et al., 2008):

1) Early enargite-pyrite, followed by
2) An assemblage dominated by tennantite and pyrite, and
3) A late assemblage of iron-poor sphalerite and galena.

In the widest veins, these assemblages can develop obvious zones, but in most veins the enargite-pyrite assemblage is dominant and the other two are absent or marked by late veinlets crosscutting enargite and pyrite crystals.

Oxide Mineralization

Historically, the Cerro de Pasco deposit had a supergene oxide cap. The only remaining area of the deposit with oxide mineralization is in the Santa Rosa open pit area. Previously it was thought that the mineralized lithology was the remnant of a pyroclastic flow just outside the diatreme complex; however, more recent mapping and sampling during mining identified the host rock as Mitu Group interbedded sandstone and conglomerate, cut by C2 veins resulting in massive and disseminated mineralization. Supergene oxidation generated the mined zone of silver-gold oxide mineralization which is 800 m long (and open to southeast), 400 m wide, and 125 m deep.

8 Deposit Types

The Cerro de Pasco deposit is a complex epithermal polymetallic deposit with base and precious metal mineralization, mainly silver, characterized by vein, breccia-hosted, and carbonate-replacement mineralization. This deposit type has also been referred to as a “Cordilleran base-metal deposit” type (Baumgartner *et al.,* 2008; Figure 8-1). The term “Cordilleran” was first applied to base metal-rich polymetallic vein deposits (Sawkins, 1972; Einaudi, 1982; Guilbert and Park, 1985; Bartos, 1987; Fontboté and Bendezú, 2009; Catchpole et al., 2015). Cordilleran deposits have also been referred to as Butte-type vein deposits (Meyer et al., 1968), polymetallic veins, and zoned base metal veins (Einaudi et al., 2003). Because the mineralization in many districts is dominantly mantos and not veins, and they commonly contain gold and silver in addition to base metals, Bendezú et al. (2008) and Fontboté and Bendezú (2009) prefer the more general term Cordilleran polymetallic deposits.

Cordilleran deposits are typically sulphide-rich, well zoned in time and space, and are characterized by copper-zinc-lead-(silver-gold-bismuth) metal suites with high silver/gold ratios. Cerro de Pasco is one of the largest known deposits of this type.

Cordilleran mesothermal to epithermal polymetallic deposits occur in the upper parts of the porphyry mineralizing environment and may be superimposed on mineralized porphyries and skarn-type deposits (Meyer et al., 1968; Einaudi, 1982; Prendergast et al., 2005; Gruen et al., 2010; Sillitoe, 2010; Catchpole et al., 2012). Cordilleran deposits postdate and may overprint spatially associated porphyry and skarn mineralization (Catchpole et al., 2012). The deposit style show features of high to intermediate-sulphidation epithermal deposits (Cooke and Simmons, 2000; Hedenquist et al., 2001; Einaudi et al., 2003), but frequently occur as massive sulphides in veins and replacement ore bodies and show a wide variation from low to high-sulphidation states on deposit scales (Meyer et al., 1968; Einaudi et al., 2003; Baumgartner et al., 2008; Bendezú et al., 2008).

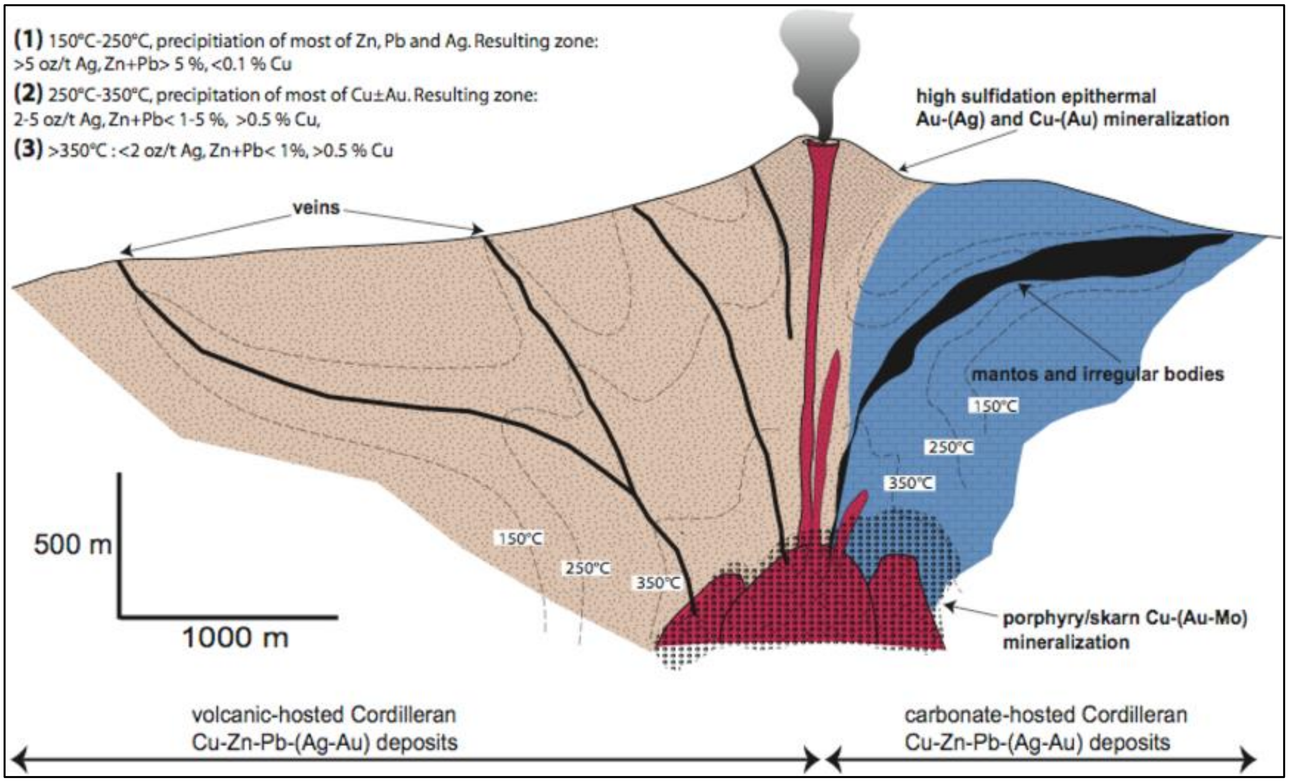


Figure 8-1: Schematic position of Cordilleran polymetallic deposits and other porphyry-related ore deposit types

Source: Fontboté, L. and Bendezú, R., 2009

The main features of Cordilleran polymetallic deposits can be summarized as follows (Bendezú et al., 2008; Fontboté and Bendezú, 2009):

- A close association in time and space with calc-alkaline igneous activity (i.e. in the same environment as most porphyry copper and high-sulphidation epithermal gold-silver deposits)
- Form under epithermal conditions at shallow levels beneath the paleosurface
- Include copper-zinc-lead-(silver-gold-bismuth) metal suites, very rich in sulphides (up to and more than 50% total sulphides), and have higher silver/gold ratios than high-sulphidation epithermal gold-(silver) mineralization
- Frequently show well-developed zonation of mineralization and alteration minerals (core zones may also include high-sulphidation and advanced argillic alteration)
- Early pyrite-quartz cores are associated with low-sulphidation mineral assemblages containing pyrrhotite-(arsenopyrite) that can be extensive and form large bodies zoned outward to zinc-lead ores such as the Cerro de Pasco deposit
- Occur as open-space fillings (veins, breccia bodies) in silicate host rocks and as replacement in carbonate rocks
- Base metals are deposited late in the evolution of the porphyry system (as seen from abundant crosscutting relationships and sparse geochronological data) after porphyry copper, skarn, and high-sulfidation gold-(silver) mineralization
- Fluid inclusion data consistently point to aqueous fluids of moderate to low salinity and trapping temperatures below 375°C (e.g. Baumgartner et al., 2008; Bendezú et al., 2008; Beuchat et al., 2004; Catchpole et al., 2008; Deen et al., 1994; Friehauf, 1998; MacFarlane et al., 1994; Prendergast et al., 2005; Rusk et al., 2008).

Two main mechanisms have been proposed to explain the formation of zinc-lead rich polymetallic deposits in shallow, epithermal portions of magmatic-hydrothermal systems:

1) Ascent to the shallow epithermal environment of intermediate density fluids that have not undergone phase separation (Rusk et al., 2008; Catchpole et al., 2011, 2015; Ortelli, 2015).
2) In case of phase separation, rise of deeply stored hypersaline metal-rich fluids driven by tectonic or magmatic processes or via mixing with low-salinity fluids (Sillitoe, 1989; Simmons, 1991; Rye, 1993; Beuchat et al., 2004; Camprubí et al., 2006a, 2006b; Baumgartner et al., 2008; Bendezú and Fontboté, 2009; Wilkinson et al., 2013).

Rottier et al. (2018b) describe three successive mineralization stages at Cerro de Pasco resulting in epithermal low- to high-sulphidation mineral associations emplaced at a paleodepth from <500 m to 1,500 m in the shallow part of a porphyry system:

1) Pyrrhotite pipes grading outward to sphalerite and galena replacement bodies (Stage A).
2) Quartz-pyrite veins (Stage B1) and a funnel-shaped massive replacement body of pyrite-quartz (Stage B2) with quartz-sericite ± kaolinite alteration.
3) Well-zoned zinc-lead-(bismuth-silver-copper) carbonate-replacement (Stage C1) and east-west trending copper-silver-(gold-zinc-lead) enargite-pyrite veins (Stage C2) accompanied by advanced argillic alteration.

Rottier et al. (2018b) suggest that fluids associated with mineralization stages A, B1, B2, and C1 are the result of mixing between a moderate-salinity metal-rich magmatic fluid and a low-salinity fluid at the site of mineral deposition. The moderate-salinity metal-rich magmatic fluid results from mixing at depth between metal-rich hypersaline fluids and low-salinity magmatic fluids exsolved late in the lifetime of the magmatic-hydrothermal system. The moderate-salinity metal-rich magmatic fluid resulting from this deep mixing rose to the epithermal environment, where it in turn mixed with low-salinity fluids that were stored below the paleowater table and had similar temperatures to the moderate-salinity fluid. The similarity between fluid compositions and evolution during stages A, B1, B2, and C1 contrasts with their significantly different mineral assemblages that are controlled by changing fO2, pH, fS2, and temperature (Rottier et al., 2018b).

In contrast, enargite-pyrite veins of Stage C2 were formed by the ascent of CO_2-bearing, vapor-like fluids that mixed with cold meteoric water. No interaction with the moderate-salinity, metal-rich magmatic fluids was noted (Rottier et al., 2018b).

9 Exploration

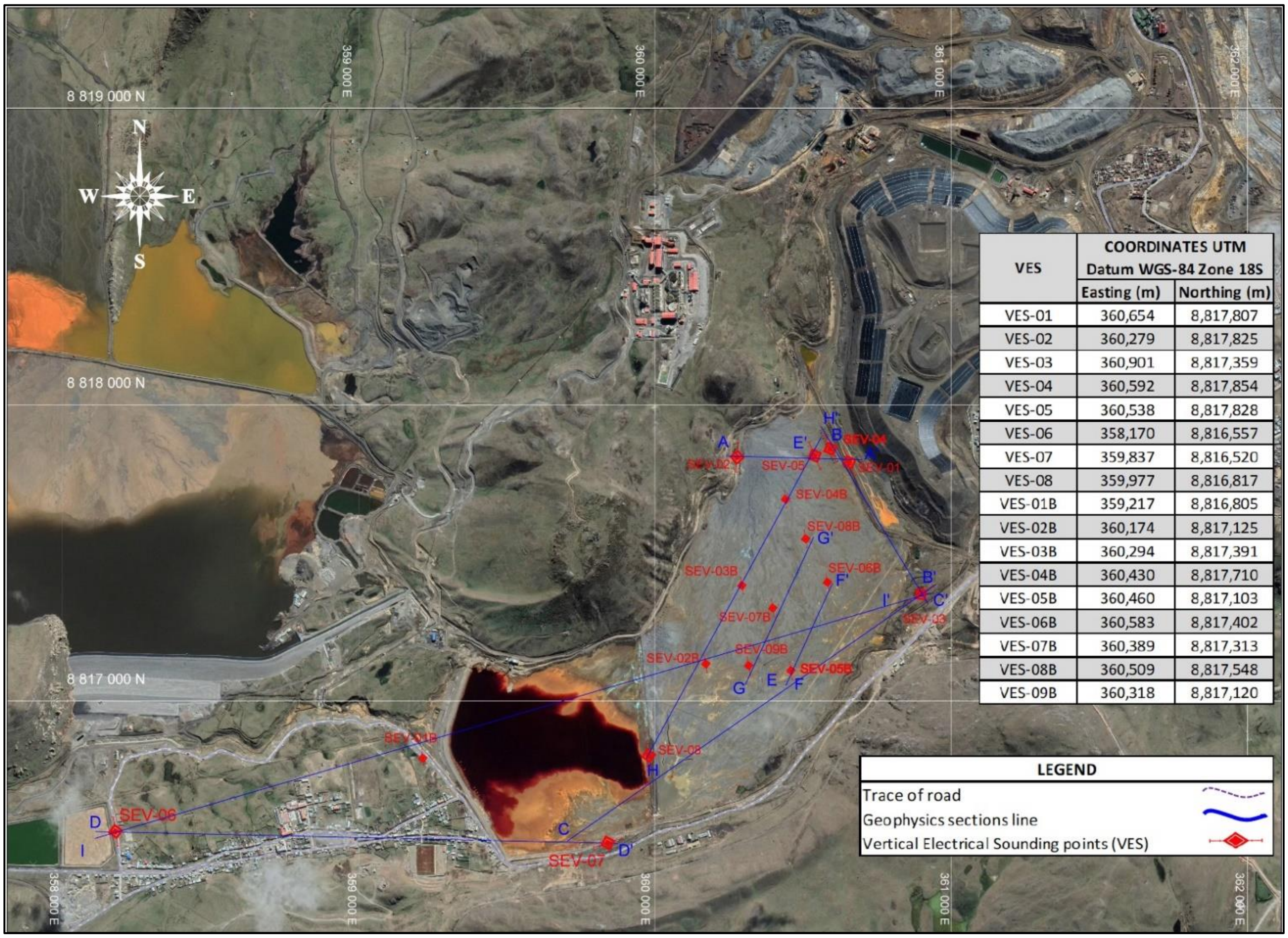
Mapping, sampling, and drilling on the El Metalurgista concession has been completed by previous operators, as described in Section 6.2.

CDPR has conducted limited exploration to date on the Project. The most recent exploration was a geophysical survey carried out by JCI Estudios & Servicios Ambientals ("JCI") over the Quiulacocha TSF in two stages, March and October 2020. The survey comprised vertical electrical sounding ("VES") at 17 stations to create seven section profiles which were used to provide an interpretation of the contact between the base of the tailings and other underlying geological formations (glacial till and bedrock).

Results showed that the depth of tailings varied throughout the TSF and ranged in depth from only a few metres on the peripheries, up to 40 m in the central areas.

Figure 9-1 shows technicians and engineers of JCI undertaking the geophysical survey. Figure 9-2 shows the location of the VES points and the section lines generated from the collected data.

Figure 9-1: JCI carrying out the VES geophysical survey



VES	COORDINATES UTM Datum WGS-84 Zone 18S	
	Easting (m)	Northing (m)
VES-01	360,654	8,817,807
VES-02	360,279	8,817,825
VES-03	360,901	8,817,359
VES-04	360,592	8,817,854
VES-05	360,538	8,817,828
VES-06	358,170	8,816,557
VES-07	359,837	8,816,520
VES-08	359,977	8,816,817
VES-01B	359,217	8,816,805
VES-02B	360,174	8,817,125
VES-03B	360,294	8,817,391
VES-04B	360,430	8,817,710
VES-05B	360,460	8,817,103
VES-06B	360,583	8,817,402
VES-07B	360,389	8,817,313
VES-08B	360,509	8,817,548
VES-09B	360,318	8,817,120

Figure 9-2: Location of VES points and profile section lines at the Quiulacocha TSF

10 Drilling

10.1 CDPR Drill Programs

As of the Effective Date, CDPR has not completed a drill program on the Project.

10.2 Volcan Drill Programs

Previous operator Volcan's drill programs prior to CDPR's acquisition of the El Metalurgista concession are presented as they have informed the MRE.

Volcan's 2004 and 2009 drilling programs at the Excelsior Stockpile are generally well documented with respect to drilling, methods and procedures, and sampling methodology. Core recoveries are recorded on hardcopy logs but have not yet been transcribed to the digital database. Downhole surveying was not completed on the Excelsior Stockpile drilling.

Summaries of drillhole information available from Volcan's work on the Excelsior Stockpile in 2004 and 2009 are presented in Table 10-1.

Collar locations of drillholes utilized in the 2020 MRE (Section 14) are presented in Figure 10-1, and Figure 10-2 shows a drill section through the Excelsior Stockpile.

Table 10-1: Summary of 2000–2009 Volcan drillhole data

Drillhole data	Comment
Drilling company	RC drilling by AK Drilling International
Sample type	Whole core HQ diameter and RC chips
Period (years)	2004 (core drilling); 2009 (RC drilling)
Total number of core drillholes	6
Total core drillhole metres	351
Archived drill core remaining	0 m, all cores recovered were sampled in entirety
RC drillholes	74
Total RC drillhole metres	4,368
Collar location	Surveyed by total station in local imperial grid coordinates then converted to metres
Drilling deviation – azimuth	Collar only as per total station survey; no downhole surveys
Drilling deviation – dip	Collar only as per total station survey; no downhole surveys
Recovery	Recovery information recorded on original logs. No recovery information in the digital database
Laboratory	Cerro SAC Mine Laboratory. No analytical certificates or similar documentation; CDPR is in process of validating the information against the original laboratory documents. Analytical database built from drill logs.
QAQC blanks	No
QAQC duplicate	No
QAQC standards	No
Independent external check laboratory	ALS lab for 2009 RC drill samples
Density measurements	No
2000–2009 drillholes used in the mineral resource models	Excelsior Stockpile: 6 core drillholes, 351 m; 74 RC drillholes, 4,368.00 m

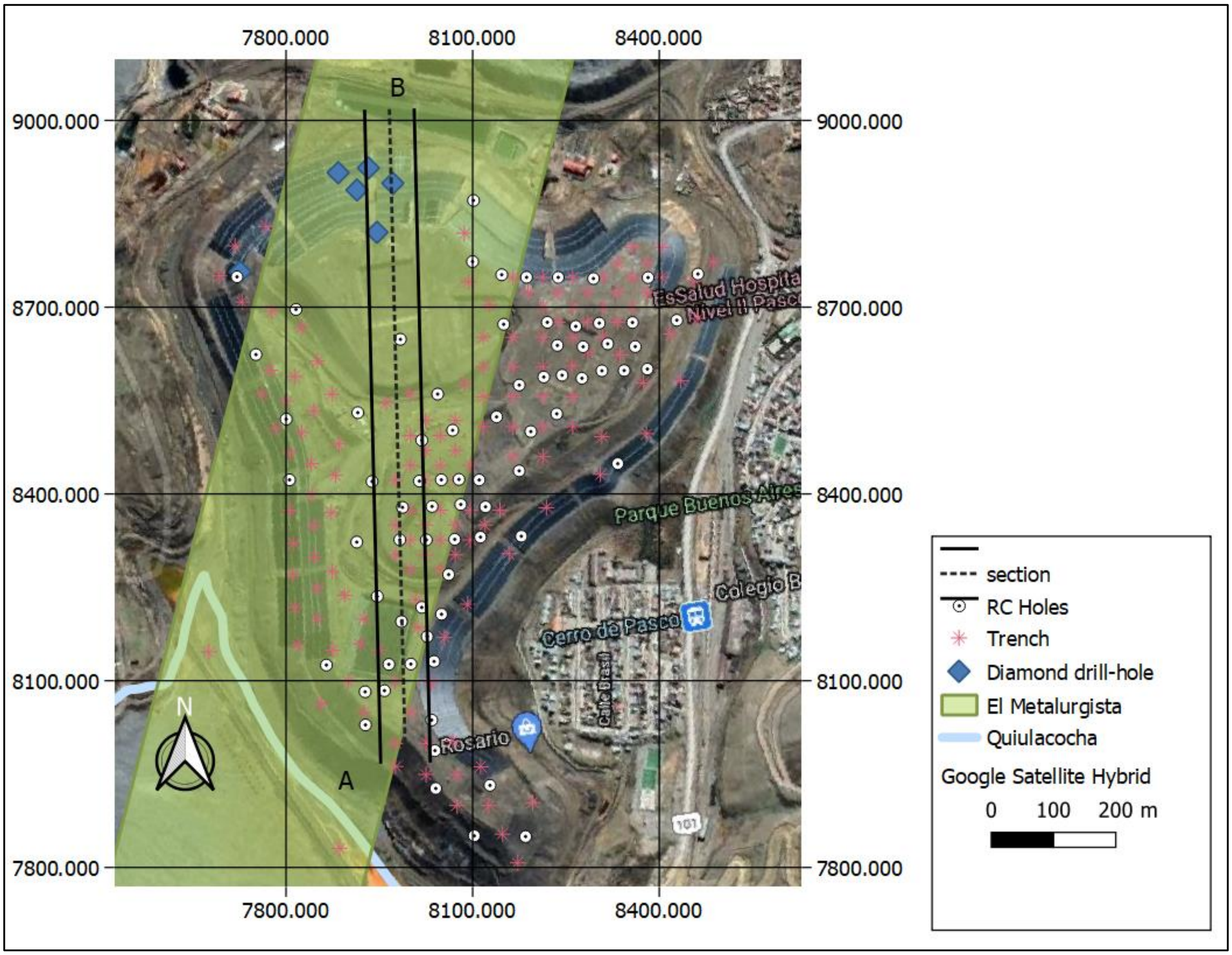


Figure 10-1: *Plan view of the Excelsior Stockpile with locations of test pit and drillhole collars and the El Metalurgista concession (mine grid)*

See Figure 10-2 for cross-section A-B.

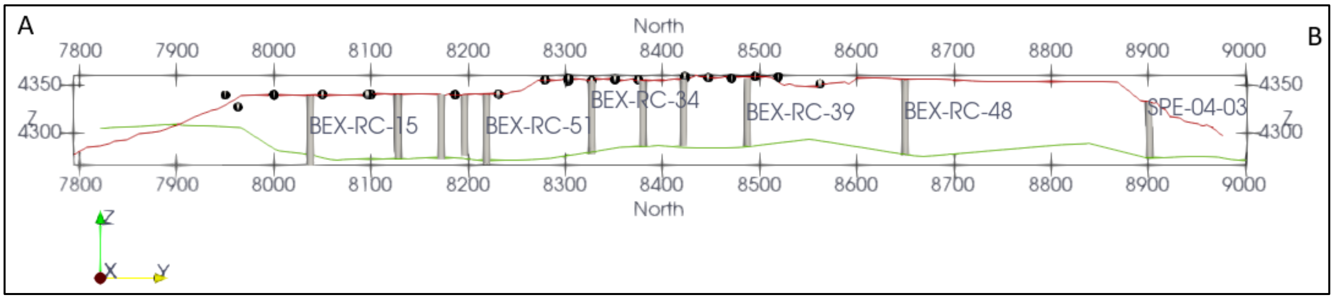


Figure 10-2: *Cross-section A-B looking west through Excelsior Stockpile showing RC and diamond drilling (grey), pit samples (black), and the upper and basal surfaces (red and green lines)*

See Figure 10-1 for cross-section A-B trace in plan.

10.2.1 Volcan Core Drilling

Volcan Drill Survey Procedures

The Volcan Geology Department designed drilling programs including the proposed location of boreholes. The drilling program was passed to the Mine Planning Department (includes Survey Department) to mark up the collar positions using a total station. The Geology Department set the azimuth and dip of the drill rigs with a compass before drilling commenced. All survey information was recorded in local grid coordinates with elevations in masl.

At completion of the core drillhole, the Survey Department conducted a final location, inclination and azimuth survey of the drillhole collar, which was delivered to the Geology Department in a standardized format.

Downhole orientation surveys were not completed by the drill rig operator. This is not considered material considering the shallow depth of drilling.

Volcan Drill Core Handling at the Rig

At the end of the drill run, the inner core tube was retrieved by wireline for unloading of the core.

1) The core was emptied from the core tube in top to bottom order, from left to right into a clean, washed stainless steel gutter, assisted by striking the core tube with a rubber hammer.
2) The inner core tube was washed and readied for return down the hole.
3) The core was the moved from the gutter to core boxes in top to bottom order, placing the core in the channels of the box from top left to lower right.
4) Core blocks were placed at the end of each run with advance written with indelible pen.
5) When the core box was full, the box was labelled with hole number, from and to distances, box number and arrows indicating the start and end position of the core.
6) The box lid was secured and then stacked in a secure location at the drill site to a maximum of five boxes high to prevent falls and spillage of the core.
7) At the end of each shift, the core was transported to a secure Volcan logging facility where Volcan geologists and technicians logged and sampled the core as described below. Chain of custody forms were signed at pickup from the drill site and at delivery to the logging facility.

Volcan Core Logging

At the core processing facility, the core logging methodology was as follows:

1) A quick log was first completed by the geologist for morning reports.
2) Verification of the core boxes (runs, recovery, number of boxes, status of the boxes) was completed by a geological technician under supervision of the Senior Geologist.
3) Core box photographs were taken.
4) The geologist logged the core in detail.
    a) Until 2019, the log was completed manually on a hardcopy log sheet for both diamond and RC drillholes. After logging was completed, a junior geologist or assistant registered the logged data into the digital database. The digital data was then verified by the geologist that logged the drillhole.
    b) The geologist was responsible for recording the description of all geological details on the log sheet (lithology, alteration, mineralization, and structure).
5) For diamond drillholes completed at the Excelsior Stockpile, the entire (whole) core was sampled.
6) The geologist marked the sample intervals, not less than 30 cm and not greater than 2 m (at the discretion of the geologist on the basis of lithology, alteration or mineralization).

7) Sample recovery (%) was also entered on the logging sheet.
8) Analytical results were added to the logging sheet when received from the laboratory.

Volcan's handwritten, hardcopy drill logs included header descriptions: drillhole identification number, drilling company, drill machine identification, drillhole start and finish date, the drilling area, the collar elevation and local collar coordinates in metric units, the drillhole collar azimuth and dip, and total drillhole length. The name of the geological logger, mine block, mine level/bench was also recorded in the header. The logging descriptions and data were reported relative to metric downhole lengths. The length of recovered core for each drill run was reported on some but not all logging sheets and the lithological log was described in both text and graphic strip log format. Additional information recorded includes, color, texture, structure (fractures), alteration intensity, and estimated sulphide content. Principal analyzed metals were reported in the log as Cu (%), Pb (%), Zn (%) and Ag (oz/t). Fe (%) and Bi (%) were also reported. Some logs have a reference location sketch of the drillhole. The logs were completed in Spanish.

Drilling at the Excelsior Stockpile used HQ core size. This information has been recorded in the drill and core logs but has not been transferred to the database. This is an ongoing process of digitizing the information from paper sources to populate the database.

Recoveries have been recorded in the drill and core logs but has not been transferred to the database. This is an ongoing process of digitizing the information from paper sources to populate the database.

Drill core sample collection procedures are described in detail in Section 11.

10.2.2 Volcan RC Drilling

Volcan retained AK Drilling International to drill on the Excelsior Stockpile using a two Foremost Prospector 4 x 4 Buggy Rigs. Drilling was carried out 24 hours per day, seven days a week from 27 April until 18 June 2009.

RC drilling was restricted to a 90° inclination at the Excelsior Stockpile in 2009, and a centre-return hammer was used. Each drillhole was lined with a 6-inch steel casing which was advanced behind the bit to prevent collapse of the drillhole and entrapment of the RC drill rods.

Volcan RC Drill Survey Procedures

The Volcan Geology Department designed the drilling program. The grids and hole spacings were dependent on geology, variability of mineralization, and costs. Drill campaigns were often staged with tightening of the grid spacing in progressive campaigns. The drilling program was passed to the survey department to mark up collar positions using a total station survey instrument. A stake and ribbon were placed at each drill collar site, labelled with platform number, collar location (east-north-elevation), drillhole number, proposed depth of drillhole, inclination, and azimuth. At completion of the drillhole, the identification code was written on a slab with spray paint and marked with either survey tape or a small flag. The Survey Department then conducted a final drillhole collar survey and recorded the collar position in local grid coordinates, final depth, inclination and azimuth with this information passed to the Geology Department in a standardized format.

No downhole surveys were completed, given holes were less than 100 m in length and completed in stockpiles.

RC Sample Handling at the Rig

A geologist was responsible for overseeing drilling activity and verified the platform, machine position and tilt angle of the drillhole to be drilled using compass, global positioning system ("GPS"), and location plans. The collection of the samples was supervised and/or carried out by a geologist.

- Sample bags were prepared and labelled with the drillhole number, sample interval (From-To), project name, date, inclination, and bag number.

- When drilling dry, the entire sample of each 2 m advance was collected into a sample bag secured to the exit of the drill rig cyclone. At the end of the interval the sample bag was removed from the cyclone and the cyclone was cleaned before the next sample bag was secured and the next 2 m advance drilled. If drilling in-situ mineralization, a selection of representative rock sample cuttings was placed in a chip tray labelled with depth intervals for later geological logging. If drilling stockpiles, chips for logging were recovered from the subsample splitting process during the sample preparation phase (see Section 11.3.1 for details).
- If a material lithologic or color change was observed during drilling, the sampler alerted the supervisor, and a decision was made to either stop sampling and start a new sample or continue to the end of the 2 m sample interval.
- The sealed sample bag was placed on a pallet in a secure location to the side of the drill rig in ascending sample number order from left to right.
- Chain of custody forms were completed prior to transport to the sample preparation warehouse including number of samples, sample ID numbers, and wet/dry status.

RC sample preparation procedures are described in detail in Section 11.

RC Sample Logging

At the sample preparation facility, the RC chip trays were logged for lithology, alteration (type/intensity), minerals (type/%/mode of occurrence), veins (texture/% of rock), and structures (type/fill type). All data were logged directly into a Microsoft Excel spreadsheet and subsequently imported into Fusion software.

RC drill recovery % was calculated based on the ratio of dry sample weight recovered divided by theoretical sample weight of the sample interval multiplied by 100. The RC drillholes were not calipered which would be of no value in the stockpiles. The theoretical weight was determined by multiplying the volume of the drillhole interval (where $V = \pi * r^2 * h$) by the estimated density of the rock comprising the mineral type in that interval.

When drilling stockpiles, the recovery of RC drilled stockpile materials depends on the degree of compaction of the material, humidity, and porosity; the latter being very high due to the gaps (empty space) left between the different sizes of materials deposited heterogeneous stockpiles. Volcan estimated that the average maximum recovery obtained in stockpiles is approximately 70%. A very high recovery is considered greater than 70%, a high recovery 50–70%, a moderate recovery 35–50%, a low recovery 20–35%, and a very low recovery less than 20%.

10.3 Volcan Test Pitting

Volcan completed 157 test pits totalling 896 m depth on the Excelsior Stockpile in 2008. Each test pit was dug with a CAT 325/330 swing shovel to ±6 m depth. At each test pit location, the excavator cleaned and levelled off an area approximately 5.7 m x 2.6 m and then commenced the dig. During the dig, five buckets of excavated material was placed to one side as a cone which was then sampled down one side. This would be repeated after every five buckets with the cone getting larger each time. In this way a sample of 50–60 kg was obtained. All samples would be numbered (inside and outside of the bag) before being sealed and taken off site. This gave about 60 kg in total for the trench, which was then split, to produce a 30 kg sample, from which a 2 kg sample was taken and sent to the laboratory. The remaining material from the 30 kg was archived for future testing purposes.

11 Sample Preparation, Analyses and Security

11.1 CDPR Sample Preparation, Analysis and Security

CDPR has not yet completed any sampling on the Project.

11.2 Volcan Drill Core Sample Preparation and Security

At the end of each drill shift, the core was transported to a secure Volcan logging facility where Volcan geologists and technicians logged and sampled the core. Chain of custody forms were signed at pickup from the drill site and at delivery to the logging facility.

Following logging, drill core samples were collected at intervals ranging from 0.3 m to 2 m at the discretion of the geologist, respecting changes in lithology, mineralization, and structural controls (the geologist could vary from these intervals, but it had to be justified).

At the core processing facility, the core sampling methodology was as follows:

1) After the geologist marked the cutting line and sample intervals, technical staff transferred the boxes to the cutting room where the core was cut lengthwise into two equal parts using a diamond disk saw. The core saw was cleaned before and after each cut sample.
2) If the core had a diameter less than or equal to 3.8 cm (BQ), the entire core was sent to the laboratory.
3) If core was intensely broken, the sample interval was split into two equally representative parts using a spatula.
4) One-half of each sample interval was packed in a bag, sealed, weighed, and recorded (if less than 3 kg, the sample was noted and submitted as a “special sample”).
5) A unique sample number was assigned to the sample from a four-tag sample book. One tag was placed in the core box with the archived sample interval, two copies were placed in the sample bag, and one tag remained in the sample book for record keeping purposes.
6) The remaining half was replaced into the core box for future requirements and archived in Volcan’s core shack.
7) Prior to transport to the laboratory, technical staff checked that the sample batch was complete and samples were properly labelled.
8) Handling of the samples prior to delivery to the laboratory was restricted to authorized personnel only. Chain of custody forms were signed at pickup of the core from the drill site and at delivery to the logging/sampling facility. Samples were stored in wooden boxes, until the preparation of the sample batch is complete. A sample custody record of pickup from the sampling facility and receipt at the Volcan on-site lab accompanied each batch. The lab assigned a work order number which was the same as the batch number.
9) The Volcan geologist was responsible for coordinating the transfer of the samples and delivery to the laboratory.

The analytical methods are described in Sections 11.5 to 11.6.

11.3 Volcan RC Sample Preparation and Security

11.3.1 RC Sample Warehouse Preparation Procedures and Security

Chain of custody forms were signed at pickup of the RC samples from the drill site and again at delivery to the logging/sampling facility.

Upon arrival at the sample preparation warehouse, samples bags were inspected for potential damage, wet/dry status, and chain of custody records. Sample tickets and bar codes were prepared for each sample in accordance with the information written on the sample bags and documented within the chain of custody forms. Any deviation noted between the information written on the sample bags and chain of custody forms was reported to the geology supervisor for correction.

- Samples received dry from the drill were placed in an ascending and orderly manner, from left to right on pallets.
- Wet samples were emptied into pre-washed and cleaned aluminum trays to prevent sample contamination. The trays of wet samples were placed into the drying oven (110°C). After drying, the samples were homogenized.
- The dried samples were placed on a weighing scale and the sample weight was recorded on the sample card. Samples drilled dry were weighed either at the drill rig or at the sample preparation warehouse. The RC sample recovery percentage was determined using the weighed dry sample weight and calculating the difference expected between it and a theoretical 100% recovered sample. Wheeler (2009) reports a density of 2.4 t/m^3 was assumed for recovery estimates.
- Prior to sample splitting, bags for each sample are encoded on both sides with barcodes and secured with packing tape to prevent damage or loss of these codes.
- After drying, all samples were split using a Jones-type riffle splitter. The splitter was cleaned with manual tools prior to the splitting of each sample to avoid potential contamination between samples. Each sample was homogenized before splitting. The sample was successively split until a sample of approximately 10 kg was obtained, which was then split to obtain two samples of 5 kg; the first 5 kg sample was for metallurgical tests, and the second 5 kg was split into two samples of 2.5 kg, one for chemical analysis and the other for geological logging. This process of logging the sample chips after sample splitting was only done for RC drilling of stockpiles. The chips were logged in this manner as it allowed for more detailed study and a better estimation of the normally mixed different lithologies that were present in each sample interval.
- Each filled sample bag was sealed with its corresponding ticket (sample number and the elements to be analyzed) and was stacked on marked pallets according to drillhole number until a sufficient number of samples were prepared for a sample batch – approximately 30 regular samples.
- Prior to transport to the laboratory, technical staff checked the sample batch was complete, samples were properly labeled, and that sample bags were not damaged.
- Handling of the samples prior to delivery to the laboratory was restricted to authorized personnel only. A sample custody record of pickup from the sampling facility and receipt at the Volcan on-site lab accompanied each batch. The lab assigned a work order number which was the same as the batch number.
- A Volcan geologist was responsible for coordinating the transfer of the samples and delivery to the laboratory.
- Sampling records were input into the GDMS System by the chief sampler under supervision of a responsible geologist. Sampling cards and sampling reports were delivered to the Geology office.

The analytical methods and check sample program are described in Sections 11.5 to 11.6 and 11.8.

11.4 Volcan Pit Sample Preparation and Security

Upon arrival at the sample preparation warehouse, samples bags were inspected for potential damage, and chain of custody records.

- Prior to sample splitting, bags for each sample are encoded on both sides with barcodes and secured with packing tape to prevent damage or loss of these codes.
- Each 50–60 kg sample was crushed and quartered using Jones-type riffle splitter. The splitter was cleaned with manual tools prior to the splitting of each sample to avoid potential contamination between samples. Each sample was homogenized before splitting. The sample was successively split until two samples of approximately 1.5 kg was obtained, one for assay in the Cerro laboratory and the second stored with 1-in-20 check samples being sent to ALS Chemex. A third 30 kg sample was set aside for metallurgical testing.
- Each filled sample bag was sealed with its corresponding ticket (sample number and the elements to be analyzed).
- Prior to transport to the laboratory, technical staff checked the sample batch was complete, samples were properly labelled, and that sample bags were not damaged.
- Handling of the samples prior to delivery to the laboratory was restricted to authorized personnel only. A sample custody record of pickup from the sampling facility and receipt at the Volcan on-site lab accompanied each batch. The lab assigned a work order number which was the same as the batch number.
- A Volcan geologist was responsible for coordinating the transfer of the samples and delivery to the laboratory.

The analytical methods are described in Sections 11.5 to 11.6.

11.5 On-Site Laboratory Sample Preparation

Volcan's sample preparation and analyses was completed at the Paragsha (Cerro Pasco Mining Unit) laboratory facilities. The Paragsha laboratory is not independent of Volcan or CDPR. The CERRO SAC Laboratory obtained ISO 9001 certification on 18 July 2019.

Samples were dried at 105°C, then crushed with a jaw crusher to 75% passing 10 mesh. A 250 g split of the crushed product is taken using a Jones riffle spitter. The 250 g split is then pulverized with a chrome steel ring pulverizer to 95% passing 140 mesh. The pulverized material is homogenized and inserted into coded sample envelopes for respective analytical methods.

11.6 On-Site Analytical Methods

A 0.2–0.5 g sample was used for atomic absorption analysis of silver, copper, lead, zinc, iron, arsenic, antimony, bismuth, manganese, OxPb and OxZn. OxPb and OxZn refers to a proprietary digest that selectively dissolves non-sulphide zinc and lead without dissolving sulphides. The sample was digested with either aqua regia, potassium chlorate or hydrogen peroxide depending on the analyte. In the case of OxPb and OxZn, the 0.2 g sample is leached with 25% acetic acid then analyzed by atomic absorption.

Gold is analyzed by fire assay with an atomic absorption finish using a 10–20 g sample for sulphide samples and 30–50 g sample for oxide samples.

On completion of assays, the sample rejects and pulps were retrieved from the laboratory for archiving and storage.

11.7 Density Measurement Methods

The Qualified Person updated the density of the Excelsior Stockpile model using apparent density measurements provided by CDPR and obtained from Volcan for materials from the stockpiles Tacora Sur, Tacora Norte, Tacna Arica, Miraflores, Pampa Seca, and Hanancocha.

Bureau Veritas carried out the density study in 2017 to determine percentage of moisture and apparent density of material stored in the different stockpiles. The evaluation used the following generalized process:

- Survey the volume of material placed in the trailer section of a 20-tonne truck.
- Sample the mineral to determine moisture content in the laboratory.
- Determination of the apparent density by weighing the truck before and after inclusion of stockpile material. Weighing was performed on a calibrated weighbridge usually used for weighing concentrates before transport to Lima.

11.8 Quality Assurance and Quality Control

Volcan gradually introduced a QAQC program for sample analysis beginning in 2010. Drill and pit samples collected in 2004 and 2009 and used to inform the Excelsior Stockpile MRE lacked a QA/QC program of certified reference materials, blanks, and duplicates. However, Wheeler (2009) reports that for the 2009 RC sample data, 127 external check samples were sent to ALS Chemex for external assaying. These results are summarised in Table 11-1.

Table 11-1: Summary of external assaying results

Field	HARD precision at 90% rank	Correlation coefficient	Regression coefficient
Zn	14.3	938	1.037
Pb	21.7	0.958	0.981
Ag	31.7	0.974	1.029

Notes:

- *Duplicates external*
- *127 duplicates taken, all from RC samples.*
- *HARD – half absolute relative difference.*

The half absolute relative difference (“HARD”) results for zinc are shown graphically in Figure 11-1. Normally a HARD precision value at 15% or below (at the 90% rank) is considered acceptable. By this criterion, it can be seen that lead and silver HARD levels are rather high. However, the correlation and regression coefficients for zinc, lead and silver do support the Cerro assay results. These comparisons are also displayed graphically in Figure 11-2.

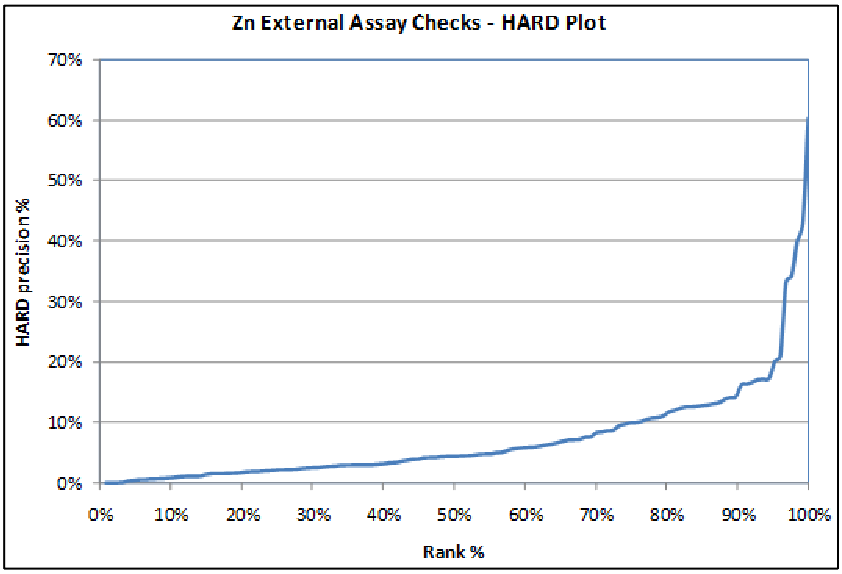


Figure 11-1: External zinc assays – HARD precision plot
Source: Wheeler (2009)

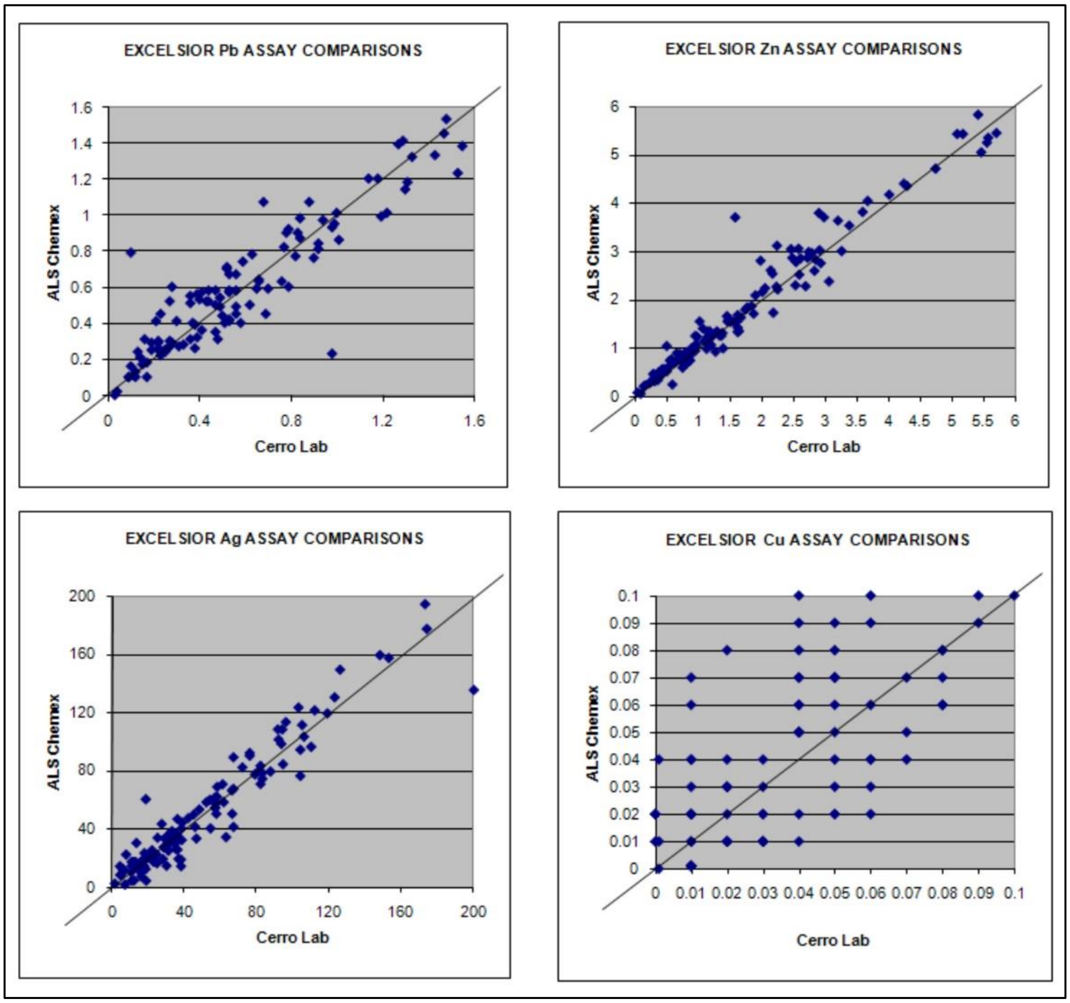


Figure 11-2: 2009 RC sample check assay comparisons – Pb (%), Zn (%), Cu (%), Ag (g/t)
Source: Wheeler (2009)

11.9 Qualified Person's Opinion on Sample Preparation, Security and Analytical Procedures

Volcan's 2004, 2008 and 2009 sample preparation, analytical techniques, and security protocols and procedures were provided to the Qualified Person and appear to be generally well documented. Volcan did not implement a sample QAQC program until 2010 therefore there are no QAQC data for assay results for these sample programs other than check duplicates completed at an independent commercial laboratory for RC drill samples collected in 2009.

Given the limited QAQC, an independent assessment cannot be made of the analytical quality of the Excelsior sample results used to inform the MRE. The Qualified Person is however of the opinion that the pre-2010 data is of sufficient quality to provide the basis of Mineral Resource estimation and the conclusions and recommendations reached in this Report, based on the fact that the extensive historical mining at Cerro de Pasco relied on the data generated at the same laboratory, and that QAQC subsequent to 2010 has given adequate results. However, some degree of risk is associated with the historical data, hence it has only been used to estimate Mineral Resources with Inferred classification.

Future sampling programs must implement a robust QAQC program.

12 Data Verification

The Qualified Person has completed validation checks on the database which informs the Mineral Resource estimate contained in this Technical Report, including sample assays, geological logs, density analysis, and analytical QAQC. The Qualified Person also audited work completed by third parties, including data verification, interpolation parameters, and geological modelling assumptions.

12.1 Qualified Person Site Visit

The Qualified Person completed a site inspection and familiarization with the Project and surrounding area from 25 to 27 February 2020. In addition, a visit to the CDPR office in Lima was completed on 21 February 2020. The data verification activities conducted by the author during the site inspection consisted of:

- Observation of the mineralization in surface outcrops in the open pit, stockpiles, and TSF
- Observation of the Volcan on-site assay laboratories, and sample storage facilities
- Observation of Volcan geological logging procedures, and review of the drillhole database
- Observation of the Volcan operation, including mining, and transportation
- Review of supporting documentation of the historical data
- Review of Volcan sampling and QAQC procedures documentation.

The Qualified Person observed the mineralization in the Raúl Rojas pit, and the Santa Rosa pit (Figure 12-1A and Figure 12-1B). Special attention was paid to the distribution controls of the different styles of mineralization since this is the source for the Excelsior Stockpile material. A significant amount of archived core, RC samples, and processed sample pulps completed by Volcan are maintained in secure and dedicated facilities (Figure 12-2).

Figure 12-1: Mineralization observed during the site visit: Quiulacocha tailings with Excelsior Stockpile in background

Figure 12-2: Sample storage facilities: pulp storage (A), core storage (B), RC samples (C and D)

Historical data documentations were reviewed. The Excelsior Stockpile data documentation was provided to CDPR in digital format by the Volcan Geology Department and is well organized and categorized.

The Volcan's two plant laboratories (Paragsha and Oxidos) were visited, and it was observed that both are well organized and clean. The laboratory technicians were interviewed regarding sample preparation, analytical equipment and assay procedures.

12.2 Additional Data Verification

The Qualified Person interviewed Adam Wheeler, the Volcan subcontractor who completed the 2009 Excelsior Stockpile Mineral Resource model and estimate. The interview verified the sources of information, assumptions used for interpolation, and geological interpretation.

CDPR provided the Qualified Person with the Excelsior Stockpile block model, the informing data used for interpolation, relevant wireframes with geological interpretation and topographic surface, and the accompanying report with the assumptions and parameters used for interpolation. The Qualified Person completed a set of validations on the model, informing data, geological interpretation and estimation domains, interpolation parameters and assumptions.

The local mine coordinate system and its conversion to PSAD56/UTM zone 19S were also verified by overlapping the data provided by CDPR (in local coordinates) over public domain satellite imagery.

Additional data verification was completed to ensure the absence of systematic bias in the informing data that could impact the MRE.

12.3 Qualified Person's Opinion and Conclusions

It is the Qualified Person's opinion that the available historical drillhole information and data are a reasonable and accurate representation of the Project, and the Project database is of sufficient quality for the geological interpretations and support of Mineral Resource estimation at an Inferred classification.

13 Mineral Processing and Metallurgical Testing

13.1 Introduction

CDPR has conducted no mineral processing and metallurgical testing of mineralization from the Excelsior Stockpile.

For metallurgical and processing purposes, the Cerro de Pasco mineralization can be broadly divided into three types: lead-zinc-silver sulphide, pyrite-silver-gold, and oxide. The historical and current production and recoveries at the Paragsha and San Expedito sulphide plants are presented in Section 13.3 as a proxy for documented mineral processing and metallurgical testwork and an indication of recoveries expected for the lead-zinc-silver sulphide mineralization type which dominates the Excelsior Stockpile material. These recoveries have been incorporated into the parameters for “reasonable prospects for economic extraction” in Section 14.

CSA Global notes that significant geological variability is known within each of the three mineralization types and recommends a geometallurgical study and model to better understand the metallurgical and recovery implications with respect to material from the Excelsior Stockpile.

13.2 Historical Metallurgical Testing

CDPR informs the Qualified Person that Volcan has completed internal metallurgical testwork on an ongoing basis on both the lead-zinc-silver bearing sulphide mineralization stockpiles and the in-situ silver and gold-bearing oxide material before mining and has aligned treatment in the standard flotation process plant and the oxide process plant, respectively. The metallurgical staff also determine the reagent dosages to be used when the mineralized blocks are tested for metallurgical response prior to processing in the plant.

13.3 Paragsha and San Expedito Plant Production, Recoveries and Concentrate Grades

Lead and zinc concentrates are recovered from the Paragsha and San Expedito plants using conventional sulphide flotation circuits that include comminution in the form of crushing and milling, followed by flotation and subsequent cleaning and filtration of each of the floated concentrates. This technology is in common use in the mining and processing industry and the flotation of fresh sulphide mineralization can often result in metal recoveries of more than 85% by mass.

The recovery is calculated by taking a regular representative head sample of the feed material and determining the pay element content in the feed by assaying these samples to determine the percentage of the elements present. Due to the segregation of grades in coarse run-of-mine (ROM) feed mineralization, the first point in the process where a homogeneous sample can be taken is the cyclone overflow stream that feeds the lead flotation circuit. A similar sample is taken and analysed of the slurry tailings leaving the plant to determine the quantity of the pay element that has not been recovered in the flotation process. The difference between the two samples collected indicates what the recovery of that pay element was by using the installed process flowsheet.

As a confirmation check of the mass balance and for metal balance purposes, the quantity of the pay elements metal value is also measured in the concentrates that are generated and dispatched to the toll treater for further refining. The presence of zinc in the lead concentrate, and of lead in the zinc concentrate, is not considered in the recovery calculation as these are impurities and result in possible penalties being incurred for the treatment of off-specification primary concentrates.

In the case of the current ROM feed mineralization that is being supplied to the plant, the recoveries are significantly lower that would normally be expected for fresh feed for the following reasons:

- The current ROM feed originates from several stockpiles from mining activity that occurred in previous years. This means that the surfaces of the mineralized material have been exposed to air for an extended period of time and these surfaces have become oxidized/weathered. As the flotation process relies on flotation of primarily sulphide mineral surfaces, the conversion of these sulphide surfaces to an oxide or partially altered or weathered form reduces the efficiency of the flotation reagents to recover the metals. Generally, the longer the time that elapses, the greater the degree of oxidation that takes place and hence lower metal recoveries can be expected.
- The current ROM feed is relatively fine-grained with approximately 50% of the feed (by weight) being -5 mm in size. This means that the surface area of the material is much greater than if there was less fine material present and that proportionally more of the mineralization surfaces become weathered/oxidized than if the mineralization was coarser grained.
- The ROM feed is currently being taken from a number of different stockpiles and mining locations, each of which may have different characteristics which do not necessarily complement each other in the beneficiation process. Potentially the recoveries of each mineralization type can be improved by varying the flotation reagent suite that is added ahead of the flotation process, but since these mineral-bearing materials are blended, it is not possible to setup the plant optimally for the number of different mineralization types that are mixed together.
- The mixing of the different ROM feed mineralization types as well as the possibility of introducing some waste (barren) material that contains no pay elements into the feed to the plant will reduce the metal recoveries from the plant as the presence of the waste material reduces the average residence time of the mineralized material.

There is a maximum recovery that can be achieved by the installed process for any given mineralization type. This value is measured daily by conducting milling and flotation tests on the ROM stockpile. These tests indicate how much concentrate can be recovered from the mineralized material assuming that there is an indefinite amount of residence time available. Based on the results of these tests, the flotation circuit can be modified by changing the flotation conditions/reagent types or quantities of reagents added to the flotation process.

Although the primary pay elements in the concentrates are lead and zinc, there is also an important component of silver with the base metal sulphide minerals which is recovered into the lead and zinc concentrates. Silver recoveries can be lower than for the primary metal recoveries and there is no method of increasing this percentage other than increasing the quantity of the sulphide concentrates.

The tonnes treated and recoveries recorded for the Paragsha and San Expedito plants over the past four years can be seen in Table 13-1. There is no clear trend visible over time for the average recoveries of lead, zinc or silver and the variations appear to be more dependent on the different mineralization types being processed at the time rather than the changing efficiencies of the processing operation.

Table 13-1: Tonnes treated, feed grades, and recoveries for zinc, lead, silver (stockpile material)

Year	Treatment of low-grade sulphide stockpiles				Recovery		
	Tonnes	Zn (%)	Pb (%)	Ag (oz/t)	Zn (%)	Pb (%)	Ag (%)
2016	232,993	2.01	0.71	0.97	49.72	54.50	58.88
2017	1,059,156	1.88	0.53	0.62	46.85	61.81	58.72
2018	1,314,411	1.94	0.54	0.58	43.88	51.79	53.58
2019	2,072,843	1.89	0.63	0.82	44.75	48.69	46.25
Total	**4,679,403**	**1.91**	**0.59**	**0.71**	**45.23**	**52.82**	**51.76**

The average grades and moisture content for the 2019 zinc and lead concentrates can be seen in Table 13-2. The results are based on 578 sample analyses of lead concentrates and 1,383 sample analyses of zinc concentrates. The analysis was done by Cerro S.A.C. as part of its process for revising the concentrate specifications before shipping and for metal accounting purposes.

Table 13-2: Average moisture content and grade (economic and penalty elements) of 2019 concentrates

Concentrate	H_2O (%)	Cu (%)	Pb (%)	Zn (%)	Ag (oz/t)	Fe (%)	Bi (%)	As (%)	Sb (%)	Mn (%)
Zinc	9.46	0.33	2.85	45.16	5.90	10.66	0.02	0.11	0.03	0.74
Lead	11.00	2.03	45.07	5.55	38.72	10.01	0.25	0.40	0.19	0.45

14 Mineral Resource Estimates

14.1 Introduction

This MRE for the Excelsior Stockpile was prepared by Dr Adrian Martínez Vargas, P.Geo., Senior Consultant and full-time employee of CSA Global, and the Qualified Person and author of this section. Adam Wheeler, a subcontractor of Volcan, created the resource block model (Wheeler, 2009) used to produce the MRE. Dr Martínez completed sufficient work to validate and update the Wheeler (2009) block model and prepared the MRE reported herein. Andrew Sharp, P.Eng., full-time employee of CSA Global and a co-author and Qualified Person of this Report, defined the processing and mining assumptions, developed a NSR formula, and estimated the NSR cut-off used for reporting Mineral Resources. The assumptions used to calculate NSR and NSR cut-off are based on 2016 to 2020 Volcan production data and metallurgical testwork provided by CDPR, and information from similar operations in the region.

The MRE for the Excelsior Stockpile has been estimated and classified in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves, adopted by the CIM Council on 10 May 2014 ("CIM Definition Standards") and CIM Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines adopted by the CIM Council on 29 November 2019 ("CIM Guidelines"), and disclosed in accordance to NI 43-101 Standards of Disclosure for Mineral Projects (30 June 2011), companion policy NI 43-101CP, and Form 43 101F1.

The MRE has an Effective Date of 31 August 2020, which is based on the date of the topographic survey data.

CDPR provided the Qualified Person with the block model, the informing data used for interpolation, relevant wireframes with geological interpretation and topographic surfaces, and the accompanying report with the assumptions and parameters used for interpolation. The Qualified Person completed a set of validations on the model, informing data, geological interpretations and estimation domains, and interpolation parameters and assumptions. Minor updates were also completed, and the Excelsior Stockpile was reclassified. Details on the construction of the model and the validations completed by the Qualified Person are presented in the following sections. The quality of the informing data, including drilling, sampling, QAQC, and data verification, are presented in Sections 10, 11, and 12.

14.2 NSR Cut-Off Model

Andrew Sharp, P.Eng., Qualified Person and co-author of this report developed a new NSR formula with input from CDPR, independent benchmarking, and metal prices agreed with CDPR. The metal prices used for reporting was obtained by comparing the average of five years, three years, and spot prices as of 14 June 2020 (Table 14-1).

Table 14-1: Metal prices used to report resources (14 June 2020)

Metal	Units	CDPR MRE reference price
Pb	US$/t	2,125
Zn	US$/t	2,650
Ag	US$/oz	16.00

An NSR model for the Excelsior Stockpile was prepared, assuming only one type of mineralization, lead-zinc-silver style mineralization termed MINTYPE 1.

The lead-zinc-silver mineralization (MINTYPE 1) would be processed with a two-stage lead and zinc flotation process. Staged recoveries and processing cost for the lead and zinc concentrates have been calibrated by historical performance but show increasing recovery and performance if head grades are improved.

14.2.1 MINTYPE 1

The NSR formula is as follows:

NSR_MT1 = NSR1_Pb*Pb %+ NSR1_Zn*Zn %+NSR1_Ag*Ag g/t.

The coefficients NSR1_Pb, NSR1_Zn, and NSR1_Ag, are shown in Table 14-2.

Table 14-2: NSR coefficients used to calculate NSR for MINTYPE 1

NSR	Lower range	Formula	Upper range	Formula	Additional conditions
NSR1_Pb	<0.25%	44*Pb % -4	=>0.25%	2.19*Pb %+6.5	Where Cu % > 0.1% add 2.5
NSR1_Zn	<0.5%	11*Zn %	0.5 %-8%	0.96*Zn %+4.3	Where Zn % > 8.0% = 12
NSR1_Ag	<22 g/t	0.0041*Ag g/t	=>22 g/t	0.09	Add 14*Pb %/100 all ranges

The formulae are dependent on recovery (Rec), concentration grades (PbC_Pb%, for example), payable formula (Pay), treatment costs (TC), refining costs (RC) and shipping (Ship) costs that are included in Table 14-3 to Table 14-4.

Table 14-3: Lead concentrate NSR formula parameters

Parameter	Formula	Comment
PbC_Pbrec	45.9+14.7*Pb%	Maximum recovery 90%; less 20% if copper circuit operating
PbC_Curec	15%	Equal to 2.5% if copper circuit operating
PbC_Znrec	2.33%	
PbC_Agrec	16.4+0.04*Aggpt+0.03*Pb%	Less 9% if copper circuit operating
PbC_Aurec	0.12*PbC_Agrec	
PbC_Pb%	48.54+1.89*Pb%	Limit 67%
PbC_Pay_Pb	(PbC_Pb%-3%)/ PbC_Pb%	Minimum 0%
PbC_Pay_Cu	(PbC_Cu%-3%)/ PbC_Cu%	Minimum 0%, maximum 95%
PbC_Pay_Zn	0.0	
PbC_Pay_Ag	(PbC_Ag-51)/ PbC_Ag	Minimum 0%, maximum 95%
PbC_Pay_Au	(PbC_Au-1)/PbC_Au	Minimum 0%
PbC_RC_Ag	1.5/AgPrice*PbC_Pay_Ag	Silver price in US$/oz
PbC_RC_Au	10/AuPrice*PbC_Pay_Au	Gold price in US$/oz
PbC_TC	US$165/t	Includes penalties
PbC_Ship	US$90/t	All up transport, insurance, umpires sampling etc.

Note: Recovery formulae are from stage head grades and are the stage recovery.

Table 14-4: Zinc concentrate NSR formula parameters (if operated)

Parameter	Formula	Comment
ZnC_Znrec	45.9+14.7*Pb%	Maximum stage recovery 90%
ZnC_Curec	11%	
ZnC_Pbrec	56.739*Pb%	Maximum stage recovery 90%
ZnC_Agrec	Zn%*16	Maximum stage recovery 25%
ZnC_Aurec	0.12*ZnC_Agrec	
ZnC_Zn%	42+2*Zn%	Limit 52%
ZnC_Pay_Zn	(ZnC_Pb%-8%)/ ZnC_Zn%	Minimum 0%, maximum 85%
ZnC_Pay_Ag	0.7* (PbC_Ag-93)/ ZnC_Ag	Minimum 0%, maximum 70%
ZnC_Pay_Au	0.7 * (PbC_Au-1)/ZnC_Au	Minimum 0%
ZnC_RC_Ag	1.5/AgPrice*ZnC_Pay_Ag	Silver price in US$/oz

ZnC_RC_Au	10/AuPrice*ZnC_Pay_Au	Gold price in US$/oz
ZnC_TC	US$320/t	Includes penalties
ZnC_Ship	US$90/t	All up transport, insurance, umpires sampling etc.

Note: Recovery formulae are from stage head grades and are the stage recovery.

Historical data was tested against the formula and found to have a good fit.

14.2.2 NSR Cut-Off Values

Resources have been reported with a calculated NSR cut-off, as shown in Table 14-5. This table also provides a summary of the incremental costs used to define the NSR cut-off.

Table 14-5: NSR cut-off values and incremental cost assumptions

MINTYPE	Mining	Plant	Administration	NSR cut-off (US$)	Note
MINTYPE 1 Pb-Zn-Ag	1.00	8.00	2.00	11.00	Stockpiles

In the case of stockpiles, the mining cost is to move the material to the plant. There is no cost being applied to separate waste. If there is significant waste to move or to move it some distance, this cost may need revision.

Lead-zinc-silver plant costs are based on local and peer data for two or three stage flotation at Cerro de Pasco. Administration costs were determined to adhere to peer performance ratios based on size, country and location.

Royalties and Fixed Metal Repayments

All royalties and metal payments are considered after costs and therefore not included in the cut-off.

Sustaining Capital

NSR costs include provision for sustaining capital.

14.3 Coordinate System

The informing data provided for this MRE is in local mine coordinates. The conversion of a local grid point X, Y to EPSG:24878 – PSAD 56/ UTM zone 18S projection datum is completed by rotating clockwise 8.64864073 degrees over the reference point 0 X and 0 Y and translating X 351973.8107 m to east and Y 8811505.5219 to north.

All the images and coordinates in this section refer to local grid coordinates in metres unless stated.

14.4 Excelsior Stockpile Mineral Resource

Excelsior is a large stockpile located to the southwest of the Raúl Rojas pit. Its dimensions are approximately 1.3 km north-south, 0.8 km east-west, and up to 90 m depth. It was filled with mainly unprocessed low-grade carbonate-hosted zinc-lead-silver mineralized material excavated from the Cerro de Pasco Raúl Rojas pit and underground mine over many years since the 1970s; it also includes oxides containing lead-zinc-silver mineralization, volcanic rocks, and pyrite-type material. However, for the purpose of the MRE, it was assumed that all the mineralization is lead-zinc-silver (MINTYPE 1).

The upper northwest part of the stockpile contains mostly volcanics from the waste stripping of the west wall of the Raúl Rojas pit, and only a few drillholes were completed in this area of the stockpile. The upper northeast and southern parts came mostly from limestones mined from the east wall of the pit and were drilled in more detail (Figure 10-1).

The reported MRE for the Excelsior Stockpile is based on the model developed by Adam Wheeler for Volcan in 2009, which was reviewed and updated by the Qualified Person.

14.4.1 Informing Data

The informing data used to create the resource model consist of six diamond drillholes completed in 2004 and generally sampled at approximately 2 m intervals, composites collected from 146 test pit (trenches) of approximately 6 m depth completed in 2008, and 74 RC holes drilled from 27 April to 18 June 2009, and sampled at 2 m interval. In addition, a set of surface grab samples collected prior to 2009 was used only for geological modelling. A total of 2,555 samples were used for the Mineral Resource estimation: 2,191 from RC drillholes, 207 from diamond drillholes, and 146 from test pits.

Samples were assayed for copper, lead, zinc, and bismuth in percent, and silver in g/t.

Basic drillhole database validation by Wheeler (2009) included using plan and section view plots, check of FROM-TO intervals, and range check of grade fields. The Qualified Person completed basic validation of the database integrity, and no issue was identified. However, high variability was observed in the weight of the samples. QAQC show relatively high HARD plots of internal and external sample duplicates (Wheeler, 2013). However, the Qualified Person considers that the data is appropriate for MRE.

The Qualified Person notes that the use of pit test data is problematic because this data informs only the near-surface portion of the stockpile and are unconstrained at depth (Figure 14-1). They also represent a higher (support) volume of material than the other samples. However, there is sufficient drillhole data to avoid excessive extrapolation of the test pit data. This issue is also mitigated by the estimation parameters used for interpolation, and by penalizing the estimate with confidence classification.

The Qualified Person updated the density of the model using more recent density measurements provided by CDPR and obtained from Volcan for materials from the stockpiles Tacora Sur, Tacora Norte, Tacna Arica, Miraflores, Pampa Seca, and Hanancocha in 2016. The density in these other stockpiles was obtained from volume and weight measured in trucks, and moisture measured in the laboratory. These stockpiles are made up of lead-zinc-silver mineralization (MINTYPE 1) similar to Excelsior.

14.4.2 Geological Modelling and Interpolation Domains

The stockpile was divided into zones, according to the main periods of deposition (Figure 14-1, left). Zone A is the deepest and oldest part and has a mix of material types, including oxides, volcanic rocks, limestones, pyrite-quartz with copper-lead, and pyrite-quartz with lead-zinc mineralization. Zone B contains mostly volcanic rocks from the west wall of the pit and a small quantity of limestone from the east wall. Zone C1 and C2 contain mainly limestones from the east wall. Zone D is also limestones from the east wall of the Raúl Rojas pit, and was combined into Zone A.

Resources were only reported for the concession El Metalurgista, in which surface stockpile mineral rights are 100% owned by CDPR (Figure 14-1, right). The MRE is constrained within El Metalurgista’s vertical concession boundaries and by the physical limits of the Excelsior stockpile surfaces within the concession. Surface rights over the El Metalurgista concession are owned by AMSAC, a company created in June 2006 and wholly owned by the Peruvian Government.

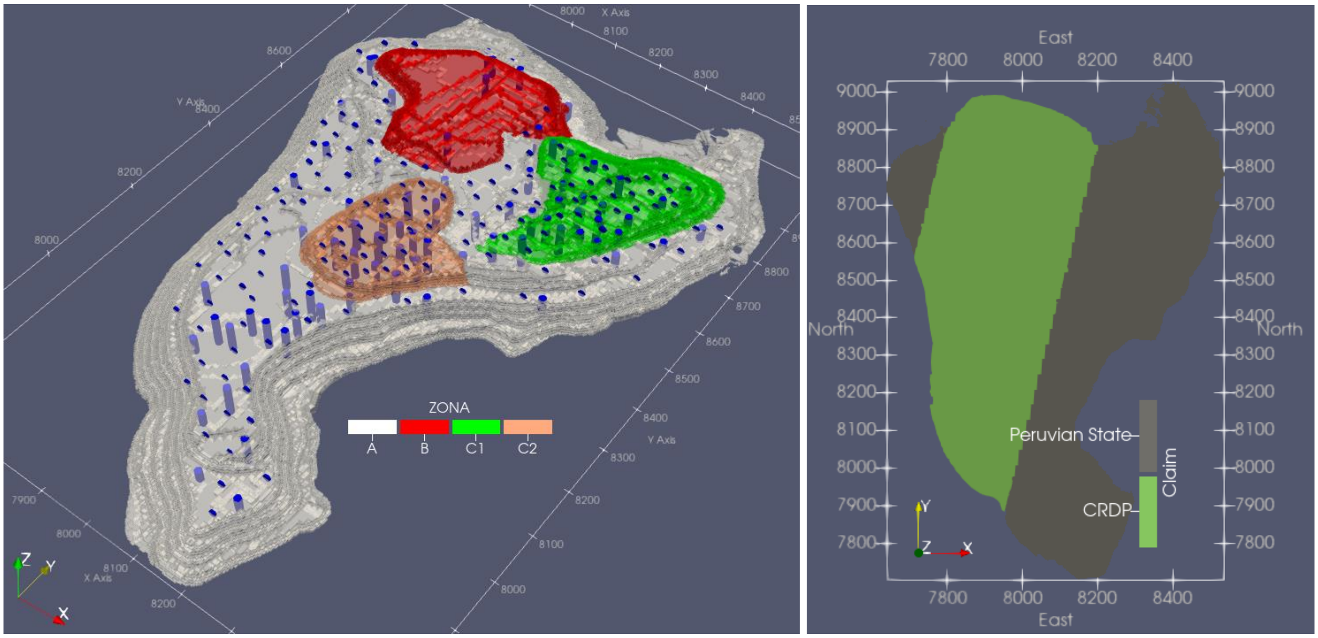


Figure 14-1: *Left – 3D perspective view looking northwest at the estimation domains of the Excelsior Stockpile and the drillhole and pit samples (blue) used to interpolate the model; Right – material within the El Metalurgista concession in green*

Subsurface mineral rights around the El Metalurgista concession are held by Cerro S.A.C. but the surface land rights, including overlying portions of the Excelsior Stockpile, are controlled by AMSAC. CDPR has initiated talks to acquire these surface rights (Parcela K) so that the surface deposits (stockpile and tailings) within Parcela K, but outside El Metalurgista concession, can be added to the existing CDPR assets within the El Metalurgista concession. The process involves removing the ownership from AMSAC and passing ownership onto the general inventory of mining liabilities. Once on the general inventory of mining liabilities, CDPR can request authorization of reuse from the General Directorate of Mining ("DGM") prior to environmental certification ("EIA"). However, the authorization of reuse is only approved after successful completion of the EIA. For further details, see Section 4.

14.4.3 Sample Compositing and Capping

Samples were composited to 2 m intervals and then capped. Capping was completed using decile analysis. Only silver in domains B and D were capped to 180 g/t and 200 g/t, respectively. The Qualified Person reviewed the capping and considered it appropriated. Statistics were also closely reproduced.

14.4.4 Statistical Analysis

Statistics were completed per drillhole type for validation purposes and per estimation domain. The trench and drillhole samples do not cover the same area, and these comparisons are meaningless. However, the average means and other statistics such as coefficient of variation and variance are very similar. The coefficients of variation are low, facilitating the estimation process.

The variograms were calculated and fit to a model with ranges in the order of 60–95 m. The Qualified Person recreated the variograms and considered them appropriate (Figure 14-2). However, the nugget used for the lead variogram has 44% of the sill and is higher than the silver nugget. This is a somewhat excessive, but it will not impact the interpolation.

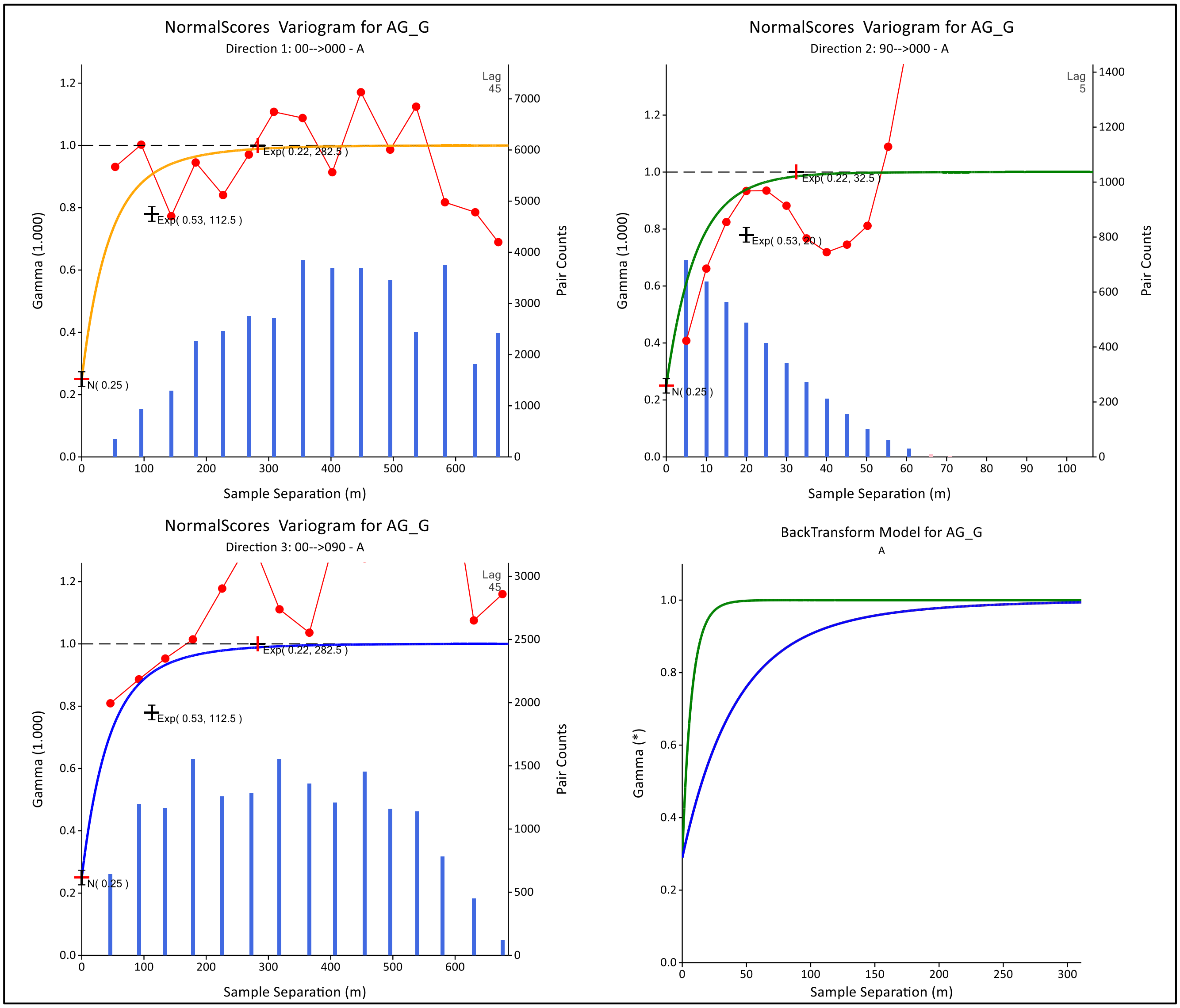


Figure 14-2: *Variograms computed for Ag (g/t), in the Excelsior Stockpile*

14.4.5 Block Model, Depletion and Interpolation

The block model was defined with a 10 m x 10 m x 10 m parent cell. The geological model was populated with sub-cells of variable size, no smaller than 2.5 m in any direction (Figure 14-1). Metal grades were interpolated with ordinary kriging using a search ellipse size of 25 m x 25 m x 10 m in the first pass. Blocks not estimated in the first pass were estimated in a second or third pass by expanding the size of the search ellipse by a factor 2.2 and 3.3, respectively. A minimum of four and a maximum of 24 composites were used in the first and second pass to interpolate. The minimum was relaxed to one composite in the third search pass. A maximum number of two composites were accepted from each drillhole. Nearest neighbour interpolation was also completed for validation purposes. Only silver, zinc and lead were interpolated in the model. Gold and copper grades and contents are unknown.

The model was validated with visual inspection of sections and drillhole data, comparison of average grade in block model and drillholes (deduced from the nearest neighbour estimate) and swath plots. The Qualified Person completed a set of independent validations consisting of visual inspection of sections with block model and composites (Figure 14-3), mean comparison, swath plots, and global change of support (Figure 14-4). The global change of support was modelled with the variograms produced by the Qualified Person (Figure 14-2). The Qualified Person is of the opinion that this model validates reasonably well and can be used for Mineral Resource reporting.

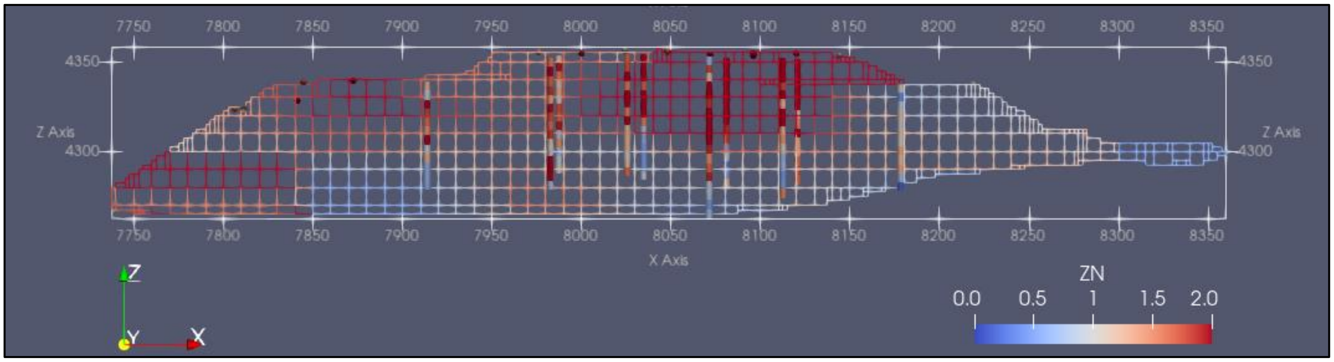


Figure 14-3: Example of visual validation in a sectional view of the Excelsior Stockpile looking Grid North

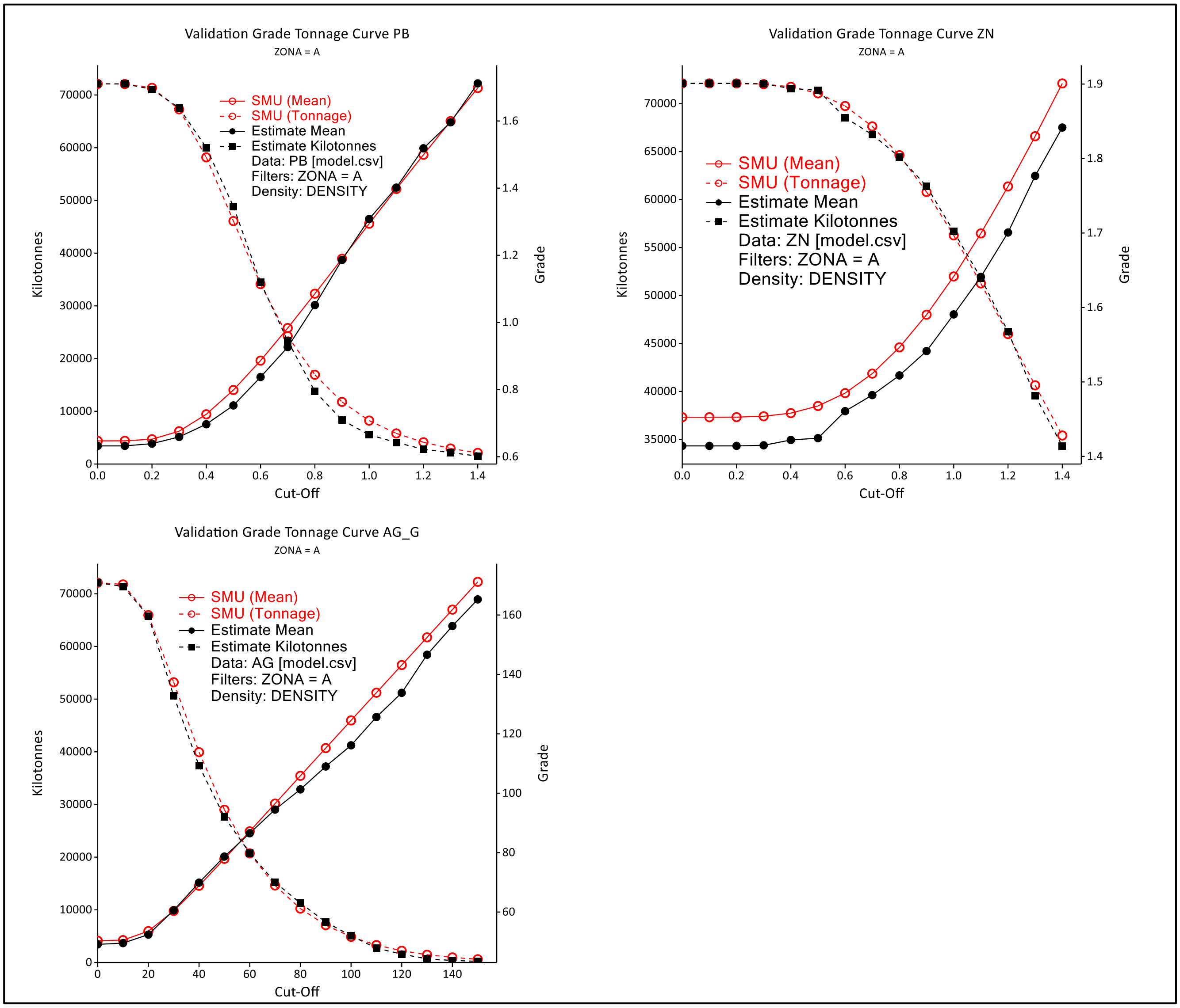


Figure 14-4: Global change of support validation of the Excelsior Stockpile

The stockpile has not been added to or exploited since 2009 and has suffered no erosion (Figure 14-1). However, a newer topographic surface was completed on 31 August 2020 and showed that a half bench was mined, or probably pushed to the sides, as part of the stabilization work of the stockpile. The blocks outside the 31 August 2020 topographic surface were removed.

14.4.6 Reasonable Prospect for Eventual Economic Extraction

The reported stockpile Mineral Resources are surface dumps of previously mined material, their upper surfaces are constrained within El Metalurgista's vertical concession boundaries and by current surface wireframes, and the bases are constrained by the topography on which the stockpile was built. It is anticipated that the stockpile Mineral Resource in the current block models have a reasonable prospect for eventual economic extraction based on estimated NSR cut-offs (see Section 14.2) and the active reprocessing by Volcan of similar stockpile material from a number of other stockpiles.

14.4.7 Mineral Resource Classification

Wheeler (2009) classified resources as Indicated if blocks were estimated with drillholes or test pits located within a distance of 55 m x 55 m; Inferred if the blocks were limited laterally by any drilling located within 80 m, and not classified if drillholes are more than 80 m from the blocks. The Qualified Person considered the use of unconstrained pit samples a risk to the extrapolation and therefore downgraded all Indicated Resources to Inferred, also considering the lack of verifiable QC data.

14.4.8 Mineral Resource Reporting

Mineral Resources are reported with updated density values and classification, as shown in Table 14-6. All the resources are assumed to be carbonate-hosted lead-zinc-silver style mineralization (MINTYPE 1) and density and reporting NSR cut-off of US$11/t have been assigned on this basis.

Table 14-6: Summary MRE of the Excelsior Stockpile

Class	**Cut-off NSR (US$/t)**	**Tonnes (kt)**	**NSR (US$/t)**	**Grade**			**Contained metal**		
				Ag (g/t)	**Pb (%)**	**Zn (%)**	**Ag (koz)**	**Pb (kt)**	**Zn (kt)**
Inferred	11	30,100	22	44	0.6	1.5	42,900	184	437

Notes:

- *The resource model for the Excelsior Stockpile was prepared by Adam Wheeler in 2009. The model was reviewed and updated and the MRE reported by Dr Adrian Martinez Vargas, Ph.D., P.Geo, an employee of CSA Global. Dr. Martinez Vargas is the Qualified Person for the estimate.*
- *The Mineral Resource has an Effective Date of 31 August 2020.*
- *Numbers have been rounded to reflect the precision of a Mineral Resource estimate, therefore numbers may not total.*
- *The reporting cut-off is calculated as the marginal NSR that equals total mining, processing, and administration costs. The NSR formulas and cut-off were developed by Andrew Sharp, P.Eng., an employee of CSA Global, assuming metallurgical extraction with multiple stage flotation and cyanidation in a Merrill-Crowe circuit for silver and gold recovery. Metal prices are: lead US$2,125/t, zinc US$2,650/t, and silver US$16/oz. Mining costs were assumed US$1/t for stockpiles. Processing cost was assumed US$8/t for sulphide lead-zinc-silver style mineralization. Administration cost was assumed US$2/t for sulphide lead-zinc-silver mineralization. Metallurgical processing recoveries were modelled using test work and production data provided to CDPR by Volcan, from its current operations at Cerro de Pasco which are processing similar material to that within the Excelsior Stockpile.*
- *A bulk density of 1.98 t/m3 is used.*
- *Block model grade interpolation was undertaken using ordinary kriging.*
- *The average grade estimates reflect in-situ resources and does not include modifying factors such as external dilution, mining losses and process recovery losses. However, resources were reported based on a regularized model that included dilution with low-grade material.*
- *The Mineral Resource estimate for the surface stockpile is constrained by the vertical lateral limits of the El Metalurgista concession boundaries and the limits of the stockpile surfaces within the concession.*

- *Mineral Resources are estimated and classified in accordance with CIM Definition Standards for Mineral Resources and Mineral Reserves, adopted by the CIM Council on May 10, 2014 using the Estimation of Mineral Resource and Mineral Reserves Best Practice Guidelines, adopted by the CIM Council on November 29, 2019.*
- *Mineral Resources are not Reserves and, as such, do not have demonstrated economic viability.*
- *One troy ounce (oz) equals 31.10348 g.*

14.4.9 Grade-Tonnage Sensitivity Analysis

The block model was evaluated at different NSR cut-off values to assess its grade and tonnage sensitivity to changes in NSR cut-off, as shown in Table 14-7. The amount of resources decreases rapidly above an NSR cut-off of US$14.

Table 14-7: Grade-tonnage sensitivity of the Excelsior Stockpile block model to changes in NSR cut-off

Class	**Cut-off NSR (US$/t)**	**Tonnes (kt)**	**NSR (US$/t)**	**Grade**			**Contained metal**		
				Ag (g/t)	**Pb (%)**	**Zn (%)**	**Ag (koz)**	**Pb (kt)**	**Zn (kt)**
Inferred	10	30,969	21	44	0.6	1.4	43,526	187	445
	11	30,116	22	44	0.6	1.5	42,916	184	437
	14	26,142	23	47	0.6	1.5	39,892	169	389
	20	15,042	27	58	0.8	1.6	27,969	113	238
	30	3,210	38	79	1.0	1.7	8,129	33	54

Note: This table is not a Mineral Resource statement. It is only intended to demonstrate the block model grade-tonnage sensitivity to NSR cut-off.

14.5 Factors that May Affect the Mineral Resource

Factors which may affect the MRE include:

- Metal price assumptions
- Changes to the assumptions used to estimate contained metal (e.g. bulk density and grade model estimation methodology)
- Geological interpretation (revision of mineralized domains)
- Changes to process plant recovery estimates if the metallurgical recovery in certain domains is lesser or greater than currently assumed
- Environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant issues can potentially affect the MRE; however, as of the Report date, the Qualified Person is not aware of any such issues that are not discussed in this Report.

15 Adjacent Properties

The Qualified Person has been unable to verify the information including Reserves and Mineral Resources reported on the third-party adjacent properties and the information is not necessarily indicative of the mineralization on the Property that is the subject of the Technical Report.

15.1 Volcan Acumulación Cerro Concession and Associated Beneficiation Concessions

CDPR's Excelsior Project is located on its 100% owned El Metalurgista mining concession which is surrounded by Volcan's Acumulación Cerro mining concession (Figure 4-2). Acumulación Cerro includes (Figure 5-2):

- Over 11,000 ha (effective area) of exploitation (mining), exploration beneficiation concessions around Cerro de Pasco mine complex
- The Oxidos precious metals leach processing facility, permitted at 2,500 tpd
- The Paragsha base and precious metals concentrator, permitted at 17,500 tpd
- The San Expedito base and precious metals concentrator, permitted at 1,800 tpd
- The Santa Rosa oxide open pit that hosts mineral for processing through the Oxidos plant
- The Raúl Rojas sulphide open pit
- The Santa Rosa oxide open pit
- The Lourdes and Excelsior Underground shafts
- Stockpiles Rumiallana, Miraflores
- All associated surface infrastructure including the Ocroyoc TSF, offices, workshops, warehouse, fuel storage and distribution facilities, reagent storage and distribution facilities, electrical substations, and staff accommodations.

Volcan ended production from the Raúl Rojas open pit in 2014 and from underground operations in 2015. Volcan's production and processing from 2016 to present has focused on retreating low-grade zinc-lead-silver sulphide stockpiles, of similar composition to that within the Excelsior Stockpile. They are also mining and treating in-situ silver and gold-bearing oxide material from the Santa Rosa open pit.

15.2 Other Properties

Other third-party mining properties in the region are presented in Figure 15-1.

North of CDPR's El Metalurgista and Volcan's Acumulación Cerro concessions, the mining concessions are owned by Empresa Minera Paragsha S.A.C. (a subsidiary of Volcan). No mines are located on these concessions.

Northeast of El Metalurgista and Acumulación Cerro, the mining concessions are owned by Nexa Resources Peru S.A.A., a subsidiary of NYSE and TSX-listed Nexa Resources. Situated on these claims, 10 km northeast of the Cerro de Pasco Project, the El Porvenir Mine has reported Proven and Probable Reserves of 16.21 Mt at 3.70% Zn, 0.23% Cu, 46.9 g/t Ag and 0.75% Pb, and Measured and Indicated Mineral Resources of 9.31 Mt at 3.62% Zn, 0.22% Cu, 58.0 g/t Ag and 0.85% Pb. None of the El Polvenir mine operations overlap or interfere with CDPR operations.

West of El Metalurgista and Acumulación Cerro, the mining concessions are owned by Corporacion Minera Centauro S.A.C. The exhausted Quicay mine which produced 0.6 Moz of gold (open pit porphyry gold) is situated on these claims. Corporacion Minera Centauro S.A.C. is currently exploring Quicay II, a porphyry gold-copper target 2 km from the original mine. None of its operations overlap or interfere with CDPR operations.

South of El Metalurgista and Acumulación Cerro, the mining concessions are owned by El Brocal S.A.A. The Colquijirca and Marcapunta mines and the San Gregorio project are situated on these claims, 8.3 km, 10.3 km, and 14.8 km south of the Cerro de Pasco Project respectively, within the same structural corridor as the Cerro de Pasco deposit. Reported Reserves include:

- Colquijirca – 18.55 Mt at 2.87% Zn; 0.83 oz/t Ag, and 0.78% Pb
- Marcapunta – 121.397 Mt at 0.017 oz/t Au, 0.59 oz/t Ag, and 1.24% Cu
- San Gregorio project – 79.93 Mt at 5.22% Zn; 0.31 oz/t Ag, and 1.53% Pb.

The northern portion of the El Brocal S.A.A. concessions that borders the Acumulación Cerro concession contain the waste stockpiles of the Colquijirca open pit. These stockpiles do not interfere with CDPR operations.

In addition to the above-mentioned third-party mines in concessions that border the Project, there are other significant mines and projects within a 45 km radius of the Cerro de Pasco deposit (Figure 15-1). A summary of all third-party adjacent projects is presented in Table 15-1.

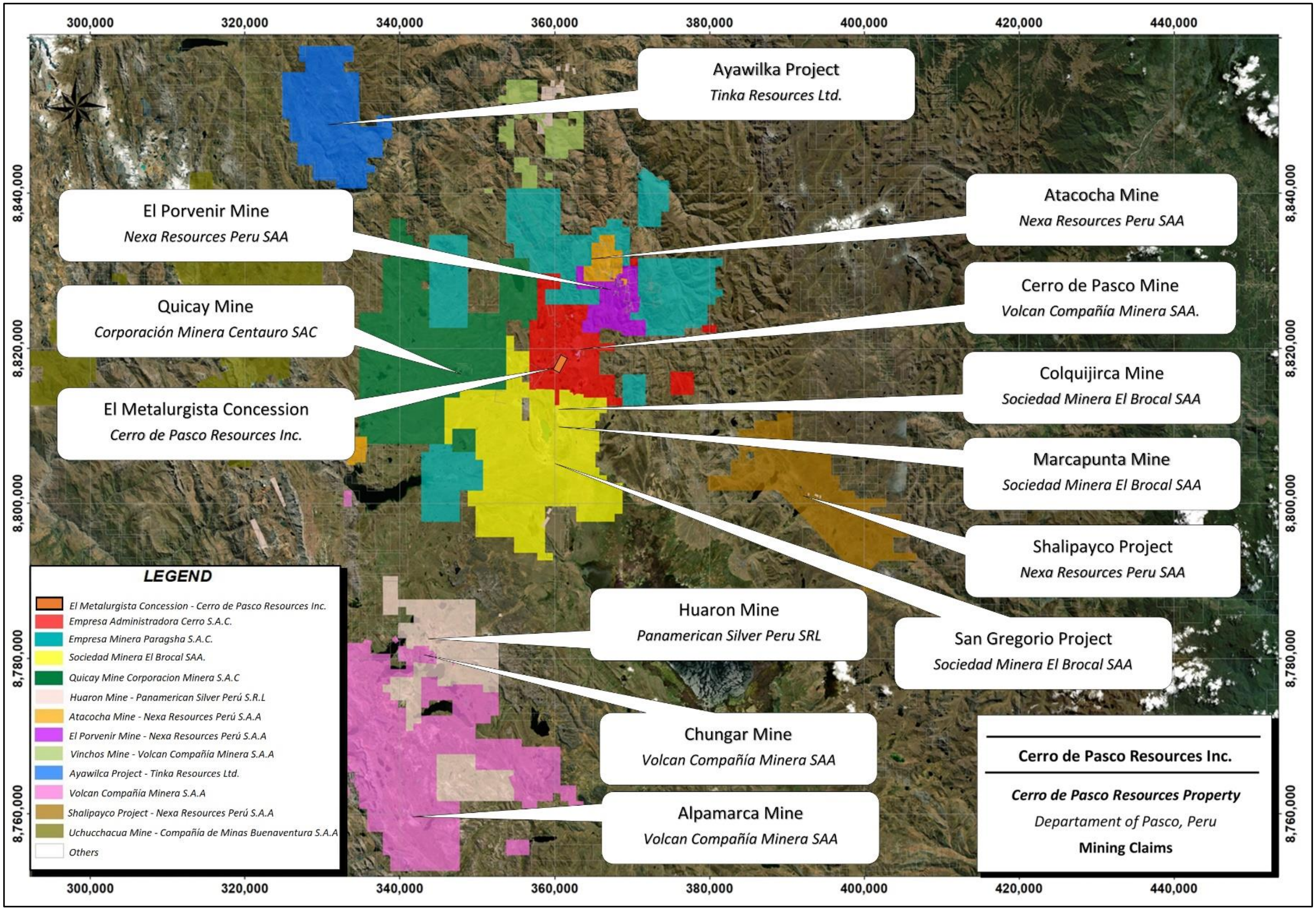


Figure 15-1: Location of adjacent properties

Source CDPR, 2020

Table 15-1: Adjacent properties

Name	Company	Deposit type	Details
El Porvenir Mine	Nexa Resources Peru S.A.A.	Cordilleran epithermal deposit, skarn-stockwork	**Reserves (Proven and Probable, as per 2014 CIM Definition Standards):** Underground: 16.21 Mt @ 3.70% Zn, 0.23% Cu, 46.9 g/t Ag, and 0.75% Pb. **Resources (Measured and Indicated, as per 2014 CIM Definition Standards – exclusive of Reserves):** Underground: 9.31 Mt @ 3.62% Zn, 0.22% Cu, 58.0 g/t Ag, and 0.85% Pb. (1) Source: Nexa (2020)
Atacocha Mine	Nexa Resources Peru S.A.A.	Cordilleran epithermal deposit, skarn-stockwork	**Reserves (Proven and Probable, as per 2014 CIM Definition Standards):** Underground: 3.91 Mt @ 3.77% Zn, 0.23% Cu, 78.8 g/t Ag and 1.73% Pb Open pit: 5.33 Mt @ 1.10% Zn, 0.03% Cu, 29.8 g/t Ag and 0.86% Pb. **Resources (Measured and Indicated, as per 2014 CIM Definition Standards – exclusive of Reserves):** Underground: 7.37 Mt @ 3.67% Zn, 0.40% Cu, 56.7 g/t Ag and 0.87% Pb Open pit: 1.68 Mt; @1.11% Zn, 0.03% Cu, 29.2 g/t Ag and 0.83% Pb. (1) Source: Nexa (2020)
Shalipayc Project	Nexa Resources Peru S.A.A.	Mississippi Valley Type Pb-Zn-Ag	**Resources (Measured and Indicated, as per 2014 CIM Definition Standards):** Underground: 6.29 Mt @ 5.61% Zn, 38.48 g/t Ag and 0.43% Pb. (2) Source: RPA (2017)
Colquijrca Mine	Sociedad Minera El Brocal S.A.A.	Cordilleran epithermal deposit, high sulphidation	**Reserves (Proven and Probable, as per JORC):** Open pit: 42.21 Mt @ 1.08 oz/t Ag, 1.11% Cu, and 14.75 Mt @ 2.52% Zn, 1.17% Pb. **Resources not reported.** Source: Buenaventura 2018 Annual Report, Reserves and Resources as of 31 December 2019
San Gregorio Project	Sociedad Minera El Brocal S.A.A.	Cordilleran epithermal deposit, high sulphidation	**Resources (Measured and Indicated, as per JORC):** Resources: 79.93 Mt @ 5.22% Zn, 0.31 oz/t Ag, and 1.53% Pb. (3)
Marcapunta Mine	Sociedad Minera El Brocal S.A.A.	Epithermal deposit, high sulphidation	**Reserves (Proven and Probable, as per JORC):** Underground: 34.5 Mt @ 0.023 oz/t Au, 1.15 oz/t Ag & 1.30% Cu **Resources excluding Measured and Indicated:** 26.28 Mt @ 0.023 oz/t Au, 0.87 oz/t Ag, and 1.63% Cu. Source: Buenaventura 2018 Annual Report, Reserves and Resources as of 31 December 2019
Chungar Mine	Volcan Compañía Minera S.A.A.	Cordilleran epithermal deposit	**Reserves (Proven and Probable, as per JORC):** Underground: 10.0 Mt @ 4.6% Zn, 1.5% Pb, 0.1% Cu, and 2.1 oz/t Ag. (4) **Resources (Measured and Indicated, as per JORC – inclusive of Reserves):** Underground: 21.1 Mt @ 6.3% Zn, 1.8% Pb, 0.2% Cu, and 3.4 oz/t Ag. Source: Volcan (2019)
Alpamarca Mine	Volcan Compañía Minera S.A.A.	Cordilleran epithermal deposit	**Reserves (Proven and Probable, as per JORC):** 1.8 Mt @ 0.9% Zn, 0.7% Pb, 0.1% Cu, and 1.5 oz/t Ag. (4) **Resources (Measured and Indicated, as per JORC – inclusive of Reserves):** 2.9 Mt @ 1.0% Zn, 0.7% Pb, 0.1% Cu, and 1.6 oz/t Ag. Source: Volcan (2019)

Name	Company	Deposit type	Details
Huaron Mine	Panamerican Silver Peru S.R.L.	Cordilleran epithermal deposit	**Reserves (Proven and Probable, as per 2014 CIM Definition Standards):** Underground: 10.5 Mt @ 3.04% Zn, 165.7 g/t Ag, 1.49% Pb, and 0.61% Cu. (5) **Resources (Measured and Indicated, as per 2014 CIM Definition Standards – exclusive of Reserves)** Underground: 4.2 Mt @ 2.92% Zn, 157.6 g/t Ag, 1.64% Pb, and 0.43% Cu. Source: Pan American Silver, 2020
Ayawilca Project	Tinka Resources Ltd	Polymetallic sedimentary hosted stratabound Pb-Zn-Cu-Mo	**Resources (Indicated, as per 2014 CIM Definition Standards):** Underground: 11.7 Mt @ 6.9% Zn, 15 g/t Ag, 84 g/t In, and 0.16% Pb. (6)
Quicay Mine	Corporacion Minera Centauro S.A.C	Epithermal deposit, high sulphidation	Quicay is mined out producing 0.6 Moz between 2002 and 2011. The company is currently exploring a new copper-gold porphyry 2 km from the original mine site.

(1) *Nexa Resources Peru SAA, Reserves and Mineral Resources 2019.*
http://www.smv.gob.pe/ConsultasP8/temp/PR%20Nexa%20Mining%20Report%20-%20December%2031%202019.pdf

(2) *Nexa Resources Peru SAA, Supplemented prospectus.*
https://www.nexaresources.com/Lists/RegulatoryDocumentos/Attachments/7/Nexa%20-%20Supp%20PREP%20-%20ENGLISH%20-%20CLEAN.PDF

(3) *Sociedad Minera El Brocal SAA, Annual Report 2019.*
https://www.buenaventura.com/assets/uploads/publicaciones/3dd5c9bda053946fda78d47f8075f282.pdf

(4) *Volcan Compañía Minera SAA, Annual Report 2019.*
https://www.volcan.com.pe/download/esp-memorias-anuales/

(5) *Pan American Silver Corporation, Mineral Reserves 2019.*
https://www.panamericansilver.com/assets/Reserves-Resources/d4fcb44997/Pan-American-Silver-resources-and-reserves-end-June-2019.pdf

(6) *Ayawilca Polymetallic Project Department of Pasco, Central Peru NI 43-101 Technical Report.*
https://www.tinkaresources.com/assets/docs/reports/Tinka%20Ayawilca%20TR%20Final.pdf

(7) *Corporacion Minera Centauro Website.*
https://www.cmcentauro.com/proyecto-quicay-i

16 Other Relevant Data and Information

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

17 Interpretation and Conclusions

17.1 General Statements

An updated MRE was prepared for the Excelsior Project with an Effective Date of 31 August 2020. The MRE is based on historical drilling and pitting on the Excelsior Stockpile that Volcan conducted between 2004 and 2009. The quantity and quality of the lithological, mineralization, and drillhole location data collected during historical drill campaigns and compiled and validated in the drillhole database are sufficient to support the MRE.

The MRE is presented in Table 14-6. The reporting cut-off is calculated as the marginal NSR that equals total mining, processing, and administration costs. The NSR formula and cut-off assume metallurgical extraction with multiple stage flotation (based on Paragsha/San Expedito process plant). Metal prices are: lead US$2,125/t, zinc US$2,650/t, and silver US$16/oz. Mining costs were assumed US$1/t for stockpiles.

Metallurgical processing cost and metal recovery for sulphide lead-zinc-silver mineralization were modelled using existing Volcan testwork and production data from its current operations at Cerro de Pasco which are processing similar material to that within the Excelsior Stockpile.

17.2 Risks

Environmental, permitting, legal, title, taxation, socio-economic, marketing, and political or other relevant issues could potentially materially affect access, title, or the right or ability to perform the work recommended in this report. However, at the time of this report, the Qualified Persons are unaware of any such potential issues affecting the Project and work programs recommended in this report.

Specific summary discussion of risks is included below, and the reader is encouraged to seek further detail in the relevant sections of this Technical Report.

17.2.1 Geology and Mineral Resources

- Generally, no downhole deviation data is available for historical drillholes; however, most holes are relatively short in length and deviation is not anticipated to be a significant issue.
- Except for limited external laboratory check samples, the MRE is not supported by QAQC procedures and data, therefore Mineral Resources have been classified as Inferred.
- Metal price assumptions may change due to macroeconomic factors.
- Changes to the assumptions used to estimate contained metal (e.g. bulk density and grade model estimation methodology) may result from additional data acquisition and improved geological understanding but is unlikely to be material at the level of resource classification.
- Geological interpretation (revision of mineralized domains) may alter the estimate but is unlikely to be material at the level of resource classification.
- Changes to process plant recovery estimates if the metallurgical recovery in certain domains is lesser or greater than currently assumed; this will be evaluated through geometallurgical modeling which is expected to improve process optimisation.

17.3 Opportunities

17.3.1 Geology and Mineral Resources

- There is potential to expand stockpile Mineral Resources where historical drilling has not tested to the base of the stockpile within the El Metalurgista mining concession.

- Infill drilling and more detailed sampling in stockpile mineralization will allow more granularity in the Mineral Resource and may enable the delineation of higher-grade domains and potentially allow for upgrading of classifications.
- Negotiations with the AMSAC may provide access to the portion of the Excelsior Stockpile not within CDPR's 100% owned El Metalurgista mining concession and not reported in the MRE at this time.
- Investigate potential for reprocessing of the Quiulacocha tailings.
- Metal price assumptions may be conservative.

17.3.2 Metallurgy/Mineral Processing

Detailed metallurgical test programs and a geometallurgical model may improve potential recovery.

18 Recommendations

The authors recommend that CDPR undertake short to medium-term programs required to better understand the Project's potential, potentially increase the Mineral Resource base and improve its classification, develop a geometallurgical model, and undertake additional testwork to improve metallurgical recoveries.

The Project contains legacy data from work completed by previous operators. The Qualified Person recommends completing the database compilation and a program to verify the data from previous operators. This would include re-assaying archived drillhole sample intervals (if available) for verification purposes, verifying drillhole logging, and re-assaying archived samples (if available) with known QAQC issues to evaluate any potential bias. Strategy for further exploration work on the Excelsior Stockpile, including RC drilling, depends on the outcome of negotiations with AMSAC for surface use rights.

CDPR has proposed a work program with costs, summarised in Table 18-1. All assaying will be supported by QAQC programs. The schedule and budget in Table 18-1 may vary depending on permit approvals and other variables.

The authors have reviewed the proposed work programs and agree with the planned work.

18.1 Phase 1 – Geology and Mineral Resource Work Programs

18.1.1 Excelsior Stockpile Work Program – Phase 1

The Qualified Person noted that the Excelsior stockpile drill program lacked a QAQC program and recommends a data verification program consisting of re-assaying 10% of the archived original samples (if available) in an independent laboratory. This verification program would use appropriate quality assurance procedures (blanks, duplicates, and certified reference materials).

The geological database associated with this project consists of individual Microsoft Excel spreadsheets. All geological data are to be centralised using an appropriate relational drillhole database and a GIS database set up through a server.

18.1.2 Quiulacocha Tailings Work Program – Phase 1

The following work programs are planned to generate the data required to support economic evaluation of reprocessing of the Quiulacocha tailings potential:

- Present a DIA application to the DGAAM to support permitting of exploration drilling on the Quiulacocha TSF within the El Metalurgista concession. When approval of the permit is received, CDPR will apply for the "Start of Activities" (Inicio de Actividades) authorization to the DGM.
- Subject to permitting approvals, a 40-drillhole program is planned (100 m drillhole spacing, 20 m average depth, for 800 m of drilling). Drilling would utilize percussion or sonic (depending on availability) drilling method with a plastic sleeve pushed ahead to maximize recovery.
- Samples would be collected in 2 m intervals to be assayed in an independent laboratory in Lima for multi-element inductively coupled plasma – mass spectrometry (ICP-MS), copper sequential leach, non-sulphide zinc and lead, and gold and silver by fire assay. In addition, quantitative mineralogy and element composition of minerals analysis would be undertaken on selected samples. Sieve tests would be done to provide information on particle size distribution and samples would be taken for density measurements.
- Geological interpretation and a MRE would be completed by an independent Qualified Person, supported by CDPR geologists.

18.1.3 Quiulacocha Tailings Metallurgical Testwork Program – Phase 1

A testwork program to characterize and optimize the recovery of lead and zinc minerals present in the historical tailings in the Quiulacocha TSF is expected to use similar recovery methods to those in use in Volcan's Paragsha and San Expedito process plants. Testwork on tailings samples would include:

- A mineralogical evaluation to determine the reasons for the original non-recovery of the lead and zinc minerals in the mill, to determine the mineral associations and grain sizes, and to establish the extent of oxidation and/or alteration of the mineral surfaces.
- A flotation test program which would likely include scrubbing and/or attrition grinding stages, fine particle flotation, and include investigating the use of a sulphidizing reagent for recovery of oxidized minerals. The assay costs have been included in the cost estimate.

18.2 Phase 2 – Recommended Geology and Mineral Resource Work Programs

The details of Phase 2 will be contingent on the outcomes of the work completed in Phase 1. At this time, a Phase 2 work program has only been planned for the Quiulacocha tailings to expand the resource estimation if Phase 1 drilling, resource estimation and metallurgical studies provide favourable results.

18.2.1 Quiulacocha Tailings Work Program – Phase 2

Contingent on positive Phase 1 drilling results, CDPR will apply to undertake a Phase 2 drilling program for the area outside the El Metalurgista concession, which is state property, which would consist of the following:

- Develop a DIA (40 drillholes, 800 m) for the area outside the El Metalurgista concession. The time required for the development, review, and approval of the second DIA is estimated to be approximately six months.
- CDPR expects that the Phase 2 drilling program would not deviate significantly from the technical requirements of Phase 1 and has costed it accordingly.
- Geological interpretation and a MRE will be completed in-house under the supervision of an independent Qualified Person.

18.2.2 Quiulacocha Tailings Metallurgical Testwork Program – Phase 2

Phase 2 metallurgical testwork would depend on the outcomes of work completed in Phase 1, especially the geometallurgical study and the metallurgical testwork. At this stage, a work program has only been planned to support the evaluation of potential re-processing of the historical Quiulacocha tailings. Testwork will focus on reproducing Phase 1 results with Phase 2 drill samples and confirming process design. The same cost has been used as the Phase 1 metallurgical program however this may vary.

18.3 Recommended Work Budget

A budget for this future work is outlined in Table 18-1.

Table 18-1: Recommended Phase 1 and Phase 2 work programs budget

Description		**Estimated duration**	**Estimated cost (US$)**
PHASE 1			
Excelsior Stockpile Work Program – Phase 1			
Excelsior Stockpile – data verification program	Data verification program, re-assaying 10% of original samples + QAQC inserts (approximately 525 assays)	3 months	$18,000
	Centralise all geological data using appropriate GIS and set up database through server	3 months	$10,000
Subtotal			**$28,000**
Quiulacocha Tailings Work Program – Phase 1			
Quiulacocha tailings drill program	Permitting	4 months	$5,000
	40-borehole program (100 m borehole spacing, 800 m of drilling) and assaying at independent laboratory	3 months	$400,000
	Independent resource estimation	1 month	$39,500
Subtotal			**$444,500**
Quiulacocha Tailings Metallurgical Testwork Program – Phase 1			
Quiulacocha tailings metallurgical test program	Mineralogical characterization	3 months	$16,000
	Flotation test program	2 months	$20,000
Subtotal			**$36,000**
PHASE 1 – TOTAL			**$508,500**
PHASE 2			
Quiulacocha Tailings Work Program – Phase 2			
Quiulacocha tailings drill program	Permitting	6 months	$35,000
	40-borehole program (100 m borehole spacing, 800 m of drilling) and assaying at independent laboratory	3 months	$410,000
	3D geological modeling of Quiulacocha tailings and internal MRE	1 month	$35,000
Subtotal			$480,000
Quiulacocha Tailings Metallurgical Testwork Program – Phase 2			
Quiulacocha tailings metallurgical test program	Mineralogical characterization	2 months	$16,000
	Flotation test program	2 months	$20,000
Subtotal			**$36,000**
PHASE 2 – TOTAL			**$516,000**
PHASE 1 AND PHASE 2 – GRAND TOTAL			**$1,024,500**

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Appendix A Overview of Mining and Environmental Law and Regulations in Peru

A-1 General Mining Law – Legal Framework Overview

The General Mining Law, approved by the Supreme Decree No. 014-92-EM, is the primary national law that regulates the mining industry in Peru. Said law, its regulations and ancillary rules apply considering the Peruvian Constitution in a Romano-Germanic legal system.

The Ministry of Energy and Mines (MINEM) is the main state government body that administers the mining industry through the General Directorate of Mining (DGM). MINEM also have regional Directorates of Energy and Mines (DREM) that contribute to regulation and administration on a regional basis. Other relevant bodies include the Geological, Mining and Metallurgical Institute (INGEMMET), the Ministry of Environment (MINAM), the National Environmental Certification Authority (SENACE), the Supervisory Agency for Investment in Energy and Mining (OSINERGMIN) and the Agency for Environmental Assessment and Enforcement (OEFA).

In addition to the General Mining Law, other sources of law affecting the mining industry include:

- the Peruvian Constitution
- the Peruvian Civil Code
- the General Environmental Law
- the Law that Regulates Environmental Liabilities for Mining
- the Water Resources Law
- the General Law of Local Communities
- the General Corporations Law, and,
- the General Law of the Public Registries.

A-1.1 Concession Acquisition and Rights

All natural resources, within the Peruvian territory are owned by the Peruvian State, which has sovereignty on the use and deployment of such resources. The mineral resources are owned by the Peruvian State, and the private sector is only allowed to exploit them as provided in the General Mining Law. According to such law, a concession is required to carry out all mining activities (i.e. exploration, exploitation, beneficiation, general works and transportation – Table A-1), except for sampling, prospecting, storage and trading of minerals and mining products.

- Mining concessions may be separately granted for metallic and non-metallic minerals.
    - A mining concession granted for metallic minerals only allows the holder of rights to explore for or mine primary and secondary metallic minerals, as opposed to non-metallic concessions.
    - Concessions can range in size from a minimum of 100 ha to a maximum of 1,000 ha.
    - Mining concessions are granted for indefinite terms (subject to the compliance of the applicable obligations), and the ownership of extracted minerals is vested in the holders of mining concessions.
    - Under the General Mining Law, a mining concession is valid for exploration and exploitation operations; hence there is no complicated “conversion” procedure. Notwithstanding, to execute those rights it is necessary to obtain the permits and authorizations required by law, from appropriate authorities.
- A separate beneficiation (processing) concession is available, granting the right to concentrate, smelt or refine minerals already mined.

Any person (including individuals and entities) is entitled to request INGEMMET for the granting of mining concession rights. These rights are independent from surface and real estate property rights located over the mining concessions. INGEMMET is the government body that consolidates a nationwide publicly available database with all mining concessions for metallic and non-metallic minerals.

Table A-1: Mining Rights required to conduct mining operations

Mining Rights	**Scope**
Mining Concession	Exploration activities and exploitation of metallic and non-metallic materials within a determined area.
Beneficiation Concession	Performance of physical and/or chemical procedures required for extraction, concentration, smelting and/or refining.
General Works Concession	Auxiliary activities or complementary services (such as ventilation, sewerage, drainage, lifting, underground access or extraction) for two or more mining concessions.
Mineral Transport Concession	Required for massive and continuous transportation of mineral via unconventional methods, such as conveyor belts, pipelines etc.

Mining concessions are granted on a "first come, first served" basis. If simultaneous requests are made over a specific area, an auction among the interested parties settles such requests. A mining concession provides its holder with the exclusive right to undertake mining activity within a determined area.

All holders of mining concessions are required to pay good standing fees, called validity fees. These fees are calculated based on the concession area and paid on an annual basis to INGEMMET[3]. Reduced fees apply for artisanal and small mining producers. Failure to pay validity fees for two years results in the cancellation of the mining concession.

Also, holders of mining concessions must achieve a minimum production levels of at least one Tax Unit (As of 2020, approximately US$1,303, although this amount may vary each year) per hectare per year[4] within a 10-year term following the year in which the respective mining concession title was granted. If such minimum production is not reached within the referred term, the mining titleholders shall pay a penalty equivalent to: 2% of the minimum production (between year 11 and 15), 5% of the minimum production (between year 16 and 20) and 10% of the minimum production (between year 21 and 30). Titleholders of mining concessions have a 30-year term to achieve the minimum production levels set by law. If minimum production is not reached within this term, the relevant mining concession is cancelled. In principle, the 30-year term is counted as from the year following granting of the mining concession title. However, for those concessions granted before 31 December 2008, the term is counted as from January 2009.

In order to perform mining activities on the abovementioned concessions, additional permits and authorizations are required (such as an environmental impact study, water licenses, construction permits, etc.).

Other rights required to conduct mining activities in Peru include the acquisition of surface and access rights to the area of interest (see Sub-Section A-1.5), environmental certification and permitting (see Sub-Section A-2.5), and, as applicable, authorizations, permits and licenses for the construction of facilities, use of explosives, use of water resources, use of controlled substances and chemicals, fuel storage, management and disposal of waste or hazardous materials, among others.

A-1.2 Foreign Ownership, Ownership Requirements and Restrictions

Individuals and entities, whether national or foreign, are entitled to apply for and hold mining rights. The latter is based on the Peruvian Constitution, which acknowledges the same rights to all national and foreign individuals and entities.

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[3] The current validity fee is US$3 per hectare per year.

[4] Reduced minimum production requirements are applicable for non-metallic concessions and for artisanal and small mining producers.

The foregoing general rule is subject to one exception. Foreigners are restricted to acquire property rights over real estate and/or mining concessions located within 50 kilometres of the Peruvian national border, unless prior authorization is obtained via a Supreme Decree.

Public officers and officials, such as the President, Congressmen, judges, ministers, prosecutors, among others, cannot participate in mining while holding office.

The Peruvian State does not have free carry rights or options to acquire shareholdings in mining companies or other entities that conduct mining in Peru. The Peruvian Constitution provides for the government to have a promotional role for the development of private investment. The government may participate in any business only in a subsidiary manner, provided that a special law is issued and approved by Congress.

A-1.3 Processing, Refining, Beneficiation and Export

The General Mining Law and its regulations include special provisions for beneficiation rights and related processing and refining procedures. The law defines beneficiation as the conjunction of physical, chemical and/or chemical-physical processes required for extraction or concentration in order to purify, smelt or refine minerals. Beneficiation considers the following:

- Mechanical preparation process, whereby a mineral is downsized, classified or separated through mechanical processes.
- Metallurgy, whereby chemical and/or physical processes are performed to make mineral concentrates.
- Refining of concentrates to produce metal.

A holder of a beneficiation concession has the right to perform extraction and/or concentration processes to purify, smelt and/or refine metals.

There are no restrictions on the export of minerals. Mining producers may freely export their production and no authorization or license is required for such purposes. Notwithstanding, the producer shall follow and comply with tax and custom regulations. In the case of gold, all individuals and entities that trade and/or refine such metal are required to be registered in the Special Registry of Gold Traders and Producers.

A-1.4 Transfer and Encumbrance

There are no restrictions on the transfer of mining rights in Peru. Mining rights may be freely transferred, mortgaged, sold and, in general, subject to any legal transaction or contract, and no authorization or consent is required from government bodies.

The transfer, encumbrance or other disposition of mining rights agreed among parties or pursued by creditors (such as injunctions) against holders of such mining rights, are all acts that may be registered before the Public Registries. Registration provides publicity to the holder of such rights and enforceability priority of such rights against the Peruvian State and third parties.

Mining rights are capable of being mortgaged, encumbered or otherwise granted as collateral to secure obligations, whether financial or other. In case of mortgages, said security interests are constituted upon their registration in the Public Registries.

The holder of a mining concession is entitled to file a request before INGEMMET to divide or split the mining concession into two or more concessions. If the mining concession is mortgaged or encumbered, the authorization and consent of the creditor or holder of any such creditor rights is required. It is also possible to join individual concessions into a concession accumulation as long as all individual concessions touch one another.

A mining concession may be held by multiple parties or holders in undivided interests or shares. The undivided interests of multiple holders to a mining concession are of similar legal nature to the rights held by multiple owners of a single real estate property. When multiple parties hold rights to a mining concession, they must appoint a common representative.

A-1.5 Surface Land Usage and Rights

Mining rights are independent from surface rights. Hence, the holders of mining rights may be different parties to those holders or owners of the lands where such mining rights are confined.

There is no restriction for mining concession holders to acquire or purchase lands, real estate properties, easements, rights of way, and/or other surface rights owned or held by third parties.

If the owner of such properties is the government, then a regulated acquisition process would need to be initiated by the mining concession holder before the National Agency of State-owned Properties.

If the owner or holder of such properties or rights is a local community, then such community's approval is required and, generally, an agreement must be negotiated and agreed with the community addressing their expectative in respect of the mining investment.

The holder of a mining concession has to respect the landowner's property or rights of an occupier. A holder of mining rights cannot trespass such property or use surface lands without the landowner's or occupier's consent.

Expropriation rights of the government are limited to events of national security or in case of public necessity, as specifically declared by law. In case of expropriation, the Peruvian State is required to establish it by law and follow a special procedure, which includes the payment of a compensation to the former owner based on fair valuation of the expropriated property. Note that the development of mining activities do not qualify as public necessity, thus expropriation will not apply for that purpose.

A1-2 Environmental & Permitting Requirements – Legal Framework Overview

The development of economic activities in the Peruvian territory, such as those related to the mining industry, is subject to a broad range of general environmental laws and regulations, such as:

- The General Environmental Law, enacted by Law N° 28611
- The Organic Law for the Sustainable Exploitation of Natural Resources, enacted by Law N° 26821
- The Law on the National System of Environmental Impact Assessment, enacted by Law N° 27446 and its Regulations, approved by Supreme Decree N° 019-2009-MINAM
- The Environmental Quality Standards for Water, approved by Supreme Decree N° 004-2017-MINAM
- The Environmental Quality Standards for Air, approved by Supreme Decree N° 003-2017-MINAM
- The Environmental Quality Standards for Soil, approved by Supreme Decree N° 011-2017-MINAM
- The Environmental Quality Standards for Noise, approved by Supreme Decree N° 085-2003-PCM; and
- The General Law on Solid Wastes, enacted by Legislative Decree N° 1278 and its Regulations approved by Supreme Decree N° 014-2017-MINAM, among others. Additionally, the environmental aspects of the mining industry are specifically governed by Supreme Decree N° 040-2014-EM and Supreme Decree N° 042-2017-EM.

These environmental laws and regulations govern, *inter alia*, the generation, storage, handling, use, disposal and transportation of hazardous materials; the emission and discharge of hazardous materials into the ground, air or water; and the protection of migratory birds and endangered and threatened species and plants. They also set environmental quality standards for noise, water, air and soil, which are considered for the preparation, assessment and approval of any environmental management instrument.

The main Regulatory Entities that enforce the general environmental laws and regulations can be considered as follows:

A1-2.1 Ministry of Energy and Mines (MINEM) and General Mining Directorate (DGAAM)

The General Mining Directorate (DGAMM) is a line unit of the Ministry of Energy and Mines (MIMEM), dependent on the Office of the Vice Minister of Mines. The DGAAM is the competent authority for the approval of mining plans and authorizations to start development, preparation and subsequent exploitation activities, which allow for the construction and subsequent exploitation of a deposit to be carried out. Similarly, the granting of Mining Operation Certificates is also the responsibility of this authority.

Additionally, the DGAAM also has jurisdiction over beneficiation concessions. It authorizes the operation of leaching and concentration plants and subsequently, after the respective field inspections, authorizes their operation.

The Ministry of Energy and Mines, through the General Directorate of Mining Environmental Affairs, used to be the authority responsible for the evaluation and approval of the Environmental Management Instruments (that is, the Detailed or Semi-Detailed Environmental Impact Studies, EIAD and EIAsd) or their respective amendments.

The DGAAM is the competent authority in the approval of the Mine Closure Plan and its updates and modifications.

A1-2.2 Ministry of the Environment (MINAM)

The Ministry of the Environment (MINAM) created by Legislative Decree No. 1013, is the governing body of the Executive Power of the environmental sector, which develops, directs, supervises and executes the National Environmental Policy. In its capacity as a national environmental authority, it is the governing body of the Environmental Impact Assessment System, constitutes the normative technical authority at the national level, and as such dictates the rules and establishes the procedures related to the system. The competent sectoral authorities must submit the environmental studies that MINAM requires to the Ministry of the Environment, supporting the decision of approval or disapproval.

Despite the creation of MINAM as a new national environmental authority, the sectoral exercise of environmental functions established by the Framework Law for the Growth of Private Investment, Legislative Decree (DL) No. 757, modified by Law No. 26734, it is kept under the responsibility of the different sectoral authorities. In the specific case of mining activities, the sectorial environmental authority is the DGAAM of MINEM. This scenario has been partially modified with the creation of the National Service of Environmental Certification for Sustainable Investments (SENACE) through Law No. 29968 dated December 20, 2012.

A1-2.3 National Environment Certification Service (SENACE)

The National Service of Environmental Certification for Sustainable Investments (*Servicio Nacional de Certificación Ambiental*, SENACE) was created in 2012 through Law No. 29968 and is the competent authority for the approval of detailed Environmental Impact Assessments and their modifications (EIAd, mEIAd), as well as semi-detailed Environmental Impact Studies (EIAsd) and Supportive Technical Reports (ITS).

A1-2.4 Other Authorities

In addition to the previously mentioned authorities, which exercise powers over the main activities that make up the Project, there are other competent governmental agencies with which the Project must also interact to satisfy the legal requirements for complementary activities. These include specific environmental matters such as water, forestry resources, the aquatic environment, and archaeology that regulate and supervise environmental compliance and liability.

The most important of these complementary governmental agencies are as follows:

A1-2.4.1 National Water Authority (ANA)

The National Water Authority (*Autoridad Nacional de Agua*, ANA), attached to the Ministry of Agriculture (*Ministerio de Agricultura*, MINAG), is the governing body and highest regulatory technical authority of the National System for the Management of Water Resources. This authority, through the Water Administrative Authorities, is in charge of evaluating and granting permits related to water resources, in charge of approving water availability (either through a resolution or through a technical opinion as part of the evaluation of the environmental management instrument), authorize the construction of hydraulic infrastructure, and the granting of water use rights (such as permits, authorizations and licenses for water use).

The National Water Authority, through the Water Resources Quality Management Directorate, is also competent to grant authorizations for the discharge of treated industrial water.

A1-2.4.2 General Directorate of Environmental Health (DIGESA)

The General Directorate of Environmental Health (*Dirección General de Salud Ambiental,* DIGESA) is attached to the Ministry of Health (*Ministerio de Salud*, MINSA). This authority provides its Technical Opinion for the processing of requests for authorizations for the discharge and reuse of water before the National Water Authority.

DIGESA is also in charge of the issuance of sanitary authorization for establishments that manufacture, store, distribution of food and beverages for human consumption, as well as other sanitary permits.

A1-2.4.3 Ministry of Culture (MINCUL)

The Directorate for the Qualification of Archaeological Interventions in the Ministry of Culture (*Ministerio de Cultura*, MINICUL) is required for authorizations related to the Archaeological Evaluation Projects and Archaeological Rescue Projects and the Decentralized Directorates of Culture, as appropriate and depending on the territorial scope of the interventions, to obtain the Certificates of Non-Existence of Archaeological Remains and Archaeological Monitoring Plans.

A1-2.4.4 Agency for Environmental Assessment and Enforcement (OEFA)

An important authority on environmental matters is the Agency for Environmental Assessment and Enforcement (*Organismo de Evaluación y Fiscalización Ambiental*, OEFA), which was created in 2008 by Legislative Decree No. 1013. This agency is in charge of environmental enforcement. Its objective is to ensure that there is an adequate balance between private investment in extractive activities and protection of the environment.

The OEFA has functions of (i) Evaluation, referring to the surveillance and monitoring of the quality of the environment and its components; (ii) Direct Supervision, referring to the field inspection of compliance with environmental obligations, being able to dictate preventive measures, specific mandates and requirements for updating the Environmental Management Instrument; (iii) Inspection and Sanction, through administrative sanctioning procedures that are intended to investigate the commission of possible infractions to environmental regulations and the imposition of sanctions, precautionary measures and corrective measures; and (iv) the function of applying incentives, through the Registry of Good Environmental Practices.

A1-2.5 Environmental Management Instruments (Instrumentos de Gestión Ambiental, IGA)

In 1990, Peru implemented the first environmental regulations through the enactment of the “Environmental and Natural Resources Code”. In 1993 the MINEM issued the regulations for environmental protection in mining and metallurgical activities. Pursuant to said regulations, mining companies with active operations had to prepare and submit for evaluation an Environmental Adaptation and Management Program (PAMA).

In addition, the regulations mandated that new operations and the expansion of existing ones required the approval on an Environmental Impact Assessment (EIA). In 2003 and 2005, the MINEM issued regulations mandating companies to prepare Mine Closure Plans (MCP) for their operations.

Based on current environmental regulations, the titleholder of a mining concession is liable for the emissions, effluents, wastewater discharges, solid wastes, noise, vibrations and any other environmental aspect related to its mining activity. Mining titleholders have to comply with maximum permissible limits (MPL) applicable to mining activities for which monitoring procedures need to be implemented. Also, Environmental Quality Standards (EQS) need to be considered in the structuring and preparation of the corresponding environmental instrument. A detailed description of Peru's environmental regulations is provided on the Ministry of Energy and Mines website (www.minem.gob.pe).

No environmental permit is required for prospecting and sampling activities which do not involve the execution of drilling, such as mapping, ground geophysics and geotechnical studies.

In general terms the MINEM requires that mining titleholders prepare an Environmental Technical Report (*Ficha Técnica Ambiental*, FTA), an Environmental Impact Declaration (DIA) – Category I, Semi Detailed Environmental Impact Study (EIAsd) – Category II , or an Detailed Environmental Impact Study (EIAd) – Category III, depending on the scope of activity that will be performed, such as exploration, exploitation, beneficiation, general works or transportation.

The following environmental management instruments are utilised depending on project stage:

A1-2.5.1 Exploration Drilling Activities

Drilling activities require the approval of an environmental permit. The MINEM evaluates and approves drilling environmental permit applications through DGAAM. Based on regulation D.S. No. 042-2017-EM:

- an FTA can cover drilling of up to 20 drill platforms, subject to specific requirements;
- a DIA – Category I can cover drilling of up to 40 drill platforms within a 10 ha area;
- an EIAsd–Category II is applicable to mining and exploration programs with 40 to 700 drill platforms in exploration areas greater than 10 ha.

Both the DIA – Category I and EIAsd – Category II classifications require development of public participation mechanisms, which are mainly administered under R.M. 304-2008-MEM/DM. Once the DIA or EIAsd is approved, a mining drilling permit must be obtained from the General Directorate of Mining Affairs (*Dirección General de Minería*, DGM).

A1-2.5.2 Construction and Exploitation

An EIAd – Category III is required before the initiation of mining exploitation activities (including the construction phase) along with the administrative licenses, authorizations and permits demanded by the current regulations. EIAd - Category III applications are reviewed and approved by SENACE. Also, the titleholder of the mining project is obliged to have the necessary rights for the use of the surface land related to the development of the mining project.

If the description of the project varies over time, departing from what was originally approved in the project certification, the mining licensee must modify its environmental management instrument prior to the execution of the new activities.

A1-2.5.3 Minor Modifications

A Supportive Technical Report (*Informe Técnico Sustentatorio*, ITS) is required to conduct minor modifications that do not entail a significant environmental impact, or that involve a technological improvement to the mining operation. In the case of mining exploration activities an ITS allows the modification of a DIA – Category I or EIAsd – Category II for the relocation of drilling platforms[5] or an increase in the number of drilling platforms. An ITS can also be used to perform non-significant modifications to certain components contemplated under an EIAd – Category III.

The mining concession titleholder who plans to develop mining exploitation activities, may request a modification of its environmental instrument in order to transition into the exploitation phase. This allows the deferral for a term of three years of the final closure and post-closure measures required to close the exploration project, subject to the constitution of a financial guarantee.

A1-2.5.4 Related Permits, Certifications and Authorizations

In addition to the environmental instruments mentioned in A1-2.5.1, A1-2.5.2 and A1-2.5.3, related permits, certifications and authorizations are required, where applicable, for mineral exploration and mining that include:

- Water permits, which may include the license to use certain water resources for domestic or industrial purposes, authorization to discharge domestic or industrial wastewaters or authorization to reuse and/or treat water.
- Certification on the non-existence of archaeological remains (*Certificado de Inexistencia de Restos Arqueológicos*, CIRA), and Archaeological Monitoring Plan (Plan de Manejo Arqueológico, PMA) from the Ministry of Culture (*Ministerio de Cultura*, MINCUL).
- Authorization to store and use explosives for construction and mining.
- Registry and authorization for the use, storage and transportation of controlled substances and chemicals.
- Construction authorization required for construction and implementation of the project’s beneficiation facilities.
- Approval of the Mining Plan, which includes the authorization to initiate the exploitation activities.[6]
- Approval and execution of a Mine Closure Plan (MCP) to rehabilitate the areas disturbed by the conduction of mining exploitation activities.

The most important of these related permits, certifications and authorizations are as follows:

A1-2.5.4.1 Water use permits, authorizations and licenses

Water resources are an inalienable and imprescriptible property of the Peruvian state. However, water use rights, such as licenses, permits and/or authorizations, may be granted by the ANA (described in A1-2.4.1) to third parties, based on the following efficiency criterion:

- Water Use Permits: granted exclusively over excess water resources, subject to the eventual availability of waters.
- Water Use Authorizations: granted to conduct studies or perform temporary and special works.
- Water Use Licenses: granted for the permanent use of water for a specific purpose.

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[5] Within the effective area or of direct environmental influence approved in the corresponding environmental instrument.

[6] A MCP will be also required in connection with those exploration activities with underground works that involve the removal of more than 10,000 tons of material or more than 1,000 tons of material with a ratio of neutralization potential (PN) to acidity potential (PA) less than three (PN/PA<3) in representative samples of the material removed.

According to current regulations, water use rights are subject to the payment of relevant fees in favour of ANA. Non-compliance with this obligation for two consecutive instalments results in the expiration of the respective water use right.

The discharge of domestic and/or industrial waste waters into a water body (continental or marine) is subject to the granting of the following authorizations, as the case may be:

- Authorization for the Discharge of Domestic Treated Wastewater granted by the ANA
- Authorization for the Discharge of Industrial Treated Wastewater granted by the ANA

In accordance with the applicable laws and regulations, the discharge of wastewaters is also subject to the payment of relevant fees in favour of ANA. Failure to comply with this obligation for two consecutive instalments results in the expiration of the relevant authorization.

A1-2.5.4.2 Cultural Heritage Permits

Peruvian legislation establishes that performing any works involving archaeological sites requires a previous authorization by the MINCUL (described in A1-2.4.3).

Titleholders of investment projects are also obliged to obtain a CIRA prior to the execution of a project. The CIRA solely certifies the non-existence of archaeological remains on the surface. If any archaeological remains are found as a consequence of the execution of the respective construction activities, the titleholder will be obliged to notify MINCUL of such and to temporarily suspend the execution of its construction activities.

In addition to the CIRA, titleholders must obtain the approval of an Archaeological Monitoring Plan, which is aimed at ensuring the protection of the archaeological remains that may eventually be found below surface due to the execution of earth-removal works.

A1-2.5.4.3 Beneficiation Concession

Concessions are granted under the General Mining Law described in A1-1.1.

For the granting of a beneficiation concession the process is divided into stages. The first two stages refer to construction activities while the last (which is started after the construction of the beneficiation facilities has been completed), refers to the operation of the facilities.

The three stages are:

- **Stage A:** Evaluation of the Application and Authorization for the Publication of Posters – Descriptive report of the plant and its main, auxiliary and complementary facilities, according to the format established by the DGM, construction plans and design of the tailings deposit:
  - detailed engineering of civil works (metallurgical plant, tailings deposit, leach pad, auxiliary and complementary works)
  - detailed engineering of the electromechanical installations
  - detailed engineering of metallurgical processes
  - detailed budget and schedule.
- **Stage B:** Construction Authorization – Requires:
  - the favourable technical opinion of the competent sector, as appropriate, if the project affects roads or other rights of way
  - Detailed engineering will be required.
- **Stage C:** Operation Authorization – After having carried out the construction of the facilities related to the activities the licensee must request an inspection by the authority in order for it to verify that the facilities

have been built in accordance with the approved permit. With this verification, the Authority issues the Operating Authorization for the beneficiation facilities.

A1-2.5.4.4 Mining plan and authorization for the start of exploitation activities

The mining plan permit is processed after having obtained the environmental certification and allows its holder to carry out the construction of the facilities related to the mining activities of the mining project (such as the pit, dumps, among others).

The Authorization to Start Exploitation Activities must be requested after having carried out the development and preparation activities authorized by the mining plan permit. To obtain it, it is essential that the activities carried out coincide with the construction permit. This authorization allows its holder to carry out the mining exploitation activity.

A1-2.5.4.5 Mine Closure Plan

The Mine Closure Plan (MCP) establishes the measures that the mining owner must adopt in order to rehabilitate the area used or disturbed by mining activities so that it reaches ecosystem characteristics compatible with a healthy and adequate environment for the development of life and landscape preservation. Rehabilitation includes measures to be carried out before, during and after the closure of operations which will allow the elimination, mitigation and control of the adverse effects on the environment or that could be generated by solid, liquid, or gaseous waste produced as a by-product of the mining activity.

Holders of mining concessions that intend to initiate or reinitiate mining operations are bound to obtain the approval of an MCP. An MCP is also required for mining concession holders intending to carry out underground exploration works involving the removal of more than 10,000 tonnes of material or more than 1,000 tonnes of material which may contain a potential neutralization (PN) over potential acidity (PA) lower than 3 (PN/PA<3) in representative samples of the removed material.

The MCP is an environmental management tool consisting of technical actions aimed at rehabilitating the area used or disturbed by the execution of mining activities. The respective closure measures shall be carried out before, during and after the conclusion of the mining operations, which will enable the elimination, mitigation and control of the adverse environmental effects that are generated or could be generated by the mining activity.

The MCP is required in different stages during the life of mine, as follows:

- A conceptual plan must be filed as part of the relevant exploration projects' environmental impact study, which must be approved prior to the exploration works being conducted;
- A conceptual plan must be filed as part of the relevant exploitation project´s environmental impact study;
- A detailed MCP will be required before the initiation of the operation stage; and
- The Mine Closure Plan will be subject to review and modification:
    - a first time after three years have elapsed since its approval, and subsequently every five years after its last modification or approved update; or
    - when determined by the supervisory authority, due to a significant gap between the budget of the approved MCP and the amounts actually recorded for its execution or that are expected to be executed;
    - when technological improvements or any other change that significantly varies the circumstances by virtue of which the MCP or its last modification or update was approved.

Maintenance and monitoring reports will be required after the closure of the mine, as well as post-closure follow-up actions.

Titleholders are required to lodge an environmental guarantee in favour of the MINEM that backs the costs associated with the execution of the MCP (final closure and post closure stages). The guarantee is payable by means of annual contributions, the amount of each annual contribution being the result of dividing the total amount of the guarantee by the remaining life of mine. The guarantee becomes payable as from the year immediately following the approval or amendment of the MCP, and within the first twelve working days of each year.

Titleholders are not allowed to develop exploitation and/or beneficiation mining activities before the granting of the guarantee. Non-payment of the guarantee with regards to activities in operation can cause the stoppage of activities for a maximum of a two-year term at the end of which the holder will be obliged to immediately execute the measures established in its MCP, in conjunction with other possible legal sanctions.

A1-2.6 Other Environmental Considerations

A1-2.6.1 Mining Environmental Liabilities

The concept of "mining environmental liability" (*pasivo ambiental minero*) in the Peruvian mining legal framework specifically refers to the facilities, runoffs, emissions or remains of former mining operations that, by July 2004 (when the relevant law entered into force), had been abandoned or were inactive and entailed environmental or health hazards.

Peruvian environmental law sets out the general environmental liability rule that the one harming or potentially harming the environment is the one liable for such harm, and thus is the one obliged to prevent, mitigate, repair or offset such damage. In the same manner, the legal framework on "mining environmental liabilities" sets out the general liability rule that whoever caused a "mining environmental liability" is responsible for its clean up.

This legal framework also establishes that third parties may be obliged to execute the respective remediation, reclamation and/or reuse of environmental liabilities generated by third parties should they voluntarily wish to intervene in them. In these cases, the interested party should obtain the approval of an Environmental Liabilities Closure Plan or include the measures related to these environmental liabilities into the respective environmental management instrument. The titleholder of the Environmental Liabilities Closure Plan or the environmental management instrument will then be responsible for the timely execution of the remediation, reclamation and/or reuse measures and consequently will be subject to the imposition of fines by OEFA in case of non-compliance.

A1-2.6.2 Prior Consultation

On September 2011, Peruvian Government approved the Law No. 29785 "Consulta Previa Law" (prior consultation) and its regulations approved on April 2012, by Supreme Decree № 001-2012-MC. This requires prior consultation with indigenous communities (*pueblo indígena u originario*) as determined by the Ministry of Culture, before any infrastructure or projects, in particular mining and energy projects, are developed in their areas.

A1-2.6.3 Legal framework for environmental monitoring programs

The following is the legal framework that guides environmental programs.

- Ley N° 28611 – General Law of the Environment
- Ley N°29338 – Water Resources Act
- Ley N°26842 – General Health Law
- D.S. N°040-2014-EM – Regulation on environmental protection and management for exploitation, profit, general work, transport and mining storage activities.

- D.S. N°004-2017-MINAM – Environmental Quality Standards (ECA) for Water
- D.S. N°010-2010-MINAM – Maximum Permissible Limits for the Discharge of Liquid Effluents from Mining – Metallurgical Activities
- D.S. N°031-2010-SA – Water Quality Regulations for Human Consumption
- D.S. N°003-2010-MINAM – Maximum Allowable Limits for Domestic or Municipal Wastewater Treatment Plant Effluents
- D.S. N°003-2017-MINAM – Environmental Quality Standards for Air
- D.S. N°074-2001-PCM – National Air Environmental Quality Standards Regulations
- D.S. N°069-2003-PCM – Set Annual Lead Concentration Value
- D.S. N°085-2003-PCM – Environmental Quality Standards for Noise
- D.S. N°011-2017-MINAM – Environmental Quality Standards (ECA) for Soil
- R.M. N°315-96-EM/VMM – Maximum Permissible Limits of elements and compounds present in gaseous emissions from mining-metallurgical activities.
- A1-2.3.3 Legal framework for environmental monitoring programs

Appendix B Glossary of Technical Terms and Abbreviations

Glossary of Technical Terms

azimuth	Drillhole azimuth deviation (from north)
clipping window	In case of display of three-dimensional data at the plane, plus-minus the distance, within which the data is projected perpendicular to the image plane
collar	Geographical coordinates of the collar of a drillhole or a working portal
compositing	In sampling and resource estimation, process designed to carry all samples to certain equal length
core sampling	In exploration, a sampling method of obtaining mineralized material or rock samples from a drillhole core for further assay
cut-off grade	The threshold value in exploration and geological resources estimation above which mineralized material is selectively processed or estimated
d	Diameter
de-clustering	In geostatistics, a procedure allowing bounded grouping of samples within the octant sectors of a search ellipse
dip	Angle of drilling of a drillhole
flagging	Coding of cells of the digital model
FROM	Beginning of intersection
geochemical sampling	In exploration, the main method of sampling for determination of presence of mineralization; a geochemical sample usually unites fragments of rock chipped with a hammer from drillhole core at a specific interval
geometric mean	The antilog of the mean value of the logarithms of individual values; for a logarithmic distribution, the geometric mean is equal to the median
histogram	Diagrammatic representation of data distribution by calculating frequency of occurrence
kriging	Method of interpolating grade using variogram parameters associated with the samples' spatial distribution. Kriging estimates grades in untested areas (blocks) such that the variogram parameters are used for optimum weighting of known grades. Kriging weights known grades such that variation of the estimation is minimised, and the standard deviation is equal to zero (based on the model)
lag	The chosen spacing for constructing a variogram
lognormal	Relates to the distribution of a variable value, where the logarithm of this variable is a normal distribution
mean	Arithmetic mean
median	Sample occupying the middle position in a database
overburden	All material above mineralization
percentile	In statistics, one one-hundredth of the data; it is generally used to break a database down into equal hundredths
population	In geostatistics, a population formed from grades having identical or similar geostatistical characteristics. Ideally, one given population is characterized by a linear distribution
probability curve	Diagram showing cumulative frequency as a function of interval size on a logarithmic scale

quantile plot	Diagrammatic representation of the distribution of two variables; it is one of the control tools (e.g. when comparing grades of a model with sampling data)
quantile	In statistics, a discrete value of a variable for the purposes of comparing two populations after they have been sorted in ascending order.
range	Same as Influence Zone; as the spacing between pairs increases, the value of corresponding variogram as a whole also increases. However, the value of the mean square difference between pairs of values does not change from the defined spacing value, and the variogram reaches its plateau. The horizontal spacing at which a variogram reaches its plateau is called the range. Above this spacing there is no correlation between samples
reserves	Mineable geological resources
resources	Geological resources (both mineable and unmineable)
RL	Elevation of the collar of a drillhole, a trench or a pit bench above the sea level
sample	Specimen with analytically determined grade values for the components being studied
scatterplot	Diagrammatic representation of measurement pairs about an orthogonal axis
sill	Variation value at which a variogram reaches a plateau
standard deviation	Statistical value of data dispersion around the mean value
string	Series of three-dimensional points connected in series by straight lines
TO	End of intersection
variation	In statistics, the measure of dispersion around the mean value of a dataset
variogram	Graph showing variability of an element by increasing spacing between samples
variography	The process of constructing a variogram
wireframe model	Three-dimensional surface defined by triangles
X	Coordinate of the longitude of a drillhole, a trench collar, or a pit bench
Y	Coordinate of the latitude of a drillhole, a trench collar, or a pit bench
y	Year

Abbreviations

°	degrees
°C	degrees Celsius
%	percent
µm	micron
3D	three-dimensional
Ag	silver
AMSAC	Activos Mineros S.A.C.
APS	aluminium phosphate sulphate
As	arsenic
Au	gold
Bi	bismuth
c.	circa
CDPR	Cerro de Pasco Resources Inc.
CDPRS	Cerro de Pasco Resources Sucursal de Peru
CENTROMIN	Empresa Minera del Centro del Perú S.A.
Cerro S.A.C.	Empresa Adminstradora de Cerro S.A.C.

CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CIT	Corporation Income Tax
cm, cm^3	centimetre(s), cubic centimetre(s)
CSA Global	CSA Global Consultants Canada Limited
CSR	corporate social responsibility
Cu	copper
DGAAM	General Directorate of Environmental Mining Affairs
DIA	Environmental Impact Decision
Fe	iron
g	gram(s)
g/cm^3	grams per cubic centimetre
g/t	grams per tonne
Genius	Genius Properties Ltd
Glencore	Glencore International AG
GPS	global positioning system
H_2O	water
ha	hectare(s)
HARD	half absolute relative difference
ICP-AES	inductively coupled plasma-atomic emission spectroscopy
ICP-MS	inductively coupled plasma-mass spectrometry
INGEMMET	Instituto Geológico Minero y Metalúrgico
JCI	JCI Estudios & Servicios Ambientals
JORC	Joint Ore Reserves Committee
kg	kilogram(s)
km	kilometre(s)
koz	kilo-ounces (thousand ounces)
kt	kilo-tonnes (thousand tonnes)
m, m^3	metre(s), cubic metre(s)
M	million(s) or mega (10^6)
masl	metres above sea level
MINEM	Ministry of Energy and Mines
mm	millimetres
MMR	Modified Mining Royalty
Mn	manganese
Moz	million ounces
MRE	Mineral Resource estimate
Mt	million tonnes
NaCl	sodium chloride
NI 43-101	National Instrument 43-101
NSR	net smelter return
Oxidos	Oxidos de Pasco S.A.C.
OxPb	oxidized lead
OxZn	oxidized zinc

oz	troy ounce(s)
oz/t	ounce per tonne
P.Eng	Professional Engineer
P.Geo	Professional Geoscientist
Pb	lead
PCPAM	Plan de Cierre de Pasivos Ambientales
ppb	parts per billion
ppm	parts per million
QAQC	quality assurance and quality control
RC	reverse circulation
ROM	run of mine
Sb	antimony
SMT	Special Mining Tax
SUNAT	Superintendencia Nacional de Administración Tributaria (National Superintendency of Tax Administration)
t	tonne(s)
tpd	tonnes per day
TSF	tailings storage facility
UNDAC	Daniel Alcides Carrión National University
UTM	Universal Transverse Mercator
VES	vertical electrical sounding
wt.%	weight percentage
Zn	zinc

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