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## **ADVENTUS MINING CORPORATION**

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# **TECHNICAL REPORT ON THE PRELIMINARY ECONOMIC ASSESSMENT FOR THE CURIPAMBA PROJECT - EL DOMO DEPOSIT, CENTRAL ECUADOR**

### **NI 43-101 Report**

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**Date: June 14, 2019  
Effective May 2, 2019**



## Report Control Form

**Document Title**

Technical Report on the Preliminary Economic Assessment  
for the Curipamba Project – El Domo Deposit, Central  
Ecuador

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**Document Reference**

Project #3081

**Status &  
Issue No.**

FINAL  
Version

**Issue Date**

June 14, 2019

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# 1 SUMMARY

## EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) and Knight Piésold Ltd. (KP) were retained by Adventus Mining Corporation (Adventus) to prepare an independent Technical Report on the Preliminary Economic Assessment (PEA) for the El Domo volcanogenic massive sulphide (VMS) deposit (El Domo or the Project) on the Curipamba Project, located in central Ecuador. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101). RPA has visited the Project several times, most recently from January 8 to 10, 2019.

Adventus is a TSX Venture Exchange listed (TSX-V:ADZN) mineral resource company focussed on mineral exploration and development of copper deposits in Ecuador. The El Domo deposit is the most advanced on the 21,537.48 hectare (ha) Curipamba Project and is the subject of the current Mineral Resource estimate and PEA. In addition to the Curipamba Project, Adventus is engaged in a country-wide exploration alliance with its partners in Ecuador, including the Pijili and Santiago porphyry and epithermal projects.

In September 2017, Adventus entered into an option earn-in agreement with Salazar Resources Limited (Salazar) whereby Adventus may earn a 75% interest in Salazar's wholly owned Curipamba Project by funding exploration and development expenditures of US\$25 million over five years, including the completion of a feasibility study on the El Domo deposit, which is expected to be completed within three years from signing of the agreement. During the option period, both Adventus and Salazar are cited as operators of the Project, however, Curimining S.A. (Curimining), the Ecuadorian subsidiary of Salazar, is providing 100% of the field management and services for all disciplines in Ecuador as Adventus has no staff or resources in Ecuador.

On June 12, 2019, Adventus changed its name from Adventus Zinc Corporation to Adventus Mining Corporation.

This report is considered by RPA to meet the requirements of a Preliminary Economic Assessment as defined in Canadian NI 43-101 regulations. The economic analysis contained

in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

All costs are presented in US dollars (US\$) on a 100% basis.

An update to the Mineral Resource estimate for El Domo has been completed as part of the PEA to include all recent infill drilling completed in 2018. The updated pit constrained Mineral Resource estimate for El Domo has an effective date of May 2, 2019 and is supported by information provided from 309 core drill holes, totalling 60,449 m, completed between 2007 and 2018. Measured Mineral Resources for El Domo total 1.4 million tonnes (Mt) grading 1.92% Cu, 0.37% Pb, 3.52% Zn, 3.75 g/t Au, and 58 g/t Ag. The Indicated Mineral Resources for El Domo total 7.5 Mt grading 2.02% Cu, 0.26% Pb, 2.81% Zn, 2.33 g/t Au, and 49 g/t Ag. The Inferred Mineral Resources for El Domo total 1.3 Mt grading 1.52% Cu, 0.20% Pb, 2.25% Zn, 1.83 g/t Au, and 42 g/t Ag.

The updated Mineral Resource estimate has a similar footprint to the previous Mineral Resource estimate dated January 9, 2018, however, infill drilling in 2018 resulted in the upgrading of portions of the Mineral Resource from previously classified Indicated to Measured and Inferred to Indicated Mineral Resource categories. The new Mineral Resource estimate has a total tonnage distribution of approximately 14%, 73%, and 13% classified in the Measured, Indicated, and Inferred categories, respectively. The increases in average grades in the Measured and Indicated Mineral Resource categories of approximately 24% for copper, 10% for gold, and 21% for zinc are the result of higher net smelter return (NSR) cut-off values, the improved geological model and related grade estimation domains, and changes to capping levels.

There are no Mineral Reserves at the property.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

## CONCLUSIONS

The PEA is based on an updated Mineral Resource estimate as of May 2, 2019 and evaluates a contractor-operated open pit and underground mining approach along with processing of 1,750 tonnes per day (tpd) by crushing, grinding, gravity gold recovery, flotation, concentrate thickening, and filtration producing copper, zinc, and possibly lead concentrates.

The life of mine (LOM) plan for the Project includes 8.7 Mt, at average grades of 2.5 g/t Au, 48.9 g/t Ag, 1.8% Cu, 0.3% Pb, and 2.7% Zn, mined over a 15 year period, including conventional open pit mining for the first nine years in four phases followed by a combination of open pit and underground mining thereafter.

Production in concentrates is projected to total 350,000 ounces of payable gold, 8.0 million ounces of payable silver, 122,300 tonnes of payable copper, 155,500 tonnes of payable zinc, and 8,000 tonnes of payable lead.

Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$565 million over the mine life, and simple payback occurs two years from start of production.

The after-tax net present value (NPV) at an 8% discount rate is \$288 million, and the after-tax internal rate of return (IRR) is 40%.

The PEA indicates that positive economic results can be obtained for the Project and that further advancement of the Project is merited.

Specific conclusions by area are as follows:

## GEOLOGY AND MINERAL RESOURCES

- The geological setting and character of the VMS mineralization identified to date on the Project, and specifically at the El Domo deposit, are of sufficient merit to justify additional exploration expenditures.
- Six drilling programs with the majority of drill holes targeting mineralization of the El Domo deposit have been carried out to date for a total of 342 core drill holes (68,597.24 m).
- Drilling has identified a stratiform and largely stratabound horizon of semi-massive to massive sulphide mineralization with an overlying zone of brecciated/fragmented sulphide fragments. Additional mineralization occurs in smaller lenses primarily in the footwall of the massive sulphide mineralization.



- RPA has reviewed procedures for drilling, sampling, sample preparation, and analysis and is of the opinion that they are appropriate for the type of deposit and mineralization.
- RPA reviewed the analytical quality control results and did not find any material issues. In RPA's opinion, the resource database is of sufficient quality to estimate Mineral Resources.
- Mineral Resources were estimated and reported using a US\$25 per tonne NSR cut-off value for open pit resources, and a US\$100 per tonne NSR cut-off value for underground resources.
- Measured Mineral Resources for El Domo total 1.4 Mt grading 1.92% Cu, 0.37% Pb, 3.52% Zn, 3.75 g/t Au, and 58 g/t Ag. The Indicated Mineral Resources for El Domo total 7.5 Mt grading 2.02% Cu, 0.26% Pb, 2.81% Zn, 2.33 g/t Au, and 49 g/t Ag. The Inferred Mineral Resources for El Domo total 1.3 Mt grading 1.52% Cu, 0.20% Pb, 2.25% Zn, 1.83 g/t Au, and 42 g/t Ag.
- A number of mineralized lenses in the footwall stratigraphy of El Domo are supported by limited drilling. Additionally, a number of mineral targets currently outside of the resource area of the El Domo deposit are also supported by limited drilling. This means that additional infill and exploration drilling is warranted to more fully test favourable stratigraphy both regionally and directly at El Domo.

## **MINING**

- All mining is proposed to be carried out by contractors with oversight by owner's personnel.
- Mining will begin with conventional open pit mining (drilling, blasting, loading, and hauling) in four phases for the first nine years followed by a combination of open pit and underground mining thereafter.
- Underground development will start in Year 9. Ramp-up of underground production occurs in Year 10, with mining carried out by variations of the room and pillar mining method.
- The open pit and underground mine designs including a crown pillar below the open pit will require additional geomechanical, geotechnical, and groundwater studies to develop and optimize the next stages of the Project (pre-feasibility and feasibility).
- The LOM production schedule and cash flow analysis include Inferred Mineral Resources. Inferred Mineral Resources are speculative geologically and were included in this analysis in order to understand the economic potential of the Project. Approximately 5% of the tonnage from the open pit constrained Mineral Resource and 24% of the underground constrained Mineral Resource are classified as Inferred Mineral Resources.

## **METALLURGICAL TESTWORK AND MINERAL PROCESSING**

- The most recent test work at Base Metallurgical Laboratories Ltd. (Base Met Labs) in 2019 indicates that the production of copper, zinc, and possibly lead concentrate is possible using conventional flotation methods.



- Low head grades for lead mean that it may not be necessary or feasible to produce a clean lead concentrate, however the potential to produce a lead concentrate is being evaluated in on-going test work.
- The processing plant will process 612,500 tonnes per annum (tpa) and will consist of crushing and grinding, flotation, concentrate thickening and filtration, and tailings thickening and disposal.
- Process estimates used to support the PEA are based on the available metallurgical data. Over the LOM, recoveries average 80.7% for copper, 78.5% for zinc, 38.3% for lead, 57.5% for gold, and 69.0% for silver.
- There are opportunities for optimizing the process flow sheet and reagent scheme to maximize the recovery of valuable metals while minimizing costs of consumables and reagents.

### **PROJECT INFRASTRUCTURE**

- KP reviewed previous work on mine electrical load requirements and found them to be reasonable for use in the PEA.
- The proposed grid power supply connection at Echeandía poses potential issues such as voltage stability, potential transmission line upgrades and/or voltage regulation, and transformer capacity.
- Although the Project can access relatively low-cost grid power, grid instability suggests that a fully redundant site back-up power plant is required.
- The preferred mine access route is a new build option which commences three kilometres west of El Congreso before ending at the proposed mine site location.
- A rockfill dam is proposed for storage of conventional tailings.
- Preliminary tailings dam design in the PEA is based on the Canadian Dam Association Guidelines.

### **ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS**

- The current exploration activity on the Project is carried out under a valid Environmental Licence, granted to Curimining, as Resoluciones 506, 508, and 509 from the Ministry of Environment in May 2011 upon the successful conclusion of an exploration phase Environmental Impact Assessment (EIA).
- An EIA and management plan will be required to be submitted to the Ministry of Environment in order to acquire an environmental licence for mining. The specific requirements for the Curipamba Project EIA will be elaborated in a Terms of Reference document produced by the Ministry of Environment.
- Other permits required for mining activities include those for explosives use, special labour shifts, fire department, and construction from the Mining Regulation and Control Agency (ARCOM) and the municipalities.

- Adventus and Curimining have made considerable efforts to undertake environmental studies and community engagement to facilitate the advancement of the Project.
- There is general support for the Project at the exploration stage from the affected communities in the area, as the communities will benefit from local employment.
- At this stage, KP does not see any major environmental or social issues that might prevent the issuance of the necessary permits to develop and operate the Project.

#### **CAPITAL AND OPERATING COST**

- The costs in the PEA are estimated with an accuracy of plus or minus 30% to 35%.
- The total capital cost for the Project is approximately \$289 million. The pre-production capital cost is \$185 million, including 25% contingency, as well as the value added tax (VAT) which will be a credit against taxes once exporting of concentrates commences, and the sustaining capital cost estimate totals \$104 million.
- The LOM operating cost for the Project is estimated at \$54.80 per tonne processed.

#### **ECONOMICS**

- Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$565 million over the mine life, and simple payback occurs two years from start of production.
- The after-tax NPV at an 8% discount rate is \$288 million, and the after-tax IRR is 40%.

#### **RECOMMENDATIONS**

RPA recommends a work program that includes additional regional exploration and condemnation core drilling, infill core drilling, airborne geophysical surveying, tailings and waste rock studies, additional metallurgical test work, geomechanical and hydrology studies, power supply studies, water supply and camp location studies, EIA studies, detailed open pit and underground mining studies, and other work related to advancing the Project to a pre-feasibility level.

The cost of the recommended program is estimated at US\$5.95 million (Table 1-1).

**TABLE 1-1 PROPOSED BUDGET**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	(US\$000)
General Exploration, G&A and Support	1,150
Exploration and Condemnation Drilling (~6,200 m)	950
Geomechanical, Geotechnical, and Hydrogeology Drilling	950
Airborne Geophysical Survey	500
Topographic Survey	100
Geomechanical, Geotechnical, and Hydrology Studies	300
Acid Rock Drainage (ARD) Test Work	300
Metallurgical Test Work	300
Tailings Dam and Waste Rock Facility Studies	100
Power Supply Studies	50
Water Supply and Camp Location Studies	50
Environmental Baseline	1,200
<b>Total</b>	<b>5,950</b>

Specific recommendations by area are as follows:

#### **GEOLOGY AND MINERAL RESOURCES**

- The proposed work program includes:
  - Step-out and exploration core drilling at known sulphide zones distal to the El Domo deposit with detailed mapping, and three dimensional (3D) geological modelling to aid in future targeting. Condemnation drilling over the areas proposed for tailings and waste rock storage. Total drilling proposed is 6,200 m.
  - Complete data acquisition for a detailed topographic digital terrain model.
  - Complete the on-going airborne MobileMT geophysical survey over the Curipamba property to investigate the potential for further targets.

#### **GEOTECHNICAL CONSIDERATIONS AND MINING**

- Conduct a geomechanical and geotechnical drilling and complete their respective studies to determine the optimum pit slopes for the final pit geometry and to optimize the open pit and underground designs.
- Conduct a geomechanical study to determine the dimensions of the crown pillar between the open pit and the underground mine.
- Complete a hydrogeology study to determine the open pit dewatering parameters.
- Establish the overburden dewatering parameters required for the design of surface diversions and drainage systems based on the final open pit geometry.
- Optimize the production schedule, including the transition between the open pit and underground mining operations.

- Complete a trade-off analysis evaluating the alternative of mining additional waste from Phase 3 and Phase 4 of the open pit in Years 2 and 3, to balance the mine equipment requirement.
- Complete a trade-off analysis evaluating the alternative of utilizing 100-tonne trucks along with the 40-tonne trucks for waste mining equipment in order to reduce the number of trucks required in Years 4 and 5.

#### **METALLURGY AND MINERAL PROCESSING**

- Carry out test work to address the separation of zinc and lead from copper to improve the quality of the concentrates, particularly in the case of high copper and low zinc content zones. This may include the evaluation of different reagent schemes and re-grind sizes.
- Consider the possibility of blending of mineralized material to provide a consistent feed to the processing plant and, if deemed practical, continue development of the processing conditions using sample material representative of the blended feed to the plant.
- Once preferred processing conditions have been achieved, complete optimization and variability test work in support of pre-feasibility and feasibility studies.

#### **PROJECT INFRASTRUCTURE**

- Carry out further refinement of the transmission line and power supply alternatives.
- Define the mine electrical load in more detail, including total power factor and individual power factors for large pieces of equipment, large load start-up requirements, mine load duration curve, average load, etc.
- Complete a site-specific seismic hazard assessment.
- Carry out detailed analysis of tailings storage and waste rock storage facilities for an integrated waste management plan and design to reduce overall costs.
- Investigate regional quarry sites and quality of quarry material for construction purposes, such as tailing storage facility construction.
- Investigate water supply for the Project site and complete a trade-off study of reservoir construction versus a water pipeline from a local source.
- Investigate construction camp location and complete a trade-off study of onsite accommodation versus daily commutes to the Project from local communities.

#### **ENVIRONMENTAL AND SOCIOLOGICAL CONSIDERATIONS**

- Initiate preparation of an EIA and management plan that are compliant with Ecuadorian and international standards.
- As part of the preparation of the EIA, carry out additional and more detailed baseline data collection.

- Develop a detailed closure cost estimate to support the mine EIA submission.
- Complete ARD test work for the El Domo deposit area.
- Carry out additional acquisition of surface rights.
- Update the vegetation and wildlife studies to determine if any critical natural habitats or endangered species populations will be adversely impacted, and to help direct reclamation planning.

RPA is unaware of any significant factors and risks that may affect access, title, or the right or ability to perform the recommended program.

## ECONOMIC ANALYSIS

The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

A Cash Flow Projection has been generated from the LOM plan production schedule and capital and operating cost estimates and is summarized in Table 1-2. The associated process recoveries, metal prices, operating costs, refining and transportation charges, royalties, and capital expenditures (pre-production and sustaining) were also considered. All costs are presented in US dollars. Metal prices are based on consensus, long term forecasts from banks, financial institutions, and other sources averaging: US\$3.15/lb Cu, US\$1.15/lb Zn, US\$1.00/lb Pb, US\$18.00/oz Ag, and US\$1,350/oz Au.

## ECONOMIC CRITERIA

### REVENUE (100% BASIS)

- 1,750 tpd mining from open pit and underground (612,500 tpa).
- LOM head grade
  - 1.8% Cu
  - 2.7% Zn
  - 0.3% Pb
  - 2.5 g/t Au
  - 49 g/t Ag
- Mill recovery, as indicated by test work, averaging:
  - 80.7% Cu

- 78.5% Zn
- 38.3% Pb
- 57.5% Au
- 69.0% Ag
- NSR value: \$171 per tonne processed
- Revenue is recognized at the time of production

***COSTS (100% BASIS)***

- Pre-production period: 18 months.
- Mine life: 15 years.
- Pre-production capital: \$185 million including VAT,
- LOM production plan as summarized in Table 1-2.
- Mine life capital totals \$104 million net of salvage value.
- Average operating cost over the mine life is \$54.80 per tonne processed.

**TABLE 1-2 AFTER-TAX CASH FLOW SUMMARY**  
Adventus Mining Corporation - Curipamba Project - El Domo Deposit

	INPUTS	UNITS	TOTAL	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
MINING																				
Open Pit																				
Operating Days	350	days	4,900			350	350	350	350	350	350	350	350	350	350	350	350	350	350	-
Tonnes milled per day		tonnes / day	1,527			1,604	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,464	750	750	1,381	1,427	-
Tonnes moved per day		tonnes / day	10,260			11,728	14,075	14,991	31,427	33,057	9,931	7,517	5,583	4,635	2,511	1,684	1,620	2,044	2,830	-
Production (All Minerals)																				
Au Grade		'000 tonnes	7,482			561	613	613	613	613	613	613	612	613	513	263	263	483	499	-
Ag Grade		g/t	2.6			3.9	4.3	3.0	3.2	2.9	2.6	2.4	2.1	2.7	1.8	1.8	1.7	1.6	1.3	-
Ag Grade		g/t	51.1			62.3	64.7	67.3	78.0	51.4	55.4	49.8	47.3	49.5	37.8	36.4	29.9	28.7	25.3	-
Cu Grade		%	1.7%			2.1%	2.7%	2.2%	1.8%	2.1%	1.9%	1.0%	0.9%	1.7%	1.2%	1.3%	1.2%	1.5%	1.1%	0.0%
Pb Grade		%	0.3%			0.3%	0.4%	0.4%	0.5%	0.4%	0.3%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%
Zn Grade		%	2.6%			3.2%	3.7%	3.3%	4.3%	2.9%	2.9%	2.9%	2.4%	2.3%	1.8%	1.6%	1.3%	1.2%	1.1%	0.0%
Waste		'000 tonnes	47,327	700	3,837	3,543	4,314	4,634	10,387	10,957	2,863	2,018	1,342	1,010	366	327	305	232	491	-
Total Moved		'000 tonnes	54,809	700	3,837	4,105	4,926	5,247	11,000	11,570	3,476	2,631	1,954	1,622	879	589	567	716	990	-
Stripping Ratio			6.3			6.3	7.0	7.6	17.0	17.9	4.7	3.3	2.2	1.6	0.7	1.2	1.2	0.48	0.98	-
Underground																				
Operating Days	350	days	1,860			-	-	-	-	-	-	-	-	-	350	350	350	350	350	110
Tonnes milled per day		tonnes / day	664			-	-	-	-	-	-	-	-	-	286	1,000	1,000	369	323	1,754
Production (All Minerals)																				
Au Grade		'000 tonnes	1,235			-	-	-	-	-	-	-	-	-	100	350	350	129	113	193
Ag Grade		g/t	1.7			-	-	-	-	-	-	-	-	-	1.9	1.4	1.7	1.2	1.8	2.5
Ag Grade		g/t	35.9			-	-	-	-	-	-	-	-	-	38.4	27.2	34.4	22.5	50.9	53.7
Cu Grade		%	2.8%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	2.7%	2.4%	3.5%	4.0%	2.3%
Pb Grade		%	0.2%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.1%	0.1%	0.2%	0.3%
Zn Grade		%	3.1%			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.97%	3.42%	2.94%	2.36%	3.72%	3.15%
PROCESSING																				
Mill Feed All Ore Types																				
Au Grade		'000 tonnes	8,717			561	613	613	613	613	613	613	612	613	613	613	613	613	613	193
Au Grade		g/t	2.5			3.9	4.3	3.0	3.2	2.9	2.6	2.4	2.1	2.7	1.8	1.6	1.7	1.5	1.4	2.5
Ag Grade		g/t	48.9			62.3	64.7	67.3	78.0	51.4	55.4	49.8	47.3	49.5	37.9	31.1	32.4	27.4	30.1	53.7
Cu Grade		%	1.8%			2.1%	2.7%	2.2%	1.8%	2.1%	1.9%	1.0%	0.9%	1.7%	1.5%	2.1%	1.9%	1.9%	1.6%	2.3%
Pb Grade		%	0.3%			0.3%	0.4%	0.4%	0.5%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.3%
Zn Grade		%	2.7%			3.2%	3.7%	3.3%	4.3%	2.9%	2.9%	2.9%	2.4%	2.3%	2.0%	2.7%	2.3%	1.5%	1.6%	3.1%
Contained Au		oz	697,448			70,524	84,257	59,502	62,421	56,189	51,225	48,064	40,564	52,470	35,760	31,216	33,328	29,031	27,640	15,257
Contained Ag		oz	13,714,501			1,124,740	1,274,750	1,326,082	1,536,637	1,011,714	1,091,321	980,467	931,753	974,245	746,511	612,635	638,921	539,673	592,133	332,919
Contained Cu		tonnes	158,719			12,044	16,411	13,344	10,733	13,056	11,799	6,422	5,327	10,131	18,906	13,024	11,730	11,580	9,843	4,369
Contained Pb		tonnes	23,355			1,816	2,684	2,333	3,066	2,196	1,925	2,026	1,582	1,458	978	659	784	552	760	536
Contained Zn		tonnes	236,811			17,908	22,528	20,445	26,301	17,972	17,786	17,498	14,882	14,374	12,039	16,259	13,825	9,901	9,901	6,077
CuEq grade			4.86%			6.4%	7.4%	6.0%	6.1%	5.5%	5.2%	4.1%	3.5%	4.7%	3.7%	4.4%	4.1%	3.6%	3.4%	5.5%
Net Recovery																				
Au		%	57.5%			61.1%	57.9%	58.1%	55.7%	57.9%	53.9%	54.6%	57.2%	59.4%	57.1%	60.3%	55.3%	56.5%	56.1%	61.5%
Ag		%	69.0%			69.2%	68.9%	69.4%	70.0%	69.3%	68.7%	70.1%	70.1%	69.0%	69.0%	67.4%	67.9%	66.9%	67.1%	68.8%
Cu		%	80.7%			81.1%	80.9%	79.7%	75.7%	80.8%	81.1%	74.9%	75.6%	81.1%	81.4%	82.2%	81.8%	84.2%	83.2%	81.5%
Pb		%	38.3%			24.2%	35.5%	41.2%	50.7%	38.1%	43.4%	54.4%	49.6%	30.3%	33.2%	12.7%	34.4%	17.2%	25.4%	14.4%
Zn		%	78.5%			77.6%	78.3%	79.1%	81.9%	77.9%	78.7%	82.2%	82.2%	78.0%	77.3%	76.3%	76.6%	72.9%	74.7%	75.9%
REVENUE																				
Metal Prices																				
Au	\$1,350.00	Input Units	\$1,350.00			\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00
Ag	\$18.00	US\$/oz Ag	\$18.00			\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00
Cu	\$3.15	US\$/lb Cu	\$3.15			\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15
Pb	\$1.00	US\$/lb Pb	\$1.00			\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Zn	\$1.15	US\$/lb Zn	\$1.15			\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15
Concentrate Payable																				
Cu Concentrate																				
Payable Au		oz	219,762			26,456	27,261	19,258	14,128	18,349	14,961	9,987	10,455	18,470	11,237	12,670	10,408	10,961	9,497	5,765
Payable Ag		oz	4,485,791			405,747	427,239	429,547	437,825	327,058	348,228	269,116	268,079	336,048	241,151	238,570	212,644	204,513	214,907	125,120
Payable Cu		tonnes	122,344			9,340	12,689	10,169	7,757	10,086	9,136	4,591	3,846	7,857	6,926	10,232	9,171	9,310	7,827	3,407
Zn Concentrate																				
Payable Au		oz	121,464			11,122	14,436	10,281	13,933	9,504	8,467	10,946	8,577	8,510	6,153	4,161	5,357	3,601	3,993	2,423
Payable Ag		oz	2,702,956			212,722	246,908	267,107	334,786	202,807	214,203	216,837	202,490	187,091	147,833	101,422	118,651	88,747	101,058	60,294
Payable Zn		tonnes	155,529			11,695	14,761	13,520	17,901	11,741	11,679	11,946	10,162	9,388	7,782	10,432	8,879	5,533	6,213	3,898
Pb Concentrate																				
Payable Au		oz	9,150			619	1,050	749	1,360	681	686	1,109	780	540	464	164	401	162	250	134
Payable Ag		oz	819,858			41,155	69,413	81,420	133,898	62,748	71,709	92,366	79,382	46,389	46,709	11,923	36,670	14,692	22,430	8,954
Payable Pb		tonnes	7,963			390	848	854	1,382	744	743	980	698	393	289	74	240	84	171	69
Gross Revenue																				
Au Gross Revenue		US\$ '000	\$461,491			\$51,566	\$56,291	\$39,878	\$37,882	\$37,602	\$31,627	\$28,260	\$25,693	\$36,423	\$23,476	\$22,587	\$21,282	\$19,660	\$18,212	\$11,053
Ag Gross Revenue		US\$ '000	\$130,138			\$11,873	\$12,135	\$12,540	\$13,907	\$9,538	\$10,124	\$8,747	\$8,470	\$9,416	\$7,002	\$6,120	\$5,963	\$5,279	\$5,087	\$3,337
Cu Gross Revenue		US\$ '000	\$949,614			\$64,862	\$68,119	\$70,616	\$53,870	\$70,041	\$63,446	\$31,079	\$26,706	\$54,564	\$48,098	\$71,057	\$63,688	\$64,652	\$54,353	\$23,662
Zn Gross Revenue		US\$ '000	\$394,311			\$29,649	\$37,423	\$34,277	\$45,384	\$29,767	\$29,609	\$30,288	\$25,763	\$23,801	\$19,729	\$26,447	\$22,512	\$14,029	\$15,752	\$9,885
Pb Gross Revenue		US\$ '000	\$17,551			\$860	\$1,870	\$1,283	\$3,047	\$1,640	\$1,639	\$2,161	\$1,539	\$866	\$637	\$164	\$529	\$186	\$378	\$152
Total Gross Revenue		US\$ '000	\$1,853,105			\$158,811	\$195,837	\$159,194	\$154,089	\$148,588	\$136,445	\$101,335	\$88,171	\$125,071	\$98,942	\$126,375	\$113,974	\$103,805	\$94,383	\$48,085

	INPUTS	UNITS	TOTAL	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
<b>Total Charges</b>																				
Transport																				
Cu Concentrate	\$98.00 US/t conc	US\$ '000	\$60,558			\$4,508	\$6,231	\$5,011	\$3,914	\$4,937	\$4,589	\$2,331	\$1,920	\$3,849	\$3,449	\$5,034	\$4,576	\$4,655	\$3,904	\$1,651
Pb Concentrate	\$98.00 US/t conc	US\$ '000	\$2,021			\$99	\$215	\$217	\$351	\$189	\$189	\$249	\$177	\$100	\$73	\$19	\$61	\$21	\$44	\$17
Zn Concentrate	\$98.00 US/t conc	US\$ '000	\$40,543			\$2,932	\$3,844	\$3,537	\$4,841	\$3,015	\$3,096	\$3,262	\$2,755	\$2,430	\$2,024	\$2,622	\$2,279	\$1,379	\$1,572	\$954
Treatment																				
Cu Concentrate	\$80.00 US/t conc	US\$ '000	\$45,353			\$3,376	\$4,667	\$3,753	\$2,931	\$3,697	\$3,437	\$1,745	\$1,438	\$2,882	\$2,583	\$3,770	\$3,427	\$3,486	\$2,924	\$1,236
Pb Concentrate	\$200.00 US/t conc	US\$ '000	\$3,784			\$185	\$403	\$406	\$657	\$354	\$353	\$466	\$332	\$187	\$137	\$35	\$114	\$40	\$81	\$33
Zn Concentrate	\$230.00 US/t conc	US\$ '000	\$87,296			\$6,313	\$8,276	\$7,617	\$10,424	\$6,491	\$6,666	\$7,024	\$5,932	\$5,232	\$4,358	\$5,647	\$4,908	\$2,970	\$3,384	\$2,054
Refining																				
Au	\$5.00 US/oz	US\$ '000	\$1,706			\$188	\$208	\$148	\$140	\$139	\$117	\$105	\$95	\$135	\$87	\$84	\$79	\$73	\$67	\$41
Ag	\$0.50 US/oz	US\$ '000	\$3,594			\$309	\$337	\$348	\$386	\$265	\$281	\$243	\$235	\$262	\$194	\$170	\$166	\$147	\$158	\$93
Cu	\$0.080 US/lb	US\$ '000	\$21,577			\$1,647	\$2,238	\$1,793	\$1,368	\$1,779	\$1,611	\$810	\$678	\$1,386	\$1,222	\$1,805	\$1,617	\$1,642	\$1,380	\$601
Pb	\$0.00 US/lb	US\$ '000	\$0			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Penalties																				
Cu Conc (Pb+Zn Limit 4%)																				
Zn Mineral	\$2.00/t/% >4%	US\$ '000	\$1,385			\$64	\$133	\$121	\$219	\$86	\$125	\$161	\$135	\$81	\$67	\$58	\$61	\$26	\$37	\$11
Cu/Zn Mineral	\$2.00/t/% >4%	US\$ '000	\$1,945			\$222	\$136	\$142	\$163	\$152	\$126	\$87	\$83	\$106	\$101	\$199	\$136	\$88	\$104	\$100
Cu Mineral	\$2.00/t/% >4%	US\$ '000	\$0			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Charges</b>		<b>US\$ '000</b>	<b>\$269,764</b>			<b>\$19,845</b>	<b>\$26,688</b>	<b>\$23,095</b>	<b>\$25,394</b>	<b>\$21,104</b>	<b>\$20,592</b>	<b>\$16,482</b>	<b>\$13,780</b>	<b>\$16,649</b>	<b>\$14,295</b>	<b>\$19,443</b>	<b>\$17,423</b>	<b>\$14,526</b>	<b>\$13,655</b>	<b>\$6,791</b>
<b>Net Smelter Return</b>		<b>US\$ '000</b>	<b>\$1,583,342</b>			<b>\$138,966</b>	<b>\$169,149</b>	<b>\$136,099</b>	<b>\$128,694</b>	<b>\$127,484</b>	<b>\$115,852</b>	<b>\$84,853</b>	<b>\$74,391</b>	<b>\$108,422</b>	<b>\$84,647</b>	<b>\$106,933</b>	<b>\$96,551</b>	<b>\$89,279</b>	<b>\$80,727</b>	<b>\$41,294</b>
State Royalty NSR	4%	US\$ '000	\$63,334			\$5,559	\$6,766	\$5,444	\$5,148	\$5,099	\$4,634	\$3,394	\$2,976	\$4,337	\$3,386	\$4,277	\$3,862	\$3,571	\$3,229	\$1,652
Royalty NSR	2%	US\$ '000	\$31,667			\$2,779	\$3,383	\$2,722	\$2,574	\$2,550	\$2,317	\$1,697	\$1,488	\$2,168	\$1,693	\$2,139	\$1,931	\$1,786	\$1,615	\$826
<b>Net Revenue</b>		<b>US\$ '000</b>	<b>\$1,488,341</b>			<b>\$130,628</b>	<b>\$159,000</b>	<b>\$127,933</b>	<b>\$120,973</b>	<b>\$119,835</b>	<b>\$108,901</b>	<b>\$79,762</b>	<b>\$69,927</b>	<b>\$101,916</b>	<b>\$79,568</b>	<b>\$100,517</b>	<b>\$90,758</b>	<b>\$83,923</b>	<b>\$75,884</b>	<b>\$38,817</b>
<b>Unit NSR</b>		<b>US\$/t milled</b>	<b>\$171</b>			<b>\$233</b>	<b>\$260</b>	<b>\$209</b>	<b>\$198</b>	<b>\$196</b>	<b>\$178</b>	<b>\$130</b>	<b>\$114</b>	<b>\$166</b>	<b>\$130</b>	<b>\$164</b>	<b>\$148</b>	<b>\$137</b>	<b>\$124</b>	<b>\$201</b>
<b>OPERATING COST</b>																				
Mining (Open Pit)		US\$/t moved	\$3.15			\$3.58	\$3.23	\$3.17	\$2.61	\$1.97	\$3.34	\$3.51	\$4.50	\$3.85	\$5.98	\$7.94	\$8.33	\$6.03	\$4.65	\$0.00
Mining (Underground)		US\$/t milled	\$71.48			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$151.22	\$50.02	\$49.72	\$131.07	\$113.39	\$17.48
Processing		US\$/t milled	\$21.84			\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84
G&A		US\$/t milled	\$4.74			\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74
<b>Total Operating Cost</b>		<b>US\$/t milled</b>	<b>\$64.84</b>			<b>\$52.76</b>	<b>\$52.57</b>	<b>\$53.74</b>	<b>\$73.42</b>	<b>\$63.83</b>	<b>\$45.51</b>	<b>\$41.67</b>	<b>\$40.94</b>	<b>\$44.92</b>	<b>\$59.86</b>	<b>\$62.80</b>	<b>\$62.70</b>	<b>\$61.26</b>	<b>\$55.06</b>	<b>\$44.06</b>
Mining (Open Pit)		US\$ '000	\$158,217			\$14,699	\$15,917	\$16,637	\$28,690	\$22,813	\$11,593	\$9,242	\$8,794	\$6,248	\$5,260	\$4,677	\$4,721	\$4,318	\$4,609	\$0
Mining (Underground)		US\$ '000	\$88,310			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,985	\$15,122	\$17,506	\$17,402	\$16,924	\$12,835	\$3,373
Processing		US\$ '000	\$190,375			\$12,262	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$4,214
G&A		US\$ '000	\$41,332			\$2,662	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$915
<b>Total Operating Cost</b>		<b>US\$ '000</b>	<b>\$478,072</b>			<b>\$29,623</b>	<b>\$32,198</b>	<b>\$32,918</b>	<b>\$44,971</b>	<b>\$39,094</b>	<b>\$27,874</b>	<b>\$25,523</b>	<b>\$25,075</b>	<b>\$27,514</b>	<b>\$36,664</b>	<b>\$38,464</b>	<b>\$38,404</b>	<b>\$37,522</b>	<b>\$33,726</b>	<b>\$8,502</b>
Unit Operating Cost		US\$/t milled	\$54.84			\$52.76	\$52.57	\$53.74	\$73.42	\$63.83	\$45.51	\$41.67	\$40.94	\$44.92	\$59.86	\$62.80	\$62.70	\$61.26	\$55.06	\$44.06
<b>Operating Cashflow</b>		<b>US\$ '000</b>	<b>\$1,010,270</b>			<b>\$101,005</b>	<b>\$126,802</b>	<b>\$95,015</b>	<b>\$76,002</b>	<b>\$80,741</b>	<b>\$81,027</b>	<b>\$54,239</b>	<b>\$44,852</b>	<b>\$74,402</b>	<b>\$42,905</b>	<b>\$62,053</b>	<b>\$52,354</b>	<b>\$46,400</b>	<b>\$42,158</b>	<b>\$30,315</b>
<b>CAPITAL COST</b>																				
<b>Direct Cost</b>																				
Mining		US\$ '000	\$16,720	\$3,641	\$12,636	\$0	\$64	\$126	\$0	\$64	\$126	\$0	\$64	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Processing		US\$ '000	\$51,700	\$17,233	\$34,467	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure		US\$ '000	\$24,323	\$13,368	\$10,955	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Tailings		US\$ '000	\$7,348	\$0	\$7,348	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Direct Cost</b>		<b>US\$ '000</b>	<b>\$100,091</b>	<b>\$34,243</b>	<b>\$65,405</b>	<b>\$0</b>	<b>\$64</b>	<b>\$126</b>	<b>\$0</b>	<b>\$64</b>	<b>\$126</b>	<b>\$0</b>	<b>\$64</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>Other Costs</b>																				
EPCM / Owners / Indirect Cost		US\$ '000	\$31,853	\$12,119	\$19,733	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal Costs</b>		<b>US\$ '000</b>	<b>\$131,944</b>	<b>\$46,362</b>	<b>\$85,139</b>	<b>\$0</b>	<b>\$64</b>	<b>\$126</b>	<b>\$0</b>	<b>\$64</b>	<b>\$126</b>	<b>\$0</b>	<b>\$64</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Contingency	25%	US\$ '000	\$32,986	\$11,591	\$21,285	\$0	\$16	\$32	\$0	\$16	\$32	\$0	\$16	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Initial Capital Cost</b>		<b>US\$ '000</b>	<b>\$164,930</b>	<b>\$57,953</b>	<b>\$106,423</b>	<b>\$0</b>	<b>\$80</b>	<b>\$158</b>	<b>\$0</b>	<b>\$80</b>	<b>\$158</b>	<b>\$0</b>	<b>\$80</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>VAT</b>		<b>US\$ '000</b>	<b>\$20,163</b>	<b>\$6,954</b>	<b>\$13,209</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
Sustaining - Open Pit (TMF)		US\$ '000	\$56,715	\$0	\$3,653	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$1,255	\$0
Sustaining - Underground		US\$ '000	\$23,341	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,198	\$16,178	\$2,633	\$169	\$119	\$44	\$0	\$0
Reclamation and Closure		US\$ '000	\$26,208	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,208
Contingency	30%	US\$ '000	\$7,862	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,862
Salvage Value		US\$ '000	(\$10,000)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	(\$10,000)
<b>Total Capital Cost</b>		<b>US\$ '000</b>	<b>\$289,219</b>	<b>\$64,907</b>	<b>\$123,285</b>	<b>\$3,985</b>	<b>\$4,065</b>	<b>\$4,143</b>	<b>\$3,985</b>	<b>\$4,065</b>	<b>\$4,143</b>	<b>\$3,985</b>	<b>\$8,263</b>	<b>\$20,163</b>	<b>\$6,619</b>	<b>\$4,154</b>	<b>\$4,104</b>	<b>\$4,029</b>	<b>\$1,255</b>	<b>\$24,070</b>



	INPUTS	UNITS	TOTAL	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
<b>PRE-TAX CASH FLOW</b>																				
Net Pre-Tax Cashflow		US\$ '000	\$721,051	(\$64,907)	(\$123,285)	\$97,020	\$122,737	\$90,872	\$72,017	\$76,676	\$76,885	\$50,254	\$36,590	\$54,239	\$36,286	\$57,899	\$48,250	\$42,371	\$40,903	\$6,245
Cumulative Pre-Tax Cashflow		US\$ '000		(\$64,907)	(\$188,192)	(\$91,172)	\$31,565	\$122,438	\$194,455	\$271,131	\$348,015	\$398,269	\$434,859	\$489,098	\$525,384	\$583,283	\$631,532	\$673,903	\$714,806	\$531,628
<b>Taxes</b>																				
State Profit Sharing Tax		US\$ '000	\$58,393	\$0	\$0	\$7,366	\$9,744	\$5,888	\$3,601	\$4,268	\$4,782	\$1,941	\$811	\$3,441	\$912	\$5,304	\$4,067	\$3,345	\$2,924	\$0
Workers Profit Sharing Tax		US\$ '000	\$14,598	\$0	\$0	\$1,841	\$2,436	\$1,472	\$900	\$1,067	\$1,196	\$485	\$203	\$860	\$228	\$1,326	\$1,017	\$836	\$731	\$0
Income Tax		US\$ '000	\$83,240	\$0	\$0	\$0	\$10,135	\$10,426	\$6,376	\$7,558	\$8,468	\$3,437	\$1,436	\$6,094	\$1,614	\$9,392	\$7,203	\$5,923	\$5,178	\$0
Sovereign Adjustment Tax		US\$ '000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
After-Tax Cashflow		US\$ '000	\$564,820	(\$64,907)	(\$123,285)	\$87,813	\$100,422	\$73,086	\$61,140	\$63,783	\$62,438	\$44,390	\$34,140	\$43,844	\$33,532	\$41,877	\$35,963	\$32,267	\$32,069	\$6,245
Cumulative After-Tax Cashflow		US\$ '000		(\$64,907)	(\$188,192)	(\$100,379)	\$43	\$73,129	\$134,270	\$198,053	\$260,491	\$304,882	\$339,022	\$382,866	\$416,398	\$458,276	\$494,239	\$526,506	\$558,575	\$422,643
<b>PROJECT ECONOMICS</b>																				
Pre-Tax IRR		%	48.0%																	
Pre-tax NPV at 5% discounting	5.0%	US\$ '000	\$479,480																	
Pre-tax NPV at 8% discounting	8.0%	US\$ '000	\$374,277																	
Pre-tax NPV at 10% discounting	10.0%	US\$ '000	\$318,910																	
After-Tax IRR		%	40.5%																	
After-Tax NPV at 5% discounting	5.0%	US\$ '000	\$373,139																	
After-Tax NPV at 8% discounting	8.0%	US\$ '000	\$287,586																	
After-tax NPV at 10% discounting	10.0%	US\$ '000	\$242,526																	

## **CASH FLOW ANALYSIS**

Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$565 million over the mine life, and simple payback occurs two years from start of production.

The after-tax NPV at an 8% discount rate is \$288 million, and the after-tax IRR is 40%.

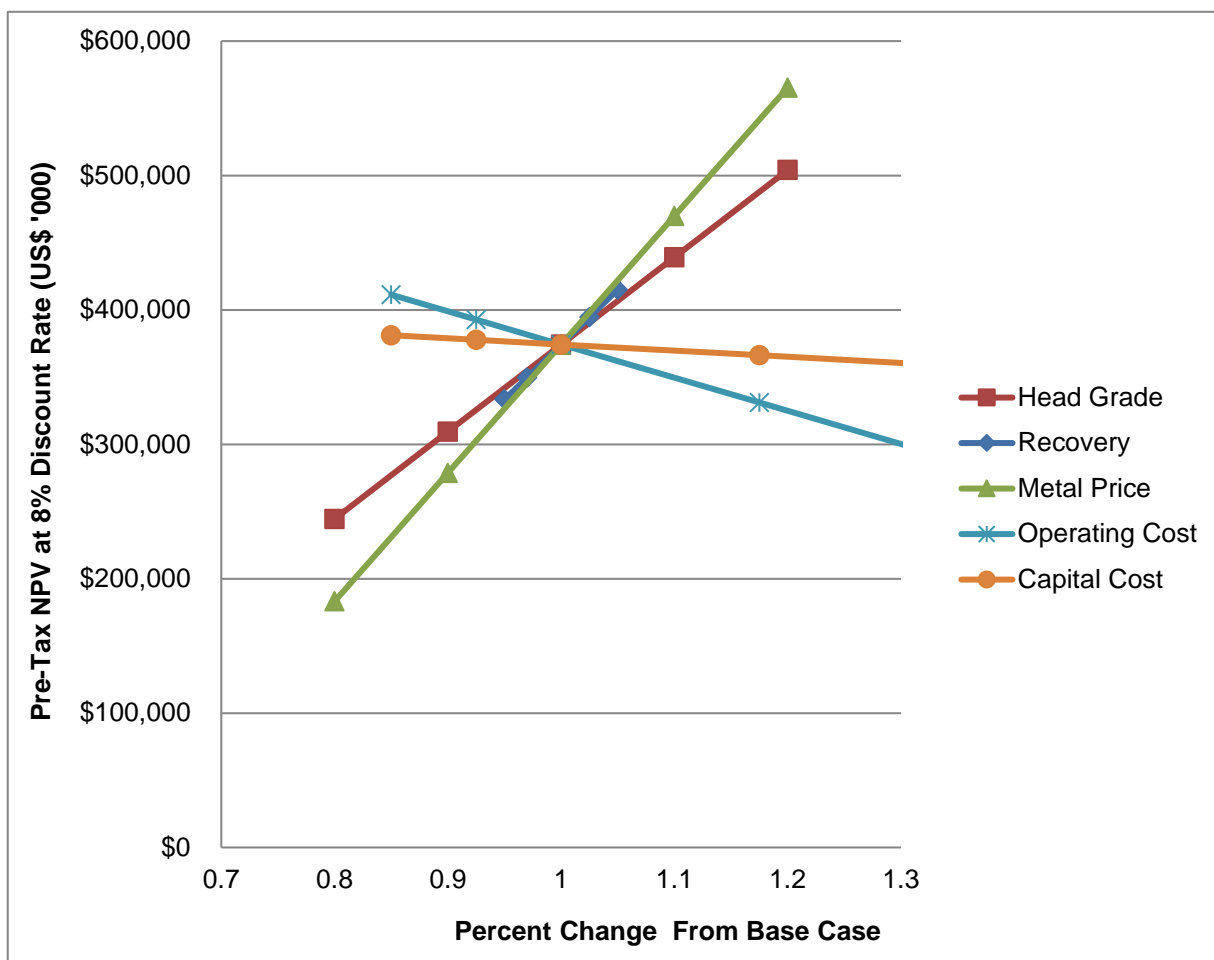
## **SENSITIVITY ANALYSIS**

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Head grade
- Metal recoveries
- Metal prices
- Operating costs
- LOM capital costs

Pre-tax NPV and IRR sensitivity over the base case has been calculated for -20% to +35% variations. The NPV and IRR sensitivities are shown in Figures 1-1 and 1-2, respectively and Table 1-3.

**FIGURE 1-1 PRE-TAX NPV SENSITIVITY ANALYSIS**



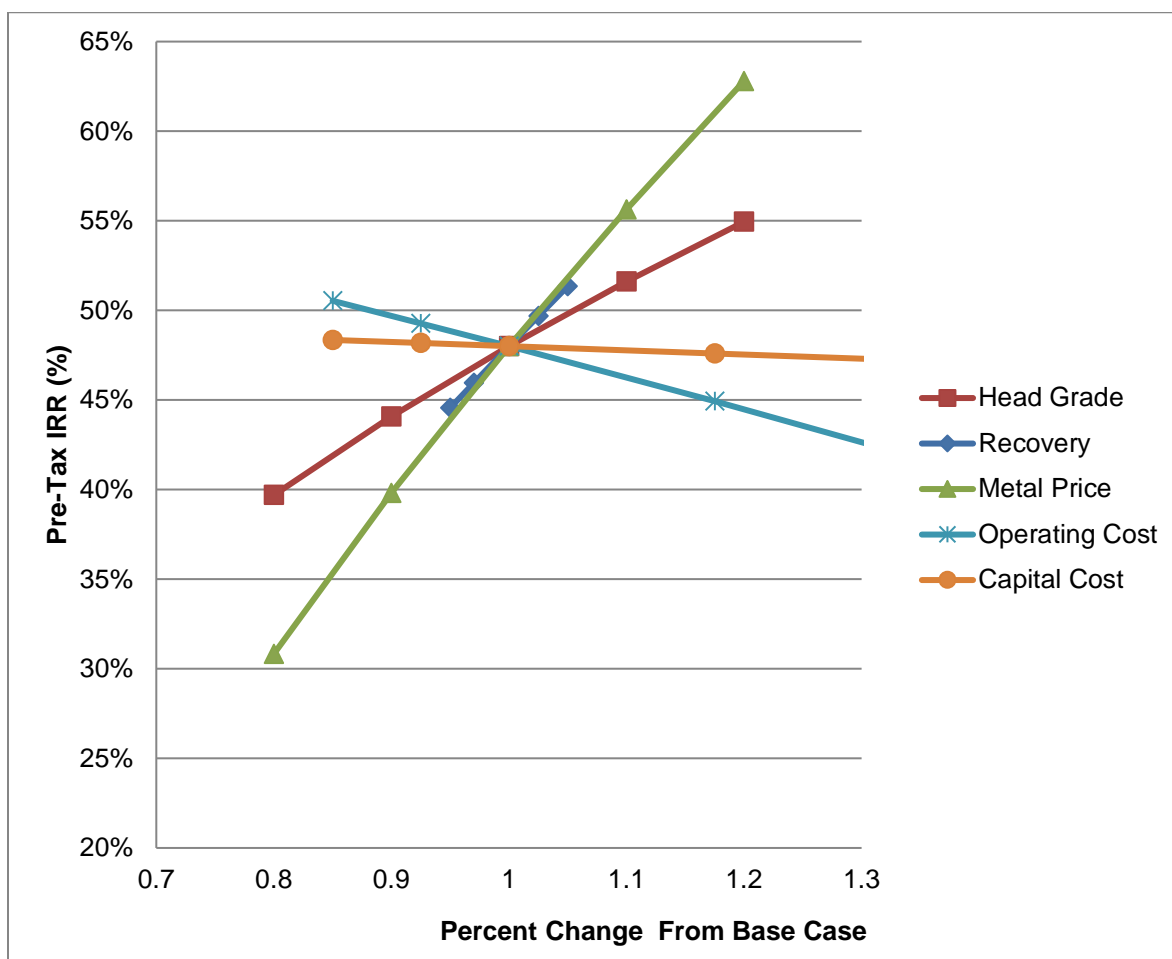
**TABLE 1-3 PRE-TAX NPV AND IRR SENSITIVITY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

	<b>Head Grade (%Cu<sup>1</sup>)</b>	<b>NPV at 8% (US\$ M)</b>	<b>IRR (%)</b>
0.80	1.21	244.5	39.7
0.90	1.50	309.4	44.1
<b>1.00</b>	<b>1.82</b>	<b>374.3</b>	<b>48.0</b>
1.10	2.18	439.2	51.6
1.20	2.56	504.1	54.9
	<b>Average Recovery (All Metals, %)</b>	<b>NPV at 8% (US\$ M)</b>	<b>IRR (%)</b>
0.95	61.6	333.4	44.6
0.97	62.9	319.7	45.9
<b>1.00</b>	<b>64.8</b>	<b>374.3</b>	<b>48.0</b>
1.03	66.4	394.7	49.7
1.05	68.0	415.2	51.3
	<b>Cu Metal Price<sup>2</sup> (US\$/lb)</b>	<b>NPV at 8% (US\$ M)</b>	<b>IRR (%)</b>
0.80	2.52	183.1	30.8
0.90	2.84	278.7	39.8
<b>1.00</b>	<b>3.15</b>	<b>374.3</b>	<b>48.0</b>
1.10	3.47	469.9	55.6
1.20	3.78	565.4	62.8
	<b>Operating Costs (US\$/t)</b>	<b>NPV at 8% (US\$ M)</b>	<b>IRR (%)</b>
0.85	46.62	411.3	50.5
0.93	50.73	392.8	49.3
<b>1.00</b>	<b>54.80</b>	<b>374.3</b>	<b>48.0</b>
1.18	64.44	331.1	44.4
1.35	74.04	287.8	41.7
	<b>Capital Costs (US\$ M)</b>	<b>NPV at 8% (US\$ M)</b>	<b>IRR (%)</b>
0.85	245.8	381.2	48.3
0.93	267.5	377.7	48.2
<b>1.00</b>	<b>289.2</b>	<b>374.3</b>	<b>48.0</b>
1.18	339.8	366.2	47.6
1.35	390.4	358.2	47.2

Notes:

1. Copper head grade shown, however, sensitivity applies to all metals
2. Copper price shown, however, sensitivity applies to all metals

**FIGURE 1-2 PRE-TAX IRR SENSITIVITY ANALYSIS**



## TECHNICAL SUMMARY

### PROPERTY DESCRIPTION AND LOCATION

The Curipamba Project is located in central Ecuador approximately 150 km south-southwest of the capital city, Quito, and approximately 150 km north-northeast of the port of Guayaquil in the provinces of Bolivar and Los Rios. The closest city to the Project is Ventanas.

Road access to the area is along paved roads, which branch off at Ventanas and Zapotal from Highway 25 that connects Quito and the port city of Guayaquil. Driving time from Guayaquil to the Project is approximately 2.5 hours. There are three well-maintained gravel roads which provide access throughout most of the Project area, especially in the El Domo deposit area.

## **LAND TENURE**

The Project comprises seven contiguous tenements (21,537.48 ha). In 2016, the tenements were classified under the small-scale mining regime, which allows for simultaneous exploration and exploitation activities without consideration of the mining phases of the general regime legislated by the Ecuadorian Mining Act. The tenements are wholly owned by Curimining. Between 2007 and 2019, Curimining has been able to secure all surface rights to the tenements.

## **EXISTING INFRASTRUCTURE**

There is basic infrastructure in the Project area such as good road access and household electricity. The national power grid, with access to higher voltage supply than 110 V, is within 20 km of the El Domo area in the Echeandía Canton.

## **HISTORY**

Early exploration in the Project area occurred in 1991 with first reported stream sediment and reconnaissance surveys by RTZ Mining PLC Inc. (RTZ). No further exploration was carried out in the Project area until 2004 when the original 16 claims of the Curipamba Project were staked. In 2006, the claims were transferred to Curimining. Drilling commenced in 2007 and Curimining completed five phases, primarily on the El Domo deposit area to the end of 2017 totalling 49,663.98 m in 242 drill holes.

In September 2017, Adventus entered into an option earn-in agreement with Salazar whereby Adventus may earn a 75% interest in Salazar's wholly owned Curipamba Project by funding exploration and development expenditures of US\$25 million over five years. In 2018, Adventus funded the sixth phase of drilling for Curimining, primarily on the El Domo deposit area totalling 18,933.26 m in 100 drill holes.

## **GEOLOGY AND MINERALIZATION**

The Project is located in the Macuchi Terrane, a volcanosedimentary island arc sequence that is part of an assemblage of accreted terranes that formed between the Late Jurassic and Eocene along the western edge of South America. The namesake Macuchi Group represents an intra-oceanic island arc volcanic sequence comprising predominately volcanoclastic and epiclastic rocks, including lithic-rich sandstone and breccia with accessory siltstone and chemical sediments, as well as basaltic and andesitic domes and flows. The Project is hosted

in a volcanic pile comprising a basal rhyodacite unit overlain by two interfingering volcanoclastic sequences, and two coherent younger lithofacies, which intruded the sequence in both the north and south of the property. Mineralization is primarily located along the contact between a rhyodacite and volcanoclastic rocks.

The El Domo deposit is a gold-rich, polymetallic VMS deposit. Mineralization is largely flat-lying, stratiform and stratabound and occurs in one main massive sulphide lens, a directly overlying talus, or breccia zone, and a number of smaller, mineralized lenses primarily in the footwall of the main lens. The geology is complicated by a number of sub-vertical faults that offset the strata by up to approximately 50 m vertically. The deposit has a lateral extent of approximately 1,300 m by 1,100 m.

Mineralization can be divided into five types, where sphalerite, chalcopyrite, and pyrite are the principal sulphide minerals:

1. Massive sulphides with indistinct texture. In some places, a fragmental texture can be seen within the sulphides, suggesting that they may be formed by the replacement of lapilli tuff.
2. Sulphide-altered lapilli tuffs and peperites.
3. Transported sulphide fragments within polymictic lapilli tuffs.
4. Sulphide “pseudo”-fragments within polymictic lapilli tuffs.
5. Rare, thinly laminated siliceous chert with banded sulphides.

Gold was identified within sphalerite + galena + barite mineralization, where it occurs as minute inclusions in sphalerite. Accessory minerals include galena, tennantite/tetrahedrite, covellite, chalcocyanite, and barite, with barite being the principal gangue mineral.

## EXPLORATION STATUS

The Curipamba Project is at the Mineral Resource development stage. Drilling was carried out between 2007 and 2018 in six distinct phases, during which Curimining completed 342 core drill holes for a total of 68,597.24 m. Other exploration work has included stream sediment sampling, targeted induced polarization (IP) and magnetometer surveys, mapping, surface chip and grab sampling, and regional lithogeochemical rock sampling for rocktype fingerprinting. Adventus is currently funding a 2,379 line-kilometre, airborne MobileMT geophysical survey over the 21,537.48 ha Curipamba Project to define further targets.

A number of mineralized lenses in the footwall stratigraphy of El Domo are supported by limited drilling. Additionally, a number of mineral targets currently outside of the resource area of the El Domo deposit are also supported by limited drilling. Additional This means that additional infill and exploration drilling is warranted to more fully test favorable stratigraphy both regionally and directly at El Domo.

## MINERAL RESOURCES

The Mineral Resource estimate has been prepared in accordance with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM (2014) definitions). Mineral Resources are not Mineral Reserves and have not demonstrated economic viability. Open pit Mineral Resources have been constrained within a preliminary pit shell. A summary of the Mineral Resources as of May 2, 2019 is presented in Table 1-4.

**TABLE 1-4 MINERAL RESOURCE SUMMARY, AS OF MAY 2, 2019**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Resource Category	Tonnes (Mt)	Grade					Contained Metal				
		Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Pb (kt)	Zn (kt)	Au (koz)	Ag (koz)
Pit Constrained Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	5.7	1.74	0.28	2.60	2.47	51	99.0	16.1	147.8	452	9,417
M+I	7.1	1.78	0.30	2.78	2.73	53	126.8	21.4	198.7	627	12,121
Inferred	0.7	0.67	0.21	1.72	1.60	46	4.6	1.5	11.9	36	1,032
Underground Mineral Resources											
Indicated	1.8	2.91	0.20	3.51	1.85	43	51.9	3.6	62.5	106	2,467
Inferred	0.6	2.46	0.19	2.82	2.09	37	15.5	1.2	17.8	42	751
Total Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	7.5	2.02	0.26	2.81	2.33	49	150.9	19.7	210.3	559	11,884
M+I	8.9	2.00	0.28	2.93	2.56	51	178.7	25.0	261.3	733	14,588
Inferred	1.3	1.52	0.20	2.25	1.83	42	20.1	2.7	29.7	78	1,783

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. A minimum mining height of two metres was applied to the Mineral Resource wireframes.
3. Bulk density assigned on a block per block basis using the correlation between measured density values and base metal grades.
4. Mineral Resources are reported above a cut-off net smelter return (NSR) value of US\$25 per tonne for potential open pit Mineral Resources and US\$100 per tonne for potential underground Mineral Resources.
5. The NSR value is based on estimated metallurgical recoveries, assumed metal prices, and smelter terms, which include payable factors, treatment charges, penalties, and refining charges.



6. Metal prices are based on consensus, long term forecasts from banks, financial institutions, and other sources averaging US\$3.15/lb Cu, US\$1.00/lb Pb, US\$1.15/lb Zn, US\$1,350/oz Au, and US\$18/oz Ag.
7. Metallurgical recoveries assumptions were based on three mineralization types defined by the metal ratio Cu/(Pb+Zn):
  - Zinc Mineral (Cu/(Pb+Zn)<0.33): 84% for Cu, 84% for Pb, 95% for Zn, 51% for Au, and 71% for Ag
  - Mixed Cu/Zn Mineral (0.33≤Cu/(Pb+Zn)≤3.0): 88% for Cu, 85% for Pb, 96% for Zn, 66% for Au, and 69% for Ag
  - Copper Mineral (Cu/(Pb+Zn)>3.0): 88% for Cu, 69% for Pb, 73% for Zn, 27% for Au, and 50% for Ag
8. NSR factors were also based on the mineralization type:
  - Zinc Mineral: 29.94 US\$/% Cu, 9.17 US\$/% Pb, 11.52 US\$/% Zn, 14.17 US\$/g Au, and 0.27 US\$/g Ag
  - Mixed Cu/Zn Mineral: 44.20 US\$/% Cu, 11.34 US\$/% Zn, 22.90 US\$/g Au, and 0.27 US\$/g Ag
  - Copper Mineral: 46.27 US\$/% Cu, 6.86 US\$/g Au, and 0.19 US\$/g Ag
9. Numbers may not add due to rounding.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
11. Open pit Mineral Resources have been constrained within a preliminary pit shell.

## MINING METHOD

All mining will be carried out by contractors with oversight by owner's personnel and will begin with conventional open pit mining (drilling, blasting, loading, and hauling) for the first nine years in four phases followed by a combination of open pit and underground mining thereafter.

The PEA proposed open pit production totals 7.5 Mt, which is estimated from open pit constrained Mineral Resources using a \$25 per tonne NSR cut-off value, a dilution factor of 5%, and 100% mining recovery. The open pit mine life, including pre-stripping, is estimated to be approximately 16 years, with a total stripping ratio of 6.3 and an average production rate of 1,750 tpd of mineralized material.

The PEA proposed underground production totals 1.2 Mt, which is estimated from underground constrained Mineral Resources using a \$100 per tonne NSR cut-off value, a dilution factor of 10%, and 80% mining recovery. Due to the geometry of the deposit, the proposed mining method is room and pillar with delayed backfill in steeper portions of the deposit. The underground mine life, with a production of up to 1,000 tpd, is estimated to be approximately six years, with additional time required for underground access development and infrastructure construction.

All open pit and underground mining will be carried out using contractor personnel and equipment with oversight by owner's personnel. The open pit contractor operations will include pit and dump operations, pit dewatering, and road maintenance. The underground contractor operations will include all development and production activities.

## MINERAL PROCESSING AND METALLURGICAL TESTING

The processing plant design is based on the results of indicative bench scale test work conducted at Base Met Labs in late 2018 and early 2019, as well as earlier test work, typical processing methods for VMS deposits, and design criteria provided by RPA and Adventus.

The plant will process 612,500 tpa through conventional comminution and flotation circuits to produce saleable copper, zinc, and possibly lead concentrates. The potential to produce a lead concentrate is being evaluated in on-going test work. In addition, future test work will be aimed at optimizing the process flow sheet and reagent scheme to maximize the recovery of valuable metals while minimizing costs of consumables and reagents.

The processing plant will consist of crushing and grinding, gravity gold recovery, flotation, concentrate thickening and filtration, and tailings thickening and disposal.

## PROJECT INFRASTRUCTURE

The major infrastructure items considered and costed in the PEA support a mining and milling operation that is expected to operate 24 hours per day, seven days per week. The design of project infrastructure has prioritized environmental protection, workforce safety, and operating efficiency while minimizing community impacts. Major infrastructure items include, but are not limited to the following:

- **Power Supply:** It is assumed that El Domo will connect to the Ecuadorian power grid along the existing access road and a new mine access road based on work completed by KP in early 2019. RPA has benchmarked and estimated the cost for power at \$0.11/kWh.
- **Road Access:** Access to the Project site is planned to use both new and existing road networks based on work completed by KP in 2019. A new 12.5 km access road is expected to connect the Project site to the existing road network. Secondary access roads to El Domo will also be maintained.
- **Mine haul road access** for waste and feed to the mill that can accommodate 40-tonne trucks.
- **Mine facilities** including but not limited to buildings for maintenance, warehousing, administration, laboratories, security, first aid, explosive storage, and fuel storage.
- **Mill and process plant** including crushing, grinding, and flotation.
- **Water supply and management systems.**

- Lined tailings storage facility and waste rock storage pads based on studies completed by Klohn Crippen Berger (KCB) in early 2019.

## MARKET STUDIES

The Curipamba Project will produce copper, zinc, and possibly lead concentrates which contain gold and silver by-products. The concentrates will be sold to worldwide smelters either on a contract basis or on the spot market. Prices for copper, zinc, and lead are determined by the London Metal Exchange (LME).

## ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS

The Curipamba Project conducts its current exploration activity under a valid Environmental Licence, granted to Curimining as Resoluciones 506, 508, and 509 from the Ministry of Environment in May 2011 upon the successful conclusion of an exploration phase Environmental Impact Assessment (EIA). The Environmental Licence remains valid for the duration of the exploration and evaluation phases of the Project, subject to fulfillment of monitoring report submissions.

Mining activities in Ecuador are mainly regulated by the Ministry of Mining, ARCOM, the Ministry of Environment, and the Water Secretariat (SENAGUA). The Ministry of Environment issues an environmental licence for mining following approval of an EIA and management plan. Other permits required for mining activities include those for explosives use, special labour shifts, fire department, and construction from ARCOM and the municipalities.

The specific requirements for the Curipamba Project EIA will be elaborated in a Terms of Reference document produced by the Ministry of Environment. The public has the right to participate in environmental assessment of projects, including through consultations, public open houses, and other initiatives.

In addition to Ecuadorian requirements, efforts will be made to ensure that the EIA is compliant, or could be made to be compliant, with appropriate international standards. At minimum, these would include the Equator Principles, and the International Finance Corporation Performance Standards and Environmental, Health, and Safety Guidelines.

Adventus and Curimining have made considerable efforts to undertake environmental studies and community engagement in order to facilitate the advancement of the Project. Dedicated

environmental and social outreach departments based at the Project camp and in nearby communities are staffed with responsible practitioners, who oversee the program.

Since 2011, Curimining has been collecting and compiling climate data, has carried out a geochemical characterization program on potential waste rock from the El Domo deposit, hydrology studies, collected water samples for chemical analysis, conducted terrestrial, flora, and fauna studies, and completed aquatic fauna studies.

Curimining conducted interviews with representatives of organizations, local governments, community leaders, and members of the public in affected communities to gauge the perception of communities on the presence of the concessions. There is general support for the Project at the exploration stage, as the community benefits from local employment.

## **CAPITAL AND OPERATING COST ESTIMATES**

The total capital cost for the Project is approximately \$289.2 million. The pre-production capital cost is \$185 million, which covers pre-production mine development costs, process plant construction costs, surface infrastructure, tailings facility, Engineering, Procurement, and Construction Management (EPCM), and contingency amounts as well as VAT which will be a credit against taxes once exporting of concentrates commences.

The sustaining capital cost estimate totals \$104 million and includes tailings dam raises over the LOM, underground infrastructure and development starting in Year 9, reclamation and closure costs, and salvage value.

The average LOM operating cost for the mine is estimated at \$54.80 per tonne processed. The operating costs are distributed between open pit and underground mining, processing, and general and administration (G&A) costs. The following is a breakdown of the LOM operating cost.

- |                        |                             |
|------------------------|-----------------------------|
| • Mining (Open Pit)    | \$3.15 per tonne moved      |
| • Mining (Underground) | \$71.50 per tonne processed |
| • Processing           | \$21.80 per tonne processed |
| • G&A                  | \$4.74 per tonne processed  |
| • Total Operating Cost | \$54.80 per tonne processed |

## 2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) and Knight Piésold Ltd. (KP) were retained by Adventus Mining Corporation (Adventus) to prepare an independent Technical Report on the Preliminary Economic Assessment (PEA) for the El Domo volcanogenic massive sulphide (VMS) deposit (El Domo or the Project) on the Curipamba Project, located in central Ecuador. This Technical Report conforms to National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

Adventus is a TSX Venture Exchange listed (TSX-V:ADZN) mineral resource company focussed on mineral exploration and development of copper deposits in Ecuador. The El Domo deposit is the most advanced on the 21,537.48 hectare (ha) Curipamba Project and is the subject of the current Mineral Resource estimate and PEA. In addition to the Curipamba Project, Adventus is engaged in a country-wide exploration alliance with its partners in Ecuador, including the Pijili and Santiago porphyry and epithermal projects.

In September 2017, Adventus entered into an option earn-in agreement with Salazar Resources Limited (Salazar) whereby Adventus may earn a 75% interest in Salazar's wholly owned Curipamba Project by funding exploration and development expenditures of US\$25 million over five years. During the option period, both Adventus and Salazar are cited as operators of the Project, however, Curimining S.A. (Curimining), the Ecuadorian subsidiary of Salazar, is providing 100% of the field management and services for all disciplines in Ecuador as Adventus has no staff or resources in Ecuador.

On June 12, 2019, Adventus changed its name from Adventus Zinc Corporation to Adventus Mining Corporation.

This report is considered by RPA to meet the requirements of a Preliminary Economic Assessment as defined in Canadian NI 43-101 regulations. The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

## SOURCES OF INFORMATION

Site visits were carried out by Ms. Dorota El Rassi, M.Sc., P.Eng., Senior Geological Engineer, RPA, and Mr. Hugo M. Miranda., ChMC(RM), Principal Mining Engineer, RPA, from January 8 to 10, 2019. RPA had previously visited the property on two other occasions, July 1 to 4, 2011 and November 20 to 23, 2017.

The purpose of the site visit was to ascertain the geology of the Project area, review exploration procedures, examine drill core, hold discussions with Project personnel, and collect all relevant information for the compilation of a Technical Report.

RPA was given full access to relevant data and held discussions with Jason Dunning, vice president of exploration for Adventus, and Mr. Christian Paramo, project geologist with Curimining, and other Curimining personnel to obtain information on the past exploration work and to understand procedures used to collect, record, store, and analyze historical and current exploration data.

RPA has no reason to doubt the reliability of the information provided by Adventus. Other information was obtained from the public domain. This Technical Report is based on the following sources of information:

- Discussions with Adventus personnel
- Inspection of the Curipamba Project drill core and selected outcrops
- Review of exploration data collected and documented by Adventus and previous operators
- Additional information from public domain sources

Ms. El Rassi is responsible for Sections 7 through 12, and 14, and shares responsibility with her co-authors for Sections 1, 25, 26, and 27 of this report. Mr. Miranda is responsible for Section 16 and shares responsibility with his co-authors for Sections 1, 25, 26, and 27 of this report. Mr. Torben Jensen, P.Eng., RPA Principal Mining Engineer, is responsible for overall preparation of the report, in particular Sections 2 to 6, 15, 18, 19, 21 to 23, and shares responsibility with his co-authors for Sections 1, 25, 26, and 27 of this report. Mr. Avakash Patel, P.Eng., RPA Principal Metallurgist, is responsible for Sections 13 and 17 and shares responsibility with his co-authors for Sections 1, 25, 26, and 27 of this report. Mr. Ken Embree,

P.Eng., of KP, is responsible for Section 20 and shares responsibility with his co-authors for Sections 1, 25, 26, and 27 of this report.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

### LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the metric system. All currency in this report is US dollars (US\$) on a 100% basis unless otherwise noted.

μ	micron	LCT	locked cycle test
μg	microgram	LOM	life of mine
a	annum	L/s	litres per second
A	ampere	m	metre
ARD	acid rock drainage	M	mega (million); molar
AA	atomic absorption	m <sup>2</sup>	square metre
bbl	barrels	m <sup>3</sup>	cubic metre
BLEG	bulk leachable extractable gold	MASL	metres above sea level
Btu	British thermal units	MCE	Maximum Credible Earthquake
BWi	Bond ball mill work index	m <sup>3</sup> /h	cubic metres per hour
°C	degree Celsius	mi	mile
C\$	Canadian dollars	min	minute
cal	calorie	ML	metal leaching
CDA	Canadian Dam Association	μm	micrometre
cfm	cubic feet per minute	mm	millimetre
CIF	cost, insurance and freight	mph	miles per hour
cm	centimetre	Mt	million tonnes
cm <sup>2</sup>	square centimetre	MVA	megavolt-amperes
d	day	m <sup>3</sup> /s	cubic metres per second
dia	diameter	MW	megawatt
dmt	dry metric tonne	MWh	megawatt-hour
DRX	Drilling Reporting Targeting	NPV	net present value
dwt	dead-weight ton	NSR	net smelter return
EDA	exploratory data analysis	oz	troy ounce (31.1035g)
EDX	energy dispersive X-ray spectroscopy	oz/st, opt	ounce per short ton
EIA	Environmental Impact Assessment	PAG	potentially acid generating
EPCM	Engineering, Procurement, and Construction Management	p.f.	power factor
°F	degree Fahrenheit	PLT	point load testing
FEL	front end loader	PMA	particle mineral analysis
ft	foot	PMP	Probable Maximum Precipitation
ft <sup>2</sup>	square foot	ppb	part per billion
ft <sup>3</sup>	cubic foot	ppm	part per million
ft/s	foot per second	PSD	particle size distribution
g	gram	psia	pound per square inch absolute
G	giga (billion)	psig	pound per square inch gauge
Gal	Imperial gallon	QA/QC	quality assurance/quality control
g/L	gram per litre	QEMSCAN	scanning electron microscopy
GPS	global positioning system	RC	Refining charge

Gpm	Imperial gallons per minute	RL	relative elevation
GRG	gravity gold recovery	ROM	run of mine
g/t	gram per tonne	RMR	rock mass rating
gr/ft <sup>3</sup>	grain per cubic foot	RQD	rock quality designation
gr/m <sup>3</sup>	grain per cubic metre	RTK	real-time kinematic
G&A	general and administration	s	second
ha	hectare	SD	standard deviation
hp	horsepower	SEM	scanning electron microscopy
hr	hour	SRM	standard reference material
Hz	hertz	st	short ton
ICP	inductively coupled plasma	stpa	short ton per year
ID <sup>2</sup>	inverse distance squared	stpd	short ton per day
in.	inch	t	metric tonne
in <sup>2</sup>	square inch	TC	treatment charge
IRR	internal rate of return	tpa	metric tonne per year
IP	induced polarization	tpd	metric tonne per day
J	joule	TSF	tailings storage facility
JV	joint venture	UBR	unified basic remuneration
k	kilo (thousand)	US\$	United States dollar
kcal	kilocalorie	UTM	Universal Transverse Mercator
kg	kilogram	USg	United States gallon
km	kilometre	USgpm	US gallon per minute
km <sup>2</sup>	square kilometre	V	volt
km/h	kilometre per hour	VAT	value added tax
kPa	kilopascal	VMS	volcanogenic massive sulphide
KV	kilovolt	W	watt
kVA	kilovolt-amperes	wmt	wet metric tonne
kW	kilowatt	wt%	weight percent
kWh	kilowatt-hour	yd <sup>3</sup>	cubic yard
L	litre	yr	year
lb	pound		



### 3 RELIANCE ON OTHER EXPERTS

This report has been prepared by RPA for Adventus. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and

For the purpose of this report, RPA has relied on ownership information provided by Adventus. The client has relied on an opinion by Tobar ZVS Spingarn, of Quito, Ecuador, dated September 22, 2017, and this opinion is relied on in Sections 4 and the Summary of this report. RPA has not researched property title or mineral rights for the Curipamba Project and expresses no opinion as to the ownership status of the property.

RPA has relied on Adventus for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Project. Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

## 4 PROPERTY DESCRIPTION AND LOCATION

The Curipamba Project is located in central Ecuador approximately 150 km south-southwest of the capital city, Quito, and approximately 150 km north-northeast of the port city of Guayaquil in the provinces of Bolívar and Los Ríos. The closest city to the Project is Ventanas, which is approximately 20 km to the southwest and in 2010 had a population of approximately 38,000 people (Figure 4-1).

### LAND TENURE

The Project comprises seven contiguous concessions with a total area of 21,537.48 ha (Table 4-1 and Figure 4-2). The tenements are wholly owned by Curimining. Adventus reports that all tenements are in good standing and free of liens or encumbrances. The tenements were originally registered to Curimining between 2003 and 2006; following the enactment of the Ecuadorian Mining Act, the tenement titles were replaced by new titles on the dates shown in Table 4-1. The titles grant an exclusive right to perform mining activities, including exploration, exploitation, and processing of minerals over the area covered by the titles. Titles were granted for a period of 25 years, except for Las Naves, for which the title was granted for 22 years, 11 months, and 22 days. The proposed open pit is located near 79° 16' W longitude and 1° 18' S latitude.

**TABLE 4-1 TENEMENT INFORMATION**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Tenement	Tenement Number	Area (ha)	County	Province	Date Mining Title issued	Date registered in Mining Register	Expiry
Jordan 1	700918	2,200.00	Ventanas, Echeandía	Los Ríos, Bolívar	April 27, 2010	May 10, 2010	April 26, 2035
Jordan 2	200652	1,639.48	Echeandía, Guaranda	Bolívar	March 15, 2010	March 19, 2010	March 14, 2035
Las Naves	200508	1,458.00	Las Naves Guaranda	Bolívar	March 15, 2010	March 19, 2010	April 6, 2033
Las Naves 1	200627	3,200.00	Guaranda	Bolívar	March 15, 2010	March 19, 2010	March 14, 2035
Las Naves 2	200628	3,700.00	Guaranda, Las Naves	Bolívar	March 15, 2010	March 19, 2010	March 14, 2035
Las Naves 3	200629	4,815.00	Las Naves, Guaranda, Ventanas, Guaranda, Echeandía	Bolívar, Los Ríos	March 15, 2010	March 19, 2010	March 14, 2035
Las Naves 5	700885	4,525.00	Ventanas, Las Naves	Los Ríos, Bolívar	April 27, 2010	May 10, 2010	April 26, 2035
<b>Total</b>		<b>21,537.48</b>					





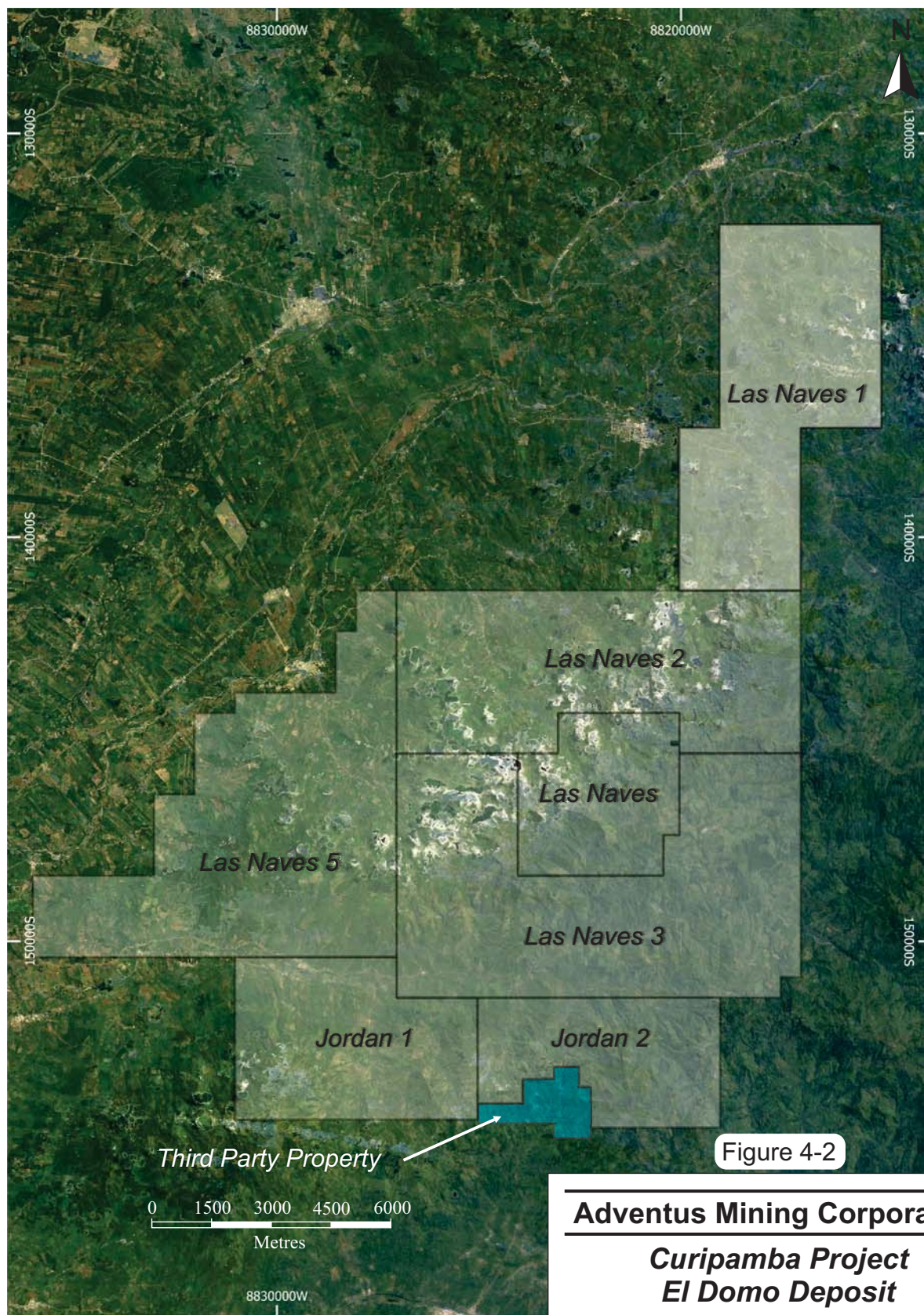


Figure 4-2

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**

Central Ecuador  
**Property Map**

The Ecuadorian Mining Act establishes mining phases for the general mining regime, which is based on a strictly staged exploration schedule. In light of these restrictions, the tenements were classified under the small-scale mining regime in 2016, which allows for simultaneous exploration and exploitation activities without consideration of the mining phases of the general regime.

The third party property shown in Figure 4-2 is a kaolin mine located on a separate block south of the Jordan 2 concession.

## **UNDERLYING AGREEMENT**

In September 2017, Adventus entered into an option earn-in agreement with Salazar whereby Adventus may earn a 75% interest in Salazar's wholly owned Curipamba Project by funding exploration and development expenditures of US\$25 million over five years, including the completion of a feasibility study on the El Domo deposit, which is expected to be completed within three years from signing of the agreement. Under the agreement, Adventus is required to fund 100% of the development expenditures to commercial production. Once commercial production has been achieved, Adventus will receive 95% of the dividends from the Project until its aggregate investment, including the US\$25 million, has been recouped minus the approximate Salazar carrying value of US\$18.2 million, after which dividends will be shared on a 75%/25% pro-rata basis with Salazar. During the option period both Adventus and Salazar are cited as operators of the Project, however, Curimining is providing 100% of the field management and services for all disciplines in Ecuador as Adventus has no staff or resources in Ecuador. Salazar will manage exploration and stakeholder relations relating to the Project in return for a 10% management fee worth a minimum of US\$350,000 per year. In addition, Adventus will provide Salazar with a US\$250,000 per year advance payment until the achievement of commercial production, to a maximum cumulative total of US\$1.5 million. The advance payment is to be repaid preferentially to Adventus upon start of commercial production.

On January 21, 2019, Altius Minerals Corporation entered into an agreement to acquire a 2% net smelter return (NSR) covering the Curipamba Project from Resource Capital Fund VI L.P. and RCF VI SRL LLC (collectively, RCF) for US\$10 million in cash.

## **PERMITS AND AUTHORIZATION**

Curimining has complied with all of its obligations to pay the conservation patent fees and to submit annual exploration reports for the tenements for each year dating back to at least 2014. Curimining holds an environmental licence to carry out exploration activities; environmental impact studies submitted by Curimining have been approved by the environmental authorities. Curimining has been granted permits to use water and rainwater for industrial mining purposes and has complied with all obligations of filing quarterly reports with local, regional, and national authorities in order to maintain such permits in good standing. In addition, all requirements for community involvement have been met by Curimining, and Curimining has been involved in community outreach programs for the past 10 years.

Between 2007 and 2019, Curimining was able to secure all surface access to the tenements (Table 4-2).



**TABLE 4-2 SUMMARY OF SURFACE ACCESS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Document	Seller	Date	Type	Area	Surface
Public Deed	Jacinto Joselito Guarnizo Torres y Sra.	2007-01-24	rural	Sesmo Sur-El Congreso	
Public Deed	Jeferson Hernán Barragán Gusmán and others	2007-02-08	rural	Sesmo Sur-El Congreso	
Public Deed	Flia Rueda	2007-02-26	rural	Sesmo Sur-El Congreso	
Public Deed	Segundo Manuel Rueda Aumala and others	2007-02-28	rural	Sesmo Sur-El Congreso	
Public Deed	Curia Guaranda	2007-03-07	rural	Sesmo Sur-El Congreso	
Public Deed	Ibarra Robayo Angel Ovideo y Sra.	2007-05-18	rural	Sesmo Sur-El Congreso	218.50
Public Deed	Flia Ulloa	2007-06-14	rural	Sesmo Sur-El Congreso	
Public Deed	Rea Llunitaxi Carlos Gerardo y Sra.	2007-06-15	rural	Sesmo Sur-El Congreso	
Public Deed	Núñez Bonilla Gastón Tucapel y Sra.	2007-07-24	rural	Sesmo Sur-El Congreso	
Public Deed	Flores Aguilar Gloria María and others	2007-09-04	rural	Sesmo Sur-El Congreso-La Vaquera	
Public Deed	José Franklin Ulloa Salazar y Sra.	2011-09-20	rural	Sesmo Sur-El Congreso	
Public Deed	Maria Manobanda		rural	Sesmo Sur-El Congreso	
Public Deed	Eugenio Ramiro Sarmiento y Sra.	2017-01-17	rural	Agua Santa	8.00
Public Deed	Julio Cesar Guapulema	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Lucina Guapulema	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Maria Petita Guapulema	2017-12-28	rural	Sesmo/El Domo	100.00
Public Deed	Elsy Moran Guapulema	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Julissa Guapulema Zuñiga	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Carmen Guapulema Galeas	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Marcos Guapulema Galeos	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Lucila Margot Guapulema	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Leidy Guapulema Galeas	2017-12-28	rural	Sesmo/El Domo	
Public Deed	Matias Alban		rural	El Domo-Naves Chico	10.00
Public Deed	Angel Belico García Ortiz y Sra.	2013-01-08	rural	El Domo-Naves Chico	39.70
Public Deed	Ramiro Quilligana	2017-07-11	rural	El Domo-Naves Chico	15.00
Public Deed	Fernando Bladimir Aguila Vera	2011-04-29	urban	Ciudad Las Naves	0.30
Public Deed	Marcelo Rodrigo Yáñez Barragán y Otra.	2011-05-17	urban	Ciudad Las Naves	0.46
Public Deed	Alberto Chariguamán Chela y Sra.	2016-12-27	urban	Ciudad Las Naves	
Public Deed	Fernando Bladimir Aguila Vera		rural	Las Mercedes	0.50
Lease	Hector Garcia and other (1 year lease)	2017-01-12	rural	El Domo-Naves Chico	87.96

RPA is not aware of any environmental liabilities on the property. Curimining has all required permits to conduct the proposed work on the property. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

## MINING RIGHTS IN ECUADOR

The following section has been extracted largely from [thelawreviews.co.uk](http://thelawreviews.co.uk) and Buenaventura Ingenieros S.A. (BISA), 2014a.

Ecuador passed a new Mining Law in 2009. The law was amended on July 16, 2013. Mining concessions can be obtained through public tender or auction processes. The public auction processes are for those mining areas that the state decides to delegate to a private party and that have not been subject to prior concession processes, while the process of public tender of mining concessions applies to those concessions that have expired or have been returned or reverted to the state. An exception for public tender or auction processes exists for right of the national mining company or foreign state companies or their subsidiaries, to acquire mining concessions directly from the state. In addition to the public tender and auction processes, the mining concession titles can be transferred between private parties, with previous written consent granted by the Ministry of Mines.

Mining concessions are granted for a term of up to 25 years; terms may be renewed for equal periods provided that, prior to its expiration, the mining concessionaire has presented a written petition to the Ministry of Mines. Mining concessions may be revoked by the state if minimum investments have not been made during any one year. Similarly, concessions rights may be revoked if after completion of one mining phase, the title holder does not apply for a change in concession status to reflect a more advanced mining phase.

Mining concessionaires have the exclusive right to prospect, explore, exploit, benefit, smelt, refine, market, and dispose of all mineral substances that may exist and may be obtained in the mining concessions. Currently, exploration and mining concessions are being tendered by the government to bidders under consideration of best practice in exploration and exploitation, financial and technical capacity, and commitment to high environmental standards.

The life cycle of mining concessions is broadly divided into an exploration and an exploitation phase. The exploration period is divided into three sub-periods including an initial exploration phase with a length of up to four years, an advanced exploration phase with a length of up to four years, and an economic evaluation phase of two years with the option to extend to a total of four years. In addition, mining concessions are divided into large-scale concessions, medium-sized mining and small-scale mining, as shown in Table 4-3. Holders of concessions



that fall under the small-scale mining regime do not need to follow the structured sequence of exploration, advanced exploration, etc., effectively allowing exploration and exploitation activities concurrently. The type of concession dictates royalties and other fees payable by the concession holder.

**TABLE 4-3 SUMMARY OF FEES RELATED TO MINING CONCESSIONS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Concession Type	Mass	Royalties	Annual Patent Payments	Labour profit-sharing	Taxes
Small	Up to 300 t underground, up to 1,000 t open pit, up to 1,500 t alluvial mining	3%	2% minimum wage	5% workers, 10% state	Income Tax (25%) VAT (14%, recoverable for mineral exporters as of Jan 1, 2018) Capital Outflow Tax (5%)
Medium	301 t to 1,000 t. Underground. 1,001 t to 2,000 t open pit, 1,501 t to 3,000 t per day in alluvial mining.	4%	2.5%, 5% and 10% per mining Phase 1	5% workers, 10% state	Windfall Tax removed in 2018  Sovereign Adjustment (this is not a tax <i>per se</i> , but it is an economic compensation to the state to fulfil the 50/50 profit distribution among the concessionaire and the state)
Large Scale	More than 1,000 t underground, more than 2,000 t open pit, and more than 3,000 t per day in alluvial mining	5–8% (Au, Ag, Cu)	2.5%, 5% and 10% per mining phase	3% workers, 12% state	

Mining rights are independent of the surface rights, however, mining concessionaires or mining rights titleholders have the right to acquire, buy, rent, lease, or lend the surface lands required for the development of the mining projects or related infrastructure.

The primary permits to conduct exploration include an environmental permit, granted by the Ministry of Environment, as well as a number of permits issued by the National Water Secretariat (SENAGUA).

## **5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY**

The following section has been extracted largely from BISA, 2014a.

### **ACCESSIBILITY**

International access to Ecuador is either through the airport in Guayaquil or Quito with daily flights to many international destinations. Road access to the area is along paved roads, which branch off at Ventanas and Zapotal from Highway 25 that connects Quito and the port city of Guayaquil (Figure 4-1). Driving time from Guayaquil to the Project is approximately 2.5 hours. There are three well-maintained gravel roads which provide access throughout most of the Project area, especially in the El Domo deposit area. Salazar has actively participated with local government in maintaining the gravel roads, as well as making improvements in certain area as part of the community outreach programs that also improve general access to the area for exploration and drill staff. Certain areas in the northern part of the Project can only be reached by mule or on foot.

### **CLIMATE**

The climate at Curipamba is tropical, humid, and hot most of the year. The wet season lasts from December to May, with the rest of the year considered to be the dry season. The average annual rainfall ranges from 2,100 mm to 2,900 mm, with most of the precipitation falling during the wet season. The climate has little effect on the operating season and exploration activities can be carried out year-round.

### **LOCAL RESOURCES**

The Project area is near the towns of Ventanas, Quevedo, and Babahoyo, as well as a number of smaller villages from where a general labour force and non-specialized supplies can be sourced easily. The local economy is largely agricultural in nature, and there are no large gold or base metal mines operating in this part of Ecuador; therefore, contractors, skilled labour, heavy mining equipment, and other mining and exploration specific items would need to be acquired elsewhere.

## **INFRASTRUCTURE**

There is basic infrastructure in the Project area such as good road access and household electricity (110 V). The national power grid, with access to higher voltage supply than 110 V, is within 20 km of the El Domo area in the Echeandía Canton.

The Runayacu River can be used as a water source.

There are areas on the property available for potential waste disposal areas and potential processing plant sites.

## **PHYSIOGRAPHY**

The Project is located in the transition zone between the Western Mountain Range (Cordillera Occidental) and the adjacent coastal lowlands. The physiography is characterized by floodplains to the west and moderate to steep-sloped hills to the east, with elevations ranging from 100 metres above sea level (MASL) to 1,000 MASL in less than seven kilometres of horizontal distance.

Vegetation in the area consists of thick forests, plantations of banana, cacao, and oranges, and cleared pastures for cattle.

Local drainage is provided by small rivers off the west side of the foothills. Primary drainage is through the Zapotal River that drains into the Babahoyo River, which ultimately empties into the Gulf of Guayaquil.

## 6 HISTORY

The following section has been extracted largely from BISA, 2014a and references therein.

The exploration history of the Curipamba Project dates back to 1991 when the first reported exploration activity occurred. In 1991, RTZ Mining PLC Inc. (RTZ) conducted a regional stream sediment reconnaissance survey near the Curipamba Project, collecting 548 samples. Results from this survey were in the public domain by 2004.

The Las Naves concessions were obtained by Mr. Leiva Ivan Santillan from the government in 2003; subsequently, in 2005, he transferred the properties to Amlatminas, a private Ecuadorian company owned by Mr. Salazar.

In 2004, Mr. Salazar and Mr. Geovani staked 16 claims comprising the original Curipamba property. The claims were held under Amlatminas. In September 2006, those claims were transferred to Curimining, a company at the time owned by Mr. Salazar and Mr. Acosta. Mr. Salazar and Mr. Acosta subsequently agreed to sell their shares in Curimining to Consolidated Kookaburra Resources Ltd (Consolidated Kookaburra). In March 2007, Consolidated Kookaburra changed its name to Salazar. Through these transfers of shareholding, Curimining is the Ecuadorian subsidiary of Salazar.

On March 13, 2006, Newmont Mining Corporation (Newmont) was granted a three-month exclusive access to the Curipamba property and agreed to possible joint venture (JV) terms in a Letter of Intent. Newmont conducted a bulk leachable extractable gold (BLEG) stream sediment survey comprising 225 samples. The Newmont BLEG stream sediment survey identified significant gold concentrations in streams draining mineralized areas, however, Newmont did not reach a final agreement and did not retain any interest in the property.

According to Lahti (2006), the BLEG method provided a good indication of epithermal gold mineralization. The method identified the claims above the Umbe River as having potential for gold and copper mineralization. The survey also identified the southern two-thirds of the Curipamba property as being enriched in gold, silver, arsenic, and, to a much lesser degree, copper. The enrichment in arsenic, silver, mercury, and molybdenum indicates an epithermal

signature over and adjacent to the gold-silver mineralization at Sesmo Sur, Las Naves Central, Roble, Caracol, and Piedras Blancas (Lahti, 2006).

In April 2007, Salazar contracted Geofísica Consultores of Peru to carry out induced polarization (IP) and magnetometer studies in the area where stream sediments, rock, and soil anomalies had been detected. As a result of this work, 13 chargeability and resistivity anomalies were identified in the El Domo and surrounding areas.

Between late 2007 and April 2008, initial core drilling (Phase I) was completed. A total of 51 core drill holes for 10,001.44 m tested 11 target areas (Buckle, 2009). Drill hole CURI-39 intersected 12.22 m of massive sulphide mineralization at 1.20% Cu, 4.54% Zn, 3.62 g/t Au, and 51.89 g/t Ag at El Domo in February 2008. Regional exploration also collected 1,842 prospecting rock samples and 1,413 soil samples.

On April 18, 2008, Ecuador's Constitutional Assembly passed a Constituent Mandate Resolution (the Mining Mandate) that provided, among other provisions, for the suspension of mineral exploration activities for 180 days or until a new Mining Law was approved. In January 2009, the new Mining Law was passed into law. The new Mining Law states that each company must negotiate an exploitation contract with the government.

In 2008 and 2009, Salazar carried out detailed mapping and core logging to establish in more detail the local stratigraphy and understand better the geology in light of the newly discovered massive sulphide mineralization.

Subsequent to January 29, 2009, the new mining regulations were implemented. Between March and May 2010, the government reissued titles of the Curipamba Project according to the new Mining Law to Curimining.

On June 3, 2010, Curimining received official notice from the Minister of Mines and Petroleum of Ecuador authorizing the restart of field operations. The notice granted Curimining the right to continue its exploration program in five properties within the Curipamba Project (Las Naves, Las Naves 2, Las Naves 3, Jordan 1, and Jordan 2) in central Ecuador, subject to receipt of certain permits. On January 14, 2010, Curimining received its water permit and filed an updated environmental impact assessment.

Between June 4 and September 23, 2010, a second drill program (Phase II drilling) was carried out at El Domo. The program comprised 20 core drill holes totalling 3,241.30 m. A total of 148 prospecting rock samples, 136 soil samples, and 135 stream sediment samples were collected in a regional exploration program.

In August 2010, Salazar commissioned Scott Wilson Roscoe Postle Associates (Scott Wilson RPA), the predecessor to RPA, to complete an initial resource estimate of the El Domo deposit. A Technical Report in support of the disclosure of the Mineral Resource estimate was filed on SEDAR on October 13, 2010 (Valliant et al., 2010).

Between September 2010 and August 2011, Curimining completed a third drill program comprising 84 core drill holes for a total of 15,699.50 m (Phase III drilling). Drilling was focussed on the El Domo deposit. Regional exploration also collected 85 prospecting rock samples and 224 soil samples.

In 2011, RPA completed an updated resource model of the El Domo deposit. This model incorporated results from the Phase III drilling. A Technical Report in support of the disclosure of the updated Mineral Resource estimate was filed on SEDAR on February 12, 2012 (Lavigne and McMonnies, 2011).

Between August 2011 and April 2012, Curimining completed a fourth drilling program (Phase IV drilling), again targeting the El Domo deposit. The program comprised 51 core drill holes for a total of 10,248.8 m.

In April 2013, Salazar commissioned BISA to complete a PEA (BISA, 2014a) of the El Domo deposit. The BISA PEA was supported by an updated Mineral Resource model that incorporated results from the Phase IV drilling. The BISA PEA is considered to be historical in nature and should not be relied upon.

In 2015, Salazar requested that, according to the Mining Law, the exploration status be upgraded to Advanced Exploration. This change in status was granted by the government. As part of the status change, Salazar relinquished certain parts of the property, resulting in a slightly smaller, overall tenement.

Between February 2016 and September 2017, Curimining completed a fifth drilling program (Phase V drilling), comprising 36 core drill holes for a total of 10,472.99 m. Drilling focussed on the El Domo deposit, specifically on the eastern and southwestern edges of the massive sulphide mineralization. Regional exploration also collected 52 prospecting rock samples.

In early 2017, Curimining commissioned a resistivity-IP survey over the Barranco Colorado target and interpretation of collected data. The survey consisted of seven survey lines with a total length of 9,650 m, spaced 200 m apart.

During 2018, Curimining undertook 100 core drill holes for a total of 18,933.26 m. Drilling focussed on the El Domo deposit, specifically within the open pit constrained Mineral Resource, firstly, to increase confidence in categorization of the known massive sulphide mineralization and, secondly, to provide material for a metallurgical work program.

Curimining also conducted general exploration within the Project during 2018 including mapping and collection of surface samples, as well as ground IP and magnetic geophysical surveys over the Sesmo target. Regional exploration also collected 224 prospecting rock samples and 333 soil samples.

There has been no past production on the property.

## 7 GEOLOGICAL SETTING AND MINERALIZATION

The Curipamba Project is located in central Ecuador, in the provinces of Bolívar and Los Rios near the town of Ventanas. It is part of the western and lowermost foothills of the northern Cordillera Occidental of the Andes, near the boundary with the western coastal plain (Figure 7-1). Geologically, the Project area is located in the central equatorial Andes, within the Macuchi Terrane, a predominantly juvenile magmatic island arc of Paleocene–Eocene age adjacent to the Amazonian Craton.

### REGIONAL GEOLOGY

The Andes of Ecuador comprise two mountain chains, the Cordillera Occidental and the Cordillera Oriental, separated by a central inter-Andean basin. To the west, the Cordillera Occidental predominantly consists of fault-bounded Cretaceous to Tertiary volcanic oceanic and island arc terranes (Litherland and Aspden, 1992; Kerr et al., 2002; Spikings et al., 2005). Here, strike-slip fault displacement along approximately north-south trending faults has resulted in a complicated assemblage of tectono-stratigraphic units that juxtaposes volcanosedimentary successions of similar lithologies but different ages. These terranes, of dominant oceanic affinity, have traditionally been interpreted as being successively accreted onto the western edge of the Amazon craton along a long-lived continental margin. Accretion occurred from the Late Jurassic to the Eocene. Superimposed on the accretionary assemblage are four magmatic arcs, which are related to the subduction of the Farallon/Nazca plate beneath the continent.

The largest and also the youngest accretionary units are the Pallatanga and the Macuchi terranes (Figure 7-1), which have been interpreted to have been accreted during the Eocene. The Macuchi Terrane, which hosts the Curipamba Project, is several hundred kilometres long and tens of kilometres wide. In the past, it has been interpreted as an allochthonous terrane accreted to the Pallatanga continental margin during the Late Eocene in response to the closure of a back-arc basin (Spikings et al., 2001; Hughes and Pilatasig, 2002; Kerr et al., 2002). Recent work suggests that the Pallatanga Terrane represents the oceanic basement of the Western Cordillera and a dismembered terrane from the Caribbean plateau (ca. 88 Ma;



Luzieux et al., 2006; Vallejo et al., 2006; Spikings et al., 2005; Vallejo et al., 2009). The exact nature of the Macuchi Terrane is yet to be confirmed. The presence of detrital zircon of Cambrian age inherited from the nearby basement suggests that the Macuchi Terrane may represent a forearc basin that formed near its present position and close to an eroding basement like that in the Eastern Cordillera.

The Macuchi Terrane crops out along the western flank of the Cordillera Occidental (between 0° and 2°30'S) and contains an intra-oceanic island arc volcanic sequence represented by the namesake Macuchi Group, which is interpreted as an oceanic plateau sequence. Radiometric and biostratigraphic ages suggest that the Macuchi Formation was deposited during the Paleocene to late Eocene (Egüez 1986; Spikings et al., 2005; Vallejo 2007). The Macuchi Group comprises predominantly submarine volcanic and volcanoclastic rocks with subordinate sedimentary rocks (BGS-CODIGEM, 1993; McCourt et al., 1997). More than 80% of the sequence is dominated by volcanoclastic and epiclastic rocks, including lithic-rich sandstone and breccia with accessory siltstone and chemical sediments. The latter are mostly cherty sediments grouped in a turbidite-like sequence. The sequence also includes domes and flows of basalt to basaltic andesite, with abundant pillow lavas/breccias and hyaloclastic textures as well as their sub-volcanic equivalents (dykes) of micro-porphyritic basalt and diabase. Most of these rocks show pervasive hydrothermal-submarine alteration with chlorite-epidote (Aguirre and Atherton, 1987). The non-volcanic sedimentary fraction is dominated by scarce calcarenite and recrystallized limestone, which are associated with what has been interpreted as a reef system (Hughes and Pilatasig, 2002). The Macuchi Group has an estimated minimum thickness of 2.0 km to 2.5 km (Aguirre and Atherton, 1987).

The Macuchi Group can be divided further into two primary sub-units (Chiaradia and Fontboté, 2001). The Basal Macuchi unit includes primitive basalt, mostly as submarine lava flows, interbedded with mudstone. The Main, or upper, Macuchi unit contains predominantly volcanoclastic, less primitive, basaltic andesite to andesite. Although most research emphasizes the predominance of mafic rocks, the Macuchi Group also includes several dacitic to rhyolitic domes that appear to be directly related to massive sulphide mineralization like those found at El Domo (Chiaradia and Fontboté, 2001; Vallejo, 2013), suggesting that the magmatism was bimodal.

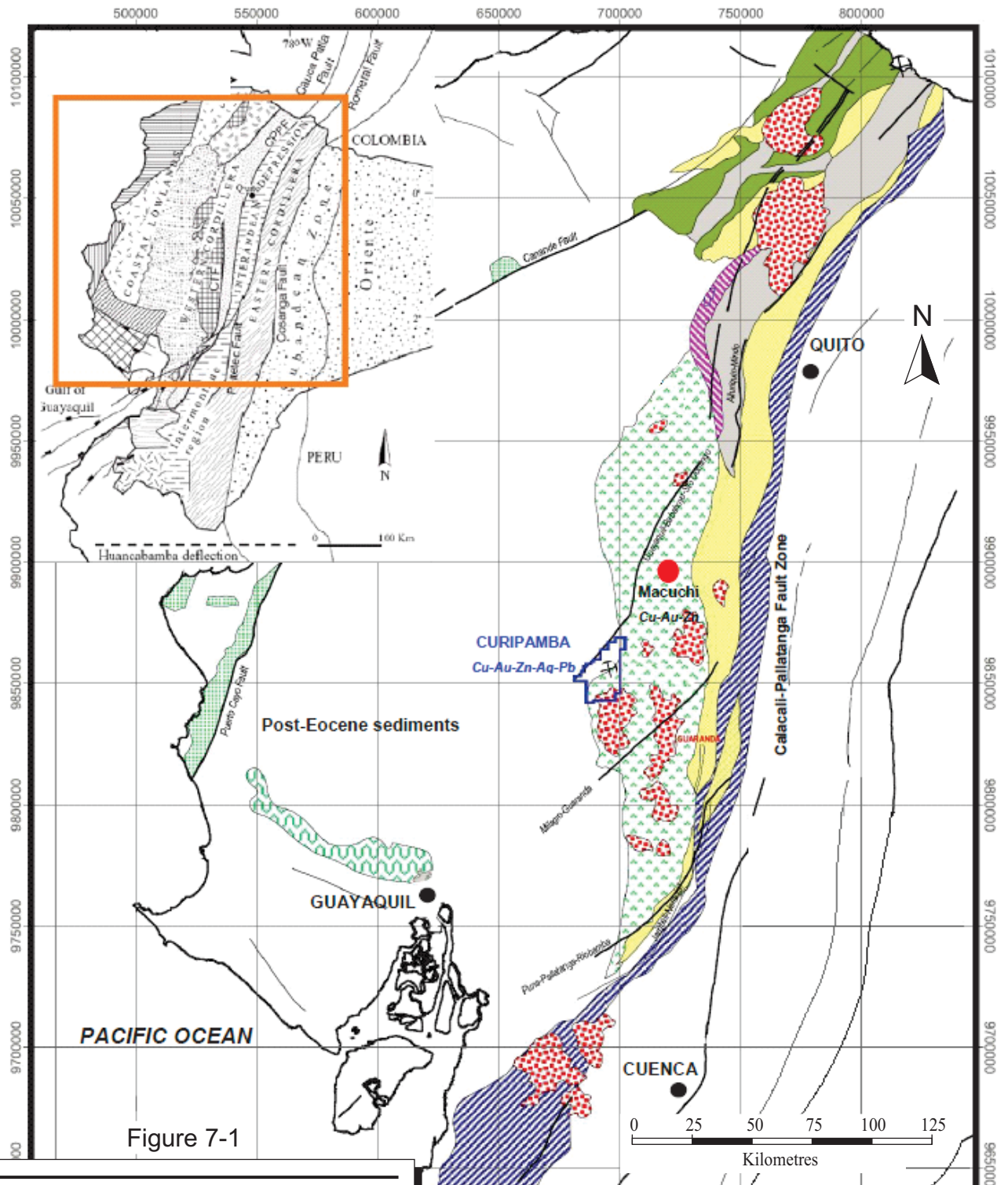


Figure 7-1

**Adventus Mining Corporation**  
**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
 Macuchi Terrane and  
 Location of VMS Deposits

**Legend:**

- |                    |                      |
|--------------------|----------------------|
| Fault              | Macuchi Block        |
| Tertiary Sediments | Piñon Unit           |
| Pattatangs Block   | Cretaceous Sediments |
| San Lorenzo        | Shear Zone           |
| Naranjal Unit      | Tertiary Batholiths  |

Source: C. Kerr et al., 2002.

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## PROPERTY GEOLOGY

The geology of the Project is characterized by the predominantly volcanic and volcanoclastic rocks of to the Macuchi Group of Middle Paleocene–Eocene age (Hughes and Pilatasig, 2002; Vallejo, 2007; McCourt et al., 1997). In the Project area, rocks of the Macuchi Group are overlain by Late Tertiary to Holocene volcanic rocks and Holocene alluvial deposits that are the dominant outcropping rocks. In addition, the Curipamba Project is covered by five metres to six metres of volcanic ash from eruptions of the Quilotoa Volcano. Radiometric dating of the footwall and hanging wall to the deposit indicates that the VMS deposit formed between  $42.13 \pm 0.54$  Ma and  $41.49 \pm 0.37$  Ma (Vallejo et al., 2016).

Specifically, the volcanic pile in the Project area comprises a basal rhyodacite unit overlain by two interfingering volcanoclastic sequences, one mafic and the other felsic, and two coherent younger lithofacies, one andesitic and the other rhyolitic, which intruded the sequence in both the north and south of the property. The massive sulphides are located along the contact between the rhyodacite and the volcanoclastic rocks but also within the mafic volcanoclastics. These latter rocks, locally known as grainstone, are interpreted as a marker unit in the immediate hanging wall of the massive sulphides (Franklin, 2009) that may be used to guide exploration for additional camp-wide resources. Figure 7-2 is a geological map of the Las Naves/El Domo area (Pratt, 2008). The strata are generally sub-horizontal with an overall synclinal shape. Numerous sub-vertical faults that strike northerly and east-northeasterly complicate the overall geology with vertical offsets of up to approximately 50 m.

The massive sulphides are related to a zone of abundant hydrothermal alteration, which includes extensive sericitization-silicification in the rhyodacitic footwall and widespread silicification-chloritization-argillitization in the overlying mafic volcanoclastic rocks. The rhyodacite hosts a sulphide-rich stockwork zone and abundant gypsum replacing earlier anhydrite. The known lateral extent of the massive sulphide mineralization is approximately 1,000 m by approximately 800 m. Additional mineralization increases the footprint of the known mineralization to approximately 1,300 m by 1,100 m.

The area lacks indication of regional metamorphism, such as metamorphic mineral assemblages or foliation fabric. Instead, volcanogenic textures such as sulphide replacement, collapse breccias, and peperites are widespread and well-preserved in core.

The formation of the El Domo deposit led to abundant stratabound hydrothermal alteration mainly controlled by the fluid-rock ratio and the composition of the protolith. Overall, the area is affected by a large hydrothermal halo related to the mineralization process. Felsic rocks in the footwall of the main mineralized body have been affected by quartz-sericite alteration, whereas polymictic breccias in the hanging wall have been altered irregularly to an assemblage including chlorite, phyllosilicates, and quartz. Other rocks in the area are virtually unaltered and only the igneous rocks show subtle seafloor hydrothermal alteration.

A characteristic feature of El Domo is large amounts of gypsum and its high-temperature precursor, anhydrite. The calcium sulphates  $\pm$  pyrite form thick veins and stratabound bodies that are up to five metres thick, mostly in a semi-continuous stratabound zone beneath the massive sulphides (Schandl, 2009). Anhydrite is common in recent submarine hydrothermal systems; its occurrence in an old system is evidence of the low amount of alteration and recrystallization post mineralization. The gypsum shows frequent evidence of ductile disturbance and movement along faults.



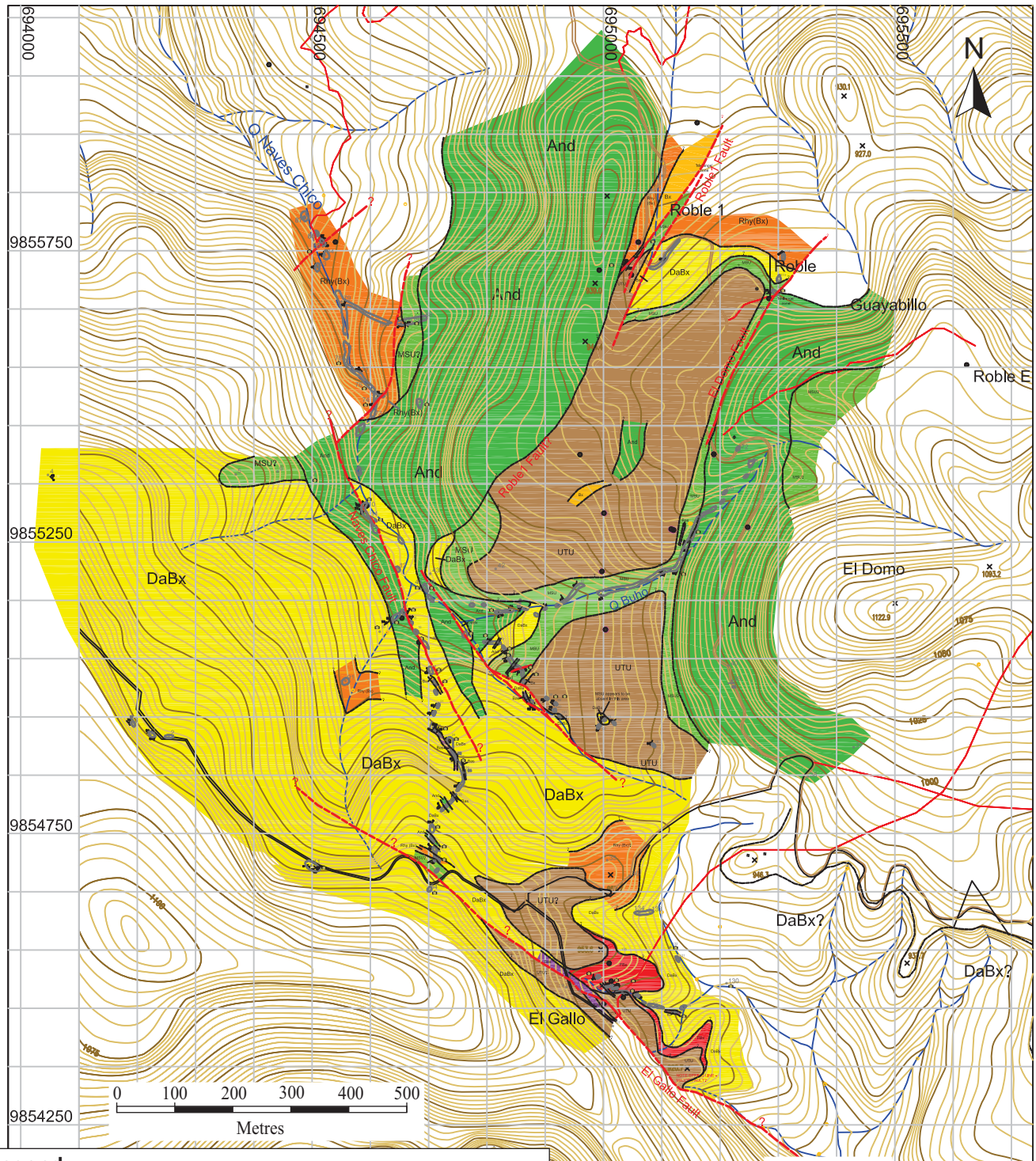


Figure 7-2

**Legend:**

LITHOSTRATIGRAPHY		INTRUSIVE IGNEOUS ROCKS & BRECCIA	
Paleocene-Eocene ('Macuchi Unit')	Upper Tuffaceous Unit	And	Porphyritic andesite (post-mineral)
	Massive Sulphide Unit	Bx	Hydrothermal breccia
	Dacite		
	Rhy (Bx)		
STRUCTURAL SYMBOLS			
Fault, inferred, Arrows show sense of offset.			
Geological contact, Inferred.			
Limit of exposure			
Bedding, compaction, or welding fabric			
Overturned bedding, compaction, or welding fabric			
Igneous contact			
Fault			
Quartz/chalcedony vein			
Igneous flow foliation			

Source: Modified from Pratt, 2008.

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**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**

Central Ecuador

**Property Geology**

## REGIONAL TECTONIC SETTING

The Project area has been interpreted as a north-northeast trending graben with a minimum size of approximately 6 km<sup>2</sup>. Structural investigations to date have identified a fault pattern consistent with dextral movement along major faults that resulted in the opening of pull-apart or transtensional basins. As interpreted by Mayor (2010), the graben is bounded by the steeply dipping Roble 1 and El Domo faults. It is truncated at the southwestern boundary, against footwall rocks, by the northwesterly striking Naves Chico Fault Zone and at the northeastern boundary, by an unnamed fault. The western edge is defined by the Cade and Cade Sur anomalies and a string of unnamed and untested prospects hosted in breccia. The graben structure itself is cross-cut by east-northeasterly striking extensional faults with little displacement that predominate in the area and control drainage.

Evidence for faulting is widespread in core and ranges from zones of intensely broken core indicating brittle faulting and cracking to distinct fault breccia and gouge with features of brittle-ductile shearing in the rocks with strong argillic alteration. Locally, these latter structures define major shear zones with up to 10 m of hydrothermally altered rocks (including brecciated and sheared fragments of massive sulphides) showing tectonic cleavage and, therefore, indicative of brittle-ductile behaviour. Furthermore, Pratt (2008) describes the injection of ductile sericite/illite and gypsum into the fault zones and forming significant amounts of the fault gouge.

Current understanding of the timing of structural events is that the graben formed in the Eocene in a transpressional stress regime that also controlled the deposition of the volcanosedimentary rocks of the Hanging Wall Unit. The geological data suggest that the El Domo deposit formed in a third-order basin within a larger intra-magmatic arc basin. There are no geophysical or geological data supporting the presence of a caldera, however, the structure and composition of the volcanoclastic rocks are typical of caldera settings.

Late extensional faults likely led to local remobilization of sulphide mineralization and further modified north trending grabens likely related to post-collisional transform faults of post-Eocene to Quaternary age. Late dextral reactivation has also been observed in many of the faults, likely related with the modern reactivation of the Chimbo-Toachi Shear Zone.

## MINERALIZATION

Pratt (2008) was the first to document and describe a Kuroko-type VMS environment on the Curipamba concessions. He established a lithostratigraphy for the Las Naves/El Domo area in which massive sulphide mineralization rests on a footwall sequence of rhyolite and dacitic autobreccias. He divided the sulphide mineralization into five types:

1. Massive sulphides with indistinct texture. In some places, a fragmental texture can be seen within the sulphides, suggesting that they may be formed by the replacement of lapilli tuff.
2. Sulphide-altered lapilli tuffs and peperites.
3. Transported sulphide fragments within polymictic lapilli tuffs.
4. Sulphide “pseudo”-fragments within polymictic lapilli tuffs.
5. Rare, thinly laminated siliceous chert with banded sulphides.

The mineralized zone at El Domo is an intact, upright, and only mildly disturbed Kuroko-type VMS deposit. As such, it displays the characteristic zoning of the model type from the underlying feeder pipe area through vertical and lateral variations upward to the abrupt termination of the massive sulphides against the characteristic hanging wall grainstone marker defined by Franklin et al. (2005). Over time, the evolution of the hydrothermal mineralizing system and the growth of the mineralized deposit account for the spectrum of mineralization types distinguished by Pratt.

Schandl (2009) conducted a petrographic study on 17 core samples from the Naves Central area and provided the first details on the mineralogy. Sphalerite, chalcopyrite, and pyrite are the principal sulphides in the mineralized rocks from the Curipamba prospect. Galena is less common, and tennantite/tetrahedrite and covellite are minor phases. Gold was identified within sphalerite + galena + barite mineralization, where it occurs as minute (5 µm to 50 µm) inclusions in sphalerite. The colloform banded sphalerite also contains an abundance of large, partly dissolved inclusions of skeletal galena. Careful microscopic examination revealed that gold was introduced to sphalerite via fractures with late chalcopyrite. Minute gold also occurs on the rim of some galena and is intergrown with some chalcopyrite. The galena is partly replaced by tennantite, and it is rimmed and cross-cut by chalcopyrite veinlets. Two small grains of gold were also identified in a late carbonate veinlet that cross-cuts the sphalerite. The sphalerite is a pure zinc end-member with little or no iron content. In a number of samples, sphalerite is colloform banded and, just as some pyrite, often has framboidal texture. Textural



evidence suggests that galena was largely contemporaneous with sphalerite, and both post-dated the pyrite. Tennantite and tetrahedrite represent a relatively minor phase and both crystallized at the expense of galena and less commonly, pyrite. Chalcopyrite was the last sulphide to crystallize in the polymetallic assemblage. In some samples, fragmented pyrite and sphalerite are “flooded” and partly replaced by massive chalcopyrite. Locally, chalcopyrite is stained to an unusual purple/blue colour. Microprobe analysis showed that in these domains the chalcopyrite has an unusual chemistry, and contains 2.2 wt% Br to 3.7 wt% Br. Galena occurs as a skeletal inclusion in chalcopyrite and as replacement after pyrite. It contains inclusions of, and can be partly replaced by, tennantite and tetrahedrite. Covellite and chalcocyanite occur within sediments. Covellite forms a rim on detrital sphalerite and some pyrite, and chalcocyanite (anhydrous Cu-sulphate) is disseminated through the matrix. Barite is the principal gangue mineral (Schandl, 2009).

Mineralization at El Domo is broadly zoned with an upper “cap” of barite, enriched variably in silica sphalerite, galena, and gold. This cap is underlain by a massive sulphide zone with local zoning of zinc-rich mineralization along the hanging wall contact and a copper-rich base. Vallejo et al. (2016) describes the vertical zonation of massive sulphides well-developed where the stockwork grades over a few metres into massive pyrite which is irregularly replaced by abundant chalcopyrite. The copper-rich zone is overlain by the zinc-lead zone dominated by coarse grained low-iron sphalerite, and associated skeletal galena with subordinate pyrite. The contact between the copper and zinc-lead zones is polymetallic and marks the replacement of the zinc-lead assemblage by the copper-rich one.

Mineralization in the grainstone shows evidence of at least two mineralization events. The sulphides include breccias which appear to have been caused by some form of collapse (possible anhydrite dissolution), while interstitial spaces were infilled by sphalerite and, in some cases, chalcopyrite. This brecciation replacement texture is common in many massive sulphide mounds as they grow by “displacement” or expansion. During this process, the core of a mound is constantly impregnated by high temperature hydrothermal fluid, displacing the lower temperature minerals outwards and leading to a constant zone refinement of the mineralization. Some samples of massive sulphide in CURI 0-08-48 display ovoid features that may be replaced tube worms that have become incorporated in a growing sulphide mound on the seafloor (Franklin, 2009).



Massive sulphides overlie a stockwork zone which is characterized by quartz-sericite alteration and was likely related to a major hydrothermal brecciation event (Vallejo et al., 2016). The sulphide mineralization occurs in veins of quartz with pyrite and some proportions of chalcopryite, sphalerite, and minor galena. Additionally, sulphides can occur as replacements of altered rhyodacite, both as disseminations and in textures that mimic the magmatic flow banding (Vallejo et al., 2016)

The sulphide and precious metal compositions have numerous unusual features, usually associated with high temperature systems that have achieved boiling just prior to their expulsion on or near the seafloor. The exceptionally high gold recorded in many of the upper zones in all of the occurrences, together with the anomalous antimony, arsenic, mercury, and bromine contents of some of the minerals, can only be achieved by this process, which enables exceptionally efficient gold precipitation. Gold is conserved in the vapour phase of a hydrothermal fluid, and thus may be deposited over a much wider area than the base metals. At Curipamba, gold is generally associated with baritic exhalite.

## 8 DEPOSIT TYPES

The mineralization at El Domo shares most of the features of a VMS deposit (Franklin et al., 2005; Franklin et al., 1981; Large, 1992; Large et al., 2001; Lydon, 1996; Lydon, 1988a; Lydon, 1988b). VMS deposits are major sources of Zn, Cu, Pb, Ag, and Au, and can contain trace metals such as Co, Sn, Se, In, Bi, Te, Tl, Ga, and Ge. There are over 800 VMS deposits known worldwide, up to 56 of which are considered world class (>32 Mt). VMS deposits occur throughout geological history and typically occur in clusters, or camps, such as the Noranda and Matagami Camps in the Abitibi Greenstone Belt, the Flin Flon – Snow Lake Camp in the Flin Flon Greenstone Belt, the Bathurst Camp in New Brunswick, the Iberian Pyrite Belt in Spain, and the Mokuroko district in Japan (Large and Blundell, 2000).

Deposits of this type are spatially and chronologically related to submarine felsic and/or mafic volcanism and are characterized by an underlying stockwork or feeder zone related to major hydrothermal alteration, which is typically more prominent in the footwall than in the hanging wall, and massive or semi- massive mineralization formed on or near the seafloor.

The principal model for the genesis of VMS deposits include a submarine rifting environment, where a sub-seafloor magma chamber drives a hydrothermal convective cell. Cold unmineralized sea water enters the oceanic crust through faults and cracks distal to the magma chamber. As the fluids circulate as part of the convective cell, fluids become progressively heated due to increasing proximity to the magma chamber and, in the process, leach metals out of the surrounding rocks. Eventually, fluids ascent back to the seafloor along focussed exit pathways due to a lower specific gravity than surrounding water as heated, metal laden hydrothermal fluids. Renewed interaction with cold, low Eh and pH seawater at and near the seafloor leads to the precipitation and deposition of metals that were held in solution.

Most ancient VMS deposits still preserved in the geological record formed mainly in oceanic and continental nascent-arc, rifted-arc, and back-arc settings. The crustal composition exerts a major control on the mineral contents of VMS deposits, with Cu-Au-(Zn) deposits forming mainly on the primitive crust and Zn-Cu-Pb-Ag deposits on continental crust (Barrie and Hannington, 1999).

## 9 EXPLORATION

Adventus has not carried out exploration activities on the Curipamba Project. During the option period, both Adventus and Salazar are cited as operators of the Project, however, Curimining is providing 100% of the field management and services for all disciplines in Ecuador as Adventus has no staff or resources in Ecuador.

Historical exploration in the Project area is discussed in Section 6 History.

## 10 DRILLING

All drilling on the Project has been completed by Curimining, the current operator of the Project.

Drilling was carried out between 2007 and 2018 in six distinct phases, during which Curimining completed 342 core drill holes for a total of 68,597.24 m (Table 10-1). Curimining used HQ (63.5 mm), NQ (47.6 mm), and BQ (36.5 mm) sized boring equipment. Due to the locally steep terrain, Curimining used two small, man-portable drill rigs capable of reaching maximum drill depths of approximately 1,000 m.

The majority of drilling to date has focussed on the open pit constrained Mineral Resource for the El Domo deposit (Figure 10-1). The 2018 drilling focussed on infill core drilling at El Domo to decrease borehole spacing to approximately 25 m to 35 m with a focus in the area of the starter pit (approximately the first seven years of mine production).

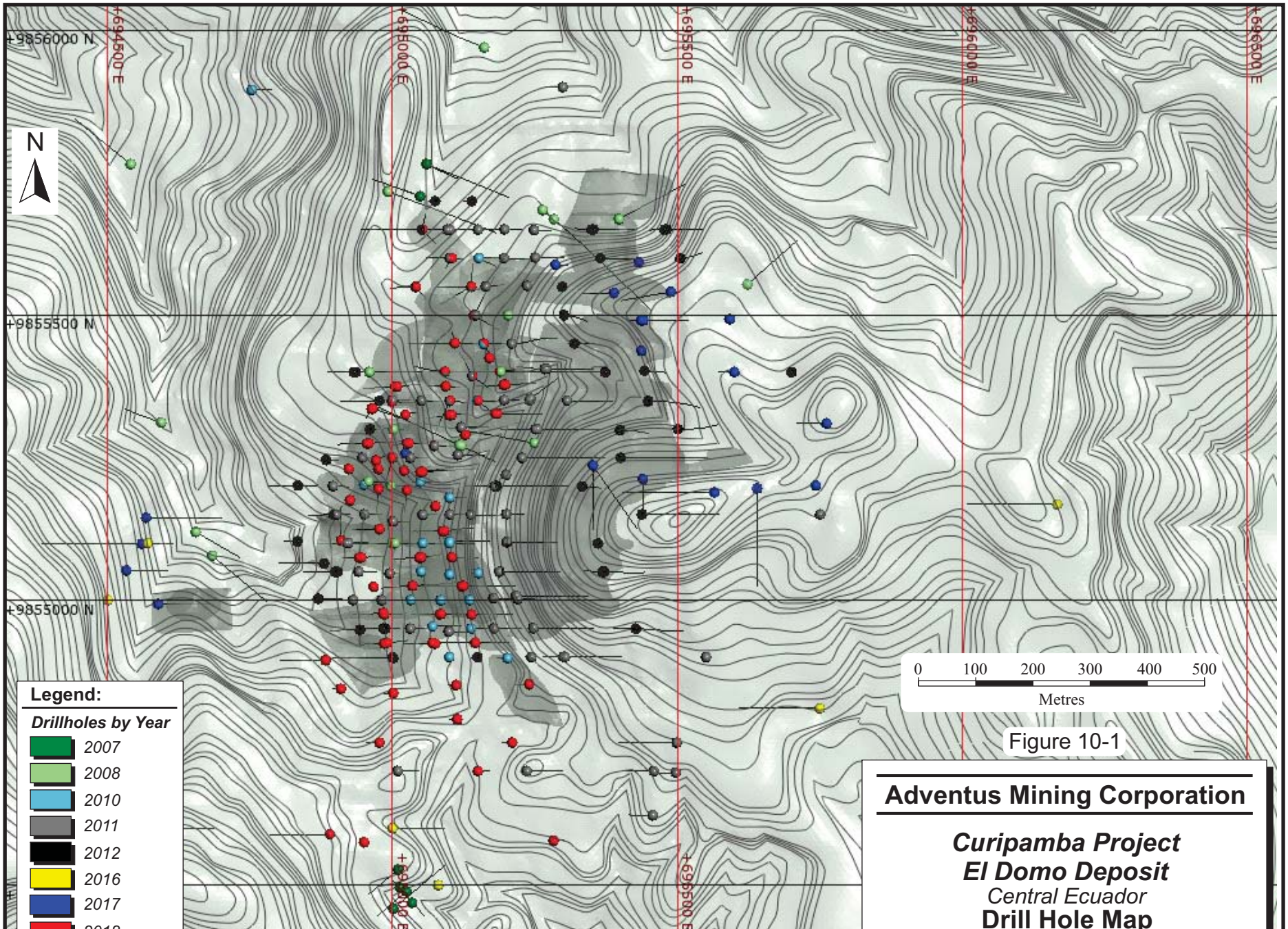
Despite abundant faulting, core recovery has been excellent at or exceeding 90%. RPA did not identify any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results.

**TABLE 10-1 SUMMARY OF DRILLING**  
**Adventus Mining Corporation - Curipamba Project – El Domo Deposit**

Drill Program	Year	Number of Holes	Combined Length of Holes (m)	Targets
Phase I	2007/2008	51	10,001.44	Sesmo Sur, El Gallo, Roble 1, El Roble, Roble Este, Cade Sur, Cade 1, Cade, Caracol 1, El Domo
Phase II	2010	20	3,241.3	El Domo, Sesmo Sur, La Vaquera
Phase III	2010/2011	84	15,699.50	El Domo
Phase IV	2011/2012	51	10,248.75	El Domo
Phase V	2016/2017	36	10,472.99	El Domo, Barranco Colorado
Phase VI	2018	100	18,933.26	El Domo, Sesmo, Caracol
<b>Total</b>		<b>342</b>	<b>68,597.24</b>	

Drilling established the geology of the El Domo deposit accurately enough to use the resulting model for resource estimation purposes. As a result of the 2018 in-fill drilling, 33 cross sections at 25 m apart, with detailed geological interpretation, were created to improve understanding of the geological framework and structural setting.





June 2019

Source: RPA, 2019.

## DRILLING PROCEDURES

Drill holes were spotted by Curimining personnel initially using a global positioning system (GPS) receiver with real-time kinematic (RTK) capabilities, and since approximately 2011 with a GPS total station, prior to the drill rig being moved into position. Fore- and backsites were placed to aid in setting the drill to the correct azimuth. The dip was set and confirmed by Curimining using a clinometer.

To minimize impact on the local environment, Curimining employs low impact, hydraulic, man-portable, drill rigs. Each drill pad is stabilized using filled rice sacks creating a leveled foundation platform used by the drilling equipment. Upon completion of the drilling, the rice bags are emptied and the terrain is returned to its original contour. With vegetation naturally regenerating the area of where the drill pads were located, it is imperceptible from undisturbed ground. A concrete marker is placed over the collar location for future inspection with the drill hole number etched into the concrete.

Between 2007 and 2017, drill holes were completed on an approximately 50 m by 50 m spaced grid over the main El Domo deposit. In 2018, the drill spacing was decreased to 25 m, particularly in the open pit constrained Mineral Resource portion of the deposit. The majority of the drill holes in the El Domo deposit area between 2007 and 2017 were drilled with an azimuth of 90° or 270°, which was consistent with drill section orientation. In 2019, Adventus engaged Drilling Reporting Targeting (DRX), a software program by Objectivity.ca, to aid in drill layout planning for the sixth phase of drilling at El Domo deposit. DRX employs optimization algorithms that can create drill plans to control costs while maximizing conversion of Mineral Resource categories.

Final drill hole positions were surveyed using the same instrumentation used for initial hole spotting.

Downhole surveys were completed using a Reflex tool. No additional surveys were conducted along the drill hole trace.

Core was placed into wooden core boxes at the drill and were quick-logged prior to transport and storage. Core transport from the drill to Curimining's field office and core logging facility in Las Naves was performed by Curimining personnel. At the core shed, Curimining



technicians determined rock quality designation (RQD) and rock mass rating (RMR), confirmed run lengths, and prepared the core for logging. Core boxes were labelled with drill hole number, box number, and core “from” and “to” data. Curimining uses a fixed, standardized set-up to photograph two core boxes with uncut core at a time, to create a full photographic record of all core prior to sampling.

In addition to RQD and RMR recorded for each run of core, point load testing (PLT) is performed to provide additional geomechanical information about lithologies. PLT is done both parallel and perpendicular to the plane of anisotropy on intact core that is representative of a lithology, which ensures that intervals with quartz veins and/or healed joints are not tested.

# 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

## CURIMINING DRILLING CAMPAIGNS

Curimining used two primary analytical laboratories throughout the six core drilling campaigns: BSI Inspectorate (Inspectorate) or ALS Chemex Laboratories (ALS Chemex). Both laboratories are certified to ISO 9001:2000 and ISO17025 and are independent of Curimining and Adventus.

The core is photographed, logged, marked for sampling, sawn, bagged, and sealed in rice bags for shipment by Curimining personnel to their logging facility at Las Naves. The logging facility consists of a walled and locked compound in which core is stored in a locked warehouse. Data are kept secure in a locked building within the compound with access only by selected Curimining staff.

Logging was performed by qualified Curimining personnel who also determined sample intervals. Core was cut lengthwise on core saws; one half of the core remained in the core box for reference, while the other half was prepared for shipment to the analytical laboratory. Sample tags were placed in the core box, in the sample bag, and the last part of the sample tag remained as a reference. Individual bagged samples were collated into sample shipments with sample numbers written on the outside of the shipping bags.

Shipment of sample batches for assay was overseen by a Curimining geologist and sent with a chain of custody by pickup truck from Las Naves to Quito for sample preparation at either Inspectorate or ALS Chemex Laboratories. After preparation, sample pulps were shipped by TNT courier to Inspectorate or ALS Chemex laboratories in Lima, Peru for analysis.

At Inspectorate, the precious metal grades were determined using fire assay and atomic absorption (AA) spectroscopy (procedure Au-25). Base metals were determined by inductively coupled plasma (ICP) spectroscopy. At ALS Chemex, precious metals were determined by the fire assay and AA spectroscopy and base metals, by ICP.



RPA confirmed the adequacy of the samples taken by Curimining, Curimining's analytical quality assurance/quality control (QA/QC) program, the security of the shipping procedures, the sample preparations, and the analytical procedures at the two laboratories.

## **BULK DENSITY DATA**

Curimining collected density data from approximately 10 cm long, uncut core sub-samples using a water immersion method. Friable and/or vesicular samples were coated in paraffin wax to account for porosity. Density determinations were completed by qualified staff in the core storage and logging facility in Ventanas. Density data was collected on the infill drilling for every sample sent to the laboratory and the lithology units above the El Domo deposit. Specific gravity data was collected on the infill drilling for every sample sent to the laboratory and the lithology units above the El Domo deposit. As part of the specific gravity control, 53 samples were sent to the Inspectorate laboratory. On average, the Inspectorate specific gravity measurements were approximately 11% higher. RPA recommends that this differences be further investigated.

## **QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM**

Quality control measures are typically set in place to ensure the reliability and trustworthiness of exploration data. Measures include written field procedures and independent verifications of aspects such as drilling, surveying, sampling and assaying, data management, and database integrity. Appropriate documentation of quality control measures and regular analysis of quality control data are important as a safeguard for project data and form the basis for the quality assurance program implemented during exploration.

Analytical control measures typically involve internal and external laboratory control measures implemented to monitor the precision and accuracy of the sampling, preparation, and assaying process. These measures are also important to prevent sample mix-up and to monitor the voluntary or inadvertent contamination of samples.

Assaying protocols typically involve regularly duplicating and replicating assays and inserting quality control samples to monitor the reliability of assaying results throughout the sampling and assaying process. Check assaying is normally performed as an additional test of the

reliability of assaying results. It generally involves re-assaying a set number of sample rejects and pulps at a secondary umpire laboratory.

Curimining used a range of commercial, certified and prepared, non-certified reference materials and blanks throughout the drilling programs. Tables 11-1 through 11-3 summarize the types and frequency of materials used by Curimining during the 2018 drill program.

**TABLE 11-1 SUMMARY OF BLANK SAMPLES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Hole ID	Blank Material			TOTAL
	BK	BL-115	BL-112	
CURI 240 - CURI 253	6	1	7	14
CURI 254 - CURI 267	16	0	18	34
CURI 268 - CURI 281	8	0	16	24
CURI 282 - CURI 295	1	2	7	10
CURI 296 - CURI 310	0	24	12	36
CURI 311 – CURI 330	0	33	0	33
<b>Total</b>	<b>31</b>	<b>60</b>	<b>60</b>	<b>151</b>

**TABLE 11-2 SUMMARY OF DUPLICATE SAMPLES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Hole ID	TOTAL
CURI 240 - CURI 253	<b>12</b>
CURI 254 - CURI 267	<b>16</b>
CURI 268 - CURI 281	<b>17</b>
CURI 282 - CURI 295	<b>15</b>
CURI 296 - CURI 310	<b>16</b>
CURI 311 – CURI 330	<b>25</b>
<b>Total</b>	<b>76</b>

**TABLE 11-3 SUMMARY OF STANDARD REFERENCE SAMPLES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Hole ID	PM-1123	CU-152	CU-155	CU-160	CU-163	CU-174	CU-175	Total
CURI 240 - CURI 253	9	0	7	7	0	0	7	<b>30</b>
CURI 254 - CURI 267	18	2	16	15	0	2	20	<b>73</b>
CURI 268 - CURI 281	9	0	9	10	0	0	10	<b>38</b>
CURI 282 - CURI 295	7	6	8	5	5	3	10	<b>44</b>
CURI 296 - CURI 310	14	18	0	15	1	24	0	<b>72</b>
CURI 311 – CURI 330	0	17	0	17	0	34	0	<b>68</b>
<b>Total</b>	<b>57</b>	<b>43</b>	<b>40</b>	<b>69</b>	<b>6</b>	<b>63</b>	<b>47</b>	<b>325</b>

## BLANKS

Curimining utilized three different types of blank material, two certified materials from WCM Minerals and a custom material provided by Inspectorate. A number of failures were reported, but were considered to be non-material due to the low grades. Nevertheless, RPA recommended investigating the reason for failures and suggested that a slight sample contamination issue existed. Table 11-4 is a summary of failure rates for the blank reference materials. Figures 11-1 and 11-2 are graphical representations of the performances of blank materials for gold, silver, copper, zinc, and lead.

**TABLE 11-4 SUMMARY OF BLANK FAILURES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

	Gold	Silver	Copper	Lead	Zinc	Total
No. Assays	112	86	117	86	117	518
No. values outside 3 SD	3	0	9	0	9	21
Percent outside 3 SD	2%	0%	8%	0%	8%	1%

**FIGURE 11-1 PERFORMANCE OF BLANK REFERENCE MATERIAL BL 112**

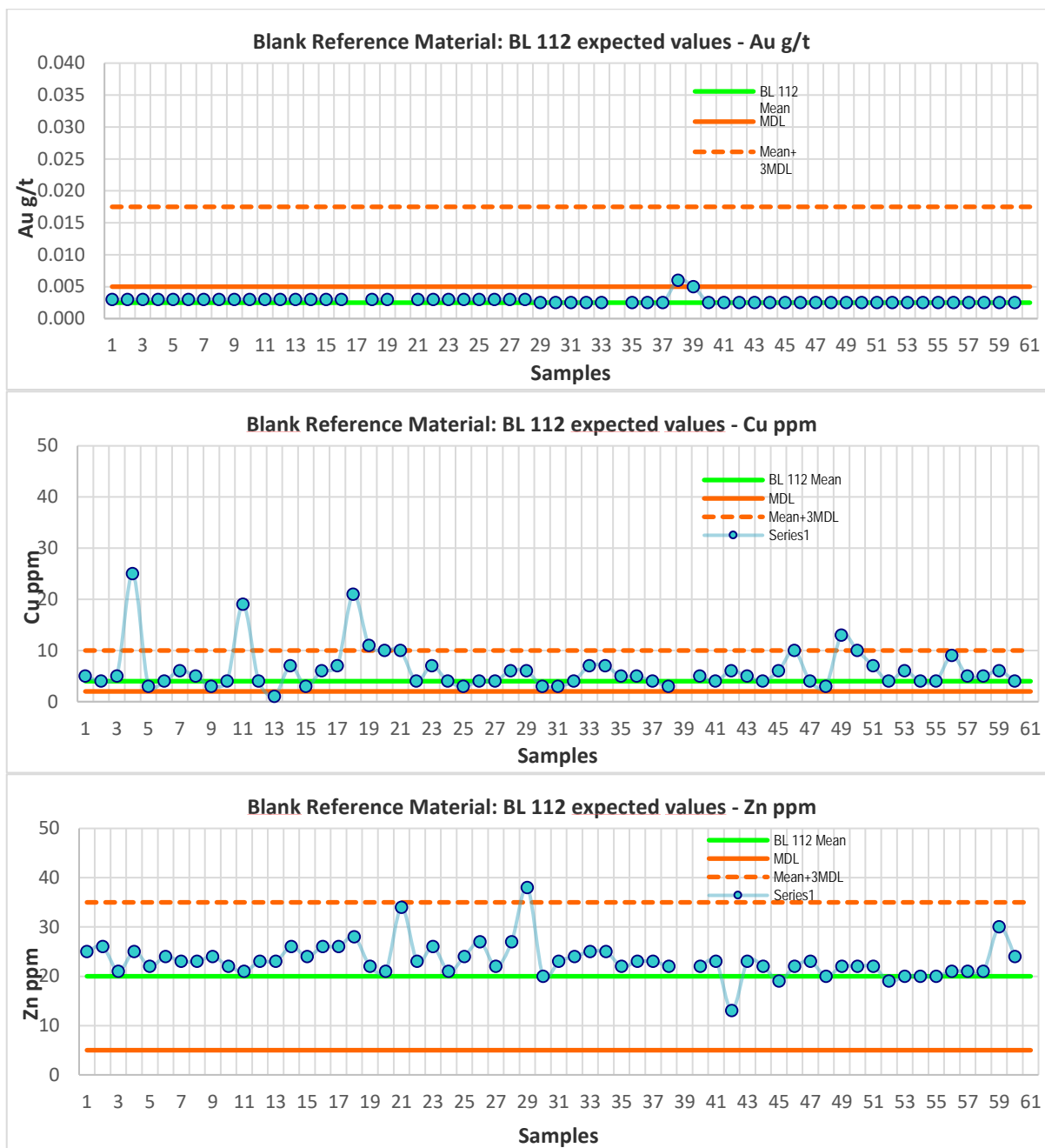
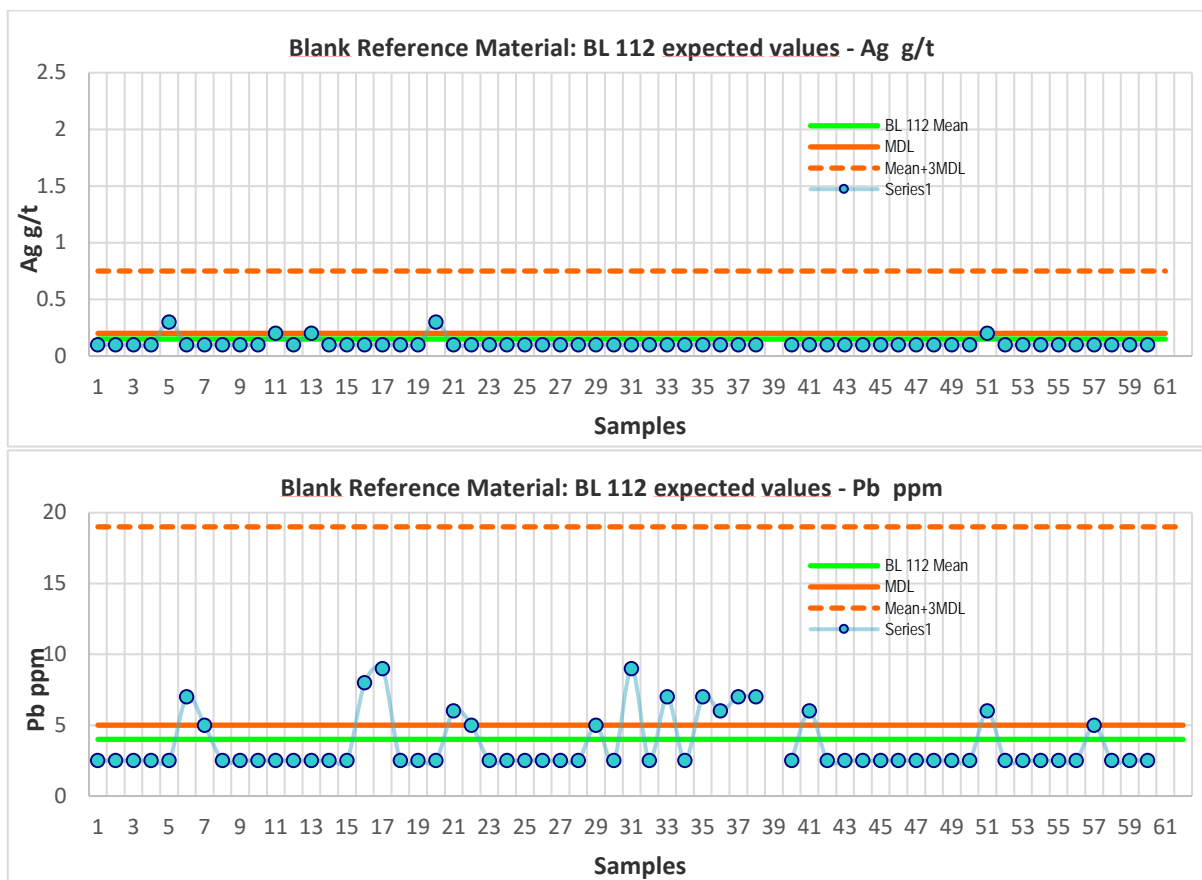


Figure 11-1 Cont'd



**FIGURE 11-2 PERFORMANCE OF BLANK REFERENCE MATERIAL BL 115**

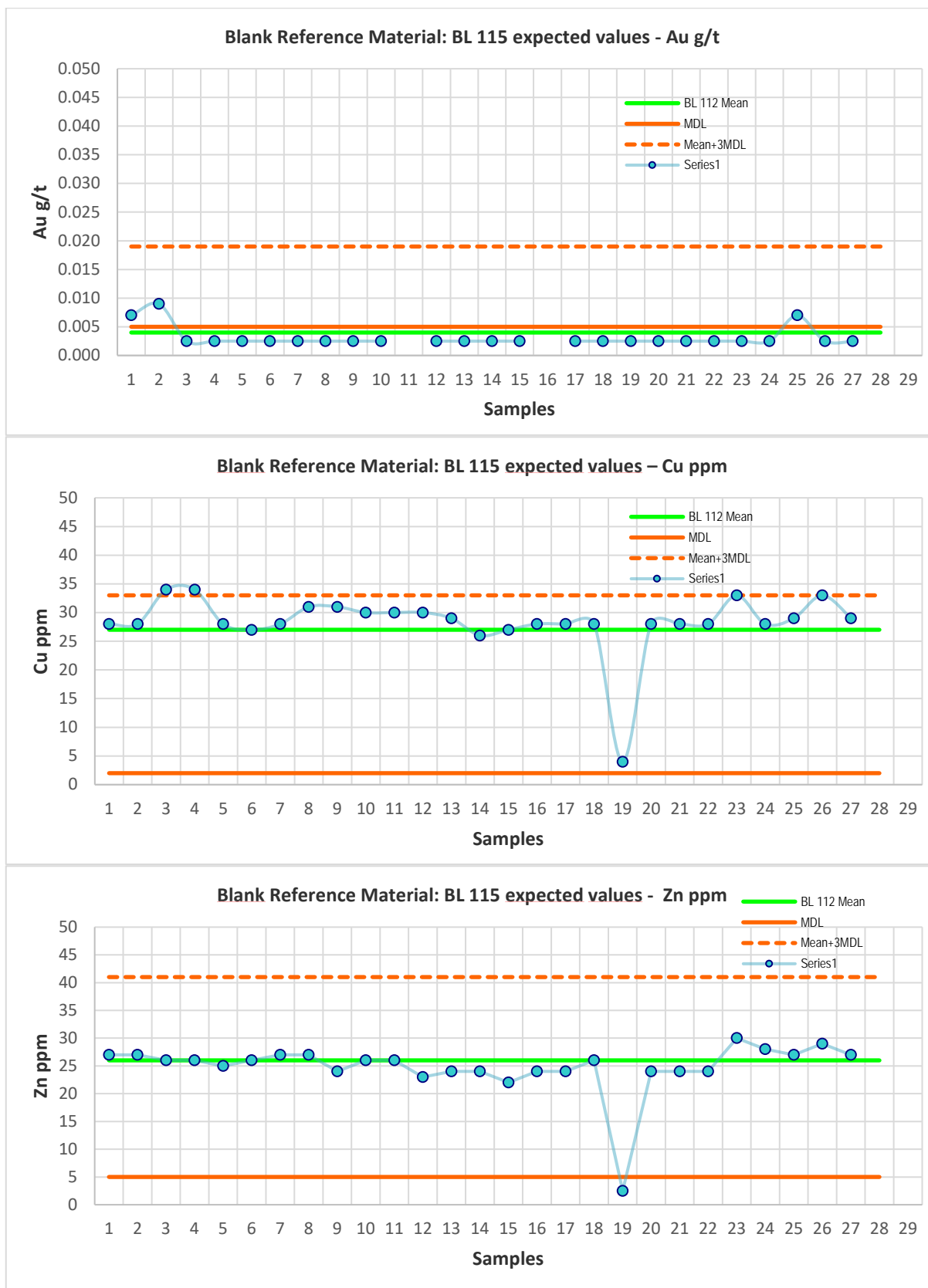
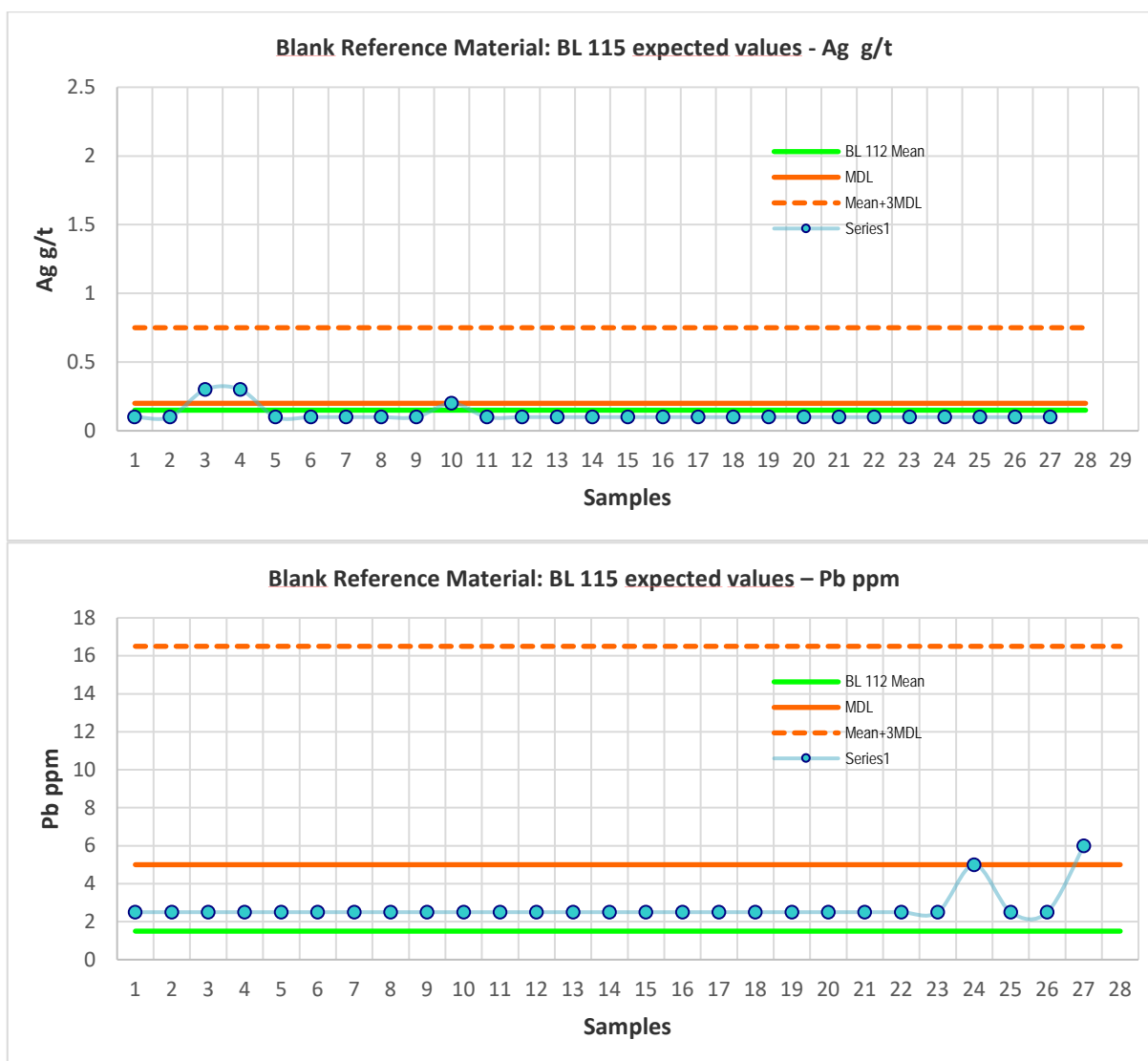


Figure 11-2 Cont'd



## STANDARDS

RPA analyzed the analytical quality control data for the 2018 drilling campaign. Curimining's analytical quality control program comprised the insertion of standard reference material (SRM) into the normal sample stream, as well as pulp duplicate analyses at a secondary laboratory. Insertion rates were considered to be in line with industry practice.

Curimining utilized seven different SRMs to cover a range of expected mineralization grades of gold, silver, and copper. SRMs were sourced from WCM Minerals in Burnaby, British Columbia.

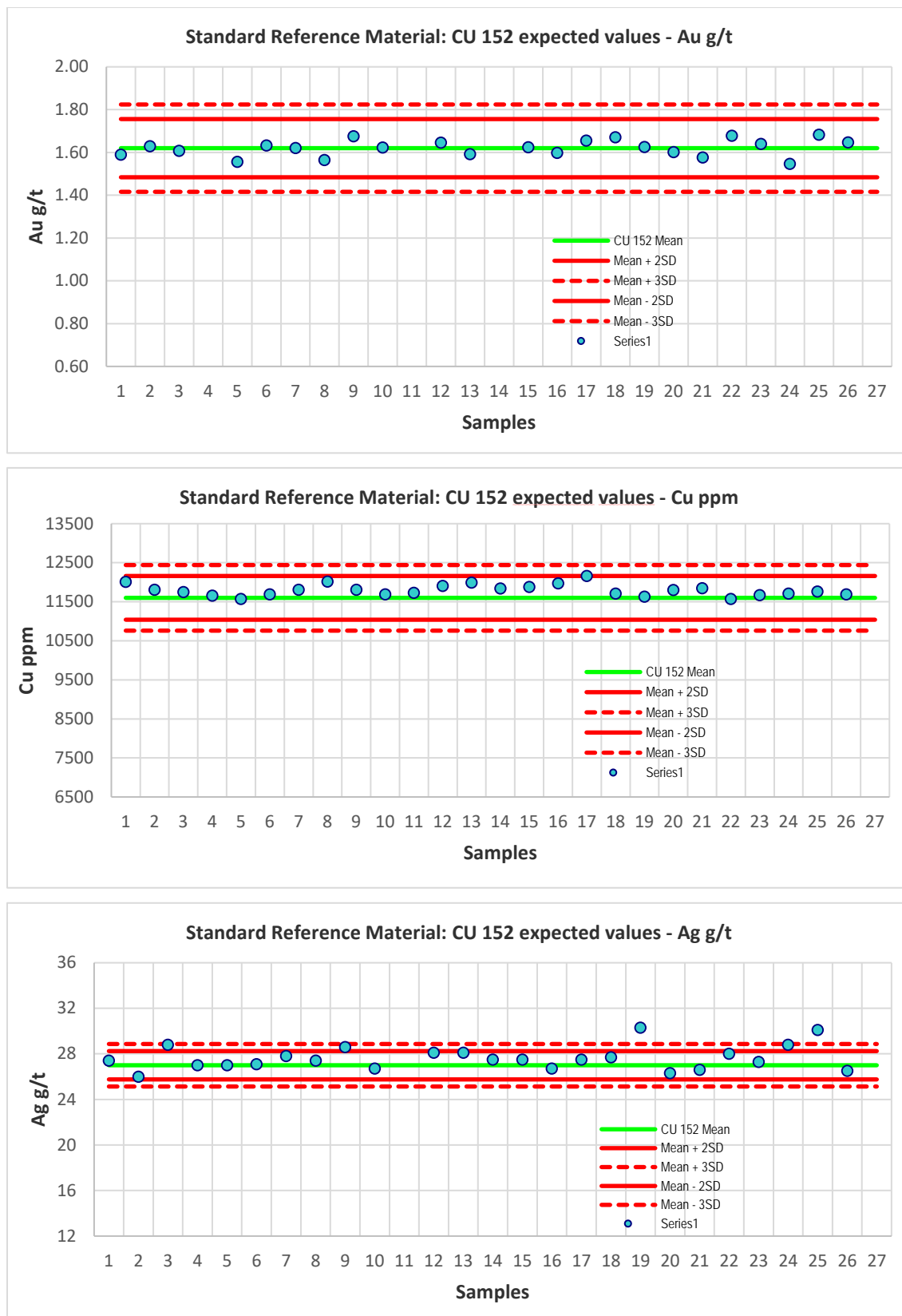
The SRM performance was generally acceptable; one standard (Cu 160) had a more than 10% failure rate. RPA recommended a follow-up investigation to identify the reason for the failures. Additional analyses that returned values outside of three standard deviations (SD) from expected values were few, and RPA considered them to be non-material. Table 11-5 summarizes SRM failure rates. Figures 11-3 to 11-9 are graphical representations for each SRM used during the 2018 drilling campaign.

**TABLE 11-5 SUMMARY OF STANDARDS FAILURES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

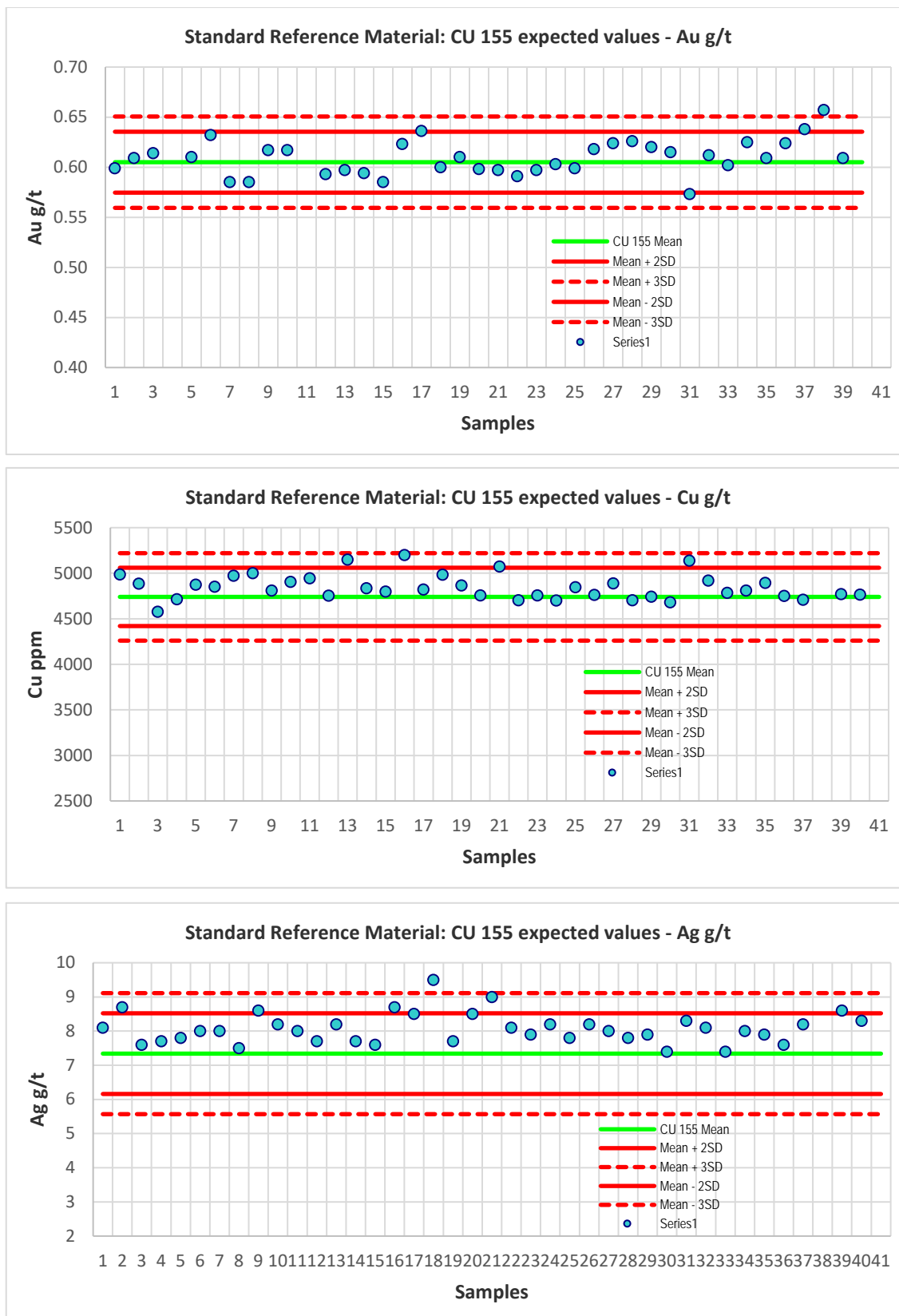
	Gold	Silver	Copper	Lead	Zinc	Total
No. Assays	240	248	249			737
No. values outside 3 SD	3	30	23			56
Percent outside 3 SD	1%	12%	9%			8%



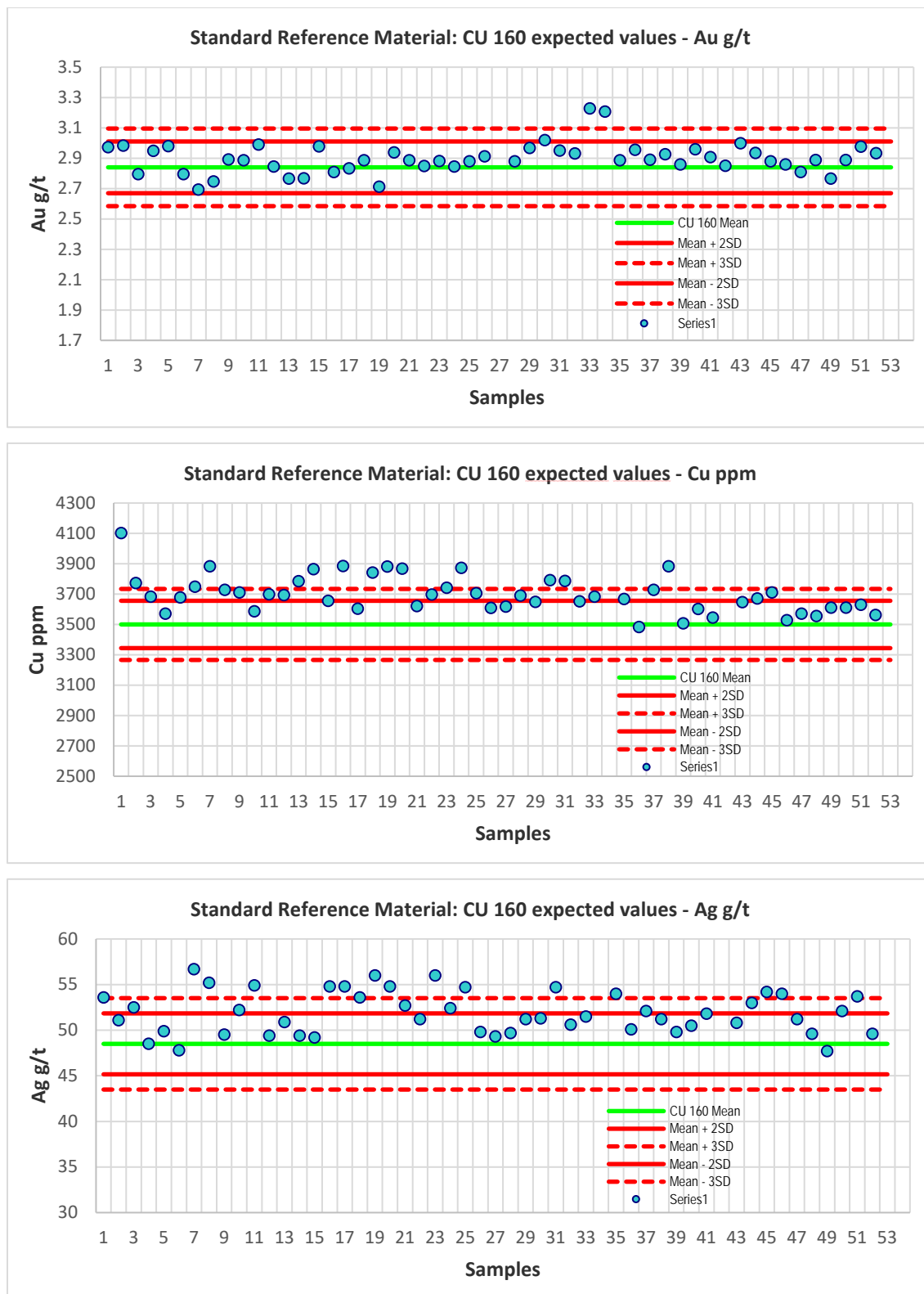
**FIGURE 11-3 PERFORMANCE OF STANDARD REFERENCE MATERIAL  
CU 152**



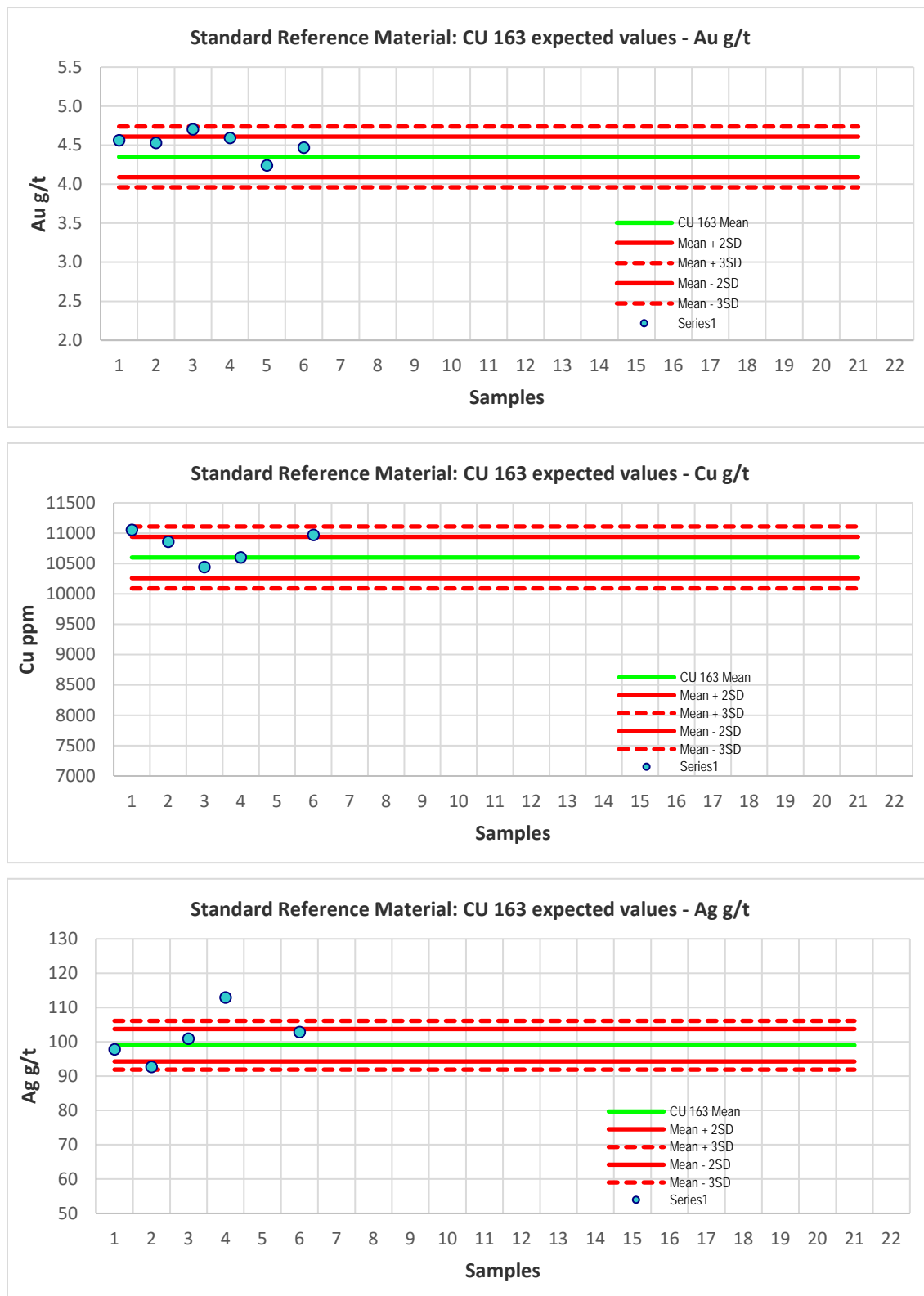
**FIGURE 11-4 PERFORMANCE OF STANDARD REFERENCE MATERIAL CU 155**



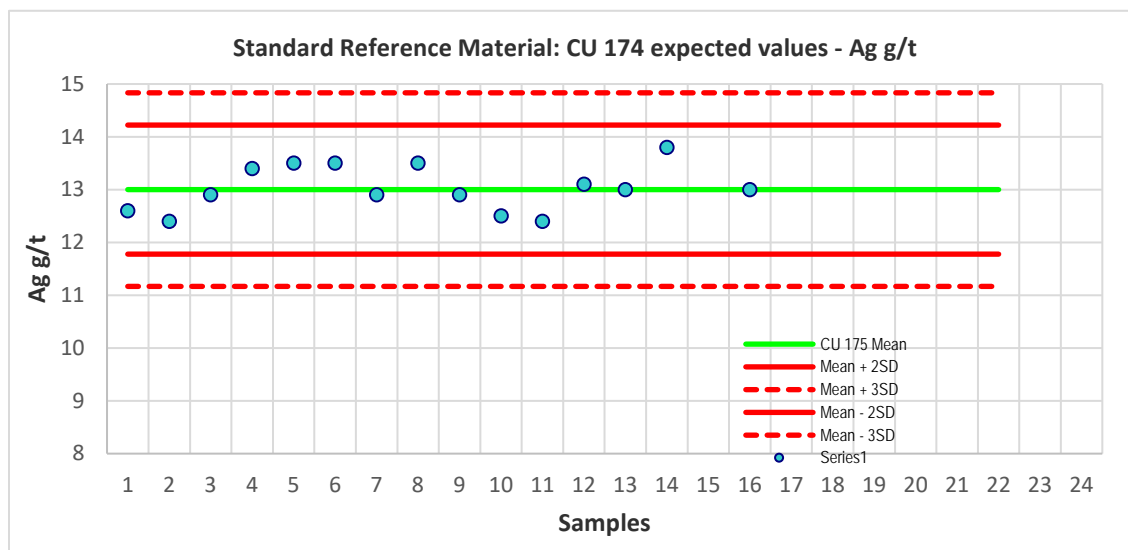
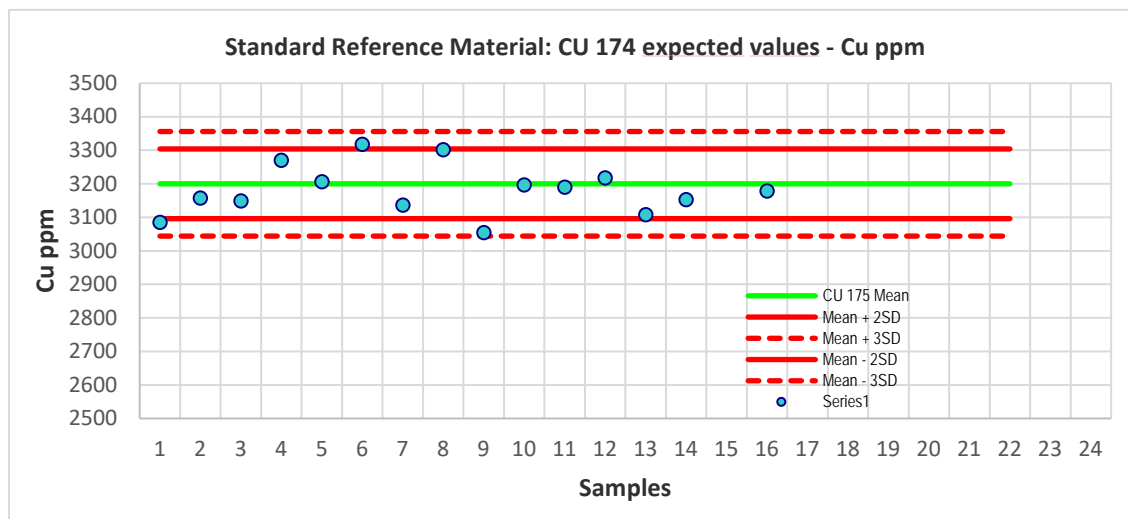
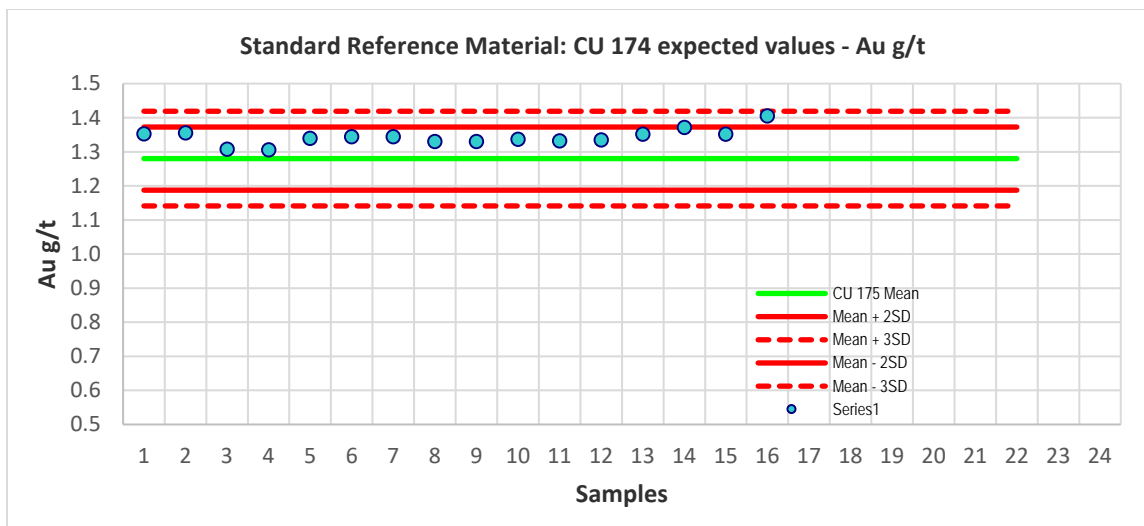
**FIGURE 11-5 PERFORMANCE OF STANDARD REFERENCE MATERIAL CU 160**



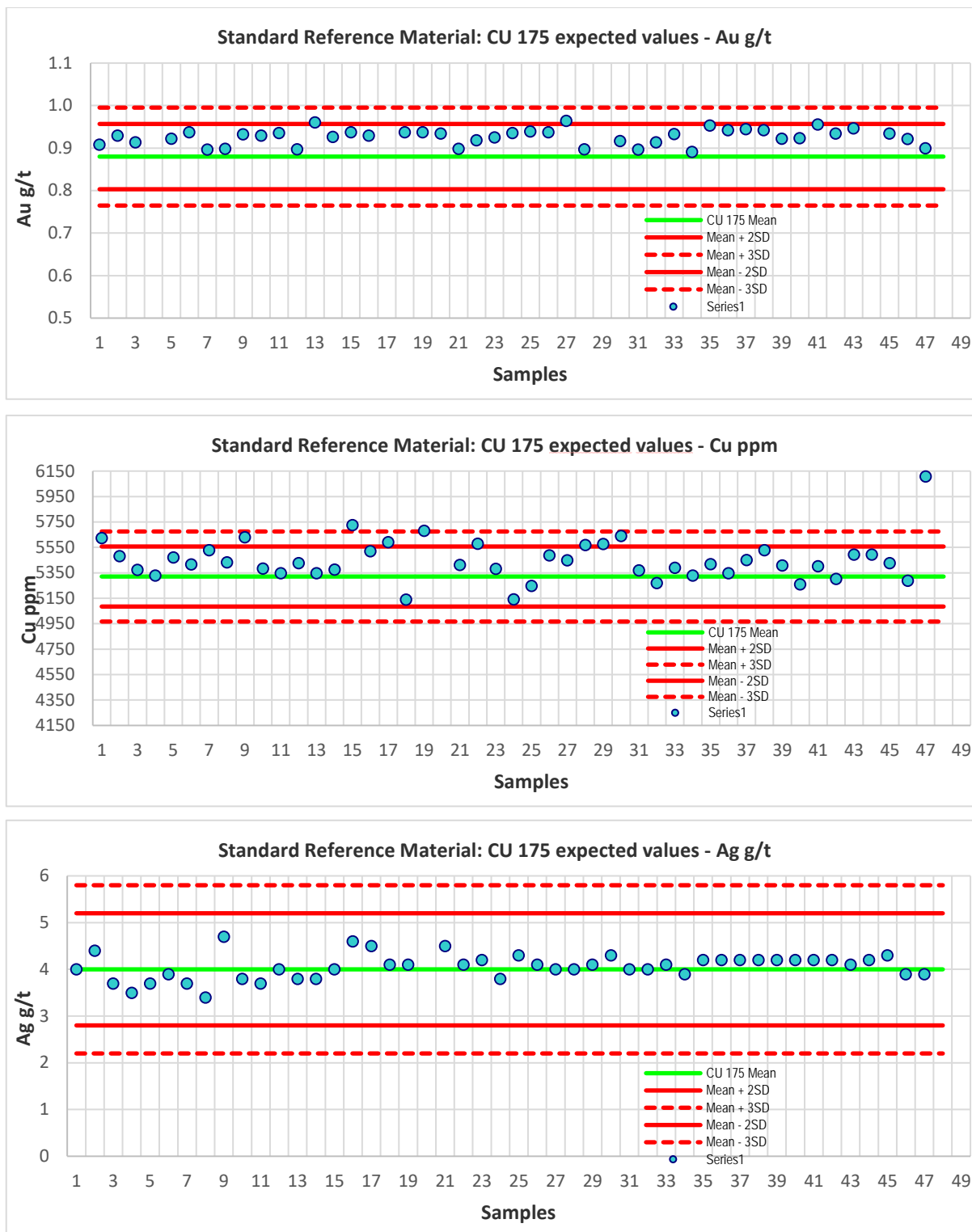
**FIGURE 11-6 PERFORMANCE OF STANDARD REFERENCE MATERIAL CU 163**



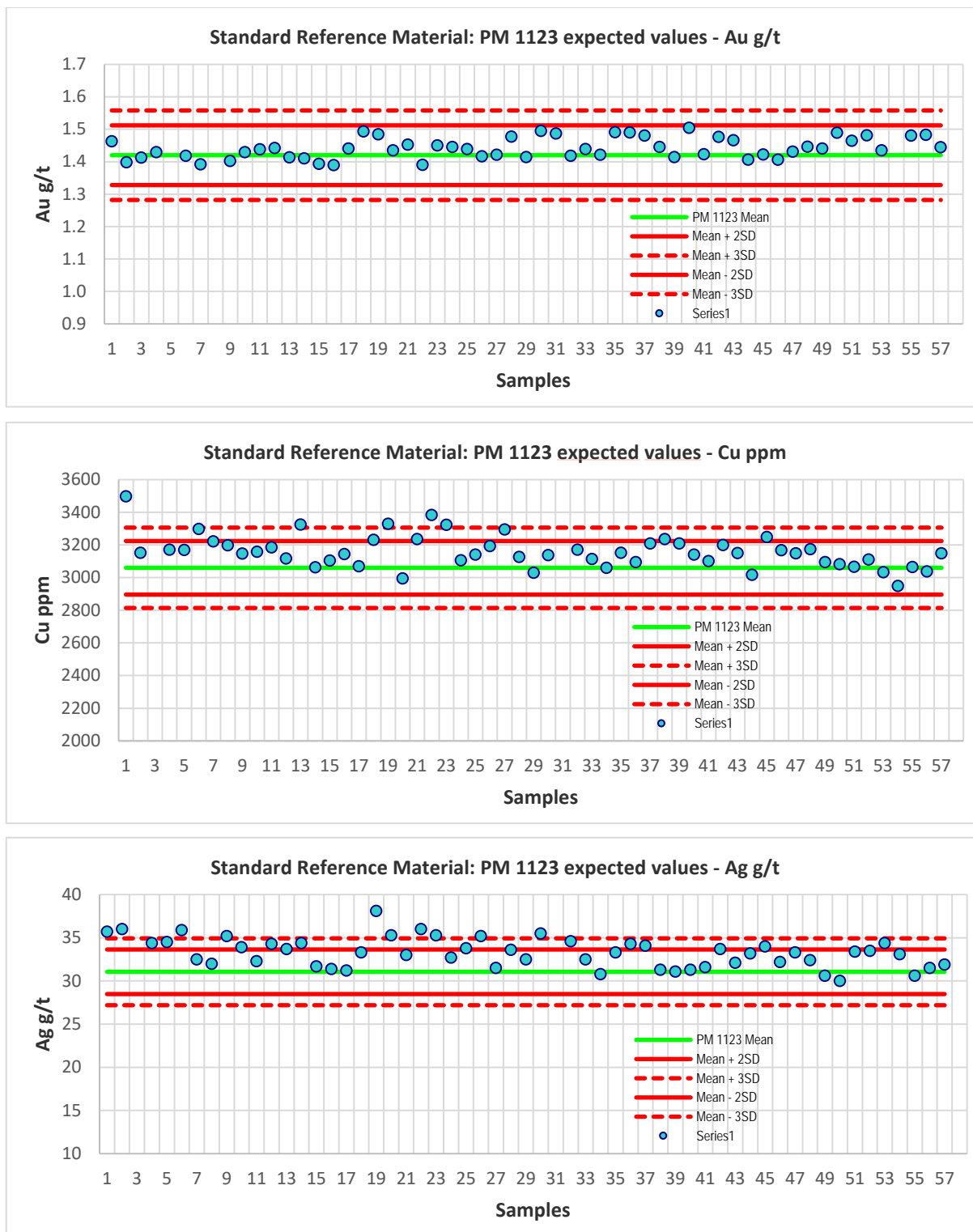
**FIGURE 11-7 PERFORMANCE OF STANDARD REFERENCE MATERIAL CU 174**



**FIGURE 11-8 PERFORMANCE OF STANDARD REFERENCE MATERIAL CU 175**



**FIGURE 11-9 PERFORMANCE OF STANDARD REFERENCE MATERIAL PM 1123**



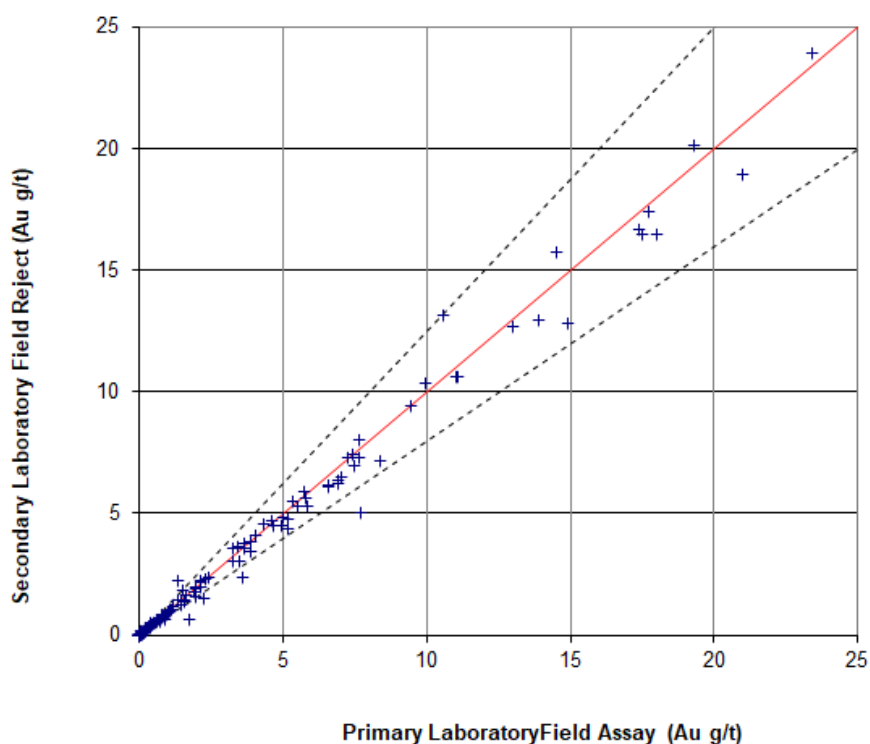


## UMPIRE SAMPLES

Umpire samples which consisted of pulps and coarse rejects were analyzed at a laboratory different from the primary laboratory. A total of 213 (three per drill hole) pulp samples were submitted to an umpire laboratory for check analysis. RPA noted that analyses of copper, silver, and zinc at Inspectorate returned slightly lower values than those obtained from analyses at ALS Chemex, however, the bias was slight, and RPA considered the data to be within industry standards.

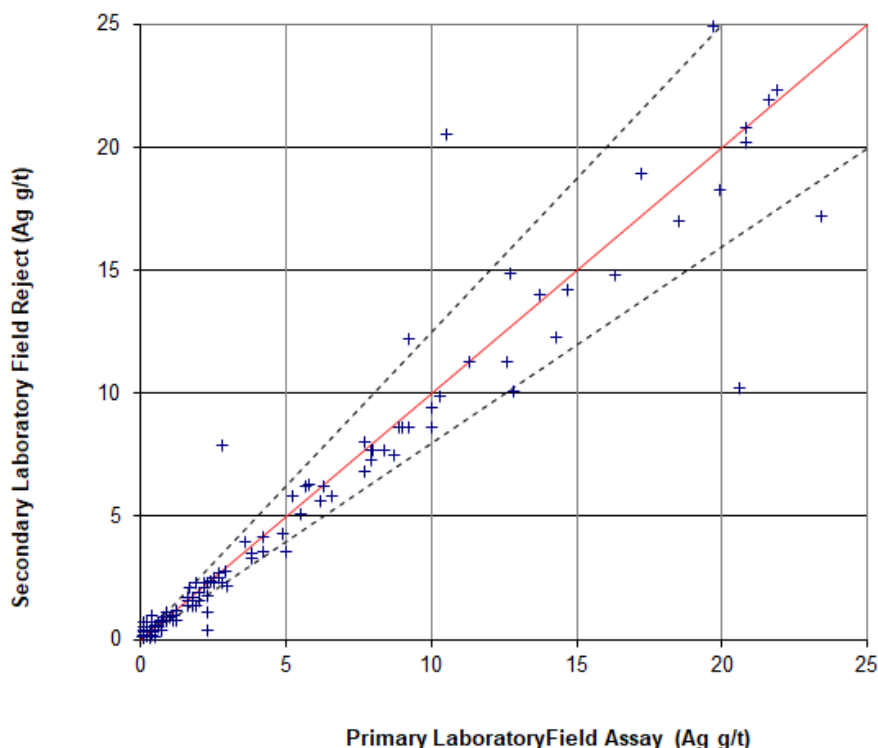
Analytical quality control data collected during 2018 drilling were analyzed by Curimining. RPA reviewed the data and results of their analysis and considers them to be sound, with no significant issues identified. Hence, RPA is of the opinion that all exploration data from 2018 drilling are sufficiently reliable for resource estimation. Figures 11-10 and 11-11 show the original assays for gold and silver plotted against the umpire laboratory assays.

**FIGURE 11-10 ORIGINAL VERSUS UMPIRE ASSAY RESULTS (AU)**



*Note: Dashed lines indicate 20% difference in range*

**FIGURE 11-11 ORIGINAL VERSUS UMPIRE ASSAY RESULTS (AG)**

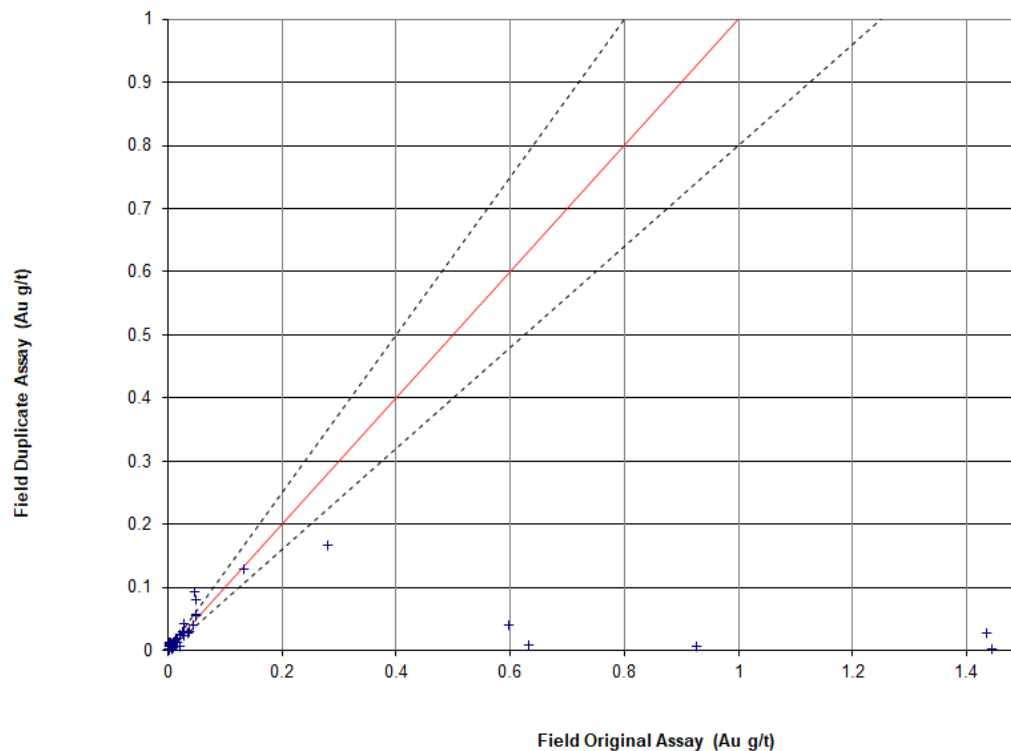


*Note: Dashed lines indicate 20% difference in range*

## DUPLICATE SAMPLES

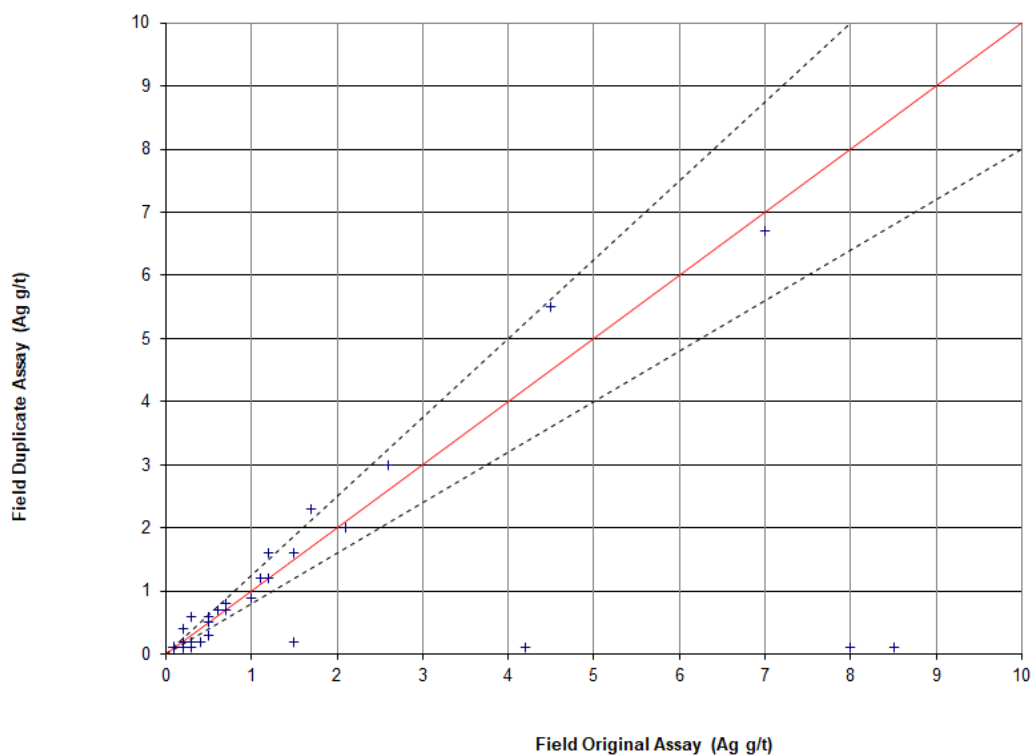
In response to RPA recommendations, three types of duplicates, field duplicates, pulp duplicates, and coarse reject duplicates, were implemented for the 2018 drilling campaign. The purpose of these duplicates was to test the quality of preparation and repeatability of samples along the analysis pathway. Field duplicates come from split core. Coarse reject duplicates test the remaining material left over from the primary crushing phase. Pulp duplicates test the remaining material left over from the pulverized material. On average, 1.2 samples per drill hole were submitted for a duplicate analysis. Figures 11-12 to 11-17 are graphical representations of the field duplicates, reject duplicates, and pulp duplicates, respectively. Some outliers were noted in the results and RPA recommends investigating these samples to determine the nature of the discrepancy. RPA considers the overall duplicate results to be satisfactory and support the reliability of an estimated resource.

**FIGURE 11-12 FIELD DUPLICATE ASSAY RESULTS (AU G/T)**



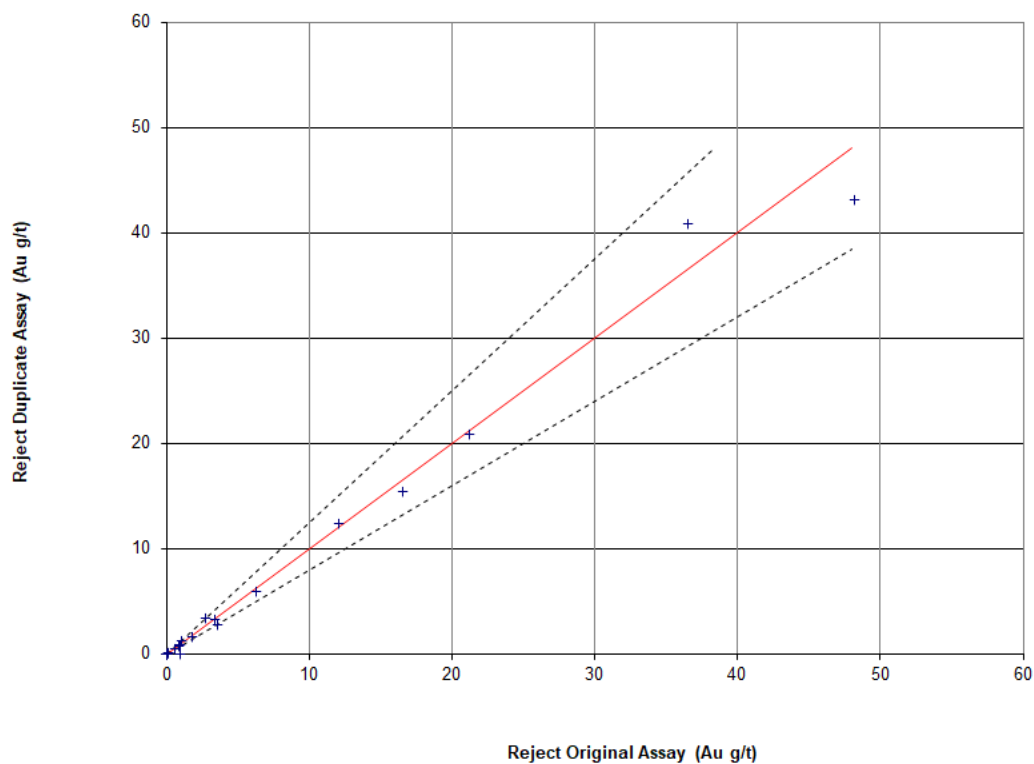
*Note: Dashed lines indicate 20% difference in range*

**FIGURE 11-13 FIELD DUPLICATE ASSAY RESULTS (AG G/T)**



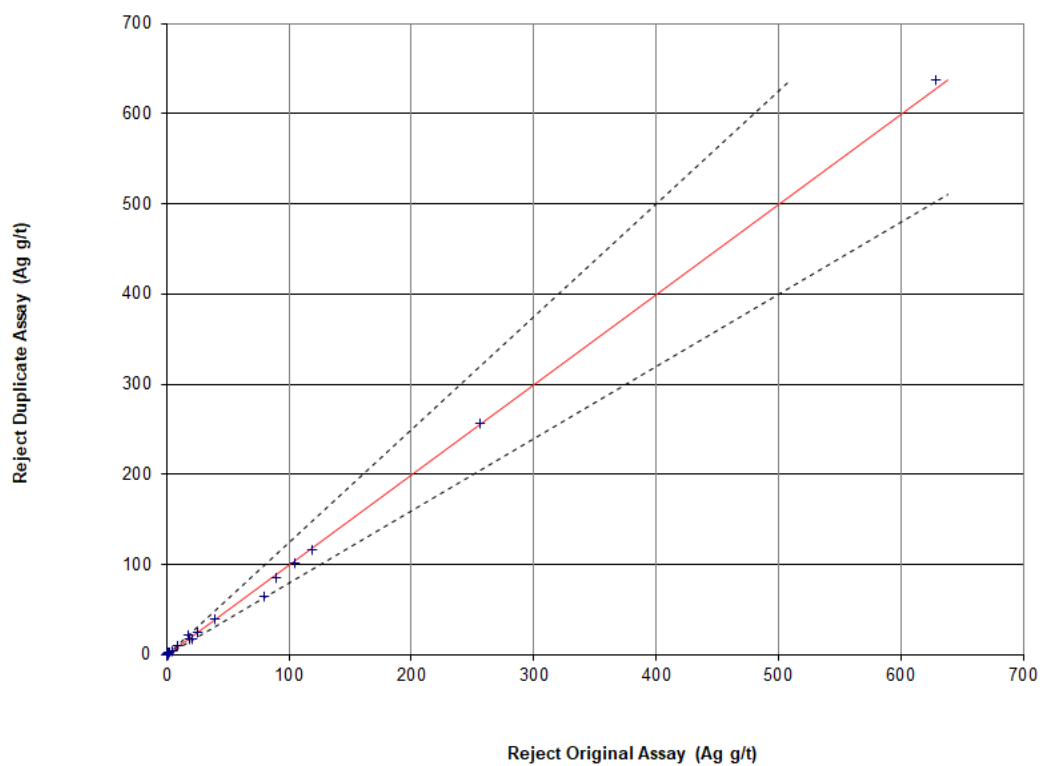
*Note: Dashed lines indicate 20% difference in range*

**FIGURE 11-14 REJECT DUPLICATE ASSAY RESULTS (AU G/T)**



*Note: Dashed lines indicate 20% difference in range*

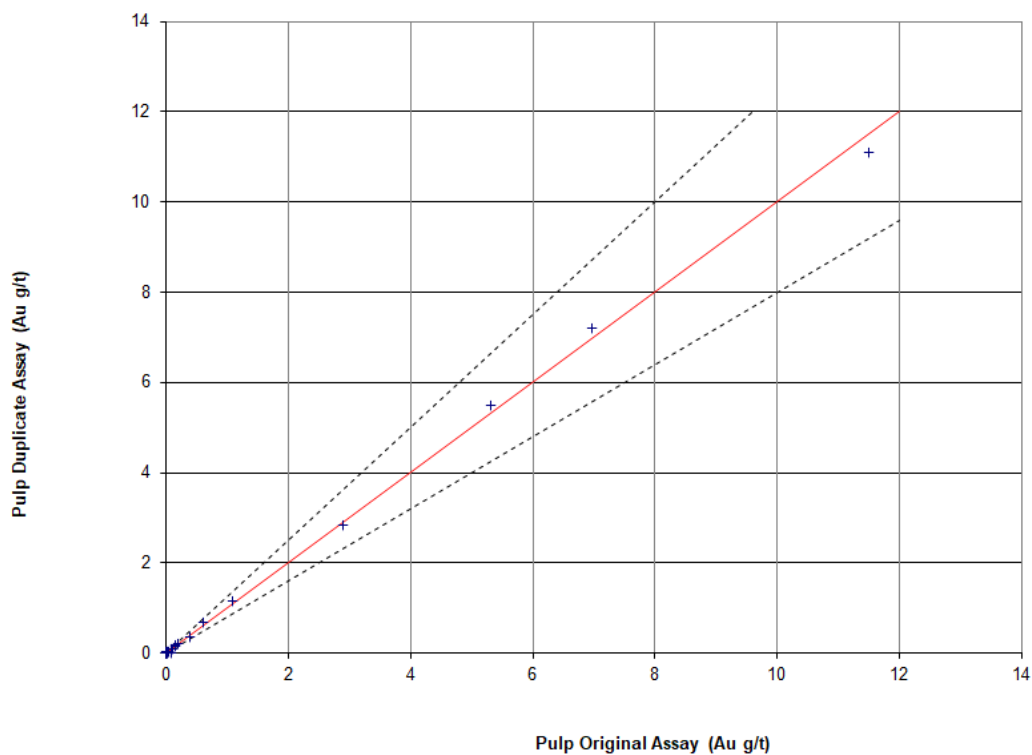
**FIGURE 11-15 REJECT DUPLICATE ASSAY RESULTS (AG G/T)**



*Note: Dashed lines indicate 20% difference in range*

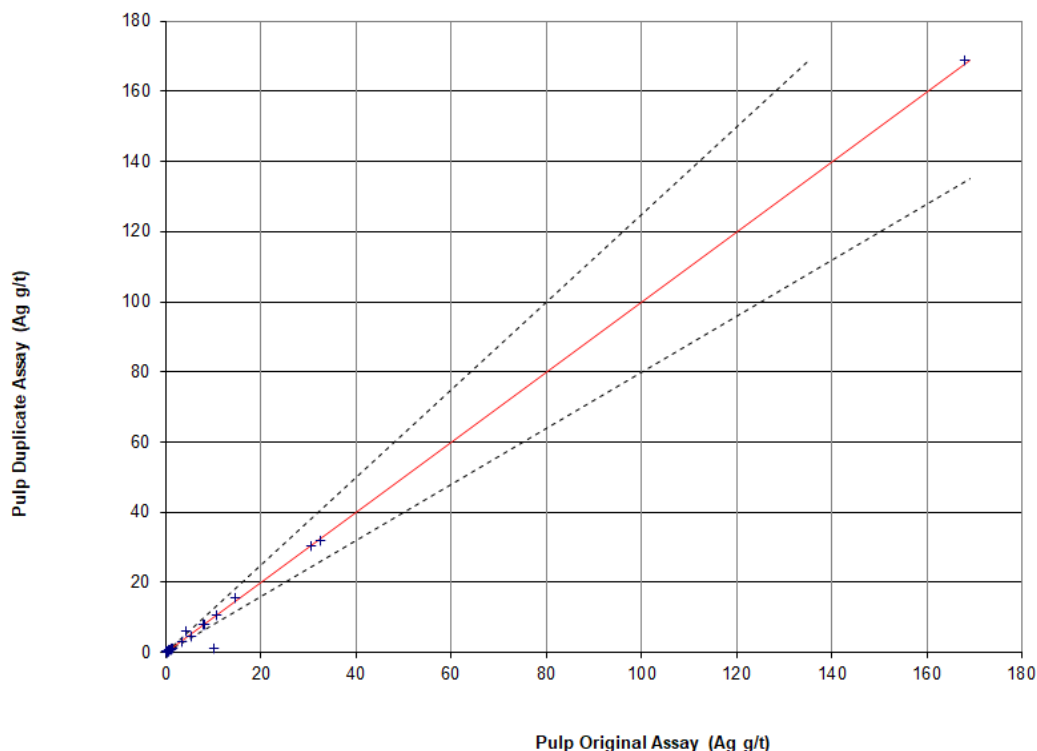


**FIGURE 11-16 PULP DUPLICATE ASSAY RESULTS (AU G/T)**



*Note: Dashed lines indicate 20% difference in range*

**FIGURE 11-17 PULP DUPLICATE ASSAY RESULTS (AG G/T)**



*Note: Dashed lines indicate 20% difference in range*

## RPA COMMENTS

In the opinion of RPA, the current sampling, sample preparation, security, and analytical procedures used by Curimining are consistent with generally accepted industry best practices and are, therefore, adequate for a project in the resource delineation stage. RPA's review of the QA/QC results did not reveal any significant issues.

RPA makes the following recommendations to improve and streamline the procedures:

- Use only a barren rock as blank material.
- Use full-length samples for the collection of density data in order to make these data more representative.

## **12 DATA VERIFICATION**

### **DATA VERIFICATION BY CURIMINING**

The exploration work carried out on the Curipamba Project is conducted by Curimining personnel and qualified subcontractors, and field work is supervised by qualified geologists. Curimining has implemented a series of routine verifications to ensure the collection of reliable exploration data.

Exploration data are recorded digitally to minimize data entry errors. Core logging, surveying, and sampling were monitored by qualified geologist and verified routinely for consistency. Drilling and surface geochemical data were captured in Microsoft Excel format.

The digital database is maintained by a senior geologist who coordinates data import and validation. Analytical results were delivered electronically by the primary and umpire laboratories to Curimining and were examined for consistency and completeness. A comprehensive analytical QA/QC program was implemented by Curimining. Analytical results for control samples were reviewed and compared to set tolerances. Failures were scrutinized further, and affected sample batches were submitted for re-analysis when required. Back-ups of the database are performed on a regular basis, before and after any substantial changes are made to the database.

### **DATA VERIFICATION BY ADVENTUS**

Adventus has not carried out data verification but has relied on data verification processes and procedures carried out by Curimining.

### **DATA VERIFICATION BY RPA**

#### **SITE VISIT**

Pursuant to NI 43-101, Ms. Dorota El-Rassi of RPA completed a site visit to the Curipamba Project from January 8 to 10, 2019. During the site visit, Ms. El-Rassi inspected core samples and outcrops in the El Domo, Sesmo Sur, and Sesmo areas, interviewed Curimining personnel, and gathered other information for the completion of this report. Curimining

provided full access during all parts of the site visit. Ms. El-Rassi was accompanied by Mr. Jason Dunning, Vice President Exploration for Adventus.

## **DIGITAL AND VISUAL QUERIES**

RPA visually inspected the drill hole traces, performed basic database validation procedures, and reviewed the drill hole traces in 3D, level plan, and in vertical sections, and found no unreasonable geometries. RPA also confirmed that there are no duplicate sample numbers and that sample numbers are available for every assayed interval.

RPA compared more than 3,300 assay records from the resource database to digital results provided directly from Inspectorate and ALS Chemex. These included 49 certificates from 94 holes. No significant discrepancies were identified.

In addition, a number of standard data integrity checks were performed by the software program on the drill hole database such as:

1. Intervals exceeding the total hole length (from-to issue)
2. Negative length intervals (from-to issue)
3. Inconsistent downhole survey records
4. Out-of-sequence and overlapping intervals (from-to issue; additional sampling/QA/QC/check sampling included in table)
5. No interval defined within analyzed sequences (not sampled or missing samples/results)
6. Inconsistent drill hole labelling between tables
7. Invalid data formats and out-of-range values

RPA is of the opinion that database verification procedures for the Project comply with industry standards and are adequate for the purposes of Mineral Resource estimation.

## 13 MINERAL PROCESSING AND METALLURGICAL TESTING

Results of metallurgical test work conducted on samples from the El Domo deposit are provided in the following reports:

1. Inspectorate Services Perú S.A.C. 2009, Pruebas Metalurgicas Para Explorar El Comportamiento Del Mineral “El Domo VMS” / Proyecto Curipamba, Ecuador
2. G&T Metallurgical Services Ltd. 2011, Metallurgical Assessment of the El Domo Deposit
3. Surface Science Western, 2011 (April and July)
4. SGS Mineral Services, 2013, Pruebas Metalúrgicas de Flotación
5. Laboratorio BISA, 2013, Estudios Mineralogicos Y Analisis Mineralogicos de Cinco Muestras Tamizadas
6. Base Metallurgical Laboratories Ltd. 2019, Preliminary Metallurgical Assessment El Domo Deposit

Adventus engaged RPA to provide metallurgical advice during the test work campaign conducted at Base Metallurgical Laboratories Ltd. (Base Met Labs) in Kamloops, British Columbia, Canada, in late 2018 and early 2019. Summaries of test work completed prior to the work at Base Met Labs have been taken from the 2014 BISA report on its preliminary economic assessment for the Curipamba Project (BISA, 2014a). RPA has not verified results of the work covered in those summaries.

### INSPECTORATE 2009

The earliest metallurgical test work on samples from the Curipamba Project was completed in 2009 by Inspectorate Services Perú S.A.C. (Inspectorate Peru) (Inspectorate, 2009); in addition, mineralogical studies were completed by GeoConsult in Toronto, Canada. Samples used for the metallurgical study were sourced from sample rejects that were not adequately stored to prevent oxidation.

While the results from the Inspectorate Peru work were questionable, the metallurgical test work did suggest that recovery by differential flotation was likely the most effective process for recovering the valuable minerals, with production first of a bulk lead-copper rougher

concentrate, followed by a zinc concentrate. The bulk lead-copper concentrate could then be ground further and separated into copper and lead concentrates.

The results of the mineralogy work suggest complex interlocking of some of the valuable sulphide minerals including inclusions, rimming, and interstitial grains. Valuable sulphide minerals include chalcopyrite, sphalerite, galena, tennantite, and tetrahedrite. Gold was identified to be associated with the sphalerite, galena, and barite as small (5 µm to 50 µm) inclusions, and to a lesser extent with chalcopyrite.

## G&T METALLURGICAL SERVICES - 2010

In 2010, Salazar commissioned RPA to manage and supervise a metallurgical test program at G&T Metallurgical Services Ltd. (G&T) in Kamloops, British Columbia, Canada (G&T, 2011). Sample material from 12 core drill holes was provided to G&T to produce three master composite samples. The final master samples consisted of samples from seven core drill holes and weighed 90 kg. The samples comprising the master samples were selected to reasonably represent the deposit with respect to assays, mineralogy, lithology, and spatial representation.

The test work at G&T included:

- A mineralogical analysis of the master composite sample
- A Bond ball mill work index (BWi) test
- A series of eight rougher flotation tests
- Two cleaner flotation tests

Results indicated that mineralized material is moderately soft with a BWi of 11.6 kWh/tonne. The fragmentation characteristics of the composite, measured at 91 µm K<sub>80</sub>, determined that copper sulphides and sphalerite were 37% and 40% liberated, respectively. The majority of the unliberated copper occurred either as binaries with pyrite, or in structurally complex multiphase particles. The majority of the unliberated sphalerite was locked in complex multiphase structures.

The test work was unable to produce an efficient copper-zinc concentrate, primarily due to the presence of chalcocite and covellite in the material, which resulted in high levels of sphalerite reporting to the copper flotation concentrate. Significant interlocking of copper sulphides with sphalerite further influenced selectivity negatively.



Mineralogical analysis using Quantitative Evaluation of Materials by scanning electron microscopy (QEMSCAN) on the copper and zinc concentrate from a select cleaner test revealed that impurities of extremely fine copper sulphide particles were present within some of the sphalerite particles. This occurrence was confirmed by Surface Science Western, at the University of Western Ontario (Surface Science Western, 2011), by conducting scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM/EDX) analysis on a number of sphalerite particles. The sphalerite particles were found to contain very fine copper sulphide particles embedded within them. This analysis further determined that not all sphalerite particles in the samples occurred in this fashion. The sample also contained sphalerite particles which were clean or contained no copper.

## SGS MINERAL SERVICES - 2013

In 2013, Salazar commissioned BISA to supervise mineral processing and metallurgical testing. BISA subcontracted certain parts of the study to Transmin Metallurgical Consultants (Transmin) in Lima, Peru. Test work was carried out by SGS Mineral Services (SGS, 2013). The test work was designed with the aim of developing an efficient flotation scheme for all mineral types found at El Domo. The investigation considered three composite samples sourced from 134 core samples stored at Curimining's core storage facility in Ventanas. The three composite samples considered the Cu/(Pb+Zn) ratio, the spatial distribution of the core, lithology, and distribution of grades. Final composite samples were grouped according to the Cu/(Zn + Pb) metal ratio and labelled as:

- Composite CPO-001: Zinc mineral:  $\text{Cu}/(\text{Pb}+\text{Zn}) < 0.33$ .
- Composite CPO-002: Mixed copper/zinc mineral:  $0.33 \leq \text{Cu}/(\text{Pb}+\text{Zn}) \leq 3$
- Composite CPO-003: Copper mineral:  $\text{Cu}/(\text{Pb}+\text{Zn}) > 3$

The study aimed to better understand the following parameters of mineralized material:

- Grind size
- Effect of solids concentration in flotation on reducing interference from clays
- Types of reagents for pyrite depression and reduction of insoluble entrainment to concentrate
- Regrind effect
- Flotation schemes

Preliminary tests showed that flotation froths were overloaded with gangue. The use of lime to adjust the flotation pH was noted to cause the activation of gangue minerals, impairing the selective flotation of valuable minerals. Consequently, a bulk sulphide flotation stage at low pH and coarse grinding was successfully implemented resulting in the successful rejection of gangue minerals. This finding enabled the use of fine milling and lime to achieve selective flotation of a bulk concentrate. This same method was necessary for the three composites studied.

After implementing the bulk flotation system for the rougher stage, the use of the following schemes was evaluated for the separation of copper and zinc:

- Float the zinc and depress the copper
- Float the copper and depress the zinc

Better results were achieved by depressing zinc.

Assays of concentrates produced during the test work found the presence of potentially penalty elements such as arsenic, antimony, bismuth, and cadmium.

Based on the results from the 2013 flotation testing program, Transmin estimated recoveries and grades of the copper and zinc concentrates that would be produced in an efficiently operated industrial plant, with mineralized material similar to the composites studied. Modelled recoveries and grades for each of the three test composites are shown in Table 13-1.

**TABLE 13-1 TRANSMIN METALLURGICAL BALANCE PROJECTION – RECOVERIES AND GRADES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Composite ID	Products	Weight (%)	Assays					Distribution				
			Cu (%)	Zn (%)	Pb (%)	Au (g/t)	Ag (g/t)	Cu (%)	Zn (%)	Pb (%)	Au (%)	Ag (%)
CPO-001 Zinc Mineral	Concentrate Cu	2.46	19.7	17.0	1.31	8.18	748	58.2	8.24	7.67	6.16	22.6
	Concentrate Pb	0.61	17.7	17.0	47.3	21.8	1,995	6.47	0.92	69.0	4.11	15.1
	Concentrate Zn	9.49	1.73	45.5	0.31	14.0	286	19.7	85.4	6.90	40.8	33.4
	Final Tail	87.4	0.15	0.31	0.08	1.83	26.9	15.5	5.39	16.4	49.0	28.9
	Head Calculated	100	0.89	5.11	0.42	3.26	81.2	100	100	100	100	100
CPO-002 Mixed Mineral Cu / Zn	Concentrate Cu	7.62	21.0	8.51	0.94	8.77	230	75.0	29.8	49.6	29.3	40.8
	Concentrate Zn	2.59	6.28	42.0	0.86	19.4	371	7.62	50.0	15.4	22.0	22.4
	Final Tail	89.8	0.41	0.49	0.06	1.24	17.6	17.4	20.2	35.0	48.7	36.8
	Head Calculated	100	2.13	2.17	0.14	2.28	42.9	100	100	100	100	100
CPO-003 Copper Mineral	Concentrate Cu	13.9	24.2	2.34	0.09	3.69	53.1	89.7	80.9	43.4	24.4	39.7
	Final Tail	86.1	0.45	0.09	0.02	1.84	13.0	10.3	19.1	56.6	75.6	60.3
	Head Calculated	100	3.75	0.40	0.03	2.10	18.6	100	100	100	100	100

## BASE MET LABS - 2019

Base Met Labs performed test work from November 2018 to April 2019 (Base Met Labs, 2019). This test work was initiated to further develop the process flow sheet, to produce saleable concentrates, and explore ways to enhance gold recovery for the deposit.

Assay laboratory reject samples from the 2018 drill program were provided for the test work program. The assay rejects were received pre-crushed to 90% passing two millimetre. Three composites were produced for use in the test work:

- Composite 1 – spatial representation of the deposit and resource grade
- Composite 2 – with relatively high zinc content
- Composite 3 – with high copper and lower zinc content.

Two continuity samples were also produced, each consisting of composites of all of the mineralized intervals from two drill holes, although they were not used in the test work program.

Head assays for the five composites are shown in Table 13-2.

**TABLE 13-2 COMPOSITE HEAD ASSAYS**  
Adventus Mining Corporation – Curipamba Project – El Domo Deposit

Sample	Element (percent or g/tonne)										
	Cu	Pb	Zn	Fe	S	C	Ag	Au	As	CuOx	CuCN
Composite 1	1.66	0.25	2.77	12.4	15.6	0.13	35	2.54	697	0.02	0.13
Composite 2	1.58	0.54	5.40	11.4	16.3	0.11	62	2.76	727	0.02	0.13
Composite 3	2.14	0.04	0.39	20.8	26.0	0.08	14	1.23	301	0.05	0.17
Sample 1	3.82	0.14	0.68	14.9	21.0	0.05	26	1.51	326	0.03	0.07
Sample 2	1.50	1.30	10.7	9.90	17.8	0.02	131	6.34	1700	<0.001	0.65

Source: Base Met Labs, 2019

Note: Ag, Au and As values are shown in g/tonne, all others are in percent

In addition to flotation test work, BWi tests and gravity tests for gold recovery (GRG) were also completed. BWi and GRG recoveries are shown in Table 13-3. The BWi determinations were completed with a closing screen size of 106 µm, resulting in a P<sub>80</sub> size of nominally 75 µm. Since the sample material had been pre-crushed prior to the production of the composites, the GRG tests were conducted on the composite samples without additional crushing or grinding to provide indicative results of amenability to gravity concentration within a grinding circuit.

**TABLE 13-3 BWI AND GRG RESULTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<b>Sample</b>	<b>BWi kWh/t</b>	<b>GRG Recovery Au %</b>
Composite 1	14.1	7.9
Composite 2	12.4	8.6
Composite 3	12.3	1.3

Mineralogical analysis was conducted by QEMSCAN using particle mineral analysis (PMA). Mineral content and fragmentation characteristics were measured for each composite. Mineral content is shown in Table 13-4. The samples would be considered semi-massive sulphide. Composites 1 and 2 had about one third of the sample mass as sulphide minerals. Composite 3 had considerably more sulphide mineralization, representing about half of the sample mass.

The primary sulphide minerals in the samples were pyrite, chalcopyrite, sphalerite, and galena. Pyrite was the most abundant sulphide mineral in each sample. Chalcopyrite content ranged from 4.2% to 6.0%. The level of sphalerite was manipulated by sample selection: Composite 1 represented overall resource levels, Composite 2 represented high levels of sphalerite, and Composite 3 represented low levels of sphalerite.

**TABLE 13-4 MINERAL CONTENT BY QEMSCAN**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Mineral	Mineral Content (%)		
	Comp 1	Comp 2	Comp 3
Chalcopyrite	4.67	4.10	5.97
Bornite	0.11	0.13	0.36
Chalcocite	0.11	0.10	0.09
Covellite	0.03	0.02	0.01
Enargite / Tennantite	0.16	0.24	0.06
Tetrahedrite	0.04	0.10	0.01
Malachite/Azurite	<0.01	<0.01	<0.01
Galena	0.25	0.62	0.04
Sphalerite	4.55	7.99	0.65
Pyrite	23.4	20.9	43.1
Pyrrhotite	0.02	0.01	0.04
Arsenopyrite	<0.01	<0.01	<0.01
Iron Oxides	0.52	0.28	0.48
Quartz	22.9	19.5	12.6
Muscovite / Illite	21.2	18.2	17.6
Chlorite	5.59	8.76	7.20
K-Feldspar	4.95	3.13	1.56
Plagioclase Feldspar	2.61	4.99	3.03
Barite	2.85	4.72	0.57
Kaolinite (Clay)	1.71	1.68	0.91
Ca-sulphate	1.98	1.25	3.94
Calcite	0.40	0.41	0.20
Biotite / Phlogopite	0.69	0.94	0.56
Amphibole / Pyroxene	0.24	0.48	0.21
Epidote	0.06	0.22	0.06
Rutile / Anatase	0.43	0.62	0.36
Others	0.56	0.61	0.43
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Base Met Labs, 2019

Based on the minerals present, conventional flotation treatment separating copper, lead, and zinc into separate concentrates should be feasible. Gold and silver would be recovered as by-product metals, preferably into copper or lead concentrates. Due to the presence of secondary copper minerals and the relatively high levels of pyrite, it is likely that chemical depressants will be required to separate the minerals into saleable concentrates.

Mineral fragmentation characteristics were determined during the QEMSCAN analysis of the feed samples. The analysis was performed on samples ground to a nominal grind size of 70

$\mu\text{m K}_{80}$ . The samples were separated into five size fractions, each fraction was mounted in epoxy, polished, and analyzed. A summary of the fragmentation data is presented in Table 13-5.

**TABLE 13-5 SUMMARY OF MINERAL FRAGMENTATION DATA**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Mineral Status	Composite 1 – 68 $\mu\text{m K}_{80}$					Composite 2 – 78 $\mu\text{m K}_{80}$					Composite 3 – 63 $\mu\text{m K}_{80}$				
	Cs	Ga	Sp	Py	Gn	Cs	Ga	Sp	Py	Gn	Cs	Ga	Sp	Py	Gn
Liberated	54	29	60	71	93	42	24	57	65	91	52	26	43	80	92
Binary - Cs		9	7	7	1		8	9	7	1		14	7	8	1
Binary - Ga	<0.5		1	<0.5	<0.5	1		2	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5
Binary - Sp	5	16		2	1	13	13		2	2	1	5		1	<0.5
Binary - Py	23	7	9		4	19	2	5		4	32	16	26		6
Binary - Gn	9	9	12	17		8	5	12	20		9	13	9	10	
Multiphase	9	30	11	3	1	17	48	15	6	2	6	26	15	2	1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Base Met Labs, 2019

Notes: Cs-Copper Sulphide, Ga-Galena, Sp-Sphalerite, Py-Pyrite, Gn-Non-sulphide gangue

The feed liberations of copper sulphide in the three composites were 54%, 42%, and 52%, measured in two dimensions. Base Met Labs considered these levels low for efficient recovery to selective rougher concentrates when compared to data for similar operating polymetallic deposits. Composite 2 had noticeably poorer copper sulphide liberation when compared to the other two composites. Copper sulphides for this composite were interlocked with pyrite (19%), sphalerite (13%), multiphase particles (17%), and non-sulphide gangue (8%).

Sphalerite liberation for Composites 1 and 2 were 60% and 57%, respectively. These levels of liberation would be considered just enough for selective rougher recovery. Sphalerite interlocking was more associated with non-sulphide gangue and multiphase particles. Recovery of sphalerite into a selective concentrate from Composite 3 would be difficult due to the low sphalerite content and the poor liberation.

Galena liberation for all composites was very poor. Galena was interlocked with many other sulphide and gangue minerals. Production of a separate saleable lead concentrate is unlikely.

The majority of the flotation flow sheet development was completed using Composite 1 after the initial comparative test work on bulk and sequential flow sheets. Once a preferred flow



sheet, reagent scheme, and flotation conditions were achieved, these were tested in locked cycle tests (LCTs) using Composite 1, and then Composites 2 and 3 with adjustments aimed at improving performance with those two samples.

Initial flotation testing indicated that sphalerite was chemically active and was readily recovered to the copper concentrate. The testing also indicated that all three composite samples had elevated viscosity and better metallurgical performance was achieved by reducing the flotation pulp density to 25% by weight solids.

Flotation testing was then focussed on Composite 1 to optimize metallurgical performance. The testing investigated two paths: bulk flotation of sulphides followed by re-grinding and separation into separate copper and zinc concentrates, and more conventional sequential copper and zinc rougher flotation with separate re-grinding and cleaning circuits. Both paths indicated that zinc could be partially depressed from the copper circuit with the use of zinc sulphate and cyanide. Cyanide was the critical component of the depression scheme. Tests with only zinc sulphate were ineffective. Similarly, re-grinding was required to achieve high grade concentrates; more testing is warranted to optimize re-grind size.

The test data indicated that the bulk flotation route had a clear metallurgical performance advantage with respect to copper, silver, and gold recovery to the copper concentrate. This conclusion was supported by the mineralogical data.

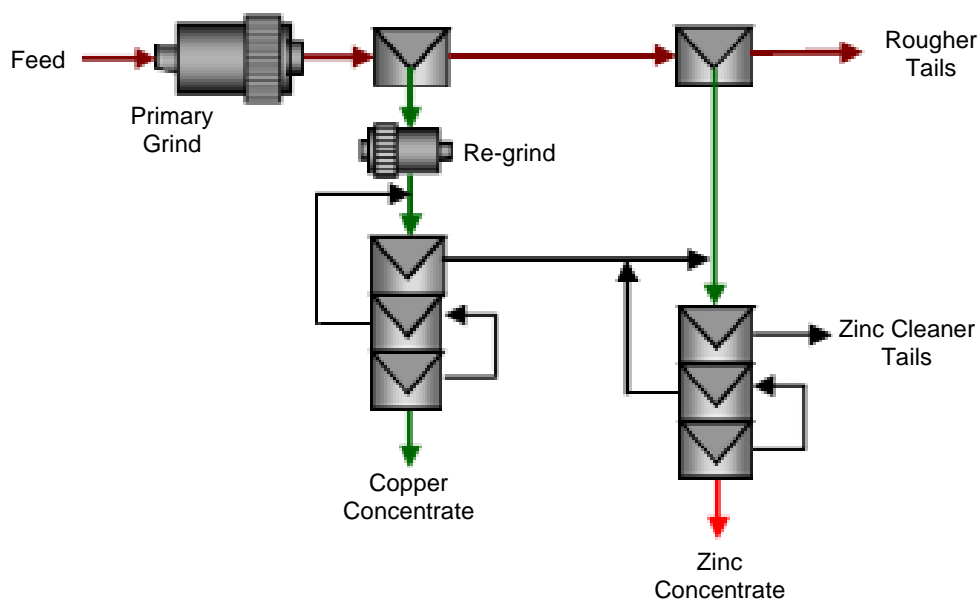
LCTs were performed on each composite with the bulk flowsheet. Table 13-6 displays a summary of selected results. A zinc scavenger with copper sulphate was used in the LCTs to enhance zinc recovery for Composites 1 and 2 (no zinc concentrate was produced from Composite 3). The flow sheet for the LCTs is provided in Figure 13-1. The current process development assumes that the sphalerite is highly active, however, natural activation of sphalerite may not be deposit-wide at the Project. As development of the Project moves forward, it is recommended that this aspect of the flowsheet be verified.

**TABLE 13-6 SUMMARY OF SELECTED LOCKED CYCLE TEST RESULTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Test	Mass	Grade (% or g/t)					Distribution (%)				
	%	Cu	Pb	Zn	Ag	Au	Cu	Pb	Zn	Ag	Au
Comp 1 - Test 49											
Feed	100	1.67	0.24	2.85	44	2.6	100	100	100	100	100
Copper Con	6	<b>23.9</b>	2.95	8.69	340	21.8	<b>81</b>	71	17	45	47
Zinc Con	4	2.70	0.63	<b>54.0</b>	260	12.3	7	11	<b>78</b>	25	19
Comp 1 - Test 52											
Feed	100	1.60	0.21	2.77	39	2.63	100	100	100	100	100
Copper Con	6	<b>22.4</b>	2.96	10.7	315	23.3	<b>85</b>	85	24	49	54
Zinc Con	4	1.67	0.35	<b>52.2</b>	215	9.38	4	6	<b>73</b>	21	14
Comp 2 - Test 64											
Feed	100	1.61	0.60	5.22	69	3.13	100	100	100	100	100
Copper Con	7	<b>17.3</b>	6.65	21.1	495	24.6	<b>80</b>	83	30	53	59
Zinc Con	6	1.66	0.71	<b>57.9</b>	325	8.59	6	7	<b>65</b>	28	16
Comp 3 - Test 59											
Feed	100	2.17	0.05	0.38	19	1.35	100	100	100	100	100
Copper Con	8	<b>23.1</b>	0.31	2.68	105	3.92	<b>88</b>	58	59	46	24

Source: Base Met Labs, 2019

**FIGURE 13-1 LOCKED CYCLE TEST FLOW SHEET**



Source: Base Met Labs, 2019

Note: The LCT for Composite 3 did not include the zinc circuit

The copper concentrates from LCTs using Composites 1 and 3 were relatively low in deleterious elements, except for lead, zinc, arsenic (0.325% and 0.137%), and antimony (0.136% and 0.031%). The higher arsenic and antimony levels were expected due to trace levels of enargite, tennantite, and tetrahedrite in the feed samples. At the levels measured, the copper concentrate may attract some penalties for lead and zinc, however, further metallurgical test work may result in improved separation of zinc and lead from copper, and reduced levels of deleterious elements. Due to the low copper grade of the copper concentrate from Composite 2 (LCT 64), test work on this composite is on-going, and the concentrate was not analyzed for deleterious elements.

Elevated levels of arsenic (0.114%) and cadmium (>2,000 ppm) measured in the zinc concentrate may or may not attract penalties. Penalties will only be determined during negotiations for mineral offtake agreements, as negotiated by Adventus in the future.

Static settling tests were performed on final tailings Composite 1 and 3. The material was slow to settle and final densities achieved were low; future testing programs should include expanded scope for dewatering studies for tailings.

Estimated recoveries are provided in Section 17 - Recovery Methods.

## **FUTURE TEST WORK**

Test work to date has indicated that the production of copper, zinc, and possibly lead concentrate is possible using conventional flotation methods. Future test work should address separation of zinc and lead from copper to improve the quality of the concentrates, particularly in the case of high copper and low zinc content. This may include the evaluation of different reagent schemes and re-grind sizes. Alternatively, consideration should be given to the possibility of blending of mineralized material to provide a consistent feed to the processing plant and, if deemed practical, continue development of the processing conditions using sample material representative of the blended feed to the plant. Once preferred processing conditions have been achieved, optimization and variability test work can be completed in support of pre-feasibility and feasibility studies.

## 14 MINERAL RESOURCE ESTIMATE

RPA updated the Mineral Resource estimate for El Domo based on information available to May 2, 2019. The Mineral Resources conform to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM (2014) definitions, 2014) and are reported in accordance with NI 43-101. Mineral Resources are not Mineral Reserves and have not demonstrated economic viability. Open pit Mineral Resources have been constrained within a preliminary pit shell. A summary of the Mineral Resources is presented in Table 14-1.

**TABLE 14-1 MINERAL RESOURCE SUMMARY AS OF MAY 2, 2019**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Resource Category	Tonnes (Mt)	Grade					Contained Metal				
		Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Pb (kt)	Zn (kt)	Au (koz)	Ag (koz)
Pit Constrained Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	5.7	1.74	0.28	2.60	2.47	51	99.0	16.1	147.8	452	9,417
M+I	7.1	1.78	0.30	2.78	2.73	53	126.8	21.4	198.7	627	12,121
Inferred	0.7	0.67	0.21	1.72	1.60	46	4.6	1.5	11.9	36	1,032
Underground Mineral Resources											
Indicated	1.8	2.91	0.20	3.51	1.85	43	51.9	3.6	62.5	106	2,467
Inferred	0.6	2.46	0.19	2.82	2.09	37	15.5	1.2	17.8	42	751
Total Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	7.5	2.02	0.26	2.81	2.33	49	150.9	19.7	210.3	559	11,884
M+I	8.9	2.00	0.28	2.93	2.56	51	178.7	25.0	261.3	733	14,588
Inferred	1.3	1.52	0.20	2.25	1.83	42	20.1	2.7	29.7	78	1,783

**Notes:**

1. CIM (2014) definitions were followed for Mineral Resources.
2. A minimum mining height of two metres was applied to the Mineral Resource wireframes.
3. Bulk density assigned on a block per block basis using the correlation between measured density values and base metal grade.
4. Mineral Resources are reported above a cut-off NSR value of US\$25 per tonne for potential open pit Mineral Resources and US\$100 per tonne for potential underground Mineral Resources.
5. The NSR value is based on estimated metallurgical recoveries, assumed metal prices, and smelter terms, which include payable factors treatment charges, penalties, and refining charges.
6. Metal prices are based on consensus, long term forecasts from banks, financial institutions, and other sources averaging US\$3.15/lb Cu, US\$1.00/lb Pb, US\$1.15/lb Zn, US\$1,350/oz Au, and US\$18/oz Ag.
7. Metallurgical recoveries assumptions were based on three mineral types defined by the metal ratio Cu/(Pb+Zn):
  - Zinc Mineral (Cu/(Pb+Zn)<0.33): 84% for Cu, 84% for Pb, 95% for Zn, 51% for Au, and 71% for Ag
  - Mixed Cu/Zn Mineral (0.33≤Cu/(Pb+Zn)≤3.0): 88% for Cu, 85% for Pb, 96% for Zn, 66% for Au, and 69% for Ag

- Copper Mineral (Cu/(Pb+Zn)>3.0): 88% for Cu, 69% for Pb, 73% for Zn, 27% for Au, and 50% for Ag
8. NSR factors were also based on the metal ratio Cu/(Pb+Zn):
    - Zinc Mineral: 29.94 US\$/% Cu, 9.17 US\$/% Pb, 11.52 US\$/% Zn, 14.17 US\$/g Au, and 0.27 US\$/g Ag
    - Mixed Cu/Zn Mineral: 44.20 US\$/% Cu, 11.34 US\$/% Zn, 22.90 US\$/g Au, and 0.27 US\$/g Ag
    - Copper Mineral: 46.27 US\$/% Cu, 6.86 US\$/g Au, and 0.19 US\$/g Ag
  9. Numbers may not add due to rounding.
  10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
  11. Open pit Mineral Resources have been constrained within a preliminary pit shell.

Leapfrog Geo software (version 4.4.2) was used to construct the geological solids, to prepare assay data for geostatistical analysis, to construct the initial block model, and to estimate the grades in some of the domains. GEOVIA GEMS software (version 6.8.2) was used to construct the final block model, estimate metal grades, and tabulate the Mineral Resource statement.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

## MINERAL RESOURCE ESTIMATION METHODOLOGY

The evaluation of Mineral Resources involved the following procedures:

- Database compilation and verification;
- Generation of the Lithological Model;
- Definition of geostatistical resource domains;
- Data conditioning (capping and compositing) for geostatistical analysis and variography;
- Selection of estimation strategy and estimation parameters;
- Block modelling and grade interpolation;
- Validation, classification, and tabulation;
- Assessment of “reasonable prospects for eventual economic extraction” and selection of reporting assumptions;
- Preparation of the Mineral Resource statement.

## RESOURCE DATABASE

The database used to estimate Mineral Resources includes 309 core drill holes (60,449 m) completed between 2007 and 2018. An additional 33 core drill holes (7,826 m) are located outside of the resource area and were not considered for the model. Table 14-2 summarizes the records in the drill hole database used to model Mineral Resources.

**TABLE 14-2 SUMMARY OF DATABASE RECORDS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Table	Number of Records
Collars	309
Survey	4,418
Assay	13,449
Lithology	4,196
2 m Composites within Resource Domains	2,239
Density	4,972
Solid Intervals of Resource Domains	562

## GEOLOGICAL INTERPRETATION AND MODELLING

RPA used Leapfrog Geo software to generate structural, geological, and grade estimation domain models.

### STRUCTURE MODEL

Using geological logs, vertical cross sections, longitudinal sections, and surface geology maps, a preliminary structural model composed of eleven faults was created. This model was the basis for all domain models and used to control the vertical offsets of lithological units and mineralized domains. Figure 14-1 shows an oblique view of the structural model with a longitudinal and cross section that were supplied by Adventus for reference. Faults were modelled from sections, however, they had to be modified locally to honour drill hole information.

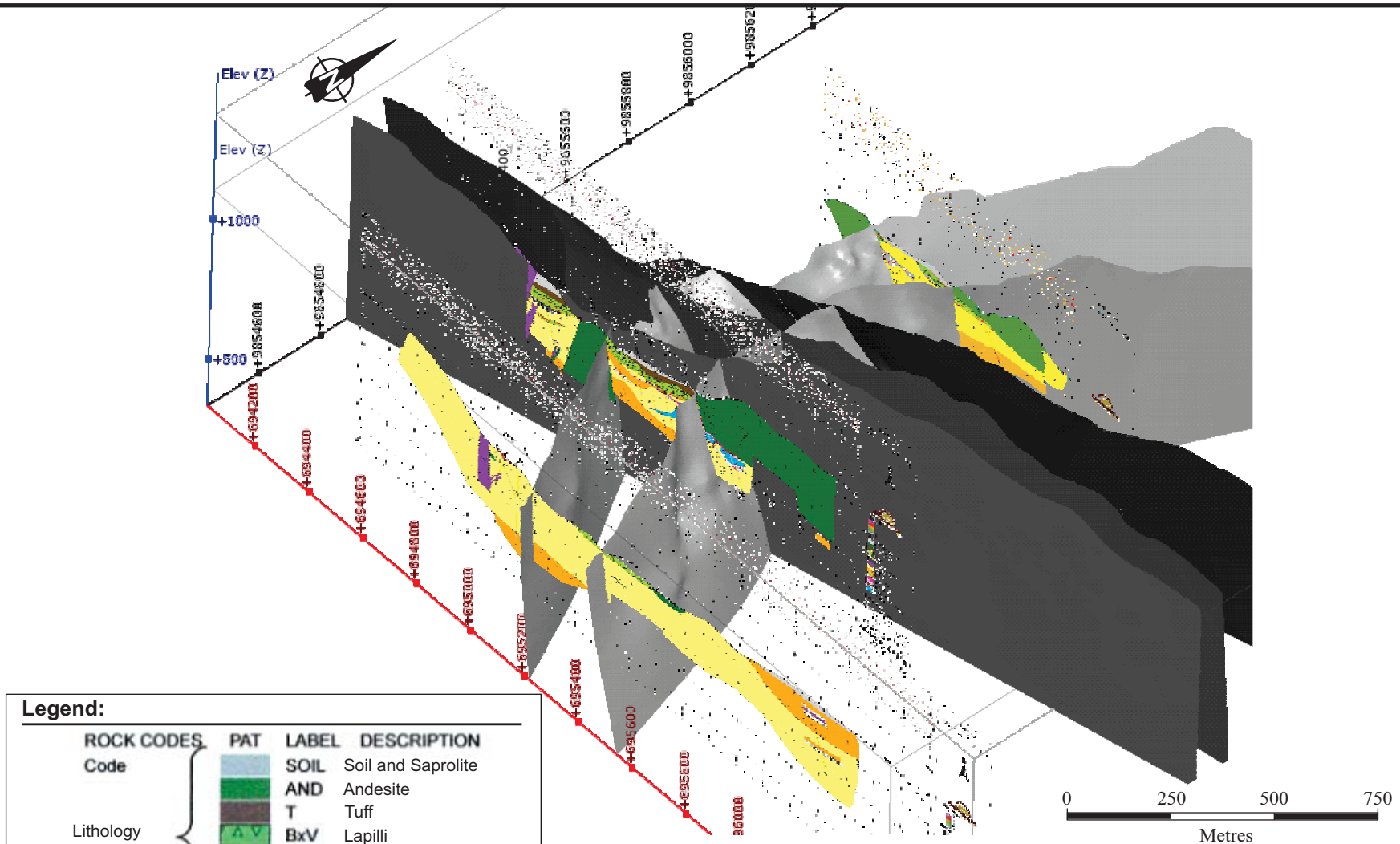


Figure 14-1

Legend:

ROCK CODES	PAT	LABEL	DESCRIPTION
Code			
Lithology		SOIL	Soil and Sapolite
		AND	Andesite
		T	Tuff
	Δ V	BxV	Lapilli
		T-RHY	Rhyolitic Tuff
		B	Basalt
		DaBx	Dacite
Mineralization		Rhy	Rhyolite
		Gr	Grainstone
		VMS	Massive Sulphides
		SMS	Semi-Massive Sulphides
	Δ V	BxH	Hydrothermal Breccia
		Gy	Gypsum
		Fault	Fault
		SW	Sulfide Stockwork

June 2019

Source: RPA, 2019.

**Adventus Mining Corporation**  
**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
**Oblique View of Structural Model**



## LITHOLOGICAL MODEL

RPA used a combination of geological logs, assays, sectional information, and a rock type model to construct a geological model within each fault block. The main rock types include rhyolite, andesite, dacite, tuff, and overburden. The dacite unit encompasses smaller lithological bodies such as gypsum, hydrothermal breccia, and basalt dikes.

The base and precious metal mineralization at El Domo occurs primarily in a tabular zone comprising semi-massive to massive sulphides. Secondary loci of mineralization are in a breccia zone in the immediate hanging wall of the massive sulphide zone (the grainstone horizon), and in smaller lenses throughout the footwall of the massive sulphide zone.

RPA modelled the massive sulphide horizon based on lithological logging information, however, where high grade drill hole interceptions had been recorded in otherwise barren lithology, the model was adjusted to include these in the massive sulphide domain.

RPA calculated an NSR value for all assay intervals using the five relevant metals: Au, Ag, Cu, Pb, and Zn. Since the mineralization at the Project does not exhibit uniform zoning of any particular metal, this approach ensures that all elements are contributing evenly to the values of the assayed intersection.

In addition to lithological logging, modelling of the grainstone unit took into account the calculated NSR values. An indicator grade shell, based on an NSR cut-off value of \$20/t, was generated in Leapfrog to better define mineralization within the grainstone domain. Where the grainstone domain coalesces into the massive sulphide domain, precedence was given to the massive sulphide domain.

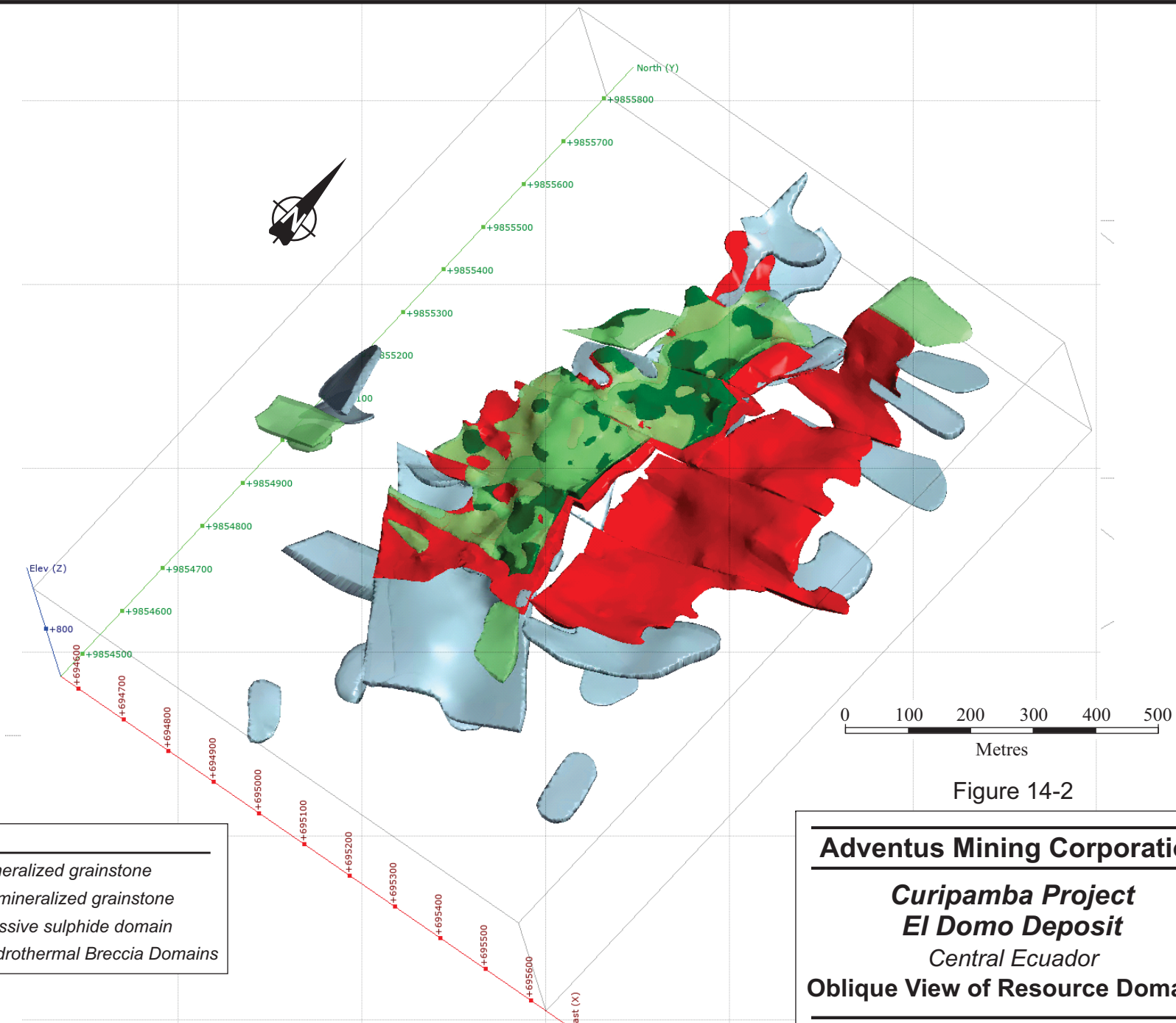
Smaller lenses of mineralization were modelled using the calculated NSR value alone. These lenses are typically associated with the hydrothermal breccia units occurring in the footwall of the massive sulphide domain.

The lithological units included in the current model and their respective codes used in the Mineral Resource estimate are presented in Table 14-3.

**TABLE 14-3 LITHOLOGICAL DOMAINS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<b>Lithology</b>	<b>Rock Code</b>
Andesite	110
Basalt	120
Breccia	130
Dacite	140
Gypsum	150
Rhyolite	160
Tuff	170
Lapilli Tuff	180
T-Rhyolite	190
<b>Mineralized Domains</b>	
VMS	1600
Grainstone inside indicator shell	2000
Grainstone outside indicator shell	2100
Hydrothermal Breccia	3000

Figure 14-2 shows an oblique view of the resource domains. Note the offset along faults (faults not shown).



**Legend:**

- Mineralized grainstone
- Unmineralized grainstone
- Massive sulphide domain
- Hydrothermal Breccia Domains

**Adventus Mining Corporation**

**Curipamba Project**

**El Domo Deposit**

Central Ecuador

**Oblique View of Resource Domains**

## DENSITY

Density data were collected by Curimining from core samples using approximately 10 cm long sub-samples. Measurements were conducted on samples for both the mineralized domains and waste rocks. In total, 4,972 density records were provided to RPA. RPA noticed that density measurements obtained from the 2018 drilling are on average 10% lower than the values used in the previous Mineral Resource estimate.

For the lithological domains, RPA elected to assign averaged values that were used in the 2018 Mineral Resource estimate (Table 14-4). A correlation between the three base metals (Cu, Pb, and Zn) and density was used to calculate density value for each block inside the mineralized domains. For this purpose, RPA removed outlier values less than 2.00 from the SG data within the hydrothermal breccia domain, and less than 2.50 from the grainstone and VMS domains. Figure 14-3 shows the correlation matrix plots.

RPA recommends that additional density measurements be collected.

**TABLE 14-4 ASSIGNED DENSITY VALUES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<b>Lithology</b>	<b>Assigned Value (t/m<sup>3</sup>)</b>
Andesite	2.73
Basalt	2.57
Breccia	2.76
Dacite	2.61
Gypsum	2.65
Rhyolite	2.67
Tuff, Lapilli Tuff, T-Rhyolite	2.46

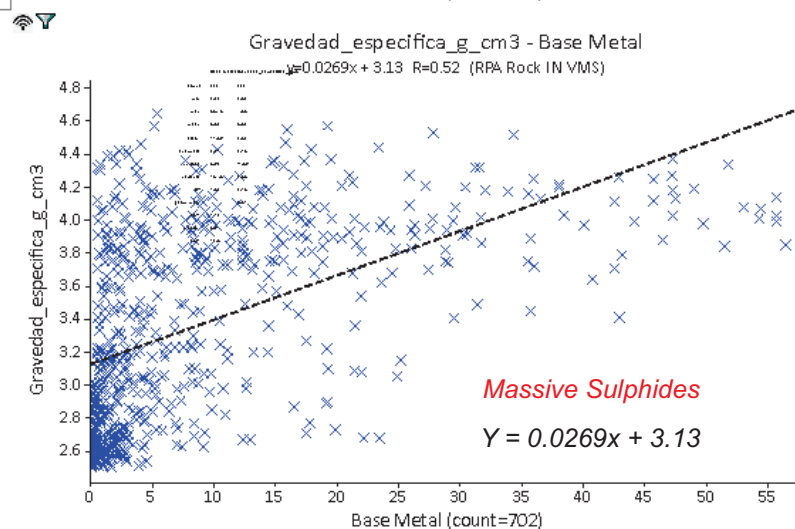
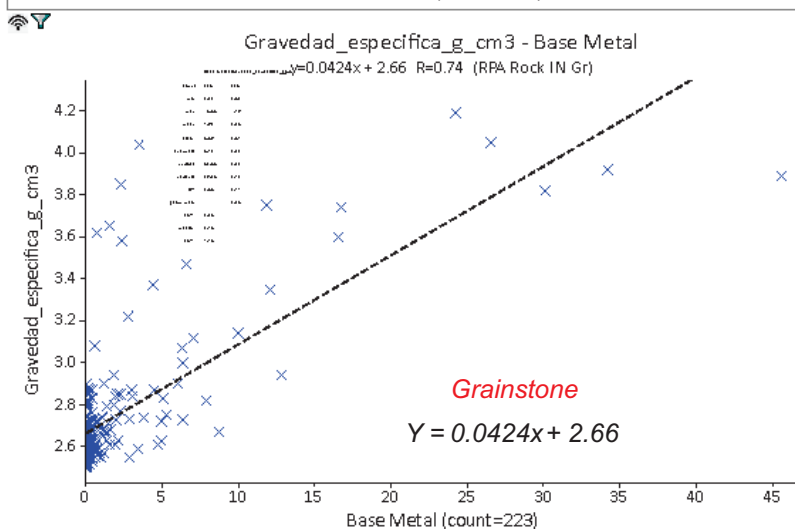
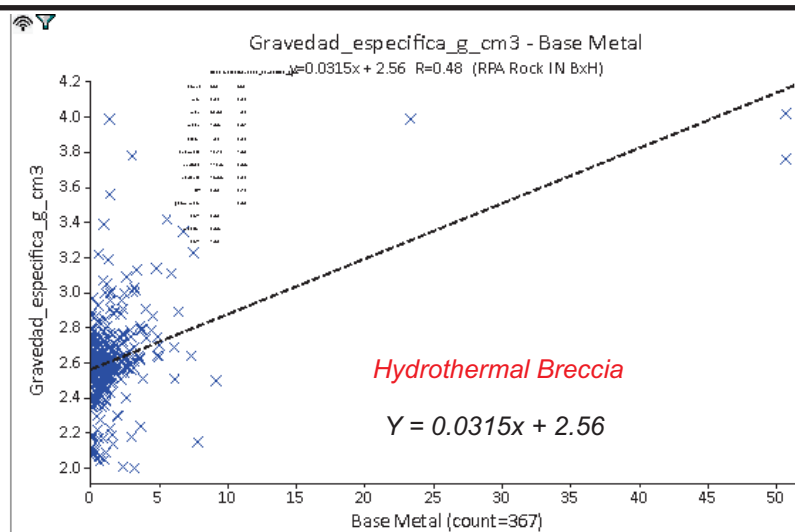
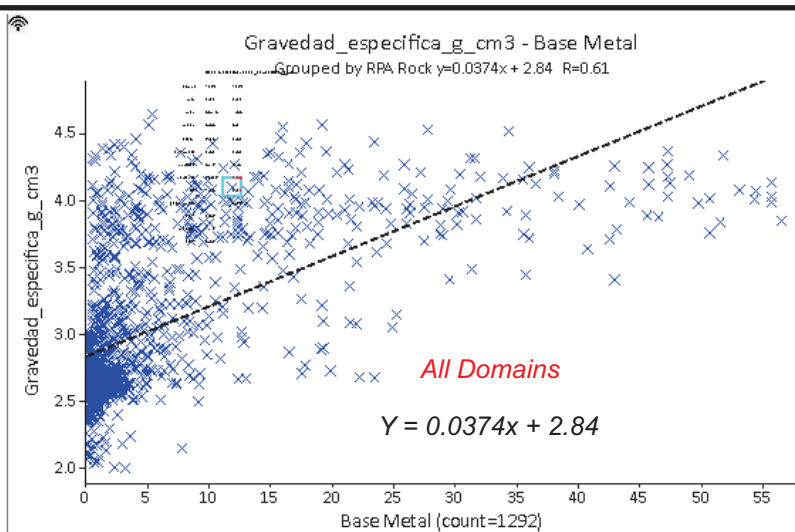


Figure 14-3

**Adventus Mining Corporation**  
**Curipamba Project**  
**El Domo Deposit**  
Central Ecuador  
**Correlation Matrix between**  
**Base Metals and Density**

## EXPLORATORY DATA ANALYSIS (EDA) - ASSAYS

The first step in developing a block model estimate after completing 3D solid models is to assess the assay data located inside the resource domains and to determine whether any additional domaining is required prior to compositing. Typically, raw assay data are extracted from each domain and assessed using histograms and cumulative probability plots.

Extreme high grade values, commonly called “outliers”, can lead to overestimation of grade in the block model. Histograms and probability plots were generated for each population; a review determined that the grade capping was required for most metals and domains.

Tables 14-5 and 14-6 show descriptive statistics for uncapped and capped gold, silver, copper, lead, and zinc assays, respectively, within each resource domain.

**TABLE 14-5 SUMMARY UNCAPPED ASSAY STATISTICS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Metal	Domain*	Count	Min	Max	Mean	Variance	Std Dev	CV	Median
Gold (g/t)	1600	1,772	0.01	94.00	2.95	37.32	6.11	2.07	0.96
	2000	253	0.01	43.00	2.25	21.13	4.60	2.05	0.87
	2100	380	0.00	4.39	0.15	0.14	0.37	2.41	0.02
	3000	1,241	0.01	19.37	0.54	1.86	1.36	2.52	0.17
Silver (g/t)	1600	1,772	0.00	1,836.00	57.40	16,846.00	129.80	2.26	13.00
	2000	253	0.00	2,160.00	47.69	25,933.00	161.00	3.38	11.00
	2100	380	0.00	89.00	2.62	54.08	7.35	2.81	0.00
	3000	1,241	0.00	763.00	17.13	1,922.00	43.85	2.56	5.00
Copper (%)	1600	1,772	0.00	23.30	2.03	11.67	3.42	1.68	0.48
	2000	253	0.00	23.63	1.10	7.80	2.79	2.53	0.16
	2100	380	0.00	1.80	0.03	0.01	0.12	3.67	0.01
	3000	1,241	0.00	16.25	0.34	1.31	1.15	3.38	0.06
Lead (%)	1600	1,772	0.00	17.20	0.32	1.08	1.04	3.21	0.03
	2000	253	0.00	8.91	0.21	0.50	0.71	3.35	0.03
	2100	380	0.00	0.59	0.01	0.00	0.05	3.38	0.00
	3000	1,241	0.00	2.62	0.09	0.04	0.20	2.18	0.02
Zinc (%)	1600	1,772	0.00	52.75	3.18	48.49	6.96	2.19	0.43
	2000	253	0.01	34.23	1.64	20.85	4.57	2.78	0.27
	2100	380	0.00	4.90	0.08	0.09	0.29	3.82	0.02
	3000	1,241	0.00	44.23	0.83	3.11	1.76	2.13	0.38

Note: \* Domain 1600: Massive Sulphide  
Domain 2000: Grainstone inside Indicator shell  
Domain 2100: Grainstone outside Indicator shell  
Domain 3000: Hydrothermal Breccia

**TABLE 14-6 SUMMARY CAPPED ASSAY STATISTICS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Metal	Domain*	Count	Min	Max	Mean	Variance	Std Dev	CV	Median
<b>Gold (g/t)</b>	1600	1,772	0.00	35.00	2.83	28.90	5.38	1.90	0.94
	2000	253	0.00	9.00	1.77	5.23	2.29	1.29	0.86
	2100	380	0.00	1.20	0.13	0.07	0.26	1.48	0.05
	3000	1,241	0.00	7.00	0.49	0.94	0.97	1.98	0.17
<b>Silver (g/t)</b>	1600	1,772	0.00	600.00	54.28	11,506.00	107.30	1.98	13.00
	2000	253	0.00	300.00	35.02	4,131.00	64.28	1.84	11.00
	2100	380	0.00	35.00	2.40	29.61	5.44	2.27	0.00
	3000	1,241	0.00	235.00	16.20	1,228.00	35.05	2.16	5.00
<b>Copper (%)</b>	1600	1,772	0.00	15.00	2.01	10.85	3.29	1.64	0.48
	2000	253	0.00	7.00	0.89	2.85	1.69	1.90	0.16
	2100	380	0.00	1.80	0.03	0.01	0.12	3.67	0.01
	3000	1,241	0.00	8.00	0.32	0.89	0.94	2.96	0.06
<b>Lead (%)</b>	1600	1,772	0.00	7.00	0.31	0.82	0.91	2.91	0.03
	2000	253	0.00	1.20	0.15	0.07	0.27	1.81	0.03
	2100	380	0.00	0.59	0.01	0.00	0.05	3.38	0.00
	3000	1,241	0.00	1.40	0.09	0.03	0.18	2.00	0.02
<b>Zinc (%)</b>	1600	1,772	0.00	35.00	3.10	42.28	6.50	2.10	0.43
	2000	253	0.01	10.00	1.23	5.55	2.36	1.92	0.27
	2100	380	0.00	1.00	0.06	0.02	0.14	2.22	0.02
	3000	1,241	0.00	6.00	0.77	1.04	1.02	1.33	0.38

Note: \* Domain 1600: Massive Sulphide  
Domain 2000: Grainstone inside Indicator shell  
Domain 2100: Grainstone outside Indicator shell  
Domain 3000: Hydrothermal Breccia

Table 14-7 shows the assay grade capping statistics, the selected capping values, and the theoretical metal loss. Typically, a metal loss of greater than 20% indicates that the capping level may be too severe as a significant amount of contained metal would be lost.



**TABLE 14-7 ASSAY GRADE CAPPING AND METAL LOSS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Metal	Domain*	Number of Assays	Raw Assay** Mean	Raw Assay Cap	Capped Assay Mean	Number of Assays Capped	Metal Loss (%)
<b>Gold (g/t)</b>	1600	1,772	2.95	35.0	2.83	12	4
	2000	253	2.25	9	1.77	12	10
	2100	380	0.15	1.2	0.13	5	2
	3000	1,241	0.54	7	0.49	9	8
<b>Silver (g/t)</b>	1600	1,772	57.40	600	54.28	19	7
	2000	253	47.69	300	35.02	7	14
	2100	380	2.62	35	2.40	5	3
	3000	1,241	17.13	235	16.20	12	6
<b>Copper (%)</b>	1600	1,772	2.03	15	2.01	16	1
	2000	253	1.10	7	0.89	9	17
	2100	380	0.03	NA	0.03	0	0
	3000	1,241	0.34	8	0.32	9	5
<b>Lead (%)</b>	1600	1,772	0.32	7	0.31	9	6
	2000	253	0.21	1.2	0.15	7	13
	2100	380	0.01	NA	0.01	0	0
	3000	1,241	0.09	1.4	0.09	5	2
<b>Zinc (%)</b>	1600	1,772	3.18	35	3.10	15	2
	2000	253	1.64	10	1.23	9	13
	2100	380	0.08	1	0.06	3	2
	3000	1,241	0.83	6	0.77	11	7

Note: \* Domain 1600: Massive Sulphide  
Domain 2000: Grainstone inside Indicator shell  
Domain 2100: Grainstone outside Indicator shell  
Domain 3000: Hydrothermal Breccia

\*\* Assays are length weighted for mean grade calculations

## EXPLORATORY DATA ANALYSIS - COMPOSITES

Prior to grade interpolation, the assay data within each of the individual mineralized domains were combined into two metre downhole composites. Table 14-8 shows composite statistics for gold, silver, copper, lead, and zinc, for the four grade domains. Due to precision differences between the original data and data stored in GEMS (data in GEMS have two decimal places, while the original data had three decimal places), some very low grade assays translated into zero grade composites. This difference is considered to be not material.

**TABLE 14-8 SUMMARY COMPOSITE STATISTICS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Metal	Domain*	Count	Min	Max	Mean	Variance	Std Dev	CV	Median
<b>Gold (g/t)</b>	1600	954	0.00	33.70	2.74	20.04	4.48	1.64	1.07
	2000	151	0.01	7.44	1.56	2.30	1.51	0.97	1.03
	2100	301	0.00	1.01	0.10	0.03	0.18	1.76	0.02
	3000	833	0.00	7.00	0.47	0.75	0.86	1.85	0.17
<b>Silver (g/t)</b>	1600	954	0.00	600.00	50.91	7,602.00	87.19	1.71	15.60
	2000	151	0.00	276.20	29.13	1,786.00	42.26	1.45	15.10
	2100	301	0.00	24.12	1.67	10.96	3.31	1.99	0.00
	3000	833	0.00	235.00	15.77	1,008.00	31.76	2.01	4.86
<b>Copper (%)</b>	1600	954	0.00	15.00	1.93	7.39	2.72	1.41	0.77
	2000	151	0.00	6.30	0.76	1.38	1.17	1.55	0.33
	2100	301	0.00	0.84	0.02	0.00	0.07	2.80	0.00
	3000	833	0.00	8.00	0.34	0.76	0.87	2.57	0.08
<b>Lead (%)</b>	1600	954	0.00	6.24	0.30	0.51	0.72	2.43	0.04
	2000	151	0.00	1.10	0.13	0.03	0.18	1.44	0.05
	2100	301	0.00	0.12	0.01	0.00	0.02	2.22	0.00
	3000	833	0.00	1.40	0.09	0.02	0.15	1.68	0.03
<b>Zinc (%)</b>	1600	954	0.00	34.33	2.87	26.75	5.17	1.80	0.75
	2000	151	0.02	8.27	0.97	1.77	1.33	1.37	0.39
	2100	301	0.00	0.60	0.05	0.01	0.08	1.77	0.02
	3000	833	0.00	6.00	0.73	0.74	0.86	1.18	0.44

## BLOCK MODEL PARAMETERS

An unrotated block model was created using GEMS. The block model coordinates are based on the local Universal Transverse Mercator (UTM) grid (Zone 17 S, PSAD 1956). Table 14-9 summarizes the block model definition.

**TABLE 14-9 GEMS BLOCK MODEL DEFINITION**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

	Block Size (m)	Origin* (m)	Block Count
X	5	694,200	400
Y	5	9,854,300	350
Z	2.5	1,200	350

Note: \* GEMS considers the following convention for origin definition: minimum X and Y, maximum Z.

The grades for each of the grade domains were populated into a partial percent block model. The final block model includes a diluted grade attribute that provides a single grade per block that takes into account the percent and density of all grade domains within that block.

## VARIOGRAPHY AND GOLD GRADE ESTIMATION

Variogram analyses were completed for each domain. The data distribution within the domains did not produce reliable variograms, which RPA attributes to the thin, but folded and faulted, domain shapes for the massive sulphide domain and the small, isolated grade domains in the footwall of the massive sulphide. As a result, RPA elected to use the inverse distance estimator to the power of two ( $ID^2$ ) with universal search radii as defined in the 2018 estimation. Table 14-10 shows a summary of the search parameters.

**TABLE 14-10 SUMMARY OF SEARCH PARAMETERS**  
Adventus Mining Corporation – Curipamba Project – El Domo Deposit

Search Domain*	Search Ellipse **	Search Range (m)		High Grade Restriction		
		Pass 1	Pass 2	Element	Grade Limit	Range X/Y/Z (m)
1600	Prin. Az.	70	140	Au (g/t)	20	30/30/30
	Prin. Dip	70	140	Cu (%)	10	30/30/30
	Inter. Az.	60	60			
	Min Comps	3	2			
	Max Comps	8	10			
	Max Comps/Hole	2				
2000	Prin. Az.	70	140	Au (g/t)	5	30/30/30
	Prin. Dip	70	140	Cu (%)	4	30/30/30
	Inter. Az.	60	60			
	Min Comps	3	2			
	Max Comps	8	10			
	Max Comps/Hole	2				
2100	Prin. Az.	70	140	Au (g/t)	-	30/30/30
	Prin. Dip	70	140	Cu (%)	-	30/30/30
	Inter. Az.	60	60			
	Min Comps	3	2			
	Max Comps	8	10			
	Max Comps/Hole	2				

Search Domain*	Search Ellipse **	Search Range (m)		High Grade Restriction		
		Pass 1	Pass 2	Element	Grade Limit	Range X/Y/Z (m)
3000	Prin. Az.	70	140	Au (g/t)	3	30/30/30
	Prin. Dip	70	140	Cu (%)	5	30/30/30
	Inter. Az.	60	60			
	Min Comps	3	2			
	Max Comps	8	10			
	Max Comps/Hole	2				

Note: \* Domain 1200: Massive Sulphide  
Domain 2000: Grainstone inside Indicator shell  
Domain 2100: Grainstone outside Indicator shell  
Domain 3000: Hydrothermal Breccia

\*\* Search orientation was aligned to the continuity of the mineralization either in original or unfolded space.

Grade interpolation using ID<sup>2</sup> and capped two-metre long composites was based on a minimum of three and a maximum of eight composites in the first pass, and a minimum of two and a maximum of ten composites in the second estimation run. For the first estimation run, a maximum of two samples per drill hole were utilized, which forces each block to use composite samples from at least two drill holes to obtain a block estimate. Estimation was performed in two passes, with the first pass having the shorter ranges and the second pass having two times the search range of pass one in the easting and northing, while the vertical search range remained the same. Even though the grade domains have limited thicknesses, comparatively large vertical search ranges were used to ensure that grade continuity occurred across faults, where domains (and grades) are offset vertically. Hard boundaries were used between individual grade domains.

For the estimation of grades in the massive sulphide and grainstone within the indicator shell domains, RPA used an unfolding routine in GEMS. This procedure translates blocks and composites into a virtual, flattened space, applies regular search and interpolation parameters, and later returns the blocks with estimated grades into their original space. This technique also eliminates fault offsets during the estimation. The benefit of this procedure is that grade distribution will follow the variable dip of a folded host horizon and interpolation will consider samples for correlation that would otherwise fall outside a static search ellipsoid's range.

In conjunction with the copper grade interpolation, the distance (in metres) to the closest sample, number of samples, and drill holes used for block interpolation were recorded in a separate model to be used for block resource classification.

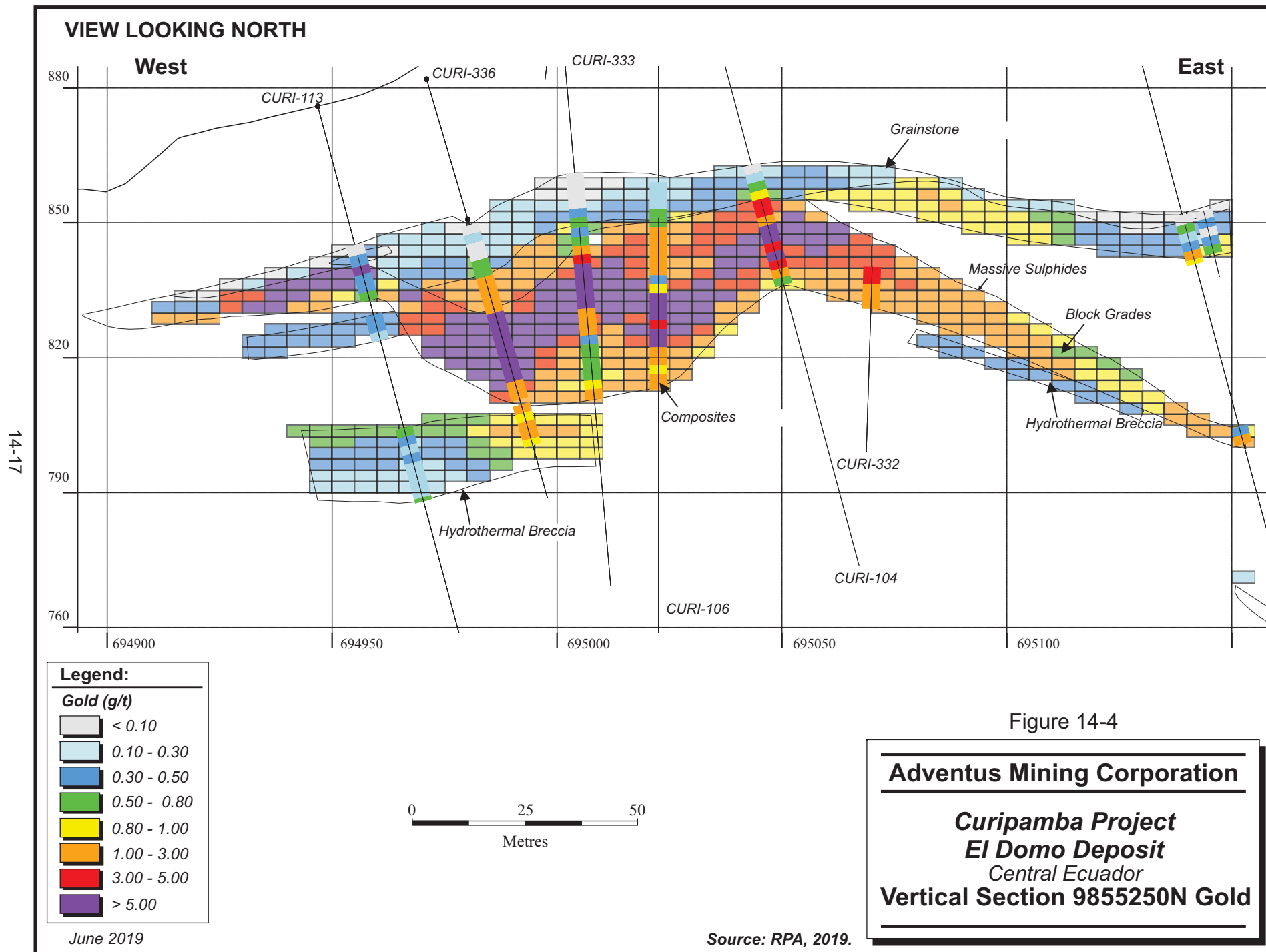
The block model was set up as a multi-folder partial percent model with separate folders for massive sulphide, grainstone, hydrothermal breccia, and lithological domains. The percent of a domain inside a block was recorded in a separate attribute. After estimation, grades and percent were combined in a fifth folder such that the individual percent amounts of the three individual folders (mineralization domains) were added, as well as metal content weighted by the corresponding percent attribute and density. Resources were reported based on the unified model.

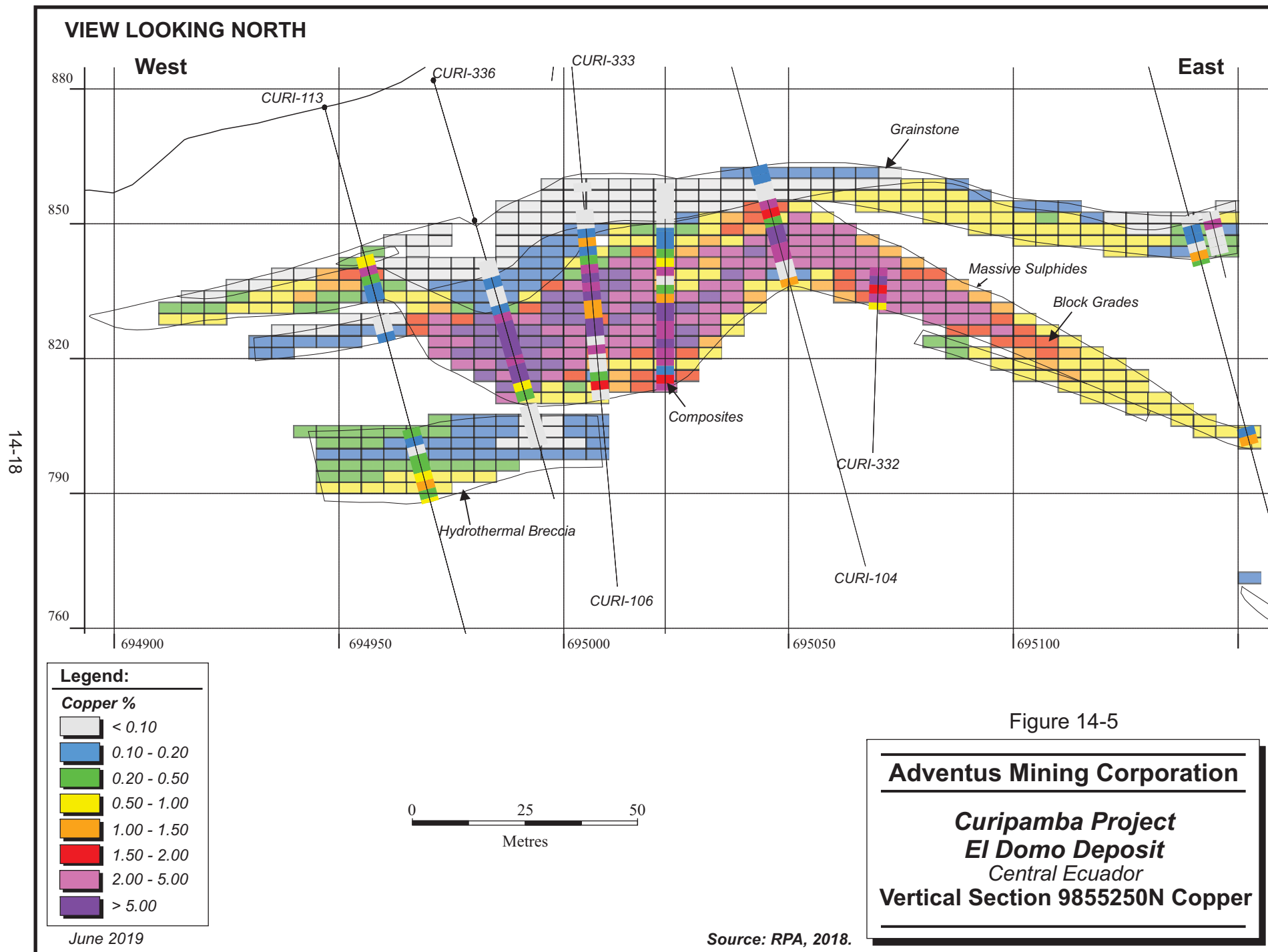
## BLOCK MODEL VALIDATION

Validation of the block grade estimates was conducted using the following processes:

- Visual comparison of block grades versus the informing two metre composites on sections and level plans.
- Global and local mean grade comparison between the primary ID<sup>2</sup> grade estimates, the nearest neighbour, and the informing two metre composite grades.
- Swath plots along the three axes of composite grades versus ID<sup>2</sup> and NN

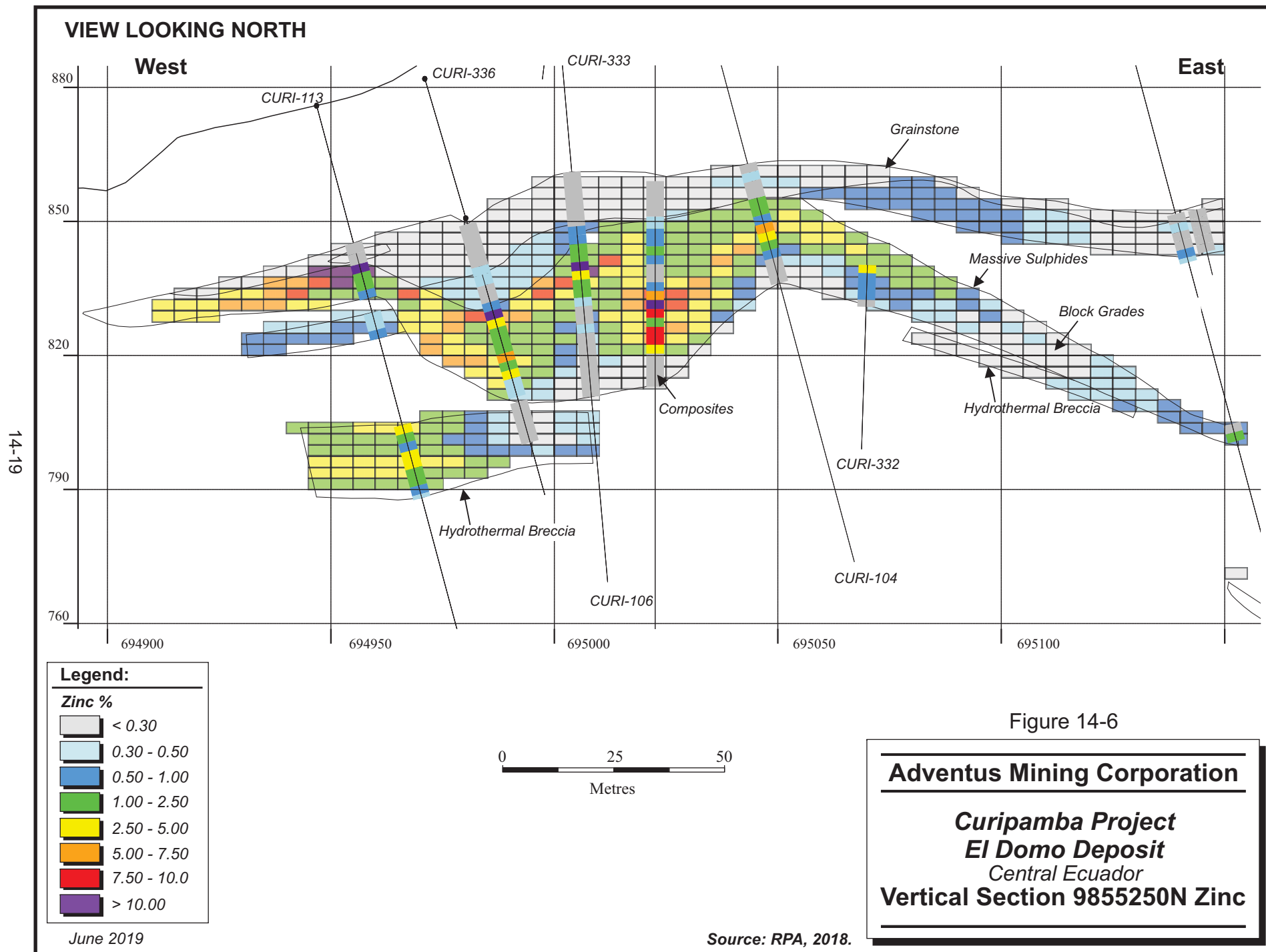
A thorough visual section-by-section comparison was completed between informing data and block estimates. Sample sections are shown in Figures 14-4 to 14-6 for gold, copper, and zinc, respectively. In addition, swath plots were used to compare the informing data with the estimated grades using both ID<sup>2</sup> and NN methods (Figures 14-7 to 14-9). Block grade estimates compared well with the informing data, indicating that the estimation parameters used in the interpolation of grades were appropriate (Table 14-11).





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**TABLE 14-11 COMPOSITE VERSUS BLOCK DATA**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Metal	Domain*	Capped Composites			Block Model – ID <sup>2</sup>			Block Model - NN		
		Count	Max	Mean	Count	Max	Mean	Count	Max	Mean
Gold (g/t)	1600	954	33.70	2.74	73,593	26.35	2.20	73,593	33.70	2.46
	2000	151	7.44	1.56	13,859	5.82	1.43	13,859	7.44	1.39
	2100	301	1.01	0.10	20,906	0.65	0.07	20,906	0.87	0.10
	3000	833	7.00	0.47	105,641	6.24	0.42	105,641	7.00	0.47
Silver (g/t)	1600	954	600.00	50.91	73,593	548.55	45.13	73,593	600.00	47.78
	2000	151	276.20	29.13	13,859	192.37	29.48	13,859	276.18	25.97
	2100	301	24.12	1.67	20,906	18.80	1.20	20,906	24.12	1.21
	3000	833	235.00	15.77	105,641	234.62	14.82	105,641	235.00	15.77
Copper (%)	1600	954	15.00	1.93	73,593	13.95	1.78	73,593	15.00	2.00
	2000	151	6.30	0.76	13,859	5.05	0.81	13,859	6.30	0.78
	2100	301	0.84	0.02	20,906	0.46	0.02	20,906	0.84	0.01
	3000	833	8.00	0.34	105,641	6.67	0.28	105,641	8.00	0.38
Lead (%)	1600	954	6.24	0.30	73,593	5.75	0.26	73,593	6.24	0.28
	2000	151	1.10	0.13	13,859	0.89	0.12	13,859	1.10	0.10
	2100	301	0.12	0.01	20,906	0.12	0.01	20,906	0.12	0.01
	3000	833	1.40	0.09	105,641	1.21	0.09	105,641	1.40	0.09
Zinc (%)	1600	954	34.33	2.87	73,593	32.76	2.76	73,593	34.33	2.62
	2000	151	8.27	0.97	13,859	6.35	0.96	13,859	8.27	0.85
	2100	301	0.60	0.05	20,906	0.59	0.05	20,906	0.60	0.04
	3000	833	6.00	0.73	105,641	5.64	0.72	105,641	6.00	0.75

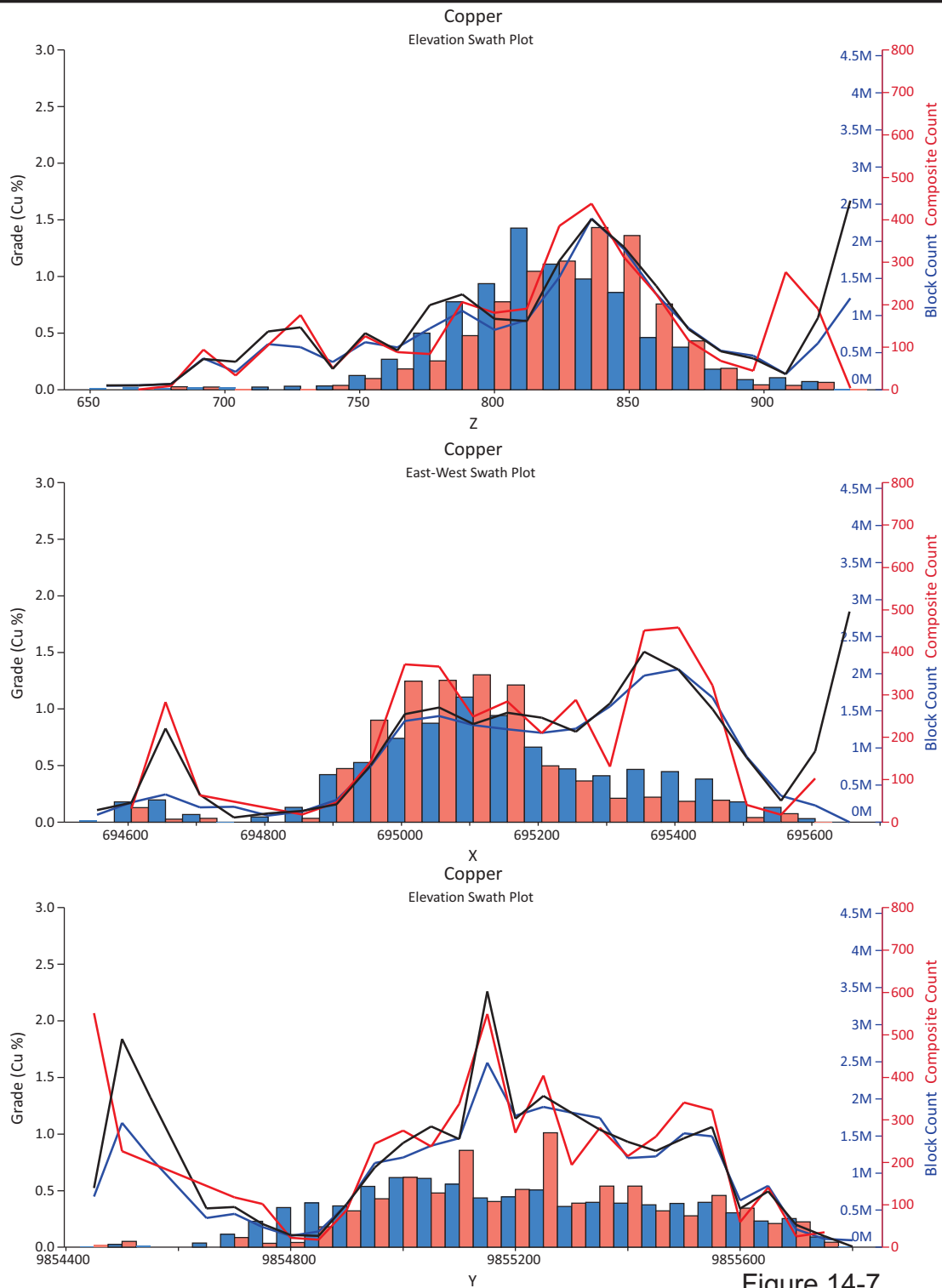


Figure 14-7

**Legend:**

- BM ID2 Grade
- Composite Grade
- BM NN Grade
- Block Count
- Composite Count

June 2019

Source: RPA, 2019.

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
**Swath Plots - Copper**

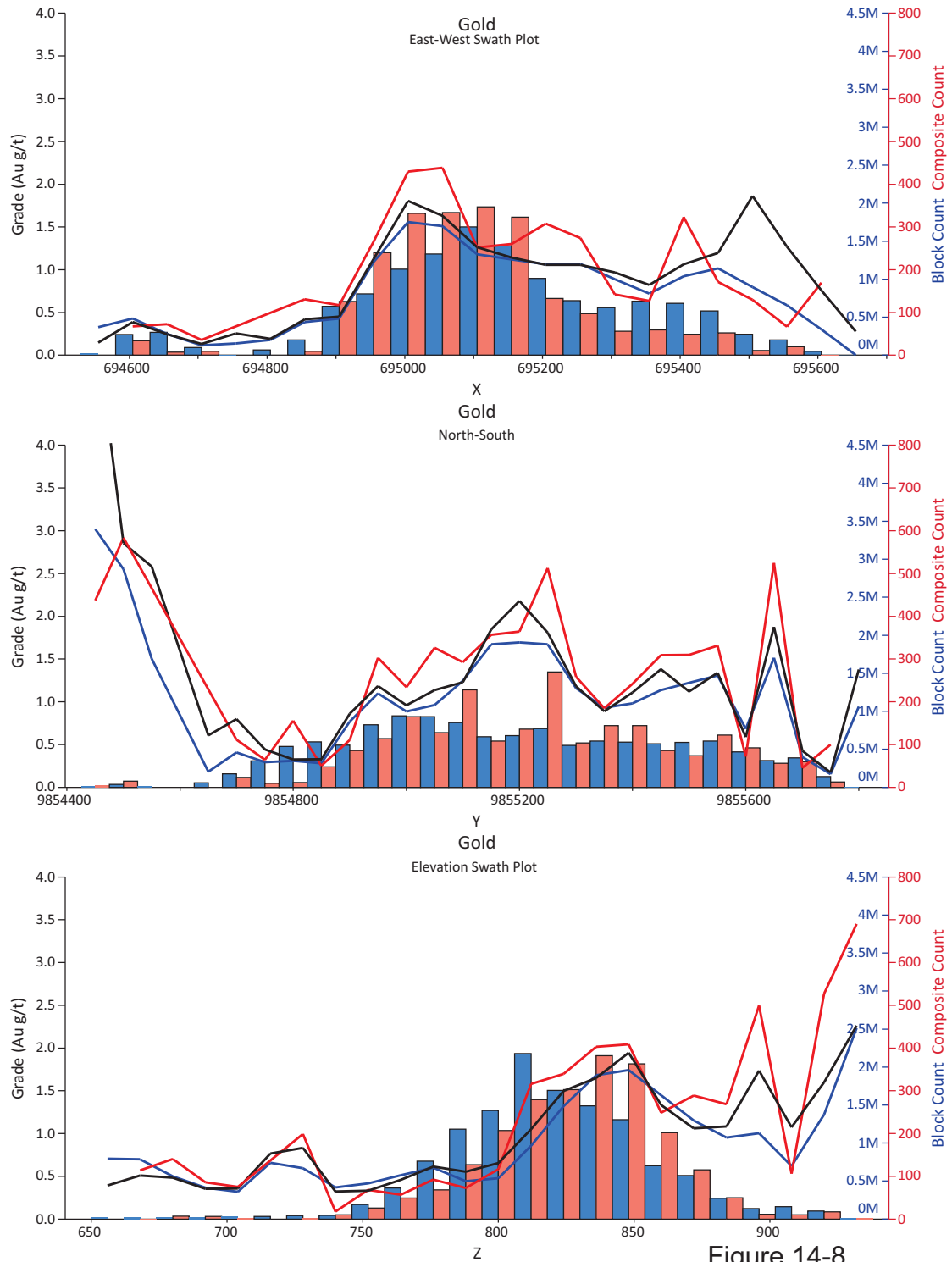


Figure 14-8

**Legend:**

- BM ID2 Grade
- Composite Grade
- BM NN Grade
- Block Count
- Composite Count

June 2019

Source: RPA, 2019.

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
**Swath Plots - Gold**

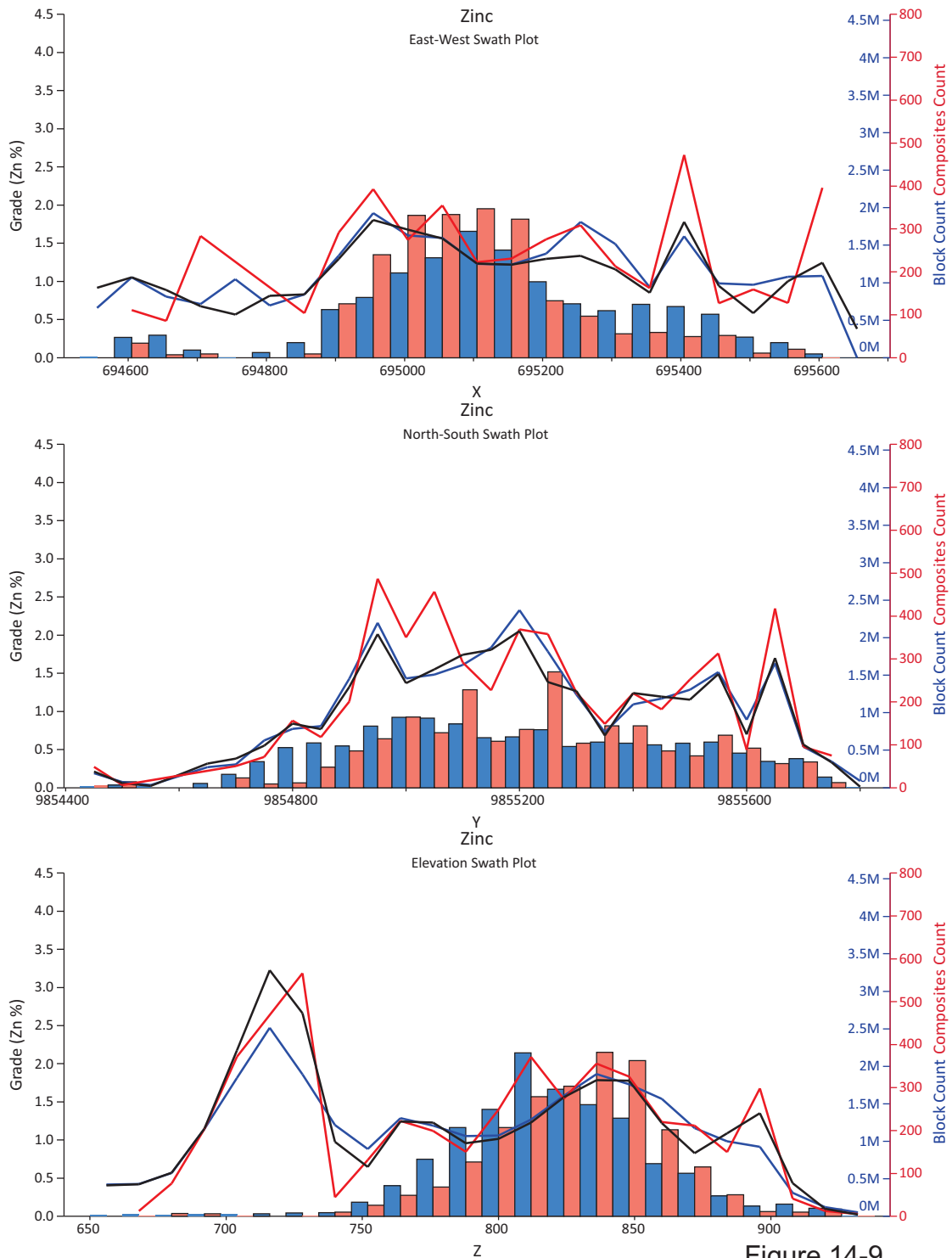


Figure 14-9

**Legend:**

- BM ID2 Grade
- Composite Grade
- BM NN Grade
- Block Count
- Composite Count

June 2019

Source: RPA, 2019.

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
**Swath Plots - Zinc**

## NSR FACTORS AND CUT-OFF VALUE

NSR factors were developed by RPA for the purposes of geological interpretation and resource reporting. NSR is the estimated value per tonne of mineralized material after allowance for metallurgical recovery and consideration of smelter terms, including payables, treatment charges, refining charges, price participation, penalties, smelter losses, transportation, and sales charges.

The calculation of the NSR value of each block was a two-step process. Initially, each block was flagged as one of three types of mineralization, based on the metal ratio of copper to the sum of lead plus zinc (metal ratio =  $\text{Cu}/(\text{Pb} + \text{Zn})$ ). Blocks with a metal ratio less than 0.33 were assigned Zn-type mineralization – Type 1; blocks with a metal ratio between 0.33 and 3.0 were assigned Mixed Cu-Zn mineralization – Type 2; and blocks with a metal ratio greater than 3.0 were assigned Cu-type mineralization – Type 3.

Input parameters used to develop the NSR factors have been derived from recent metallurgical test work on the El Domo deposit and smelter terms from comparable projects. These assumptions are dependent on the processing scenario, and will be sensitive to changes in inputs from further metallurgical test work. The net revenue from each metal was calculated and then divided by grade to generate an NSR factor. These NSR factors represent revenue (US\$) per metal unit (per g/t Au, for example), and are independent of resource grade. Table 14-12 shows key assumptions and factors used by RPA to calculate the NSR, while Table 14-13 shows recoveries used in the calculation.

**TABLE 14-12 KEY ASSUMPTIONS FOR THE NSR CALCULATION**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

	Gold	Silver	Copper	Lead	Zinc
Metal Prices	US\$1,350/oz	US\$18/oz	US\$3.15/lb	US\$1.00/lb	US\$1.15/lb
	US\$/g	US\$/g	US\$/%	US\$/%	US\$/%
Value Factor Zn-Type	14.17	0.27	29.94	9.17	11.52
Value Factor Mixed Cu/Zn-Type	22.90	0.27	44.20	0.00	11.34
Value Factor Cu-Type	6.86	0.19	46.27	0.00	0.00

Note:

- Type 1: Zinc mineral:  $\text{Cu}/(\text{Pb}+\text{Zn}) < 0.33$
- Type 2: Mixed Cu/Zn mineral:  $0.33 \leq \text{Cu}/(\text{Pb}+\text{Zn}) \leq 3$
- Type 3: Copper mineral:  $\text{Cu}/(\text{Pb}+\text{Zn}) > 3$

**TABLE 14-13 RECOVERIES FOR NSR CALCULATION**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Concentrate	Metal	Recovery (%)		
		Zn-Type Mineralization	Mixed Cu/Zn-Type Mineralization	Cu-Type Mineralization
Cu	Au	6.2	50.1	26.6
	Ag	22.6	46.1	50.2
	Cu	58.2	82.7	88.3
	Pb	7.7	76.0	68.6
	Zn	8.2	20.5	73.4
Zn	Au	40.8	15.5	-
	Ag	33.4	22.9	-
	Cu	19.7	5.6	-
	Pb	6.9	9.4	-
	Zn	85.4	75.4	-
Pb	Au	4.1	-	-
	Ag	15.1	-	-
	Cu	6.5	-	-
	Pb	69.0	-	-
	Zn	0.9	-	-

To fulfill the CIM requirement of “reasonable prospects for eventual economic extraction”, RPA performed pit optimization analyses on the Mineral Resource to determine the economics of extraction by open pit methods. The pit shell was generated using Whittle software. Table 14-14 lists the common parameters used to calculate NSR cut-off values and items used to optimize a preliminary pit shell to report Mineral Resources.

**TABLE 14-14 WHITTLE PIT PARAMETERS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Parameter	Unit	Input
Block Size	m	5x5x2.5
Whittle Block Size	m	5x5x5
Pit Slope	°	45.0
East Wall Pit Slope	°	50.0
Au Price	US\$/oz	1,350
Ag Price	US\$/oz	18.0
Cu Price	US\$/lb	3.15
Pb Price	US\$/lb	1.00
Zn Price	US\$/lb	1.15
Cu Concentrate Transport	US\$/wmt	98.0
Pb Concentrate Transport	US\$/wmt	98.0
Zn Concentrate Transport	US\$/wmt	98.0
Cu Concentrate Treatment	US\$/dmt	80.0
Pb Concentrate Treatment	US\$/dmt	200.0
Zn Concentrate Treatment	US\$/dmt	190.0
Au Refining	US\$/oz	5.0
Ag Refining	US\$/oz	0.70
Cu Refining	US\$/lb	0.80
Royalty (Net Revenue)	%	6.0
Costs		
Open Pit Mining Cost	US\$/t mined	3.5
Process Cost	US\$/t processed	13.0
G&A Cost	US\$/t processed	12.0
Underground Alternative Mining Cost	US\$/t processed	75.0
Resource Classification	Measured Indicated & Inferred	All

Whittle calculates a final break-even pit shell based on all operating costs (mining, processing, and general and administration (G&A)) required to mine a given block of material. Since all blocks within the break-even pit shell must be mined (regardless if they are waste or mineral), any block that has sufficient revenue to cover the costs of processing and G&A is sent to the processing plant. The open pit Mineral Resources were reported from within the pit shell using an NSR cut-off value of US\$25.00 per tonne based on a \$13.00 per tonne processing cost and \$12.00 per tonne G&A cost.



Mineral Resources located outside the pit shell were reported on the basis of a potential underground mining operation at an NSR cut-off value of \$100 per tonne. This cut-off value was based on mining costs of \$75 per tonne and the same processing and G&A assumptions as listed above.

## CLASSIFICATION

Definitions for resource categories used in this report are consistent with CIM (2014) definitions incorporated by reference into NI 43-101. In the CIM classification, a Mineral Resource is defined as “a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity, and other geological characteristics of a Mineral Resource are known, estimated, or interpreted from specific geological evidence and knowledge, including sampling. Mineral Resources are classified into Measured, Indicated, and Inferred categories. A Mineral Reserve is defined as the “economically mineable part of a Measured and/or Indicated Mineral Resource” demonstrated by studies at pre-feasibility or feasibility level as appropriate. Mineral Reserves are classified into Proven and Probable categories.

The classification of the El Domo deposit is based on drill hole spacing, confidence in the available data, and the apparent continuity of mineralization. With significant increase in geological understanding, and the infill drilling carried out in 2018, RPA was able to upgrade a portion of the Mineral Resources to a Measured category. The Mineral Resources assigned to the Measured category have a drill hole spacing of approximately 25 m or less, are within the massive sulphide horizon (Figure 14-10), and exhibit good grade continuity. The areas with drill hole spacing of 50 m or less, located within the massive sulphides and grainstone domains, with good mineralization continuity, were classified as Indicated Mineral Resources. Additionally, parts of the hydrothermal breccia that are positioned in proximity to the massive sulphide domain, with drill hole spacing of 50 m or less were assigned an Indicated category. All other areas of the Mineral Resources were assigned to the Inferred category.

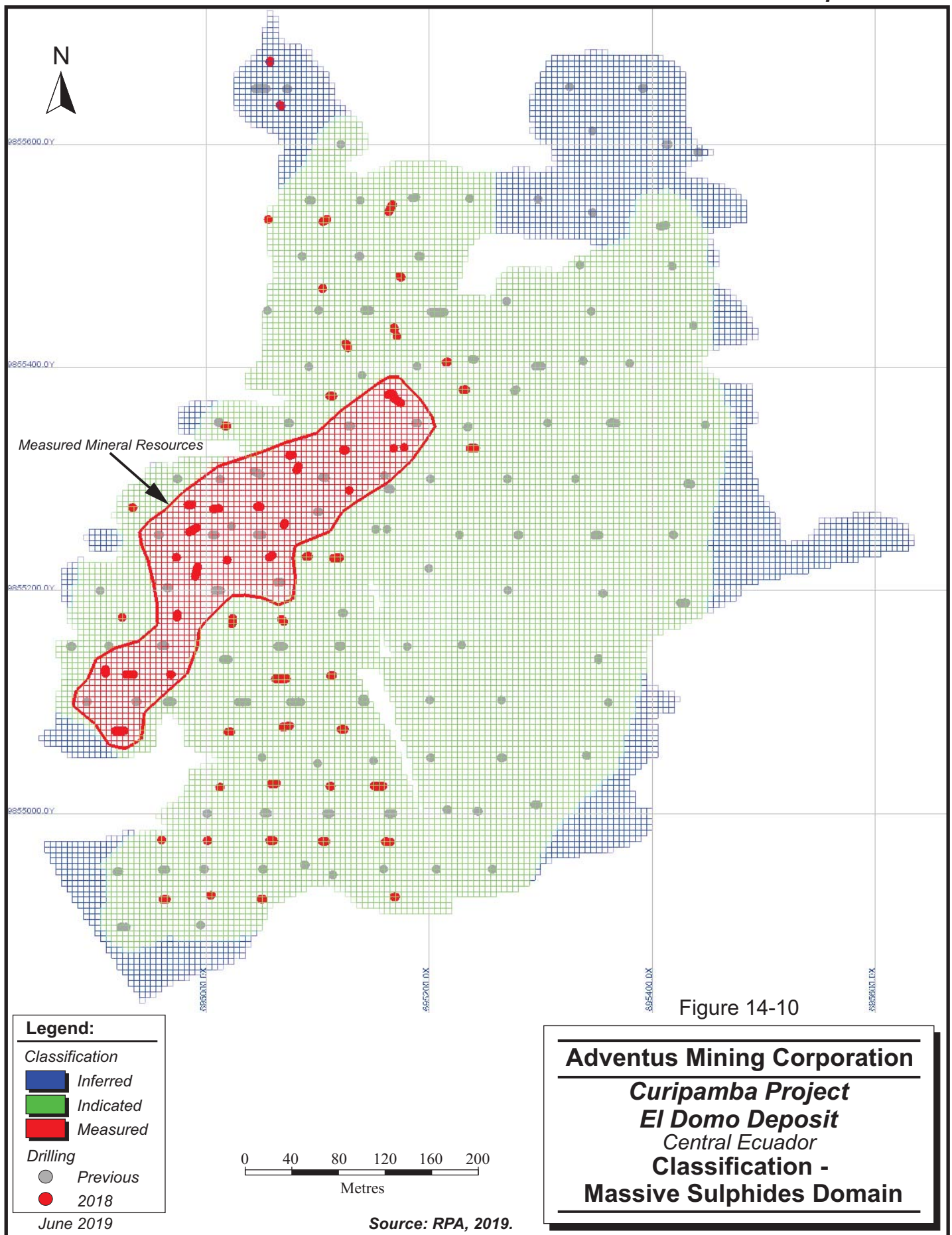


Figure 14-10

In the underground portion of the Mineral Resource estimate, isolated blocks above NSR cut-off values and blocks located within areas of thickness less than two metres were removed from the Mineral Resource statement.

## MINERAL RESOURCE STATEMENT

The Mineral Resource estimate has an effective date of May 2, 2019 (Table 14-15).

**TABLE 14-15 MINERAL RESOURCE STATEMENT AS OF MAY 2, 2019**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Resource Category	Tonnes (Mt)	Grade					Contained Metal				
		Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Pb (kt)	Zn (kt)	Au (koz)	Ag (koz)
Pit Constrained Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	5.7	1.74	0.28	2.60	2.47	51	99.0	16.1	147.8	452	9,417
M+I	7.1	1.78	0.30	2.78	2.73	53	126.8	21.4	198.7	627	12,121
Inferred	0.7	0.67	0.21	1.72	1.60	46	4.6	1.5	11.9	36	1,032
Underground Mineral Resources											
Indicated	1.8	2.91	0.20	3.51	1.85	43	51.9	3.6	62.5	106	2,467
Inferred	0.6	2.46	0.19	2.82	2.09	37	15.5	1.2	17.8	42	751
Total Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	7.5	2.02	0.26	2.81	2.33	49	150.9	19.7	210.3	559	11,884
M+I	8.9	2.00	0.28	2.93	2.56	51	178.7	25.0	261.3	733	14,588
Inferred	1.3	1.52	0.20	2.25	1.83	42	20.1	2.7	29.7	78	1,783

**Notes:**

- CIM (2014) definitions were followed for Mineral Resources.
- A minimum mining height of two metres was applied to the Mineral Resource wireframes.
- Bulk density assigned on a block per block basis using the correlation between measured density values and base metal grades.
- Mineral Resources are reported above a cut-off NSR value of US\$25 per tonne for potential open-pit Mineral Resources and US\$100 per tonne for potential underground Mineral Resources.
- The NSR value is based on estimated metallurgical recoveries, assumed metal prices, and smelter terms, which include payable factors treatment charges, penalties, and refining charges.
- Metal prices are based on consensus, long term forecasts from banks, financial institutions, and other sources averaging US\$3.15/lb Cu, US\$1.00/lb Pb, US\$1.15/lb Zn, US\$1,350/oz Au, and US\$18/oz Ag.
- Metallurgical recoveries assumptions were based on three mineralization types defined by the metal ratio Cu/(Pb+Zn):
  - Zinc Mineral (Cu/(Pb+Zn)<0.33): 84% for Cu, 84% for Pb, 95% for Zn, 51% for Au, and 71% for Ag
  - Mixed Cu/Zn Mineral (0.33≤Cu/(Pb+Zn)≤3.0): 88% for Cu, 85% for Pb, 96% for Zn, 66% for Au, and 69% for Ag
  - Copper Mineral (Cu/(Pb+Zn)>3.0): 88% for Cu, 69% for Pb, 73% for Zn, 27% for Au, and 50% for Ag
- NSR factors were also based on the mineralization types:
  - Zinc Mineral: 29.94 US\$/% Cu, 9.17 US\$/% Pb, 11.52 US\$/% Zn, 14.17 US\$/g Au, and 0.27 US\$/g Ag
  - Mixed Cu/Zn Mineral: 44.20 US\$/% Cu, 11.34 US\$/% Zn, 22.90 US\$/g Au, and 0.27 US\$/g Ag

- Copper Mineral: 46.27 US\$/% Cu, 6.86 US\$/g Au, and 0.19 US\$/g Ag
- 9. Numbers may not add due to rounding.
- 10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- 11. Open pit Mineral Resources have been constrained within a preliminary pit shell.

Mineral Resources reported within each mineralized domain are presented in Table 14-16.

**TABLE 14-16 MINERAL RESOURCE STATEMENT AS OF MAY 2, 2019 PER DOMAIN**

**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Resource Category	Tonnes (Mt)	Grade					Contained Metal				
		Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Pb (kt)	Zn (kt)	Au (koz)	Ag (koz)
Pit Constrained Mineral Resources											
Massive Sulphides											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	3.9	2.13	0.35	3.31	2.95	62	82.3	13.6	127.9	366	7,646
M+I	5.3	2.07	0.36	3.37	3.16	60.63	110.1	18.9	178.8	540	10,350
Inferred	0.2	0.59	0.52	4.38	3.40	94	1.0	0.8	7.1	18	489
Grainstone											
Indicated	1.5	0.95	0.14	1.20	1.62	32	14.2	2.2	17.9	77	1,552
Inferred	0.0	0.63	0.06	0.63	1.24	28	0.2	0.0	0.2	1	28
Hydrothermal Breccia											
Indicated	0.3	0.75	0.09	0.57	0.80	20	2.6	0.3	1.9	9	219
Inferred	0.5	0.70	0.12	0.93	1.03	32	3.5	0.6	4.6	17	515
Underground Mineral Resources – Massive Sulphides											
Indicated	1.8	2.91	0.20	3.51	1.85	43	51.9	3.6	62.5	106	2,467
Inferred	0.6	2.46	0.19	2.82	2.09	37	15.5	1.2	17.8	42	751
Total Mineral Resources											
Measured	1.4	1.92	0.37	3.52	3.75	58	27.8	5.3	50.9	174	2,704
Indicated	7.5	2.02	0.26	2.81	2.33	49	150.9	19.7	210.3	559	11,884
M+I	8.9	2.00	0.28	2.93	2.56	51	178.7	25.0	261.3	733	14,588
Inferred	1.3	1.52	0.20	2.25	1.83	42	20.1	2.7	29.7	78	1,783

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. A minimum mining height of two metres was applied to the Mineral Resource wireframes.
3. Bulk density assigned on a block per block basis using the correlation between measured density values and base metal grade.
4. Mineral Resources are reported above a cut-off NSR value of US\$25 per tonne for potential open-pit Mineral Resources and US\$100 per tonne for potential underground Mineral Resources.
5. The NSR value is based on estimated metallurgical recoveries, assumed metal prices, and smelter terms, which include payable factors treatment charges, penalties, and refining charges.
6. Metal prices are based on consensus, long term forecasts from banks, financial institutions, and other sources averaging US\$3.15/lb Cu, US\$1.00/lb Pb, US\$1.15/lb Zn, US\$1,350/oz Au, and US\$18/oz Ag.
7. Metallurgical recoveries assumptions were based on three mineralization types defined by the metal ratio Cu/(Pb+Zn):
  - Zinc Mineral (Cu/(Pb+Zn)<0.33): 84% for Cu, 84% for Pb, 95% for Zn, 51% for Au, and 71% for Ag
  - Mixed Cu/Zn Mineral (0.33≤Cu/(Pb+Zn)≤3.0): 88% for Cu, 85% for Pb, 96% for Zn, 66% for Au, and 69% for Ag



- Copper Mineral (Cu/(Pb+Zn)>3.0): 88% for Cu, 69% for Pb, 73% for Zn, 27% for Au, and 50% for Ag
- 8. NSR factors were also based on the mineralization types:
  - Zinc Mineral: 29.94 US\$/% Cu, 9.17 US\$/% Pb, 11.52 US\$/% Zn, 14.17 US\$/g Au. and 0.27 US\$/g Ag
  - Mixed Cu/Zn Mineral: 44.20 US\$/% Cu, 11.34 US\$/% Zn, 22.90 US\$/g Au. and 0.27 US\$/g Ag
  - Copper Mineral: 46.27 US\$/% Cu, 6.86 US\$/g Au. and 0.19 US\$/g Ag
- 9. Numbers may not add due to rounding.
- 10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
- 11. Open pit Mineral Resources have been constrained within a preliminary pit shell.

## COMPARISON TO PREVIOUS MINERAL RESOURCE ESTIMATES

The current Mineral Resource estimate supersedes a previous Mineral Resource estimate dated January 9, 2018. The current Mineral Resource model incorporates additional drilling completed in 2018 and an updated 3D seamless geological model. Table 14-17 shows a direct comparison between the January 31, 2018 and the current Mineral Resource estimates.

**TABLE 14-17 COMPARISON BETWEEN 2018 AND 2019 MINERAL RESOURCES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

2018 Model Prepared by RPA											
Class	Tonnage (Mt)	Grade					Contained Metals				
		Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Pb (kt)	Zn (kt)	Au (koz)	Ag (koz)
Indicated	8.8	1.62	0.27	2.42	2.34	48	141.8	23.5	211.8	660	13,400
Inferred	2.6	1.29	0.14	1.51	1.09	30	33.9	3.7	39.6	92	2,500

2019 Model Prepared by RPA											
Class	Tonnage (Mt)	Grade					Contained Metals				
		Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Cu (kt)	Pb (kt)	Zn (kt)	Au (koz)	Ag (koz)
M+I	8.9	2.00	0.28	2.93	2.56	51	178.7	25.0	261.3	733	14,588
Inferred	1.3	1.52	0.20	2.25	1.83	42	20.1	2.7	29.7	78	1,783

Difference											
Class	Tonnage	Grade					Contained Metal				
		Cu	Pb	Zn	Au	Ag	Cu	Pb	Zn	Au	Ag
M+I	1%	23%	4%	21%	9%	6%	26%	6%	23%	11%	9%
Inferred	-50%	18%	43%	49%	68%	40%	-41%	-27%	-25%	-15%	-29%

Notes:

1. 2018 numbers are reported as per press release dated January 31, 2018.
2. 2019 numbers are reported as per press release dated May 2, 2019.

It is evident from Table 14-17 that while the overall tonnage has decreased, the overall metal content has increased. In 2018, mineralization domains were modelled considering mineralization in the lithological controlled massive sulphide and grainstone domains, which were altered locally to include continuous assays. The purely grade based domains, located primarily in the footwall of the massive sulphide domain, were also encapsulating the latter to form a lower grade halo.

The current domain model benefited from a significant increase of lithological understanding due to additional drilling completed in 2018. The refined geological model, taking into consideration the structural setting at the El Domo deposit, was used as a base for defining mineralization domains. The boundaries of massive sulphides and grainstone domains were slightly modified locally to better represent mineralization within the units. Additional, low grade envelopes were defined within the hydrothermal breccia unit located in the footwall of the massive sulphide domain.

In both 2018 and 2019 models, mineralization domains terminate along modelled faults and are offset vertically. Although the 2019 model is more confined to the lithology, the volumetric comparison of all of the mineralized zones shows a slight increase (~1.5%) in 2019 volume mainly due to additional mineralization in the north of the El Domo deposit defined by the latest drilling.

Assay data were analyzed for grade continuity and high grade assays were capped, where deemed necessary. In most cases, capping values are comparable to those used during the 2018 estimation. A notable exception is a capping value of 28% Zn employed in 2018 in a massive sulphide sub-domain, versus a 35% cap applied in 2019. Additionally, the grade domain inside the grainstone unit separating the mineralized zone from the barren one allowed for the small increase in capping levels for each metal. For grainstone, the highest increase is noted in the capping level for silver which increased from 150 g/t in 2018 to 300 g/t in the 2019 estimation.

The current resource model is reported at higher NSR cut-off values for both the open pit and underground mining methods, \$22 per tonne in 2018 versus \$25 per tonne in 2019 and \$65 per tonne in 2018 versus \$100/ per tonne in 2019, respectively. The additional material defined by the latest drilling and an increase of the pit slope (in the eastern part of the deposit) resulted in the larger optimized shell for open pit reporting. Higher reporting cut-off values and slightly

adjusted capping levels in 2019 had an impact on the increase in the reported grades; whereas, due to the larger shell and some of the Inferred material being upgraded to the Indicated category, the tonnage of the 2019 Indicated Mineral Resource remained similar to the 2018 tonnage.

## **15 MINERAL RESERVE ESTIMATE**

There are no Mineral Reserves in the Project.



## 16 MINING METHODS

The principal mining method proposed in the PEA is conventional open pit mining (drilling, blasting, loading, and hauling) at a production rate of 1,750 tpd. The open pit mine design consists of a single pit with a mining sequence optimized through four main phases to maximize grade, reduce stripping ratios, and maintain the processing plant at optimum capacity.

Initially, open pit mining will be used, followed by a combination of open pit and underground mining. Underground development will start in Year 9 of the production schedule proposed in the PEA at a target rate of 1,000 tpd, using variations of room and pillar methods.

The PEA proposed open pit production totals 7.5 Mt, which is estimated from open pit constrained Mineral Resources using a \$25 per tonne NSR cut-off value, a dilution factor of 5%, and 100% mining recovery. The open pit mine life, including pre-stripping, is estimated to be approximately 16 years, with a total stripping ratio of 6.3 and an average production rate of 1,750 tpd of mineralized material.

The PEA proposed underground production totals 1.2 Mt, which is estimated from underground constrained Mineral Resources using a \$100 per tonne NSR cut-off value, a dilution factor of 10%, and 80% mining recovery. Due to the geometry of the deposit, the proposed mining method is room and pillar with delayed backfill. The underground mine life, with a production of 1,000 tpd, is estimated to be approximately six years, with additional time required for underground access development and infrastructure construction.

All open pit and underground mining will be carried out using contractor personnel and equipment with oversight by owner's personnel. The open pit contractor operations will include pit and dump operations, pit dewatering, and road maintenance. The underground contractor operations will include all development and production activities.

Approximately 5% of the tonnage from the open pit constrained Mineral Resource and 24% of the tonnage from the underground constrained Mineral Resource, which form the basis of the PEA, are derived from Inferred Mineral Resources.

## OPEN PIT

The El Domo VMS deposit has two structural domains: the Eastern sector, which contains the deepest mineralized zone, below the andesite unit, and the Western sector, which encompasses the mineralized zone underneath the tuff unit. The tuff unit is mostly composed of incompetent rocks, and will be mined by open pit methods. Material will be drilled and blasted, then loaded by backhoe excavators into haul trucks dispatched to the crusher, waste dumps, or stockpiles.

## OPTIMIZATION

Parameters presented in Section 14 were used in Whittle pit optimization, applying the economic trade-off between open pit mining and underground mining. Table 16-1 shows the nested pit shell optimization results using different revenue factors and Figure 16-1 presents the Resource Pit based on a revenue factor of 1.0.

**TABLE 16-1 MINERAL RESOURCE PIT OPTIMIZATION RESULTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Pit	Revenue Factor	Tonnes (kt)	Grade					Waste (kt)	Total (kt)	W:O Ratio
			Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)			
1	0.15	784	3.92	0.56	4.96	6.14	91.0	5,349	6,133	6.8
2	0.20	1,808	3.25	0.54	4.91	4.97	90.2	11,100	12,908	6.1
3	0.25	2,255	2.96	0.49	4.43	4.48	81.9	12,110	14,365	5.4
4	0.30	2,548	2.78	0.46	4.16	4.21	77.4	12,771	15,319	5.0
5	0.35	3,019	2.56	0.45	4.03	3.93	74.8	15,354	18,373	5.1
6	0.40	3,365	2.41	0.44	3.89	3.78	73.0	17,202	20,568	5.1
7	0.45	3,722	2.30	0.43	3.75	3.62	69.9	19,500	23,222	5.2
8	0.50	5,287	2.11	0.36	3.25	3.24	62.1	32,915	38,202	6.2
9	0.55	5,668	2.02	0.35	3.15	3.11	60.0	34,685	40,352	6.1
10	0.60	6,184	1.93	0.33	3.03	3.01	58.3	38,462	44,646	6.2
11	0.65	6,475	1.89	0.32	2.96	2.94	57.0	40,134	46,609	6.2
12	0.70	6,679	1.85	0.32	2.93	2.89	56.4	41,384	48,064	6.2
13	0.75	6,873	1.82	0.31	2.89	2.85	55.6	42,737	49,610	6.2
14	0.80	7,073	1.79	0.31	2.84	2.80	54.9	44,057	51,131	6.2
15	0.85	7,232	1.77	0.30	2.81	2.77	54.4	44,989	52,221	6.2
16	0.90	7,397	1.74	0.30	2.77	2.73	53.8	46,021	53,418	6.2
17	0.95	7,720	1.70	0.29	2.72	2.66	52.7	48,332	56,052	6.3
18	1.00	7,837	1.68	0.29	2.69	2.63	52.2	48,724	56,562	6.2

## **GEOMECHANICS**

The PEA pit optimization was based on overall pit slope of 45° and 50° on the East Wall where an apparently competent andesite rock was found. There is no geotechnical study supporting these pit slopes. RPA is of the opinion that these pit slopes are reasonable for the PEA level of study.

RPA recommends that a geotechnical study be conducted to determine the optimum pit slopes for the final pit geometry.

RPA recommends that a hydrogeology study be completed to determine the open pit dewatering parameters. The overburden dewatering parameters required for the design of surface diversions and drainage systems based on the final open pit geometry should also be established.

## **DESIGN**

Open pit mine design criteria are based on a conventional surface mine operation using 114 mm blasthole production drills, 3.8 m<sup>3</sup> backhoe excavators, and haulage by a fleet of 40-tonne capacity trucks.

The final pit design was established using the Whittle pit geometry at a revenue factor of 1.0 as a guideline to include ramps and a catch bench every 80 m. The geometric, operational, and geotechnical variables, as well as the inclusion of a ramp, the bench height, and the presence of berms were taken into account.

The pit design parameters are listed in Table 16-2. The width of the ramp is 12 m, including the safety berms, which enables safe operation for 40-tonne trucks. The final 3D open pit design is shown in Figure 16-2, and the plan view is shown in Figure 16-3.

**TABLE 16-2 OPEN PIT DESIGN PARAMETERS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<b>Pit Design Parameters</b>	<b>Units</b>	<b>Value</b>
Bench Height	m	5.0
Ramp Width	m	12
Overall Pit Slope (excluding East Wall)	°	45.0
East Wall Pit Slope	°	50.0
Catch Bench	m	12
Vertical Spacing (Catch Bench)	m	80
Inter-ramp Design (45° zone)		
Berm Width	m	3.66
Bench Face Angle	°	75
Inter-ramp Design (50° zone)		
Berm Width	m	2.2
Bench Face Angle	°	75

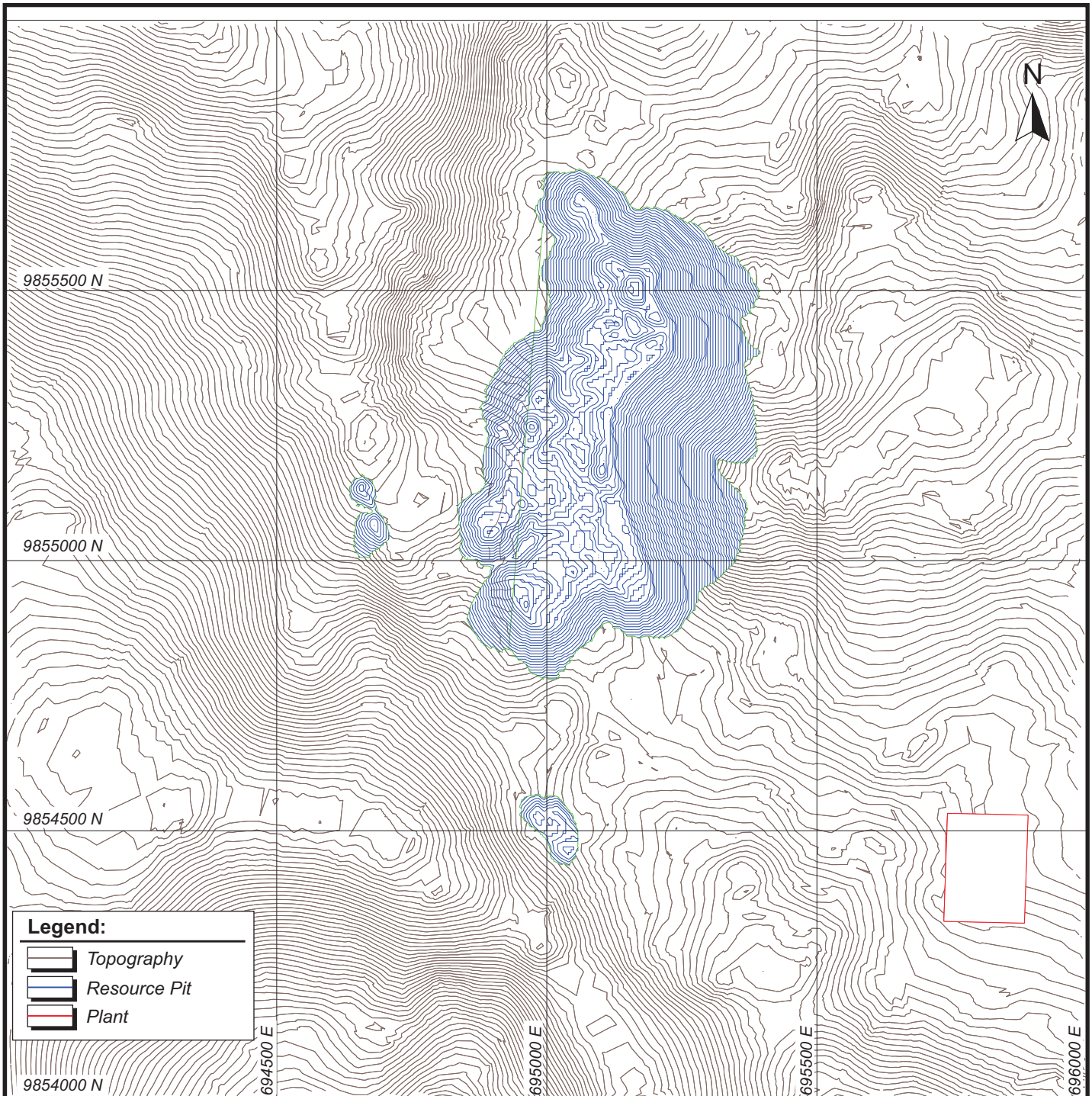


Figure 16-1

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**  
**Central Ecuador**  
**Resource Pit**

0 100 200 300 400 500  
 Metres

UTM Grid Zone 17 S, PSAD 1956

June 2019

Source: RPA, 2019.



16-6

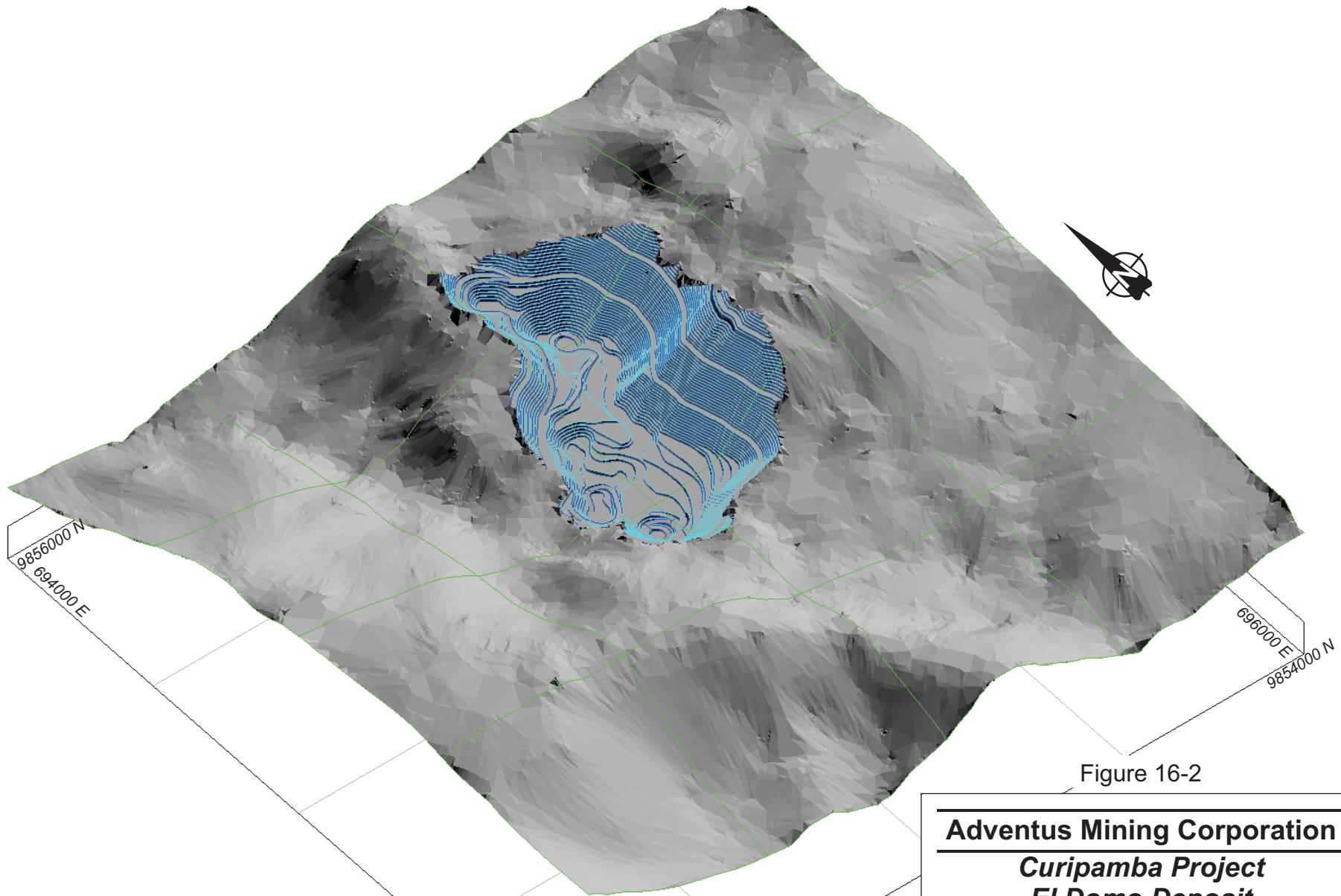


Figure 16-2

0 100 200 300 400 500  
Metres

UTM Grid Zone 17 S, PSAD 1956

June 2019

Source: RPA, 2019.

**Adventus Mining Corporation**  
**Curipamba Project**  
**El Domo Deposit**  
Central Ecuador  
**Final Pit Design**  
**Isometric View**

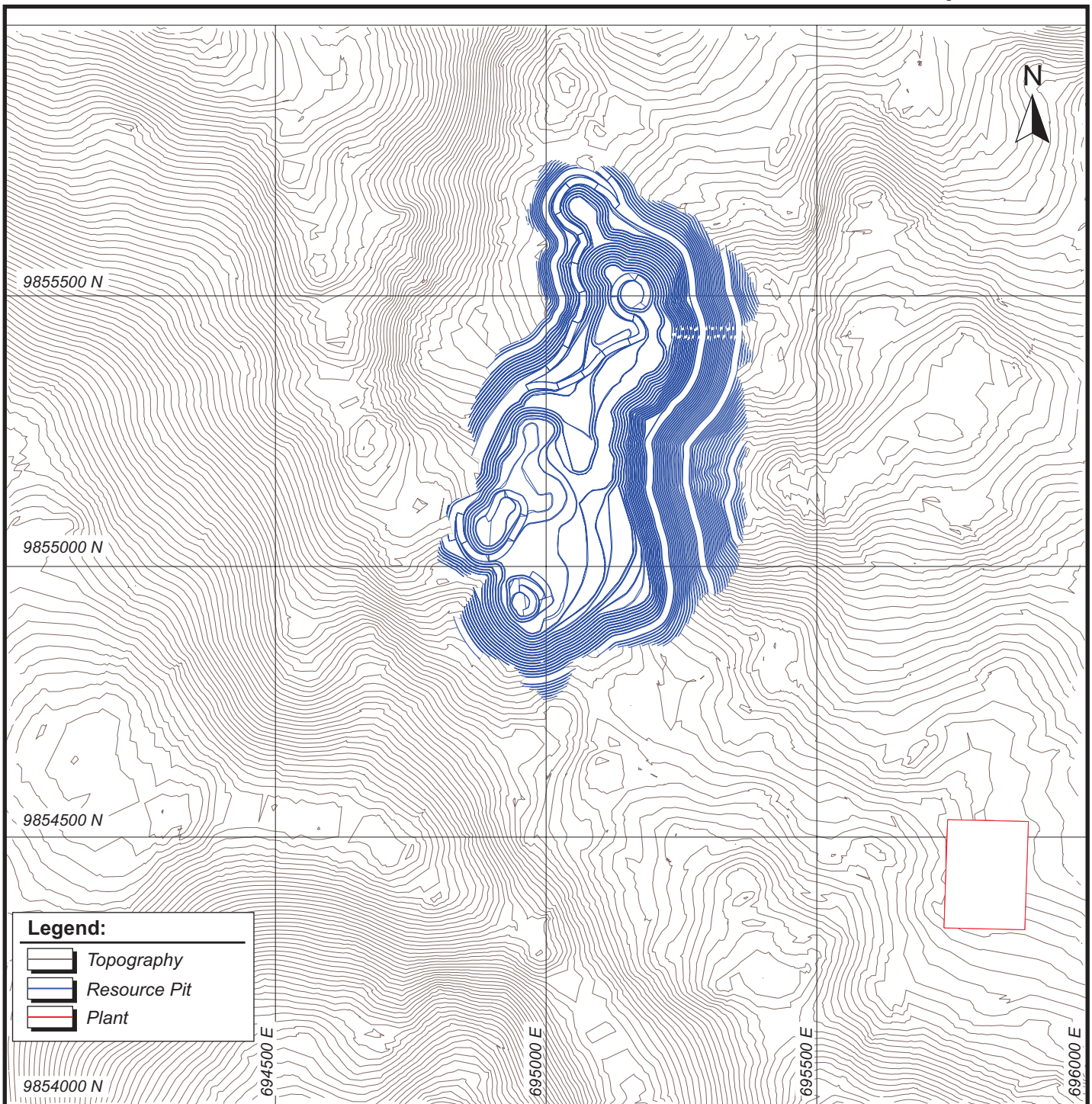
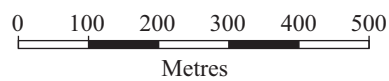


Figure 16-3



UTM Grid Zone 17 S, PSAD 1956

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
**Final Pit Design Plan**

June 2019

Source: RPA, 2019.

## NSR CUT-OFF VALUE

To develop the conceptual PEA open pit mine plan, RPA has applied an NSR cut-off value of US\$25 per tonne to the Mineral Resources to determine the insitu tonnes to be potentially mined by open pit. Table 16-3 shows the potential insitu tonnes. Mining has been scheduled in four phases over the life of mine (LOM).

**TABLE 16-3 INSITU MINERAL RESOURCES IN THE PEA OPEN PIT MINE PLAN**

**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Insitu	NSR (\$/t)	Resource (000 t)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Waste (000 t)	Total (000 t)	W:O Ratio
Ph01	25	1,075	4.42	68.13	2.61	0.41	3.71	5,886	6,961	5.47
Ph02	25	851	3.48	80.76	2.41	0.47	4.33	6,001	6,851	7.05
Ph03	25	2,212	2.66	54.84	1.64	0.36	3.11	10,751	12,963	4.86
Ph04	25	2,987	2.02	40.12	1.33	0.17	1.79	24,968	27,955	8.36
<b>Total</b>		<b>7,125</b>	<b>2.75</b>	<b>53.77</b>	<b>1.75</b>	<b>0.30</b>	<b>2.79</b>	<b>47,606</b>	<b>54,731</b>	<b>6.7</b>

## DILUTION AND MINING RECOVERY

For this preliminary stage, RPA considered 5% dilution and 100% mining recovery. Table 16-4 shows the diluted Mineral Resources included in the conceptual PEA open pit plant feed.

**TABLE 16-4 DILUTED MINERAL RESOURCES IN THE PEA OPEN PIT MINE PLAN BY PHASE**

**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Phase	Dilution (%)	Mining Recovery (%)	Resource (000 t)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)	Waste (000 t)	Total (000 t)	W:O Ratio
Ph01	5%	100%	1,129	4.20	64.72	2.48	0.39	3.52	5,832	6,961	5.2
Ph02	5%	100%	893	3.31	76.72	2.29	0.45	4.11	5,958	6,851	6.7
Ph03	5%	100%	2,323	2.53	52.10	1.56	0.34	2.95	10,640	12,963	4.6
Ph04	5%	100%	3,137	1.92	38.11	1.27	0.16	1.70	24,819	27,955	7.9
<b>Total</b>			<b>7,482</b>	<b>2.62</b>	<b>51.08</b>	<b>1.66</b>	<b>0.29</b>	<b>2.65</b>	<b>47,249</b>	<b>54,731</b>	<b>6.3</b>

## MINERAL RESOURCES IN THE CONCEPTUAL PEA OPEN PIT PLANT FEED

RPA estimated the Mineral Resources in the conceptual PEA open pit mine plan for each of the mineral types. In this plan, the Mineral Resources in the plant feed total 953 kt of copper mineral; 2,141 kt of zinc mineral, and 4,387 kt of mixed copper/zinc mineral, for a total of 7,481 kt of mineral and 47.3 Mt tonnes of waste rock for a stripping ratio of 6.3:1 (Table 16-5).



**TABLE 16-5 DILUTED MINERAL RESOURCES IN THE PEA OPEN PIT MINE PLAN**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

		Y-2	Y-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	TOTAL
<b>Zn Mineral</b>																		
Resource	t ('000)			140	208	117	250	177	171	294	297	166	116	35	31	50	91	2,141
Au	g/t			3.7	4.2	5.3	4.6	3.2	3.4	3.2	2.2	2.7	2.7	2.0	1.9	2.0	1.7	3.3
Ag	g/t			64.7	73.4	153.0	118.2	78.2	92.5	69.2	58.9	61.7	73.3	54.3	50.7	46.9	41.6	78.2
Cu	%			0.7	0.9	1.8	1.4	0.8	1.0	0.8	0.5	0.6	0.8	0.6	0.7	0.6	0.4	0.9
Pb	%			0.5	0.7	1.2	0.9	0.7	0.7	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.6
Zn	%			3.8	5.2	8.8	7.3	4.2	5.9	4.4	3.5	3.9	3.8	2.5	3.5	2.6	2.2	4.7
<b>Mixed Cu/Zn Mineral</b>																		
Resource	t ('000)			397	347	441	328	354	294	266	292	372	323	192	171	313	298	4,387
Au	g/t			4.1	4.5	2.5	2.2	3.0	2.6	1.8	2.0	2.9	1.7	1.9	1.8	1.8	1.4	2.5
Ag	g/t			63.7	64.7	50.4	53.7	46.9	53.6	36.1	38.2	51.0	31.3	37.9	32.3	32.3	26.2	45.7
Cu	%			2.6	3.3	2.1	1.8	2.7	2.0	1.2	1.2	2.0	1.2	1.4	1.2	1.4	1.1	1.9
Pb	%			0.3	0.4	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2
Zn	%			3.1	3.2	2.2	2.4	2.9	2.4	1.6	1.5	2.0	1.4	1.7	1.4	1.4	1.1	2.1
<b>Cu Mineral</b>																		
Resource	t ('000)			24	58	54	35	82	148	53	24	74	74	36	61	120	110	953
Au	g/t			2.6	3.3	2.2	1.9	1.6	1.8	1.5	1.3	1.2	0.9	1.0	1.0	0.8	0.8	1.5
Ag	g/t			25.7	33.8	20.2	19.8	13.1	16.2	10.5	13.8	14.9	10.6	11.3	12.5	11.8	9.5	14.9
Cu	%			3.7	5.2	3.9	4.2	2.5	2.8	1.7	1.4	2.4	1.7	1.7	1.5	2.0	1.6	2.5
Pb	%			0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Zn	%			0.8	1.0	0.7	0.4	0.5	0.4	0.3	0.2	0.5	0.3	0.3	0.3	0.3	0.3	0.4
<b>Total Open Pit Processed</b>																		
Resource	t ('000)			561	613	613	613	613	613	613	612	613	513	263	263	483	499	7,482
Au	g/t			3.9	4.3	3.0	3.2	2.9	2.6	2.4	2.1	2.7	1.8	1.8	1.7	1.6	1.3	2.6
Ag	g/t			62.3	64.7	67.3	78.0	51.4	55.4	49.8	47.3	49.5	37.8	36.4	29.9	28.7	25.3	51.1
Cu	%			2.1	2.7	2.2	1.8	2.1	1.9	1.0	0.9	1.7	1.2	1.3	1.2	1.5	1.1	1.7
Pb	%			0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.3
Zn	%			3.2	3.7	3.3	4.3	2.9	2.9	2.9	2.4	2.3	1.8	1.6	1.3	1.2	1.1	2.6
Waste	t ('000)	700	3,837	3,543	4,314	4,634	10,387	10,957	2,863	2,018	1,342	1,010	366	327	305	232	491	47,327
Stripping Ratio	O/W	-	-	6.3	7.0	7.6	17.0	17.9	4.7	3.3	2.2	1.6	0.7	1.2	1.2	0.48	0.98	6.3

## MINE PLAN

The production plan was designed to extract a maximum of 1,750 tpd, or approximately 612,500 tpa. At this rate of production, the mine life is 16 years, including two years of pre-stripping. This plan complies with the new Ecuadorian mining regulations. From Year 10 onwards, the open pit annual production is decreased once the underground mine commences operation in order to maintain a plant throughput of 612,500 tpa. Table 16-5, above, shows the open pit mine plan with the total production from the three metallurgical mineral types and the waste rock generated during the 16 years of open pit operation. Figure 16-4 is a graphic presentation of production by mineral type.

**FIGURE 16-4 ANNUAL OPEN PIT MINING PLAN**

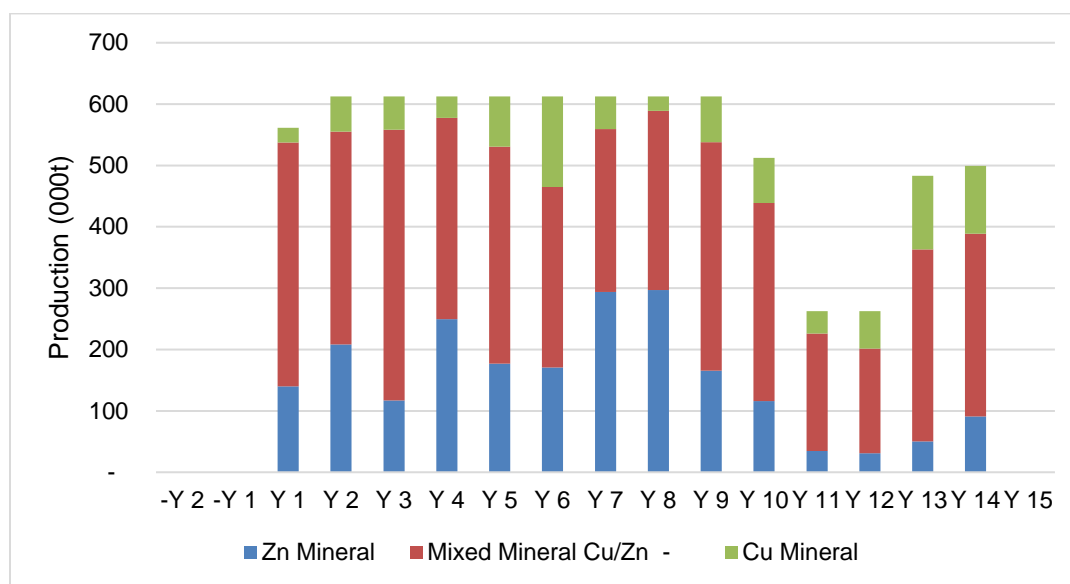
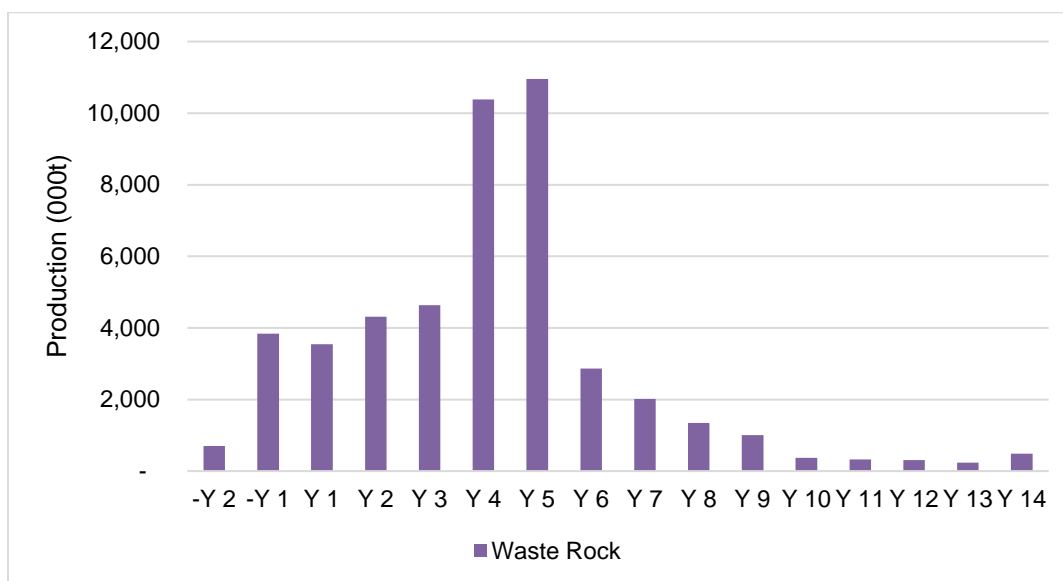


Figure 16-5 is a graphic presentation of waste production. Years 4 and 5 will require additional contractor mining capacity for Phase 3 and Phase 4 pre-stripping.

RPA recommends that a trade-off analysis be carried out evaluating the alternative of mining additional waste from Phase 3 and Phase 4 in Years 2 and 3, to balance the mine equipment requirements.

**FIGURE 16-5 ANNUAL OPEN PIT WASTE PRODUCTION**



## MINE EQUIPMENT

The requirements for mining equipment were based on annual mining production, estimated effective operating time (uptime), and the productivity of the equipment. The size and type of equipment are consistent with the Project scope:

- Initial work and construction of access roads to the mine and crusher, stockpile, and waste rock dump
- First two years of stripping (pre-production)
- Transport of mineralized material or waste rock to the plant, stockpile, and waste rock dump
- Maintenance of open pit working areas, internal and external access roads, etc.
- Waste rock dumps and stockpile
- Construction of infrastructure

The proposed equipment is detailed in Table 16-6.

RPA recommends that a trade-off analysis be carried out evaluating the alternative of utilizing 100-tonne trucks along with the 40-tonne trucks for waste mining equipment, in order to reduce the number of trucks required in Years 4 and 5.

**TABLE 16-6 OPEN PIT MINING EQUIPMENT FLEET**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	Y-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14
<b>Main Equipment</b>															
Mineralized material trucks - Volvo FMX84R - 20 m <sup>3</sup>	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mineralized material excavators - CAT 365 - 3.8 m <sup>3</sup>	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Waste trucks - Volvo FMX84R -20 m <sup>3</sup>	7	7	8	9	19	20	6	4	3	2	1	1	1	1	1
Waste excavators - CAT 365- 3.8 m <sup>3</sup>	2	2	2	2	4	4	2	1	1	1	1	1	1	1	1
Drills - ROC L8 – 114 mm (4 1/2")	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1
Front end loader - 966 CAT - 3.6 m <sup>3</sup>	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1
Bulldozer - D8R - 11.8 m <sup>3</sup>	2	2	2	2	6	6	1	1	1	1	1	1	1	1	1
Grader - CAT 140H - 3.7 m <sup>3</sup>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Water tanker - 15900 - 15 m <sup>3</sup>	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1
<b>Auxiliary Equipment</b>															
Service truck	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Production truck - ANFO+emulsion - 13.5 t	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bobcat - 1.7 m <sup>3</sup>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pick-up 4x4 Curipamba	2	4	4	4	4	4	4	4	4	2	3	4	5	6	7
Pick-up 4x4 Contractor	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Pick-up 4x4 Sampling	-	1	1	1	1	1	1	1	1	1	2	3	4	5	6
Personnel bus	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1
Pump	-	1	1	1	1	1	1	1	1	1	2	3	4	5	6
Lighting	6	7	7	7	9	9	7	6	6	4	4	4	4	4	4
<b>Total</b>	<b>34</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>64</b>	<b>62</b>	<b>38</b>	<b>34</b>	<b>33</b>	<b>28</b>	<b>30</b>	<b>33</b>	<b>36</b>	<b>39</b>	<b>42</b>

## DRILLING AND BLASTING

The drilling equipment considered is the ROC L8 (sized in accordance with the properties of the mineralized material and the waste rock), which is capable of drilling holes of up to 114 mm (4½ in.) in diameter. A total of 20% of over-drilling will be applied to the final height of each bench extracted.

## LOADING AND TRANSPORT

Blasted material will be loaded with CAT365 excavators and hauled with Volvo FMX84R trucks with a 20 m<sup>3</sup> capacity.

## DESIGN OF WASTE ROCK DUMP

The waste rock dump lies south of the open pit. Table 16-7 lists the waste rock dump design parameters.

**TABLE 16-7 WASTE ROCK DUMP DESIGN PARAMETERS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Design Parameters	Unit	Value
Dry waste rock density	t/m <sup>3</sup>	1.97
Overall slope		2.5H:1V
Maximum waste dump elevation	MASL*	657
Minimum waste dump elevation	MASL	437
Volume of waste dump capacity	Mm <sup>3</sup>	35.7
Waste rock capacity	Mt	70.4

## MINING EQUIPMENT UPTIME

The mine operation system consists of two shifts per day and 350 effective operating days per year. A shift is assumed to be 12 hours and includes:

- One hour of non-operational delays (shift change, lunch hours)
- Three hours of operational delays (equipment maintenance, shutdowns, and other unplanned delays)

The net productive operating time is 952 min/day, or 5,556 hours/year. Table 16-8 shows the distribution of planned hours and uptime hours used in calculating productivity and equipment requirements.

**TABLE 16-8 EQUIPMENT UPTIME PER DAY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Description	Unit	Quantity
Scheduled time per shift	min	720
Travel time/shift change/blasting	min	20
Equipment inspection	min	10
Lunch/breaks	min	40
Fueling, lubrication, and servicing	min	15
Net uptime scheduled	min	635
Work efficiency (45 min of productive time per hour measured)		0.75
Net uptime per shift	min	476
Work days per year	day	350
Shifts per day		2
Hours/shift	h	12
Net uptime per day	min	952.5
Net uptime per year	h	5,556

The mechanical availability and use of loading and hauling equipment are estimated at 85% and 88%, respectively. Therefore, net usage will be in the order of 75%.

## ANCILLARY MINE FACILITIES

Mine services include the following activities and equipment for:

- Maintenance of roads and dumps
- Power
- Lighting

The mine will be in operation 24 hours per day except during blasting. Adequate lighting will be required during the night shifts for drilling, loading, and hauling activities as well as for the access and haul roads.

The proposed ancillary equipment consists of:

- Front end loader (FEL)
- Bulldozer
- Grader
- Water tanker
- Service truck
- Production truck
- Bobcat

- 4x4 Pickup
- Personnel bus
- Floodlights

The ancillary equipment, such as FELs, will serve as support equipment for the excavators. The bulldozers are necessary for dump maintenance and road development. Graders and water tankers will be used for road construction and maintenance. Fuel tanks must be available for the mining equipment in each sector.

## **MINING CONTRACTOR**

The mining operation will be run by a contractor, which will be supervised by owner's staff. This is a standard procedure worldwide. The contract will be fully inclusive, with the contractor providing the appropriate personnel, mining equipment, support facilities, and infrastructure to achieve the mining objectives.

The contractor's field of operation will include the following items:

- Mobilization/demobilization
- Drilling and blasting
- Loading and hauling
- Mine services

Loading and hauling includes the cost of facilities, among which are the gas stations, fuel tanks, truck maintenance, and other items related to loading and hauling processes. These costs also include road construction and maintenance. The mining equipment investment and operating costs are included in the contractor's operating costs.

## **UNDERGROUND MINE**

The underground Mineral Resource comprises several flat lying deposits of variable dip (mainly 0°–20°). The eastern mineral deposit (Eastern Sector) is located beneath and to the east of the open pit, approximately 250 m below surface, extending from 910 MASL to 750 MASL. The deposit has two main lenses and several secondary lenses, which have been grouped into three main zones, North, Central, and South (Figures 16-6 and 16-7). The mineralized lenses lie beneath the andesite dome, which has good geomechanical properties.



A 50 m crown pillar has been left between the open pit and the underground workings to ensure crown stability (Figure 16-7). The proposed mining method is ramp access room and pillar mining.

## **MINE DESIGN**

The mine design includes a 2 km long 5.0 m wide x 5.3 m high main ramp which will be driven at a grade of -12% on straight sections and -10% on curves (with a curve radius of 20 m). The main ramp is located on the central axis relative to the mineralized lenses and has a favourable lithology for mining. The portal for the main ramp is located close to the processing plant.

Development of the main ramp will commence in Year 9 and production will start in Year 10.

Cross-cuts, with a cross-section of 5.0 m x 5.3 m, will be excavated from the main ramp to access mineralization. From the cross-cuts, drifts with a 3.0 m x 3.0 m cross-section will be driven at a grade of +/-15%, from which the deposit will be mined by the room and pillar method.

Six three metre diameter raise boreholes have been designed for ventilation, services, and auxiliary or secondary personnel exits. The underground design also includes details such as remuck bays and sumps. Equipment maintenance will be carried out in a surface shop located near the processing plant.

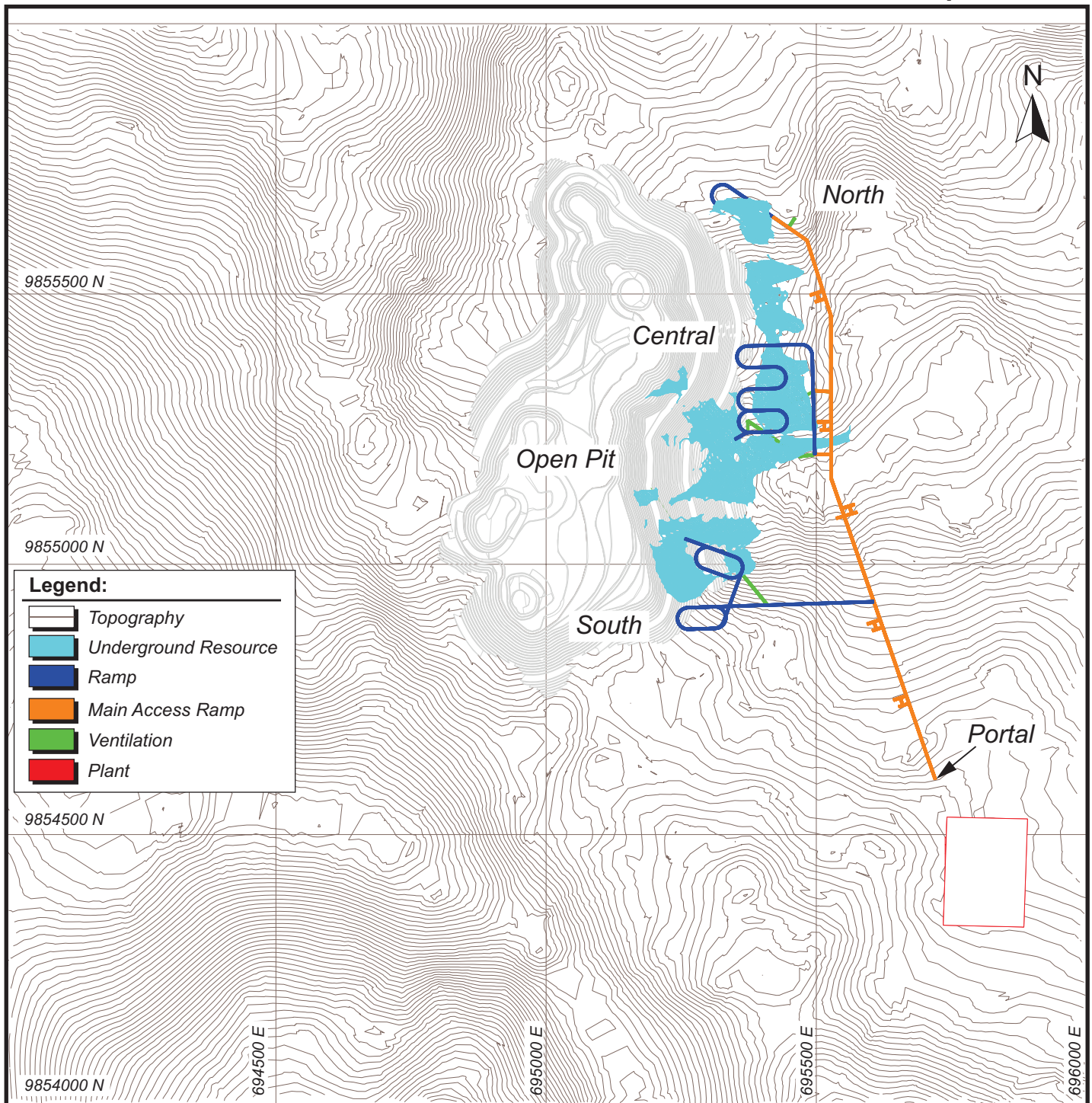


Figure 16-6

**Adventus Mining Corporation**

**Curipamba Project**

**El Domo Deposit**

Central Ecuador

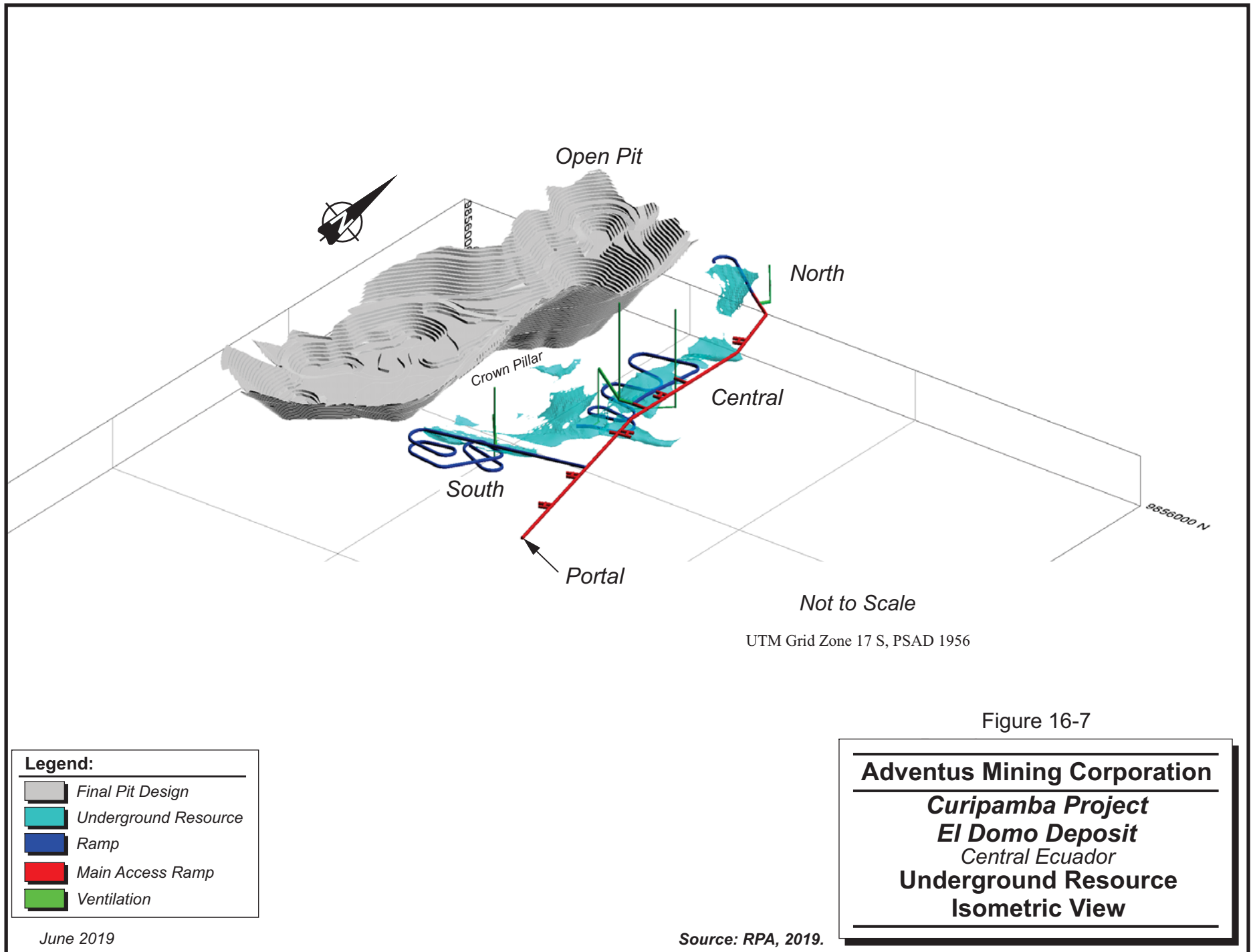
**Underground Mineralized Lenses**

0 100 200 300 400 500  
Metres

UTM Grid Zone 17 S, PSAD 1956

June 2019

Source: RPA, 2019.



## **MINE EQUIPMENT**

The development and production drilling equipment will consist of three Boomer 281 jumbos that will drill 4.27 m long, 51 mm diameter holes for the 5.0 m x 5.3 m sections, and 3.66 m long holes for the 3.0 m x 3.0 m sections.

The loading equipment will consist of four 4 yd<sup>3</sup> scooptrams. A total of four 15 m<sup>3</sup> dump trucks will be used to haul blasted material to the processing plant or the waste rock dump.

A Boltec bolter will be used for ground support installation including rock bolts and mesh. Shotcrete reinforcement will use an Aliva wet-mix shotcrete machine. Additional geotechnical studies will be required for detailed reinforcement requirements.

The 3.0 m diameter ventilation shafts will be excavated by raisebore equipment and the service shafts will be excavated conventionally.

## **UNDERGROUND MINE INFRASTRUCTURE**

The underground infrastructure will include the following:

- Portal
- Ventilation raises
- Electrical substations
- Pump stations
- Mine rescue stations
- Equipment maintenance and heavy equipment workshop inside mine
- Lamp room
- Mine dining rooms
- Explosives and detonator magazines
- Explosives accessory magazine

A total of 127 cubic metres per second (m<sup>3</sup>/s) (270,000 cubic feet per minute (cfm)) of fresh air will be provided by 150 kilowatt (kW) fans on surface.

Mine ancillary services consider a piping network for the appropriate distribution of drill water and compressed air. A piping network is also envisaged for pumping water out of the mine.

## MINE DEVELOPMENT

An underground development program was prepared based on the production requirements of 8,971 m, which includes horizontal and vertical development. A summary of the total development quantities, by type, is shown in Table 16-9.

**TABLE 16-9 UNDERGROUND DEVELOPMENT**  
Adventus Mining Corporation – Curipamba Project – El Domo Deposit

PHASE	TYPE	SECTION (m x m)	Y 9	Y 10	Y 11	Y 12	Y 13	Y 14	Total
<b>Waste Development</b>	Cross-cut	3 x 3	395	867	106	64	69	70	1,571
		5.0 x 5.3	485						485
	Ramp (-)	3 x 3	115	155					270
		5.0 x 5.3	1,360	913					2,273
	Ramp (+)	3 x 3		155	114				269
		5.0 x 5.3		51					51
	Raise			226	7				233
	Raisebore		576	565					1,141
<b>Total Waste Development (m)</b>			<b>2,931</b>	<b>2,932</b>	<b>227</b>	<b>64</b>	<b>69</b>	<b>70</b>	<b>6,293</b>
<b>Stope Preparation</b>	Cross-cut Pivot	3 x 3	30	203	90	60	90	60	533
	Gallery	3 x 3	60	482	485	501	271	346	2,145
<b>Total Stope Preparation (m)</b>			<b>90</b>	<b>685</b>	<b>575</b>	<b>561</b>	<b>361</b>	<b>406</b>	<b>2,678</b>
<b>Total (m)</b>			<b>3,021</b>	<b>3,617</b>	<b>802</b>	<b>625</b>	<b>430</b>	<b>476</b>	<b>8,971</b>

## BACKFILL

The Project considers the construction of a surface plant for backfill to supply the mine. The backfill will be pumped from the surface to the production workings by pipes.

The backfill plant will have a capacity of 350 m<sup>3</sup>/d, which will be used to backfill the voids produced by the operation, thus preventing the collapse of adjacent workings and, in turn, allowing the mineralization to be mined upwards in steeply dipping zones.

## MINING METHOD

Mining will be carried out by the room and pillar method in the flatter portions of the deposit. This method is suitable for the mineralized lenses at the Project that lie in a nearly horizontal plane as a result of their geomechanical properties. A variation of room and pillar with backfill will be used in the steeper portions of the deposit.

To mine the North, Central, and South mineralized zones, cross-cuts will be excavated from the base of the main ramp towards the zones, from which drifts will be opened to reach the base of the zones (Figure 16-6).

Room and pillar mining uses the same drilling and blasting techniques utilized in drifting using a drill jumbo. The room and pillar stope design has a cross-section of 5.0 m wide x 3.0 m high. This will create a pillar 4.0 m wide, resulting in an 80% mining recovery. Geotechnical studies will be required to determine the optimum pillar size.

Mucking of mineralized material is carried out by scooptram to a truck loading station in the main cross-cut.

Secondary support such as mesh, rock bolts, grouted rebars, and shotcrete will be installed, as required.

For the steeper portions of the deposit, primary stopes are accessed with a -15% decline. After mining of each successive five metre high cut, the stope is backfilled and the access backslashed to allow for mining of the next cut. This sequence is repeated up to five times until the stope access reaches an incline of +15%. Access to the next cut is then provided by a -15% stope access driven from a higher elevation.

Once each zone has been mined, backfill will be used to stabilize the surrounding rock and continue mining higher levels. The pillars created in the lower levels will continue up through successive levels, thereby increasing the stability of the host rock.

## **UNDERGROUND NSR CUT-OFF VALUE**

To develop the conceptual PEA underground mine plan, RPA has applied an NSR cut-off value of US\$100 per tonne to the Mineral Resources to determine the insitu tonnes to be potentially mined by underground methods. In addition, 80% of each resource block must contain mineralized material. Table 16-10 shows the potential insitu tonnes.



**TABLE 16-10 INSITU MINERAL RESOURCES IN THE PEA UNDERGROUND MINE PLAN**

**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

In Situ	NSR (\$/t)	Min. Ore (%)	Resource (000 t)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)
Total	100	80	1,404	1.90	39.94	3.08	0.17	3.47

## UNDERGROUND DILUTION AND LOSSES

For this PEA, RPA considered 10% dilution with 80% mining recovery. Table 16-11 shows the diluted Mineral Resources included in the conceptual PEA underground plant feed.

**TABLE 16-11 DILUTED MINERAL RESOURCES IN THE PEA UNDERGROUND MINE PLAN**

**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Diluted	Dilution (%)	Mining Recovery (%)	Resource (000 t)	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)
Total	10	80	1,235	1.7	35.9	2.8	0.2	3.1

## MINERAL RESOURCES IN THE CONCEPTUAL PEA UNDERGROUND PLANT FEED

RPA estimated the Mineral Resources in the conceptual PEA underground mine plan for each of the mineral types. In this plan, the Mineral Resources in the plant feed total 328 kt of copper mineral; 206 kt of zinc mineral, and 701 kt of mixed copper/zinc mineral, for a total of 1,235 kt of mineral (Table 16-12).



**TABLE 16-12 DILUTED MINERAL RESOURCES IN THE PEA UNDERGROUND  
MINE PLAN**

**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

		Y10	Y11	Y12	Y13	Y14	Y15	TOTAL
<b>Zn Mineral</b>								
Resource	t ('000)	25	46	82	14	15	24	<b>206</b>
Au	g/t	3.0	1.5	3.3	2.6	3.4	4.6	<b>3.0</b>
Ag	g/t	72.3	16.3	79.0	64.0	77.6	80.7	<b>63.3</b>
Cu	%	0.8	1.8	1.3	1.7	1.9	1.3	<b>1.4</b>
Pb	%	0.6	0.1	0.4	0.4	0.4	0.5	<b>0.4</b>
Zn	%	5.1	9.0	5.5	7.4	8.1	4.6	<b>6.4</b>
<b>Mixed Cu/Zn Mineral</b>								
Resource	t ('000)	48	246	168	43	43	153	<b>701</b>
Au	g/t	1.7	1.6	1.4	1.2	2.5	2.3	<b>1.7</b>
Ag	g/t	34.4	29.6	25.0	28.9	75.9	52.5	<b>36.6</b>
Cu	%	2.5	2.5	2.6	3.3	4.7	2.3	<b>2.7</b>
Pb	%	0.2	0.1	0.1	0.1	0.3	0.3	<b>0.1</b>
Zn	%	3.0	3.0	3.2	4.3	6.4	3.2	<b>3.4</b>
<b>Cu Mineral</b>								
Resource	t ('000)	27	58	100	72	55	15	<b>328</b>
Au	g/t	1.3	0.8	0.9	0.9	0.8	0.6	<b>0.9</b>
Ag	g/t	14.1	25.5	13.3	10.8	24.1	22.4	<b>17.2</b>
Cu	%	5.4	4.6	3.0	3.9	3.9	3.5	<b>3.9</b>
Pb	%	0.0	0.1	0.0	0.0	0.0	0.0	<b>0.0</b>
Zn	%	0.9	0.6	0.4	0.3	0.5	0.7	<b>0.5</b>
<b>TOTAL</b>								
Resource	t ('000)	<b>100</b>	<b>350</b>	<b>350</b>	<b>129</b>	<b>113</b>	<b>193</b>	<b>1,235</b>
Au	g/t	<b>1.9</b>	<b>1.4</b>	<b>1.7</b>	<b>1.2</b>	<b>1.8</b>	<b>2.5</b>	<b>1.7</b>
Ag	g/t	<b>38.4</b>	<b>27.2</b>	<b>34.4</b>	<b>22.5</b>	<b>50.9</b>	<b>53.7</b>	<b>35.9</b>
Cu	%	<b>2.9</b>	<b>2.7</b>	<b>2.4</b>	<b>3.5</b>	<b>4.0</b>	<b>2.3</b>	<b>2.8</b>
Pb	%	<b>0.3</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>
Zn	%	<b>3.0</b>	<b>3.4</b>	<b>2.9</b>	<b>2.4</b>	<b>3.7</b>	<b>3.1</b>	<b>3.1</b>

## LOM PRODUCTION SCHEDULE

Table 16-13 presents the open pit and underground mining sequence in the PEA LOM production schedule. Pre-production in Phase 1 will prepare access to resources in Year 1. Pre-production in Phase 2 will be focussed on the high top hills with difficult access and limited waste tonnage. Mining of underground resources is scheduled to start in Year 10 of the operation and will continue until the end of the mine life.

Table 16-14 shows the diluted Mineral Resources in the PEA LOM production schedule for the open pit and underground mines. In total, 8.7 Mt are mined grading 2.5 g/t Au, 48.9 g/t Ag, 1.8% Cu, 0.3% Pb, and 2.7% Zn.

**TABLE 16-13 OPEN PIT AND UNDERGROUND SEQUENCE IN THE PEA MINE PLAN**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

		Y-2	Y-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	TOTAL
<b>Open Pit</b>																			
<b>Phase 1</b>																			
Total	t ('000)	500	3,500	2,229	764	-	-	-	-	-	-	-	-	-	-	-	-	-	6,993
Waste	t ('000)	500	3,487	1,681	196	-	-	-	-	-	-	-	-	-	-	-	-	-	5,864
Resource	t ('000)	-	13	548	568	-	-	-	-	-	-	-	-	-	-	-	-	-	1,129
<b>Phase 2</b>																			
Total	t ('000)	200	350	1,563	1,862	2,499	390	-	-	-	-	-	-	-	-	-	-	-	6,865
Waste	t ('000)	200	350	1,563	1,818	1,887	155	-	-	-	-	-	-	-	-	-	-	-	5,972
Resource	t ('000)	-	-	-	45	613	236	-	-	-	-	-	-	-	-	-	-	-	893
<b>Phase 3</b>																			
Total	t ('000)	-	-	300	2,200	2,448	3,609	1,966	1,395	700	364	-	-	-	-	-	-	-	12,982
Waste	t ('000)	-	-	300	2,200	2,448	3,233	1,354	790	262	72	-	-	-	-	-	-	-	10,659
Resource	t ('000)	-	-	-	-	-	377	613	604	438	291	-	-	-	-	-	-	-	2,323
<b>Phase 4</b>																			
Total	t ('000)	-	-	-	100	300	7,000	9,604	2,081	1,931	1,590	1,622	879	589	567	716	990	-	27,970
Waste	t ('000)	-	-	-	100	300	7,000	9,604	2,073	1,756	1,269	1,010	366	327	305	232	491	-	24,833
Resource	t ('000)	-	-	-	-	-	-	8	175	321	613	513	263	263	483	499	-	-	3,137
<b>Underground</b>																			
<b>Central/South</b>																			
Resource	t ('000)	-	-	-	-	-	-	-	-	-	-	-	100	350	350	129	63	-	992
<b>North</b>																			
Resource	t ('000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	193	243
<b>Total</b>	<b>t ('000)</b>	<b>700</b>	<b>3,850</b>	<b>4,092</b>	<b>4,926</b>	<b>5,247</b>	<b>11,000</b>	<b>11,570</b>	<b>3,476</b>	<b>2,631</b>	<b>1,954</b>	<b>1,622</b>	<b>879</b>	<b>589</b>	<b>567</b>	<b>716</b>	<b>990</b>	<b>-</b>	<b>54,809</b>
<b>Waste</b>	<b>t ('000)</b>	<b>700</b>	<b>3,837</b>	<b>3,543</b>	<b>4,314</b>	<b>4,634</b>	<b>10,387</b>	<b>10,957</b>	<b>2,863</b>	<b>2,018</b>	<b>1,342</b>	<b>1,010</b>	<b>366</b>	<b>327</b>	<b>305</b>	<b>232</b>	<b>491</b>	<b>-</b>	<b>47,326</b>
<b>Resource</b>	<b>t ('000)</b>	<b>-</b>	<b>13.2</b>	<b>548.2</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>612.5</b>	<b>193.0</b>	<b>8,717</b>

**TABLE 16-14 DILUTED MINERAL RESOURCES IN THE PEA MINE PLAN**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

		Y-2	Y-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	TOTAL
<b>Zn Mineral</b>																			
Resource	t ('000)	-	-	140.2	208.2	117.2	249.5	176.8	170.7	293.8	296.8	165.7	140.7	80.4	113.4	63.9	105.9	24.5	<b>2,347.6</b>
Au	gpt	-	-	3.7	4.2	5.3	4.6	3.2	3.4	3.2	2.2	2.7	2.8	1.7	3.0	2.1	2.0	4.6	<b>3.3</b>
Ag	gpt	-	-	64.7	73.4	153.0	118.2	78.2	92.5	69.2	58.9	61.7	73.1	32.7	71.3	50.6	46.7	80.7	<b>76.9</b>
Cu	%	-	-	0.7	0.9	1.8	1.4	0.8	1.0	0.8	0.5	0.6	0.8	1.3	1.2	0.8	0.6	1.3	<b>0.9</b>
Pb	%	-	-	0.5	0.7	1.2	0.9	0.7	0.7	0.5	0.4	0.4	0.3	0.2	0.3	0.2	0.3	0.5	<b>0.6</b>
Zn	%	-	-	3.8	5.2	8.8	7.3	4.2	5.9	4.4	3.5	3.9	4.0	6.2	4.9	3.6	3.1	4.6	<b>4.9</b>
<b>Mixed Cu/Zn Mineral</b>																			
Resource	t ('000)	-	-	397.3	346.7	441.2	328.2	353.6	294.2	265.7	292.1	372.4	371.1	437.6	338.4	355.9	341.0	153.3	<b>5,088.6</b>
Au	gpt	-	-	4.1	4.5	2.5	2.2	3.0	2.6	1.8	2.0	2.9	1.7	1.7	1.6	1.7	1.5	2.3	<b>2.4</b>
Ag	gpt	-	-	63.7	64.7	50.4	53.7	46.9	53.6	36.1	38.2	51.0	31.7	33.2	28.7	31.9	32.5	52.5	<b>44.4</b>
Cu	%	-	-	2.6	3.3	2.1	1.8	2.7	2.0	1.2	1.2	2.0	1.4	2.0	1.9	1.6	1.5	2.3	<b>2.0</b>
Pb	%	-	-	0.3	0.4	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	<b>0.2</b>
Zn	%	-	-	3.1	3.2	2.2	2.4	2.9	2.4	1.6	1.5	2.0	1.6	2.5	2.3	1.7	1.8	3.2	<b>2.3</b>
<b>Cu Mineral</b>																			
Resource	t ('000)	-	-	24.0	57.6	54.2	34.8	82.1	147.6	53.0	23.7	74.4	100.8	94.5	160.7	192.6	165.6	15.2	<b>1,280.6</b>
Au	gpt	-	-	2.6	3.3	2.2	1.9	1.6	1.8	1.5	1.3	1.2	1.0	0.9	0.9	0.8	0.8	0.6	<b>1.3</b>
Ag	gpt	-	-	25.7	33.8	20.2	19.8	13.1	16.2	10.5	13.8	14.9	11.6	20.0	13.0	11.4	14.4	22.4	<b>15.5</b>
Cu	%	-	-	3.7	5.2	3.9	4.2	2.5	2.8	1.7	1.4	2.4	2.7	3.5	2.5	2.7	2.4	3.5	<b>2.8</b>
Pb	%	-	-	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	<b>0.0</b>
Zn	%	-	-	0.8	1.0	0.7	0.4	0.5	0.4	0.3	0.2	0.5	0.4	0.5	0.3	0.3	0.3	0.7	<b>0.4</b>
<b>Total Open Pit and Underground Processed</b>																			
Resource	t ('000)	-	-	561.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	612.5	193.0	<b>8,716.9</b>
Au	gpt	-	-	3.9	4.3	3.0	3.2	2.9	2.6	2.4	2.1	2.7	1.8	1.6	1.7	1.5	1.4	2.5	<b>2.5</b>
Ag	gpt	-	-	62.3	64.7	67.3	78.0	51.4	55.4	49.8	47.3	49.5	37.9	31.1	32.4	27.4	30.1	53.7	<b>48.9</b>
Cu	%	-	-	2.1	2.7	2.2	1.8	2.1	1.9	1.0	0.9	1.7	1.5	2.1	1.9	1.9	1.6	2.3	<b>1.8</b>
Pb	%	-	-	0.3	0.4	0.4	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.3	<b>0.3</b>
Zn	%	-	-	3.2	3.7	3.3	4.3	2.9	2.9	2.9	2.4	2.3	2.0	2.7	2.3	1.5	1.6	3.1	<b>2.7</b>
Open Pit Waste	t ('000)	700	3,837	3,543	4,314	4,634	10,387	10,957	2,863	2,018	1,342	1,010	366	327	305	232	491	-	<b>47,326</b>
Stripping Ratio	O/W	-	-	6.3	7.0	7.6	17.0	17.9	4.7	3.3	2.2	1.6	0.7	1.2	1.2	0.5	1.0	-	<b>6.30</b>

## 17 RECOVERY METHODS

The processing plant design is based on the results of indicative bench scale test work conducted at Base Met Labs in late 2018 and early 2019, as well as earlier test work, typical processing methods for VMS deposits, and design criteria provided by RPA and Adventus.

The plant will process 612,500 tpa through conventional comminution and flotation circuits to produce saleable copper, zinc, and possibly lead concentrates. The potential to produce a lead concentrate is being evaluated in on-going test work. In addition, future test work will be aimed at optimizing the process flow sheet and reagent scheme to maximize the recovery of valuable metals while minimizing costs of consumables and reagents.

### PROCESS DESCRIPTION

A preliminary block flow diagram for the processing plant is presented in Figure 17-1. The processing plant will consist of the following unit operations:

- Crushing and grinding
- Flotation
- Concentrate thickening and filtration
- Tailings thickening and disposal

Mineralized material from the open pit mine, underground mine, or run of mine (ROM) stockpiles will be delivered to the primary crusher dump hopper by trucks or FELs. A stationary grizzly over the dump hopper will ensure that the feed passing through to the primary jaw crusher will not exceed 600 mm in size. The multi-stage crushing circuit will produce a product suitable for feed to the grinding circuit, which, in closed circuit with cyclones, will produce a product with a  $P_{80}$  of 75  $\mu\text{m}$ . Cyclone overflow will be thickened in a flotation feed thickener to enable control of flotation feed density. The underflow from the cyclones will be returned to the grinding mill. A crushed mineralized material stockpile will provide feed for the grinding circuit when the crushing circuit is not operating.

Underflow from the flotation feed thickener will be diluted to the desired density with process water and then be conditioned with flotation reagents prior to flotation. Initial flotation will recover the majority of sulphide minerals and precious metals into a rougher concentrate. The

rougher concentrate will be reground to improve liberation of copper and zinc minerals. Subsequent processing of the rougher concentrate will separate copper and zinc minerals into copper and zinc concentrates through sequential flotation, initially by depressing zinc and lead, and floating copper, and then by upgrading the resulting products in dedicated cleaning circuits. Gold and silver will report preferentially to the copper concentrate. A lead recovery circuit, if required, will process copper rougher tails to recover lead into a lead concentrate. The rougher tails, consisting mainly of non-sulphide gangue, will be processed in a zinc rougher circuit to recover zinc that did not report to the rougher concentrate. The zinc rougher concentrate will report to the zinc cleaner circuit.

Concentrates will be thickened, filtered, and stored prior to shipping in bulk, containers, or bags. Tails from the zinc scavenger circuit and zinc cleaner circuit will report to the flotation tails thickener and will be thickened prior to being pumped to the conventional tailings storage facility (TSF). Water recovered from the concentrate and tailings dewatering steps, as well as from the TSF, will be recycled back into the process.

## DESIGN CRITERIA

The processing plant will process an average of 1,678 tpd of mineralized material to produce copper, zinc, and possibly lead concentrates.

**TABLE 17-1 KEY PROCESS DESIGN CRITERIA**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Description	Units	Value
Operating Schedule		
Operating Days Per Year, Mine	days	350
Operating Days Per Year, Processing Plant	days	365
Average Production Rates		
Daily Production, Mine	tpd	1,750
Annual Throughput, Processing Plant	tpa	612,500
Daily Throughput, Processing Plant	tpd	1,678
Average Feed Grade		
Au	g/t	2.49
Ag	g/t	48.9
Cu	%	1.82
Pb	%	0.27
Zn	%	2.72
Bond Ball Mill Work Index	kWh/t	14
Crushing Availability	%	75
Nominal Crushing Throughput	dry tph	93.2
Feed P <sub>100</sub>	mm	600
Grinding and Flotation Availability	%	92
Nominal Grinding Throughput (Fresh Feed)	tph	76.0
Feed Particle Size (F <sub>80</sub> )	µm	2,000
Product Particle Size (P <sub>80</sub> )	µm	76
Rougher Flotation Feed % Solids	%	25
Rougher Concentrate Re grind (P <sub>80</sub> )	µm	25

## RECOVERY

Estimates for recovery of metals to concentrate, as well as concentrate grades are provided in Table 17-2. These estimates are taken from the results of indicative locked cycle flotation tests conducted at Base Met Labs in 2019 on composite samples intended to represent Mixed Cu-Zn mineralization and Cu-type mineralization of the starter pit (approximately the first seven years of mine production). Projections of recoveries from Zn-type mineralization provided in earlier reports (BISA, 2014a) have been used for material from high zinc zones, since test work on composite material representing this material is on-going. There is potential for recoveries to change significantly as test work continues in efforts to optimize process efficiency and economics.



**TABLE 17-2 RECOVERIES AND CONCENTRATE GRADES**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Composite (Test) Product		Weight		Assay				Distribution					
		%	Cu %	Pb %	Zn %	Ag g/t	Au g/t	Cu %	Pb %	Zn %	Ag %	Au %	
Mixed Composite (LCT 49)	Cu Con	5.31	24.70	2.91	8.00	340	22.17	79.17	66.50	14.95	41.64	43.92	
	Zn Con	4.29	3.12	0.72	53.40	270	13.45	8.07	13.28	80.54	26.69	21.51	
	Feed	100	1.66	0.23	2.84	43	2.68	100	100	100	100	100	
Mixed Composite (LCT 52)	Cu Con	6.10	22.40	2.90	11.50	320	23.60	86.30	85.50	26.1	50.6	56.40	
	Zn Con	3.50	1.38	0.32	53.8	210	6.90	3.10	5.50	70.3	19.1	9.50	
	Feed	100	1.58	0.20	2.69	39	2.55	100	100	100	100	100	
Copper Composite (LCT 59)	Cu Con	8.95	21.40	0.31	3.40	110	4.09	88.25	68.62	73.44	50.20	26.55	
	Feed	100	2.17	0.04	0.41	20	1.38	100	100	100	100	100	
Zinc Composite (BISA)	Cu Con	2.46	19.70	1.31	17.00	748	8.18	58.20	7.67	8.240	22.60	6.16	
	Zn Con	9.49	1.73	0.31	45.50	286	14.00	19.70	6.90	85.40	33.40	40.80	
	Pb Con	0.61	17.70	47.30	17.00	1995	21.80	6.470	69.00	0.92	15.10	4.11	
	Feed	100	0.89	0.42	5.11	81	3.26	100	100	100	100	100	

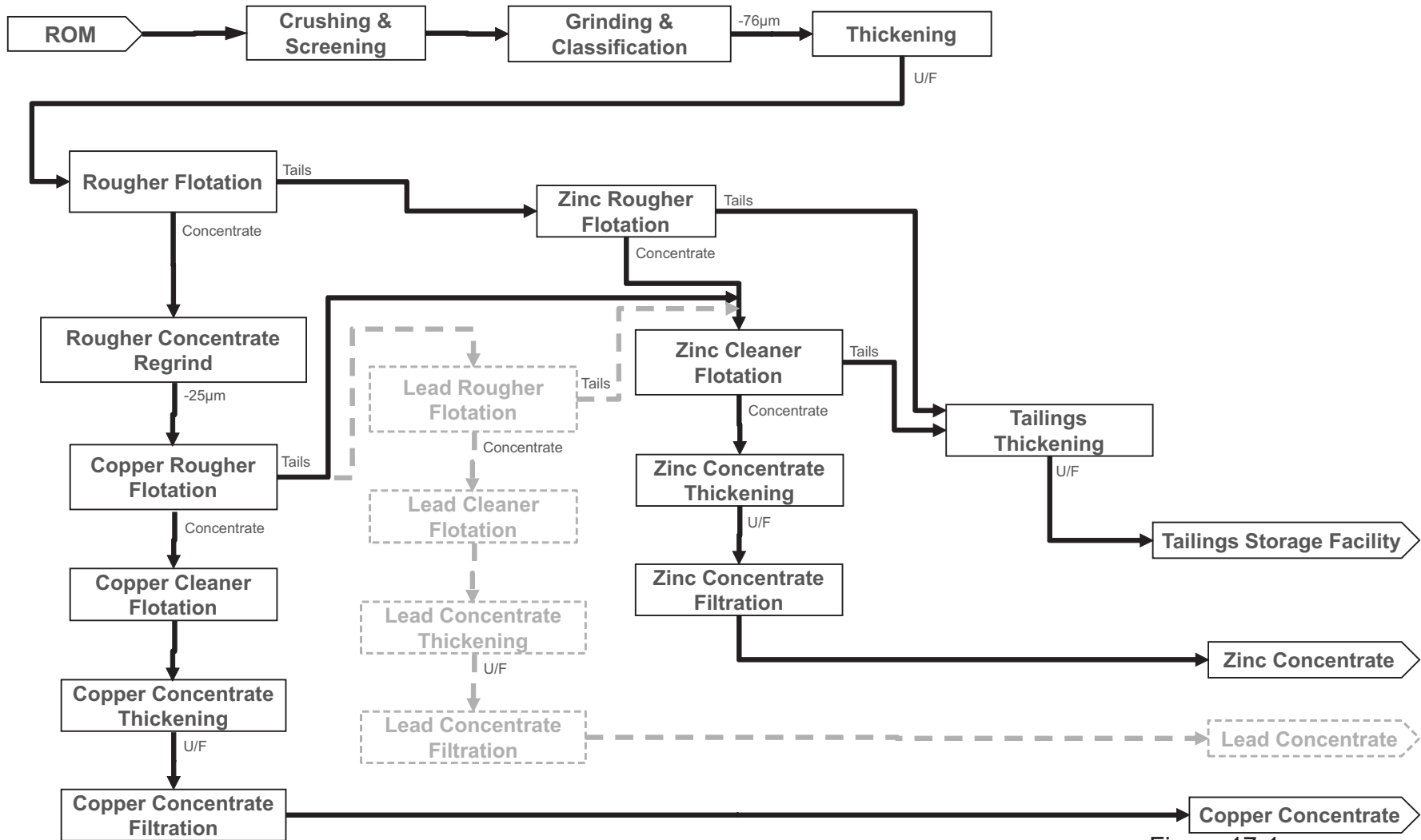


Figure 17-1

**Adventus Mining Corporation**  
**Curipamba Project**  
**El Domo Deposit**  
 Central Ecuador  
**Preliminary Process**  
**Block Flow Diagram**

## 18 PROJECT INFRASTRUCTURE

### SUMMARY

The major infrastructure items considered and costed in the PEA support a mining and milling operation that is expected to operate 24 hours per day, seven days per week. The design of Project infrastructure has prioritized environmental protection, workforce safety, and operating efficiency while minimizing community impacts. Major infrastructure items include, but are not limited to the following:

- **Power Supply:** It is assumed that El Domo will connect to the Ecuadorian power grid along the existing access road and a new mine access road based on work completed by KP in early 2019. RPA has benchmarked and estimated the cost for power at \$0.11/kWh.
- **Road Access:** Access to the Project site is planned to use both new and existing road networks based on work completed by KP in 2019. A new 12.5 km access road is expected to connect the Project site to the existing road network. Secondary access roads to El Domo will also be maintained.
- **Mine haul road access** for waste and feed to the mill that can accommodate 40-tonne trucks.
- **Mine facilities** such as buildings for maintenance, warehousing, administration, laboratories, security, first aid, explosive storage, and fuel storage.
- **Process plant** including crushing, grinding, and flotation.
- **Water supply and management systems.**
- **Lined tailings storage facility (TSF)** and waste rock storage pads based on studies completed by Klohn Crippen Berger (KCB) in early 2019.

The overall site layout is shown in Figure 18-1.

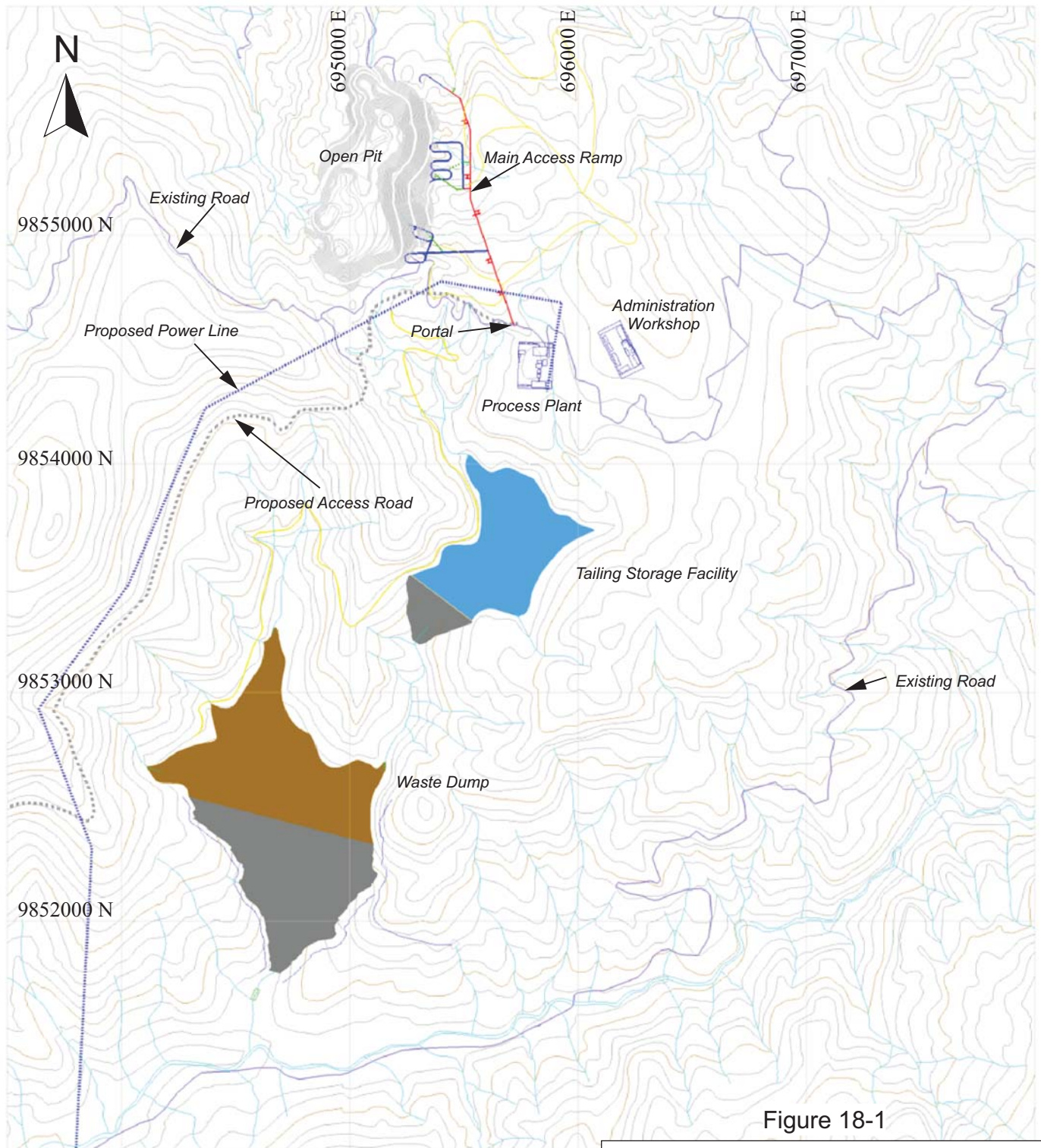


Figure 18-1

0 250 500 750 1000 1250  
Metres

UTM Grid Zone 17 S, PSAD 1956

**Adventus Mining Corporation**

**Curipamba Project**  
**El Domo Deposit**  
Central Ecuador

**Overall Site Layout**

## TRANSMISSION LINE AND SITE POWER DISTRIBUTION

Previous mine power supply studies have been completed by BISA in the 2014 BISA PEA (BISA, 2014a).

Adventus retained KP to complete a PEA for mine power supply for the Curipamba Project (Knight Piésold, 2019a). The focus of the PEA was to review the BISA work and to assess transmission line options for interconnecting the mine to the Ecuadorian electrical grid with provisions for backup generation using an on-site thermal diesel generating plant.

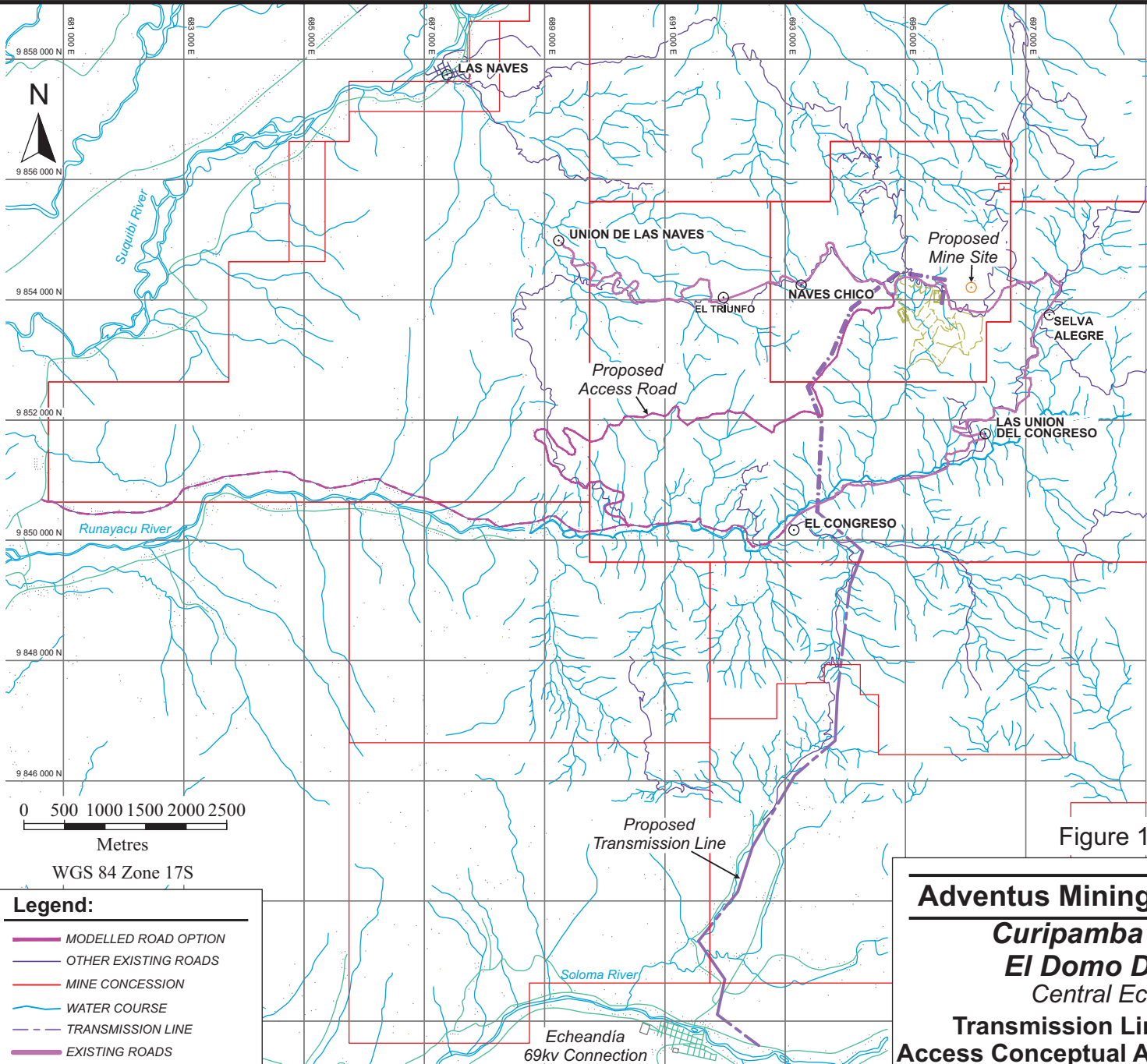
The proposed point of interconnection for the Curipamba transmission line is at the Echeandía 69 kV substation shown in Figure 18-2. Based on the available information obtained for KP's study, the Echeandía substation appears to be the closest in proximity to the Curipamba mine site.

The Echeandía substation is at the end of a 69 kilovolt (kV) radial line that appears to connect with the Ecuador transmission grid at Riobamba (to the east - outside of the area shown on the map). It is assumed that the transfer capacity of the Echeandía substation is 12.5 megavolt-amperes (MVA). It is unclear whether this is for one or more transformers that may exist at the substation. For the purposes of this PEA, it is assumed that this is for one transformer.

The fact that the Echeandía substation is at the end of a long radial transmission line poses the following potential issues with interconnection:

- Transmission system electrical stability (i.e., voltage stability) at this location may be poor due to long distance from generation sources.
- Potential line upgrades and/or voltage regulation devices may be required to increase transmission system transfer capacity.
- The substation transfer capacity of 12.5 MVA may be fully allocated servicing local off-takers.
- Potential substation upgrades may be required at Echeandía to increase substation transfer capacity.





In order to obtain a better understanding of interconnection constraints further information should be solicited from Agencia de Regulacion y Control de Electricidad (ARCONEL) during future studies. It should also be noted that any other point of interconnection to the Ecuador grid that may be technically viable will likely be at or near the end of a radial transmission line. Therefore, the potential issues noted above may need to be addressed for any point of interconnection.

## TRANSMISSION LINE GENERAL ARRANGEMENT

For the purposes of this study, it is assumed that the Curipamba transmission line will be connected to the substation located at Echeandía, as shown in Figure 18-2. The previous transmission line alignment proposed by BISA (BISA, 2014a) will be adopted in principle with refinements made as part of this study. The southern portion of the alignment from Echeandía to El Congreso will remain unchanged. From El Congreso to the Curipamba mine site routing will be overland to the northeast to the mine site (Figure 18-2) in as straight an alignment as practical (16.8 km long).

## ELECTRICAL ASSESSMENT

### MINE LOAD

Mine load requirements were previously estimated by BISA (BISA, 2014a). KP has reviewed these data with respect to similar 2,000 tpd mines and these values are in the right order of magnitude. Load data published in the BISA reports are provided in Table 18-1.

**TABLE 18-1 ESTIMATED MINE SITE POWER REQUIREMENTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Description	Estimated Load (kW)
Processing Plant	3,000
Pump Stations	500
Mine	2,000
<b>Total</b>	<b>5,500</b>

Due to the high share of motor load, assumed total power factor (p.f.) at the mine substation is 0.8. This corresponds to approximately 6,900 kVA apparent power rating for the mine load.

However, this information only gives installed load and, in a worst case scenario, the peak instantaneous load of the mine. The next step is to define the load in more detail, including



total power factor and individual power factors for large pieces of equipment, large load start-up requirements, mine load duration curve, average load, etc.

### **MINE SITE DISTRIBUTION**

There are two possible configurations when it comes to mine site power distribution.

1. Direct 33 kV distribution around the site (with load breaks and/or fused disconnects) – could be viable if the number of load drops is small. Incoming transmission line and source substation grounding scheme needs to be examined as well.
2. Central step-down substation (e.g., 33/4.16 kV) with small pole mounted transformers (e.g., 4.16/x kV) at the load drops around the mine site.

A decision will be based on the number of load drops and loads that need to be supplied (pump rated voltages in particular).

## **POWER SUPPLY ALTERNATIVES**

### **BACKUP DIESEL GENERATORS**

Following from correspondence with Adventus, it is KP's understanding that the Ecuadorian grid in vicinity of the Curipamba mine suffers from frequent brownouts. The likely cause of this is due to lack of available energy on the grid and voltage instabilities related to transmission line distances from generation sources. Brownouts will undoubtedly affect production at the Project having an adverse effect on the mine revenue. Therefore, it is recommended that Adventus incorporate a fully redundant off-grid power plant. The most common and likely lowest capital solution for this would be to install a thermal diesel generating plant. Based on current estimates for diesel thermal power plants, the anticipated capital cost is approximately \$500,000 per MW of installed capacity, however, this cost has not been included in the pre-production capital cost at this stage of the study. Once more detail of the mine loads is determined, the capital cost can be determined during the next phase of the study.

## **ROADS**

KP carried out a high-level desk top alternatives assessment of the mine access road options for the Curipamba Project (Knight Piésold, 2019b). The alternative mine access roads considered include two access road alignments from the BISA PEA study, as well as a third, new build option, identified by Adventus. KP's review considered the existing access routes,

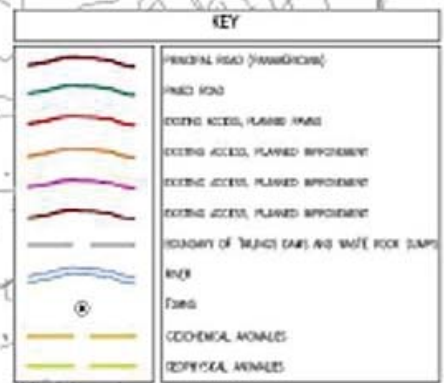
typical mine access road design criteria, and evaluation of the existing roads as candidates for the mine access road.

The proposed mine site is situated approximately 12 km from the closest maintained paved road, and 20 km from the regional network of maintained paved roads that branch off from the city of Ventanas (Figure 8-3).

The conditions of access roads used by the local communities vary from partially paved roads used for frequent community access to gravel roads used for relatively infrequent remote access. Upland settlements, within a 10 km proximity of the proposed mine site rely on a network of gravel roads.

The preferred mine access alternative is shown in Figure 18-2. Adventus reviewed the KP road options and concluded that the new build option was the best routing rather than tie up local roads for two years and impede local communities and also provides the company with full control over the use of the road by restricting travel by locals.

The road starts three kilometres west of El Congreso and ends at the proposed mine site location. The total length of the road is 12.5 km where only 52% of the road length traverses grades higher than 8%. The maximum running grade is approximately 11%. This is an optimized version of the initially proposed road alignment to better fit the site topography, while still maintaining similar grades.



**Adventus Mining Corporation**  
***Curipamba Project***  
***El Domo Deposit***  
***Central Ecuador***  
**Existing Regional  
and Community Roads**

**Source: Knight Piésold Ltd., 2019.**

## **BUILDINGS**

Mine facilities including, but not limited to, buildings for maintenance workshops, warehousing, administration, laboratories, mine dry, security, first aid, explosive storage, and fuel storage as well as a process plant including reagent stores will be constructed on site.

The proposed plant layout is conventional in general arrangement. The process plant and mine services area will be located on relatively flat terrain to the south of the open pit and to the northeast of the TSF and waste dump.

The reagents stores will be located to the south of the process plant, in close proximity to the reagents make-up area to facilitate unrestricted access to the make-up area.

## **COMMUNICATIONS**

Communication will be catered for by means of both a telephone system and a two-way radio system.

The underground mine will have a leaky-feeder communications system installed.

## **SECURITY AND FENCING**

The plant site will be enclosed by a 2.1 m mesh fence. The reagents and storage areas will be equipped with separate access control gates and gate houses for different functional areas. This area will be operated independently from the general process plant areas.

Furthermore, the plant will be fitted with CCTV cameras installed at strategic locations.

## **WATER SUPPLY AND MANAGEMENT**

The proposed fresh water system will use the Runayacu River as a water source. From the uptake point, the water will be stored in a tank and then re-pumped to a water tank above the plant area, from where it will supply the processing plant and facilities with water. It is estimated that a total of 2,400 m<sup>3</sup> per day will be required for the processing plant.

A potable water treatment plant will also be installed.

## **FIRE WATER DISTRIBUTION**

There will be an electric and a diesel-powered fire water pumping system. The fire water system will consist of a buried fire water ring main and fire hydrants at the plant site, ancillary buildings, and the process plant. Hose cabinets will be placed at the fire hydrant locations and the system will be supplemented with portable fire extinguishers placed within the process plant facilities.

## **TAILINGS STORAGE FACILITIES**

KCB has prepared a desktop assessment to aid in site selection and methodology of the future TSF for the Project (Klohn Crippen Berger, 2019a). KCB has not visited the site or completed any specific field work for this review.

No tailings test work has been provided for this assessment. Curipamba tailings properties have been assumed based on available information for hard rock tailings from International Commission on Large Dams (ICOLD, 2017) and KCB experience with similar tailings.

## **DAM CONSEQUENCES CLASSIFICATION**

The area downstream of the mine and potential TSF sites is populated, with people residing in the towns of Las Naves, Balceria, San Luis de Pambil, and agricultural lands (potentially inhabited) observed to the south, east, and north of the Project site. Hypothetically, a dam failure could release a large volume of tailings and water, with a runout path resulting in loss of life in the aforementioned towns and mine staff working downstream.

Based on the discussion above and the Canadian Dam Association (CDA) Guidelines, the Curipamba TSF project should be classified as an Extreme consequence facility. The CDA guidelines, as other internationally recognized dam safety guidelines (e.g., ANCOLD, ICOLD), outline principles that are applicable to all dams and the processes/criteria for management of dam safety according with the principles. These guidelines are proposed for the Curipamba TSF given its comprehensive content and successful application to many KCB projects around the world.

## DAM DESIGN

Design criteria for dam design of the Curipamba TSF (Extreme) are summarized in Table 18-2.

**TABLE 18-2 TAILINGS DAM DESIGN CRITERIA**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Parameter	Design Criteria
Design earthquake	1:10 000-year event or Maximum Credible Earthquake (MCE)
Inflow Design Flood (IDF)	Probable Maximum Flood (PMF) – 72 hours <sup>(1)</sup>
Static Factor of Safety	1.5
Post-earthquake factor of safety	1.2
Pseudo-static factor of safety	1.0

## DAM SECTION

For the preliminary screening assessment, the “base case” dam section will be constructed with compacted rockfill, will have 2H:1V downstream and 1.5H:1V upstream slope, and will require a composite liner system (geomembrane + low permeability soil) on the upstream slope, and crushed filter and transition materials. For this assessment, it is assumed that dam construction materials will be sourced from pre-stripping of the open pit (clean, competent, non-acid generating materials). Given the site’s geology, rockfill for dam construction will be mostly andesite. Flatter slopes may be required depending on foundation conditions and the properties of the available dam fill materials.

Other dam configurations including different materials (e.g., cycloned sand, earthfill, etc.) and construction methods (e.g., centreline) will be further reviewed for the preferred options.

## TAILINGS AND WATER MANAGEMENT

Tailings will be pumped to the TSF and discharged from the dam crest into the impoundment to promote the development of a tailings beach to push the supernatant decant water pond away from the dam. The proposed pond and surface water management strategy is described as follows:

- Zero discharge of any excess tailings transport water.
- Excess water partially stored in the impoundment, reclaimed to the plant for process and treatment. Water reclaim will be completed with a floating barge in the decant pond with a minimum depth of three metre.



- IDF storage within the impoundment, without release to the environment (100% storage).
- Freeboard contingency of two metre above IDF elevation.
- Design storm for diversion channels (if applicable): 1:100 years.
- At closure, a closure spillway will be required.

## SEEPAGE CONTROL

The permeability of foundation soils and rocks is unknown. For the preliminary screening assessment, it is assumed that cover soils and shallow bedrock are pervious. Consequently, seepage could be high and control measures for the dam and impoundment are required to mitigate acid rock drainage (ARD) seepage into the groundwater, including:

- complete lining (with geomembrane) of tailings impoundment,
- dam zonation with filter compatible materials to prevent internal erosion should the lining system fail and drain seepage water,
- seepage collection ditches, wells, and a seepage collection pond with potential water treatment or pumpback to the TSF;
- proper sealing/grouting of any existing condemnation, geotechnical, and hydrogeological drill holes from previous investigation programs. No piezometers or drill holes that may cross from upstream to downstream should remain ungrouted.

## CLIMATE AND HYDROLOGY

The site has a tropical setting with hot and humid climate throughout the year. Average annual precipitation at site ranges between 2,100 mm and 2,900 mm, with the wet season between December and May, as recorded in regional stations shown in Table 18-3 (BISA, 2014b).

**TABLE 18-3 MONTHLY AND YEARLY AVERAGE PRECIPITATION**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Station	Elevation (m)	Monthly Average Precipitation												Total avg (mm)	Total ENP1 (mm)
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Curipamba	409	414	514	665	49	251	71	57	31	24	51	80	232	2,879	4,665
Zapotal	180	401	516	433	298	169	66	10	12	10	9	71	128	2,124	4,625
Echeandía	308	378	489	500	371	186	65	41	17	38	44	73	186	2,387	4,210

BISA (2014b) conducted preliminary conceptual estimates of the maximum 24-hour storms for different return periods, as shown in Table 18-4.



**TABLE 18-4 DESIGN STORMS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<u>Return Period (year)</u>	<u>24h Precipitation (mm)</u>
2	165.4
5	189.6
10	202.3
25	215.8
50	224.5
100	232.3
200	239.5
500	248.2

The effects of the El Niño phenomenon have been reported in the area, with maximum annual precipitation (as recorded during the 1997 event) of 60% to 120% larger than the average values, as measured in the regional stations.

The Probable Maximum Precipitation (PMP) was crudely estimated using the information compiled by BISA (2014b), including precipitation during El Niño conditions and using the Hershfield Method (1961) as summarized in Table 18-5.

**TABLE 18-5 PRELIMINARY DETERMINISTIC PROBABLE MAXIMUM PRECIPITATION (PMP)**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<u>Storm</u>	<u>PMP – 24 hours</u>	<u>PMP – 72 hours</u>
Precipitation (mm)	590	890

## SEISMICITY

The Project is located in an area with medium seismicity with peak ground acceleration of 0.30 g for the 500-year earthquake, as stipulated by the Ecuadorian Earthquake Design Norm (Ministerio de Desarrollo Urbano y Vivienda, 2011)

According to the Ecuadorian Earthquake Design Norm, the peak ground acceleration (PGA) for the 1:10,000-year event (considered here as the Maximum Credible Earthquake) would range between 0.62 g and 0.90 g, as estimated and shown in the earthquake hazard curves for the cities of Babahoyo and Ambato (closest to the Project site). A site specific seismic hazard assessment should be completed.

Based on the above, a rockfill dam would provide better performance during earthquake loading as it will not show an undrained response, while earthfill and cycloned sand dams may. Additionally, the density and seismic resistance of foundation materials should be reviewed. Other consequences of seismic loading will be seismic displacements that could have an impact on the upstream core, filters, and liner. Key aspects to address this issue include:

- Proper dam configuration and zonation – staging, slopes, and filter/drain widths.
- Proper compaction of dam materials.
- Proper foundation characterization and preparation prior to dam construction.
- Proper drainage to maintain a low phreatic surface within the dam to reduce saturation of the proposed materials.

## ROCKFILL DAM

A rockfill dam is proposed for storage of conventional tailings. The key benefits of a rockfill dam are:

- Its high strength increasing the overall stability of the facility.
- It consists of “free-draining” materials that allow placement throughout the year regardless of the precipitation conditions of the site.

The main characteristics of the conceptual rockfill dam considered for this assessment include:

- Rockfill characteristics: 800 mm to 500 mm minus crushed or processed (screened and washed ROM material), with a particle size distribution (PSD) designed to be internally stable and filter-compatible with other dam zones, clean, strong (>R3), and durable material.

## OVERVIEW OF TAILINGS TECHNOLOGY

Tailings technologies reviewed for this assessment include:

- Conventional slurry (un-thickened).
- Tailings dewatering:
  - thickened;
  - paste;
  - filtered (commonly known as “dry tailings” or “dry stack”).
- Sulphide flotation.
- Particle segregation – Cycloning.

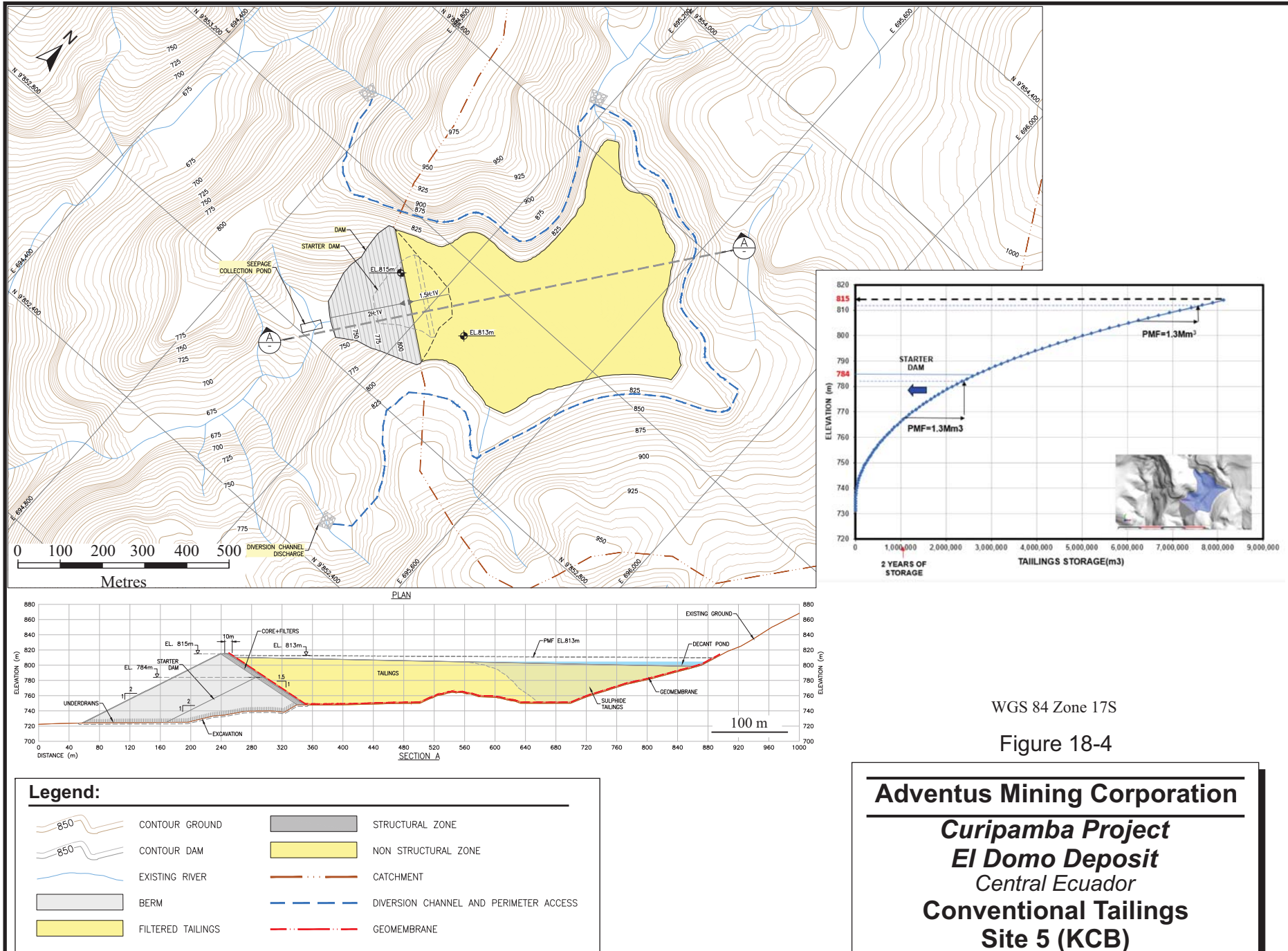
KCB carried out a tailings technology assessment including a comparison of the applicability of conventional slurry (un-thickened) and dewatered tailings (thickened, paste, and filtered

tailings). The recommended tailings technology for Curipamba is conventional tailings, based on the assessment.

## **TSF SITE SELECTION**

Based on the conceptual analysis, KCB Site 5 (Figure 18-4) is selected and recommended for further evaluation during the next phase of design, based on the following main reasons:

- The site presents amenable conditions for implementation of the three tailings technologies reviewed, although cycloned tailings may be subject to confirmation of the tailings PSD and sand yields.
- The starter dam height and dam fill volume are large since the facility is designed for full storage of the design flood without release. The next phase of design should include a review for the potential of an emergency operating spillway that will help reduce the size of the starter dam.
- The preferred tailings technology recommended for Site 5 (KCB) is conventional tailings using a rockfill dam, provided:
  - Granular dam construction material sources are confirmed.
  - A rockfill dam built following the downstream construction method will present higher stability under static and seismic loading.
  - A rockfill dam will provide higher erosion resistance during rainfall events and construction will not be weather-dependent.
  - The foundation soils are well characterized and prepared.
- The site presents good expansion potential.
- Access to the site would be the easiest as it is located 0.1 km from the main road and one kilometre from the process plant.
- The ultimate dam crest will be below the process plant elevation, which reduces tailings deposition efforts throughout its service life. Most tailings will be distributed by gravity, and pumping may be required mostly to overcome friction losses. Use of high pressure pipelines should be evaluated, if required, due to high gravity gradients.
- Presents the smaller tailings surface area and catchment area. This will help reduce water management efforts for any of the alternatives considered for this site.
- Presents the lowest initial capital cost in all the tailings technology alternatives reviewed, although the total capital cost and total operating cost for the cycloned sand alternative is slightly lower.



## **WASTE ROCK**

KCB has prepared a desktop assessment of the location and potential storage capacity for a waste rock dump (Klohn Crippen Berger, 2019b). The proposed waste dump is located directly south of the TSF (Figure 18-1). Placement of waste rock could occur in two stages with the initial stage having a capacity of 70 Mt. This capacity is adequate for the current LOM waste rock quantity of approximately 47 Mt. If required, Stage 2 increases the capacity by an additional 87 Mt, for a total combined capacity of approximately 160 Mt.

An underdrain system will be installed to collect seepage water. Collection ditches will be designed to divert non-contact water around the waste rock dump.

The overall slope for the dump will be 3H:1V.

Construction, waste management, and other operational considerations have not been addressed and should be reviewed in the next phase of the Project.

## **WATER AND OTHER LIQUID EFFLUENT HANDLING**

The site will be bounded by a series of collection ditches that will be designed to divert non-contact water around the site and reduce the volume of contact water.

All contact water collected from the mine site and inflows to the pit will be sent to collection ponds at the treatment plant. The treatment plant will be located south of the process plant.

## **SEWAGE TREATMENT PLANT**

Sewage treatment systems will be installed on site and will include an underground sewer reticulation system which connects all the buildings to a treatment plant.

## **GARBAGE AND HAZARDOUS WASTE**

### **GARBAGE DISPOSAL AND LANDFILL**

A solid waste landfill will be located on the property. Efforts will be made for recycling wherever possible.

## **HAZARDOUS MATERIAL**

Hazardous materials will be stored in a secure facility on site until arrangements can be made for shipping the material to a third party for disposal.

## **TRANSPORTATION AND LOGISTICS**

During construction, the majority of the materials will be trucked approximately 150 km by road from the port city of Guayaquil.

During operation, the same port will be utilized for the supply of reagents and consumables.

## **PERSONNEL TRANSPORTATION**

Busses will be provided to transport personnel to the nearby communities.

## **CONCENTRATE STORAGE, HANDLING, AND TRANSPORT**

Concentrates will be trucked approximately 150 km by road by a haulage contractor to a concentrate storage facility at the port of Guayaquil. The storage facility will either be leased or purchased.

## 19 MARKET STUDIES AND CONTRACTS

### MARKETS

The Curipamba Project will produce copper, zinc, and possibly lead concentrates which contain gold and silver by-products. The concentrates will be sold to worldwide smelters either on a contract basis or on the spot market. Prices for copper and zinc are determined by the London Metal Exchange (LME).

Copper concentrates will be sold to smelters and refiners who treat the concentrates and refine the copper and charge for this service via treatment charges (TCs) and refining charges (RCs). The TCs are charged in US\$ per tonne of concentrate treated and RCs are charged in cents per pound treated, denominated in US dollars, with benchmark prices set annually by major Japanese smelters.

The typical contract for a miner is denominated against the LME price, minus the TC-RCs and any applicable penalties or credits. Penalties may be assessed against copper concentrates according to the level of deleterious elements such as arsenic, bismuth, lead, or tungsten.

The Curipamba copper concentrates will contain silver and gold in appreciable amounts for which a credit will be paid if their concentration within the concentrate is above a certain amount.

### CONTRACTS

Pursuant to the earn-in option agreement with Salazar, upon the achievement of commercial production at the Curipamba Project, Adventus will retain the right to purchase 100% of the mineral offtake on commercially reasonable arm's length terms that are yet to be determined and agreed upon.

No other contracts have been established to date by Adventus.



## **20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT**

Adventus and Curimining have made considerable efforts to undertake environmental studies and community engagement in order to facilitate the advancement of the Project. Dedicated environmental and social outreach departments based at the Project camp and in nearby communities are staffed with responsible practitioners, who oversee the program. The following presents a summary of the environmental aspects, permitting, and social or community impacts of the work program to date.

### **PROJECT PERMITTING**

#### **LEGAL FRAMEWORK**

Mining activities in Ecuador are mainly regulated by the Ministry of Mining, the Mining Regulation and Control Agency (ARCOM), the Ministry of Environment, and the Water Secretariat (SENAGUA). The principal environmental laws that apply to the mining industry are the Constitution, the Mining Law (Ley de Minería), the Environmental Regulation for Mining Activities (Reglamento Ambiental para Actividades Mineras, or RAAM), the Unified Text of Secondary Environmental Legislation (Texto Único de la Legislación Secundaria de Manejo Ambiental, or TULSMA), the Water Act (Ley Orgánica de Recursos Hídricos, Usos y Aprovechamiento Del Agua), and the Environmental Code (Código Orgánico del Ambiente, or COA), which entered into force in April 2018 and encompasses all the environmental legislation in one single body of law.

The Ministry of Environment issues an environmental licence for mining following approval of an Environmental Impact Assessment (EIA) and management plan. The Ministry of Mining, created in February 2015, is responsible for mine planning in Ecuador, including the negotiation of contracts for the exploitation of minerals. ARCOM is responsible for supervising mining activities, while the Ministry of the Environment is responsible for the EIA and environmental licence. The SENAGUA grants authorizations for the use of water, typically for the duration of the mining project. Other permits required for mining activities include those for explosives use, special labour shifts, fire department, and construction permits from ARCOM and the municipalities.

## ENVIRONMENTAL IMPACT ASSESSMENT

In order to comply with the EIA submission necessary to obtain mining permits, Adventus will prepare and submit an EIA with the following general inclusions:

- Detailed description of the Project, including an Alternatives Analysis
- Determination of the Area of Influence on the environmental and social landscape
- Characterization of the physical and biological baseline condition
- Characterization of the socio-economic baseline condition
- Identification, Prediction, and Evaluation of Environmental and Social Impacts
- Risk Assessment
- Environmental and Social Management Plan, which includes:
  - Mitigation Plan
  - Waste Management Plan
  - Communication, Training, and Environmental Education Plan
  - Community Relations Plan
  - Contingency Plan
  - Worker Health and Safety Plan
  - Monitoring Plan
  - Rescue and Protection Plan (for species of concern that need relocation)
  - Closure and Abandonment Plan
  - Rehabilitation Plan

The specific requirements for the Curipamba Project EIA will be elaborated in a Terms of Reference document produced by the Ministry of Environment. The public is provided the right to participate in environmental assessment of projects, including through consultations, public open houses, and other initiatives.

In addition to Ecuadorian requirements, Adventus will ensure that the EIA is consistent with appropriate international standards. At minimum, these would include the Equator Principles, and the International Finance Corporation Performance Standards and Environmental, Health, and Safety Guidelines.

## CURRENT PERMITTING

The Project conducts its current exploration activity under a valid Environmental Licence, granted as Resoluciones 506, 508, and 509 from the Ministry of Environment in May 2011 upon the successful conclusion of an exploration phase EIA (Cinge Cia. Ltda., 2007). The Environmental Licence remains valid for the duration of the exploration and evaluation phases of the Project, subject to fulfillment of monitoring report submissions.

In fulfillment of the Environmental Licence requirements, the Project currently submits semi-annual reports to the Ministry of Environment that report on internal monitoring of water, soil, climate, water, effluent, and community relations activities. This is supported by periodic environmental audits and site inspections by government authorities to demonstrate compliance.

## **ENVIRONMENTAL STUDIES**

The Project is located in the Sub-Tropical Humid, Tropical Humid, Humid Sub-Tropical, and Very Humid Sub-Tropical bioclimatic zones of the Western Andean Cordillera, with elevations of 400 m in the valley bottom to 1,075 m in the higher exploration zones. The topography is moderate to steep, incised by dendritic drainage complexes within the tributary watersheds of the Runayacu River basin.

Adventus and Curimining have an on-going environmental and social engagement program, which is described below.

## **ENVIRONMENTAL PROGRAM DEVELOPMENT**

### ***CLIMATE***

Curimining established two meteorological stations near the Curipamba site, at Naves Chico and Barranco, and has been collecting and compiling daily high and low temperatures, humidity, maximum wind speed and direction, precipitation, barometric pressure, and solar radiation since 2011, resulting in a long-term dataset that establishes annual and elevation variability.

The temperatures at Curipamba are typical sub-tropical, with variability year round between 10°C and 25°C, averaging approximately 17°C. The wet season is from December to May, with an average annual rainfall between 2,200 mm and 2,500 mm, and the dry season is from June to November.

### ***GEOCHEMICAL CHARACTERIZATION***

A geochemical characterization program is currently in progress on potential waste rock from the El Domo deposit to support pre-feasibility level evaluations. The characterization program consists of both a static and kinetic test program on the key lithological units to assess the

ARD and metal leaching potential of expected mine waste that could be generated from proposed open pit development.

The program is being conducted in a staged approach. The current stage, initiated in late February 2019, consists of static geochemical testing (acid-base accounting, trace element chemistry) on 145 samples of drill core representing waste rock and low grade mineralized material. Sample selection considered the anticipated primary rock units and spatial distribution within the proposed pit. Additional samples are planned to be added to the program and sourced from drill core from the northern portion of the proposed pit, as well as potential tailings waste streams from on-going metallurgical testing.

Once additional testing is completed, subsequent stages will include mineralogical characterization, leach extraction testing, and kinetic tests, specifically humidity cell testing.

#### **HYDROLOGY**

The Project area drains from dendritic catchments to the Runayacu River, which becomes the Oncebí River, in turn discharging to the Zapotal River.

Curimining has been collecting discharge measurements on a number of creeks and sites in the Project area on a monthly basis since 2011. Higher flows correspond with rainy season between December and May, where maxima of over 25 m<sup>3</sup>/s were observed in the Runayacu River. Low flows, occurring between July and November, are typically less than 1 m<sup>3</sup>/s.

#### **SURFACE WATER QUALITY**

Curimining has been collecting water samples for chemical analysis intermittently since 2011 from three surface water sites (Rio Runayacu, Rio Las Naves Chico, and Rio Naves Grande). Samples are analyzed at an accredited laboratory in Quito. In general, the baseline surface water quality is slightly alkaline, with low metals concentrations, but high organics content.

#### **TERRESTRIAL FLORA AND FAUNA**

Vegetation and wildlife of the southern sector of the Curipamba concessions were described in support of the exploration permits. The vegetative cover was described as predominantly secondary forest, natural pastures, and moderately disturbed forests on the banks of rivers, streams, and estuaries, along with some small, isolated remnants of natural vegetation in steep and high elevation areas. Mammal species of conservation significance that were identified in

the baseline program included white-fronted capuchin, lowland paca, red brocket, and collared peccary. Six bird species occurring in the Project area were classified as threatened or vulnerable.

#### **AQUATIC FAUNA**

A total of 15 fish species have been recorded in the southern sector of the Curipamba concessions, however, fish were noted to be scarce, which was attributed to disturbed conditions in the area and low flows. None of the species were noted to be endangered or threatened. Fisheries and habitat surveys will be implemented in rivers and creeks that will be within the footprint of the Project and in areas downstream that may be impacted by changes in water quality or quantity associated with the Project.

## **SOCIAL AND COMMUNITY REQUIREMENTS**

### **LOCAL SOCIO-ECONOMY**

Local communities identified as being potentially affected by the exploration activities were cantons of the Bolivar Province, including Las Naves, Echeandía, Guaranda, and the Las Naves canton in the province of Los Rios. Demographic characteristics for the province of Bolivar presented based on results of the 2010 census indicate a total population of approximately 184,000. Agriculture, forestry, hunting, and fishing were noted as the main economic drivers in the province.

Curimining conducted interviews with representatives of organizations, local governments, community leaders, and members of the public in affected communities to gauge the perception of communities on the presence of the concessions. There is general support for the Project at the exploration stage, as the community benefits from local employment. Curimining has located its offices in the town of Las Naves, and, in lieu of having a camp kitchen, provides staff with a per diem to take meals in local restaurants. This has allowed for good integration of the company to the community and demonstrated real benefits to the local economy. Curimining has selectively sponsored local groups and activities, based on community feedback to determine where there was greatest interest. Sponsorships include:

- Traditional dance group “Qhuya Kawsay”
- Development of youth soccer leagues
- Support to the “Los Mineros” local soccer club
- Scholarships for local schools

- An agro-forestry plant nursery
- Support of local festivals
- In-kind and financial contribution to local road maintenance

Curimining continues to operate a robust community engagement program, with an office available to the public and as a base of outreach activities.

## **ARCHAEOLOGY AND CULTURE**

Three archaeological sites have been identified near the Project. Small and eroded ceramic pieces were found at each site, which were identified as being pre-Hispanic. The sites were named “Las Naves”, “El Panecillo”, and “El Congreso”. Of these, Las Naves and El Panecillo are located west and east of the pit, respectively. El Congreso is located further to the south and on the opposite side of the Rio Runayacu.

Additional study will be conducted to ensure that a more fulsome understanding of their extent and archaeological significance is understood.

## **WASTE AND TAILINGS DISPOSAL**

The management strategy for waste rock tailings and other wastes is discussed in Section 18.

## **WATER MANAGEMENT**

The site wide water management strategy is discussed in Section 18.

## **MINE CLOSURE**

### **CLOSURE AND BONDING REQUIREMENTS**

The Mining Law (Ley de Minería) specifies that a Closure Plan is required as part of the environmental management plan submitted as part of the mining phase EIA. The Closure Plan will include an estimated closure cost, upon which a financial guarantee or insurance policy in favour of the government will be required, which must remain in force until the final closure of operations.

## **CLOSURE PLANNING**

The Closure Plan will be developed as part of the EIA, however, the approach will be designed to ensure long term stability of both physical and chemical properties of the site, and to return the landscape to its pre-mining capability where possible. Specific closure items will include:

- The closure and post-closure pit design will ensure public safety and environmental protection during all stages.
- The tailings facility will have a sufficient combination of flood storage and routing capacity to safely pass flood flows.
- The tailings embankment will have an appropriate allowance to withstand settlement from a Maximum Credible Earthquake (MCE) event.
- All potentially acid generating (PAG) material will be isolated from possible oxidation.
- Reagents and supplies will be removed and will be returned to suppliers, sold to other operations, disposed of in approved waste facilities, or transported to a certified company for disposal.
- Equipment, conductors, and other above ground facilities for the electrical supply will be dismantled or demolished.
- All foundations will be demolished and covered to approximate as closely as possible the pre-mining landscape topography.

The approach will also incorporate community involvement to ensure that remaining infrastructure closure methods end land use objectives are socially acceptable and in keeping with the broader land use planning of the area.

Progressive rehabilitation is currently integrated into the exploration phase and will be an important aspect of concurrent programs during operations in order to minimize final disturbance areas upon cessation of mining. The current program of successfully rehabilitating drill pads and other unused disturbance areas will form the basis of the approach for revegetation during operations. The plant nursery developed by Curimining will be utilized as a source of native revegetation.

## **CLOSURE COST**

A detailed closure cost will be developed to support the mine EIA submission, supported with feasibility level design. Based on the foregoing, a preliminary estimate of approximately \$34.1 million has been developed and incorporated into Project costing.



## 21 CAPITAL AND OPERATING COSTS

### CAPITAL COSTS

The capital costs in this PEA are subject to an estimated margin of error of plus or minus 30% to 35%. The total capital cost for the Project is approximately \$289 million (Table 21-1). The pre-production cost is \$185 million, which covers pre-production mine development costs, process plant construction costs, surface infrastructure, tailings facility, and the Engineering, Procurement, and Construction Management (EPCM) and contingency amounts as well as the value added tax (VAT) which will be a credit against taxes once exporting of concentrates commences. The sustaining capital cost totals \$104 million and covers the LOM costs, reclamation and closure costs, and salvage value.

**TABLE 21-1 CAPITAL COST SUMMARY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<b>Direct Costs</b>	<b>Cost (US\$000)</b>
Mining	16,700
Processing	51,700
Infrastructure	24,300
Tailings	7,400
<b>Total Direct Cost</b>	<b>100,100</b>
<b>Indirect Costs</b>	
EPCM / Owner's / Indirect	31,800
<b>Subtotal Direct and Indirect Cost</b>	<b>131,900</b>
Contingency (25%)	33,000
<b>Subtotal</b>	<b>164,900</b>
Value Added Tax (12%)	20,200
<b>Initial Capital Costs</b>	<b>185,100</b>
<b>Other Capital Costs</b>	
Sustaining Capital Cost	80,100
Reclamation and Closure	34,100
Salvage Value	(10,000)
<b>Subtotal</b>	<b>104,100</b>
<b>Total Capital Cost</b>	<b>289,200</b>

## PRE-PRODUCTION CAPITAL

The pre-production capital costs for the Project are estimated to be \$185 million. Expenditures will take place over an 18 month period with a spending distribution of 35% and 65%, in Year -1 and Year -2, respectively.

The pre-production costs are summarized in four main categories, mining, processing, infrastructure, and tailings as shown in Table 21-2.

**TABLE 21-2 PRE-PRODUCTION COST SUMMARY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	Y -2 (\$000)	Y -1 (\$000)	Total (\$000)
Mining	3,600	13,100	16,700
Processing	17,200	34,500	51,700
Infrastructure	13,400	10,900	24,300
Tailings	-	7,400	7,400
<b>Total Direct Cost</b>	<b>34,200</b>	<b>65,800</b>	<b>100,100</b>
EPCM/Indirect	12,100	19,700	31,800
Contingency	11,600	21,400	33,000
VAT	7,000	13,200	20,200
<b>Total</b>	<b>64,900</b>	<b>120,100</b>	<b>185,100</b>

It is envisaged that all of the mobile equipment related to mine development and production will be supplied by the mining contractor. As a result, the capital cost estimate has not considered the cost of purchasing a fleet of mining equipment.

Pre-production stripping has been capitalized and is estimated at approximately \$16.7 million. Pre-production processing cost totals \$51.7 million and consists of the construction of the process plant and laboratory (Table 21-3). Infrastructure costs total \$24.3 million and include construction of access road, powerline and infrastructure, surface buildings including the maintenance and office complex, topsoil removal, waste dump, and water treatment plant (Table 21-4). The tailings cost of \$7.4 million covers the initial site clearing, liner, and dam.

**TABLE 21-3 PROCESS PLANT CAPITAL COST SUMMARY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	\$ (M)
Crushing	6.7
Grinding	10.5
Flotation	9.6
Filtering	9.5
Services, Utilities, Misc.	5.0
Plant Mobile Equipment	3.6
Electrical	6.8
<b>Total</b>	<b>51.7</b>

The direct process plant capital costs are based on benchmarking and not from engineering design.

**TABLE 21-4 INFRASTRUCTURE CAPITAL COST SUMMARY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	\$ (M)
Access Road	8.1
Mine Power Supply	3.9
Surface Facilities	6.1
Top Soil Removal	0.5
Waste Dump	4.1
Water Treatment Plant	1.6
<b>Total</b>	<b>24.3</b>

The cost estimate provided below is to be considered only as a high level guideline (Class 5 AACE). Estimates are provided for major distribution system components listed above as needed to successfully power the mine site, but not for the equipment needed to distribute the power around the site as this will depend on the chosen system configuration. The total costs will depend on the adopted configuration of the system, therefore only some costs are applicable depending on the configuration. It is assumed that all three routing options described above will have comparable capital costs. Therefore, a total line length of 18 km is used for estimating indicative capital costs. Estimates are based on KP's previous project experience and are provided in US dollars. A summary of these costs is provided in Table 21-5.

**TABLE 21-5 MINE POWER SUPPLY CAPITAL COST ESTIMATE**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Component	Cost (US\$000)
33 kV line (18 km @ 120,000/km)	2,160
Step-down transformer at Curipamba (7 MVA, 33/X kV)	600
Step-down transformer at Echeandía (7 MVA, 69/33 kV)	800
Capacitors (33 kV, 4 Mvar)	350
<b>TOTAL</b>	<b>3,910</b>

All costs include installation, civil works, concrete pads, fencing, gravel, etc. Transmission line costs per kilometre are indicative of the terrain in the area surrounding the mine site. Therefore, these costs per kilometre may be applied for any transmission line alternative that may extend to the mine site from alternative points of interconnection.

Indirect capital costs total \$31.8 million and total 32% of direct costs and are shown in Table 21-6. A contingency of 25% of direct and indirect costs has been applied. VAT has been included at 12% of direct and indirect capital costs.

**TABLE 21-6 INDIRECT CAPITAL COST SUMMARY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	\$ (M)
Construction Temporary Facilities	1.0
Spares	0.9
Initial Fill	2.5
Engineering and Procurement	10.4
Start-up and Commissioning	1.0
Ocean Freight	3.5
Taxes/Duties	7.0
Owner's Cost	5.5
<b>Total</b>	<b>31.8</b>

Exclusions from the pre-production capital cost estimate include, but are not limited to, the following:

- Project financing and interest charges.
- Working capital.
- Escalation during construction.

## OTHER CAPITAL COSTS

### SUSTAINING CAPITAL COST

The sustaining capital over the LOM totals \$80 million and consist of \$56.7 million for tailings dam raises over the LOM (approximately \$4.0 million per year) and \$23.3 million for sustaining capital for the underground mine starting in Year 8, including underground infrastructure, owner's equipment, and ramp and level development not related to mineralized material, including raise development (Table 21-7). Underground contract mining costs account for mobile equipment sustaining costs.

**TABLE 21-7 UNDERGROUND SUSTAINING CAPITAL COST SUMMARY**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	Y 8	Y 9	Y 10	Y 11	Y 12	Y 13	Total
Mine Infrastructure and Miscellaneous	4.1	4.8	2.3				<b>11.3</b>
Owner's Equipment	0.1	0.1	0.3	0.2	0.1	0.0	<b>0.8</b>
Initial Underground Development		11.2					<b>11.2</b>
<b>Total</b>	<b>4.2</b>	<b>16.2</b>	<b>2.6</b>	<b>0.2</b>	<b>0.1</b>	<b>0.0</b>	<b>23.3</b>

Closure costs inclusive of infrastructure demolition, demobilization, and earthworks are estimated at \$34.1 million including a 30% contingency and will be incurred in Year 15.

All hazardous products and equipment will be removed from the site. All buildings on site will be demolished, with foundations covered with stored material. Affected areas will be regraded to obtain topography similar to that of the surrounding areas. Safety berms or barriers with appropriate signage will be constructed around the pit rim to prevent inadvertent access.

A nominal salvage value of \$10.0 million has been included in the capital cost which will be credited towards the reclamation and closure cost.

## OPERATING COSTS

The operating costs in this PEA are subject to an estimated margin of error of plus or minus 30% to 35%. The LOM operating cost for the mine is estimated at \$54.80 per tonne processed. The operating costs are distributed between open pit and underground mining, processing, and G&A costs. The total LOM operating costs and LOM cost per tonne processed are shown in Table 21-8.

**TABLE 21-8 LIFE OF MINE OPERATING COSTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	\$ (000)	Unit	Total
Mining (Open Pit)	158,200	US\$/t moved	3.15
Mining (Underground)	88,300	US\$/t processed	71.50
Processing	190,300	US\$/t processed	21.80
G&A	41,300	US\$/t processed	4.74
<b>Total Operating Cost</b>	<b>478,100</b>	<b>US\$/t processed</b>	<b>54.80</b>

The breakdown and development of operating costs by area are as follows.

## MINING COSTS

Open pit mine operating costs total \$3.15 per tonne moved based on cost rating on similar projects (Table 21-9). The costs are based on contractor mining including all loading, hauling, road and dump maintenance, and use of other auxiliary equipment required to maintain a normal operation and owner's costs including: dewatering, geotechnical, supervision, grade control, and general supervision and engineering.

**TABLE 21-9 OPEN PIT OPERATING COSTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	\$ (000)	\$/t Moved
<b>Owner's Cost</b>		
Labour	14,955	0.30
Equipment	560	0.01
Consumables	9,261	0.18
Other	1,239	0.02
<b>Subtotal</b>	<b>26,015</b>	<b>0.52</b>
-		
<b>Contractor's Cost</b>		
Labour	39,684	0.79
Equipment	65,972	1.31
Margin	26,546	0.53
<b>Subtotal</b>	<b>132,202</b>	<b>2.63</b>
<b>Total</b>	<b>158,217</b>	<b>3.15</b>

Underground mining costs total \$71.50 per tonne processed based on cost rating on similar projects (Table 21-10). The costs are based on contractor mining including stope development and production and owner's costs including: geotechnical, supervision, grade control, and general supervision and engineering.

**TABLE 21-10 UNDERGROUND OPERATING COSTS**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

<b>Owner's Cost</b>	<b>\$ (000)</b>	<b>\$/t Processed</b>
Labour	12,437	10.07
Equipment	200	0.16
Consumables	8,660	7.01
Backfill	8,290	6.71
Other	1,065	0.86
<b>Subtotal</b>	<b>30,652</b>	<b>24.81</b>
<b>Contractor's Cost</b>		
Ore Development	6,626	5.36
Production	50,068	40.53
Ore Haulage	964	0.78
<b>Subtotal</b>	<b>57,658</b>	<b>46.68</b>
<b>Total</b>	<b>88,310</b>	<b>71.49</b>

## PROCESSING COST

Processing costs were developed from first principles by RPA and total \$21.80 per tonne processed. Consumption rates for diesel, power, reagents, and mill consumables were estimated and overall costs are based on price assumptions of \$0.72/L for diesel, \$0.11/kWh for electricity, and typical unit rates for reagents and mill consumables.

A breakdown of costs by area is presented in Table 21-11.

**TABLE 21-11 UNIT PROCESS OPERATING COSTS**  
**Adventus Mining Corporation – El Domo Deposit – El Domo Deposit**

<b>Cost</b>	<b>Unit</b>	<b>\$/t Processed</b>
Labour	US\$/t	2.90
Power	US\$/t	7.00
Consumables	US\$/t	2.30
Maintenance	US\$/t	3.00
Reagents	US\$/t	5.10
Mobile Equipment	US\$/t	1.50
<b>Total Operating Cost</b>	<b>US\$/t</b>	<b>21.80</b>

## G&A COSTS

The total expenditure for G&A is estimated at \$41.3 million or \$2.9 million per year resulting in a unit rate of \$4.74 per tonne processed. The G&A includes the owner's personnel costs,



vehicle costs, camp costs, office supplies, personnel protection equipment, environmental monitoring and compliance, licences and permits, safety and first aid equipment, security supplies, consultants, communications equipment, software, insurance, travel, and training.

## MANPOWER

The manpower list for the Curipamba Project is shown in Table 21-12.

**TABLE 21-12 AVERAGE PROJECT MANPOWER**  
**Adventus Mining Corporation –Curipamba Project – El Domo Deposit**

Department	Years 1-9	Years 9-15
Administration	67	86
Contractor Mining	91	116
Processing	87	87
<b>Total</b>	<b>245</b>	<b>289</b>

The manpower shown in Table 21-12 is an average loading over the mine life with an initial buildup to the full contingent early in the Project. Manpower for Year 1 through Year 9 reflects the open pit operation period prior to production from underground. Manpower for Year 9 through Year 15 reflects the additional manpower required for the combined open pit and underground operating period.

The mine is located within short driving distance of local population centres. Mine staff will be sourced locally and work a typical work week with the weekends off. The less demanding work within the mining crews, such as truck drivers, scoop operators, and maintenance, will be sourced locally. Consideration has been made for sourcing some key skilled positions such as jumbo drill operators, production drillers, and direct mine development crews from wider areas within the province or country. For these employees, an allowance has been made for fifty men requiring room and board services in town.

## 22 ECONOMIC ANALYSIS

The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realized.

A Cash Flow Projection has been generated from the LOM plan production schedule and capital and operating cost estimates, and is summarized in Table 22-1. The associated process recoveries, metal prices, operating costs, refining and transportation charges, royalties, and capital expenditures (pre-production and sustaining) were also taken into account. All costs are presented in US dollars. Metal prices are based on consensus, long term forecasts from banks, financial institutions, and other sources averaging: US\$ 3.15/lb Cu, US\$1.15/lb Zn, US\$1.00/lb Pb, US\$18.00/oz Ag, and US\$1,350/oz Au.

### ECONOMIC CRITERIA

#### **REVENUE (100% BASIS)**

- 1,750 tpd mining from open pit and underground (612,500 tpa).
- LOM Head Grade
  - 1.8% Cu
  - 2.7% Zn
  - 0.3% Pb
  - 2.5 g/t Au
  - 49 g/t Ag
- Mill recovery as indicated by test work, averaging:
  - 80.7% Cu
  - 78.5% Zn
  - 38.3% Pb
  - 57.5% Au
  - 69.0% Ag
- NSR value: \$171 per tonne processed
- Revenue is recognized at the time of production

#### **COSTS (100% BASIS)**

- Pre-production period: 18 months.
- Mine life: 15 years.
- Pre-production capital: \$185 million including VAT,
- LOM production plan as summarized in Table 16-14.
- Mine life capital totals \$104 million net of salvage value.

- Average operating cost over the mine life is \$54.80 per tonne processed.

**TAXATION AND ROYALTIES**

Corporate tax liabilities were calculated under the Ecuadorian tax regime based on public information and information provided by Adventus. The following taxes are applicable to mining companies:

- Income tax
- Profit sharing with state and workers
- Sovereign Adjustment
- Value-added tax
- Import duties

As per the tax update of January 1, 2018, a standard corporate tax rate of 25% is applied on income taxes. Companies domiciled in Ecuador are subject to tax on their worldwide income. The income tax is paid annually in April of the following calendar year. The income tax basis is determined by the total taxable income less allowable deductions according to the tax law. All deductions and rates are based on currently enacted legislation, and are subject to change in the future, or until the company has an investment protection agreement subscribed with the Ecuadorian Government with tax stability benefits.

A profit sharing tax rate of 15% is applicable to the taxable income of the Curipamba Project. Based on Curipamba's scale of mining, the worker's portion will be 3% and the State's portion 12%. This tax is deductible for income tax purposes.

Under the "Sovereign Adjustment" tax, the Ecuadorian constitution requires that the government receives at least 50% of benefits from non-renewable resource projects. Sovereign Adjustment is only payable when the present value of cumulative company benefits exceeds the present value of cumulative government benefits.

The benefits will be calculated annually as the net present value of the cumulative free cash flows of Curipamba since the concession was granted. The benefits to the Government of Ecuador will be calculated as the net present value of the cumulative sum of corporate income tax, royalties, state profit sharing taxes, non-recoverable VAT, and previous Sovereign Adjustment payments, if any, over the same period. Based on the base case metal prices

used in the financial model presented in this report, the Project will not trigger the Sovereign Adjustment payment.

VAT is levied at the rates of either 12% or 0% on the transfer of goods, import of goods, and the rendering of services, as well as on services rendered within the country or imported. Royalties and intangible property, imported or locally paid, are also levied with a 12% VAT. VAT was applied to both capital investment and operating costs items.

In Ecuador, exportation of goods and services are levied with 0% VAT, as well as other goods and services specifically included in the tax law. Mining concessionaires are entitled to the refund of VAT paid since January 1, 2018, once exportation of concentrate commences, which will be a maximum of 12% of the value of exports in the period. Any amounts not refunded will be available for carry forward for a period of five years.

Other taxes levied include:

- Environmental conservation: The concessionaire has to pay an annual fee per mining hectare each March, as follows:
  - During the initial exploration phase, an amount equivalent to 2.5% of a unified basic remuneration (UBR) (the UBR is US\$386 for 2018).
  - During the period of advanced exploration and economic evaluation an amount equivalent to 5% of the UBR.
  - During the operations phase, an amount equivalent to 10% of the UBR.
- Payments for the import of raw materials, supplies, and capital goods contained on a list issued by the Tax Policy Committee generally pay duty on importation at a rate of 0% to 5%.
- Fodinfra: This is an additional contribution on the import of goods for the Development Fund for Children. The taxable basis is the cost, insurance and freight (CIF) of the importation, and the rate is 0.5%.

An amount of US\$41.4 million of historical costs is considered in the financial model. These historical costs provide a shield against taxes and profit-sharing expenses.

Mineral royalty taxes are calculated with reference to gross sales of minerals:

- Large-scale mining: maximum 8% for gold, silver, and copper and minimum 5% in respect of all other minerals
- Medium-scale mining: fixed – 4% of sales
- Small-scale mining: fixed – 3% of sales

The Project will be subject to a royalty of 4% on the net sales revenue of precious metals and related by-products sales and is payable to the Government of Ecuador. In addition, the Project is subject to a 2% NSR royalty to Altius Minerals Corporation.

**OFF-SITE COSTS**

Off-site costs are comprised of freight charges (highway and ocean), port handling fees, and smelter TCs and RCs and include the following:

- Silver refining: \$0.50/oz
- Gold refining: \$5.00/oz
- Copper TCs: \$80/t
- Copper RCs: \$0.08/lb
- Lead TCs: \$200/t
- Zinc TCs: \$230/t
- Transportation: \$98/t concentrate including trucking from the mine to the port, port handling charges, and ocean freight

**TABLE 22-1 AFTER-TAX CASH FLOW SUMMARY**  
 Adventus Mining Corporation - Curipamba Project - El Domo Deposit

	INPUTS	UNITS	TOTAL	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
MINING																				
Open Pit																				
Operating Days	350	days	4,900			350	350	350	350	350	350	350	350	350	350	350	350	350	350	-
Tonnes milled per day		tonnes / day	1,527			1,604	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,750	1,464	750	750	1,381	1,427	-
Tonnes moved per day		tonnes / day	10,260			11,728	14,075	14,991	31,427	33,057	9,931	7,517	5,583	4,635	2,511	1,684	1,620	2,044	2,830	-
Production (All Minerals)																				
Au Grade		'000 tonnes	7,482			561	613	613	613	613	613	613	612	613	513	263	263	483	499	-
Ag Grade		g/t	2.6			3.9	4.3	3.0	3.2	2.9	2.6	2.4	2.1	2.7	1.8	1.8	1.7	1.6	1.3	-
Ag Grade		g/t	51.1			62.3	64.7	67.3	78.0	51.4	55.4	49.8	47.3	49.5	37.8	36.4	29.9	28.7	25.3	-
Cu Grade		%	1.7%			2.1%	2.7%	2.2%	1.8%	2.1%	1.9%	1.0%	0.9%	1.7%	1.2%	1.3%	1.2%	1.5%	1.1%	0.0%
Pb Grade		%	0.3%			0.3%	0.4%	0.4%	0.5%	0.4%	0.3%	0.3%	0.3%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%
Zn Grade		%	2.6%			3.2%	3.7%	3.3%	4.3%	2.9%	2.9%	2.9%	2.4%	2.3%	1.8%	1.6%	1.3%	1.2%	1.1%	0.0%
Waste		'000 tonnes	47,327	700	3,837	3,543	4,314	4,634	10,387	10,957	2,863	2,018	1,342	1,010	366	327	305	232	491	-
Total Moved		'000 tonnes	54,809	700	3,837	4,105	4,926	5,247	11,000	11,570	3,476	2,631	1,954	1,622	879	589	567	716	990	-
Stripping Ratio			6.3			6.3	7.0	7.6	17.0	17.9	4.7	3.3	2.2	1.6	0.7	1.2	1.2	0.48	0.98	-
Underground																				
Operating Days	350	days	1,860			-	-	-	-	-	-	-	-	-	350	350	350	350	350	110
Tonnes milled per day		tonnes / day	664			-	-	-	-	-	-	-	-	-	286	1,000	1,000	369	323	1,754
Production (All Minerals)																				
Au Grade		'000 tonnes	1,235			-	-	-	-	-	-	-	-	-	100	350	350	129	113	193
Ag Grade		g/t	1.7			-	-	-	-	-	-	-	-	-	1.9	1.4	1.7	1.2	1.8	2.5
Ag Grade		g/t	35.9			-	-	-	-	-	-	-	-	-	38.4	27.2	34.4	22.5	50.9	53.7
Cu Grade		%	2.8%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	2.7%	2.4%	3.5%	4.0%	2.3%
Pb Grade		%	0.2%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.1%	0.1%	0.2%	0.3%
Zn Grade		%	3.1%			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.97%	3.42%	2.94%	2.36%	3.72%	3.15%
PROCESSING																				
Mill Feed All Ore Types																				
Au Grade		'000 tonnes	8,717			561	613	613	613	613	613	613	612	613	613	613	613	613	613	193
Ag Grade		g/t	2.5			3.9	4.3	3.0	3.2	2.9	2.6	2.4	2.1	2.7	1.8	1.6	1.7	1.5	1.4	2.5
Ag Grade		g/t	48.9			62.3	64.7	67.3	78.0	51.4	55.4	49.8	47.3	49.5	37.9	31.1	32.4	27.4	30.1	53.7
Cu Grade		%	1.8%			2.1%	2.7%	2.2%	1.8%	2.1%	1.9%	1.0%	0.9%	1.7%	1.5%	2.1%	1.9%	1.9%	1.6%	2.3%
Pb Grade		%	0.3%			0.3%	0.4%	0.4%	0.5%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.3%
Zn Grade		%	2.7%			3.2%	3.7%	3.3%	4.3%	2.9%	2.9%	2.9%	2.4%	2.3%	2.0%	2.7%	2.3%	1.5%	1.6%	3.1%
Contained Au		oz	697,448			70,524	84,257	59,502	62,421	56,189	51,225	48,064	40,564	52,470	35,760	31,216	33,328	29,031	27,640	15,257
Contained Ag		oz	13,714,501			1,124,740	1,274,750	1,326,082	1,536,637	1,011,714	1,091,321	980,467	931,753	974,245	746,511	612,635	638,921	539,673	592,133	332,919
Contained Cu		tonnes	158,719			12,044	16,411	13,344	10,733	13,056	11,799	6,422	5,327	10,131	8,906	13,024	11,730	11,580	9,843	4,369
Contained Pb		tonnes	23,355			1,816	2,684	2,333	3,066	2,196	1,925	2,026	1,582	1,458	978	659	784	552	760	536
Contained Zn		tonnes	236,811			17,908	22,528	20,445	26,301	17,972	17,786	17,498	14,882	14,374	12,039	16,259	13,825	9,016	9,901	6,077
CuEq grade			4.86%			6.4%	7.4%	6.0%	6.1%	5.5%	5.2%	4.1%	3.5%	4.7%	3.7%	4.4%	4.1%	3.6%	3.4%	5.5%
Net Recovery																				
Au		%	57.5%			61.1%	57.9%	58.1%	55.7%	57.9%	53.9%	54.6%	57.2%	59.4%	57.1%	60.3%	55.3%	56.5%	56.1%	61.5%
Ag		%	69.0%			69.2%	68.9%	69.4%	70.0%	69.3%	68.7%	70.1%	70.1%	69.0%	69.0%	67.4%	67.9%	66.9%	67.1%	68.8%
Cu		%	80.7%			81.1%	80.9%	79.7%	75.7%	80.8%	81.1%	74.9%	75.6%	81.1%	81.4%	82.2%	81.8%	84.2%	83.2%	81.5%
Pb		%	38.3%			24.2%	35.5%	41.2%	50.7%	38.1%	43.4%	54.4%	49.6%	30.3%	33.2%	12.7%	34.4%	17.2%	25.4%	14.4%
Zn		%	78.5%			77.6%	78.3%	79.1%	81.9%	77.9%	78.7%	82.2%	82.2%	78.0%	77.3%	76.3%	76.6%	72.9%	74.7%	75.9%
REVENUE																				
Metal Prices																				
Au	\$1,350.00	Input Units	\$1,350.00			\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00	\$1,350.00
Ag	\$18.00	US\$/oz Ag	\$18.00			\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00
Cu	\$3.15	US\$/lb Cu	\$3.15			\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15
Pb	\$1.00	US\$/lb Pb	\$1.00			\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00
Zn	\$1.15	US\$/lb Zn	\$1.15			\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15	\$1.15
Concentrate Payable																				
Cu Concentrate																				
Payable Au		oz	219,762			26,456	27,261	19,258	14,128	18,349	14,961	9,987	10,455	18,470	11,237	12,570	10,408	10,961	9,497	5,765
Payable Ag		oz	4,485,791			405,747	427,239	429,547	437,825	327,058	348,228	269,116	268,079	336,048	241,151	238,570	212,644	204,513	214,907	125,120
Payable Cu		tonnes	122,344			9,340	12,689	10,169	7,757	10,086	9,136	4,591	3,846	7,857	6,926	10,232	9,171	9,310	7,827	3,407
Zn Concentrate																				
Payable Au		oz	121,464			11,122	14,436	10,281	13,933	9,504	8,467	10,946	8,577	8,510	6,153	4,161	5,357	3,601	3,993	2,423
Payable Ag		oz	2,702,956			212,722	246,908	267,107	334,786	202,807	214,203	216,637	202,490	187,091	147,833	101,422	118,651	88,747	101,058	60,294
Payable Zn		tonnes	155,529			11,695	14,761	13,520	17,901	11,741	11,679	11,946	10,162	9,388	7,782	10,432	8,879	5,533	6,213	3,898
Pb Concentrate																				
Payable Au		oz	9,150			619	1,050	749	1,360	681	686	1,109	780	540	464	164	401	162	250	134
Payable Ag		oz	819,858			41,155	69,413	81,420	133,898	62,748	71,709	92,366	79,382	46,389	46,709	11,923	36,670	14,692	22,430	8,954
Payable Pb		tonnes	7,963			390	848	854	1,382	744	743	980	698	393	289	74	240	84	171	69
Gross Revenue																				
Au Gross Revenue		US\$ '000	\$461,491			\$51,566	\$56,291	\$39,878	\$37,882	\$37,602	\$31,627	\$28,260	\$25,693	\$36,423	\$23,476	\$22,587	\$21,282	\$19,660	\$18,212	\$11,053
Ag Gross Revenue		US\$ '000	\$130,138			\$11,873	\$12,135	\$12,540	\$13,907	\$9,538	\$10,124	\$8,747	\$8,470	\$9,416	\$7,002	\$6,120	\$5,963	\$5,279	\$5,687	\$3,337
Cu Gross Revenue		US\$ '000	\$949,614			\$64,862	\$86,119	\$70,616	\$53,870	\$70,041	\$63,446	\$31,879	\$26,706	\$54,564	\$48,098	\$71,057	\$63,698	\$64,652	\$54,353	\$23,662
Zn Gross Revenue		US\$ '000	\$394,311			\$29,649	\$37,423	\$34,277	\$45,384	\$29,767	\$29,609	\$30,288	\$25,763	\$23,801	\$19,729	\$26,447	\$22,512	\$14,029	\$15,752	\$9,881
Pb Gross Revenue		US\$ '000	\$17,551			\$860	\$1,870	\$1,883	\$3,047	\$1,640	\$1,639	\$2,161	\$1,539	\$866	\$637	\$164	\$529	\$186	\$378	\$152
Total Gross Revenue		US\$ '000	\$1,853,105			\$158,811	\$195,837	\$159,194	\$154,089	\$148,588	\$136,445	\$101,335	\$88,171	\$125,071	\$98,942	\$126,375	\$113,974	\$103,805	\$94,383	\$48,085

	INPUTS	UNITS	TOTAL	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15		
Total Charges																						
Transport																						
Cu Concentrate	\$98.00 US/t conc	US\$ '000	\$60,558			\$4,508	\$6,231	\$5,011	\$3,914	\$4,937	\$4,589	\$2,331	\$1,920	\$3,849	\$3,449	\$5,034	\$4,576	\$4,655	\$3,904	\$1,651		
Pb Concentrate	\$98.00 US/t conc	US\$ '000	\$2,021			\$99	\$215	\$217	\$351	\$189	\$189	\$249	\$177	\$100	\$73	\$19	\$61	\$21	\$44	\$17		
Zn Concentrate	\$98.00 US/t conc	US\$ '000	\$40,543			\$2,932	\$3,844	\$3,537	\$4,841	\$3,015	\$3,096	\$3,262	\$2,755	\$2,430	\$2,024	\$2,622	\$2,279	\$1,379	\$1,572	\$954		
Treatment																						
Cu Concentrate	\$80.00 US/t conc	US\$ '000	\$45,353			\$3,376	\$4,667	\$3,753	\$2,931	\$3,697	\$3,437	\$1,745	\$1,438	\$2,882	\$2,583	\$3,770	\$3,427	\$3,486	\$2,924	\$1,236		
Pb Concentrate	\$200.00 US/t conc	US\$ '000	\$3,784			\$185	\$403	\$406	\$657	\$354	\$353	\$466	\$332	\$187	\$137	\$35	\$114	\$40	\$81	\$33		
Zn Concentrate	\$230.00 US/t conc	US\$ '000	\$87,296			\$6,313	\$8,276	\$7,617	\$10,424	\$6,491	\$6,666	\$7,024	\$5,932	\$5,232	\$4,358	\$5,647	\$4,908	\$2,970	\$3,384	\$2,054		
Refining																						
Au	\$5.00 US/oz	US\$ '000	\$1,706			\$188	\$208	\$148	\$140	\$139	\$117	\$105	\$95	\$135	\$87	\$84	\$79	\$73	\$67	\$41		
Ag	\$0.50 US/oz	US\$ '000	\$3,594			\$309	\$337	\$348	\$386	\$265	\$281	\$243	\$235	\$262	\$194	\$170	\$166	\$147	\$158	\$93		
Cu	\$0.080 US/lb	US\$ '000	\$21,577			\$1,647	\$2,238	\$1,793	\$1,368	\$1,779	\$1,611	\$810	\$678	\$1,386	\$1,222	\$1,805	\$1,617	\$1,642	\$1,380	\$601		
Pb	\$0.00 US/lb	US\$ '000	\$0			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Penalties																						
Cu Conc (Pb+Zn Limit 4%)																						
Zn Mineral	\$2.00/t/w >4%	US\$ '000	\$1,385			\$64	\$133	\$121	\$219	\$86	\$125	\$161	\$135	\$81	\$67	\$58	\$61	\$26	\$37	\$11		
Cu/Zn Mineral	\$2.00/t/w >4%	US\$ '000	\$1,945			\$222	\$136	\$142	\$163	\$152	\$126	\$87	\$83	\$106	\$101	\$199	\$136	\$88	\$104	\$100		
Cu Mineral	\$2.00/t/w >4%	US\$ '000	\$0			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Total Charges		US\$ '000	\$269,764			\$19,845	\$26,688	\$23,095	\$25,394	\$21,104	\$20,592	\$16,482	\$13,780	\$16,649	\$14,295	\$19,443	\$17,423	\$14,526	\$13,655	\$6,791		
Net Smelter Return		US\$ '000	\$1,583,342			\$138,966	\$169,149	\$136,099	\$128,694	\$127,484	\$115,852	\$84,853	\$74,391	\$108,422	\$84,647	\$106,933	\$96,551	\$89,279	\$80,727	\$41,294		
State Royalty NSR	4%	US\$ '000	\$63,334			\$5,559	\$6,766	\$5,444	\$5,148	\$5,099	\$4,634	\$3,394	\$2,976	\$4,337	\$3,386	\$4,277	\$3,862	\$3,571	\$3,229	\$1,652		
Royalty NSR	2%	US\$ '000	\$31,667			\$2,779	\$3,383	\$2,722	\$2,574	\$2,550	\$2,317	\$1,697	\$1,488	\$2,168	\$1,693	\$2,139	\$1,931	\$1,786	\$1,615	\$826		
Net Revenue		US\$ '000	\$1,488,341			\$130,628	\$159,000	\$127,933	\$120,973	\$119,835	\$108,901	\$79,762	\$69,927	\$101,916	\$79,568	\$100,517	\$90,758	\$83,923	\$75,884	\$38,817		
Unit NSR		US\$/t milled	\$171			\$233	\$260	\$209	\$198	\$196	\$178	\$130	\$114	\$166	\$130	\$164	\$148	\$137	\$124	\$201		
OPERATING COST																						
Mining (Open Pit)		US\$/t moved	\$3.15			\$3.58	\$3.23	\$3.17	\$2.61	\$1.97	\$3.34	\$3.51	\$4.50	\$3.85	\$5.98	\$7.94	\$8.33	\$6.03	\$4.65	\$0.00		
Mining (Underground)		US\$/t milled	\$71.49			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$151.22	\$50.02	\$49.72	\$131.07	\$113.39	\$17.48		
Processing		US\$/t milled	\$21.84			\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84	\$21.84		
G&A		US\$/t milled	\$4.74			\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74	\$4.74		
Total Operating Cost		US\$/t milled	\$54.84			\$52.76	\$52.57	\$53.74	\$73.42	\$63.83	\$45.51	\$41.67	\$40.94	\$44.92	\$59.86	\$62.80	\$62.70	\$61.26	\$55.06	\$44.06		
Mining (Open Pit)		US\$ '000	\$158,217			\$14,699	\$15,917	\$16,637	\$28,690	\$22,813	\$11,593	\$9,242	\$8,794	\$6,248	\$5,260	\$4,677	\$4,721	\$4,318	\$4,609	\$0		
Mining (Underground)		US\$ '000	\$88,310			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,985	\$15,122	\$17,506	\$17,402	\$16,924	\$12,835	\$3,373		
Processing		US\$ '000	\$190,375			\$12,262	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$13,377	\$4,214		
G&A		US\$ '000	\$41,332			\$2,662	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$2,904	\$915		
Total Operating Cost		US\$ '000	\$478,072			\$29,623	\$32,198	\$32,918	\$44,971	\$39,094	\$27,874	\$25,523	\$25,075	\$27,514	\$36,664	\$38,464	\$38,404	\$37,522	\$33,726	\$8,502		
Unit Operating Cost		US\$/t milled	\$54.84			\$52.76	\$52.57	\$53.74	\$73.42	\$63.83	\$45.51	\$41.67	\$40.94	\$44.92	\$59.86	\$62.80	\$62.70	\$61.26	\$55.06	\$44.06		
Operating Cashflow		US\$ '000	\$1,010,270			\$101,005	\$126,802	\$95,015	\$76,002	\$80,741	\$81,027	\$54,239	\$44,852	\$74,402	\$42,905	\$62,053	\$52,354	\$46,400	\$42,158	\$30,315		
CAPITAL COST																						
Direct Cost																						
Mining		US\$ '000	\$16,720			\$3,641	\$12,636	\$0	\$64	\$126	\$0	\$0	\$64	\$126	\$0	\$64	\$0	\$0	\$0	\$0		
Processing		US\$ '000	\$51,700			\$17,233	\$34,467	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Infrastructure		US\$ '000	\$24,323			\$13,368	\$10,965	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Tailings		US\$ '000	\$7,348			\$0	\$7,348	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Total Direct Cost		US\$ '000	\$100,091			\$34,243	\$65,405	\$0	\$64	\$126	\$0	\$64	\$126	\$0	\$64	\$0	\$0	\$0	\$0	\$0		
Other Costs																						
EPCM / Owners / Indirect Cost		US\$ '000	\$31,853			\$12,119	\$19,733	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Subtotal Costs		US\$ '000	\$131,944			\$46,362	\$85,139	\$0	\$64	\$126	\$0	\$64	\$126	\$0	\$64	\$0	\$0	\$0	\$0	\$0		
Contingency	25%	US\$ '000	\$32,986			\$11,591	\$21,285	\$0	\$16	\$32	\$0	\$16	\$32	\$0	\$16	\$0	\$0	\$0	\$0	\$0		
Initial Capital Cost		US\$ '000	\$164,930			\$57,953	\$106,423	\$0	\$80	\$158	\$0	\$80	\$158	\$0	\$80	\$0	\$0	\$0	\$0	\$0		
VAT		US\$ '000	\$20,163			\$6,954	\$13,209	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
Sustaining - Open Pit (TMF)		US\$ '000	\$56,715			\$0	\$3,653	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$3,985	\$1,255	\$0		
Sustaining - Underground		US\$ '000	\$23,341			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,198	\$16,178	\$2,633	\$169	\$119	\$44	\$0	\$0		
Reclamation and Closure		US\$ '000	\$26,208			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$26,208		
Contingency	30%	US\$ '000	\$7,862			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,862		
Salvage Value		US\$ '000	(\$10,000)			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	(\$10,000)		
Total Capital Cost		US\$ '000	\$289,219			\$64,907	\$123,285	\$3,985	\$4,065	\$4,143	\$3,985	\$4,065	\$4,143	\$3,985	\$8,263	\$20,163	\$6,619	\$4,154	\$4,104	\$4,029	\$1,255	\$24,070



	INPUTS	UNITS	TOTAL	Year -2	Year -1	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
<b>PRE-TAX CASH FLOW</b>																				
Net Pre-Tax Cashflow		US\$ '000	\$721,051	(\$64,907)	(\$123,285)	\$97,020	\$122,737	\$90,872	\$72,017	\$76,676	\$76,885	\$50,254	\$36,590	\$54,239	\$36,286	\$57,899	\$48,250	\$42,371	\$40,903	\$6,245
Cumulative Pre-Tax Cashflow		US\$ '000		(\$64,907)	(\$188,192)	(\$91,172)	\$31,565	\$122,438	\$194,455	\$271,131	\$348,015	\$398,269	\$434,859	\$489,098	\$525,384	\$583,283	\$631,532	\$673,903	\$714,806	\$531,628
Taxes																				
State Profit Sharing Tax		US\$ '000	\$58,393	\$0	\$0	\$7,366	\$9,744	\$5,888	\$3,601	\$4,268	\$4,782	\$1,941	\$811	\$3,441	\$912	\$5,304	\$4,067	\$3,345	\$2,924	\$0
Workers Profit Sharing Tax		US\$ '000	\$14,598	\$0	\$0	\$1,841	\$2,436	\$1,472	\$900	\$1,067	\$1,196	\$485	\$203	\$860	\$228	\$1,326	\$1,017	\$836	\$731	\$0
Income Tax		US\$ '000	\$83,240	\$0	\$0	\$0	\$10,135	\$10,426	\$6,376	\$7,558	\$8,468	\$3,437	\$1,436	\$6,094	\$1,614	\$9,392	\$7,203	\$5,923	\$5,178	\$0
Sovereign Adjustment Tax		US\$ '000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
After-Tax Cashflow		US\$ '000	\$564,820	(\$64,907)	(\$123,285)	\$87,813	\$100,422	\$73,086	\$61,140	\$63,783	\$62,438	\$44,390	\$34,140	\$43,844	\$33,532	\$41,877	\$35,963	\$32,267	\$32,069	\$6,245
Cumulative After-Tax Cashflow		US\$ '000		(\$64,907)	(\$188,192)	(\$100,379)	\$43	\$73,129	\$134,270	\$198,053	\$260,491	\$304,882	\$339,022	\$382,866	\$416,398	\$458,276	\$494,239	\$526,506	\$558,575	\$422,643
<b>PROJECT ECONOMICS</b>																				
Pre-Tax IRR		%	48.0%																	
Pre-tax NPV at 5% discounting	5.0%	US\$ '000	\$479,480																	
Pre-tax NPV at 8% discounting	8.0%	US\$ '000	\$374,277																	
Pre-tax NPV at 10% discounting	10.0%	US\$ '000	\$318,910																	
After-Tax IRR		%	40.5%																	
After-Tax NPV at 5% discounting	5.0%	US\$ '000	\$373,139																	
After-Tax NPV at 8% discounting	8.0%	US\$ '000	\$287,586																	
After-tax NPV at 10% discounting	10.0%	US\$ '000	\$242,526																	

## **CASH FLOW ANALYSIS**

Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$565 million over the mine life, and simple payback occurs two years from start of production).

The after-tax net present value (NPV) at an 8% discount rate is \$288 million, and the after-tax internal rate of return (IRR) is 40%.

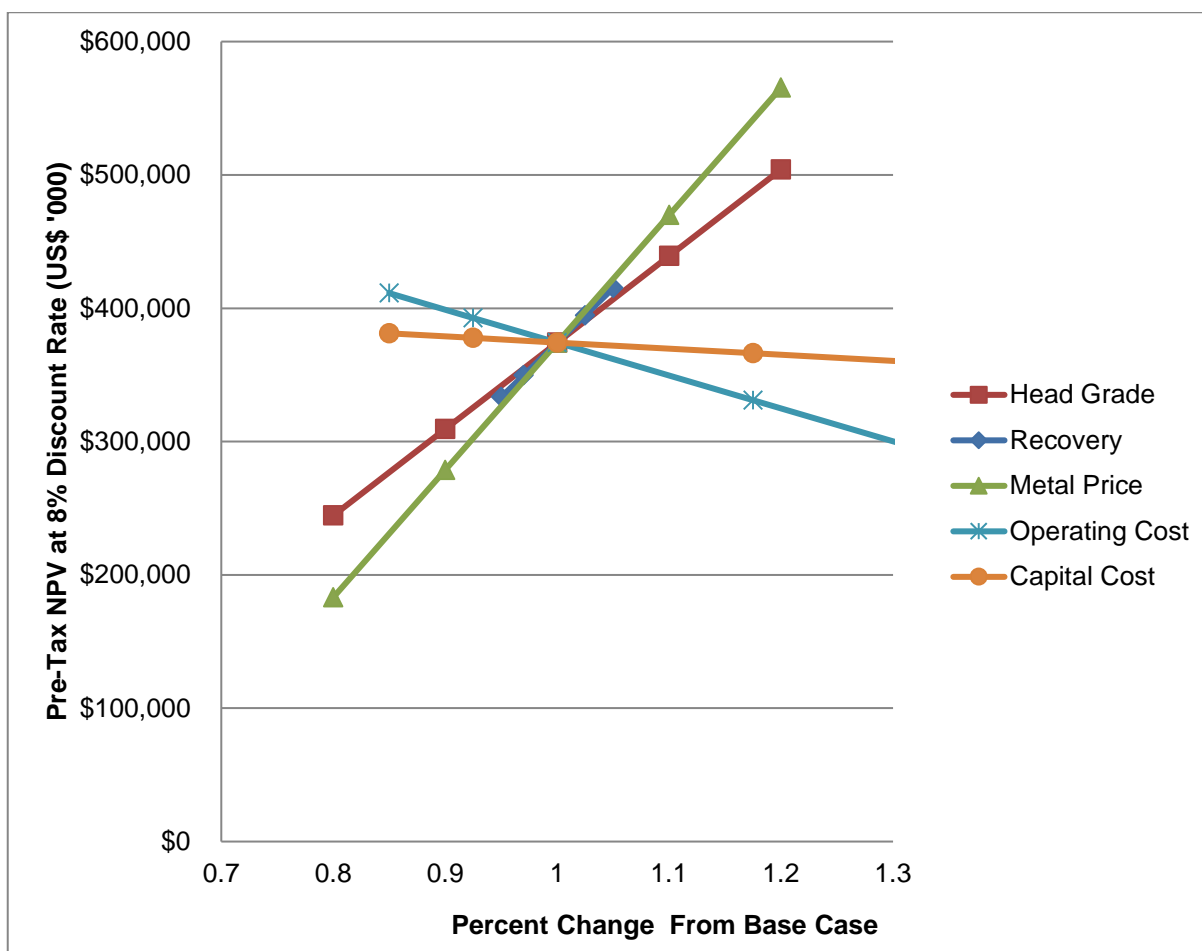
## **SENSITIVITY ANALYSIS**

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities:

- Head grade
- Metal recoveries
- Metal prices
- Operating costs
- LOM capital costs

Pre-tax NPV and IRR sensitivity over the base case has been calculated for -20% to +35% variations. The NPV and IRR sensitivities are shown in Figures 22-1 and 22-2, respectively and Table 22-2.

**FIGURE 22-1 PRE-TAX NPV SENSITIVITY ANALYSIS**



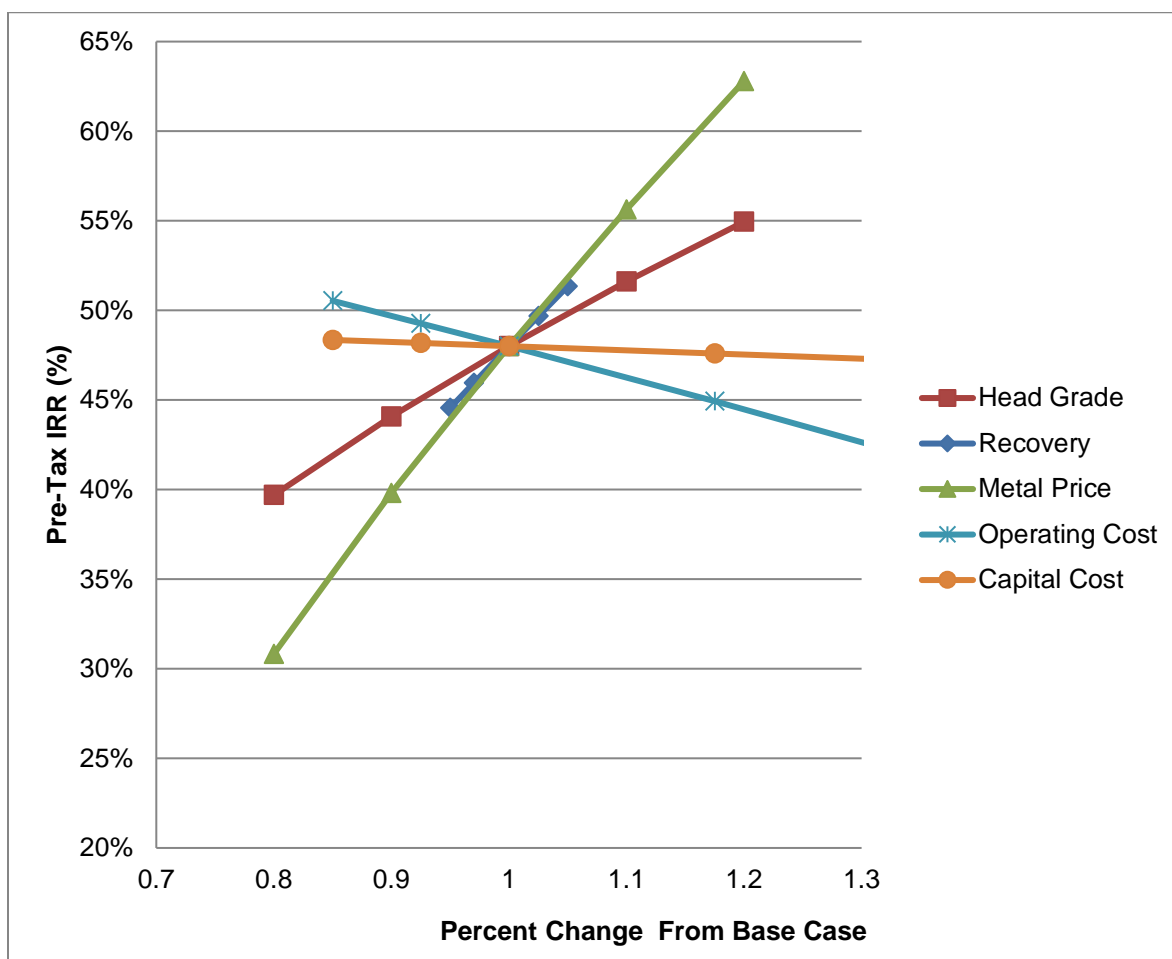
**TABLE 22-2 PRE-TAX NPV AND IRR SENSITIVITY**  
**Adventus Mining Corporation –Curipamba Project – El Domo Deposit**

	Head Grade (%Cu <sup>1</sup> )	NPV at 8% (US\$ M)	IRR (%)
0.80	1.21	244.5	39.7
0.90	1.50	309.4	44.1
<b>1.00</b>	<b>1.82</b>	<b>374.3</b>	<b>48.0</b>
1.10	2.18	439.2	51.6
1.20	2.56	504.1	54.9
	Average Recovery (All Metals, %)	NPV at 8% (US\$ M)	IRR (%)
0.95	61.6	333.4	44.6
0.97	62.9	319.7	45.9
<b>1.00</b>	<b>64.8</b>	<b>374.3</b>	<b>48.0</b>
1.03	66.4	394.7	49.7
1.05	68.0	415.2	51.3
	Cu Metal Price <sup>2</sup> (US\$/lb)	NPV at 8% (US\$ M)	IRR (%)
0.80	2.52	183.1	30.8
0.90	2.84	278.7	39.8
<b>1.00</b>	<b>3.15</b>	<b>374.3</b>	<b>48.0</b>
1.10	3.47	469.9	55.6
1.20	3.78	565.4	62.8
	Operating Costs (US\$/t)	NPV at 8% (US\$ M)	IRR (%)
0.85	46.62	411.3	50.5
0.93	50.73	392.8	49.3
<b>1.00</b>	<b>54.80</b>	<b>374.3</b>	<b>48.0</b>
1.18	64.44	331.1	44.4
1.35	74.04	287.8	41.7
	Capital Costs (US\$ M)	NPV at 8% (US\$ M)	IRR (%)
0.85	245.8	381.2	48.3
0.93	267.5	377.7	48.2
<b>1.00</b>	<b>289.2</b>	<b>374.3</b>	<b>48.0</b>
1.18	339.8	366.2	47.6
1.35	390.4	358.2	47.2

Notes:

1. Copper head grade shown, however, sensitivity applies to all metals
2. Copper price shown, however, sensitivity applies to all metals

**FIGURE 22-2 PRE-TAX IRR SENSITIVITY ANALYSIS**



## 23 ADJACENT PROPERTIES

There are no adjacent properties material to the Curipamba Project.

## **24 OTHER RELEVANT DATA AND INFORMATION**

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



## 25 INTERPRETATION AND CONCLUSIONS

The PEA is based on an updated Mineral Resource estimate as of May 2, 2019 and evaluates a contractor-operated open pit and underground mining approach along with processing of 1,750 tpd by crushing, grinding, gravity gold recovery, flotation, concentrate thickening, and filtration producing copper, zinc, and possibly lead concentrates.

The LOM plan for the Project includes 8.7 Mt, at average grades of 2.5 g/t Au, 48.9 g/t Ag, 1.8% Cu, 0.3% Pb, and 2.7% Zn, mined over a 15 year period, including conventional open pit mining for the first nine years in four phases followed by a combination of open pit and underground mining thereafter.

Production in concentrates is projected to total 350,000 ounces of payable gold, 8.0 million ounces of payable silver, 122,300 tonnes of payable copper, 155,500 tonnes of payable zinc, and 8,000 tonnes of payable lead.

Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$565 million over the mine life, and simple payback occurs two years from start of production.

The after-tax NPV at an 8% discount rate is \$288 million, and the after-tax IRR is 40%.

The PEA indicates that positive economic results can be obtained for the Curipamba Project and that further advancement of the Project is merited.

Specific conclusions by area are as follows:

### GEOLOGY AND MINERAL RESOURCES

- The geological setting and character of the VMS mineralization identified to date on the Project, and specifically at the El Domo deposit, are of sufficient merit to justify additional exploration expenditures.
- Six drilling programs with the majority of drill holes targeting mineralization of the El Domo deposit have been carried out to date for a total of 342 core drill holes (68,597.24 m).

- Drilling has identified a stratiform and largely stratabound horizon of semi-massive to massive sulphide mineralization with an overlying zone of brecciated/fragmented sulphide fragments. Additional mineralization occurs in smaller lenses primarily in the footwall of the massive sulphide mineralization.
- RPA has reviewed procedures for drilling, sampling, sample preparation, and analysis and is of the opinion that they are appropriate for the type of deposit and mineralization.
- RPA reviewed the analytical quality control results and did not find any material issues. In RPA's opinion, the resource database is of sufficient quality to estimate Mineral Resources.
- Mineral Resources were estimated and reported using a US\$25 per tonne NSR cut-off value for open pit resources, and a US\$100 per tonne NSR cut-off value for underground resources.
- Measured Mineral Resources for El Domo total 1.4 Mt grading 1.92% Cu, 0.37% Pb, 3.52% Zn, 3.75 g/t Au, and 58 g/t Ag. The Indicated Mineral Resources for El Domo total 7.5 Mt grading 2.02% Cu, 0.26% Pb, 2.81% Zn, 2.33 g/t Au, and 49 g/t Ag. The Inferred Mineral Resources for El Domo total 1.3 Mt grading 1.52% Cu, 0.20% Pb, 2.25% Zn, 1.83 g/t Au, and 42 g/t Ag.
- A number of mineralized lenses in the footwall stratigraphy of El Domo are supported by limited drilling. Additionally, a number of mineral targets currently outside of the resource area of the El Domo deposit are supported by limited drilling. This means that additional infill and exploration drilling is warranted to more fully test favourable stratigraphy both regionally and directly at El Domo.

## MINING

- All mining is proposed to be carried out by contractors with oversight by owner's personnel.
- Mining will begin with conventional open pit mining (drilling, blasting, loading, and hauling) in four phases for the first nine years followed by a combination of open pit and underground mining thereafter.
- Underground development will start in Year 9. Ramp-up of underground production occurs in Year 10, with mining carried out by variations of the room and pillar mining method.
- The open pit and underground mine designs including a crown pillar below the open pit will require additional geomechanical, geotechnical, and groundwater studies to develop and optimize the next stages of the Project (pre-feasibility and feasibility).
- The LOM production schedule and cash flow analysis include Inferred Mineral Resources. Inferred Mineral Resources are speculative geologically and were included in this analysis in order to understand the economic potential of the Project. Approximately 5% of the tonnage from the open pit constrained Mineral Resource and 24% of the underground constrained Mineral Resource are classified as Inferred Mineral Resources.

## **METALLURGICAL TESTWORK AND MINERAL PROCESSING**

- The most recent test work at Base Metallurgical Laboratories Ltd. (Base Met Labs) in 2019 indicates that the production of copper, zinc, and possibly lead concentrate is possible using conventional flotation methods.
- Low head grades for lead mean that it may not be necessary or feasible to produce a clean lead concentrate, however the potential to produce a lead concentrate is being evaluated in on-going test work.
- The processing plant will process 612,500 tpa and will consist of crushing and grinding, flotation, concentrate thickening and filtration, and tailings thickening and disposal.
- Process estimates used to support the PEA are based on the available metallurgical data. Over the LOM, recoveries average 80.7% for copper, 78.5% for zinc, 38.3% for lead, 57.5% for gold, and 69.0% for silver.
- There are opportunities for optimizing the process flow sheet and reagent scheme to maximize the recovery of valuable metals while minimizing costs of consumables and reagents.

## **PROJECT INFRASTRUCTURE**

- KP reviewed previous work on mine electrical load requirements and found them to be reasonable for use in the PEA.
- The proposed grid power supply connection at Echeandía poses potential issues such as voltage stability, potential transmission line upgrades and/or voltage regulation, and transformer capacity.
- Although the Project can access relatively low-cost grid power, grid instability suggests that a fully redundant site back-up power plant is required.
- The preferred mine access route is a new build option which commences three kilometres west of El Congreso before ending at the proposed mine site location.
- A rockfill dam is proposed for storage of conventional tailings.
- Preliminary tailings dam design in the PEA is based on the Canadian Dam Association Guidelines.

## **ENVIRONMENTAL, PERMITTING AND SOCIAL CONSIDERATIONS**

- The current exploration activity on the Project is carried out under a valid Environmental Licence, granted to Curimining, as Resoluciones 506, 508, and 509 from the Ministry of Environment in May 2011 upon the successful conclusion of an exploration phase EIA.
- An EIA and management plan will be required to be submitted to the Ministry of Environment in order to acquire an environmental licence for mining. The specific requirements for the Curipamba Project EIA will be elaborated in a Terms of Reference document produced by the Ministry of Environment.

- Other permits required for mining activities include those for explosives use, special labour shifts, fire department, and construction from ARCOM and the municipalities.
- Adventus and Curimining have made considerable efforts to undertake environmental studies and community engagement to facilitate the advancement of the Project.
- There is general support for the Project at the exploration stage from the affected communities in the area as the communities benefit from local employment.
- At this stage, KP does not see any major environmental or social issues that might prevent the issuance of the necessary permits to develop and operate the Project.

## **CAPITAL AND OPERATING COST**

- The costs in the PEA are estimated with an accuracy of plus or minus 30% to 35%.
- The total capital cost for the Project is approximately \$289 million. The pre-production capital cost is \$185 million, including 25% contingency, as well as the VAT which will be a credit against taxes once exporting of concentrates commences, and the sustaining capital cost estimate totals \$104 million.
- The LOM operating cost for the Project is estimated at \$54.80 per tonne processed.

## **ECONOMICS**

- Considering the Project on a stand-alone basis, the undiscounted after-tax cash flow totals \$565 million over the mine life, and simple payback occurs two years from start of production.
- The after-tax NPV at an 8% discount rate is \$288 million, and the after-tax IRR is 40%.

## 26 RECOMMENDATIONS

RPA recommends a work program that includes additional regional exploration and condemnation core drilling, infill core drilling, airborne geophysical surveying, tailings and waste rock studies, additional metallurgical test work, geomechanical and hydrology studies, power supply studies, water supply and camp location studies, EIA studies, detailed open pit and underground mining studies, and other work related to advancing the Project to a pre-feasibility level.

The cost of the recommended program is estimated at US\$5.95 million (Table 26-1).

**TABLE 26-1 PROPOSED BUDGET**  
**Adventus Mining Corporation – Curipamba Project – El Domo Deposit**

Item	(US\$000)
General Exploration, G&A and Support	1,150
Exploration and Condemnation Drilling (~6,200 m)	950
Geomechanical, Geotechnical, and Hydrogeology Drilling	950
Airborne Geophysical Survey	500
Topographic Survey	100
Geomechanical, Geotechnical, and Hydrology Studies	300
ARD Test Work	300
Metallurgical Test Work	300
Tailings Dam and Waste Rock Facility Studies	100
Power Supply Studies	50
Water Supply and Camp Location Studies	50
Environmental Baseline	1,200
<b>Total</b>	<b>5,950</b>

Specific recommendations by area are as follows:

### GEOLOGY AND MINERAL RESOURCES

- The proposed work program includes:
  - Step-out and exploration core drilling at known sulphide zones distal to the El Domo deposit with detailed mapping, and three dimensional (3D) geological modelling to aid in future targeting. Condemnation drilling over the areas proposed for tailings and waste rock storage. Total drilling proposed is 6,200 m.
  - Complete data acquisition for a detailed topographic digital terrain model.
  - Complete the on-going airborne MobileMT geophysical survey over the Curipamba property to investigate the potential for further targets.

## **GEOTECHNICAL CONSIDERATIONS AND MINING**

- Conduct a geomechanical and geotechnical drilling and complete their respective studies to determine the optimum pit slopes for the final pit geometry and to optimize the open pit and underground designs.
- Conduct a geomechanical study to determine the dimensions of the crown pillar between the open pit and the underground mine.
- Complete a hydrogeology study to determine the open pit dewatering parameters.
- Establish the overburden dewatering parameters required for the design of surface diversions and drainage systems based on the final open pit geometry.
- Optimize the production schedule, including the transition between the open pit and underground mining operations.
- Complete a trade-off analysis evaluating the alternative of mining additional waste from Phase 3 and Phase 4 of the open pit in Years 2 and 3, to balance the mine equipment requirement.
- Complete a trade-off analysis evaluating the alternative of utilizing 100-tonne trucks along with the 40-tonne trucks for waste mining equipment in order to reduce the number of trucks required in Years 4 and 5.

## **METALLURGY AND MINERAL PROCESSING**

- Carry out test work to address the separation of zinc and lead from copper to improve the quality of the concentrates, particularly in the case of high copper and low zinc content zones. This may include the evaluation of different reagent schemes and re-grind sizes.
- Consider the possibility of blending of mineralized material to provide a consistent feed to the processing plant and, if deemed practical, continue development of the processing conditions using sample material representative of the blended feed to the plant.
- Once preferred processing conditions have been achieved, complete optimization and variability test work in support of pre-feasibility and feasibility studies.

## **PROJECT INFRASTRUCTURE**

- Carry out further refinement of the transmission line and power supply alternatives.
- Define the mine electrical load in more detail, including total power factor and individual power factors for large pieces of equipment, large load start-up requirements, mine load duration curve, average load, etc.
- Complete a site-specific seismic hazard assessment.

- Carry out detailed analysis of tailings storage and waste rock storage facilities for an integrated waste management plan and design to reduce overall costs.
- Investigate regional quarry sites and quality of quarry material for construction purposes, such as tailing storage facility construction.
- Investigate water supply for the Project site and complete a trade-off study of reservoir construction versus a water pipeline from a local source.
- Investigate construction camp location and complete a trade-off study of onsite accommodation versus daily commutes to the Project from local communities.

## **ENVIRONMENTAL AND SOCIOLOGICAL CONSIDERATIONS**

- Initiate preparation of an EIA and management plan that are compliant with Ecuadorian and international standards.
- As part of the preparation of the EIA, carry out additional and more detailed baseline data collection.
- Develop a detailed closure cost estimate to support the mine EIA submission.
- Complete ARD test work for the El Domo deposit area.
- Carry out additional acquisition of surface rights.
- Update the vegetation and wildlife studies to determine if any critical natural habitats or endangered species populations will be adversely impacted, and to help direct reclamation planning.

RPA is unaware of any significant factors and risks that may affect access, title, or the right or ability to perform the recommended program.



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## 28 DATE AND SIGNATURE PAGE

This report titled Technical Report on the Preliminary Economic Assessment for the Curipamba Project – El Domo Deposit, Central Ecuador with an effective date of May 2, 2019 was prepared and signed by the following authors:

**(Signed & Sealed) *Dorota El Rassi***

Dated at Toronto, ON  
June 14, 2019

Dorota El Rassi, M.Sc., P.Eng.  
Senior Geological Engineer

**(Signed & Sealed) *Hugo M. Miranda***

Dated at Denver, CO, USA  
June 14, 2019

Hugo M. Miranda, ChMC(RM)  
Principal Mining Engineer

**(Signed & Sealed) *Torben Jensen***

Dated at Toronto, ON  
June 14, 2019

Torben Jensen, P.Eng.  
Principal Mining Engineer

**(Signed & Sealed) *Avakash Patel***

Dated at Toronto, ON  
June 14, 2019

Avakash Patel, P.Eng.  
Principal Metallurgist

**(Signed & Sealed) *Ken Embree***

Dated at Vancouver, BC  
June 14, 2019

Ken Embree, P.Eng.  
President, Knight Piésold Ltd.

## 29 CERTIFICATE OF QUALIFIED PERSON

### DOROTA EL RASSI

I, Dorota El Rassi, M.Sc., P.Eng., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment for the Curipamba Project – El Domo Deposit, Central Ecuador" prepared for Adventus Mining Corporation with an effective date of May 2, 2019, do hereby certify that:

1. I am Senior Geological Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of the University of Toronto in 1997 with a B.A.Sc.(Hons.) degree in Geological and Mining Engineering and in 2000 with a M.Sc. degree in Geology and Mechanical Engineering.
3. I am registered as a Professional Geological Engineer in the Province of Ontario (Reg.# 100012348). I have worked as a geologist for a total of 20 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report on exploration and mining projects for due diligence and regulatory requirements
  - Mineral Resource estimates on a variety of commodities including gold, silver, copper, nickel, zinc, PGE, and industrial mineral deposits
  - Experienced user of Gemcom, Leapfrog, Phinar's x10-Geo, and Gslib software
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason 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.
5. I visited the Curipamba Project from January 8 to 10, 2019.
6. I am responsible for Sections 7 to 12 and 14 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 14<sup>th</sup> day of June, 2019

**(Signed & Sealed) *Dorota El Rassi***

Dorota El Rassi, M.Sc., P.Eng.



**HUGO M. MIRANDA**

I, Hugo M. Miranda, ChMC(RM), as an author of this report entitled "Technical Report on the Preliminary Economic Assessment for the Curipamba Project – El Domo Deposit, Central Ecuador", prepared for Adventus Mining Corporation, with an effective date of May 2, 2019, do hereby certify that:

1. I am a Principal Mining Engineer with RPA (USA) Ltd. of 143 Union Boulevard, Suite 505, Lakewood, Colorado, USA 80228.
2. I am a graduate of the Santiago University of Chile, with a B.Sc. degree in Mining Engineering in 1993, and Santiago University, with a Masters of Business Administration degree in 2004.
3. I am registered as a Competent Person of the Chilean Mining Commission (Registered Member #0031). I have worked as a mining engineer for a total of 24 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Principal Mining Engineer - RPA in Colorado. Review and report as a consultant on mining operations and mining projects. Mine engineering including mine plan and pit optimization, pit design and economic evaluation.
  - Principal Mining Consultant – Pincock, Allen and Holt in Colorado, USA. Review and report as a consultant on numerous development and production mining projects.
  - Mine Planning Chief, El Tesoro Open Pit Mine - Antofagasta Minerals in Chile.
  - Open Pit Planning Engineer, Radomiro Tomic Mine, CODELCO – Chile.
  - Open Pit Planning Engineer, Andina Mine, CODELCO - Chile.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason 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.
5. I visited the Curipamba Project on January 8 to January 10, 2019.
6. I am responsible for Section 16 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 14<sup>th</sup> day of June, 2019

**(Signed & Sealed) Hugo M. Miranda**

Hugo M. Miranda, ChMC(RM)

**TORBEN JENSEN**

I, Torben Jensen, P.Eng., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment for the Curipamba Project – El Domo Deposit, Central Ecuador" prepared for Adventus Mining Corporation with an effective date of May 2, 2019, do hereby certify that:

1. I am Principal Mining Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of South Dakota School of Mines and Technology in 1978 with a B.Sc. degree in Mining Engineering.
3. I am registered as a Professional Engineer in the Province of Ontario (Reg.# 90286881). I have worked as a mining engineer for a total of 41 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Preparation of NI 43-101 Technical Reports, feasibility studies, and due diligence reviews for a wide range of commodities including gold, silver, nickel, lead, zinc, uranium, coal, asbestos, potash, copper, and diamonds.
  - Vice President Corporate Development with a Canadian gold mining company, responsible for the evaluation of investment opportunities.
  - Vice President Engineering with a Canadian base metal mining company, responsible for preparation of feasibility studies related to property acquisitions and development, engineering design of underground and open pit projects, short and long range mine planning, capital and operating cost estimation for budgets, and permitting.
  - Manager of Engineering with a Canadian based mining company, responsible for the reopening of a former nickel mine.
  - Chief Mining Engineer with a Canadian-based coal company, responsible for mine contracting, short and long range mine planning, budget preparations, scheduling, project management, feasibility studies related to property acquisitions, open pit and underground engineering design, underground construction design, costing, and supervision.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason 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.
5. I have not visited the Curipamba Project.
6. I am responsible for overall preparation of the report. I am responsible for Sections 2 to 6, 15, 18, 19, 21 to 23, and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 14<sup>th</sup> day of June, 2019

**(Signed & Sealed) *Torben Jensen***

Torben Jensen, P.Eng.

**AVAKASH PATEL**

I, Avakash Patel, P.Eng., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment for the Curipamba Project – El Domo Deposit, Central Ecuador" prepared for Adventus Mining Corporation with an effective date of May 2, 2019, do hereby certify that:

1. I am Vice President, Metallurgy and Principal Metallurgist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave., Toronto, ON M5J 2H7.
2. I am a graduate of the University of Regina, Saskatchewan in 1996 with a B.A.Sc. in Regional Environmental Systems Engineering (Civil/Chemical).
3. I am registered as a Professional Engineer in the Province of Ontario (Reg. #90513565) and in the Province of British Columbia (Reg. #31860). I have worked as a metallurgical engineer for a total of 22 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Reviews and reports as a metallurgical consultant on numerous mining operations and projects for due diligence and regulatory requirements.
  - Senior positions at numerous base metal and precious metal operations, and consulting companies responsible for general management, project management, and process design.
  - Sr. Corporate Manager – Metallurgy and Mineral Processing with a major Canadian mining company and a junior Canadian mining company.
  - Manager of Engineering/Processing Engineering with two large international Engineering companies responsible for designing, planning, and execution for multiple complex mining projects.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason 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.
5. I have not visited the Curipamba Project.
6. I am responsible for Sections 13 and 17 and related disclosure in Sections 1, 25, 26, and 27 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 14<sup>th</sup> day of June, 2019

**(Signed & Sealed) Avakash Patel**

Avakash Patel, P.Eng.

## **CERTIFICATE OF QUALIFIED PERSON**

I, Ken Embree, P.Eng., as an author of this report entitled "Technical Report on the Preliminary Economic Assessment for the Curipamba Project – El Domo Deposit, Central Ecuador" prepared for Adventus Mining Corporation with an effective date of May 2, 2019, do hereby certify that:

I am President of Knight Piésold Ltd. (Canada) of Suite 1400, 750 W Pender St, Vancouver, BC, V6C 2T8.

I am a graduate of the University of Saskatchewan in 1986 with a B.A.Sc. degree in Geological Engineering.

I am registered as a Professional Engineer with the Engineers and Geoscientists of British Columbia (No. 17,439).

I have practiced professionally since 1986. In that time, I have been directly involved in the generation of, and review of, risk analyses, preliminary economic assessment, pre-feasibility, and feasibility studies, and due diligence studies in North and South America, Europe, Africa, and Russia.

I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason 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 Curipamba Project.

I am responsible for Section 20, along with those sections of the Summary pertaining thereto.

I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

I have had no prior involvement with the property that is the subject of the Technical Report.

I have read NI 43-101 and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.

At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 14th day of June, 2019

***(Signed & Sealed) Ken Embree***

Ken Embree, P.Eng.