EUROSUN MINING

Euro Sun Mining Corp.

Rovina Valley Project

Preliminary Economic Assessment, NI 43-101

Rovina Valley, Romania

Effective Date: Feb. 20, 2019

Prepared by:

AGP Mining Consultants Inc.

#246-132K Commerce Park Drive

Barrie, ON L4N 0Z7   Canada

Pierre Desautels, P.Geo. – AGP Mining Consultants Inc.

Gordon Zurowski, P. Eng. – AGP Mining Consultants Inc.

Neil Lincoln, P. Eng. – Lycopodium Minerals Canada Ltd.

AGP Mining Consultants Inc.

IMPORTANT NOTICE

This report was prepared as National Instrument 43-101 Technical Report for Euro Sun Mining Inc. *(Euro Sun)* by *AGP Mining Consultants Inc.* (AGP) and Lycopodium Minerals Canada Ltd. (Lycopodium). The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in AGP's services, based on i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Euro Sun subject to terms and conditions of their contract with AGP. Their contract permits Euro Sun to each file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101 Standards of Disclosure for Mineral Projects. Except for the purposes legislated under applicable Canadian provincial, territorial, and federal securities law, any other use of this report by any third party is at that party's sole risk.

Contents

Tables

Figures

Appendices

Glossary

Units of Measure

Above mean sea level	amsl
Acre	ac
Ampere	A
Annum (year)	a
Billion	B
Billion tonnes	Bt
Billion years ago	Ga
British thermal unit	BTU
Centimetre	cm
Cubic centimetre	cm3
Cubic feet per minute	cfm
Cubic feet per second	ft3/s
Cubic foot	ft3
Cubic inch	in3
Cubic metre	m3
Cubic yard	yd3
Coefficients of Variation	CVs
Day	d
Days per week	d/wk
Days per year (annum)	d/a
Dead weight tonnes	DWT
Decibel adjusted	dBa
Decibel	dB
Degree	°
Degrees Celsius	°C
Diameter	ø
Dollar (American)	US$
Dollar (Canadian)	C$
Dry metric ton	dmt
Foot	ft
Gallon	gal
Gallons per minute (US)	gpm
Gigajoule	GJ
Gigapascal	GPa
Gigawatt	GW
Gram	g
Grams per litre	g/L
Grams per tonne	g/t

Greater than	>
Hectare (10,000 m2)	ha
Hertz	Hz
Horsepower	hp
Hour	h
Hours per day	h/d
Hours per week	h/wk
Hours per year	h/a
Inch	"
Kilo (thousand)	k
Kilogram	kg
Kilograms per cubic metre	kg/m3
Kilograms per hour	kg/h
Kilograms per square metre	kg/m2
Kilometre	km
Kilometres per hour	km/h
Kilopascal	kPa
Kilotonne	kt
Kilovolt	kV
Kilovolt-ampere	kVA
Kilovolts	kV
Kilowatt	kW
Kilowatt hour	kWh
Kilowatt hours per tonne (metric ton)	kWh/t
Kilowatt hours per year	kWh/a
Less than	<
Litre	L
Litres per minute	L/min
Megabytes per second	Mb/sec
Megapascal	MPa
Megavolt-ampere	MVA
Megawatt	MW
Metre	m
Metres above sea level	masl
Metres Baltic sea level	mbsl
Metres per minute	m/min
Metres per second	m/s
Metric ton (tonne)	t
Microns	µm
Milligram	mg
Milligrams per litre	mg/L
Millilitre	mL
Millimetre	mm

Million	M
Million bank cubic metres	Mbm3
Million tonnes	Mt
Minute (plane angle)	'
Minute (time)	min
Month	mo
Ounce	oz
Pascal	Pa
Centipoise	mPa·s
Parts per million	ppm
Parts per billion	ppb
Percent	%
Pound(s)	lb
Pounds per square inch	psi
Revolutions per minute	rpm
Second (plane angle)	"
Second (time)	sec
Specific gravity	SG
Square centimetre	cm2
Square foot	ft2
Square inch	in2
Square kilometre	km2
Square metre	m2
Thousand tonnes	kt
Three-Dimensional	3D
Tonne (1,000 kg)	t
Tonnes per day	tpd
Tonnes per hour	t/h
Tonnes per year	t/a
Tonnes seconds per hour metre cubed	ts/hm3
Total	T
Volt	V
Week	wk
Weight/weight	w/w
Wet metric ton	wmt

Abbreviations and Acronyms

Absolute Relative Difference	ABRD
Acid Base Accounting	ABA
Acid Rock Drainage	ARD
Alpine Tundra	AT
Atomic Absorption Spectrophotometer	AAS
Atomic Absorption	AA
British Columbia Environmental Assessment Act	BCEAA
British Columbia Environmental Assessment Office	BCEAO
British Columbia Environmental Assessment	BCEA
British Columbia	BC
Canadian Dam Association	CDA
Canadian Environmental Assessment Act	CEA Act
Canadian Environmental Assessment Agency	CEA Agency
Canadian Institute of Mining, Metallurgy, and Petroleum	CIM
Canadian National Railway	CNR
Carbon-in-leach	CIL
Caterpillar's® Fleet Production and Cost Analysis software	FPC
Closed-circuit Television	CCTV
Coefficient of Variation	CV
Copper equivalent	CuEq
Counter-current decantation	CCD
Cyanide Soluble	CN
Digital Elevation Model	DEM
Direct leach	DL
Distributed Control System	DCS
Drilling and Blasting	D&B
Environmental Management System	EMS
Flocculant	floc
Free Carrier	FCA
Gemcom International Inc.	Gemcom
General and administration	G&A
Gold equivalent	AuEq
Heating, Ventilating, and Air Conditioning	HVAC
High Pressure Grinding Rolls	HPGR
Indicator Kriging	IK
Inductively Coupled Plasma Atomic Emission Spectroscopy	ICP-AES
Inductively Coupled Plasma	ICP
Inspectorate America Corp.	Inspectorate
Interior Cedar – Hemlock	ICH
Internal rate of return	IRR
International Congress on Large Dams	ICOLD

Inverse Distance Cubed	ID3
Land and Resource Management Plan	LRMP
Lerchs-Grossman	LG
Life-of-mine	LOM
Load-haul-dump	LHD
Locked cycle tests	LCTs
Loss on Ignition	LOI
Metal Mining Effluent Regulations	MMER
Methyl Isobutyl Carbinol	MIBC
Metres East	mE
Metres North	mN
Mineral Deposits Research Unit	MDRU
Mineral Titles Online	MTO
National Instrument 43-101	NI 43-101
Nearest Neighbour	NN
Net Invoice Value	NIV
Net Present Value	NPV
Net Smelter Prices	NSP
Net Smelter Return	NSR
Neutralization Potential	NP
Northwest Transmission Line	NTL
Official Community Plans	OCPs
Operator Interface Station	OIS
Ordinary Kriging	OK
Organic Carbon	org
Potassium Amyl Xanthate	PAX
Predictive Ecosystem Mapping	PEM
Preliminary Assessment	PA
Preliminary Economic Assessment	PEA
Qualified Persons	QPs
Quality assurance	QA
Quality control	QC
Rhenium	Re
Rock Mass Rating	RMR '76
Rock Quality Designation	RQD
SAG Mill/Ball Mill/Pebble Crushing	SABC
Semi-autogenous Grinding	SAG
Standards Council of Canada	SCC
Stanford University Geostatistical Software Library	GSLIB
Tailings storage facility	TSF
Terrestrial Ecosystem Mapping	TEM
Total dissolved solids	TDS
Total Suspended Solids	TSS

Tunnel boring machine	TBM
Underflow	U/F
Valued Ecosystem Components	VECs
Waste rock facility	WRF
Water balance model	WBM
Work Breakdown Structure	WBS
Workplace Hazardous Materials Information System	WHMIS
X-Ray Fluorescence Spectrometer	XRF

Forward Looking Statements

This Technical Report, including the economics analysis, contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and forward-looking information within the meaning of applicable Canadian securities laws. While these forward-looking statements are based on expectations about future events as at the effective date of this Report, the statements are not a guarantee of Euro Sun Mining Inc. future performance and are subject to risks, uncertainties, assumptions and other factors, which could cause actual results to differ materially from future results expressed or implied by such forward-looking statements. Such risks, uncertainties, factors and assumptions include, amongst others but not limited to metal prices, mineral resources, smelter terms, labour rates, consumable costs and equipment pricing. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements.

1 SUMMARY

Euro Sun Mining Inc. (Euro Sun) retained AGP Mining Consultants Inc. (AGP) and Lycopodium Minerals Canada Ltd. (Lycopodium) to complete a Preliminary Economic Assessment (PEA) on their Rovina Valley Project (RVP or the Project). The project is located in the Golden Quadrilateral Mining District of the South Apuseni Mountains in west-central Romania, approximately 300 km northwest of the city of Bucharest, the capital city of Romania.

The PEA incorporates the results of the updated National Instrument 43-101 (NI 43-101) compliant mineral resources estimated for the PEA. AGP concludes, effective February 20, 2019, and utilizing approximately 120,256 m of diamond drill hole data drilled by Euro Sun from 2006 through 2012, the mineral resource of the RVP amounts to 89.8 million tonnes of Measured resources grading at 0.62 g/t Au and 0.19 % Cu, containing 1.78 million ounces of gold and 385 million pounds of copper. Indicated resources amounted to an additional 306.6 million tonnes grading 0.53 g/t Au and 0.15 % Cu, containing 5.26 million ounces of gold and 1,006 million pounds of copper.

The Colnic portion of the RVP resources have Measured resources of 29.2 million tonnes grading 0.65 g/t Au and 0.12% Cu and Indicated resources of 106.5 million tonnes grading at 0.47 g/t Au and 0.10 % Cu. These contain 2.23 million ounces of gold and 302 million pounds of copper. Inferred resources are an additional 4.7 million tonnes grading 0.34 g/t Au and 0.10 % Cu, containing 0.05 million gold ounces and 10 million pounds of copper.

The PEA concluded that the Colnic deposit could be developed as a phased open pit sending 85.7 Mt of mill feed grading 0.58 g/t Au and 0.10 % Cu to a nearby process facility. This would be done over a 14.1-year mine life which includes two years of pre-stripping. The 7.2 Mtpa process plant operates with conventional crushing and grinding followed by flotation, to produce a gold rich copper concentrate. A site layout has been prepared to illustrate the proposed location of required infrastructure, mining, and processing facilities in Figure 1-1.

The study used a gold price of $1,325/oz and copper price of $3.10/lb. With those prices, the project is estimated to have an after-tax IRR of 13.5% and a pay-back period of 5.62 years after start of production. At a discount rate of 5%, the after tax NPV is estimated at $169M.

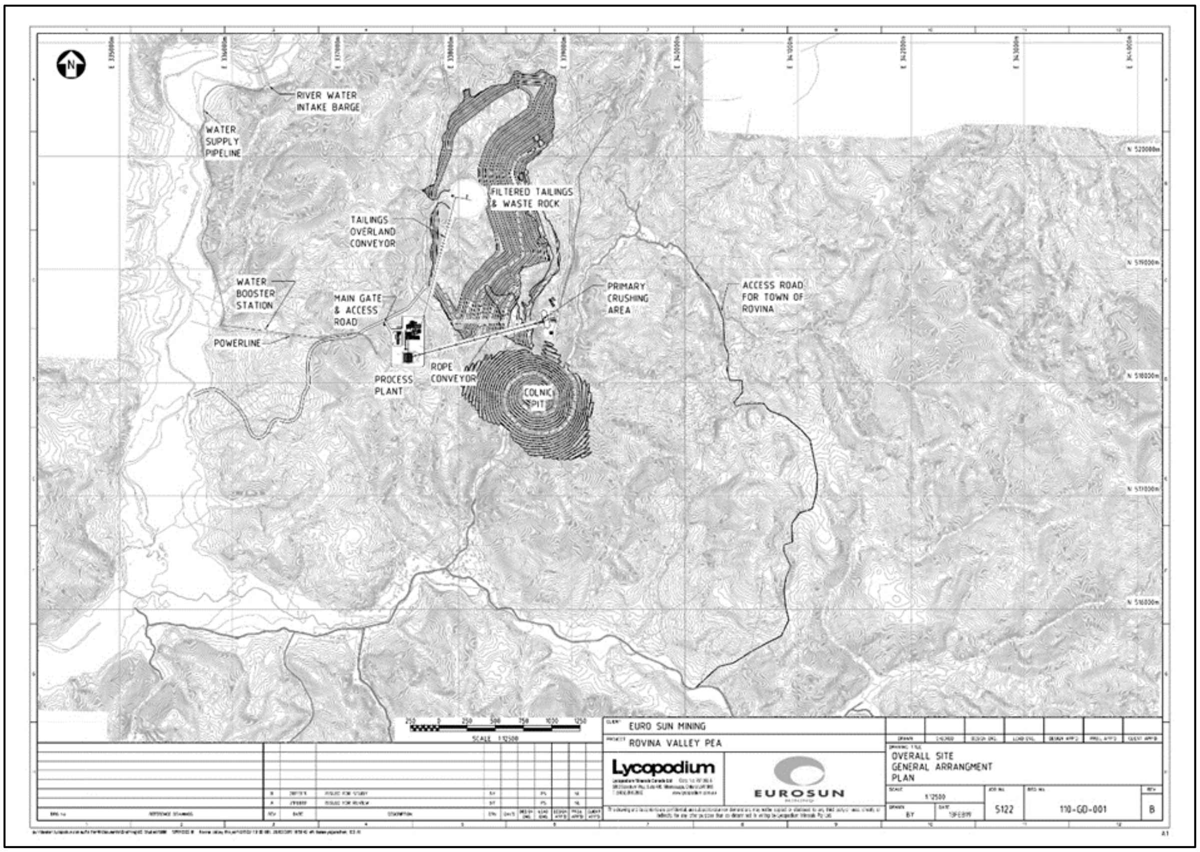
The PEA utilizes Measured, Indicated, and Inferred resources from Colnic for calculation of potential economics. The Measured resource was 31.1% of the total mill feed and the Indicated resource was 68.7% of the total mill feed. Inferred material, representing 0.2% of the mill feed, is included in the total mill feed. There is no certainty the assumptions utilized in the PEA will be realized. Inferred mineral resources are presently considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Based on the results of the PEA study, AGP recommends that Euro Sun continue with additional studies to determine a project execution decision. Recommendations and associated budgets are provided to ensure sufficient information is available going forward.

The Rovina and Ciresata deposits, while not a component of the PEA study, represent a future opportunity to expand on the scale of the project. Their inclusion in the overall project should be assessed as the project advances.

With the current level of information for the Project, AGP does not foresee any Mineral Resources, potential economics, or environmental issues that would inhibit the Project from advancing to further levels of study.

Figure 1-1: Rovina Valley Project Phase 1 (Colnic) Proposed Site Layout



1.1 Geology

The Rovina, Colnic, and Ciresata Porphyry deposits are the principal exploration targets within the RVP, with their locations defining a north-northeast trend. The Rovina Porphyry is the northern-most with the Colnic Porphyry lying approximately 2.5 km south of the Rovina Porphyry, and the Ciresata Porphyry approximately 4.5 km south of the Colnic Porphyry

The Property consists of one Exploitation (Mining) License (the Rovina Exploitation License, Number 18174/2015 for Cu-Au) centered at approximately latitude 46°07' N and longitude 22° 54' E or 515,000 N and 340,000 E using the "Stereo70" projection of the Romanian National

Geodetic System. Euro Sun, through intermediary subsidiaries, owns 100% of SAMAX Romania SRL (SAMAX), which in turn owns 100% of the Rovina Exploitation License. SAMAX is a duly registered company in the city of Criscior, Romania.

Year-round principal access to the Property is on a paved two-lane highway to the historic gold mining town of Brad followed by secondary paved roads eastward for 7 km, which passes through the town of Criscior and onward to the village of Bucureşci within the property.

On a regional level, the majority of the mineral deposits in the Romanian-Hungarian region are located in the Carpathian Fold Belt; an arcuate orogenic belt which is part of a much larger belt extending westward into Austria and Switzerland and south into Serbia and Bulgaria. These belts developed during the late Cretaceous and Tertiary periods, following closure of the Tethys Ocean, due to the collision of continental fragments of Gondwana with continental Europe and the related subduction of small, intervening oceanic basins. The development of the Carpathian Fold Belt was accompanied by widespread igneous activity, including a suite of late Cretaceous to early Eocene acidic to intermediate intrusive and extrusive rocks, known as "banatites". These rocks are believed to have formed early stages of subduction and are host to several Cu-Mo-Fe Porphyry and skarn deposits.

The Apuseni Mountains represent a somewhat "isolated massif" with the Carpathian Fold Belt. The southern portion of the Apuseni Mountains, where the Apuseni-Rovina Property is located, consists of a complex area of Palaeozoic (and older) metamorphic rocks, Mesozoic ophiolites and sedimentary rocks and Tertiary igneous and sedimentary rocks.

On a local level, the property covers a sequence of Neogene-aged subvolcanic intrusive rocks, which in other parts of the Golden Quadrilateral, host epithermal and porphyry-style mineralization. Euro Sun's exploration programs have identified Au-rich porphyry systems (the Rovina, Colnic, and Ciresata deposits) hosted by these Neogene subvolcanic intrusives. The Rovina and Colnic porphyry deposits lie within a northeastern volcanic outlier of the 8 to 10 km diameter, Neogene-aged, Brad–Barza volcanic field. The Brad-Barza volcanic field is well-known for hosting high-grade gold veins with historic gold production dating back to the Roman period (ca. 2,000 years ago). The Ciresata porphyry, 4.5 km south of Colnic, lies within the eastern part of the Brad-Barza volcanic field.

The main mineralized targets on the Rovina property are the Rovina Cu–Au porphyry, Colnic Au–Cu porphyry, and the Ciresata Au-Cu porphyry. Porphyry deposits in general are large, low- to medium-grade deposits in which primary (hypogene) sulphide minerals are dominantly structurally-controlled and which are spatially and genetically related to felsic to intermediate porphyritic intrusions.

The mineralized porphyries at Rovina, Colnic, and Ciresata display moderate to intense potassic hydrothermal altered cores, and strong quartz stockwork veining. The Au-Cu mineralization manifests as stockworks and disseminations centered on porphyritic, subvolcanic-intrusive complexes of hornblende-plagioclase diorites. These porphyries would classify as gold-rich, especially Ciresata and Colnic, and contain many of the features common in gold-rich porphyries (i.e. dioritic, calc-alkaline stock associated) and abundant magnetite alteration. Oxidation is restricted to the uppermost few metres of the prospect and no significant oxide cap or supergene enriched horizons have been encountered to date.

1.2 Resource Statement

The resource estimate was originally completed in 2012. The interpolated grades were not updated in 2019 since there was no additional data added that would materially affect the grade models. The metal prices and resource constraining shell were updated to bring the resource current and in conformance with the 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Mineral Resource and Mineral Reserve definitions referred to in the NI 43-101, Standards of Disclosure for Mineral Projects.

This updated resource estimate by AGP incorporates the late 2010 and 2012 drilling results that were available as of April 23, 2012 for Rovina, Colnic, and Ciresata.

All routine sample preparation and analyses of the Euro Sun samples were performed by ALS Chemex Romania Laboratory (ALS) in the town of Gura Rosiei (where the Rosia Montana Project is located), approximately a 45-minute drive northwest of the project area. A comprehensive Quality Assurance/Quality Control (QA/QC) program involving the use of coarse blanks, standards, and duplicates has been instigated following recommendations by AMEC Foster Wheeler (AMEC) in 2006 and 2007. The current QA/QC programs meet or exceed standard industry practices.

Prior to mineral resource estimation, AGP conducted data verification consisting of a site visit and a database audit. The assay data was thoroughly validated covering 13% of the entire database with 9% coverage for the 2010-2012 data not previously validated by AMEC or PEG Mining Consultants Inc. (PEG). AGP found the database to be acceptably accurate and error-free to be used in a mineral resource estimation.

Based on the review of the QA/QC, data validation statistical analysis, and metallurgical test work, AGP draws the following conclusions:

- AGP has reviewed the methods and procedures to collect and compile geological, geotechnical, and assaying information for the Rovina, Colnic, and Ciresata porphyry deposits, and found they met accepted industry standards for an advanced stage project and were suitable for the style of mineralization found on the property.
- While other companies conducted work on the property, only Euro Sun's data was used in the resource estimate. This ensured modern assaying techniques and proper QA/QC protocols were in place for the entire drill program and eliminated any need to rely on historical data.
- A QA/QC program utilizing industry standard blanks, standards, and duplicate samples has been used on the Project since the beginning of the Euro Sun exploration program. QA/QC submission rates meet industry-accepted standards. In AGP's opinion, Euro Sun exceeds standards by re-inserting coarse and pulp rejects in the sample stream to monitor the accuracy of the laboratory assays. In addition, a select suite of pulps is analysed at a secondary laboratory

- An apparent high bias in the copper assays was noted for the 2010 to 2012 drill campaign during the QA/QC monitoring program which did not exist in the 2006 to 2008 program. Euro Sun queried its principal laboratory on this bias and a subsequent QA/QC investigation concluded an error with calibration fluids was responsible and corrected. A total of 2,376 samples from Rovina were re-assayed and utilised for the resource estimation.
- Data verification was performed by AGP through site visits, collection of independent character samples, and a database audit prior to mineral resource estimation. AGP found the database to be exceptionally well maintained and error free, and suitable for use in mineral resource estimation.
- Although additional sampling may be beneficial, AGP is of the opinion that with the samples currently available, the specific gravity determinations are representative of the in-situ bulk density of the rock types.
- Sampling and analysis programs using standard practices provided acceptable results. AGP believes the resulting data can effectively be used in the estimation of resources.
- Core handling, core storage, and chain of custody are consistent with industry standards.
- In AGP's opinion, the current drill hole database is sufficient for interpolating grade models for use in resource estimation.
- Mineral resources were classified using logic consistent with the 2014 CIM definitions referred to in NI 43-101. At Rovina, Colnic, and Ciresata, the mineralization, density, and position of the drill holes satisfies sufficient criteria to be classified into the Measured, Indicated, and Inferred categories.
- This independent mineral resource estimate by AGP supports the February 20, 2019, disclosure by Euro Sun of the mineral resource statement for the RVP.

AGP concludes, effective February 20, 2019, and utilizing approximately 120,256 m of diamond drill hole data drilled by Euro Sun from 2006 through 2012, the mineral resource of the RVP amounts to 89.8 million tonnes of Measured resources grading at 0.62 g/t Au and 0.19 % Cu, containing 1.78 million ounces of gold and 385 million pounds of copper. Indicated resources amounted to an additional 306.6 million tonnes grading 0.53 g/t Au and 0.15 % Cu, containing 5.26 million ounces of gold and 1,006 million pounds of copper.

The total Measured and Indicated resources amounted to 396.5 million tonnes grading at 0.55 g/t Au and 0.16 % Cu, containing 7.05 million ounces of gold and 1,391 million pounds of copper. Inferred resources added an additional 28.2 million tonnes grading 0.37 g/t Au and 0.16 % Cu, containing 0.33 million gold ounces and 98 million pounds of copper. Table 1-1 summarizes the weighted average result of the mineral resource estimate for all three porphyry deposits in the RVP.

Table 1-1: Weighted Average Rovina Valley Resource Estimate (2019)

Resource Category	Tonnage (MM t)	Au (g/t)	Cu (%)	Gold (M oz)	Copper (M lb.)	AuEq* (M oz)
Measured						
Rovina (open-pit)	32.1	0.36	0.29	0.37	208	0.83
Colnic (open-pit)	29.2	0.65	0.12	0.61	74	0.77
Ciresata (underground)	28.5	0.88	0.16	0.81	102	1.03
Total Measured	**89.8**	**0.62**	**0.19**	**1.78**	**385**	**2.63**
Indicated						
Rovina (open-pit)	74.2	0.27	0.22	0.64	365	1.44
Colnic (open-pit)	106.5	0.47	0.10	1.62	228	2.12
Ciresata (underground)	125.9	0.74	0.15	3.01	413	3.92
Total Indicated	306.6	0.53	0.15	5.26	1,006	7.47
Total Measured + Indicated	**396.5**	**0.55**	**0.16**	**7.05**	**1,391**	**10.11**
Inferred						
Rovina (open-pit)	14.9	0.19	0.19	0.09	62	0.22
Colnic (open-pit)	4.7	0.34	0.10	0.05	10	0.07
Ciresata (underground)	8.6	0.70	0.14	0.19	26	0.25
Total Inferred	**28.2**	**0.37**	**0.16**	**0.33**	**98**	**0.55**

Notes: *AuEq is determined by using a long-term gold price of US$1,500/oz and a copper price of US$3.30/lb. These prices are the 10-year trailing averages as of November 26, 2018 plus 10% for copper and 15% for gold. Metallurgical recoveries are not taken into account for AuEq.

Base case cut-offs used in the table are 0.35 g/t AuEq for the Colnic deposit, 0.25% CuEq for the Rovina deposit (both of which are amenable to open-pit mining), and 0.65 g/t AuEq for the Ciresata deposit, which is amenable to underground bulk mining.

For the Rovina and Colnic porphyries, the resources are pit-shell constrained using Lerchs-Grossmann algorithm pit optimizer and market metal values of $1,500/oz Au price and $3.30/lb Cu price, with net prices after smelter payables, concentrate transport, smelter charges, and royalty of US$1,384/oz Au and US$2.61/lb Cu for Colnic and Rovina were used to generate the shell which also included flotation metallurgical recoveries of 81.5% for gold and 88.5% for copper for Colnic and Rovina.

The quantity and grade of Inferred resources reported above are conceptual in nature and are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply, but not verify, geological and grade or quality continuity. For these reasons, an Inferred Mineral Resource has a lower level of confidence than an Indicated Mineral Resource and it is reasonably expected the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. Mineral Resources, that are not Mineral Reserves, do not have demonstrated economic viability. Rounding of tonnes, as required by reporting guidelines, may result in apparent differences between tonnes, grade, and contained metal content.

1.3 Mining

The PEA study focused on the potential development of the Colnic deposit. The pit is scheduled to provide 7.2 Mtpa of mill feed to the process plant over a 12.1-year mine life after 2 years of pre-stripping.

The Colnic pit design uses three phases to sequence the mining of the pit to bring high grade material forward in the schedule. A total of 85.7 Mt of mill feed grading 0.58 g/t Au and 0.10 % Cu will be sent to the process plant over the Life of Mine (LOM). The LOM strip ratio is 1.9:1 (waste: mill feed) or 165.2 Mt of waste to be stored.

The Measured resource was 31.1% of the total mill feed and the Indicated resource was 68.7% of the total mill feed. Inferred material representing 0.2% of the mill feed is included in the total mill feed.

Conventional mining practices will be employed in developing the Colnic open pit. Drilling will use 200 mm rotary blasthole drills. Blasting will be with emulsion explosives and have powder factors of 0.30 kg/t. Loading will be with two 22 m3 hydraulic shovels and one 20 m3 front end loader. The haulage fleet will peak at 25, 136 tonne trucks in Year 6. Normal support equipment including track dozers, graders and water trucks are part of the mine equipment fleet.

Waste material will be stored in one waste storage facility and comingled with dry stack tailings from the plant. The waste storage facility has two main lift levels, the 450 and 650 masl. The 450 level is at the approximate level of the primary crusher and mine waste from pre-stripping will be used to assist in the construction of that facility. The larger lift to 650 masl contains the bulk of the waste material that is hauled from the Colnic pit. The facility as it is designed can accommodate the full quantities of both waste and dry stack tailings over the LOM.

The mine cost estimation is based on leasing the mining fleet. A 20% down payment is included in capital and the remainder of the lease cost is applied to the operating costs. The LOM operating cost is expected to average $2.35 /t moved over the 12.1-year mine life. This includes a lease component of $0.28 /t moved. Costs associated with the pre-strip have been capitalized.

1.4 Mineral Processing and Metallurgical Testing

Comprehensive metallurgical test work programs have been carried out over the years, but this technical report summarizes test work results related to the Colnic deposit and covers recently completed metallurgical test work by Eriez. The results of this metallurgical test work program were used to develop the preliminary flowsheet configuration, primary circuit grinding targets, reagent addition, and metallurgical predictions.

The samples tested to date exhibit metallurgical characteristics considered typical of copper porphyry mineralization with almost all copper typically occurring as chalcopyrite. Pyrite is the main sulphide gangue component and is present in concentrations varying from 1% to approximately 7%. Occasional pyrrhotite is noted within the Colnic deposit. Limited mineralogy has defined a gold population consisting of discrete and fine-grained particles associated mainly with chalcopyrite and pyrite, but also locked within silicate minerals.

Benchtop flotation testing and a pilot plant test program was performed to investigate the column flotation response of the two major geometallurgical domains previously defined for Colnic. Large composite samples (~3,000 kg each) designated as MET-42 (Colnic K1 Domain) and MET-44 (Colnic K2K3 Domain) were prepared from core samples to represent each of the domains with respect to copper and gold grade, lithology, and composition.

From the Eriez column flotation testwork, the key conclusions were:

- Laboratory pilot plant column flotation results showed column flotation technology can be advantageously used for gold and copper flotation of Colnic MET-42, and Colnic MET-44 samples.
- Column flotation, with use of wash water, provided greater results compared to conventional mechanical flotation.
- For Colnic MET-42, an overall copper recovery of 93.5% and overall gold recovery of 84% were achieved in bulk rougher-scavenger column flotation. However, the combined rougher-scavenger and cleaner circuit copper and gold flotation recoveries were approximately 82.8% at a copper grade of 22.2%, and 77.6% at a gold grade of 109 g/t, respectively. The average zinc grade in the final concentrate was 4.2%.
- For Colnic MET-44, rougher-scavenger column flotation copper and gold recoveries were 96.6% and 88.5%, respectively. The average rougher-scavenger and cleaner circuit copper recovery was 94.3% at the copper grade of 21.2%. The corresponding rougher-scavenger and cleaner circuit gold recovery was 85.5% at the final concentrate gold grade of 83 g/t. The zinc grade in the final concentrate averaged 1.6%.

1.5 Recovery Methods

The Rovina process plant design is based on a robust metallurgical flowsheet to produce a copper-gold concentrate at optimum recovery while minimizing initial capital expenditure and operating costs. The flowsheet comprises primary crushing, milling (SAG and ball mills), rougher, scavenger, cleaner and re-cleaner flotation, regrinding, concentrate dewatering, concentrate bagging, and tailings dewatering for dry stacking.

The key criteria for equipment selection are suitability for duty, reliability, and ease of maintenance. The plant layout is conceived to provide ease of access to all equipment for operating and maintenance requirements while, in turn maintaining a layout that will facilitate construction progress in multiple areas concurrently.

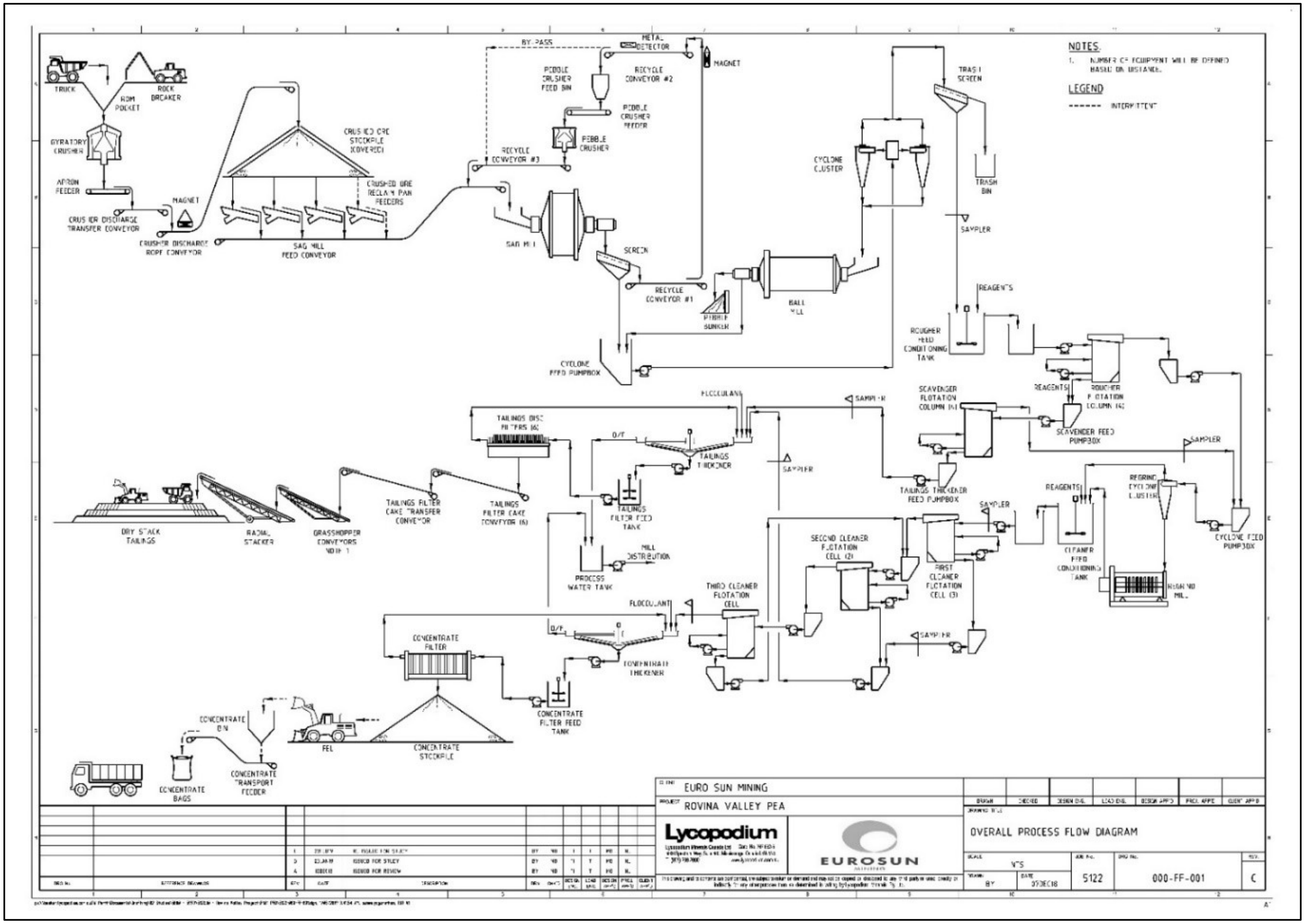
The key project design criteria for the plant are:

- nominal throughput of 21,000 tpd material
- crushing plant availability of 4,115 hours per annum and process plant availability of 8,230 hours per annum through the use of standby equipment in critical areas and reliable grid power supply

- the comminution circuit has been sized to produce grind size of P80 of 75 µm, and regrinding mill will grind rougher-scavenger concentrate to a P80 of 13 µm to recover an estimated 89% of the contained copper and 82% of the contained gold
- copper-gold concentrate will be filtered, and the filter cake will be bagged
- scavenger tailings will be filtered and disposed as 'dry' tailings and stored together with the mine waste rock
- sufficient automation and plant control will be incorporated to minimize the need for continuous operator intervention but to allow manual override and control if and when required.

The overall process flow diagram showing major unit operations is shown in Figure 1-2.

Figure 1-2: Overall Process Flow Diagram



1.6 Infrastructure and Site Layout

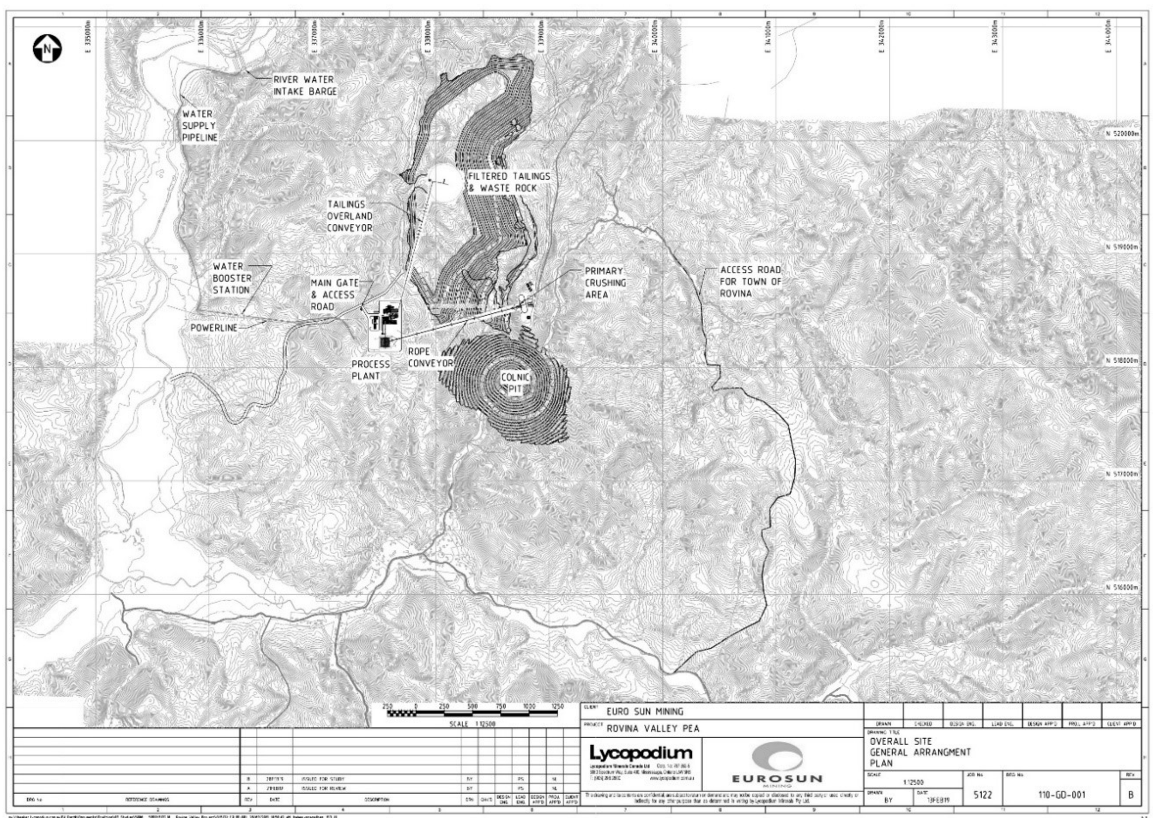
The overall site plan is shown in Figure 1-3 and includes major facilities of the Project including the Colnic open pit mine, primary crushing and overland conveying, process plant, filtered tailings and waste rock facility, raw water supply, powerline, mine services, and access roads.

Access to the facility is from the west side of the property off an existing road. Main access will be via the main security gate near the process plant.

Grid power will be provided from an incoming HV line from the west side of the property. Raw water will be provided from a dam northwest of the property.

A small diversion dam will be constructed upstream of the Colnic pit to divert the Rovina creek into a 1.85 km tunnel and move the flow away from the active mining operations.

Figure 1-3: Overall Site Plan



1.7 Capital and Operating Costs

1.7.1 Capital Costs

The initial and LOM capital cost estimate for the Project is summarized in Table 1-2 and detail on the sustaining capital cost estimate is summarized on Table 1-3.

All costs are expressed in United States dollars (USD) unless otherwise stated and are based on Q1 2019 pricing and deemed to have an overall accuracy of ±40%. The capital cost estimate conforms to Association for the Advancement of Cost Engineering International (AACEI) Class 5 estimate standards as prescribed in recommended practice 47R11.

The capital cost estimate was based on an Engineering, Procurement and Construction Management (EPCM) implementation approach and typical construction contract packaging. Equipment pricing was based on quotations and actual equipment costs from recent similar Lycopodium projects considered representative of the Project.

Table 1-2: Capital Cost Estimate (Q1 2019, ±40%)

Area	USD (Excluding Duties and Taxes)
Pre-strip (capitalized)	$33,505,000
Mining*	$19,561,000
Process Plant	$264,671,000
Infrastructure	$16,966,000
Project Owners Costs	$5,000,000
Subtotal	$339,703,000
Sustaining Capital	$12,207,000
Total	**$351,910,000**

NOTE: Mining capital costs are based on leased mining equipment and the initial capital is a 20% down payment of the mine fleet.

Table 1-3: Sustaining Capital Cost Estimate (Q1 2019, ±40%)

Area	USD (Excluding Duties and Taxes)
Mining	$12,207,000
Closure Costs	$20,000,000
Salvage Costs	-$20,000,000
Total	**$12,207,000**

1.7.2 Operating Costs

The estimated LOM operating cost per tonne of material processed is summarized in Table 1-4.

Table 1-4: LOM Operating Costs (Q1 2019)

	Total Cost ($M) from first gold pour	$/t Processed
Mining	$624	$7.28/t
Processing	$603	$7.03/t
G&A	$43	$0.50/t
Transport, Smelting, Refining Costs	$60	$0.70/t
Gold & Copper Royalties	$127	$1.48/t
Credit from Copper Sales	-$491	-$5.72/t
Total Operating Costs	**$967**	**$11.28/t**

Labour costs were developed together with the Euro Sun team in Romania. Diesel and electricity pricing come from quotations from local vendors. The diesel price used is $1.25 /litre and the electrical price is $66.94/MWh. The mine equipment is entirely diesel powered.

The mining cost includes the leasing component not included in the mine capital. This is approximately $0.28 /t moved.

General and Administrative costs consider that no camp will be required. The estimate is based on recent projects completed by AGP and Lycopodium.

1.8 Economic Analysis

A simple pre and post-tax cash flow model using EXCEL was prepared by Lycopodium on behalf of Euro Sun. Input data was provided from a variety of sources, including various consultants' contributions to this PEA, pricing obtained from external suppliers, and exchange rates and project specific financial data received from Euro Sun.

Table 1-5 shows the project cash flow summary. At a gold price of $1,325/oz and copper price of $3.10/lb, the project is estimated to have an after-tax IRR of 13.5% and a pay-back period of 5.62 years after start of production. At a discount rate of 5%, the after tax NPV is estimated at $169M. The project economics have been summarized in Table 1-6.

Table 1-5: Net Profit after Tax Summary

	$M	$/t Processed	$/oz Au
Revenue	$1,707	$19.91	$1,312
Mine Operating Cost1	$624	$7.28	$480
Processing Cost	$603	$7.03	$463
G&A Cost	$43	$0.50	$33
Transport, Smelting, Refining Costs	$60	$0.70	$46
Royalties	$127	$1.48	$98

	$M	$/t Processed	$/oz Au
Copper Credit	-$491	-$5.72	-$377
Total Operating Cost	$967	$11.28	$743
EBITDA	$740	$8.63	$569
Capital & Stockpile Working Costs	$318	$3.71	$244
Gross Profit before tax	$422	$4.92	$324
Income Tax Payable	$73	$0.86	$56
Net Profit after tax	$349	$4.07	$268

Note: Includes pre-strip costs during pre-production

Table 1-6: Financial Summary

	Value
Revenue from gold	$1,707M
AOC	$743/oz Au
Initial Capital	$340M
Sustaining capital	$12M
Closure costs	$20M
Salvage costs	-$20M
Pre-Tax Economics:	
IRR	15.4%
NPV (5%)	$218M
Payback	5.31 years
After-Tax Economics:	
IRR	13.5%
NPV (5%)	$169M
Payback	5.62 years

1.9 Environmental

Euro Sun has advanced their environmental program well beyond what is normally associated with a PEA study. The progression towards and receipt of the mining licence is indicative of this.

In compliance with the Romanian Mining Law's requirement for the Mining License Application, a series of environmental and social-economic studies have been developed mainly between 2012 and 2014. In addition, a series of more detailed studies, related to biodiversity, were produced after 2014.

The detailed biodiversity studies concluded the following:

- The forestry study shows the biodiversity of wood plant species (trees and shrubs) does not stand out as anything special. No rare endemic species, or species requiring special protection or care/ conservation measures were identified. The existing species are common species, widely spread at national level.

- The large mammal study concluded these species manifest their sporadic presence in the area, especially for marking territorial boundaries. No signs of usage such as hunting or multiplication area in the project area were identified.
- The small mammals study shows no endangered or vulnerable species in the Colnic area have been identified.
- The Invertebrates, Batrachians, Reptiles, and non-forest flora and birds study concluded that no protected, vulnerable, or endangered species have been identified in the area.

The Colnic project applied participative tools of mining project design, working in direct contact with all ongoing identified stakeholders; locals or external, public or private. Starting in 2012, Euro Sun went through four different project design scenarios based on direct (public meetings, focus groups, semi structured/interviews, door to door Q&A) and indirect (on line networking, info materials), positive or negative inputs from stakeholders.

Euro Sun prepared a Social Impact Study and Social Impact Mitigation Implementation Plan for the Mining License Application. Euro Sun, in partnership with Bucureşci Town Hall, implemented a Land Ownership Registration Campaign in the mining project area, supported by the company and promoting stakeholder's direct engagement

Archaeological investigations have been conducted by the Deva Museum of Dacian and Roman Civilization during three field campaigns (2008-2009, 2012-2013, 2015-2016) for a total of 166 archaeological trenches being excavated.

Detailed archaeological investigations were carried out in 2015 over two areas previously identified with archaeological potential. Here, the archaeologists identified some bronze-age artifacts around what has been considered two seasonal habitation areas. All the artifacts have been collected by the Deva Museum, the conclusion being that these areas can be archaeologically discharged.

1.10 Recommendations and Proposed Budget

Based on the results of the PEA study, AGP recommends that Euro Sun continue proceeding forward with additional studies and a feasibility leading to a potential project execution decision. The recommendations, and associated budgets, are described below.

The Rovina and Ciresata deposits, while not a component of the PEA study, represent an opportunity for Euro Sun to expand the project as it is currently envisaged.

1.10.1 Geotechnical

Additional drilling should focus on areas required to support a feasibility study using the mining scenario developed in this PEA. Such areas consist of:

- Colnic open pit geotechnical/hydrogeologic drilling,

- Infrastructure geotechnical drilling for process plant, crushing stations, and ancillary ore haulage conveyors,
- Condemnation drilling below planned infrastructure and waste storage facility.

1.10.2 Geology

Euro Sun should increase the drill density in selected areas. The main objectives of this drilling program would be:

- Upgrade existing resources to Measured in areas affected by the first 1- to 3-years of mining for the Colnic deposit. A similar program should be considered for the Rovina deposit when it will be considered in a possible PEA or feasibility study.
- Complete the delineation of mineralization limits at Rovina prior to inclusion in a future feasibility study.
- In preparation for a feasibility study, AGP recommends a conditional simulation run to quantify the degree of risk in the resource for an estimated cost of $20,000 for a pilot run.
- Provide new assay and geologic data through detailed drill core logging and interpretation to address any weaknesses in the current resource models following the conditional simulation model.

1.10.3 Open Pit Mining

Significant work has been completed to date on the open pit designs and this work demonstrates the potential for economic development of the Project. There are still some areas that require further definition prior to mine operation and can be handled as separate studies or part of a future feasibility study.

- Grade control procedures for proper material categorization
- Pit dewatering requirements
- Wall slope analysis to determine if steeper slopes are possible

1.10.4 Metallurgy

The following is proposed for future metallurgical work:

- Flotation configuration
- Flotation Concentrate Filtration
- Thickened Flotation Tailings Filtration

1.10.5 Infrastructure

Additional studies are required with respect to:

- Rope conveyor and its alignment
- Detailed surveys of the plant site location, road accesses and water pipeline
- Power study
- Waste and tailings placement facility

- River diversion dam and tunnel design and investigation
- Site wide water balance

This work will also include incorporation of the geotechnical work discussed early into the designs.

1.10.6 Environmental

Additional background information needs to be collected, especially in regard to the creek diversion and dry stacking of tailings. Further study will assist in providing regulators with all the required information.

1.10.7 Estimated Budget

The total estimated cost for Euro Sun to advance the project to a feasibility study are shown in Table 1-7.

Table 1-7: Summary of Recommendation Budgets

	Recommended Budget ($)
Geotechnical Drilling	Part of geology budget
Geology	3,476,000
Mining	575,000
Metallurgy	450,000
Infrastructure	400,000
Environmental	300,000
Feasibility Study	3,000,000
Total	**8,201,000**

2 INTRODUCTION

Euro Sun retained AGP to update the April 2010 PEA for Euro Sun's RVP, located in west-central Romania. Euro Sun is a mid-tier Canadian exploration and Development Company, with its head office located in Toronto, Ontario, and is listed on the TSX exchange.

The RVP consists of three mineral deposits located in west-central Romania on Euro Sun's 100%-owned Rovina Exploration License. The Rovina Exploration License is held solely by SAMAX Romania S.R.L., a Romanian registered company and a wholly-owned subsidiary of Euro Sun. Since November 16, 2018, Euro Sun has been in possession of an exploitation permit and mining license. The Colnic and Ciresata deposits are described as gold-copper porphyries, while Rovina is described as copper-gold porphyry. All three deposits are in close proximity to one another and amenable to a central ore processing facility.

2.1 Terms of Reference

Under the terms of engagement with Euro Sun, AGP and Lycopodium is to provide PEA level engineering for the Rovina Valley mine, process plant, associated infrastructure, and preparation of a capital and operating cost estimate to an accuracy of +/- 40% and provide an independent NI 43-101 report. The report is to comply with standards set out in the NI 43-101 by the Canadian Securities Commission form NI 43-101F1.

The mineral resource estimate supporting this updated PEA study was completed in July 2012 by AGP and had a data cut-off date of May 31, 2012. Since that time, six drill holes have been added to the Rovina and Colnic deposits (the main subject of this PEA update), and five drill holes were added to Ciresata. AGP validated the new drill holes to ensure they would not materially affect the 2012 resource estimate. Following that validation, the July 2012 resource estimate was not re-estimated, however, the pricing scenario and the resource constraining shell was updated to reflect 2019 metal prices and associated costs, and the mineral resource estimate was re-stated.

The terms of engagement were established through discussions held by representatives of AGP and Mr. Joe Milbourne, Technical Service Manager for Euro Sun.

The mineral resource estimate presented in this report is based on the validated results of 251 drill holes completed by Carpathian Gold Inc. (Carpathian) between February 2006 and April 23, 2012. Carpathian provided complete records in digital and, where appropriate, hard copy form of all exploration completed on the property during this period.

Carpathian announced a corporate name change to Euro Sun Inc. on August 18, 2016 as described in Section 3 of this report. For the remaining of this report, references to Carpathian were changed from the original source document to Euro Sun to reflect this name change.

The following technical report conforms to the standards set out in NI 43-101, Standards and Disclosure for Mineral Projects, and pursuant to Form 43-101F.

All units used in this report are metric units unless otherwise stated. Grid references are based on the "Stereo70" projection within the Romanian National Topographic System.

All monetary amounts are provided in USD unless otherwise noted.

All illustrations are embedded within the body of the report.

2.2 Qualified Persons and Site Visits

The Qualified Persons (QPs) preparing this technical report are specialists in the fields of geology, exploration, mineral resource and mineral reserve estimation and classification, geotechnical, environmental, permitting, metallurgical testing, mineral processing, processing design, capital and operating cost estimation, and mineral economics. None of the QPs, or any associates employed in the preparation of this report are insiders, associates, or affiliates, nor do they have any beneficial interest in Euro Sun.

The results of this technical report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Euro Sun and the QPs. The QPs are being paid a fee for their work in accordance with normal professional consulting practices.

The following individuals, by virtue of their education, experience, and professional association, are considered QPs as defined in the NI 43-101, and are members in good standing of their appropriate professional institutions. The QPs taking responsibility for specific sections of this report, and the extent of their responsibility for the purpose of the NI 43-101 are shown in Table 2-1 below.

Table 2-1: Date of Site Visits and Areas of Responsibility

Qualified Person	Company	Site Visit Date	Report Section(s) of Responsibility
Pierre Desautels, P.Geo.	AGP	August 26 – 30, 2008 July 26 -29, 2009 and July 2011	Sections 1.1, 1.2, 1.10.2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 23, 24, 25.1, 26.3, and 27
Gordon Zurowski, P.Eng.	AGP	Multiple visits starting in July 2007 with the most recent visit being from Jan 23 to Feb 01, 2012	Sections 1 (Summary), 1.3, 1.9, 1.10.1, 1.10.3, 1.10.6, 1.10.7, 2, 3, 15, 16, 19, 20, 21.2, 21.4.1, 25.2, 26.1, 26.2, 26.4, 26.7, and 26.8
Neil Lincoln, P.Eng.	Lycopodium	No Site Visit	Sections 1.4, 1.5, 1.6, 1.7, 1.8, 1.10.4, 1.10.5, 13, 17, 18, 21.1, 21.3, 21.4 (except 21.4.1), 22, 25.3, 25.4, 25.5, 26.5, and 26.6

AGP has verified all press releases issued by the Euro Sun since July 2011 to ensure no additional geological work was conducted on the property following the end of the 2012 drill campaign.

Following this review, Mr. Desautels considered the 2011 site visit remains current and no new geological data was added, following the completion of the 2012 drill program that would impact the resource estimate.

AGP would also like to acknowledge the contributions made by Mr. Randall K. Ruff P. Geo., Executive Vice President, Exploration with Euro Sun. Mr. Ruff provided the regional, local geological, and historical information on the Rovina Valley deposits. Mr. Ruff is a geologist with a BSc in geology and an MSc in geochemistry of ore deposits. He has been directly involved in the mineral exploration and mining sector for over 18 years with on-site project experience in North America, Africa, Europe, and South America on projects ranging from generative exploration, resource definition, feasibility, and mining and he directed the geologic work on the RVP, the subject of this Technical Report, from inception in 2005 to present through on-site postings. While not a QP on this report, Mr. Ruff was responsible for primary data collection derived from project field activities and on-site geologic interpretations.

2.3 Effective Dates

The report has multiple effective dates as noted below:

- The Mineral Resources have an effective date of February 20, 2019, in support of the press release by Euro Sun
- Drill data and information on the property discussed in this report is current to April 23, 2012
- The effective date of the PEA for the RVP is February 20, 2019.

There were no material changes to the scientific and technical information on the project between the effective date and the signature date of the report.

2.4 Information Sources and References

Much of the text in this report was sourced from the following reports:

- Desautels, P., P. Geo, and Zurowski, G. P. Eng., "Carpathian Gold Inc. RVP, West -Central Romania. NI43-101 Technical Report, Mineral Resource Estimate Update"., August 30, 2012
- Titaro, D. and Brady, B., 2002, Evaluation Report on the Samax Romania (BVI) Gold Properties, a report for Carpathian Gold (BVI) Limited, prepared by ACA Howe International Ltd., Report # 847, September 30, 2002

In 2006, AMEC completed an updated Technical Report. The report incorporated a review of the geology and mineralization encountered on surface at Colnic and Rovina, and also incorporated the review of the geology in the first ten drill holes at Colnic. The report was titled:

- Cinits, R., 2006: Technical Report on the Apuseni–Rovina Property: report prepared for Carpathian Gold Inc. by AMEC Peru S.A., effective date September 1, 2006

In 2007, AMEC completed an updated Technical Report that included a resource estimate effective December 31st, 2006. The report was dated May 24, 2007, and was titled:

- David G. Thomas, MAusIMM, Robert Cinits, P.Geo: Technical Report on Resource Estimation on the Colnic and Rovina Deposits NI 43-101 Technical Report

In 2008, PEG completed a Resource Update for Ciresata, Colnic, and Rovina. The work was described in a Technical Report dated January 16, 2009, with a resource effective date of September 30, 2008. The report was titled:

- Desautels, P., P.Geo.: Technical Report on the RVP, Romania

In 2010, PEG completed a PEA Study in collaboration with BGC Engineering Inc. (BGC) and Porcupine Engineering Services Inc. (PES). The report is dated April 23, 2010, and the work was based on the September 2008 resource. The report was titled:

- Harkonen E, P.Eng. et al., NI 43-101 Technical Report of the Rovina Exploration Property, South Apuseni Mountains, West-Central Romania

Information, conclusions, and recommendations contained herein are based on a field examination, including a study of relevant and available technical data and discussions with Euro Sun's site geologists, Mr. Randall K. Ruff, Executive Vice President - Exploration, and Dr. Barbara Stefanini. Additional discussions were also held with Mr. Joe Milbourne, Euro Sun Vice President – Technical Services.

3 RELIANCE ON OTHER EXPERTS

AGP has followed standard professional procedures in preparing the content of this PEA report. Data used in this report has been verified wherever possible and the report is based upon information believed to be accurate at the time of completion.

AGP has not verified the legal status or legal title to any mineral claims or licenses, and has not verified the legality of any underlying agreements for the subject properties regarding mineral rights, surface rights, permitting, or environmental issues in Section 4 of this Technical Report, and has fully relied on the information supplied by Euro Sun's representatives, as follows:

- Dr. Sorin Halga, General Director of SAMAX Romania, S.R.L. (wholly-owned subsidiary of Euro Sun), and Mr. Randall K. Ruff, Executive Vice President, Exploration with Euro Sun.

The QPs have also referenced several sources of information on the property, including technical reports by consultants to Euro Sun, digital geological maps, geological interpretations by Euro Sun, and other documents listed in the reference section of this report. Therefore, in authoring this report, the QPs have reviewed the work of the other contributors and find this work has been performed to normal and acceptable industry and professional standards.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Rovina Exploitation License lies in the Judetul (County) Hunedoara, a part of the Development Region of Transylvania. Regionally, it is located in the Golden Quadrilateral Mining District of the South Apuseni Mountains in west-central Romania, approximately 300 km northwest of the city of Bucharest (the capital city of Romania), and 140 km east–northeast of the city of Timisoara (Figure 4-1). Locally, the property is approximately 25 km north of the small city of Deva, which is the administrative center for the county, and 7 km east of the town of Brad for which mining has played an important role (Figure 4-2). The Golden Quadrilateral has a long history of gold mining, which predates the Roman occupation through several periods of activity to the results of modern exploration efforts, which have defined two other advanced stage gold projects, Rosia Montana (Gabriel Resources) and Certej (Eldorado Gold). From the Rovina License, Rosia Montana is approximately 25 km northeast, and Certej is 17 km southeast.

The Property is centered at approximately latitude 46°07’ N and longitude 22° 54’ E or 515,000 N and 340,000 E using the “Stereo70” projection of the Romanian National Geodetic System. Elevations on the Property range from 300 to 940 m above sea level.

The Rovina, Colnic, and Ciresata Porphyry deposits are the principal exploration targets on the Property, with their locations defining a north-northeast trend. The Rovina Porphyry is the northern-most deposit with the Colnic Porphyry lying approximately 2.5 km south of the Rovina Porphyry, and the Ciresata Porphyry approximately 4.5 km south of the Colnic Porphyry (Figure 4-3). Euro Sun has termed these three deposits the RVP.

4.2 Mineral Property and Title in Romania

The General Mining Law of Romania came into effect in 1998 and was re-written in 2003. The scope of the law is aligned to international current practice with the intent to ensure maximum transparency in mineral rights administration and fair competition without discrimination between operators, depending on the property type and the origin of the capital. Subterranean and aboveground mineral resources located within Romanian territory, within the continental shelf, and in Romania’s Black Sea economic area are part of the state’s public property.

The mineral rights of Romania are administrated by the state National Agency for Mineral Resources (NAMR), subordinated to the General Secretary of the Government, first created in 1993. The governing of mineral rights is guided by the Mining Law Nr. 85/2003, Norms for Applying the Mining Law Nr. 85/2003 (Official Gazette of Romania, yr. 171, No. 772, November 4th, 2003), and subsequent amendments. The Mining Law does not require state ownership beyond the prescribed royalties and Mining License tax fees. The following description of mineral property title in Romania is summarized from an English translation of the 85/2003 mining law provided by the NAMR:

- http://www.namr.ro/wp-content/uploads/2014/03/MLaw_85.pdf
- http://www.namr.ro/wp-content/uploads/2014/03/MNorms1208.pdf

The Mining Law defines and regulates different categories of exploration and mining activities, from early stage sampling and prospecting to formal exploration and finally commercialization, exploitation, and processing.

Figure 4-1: Location Map

Figure 4-2: Location, Access, and Perimeter of Rovina Mining License

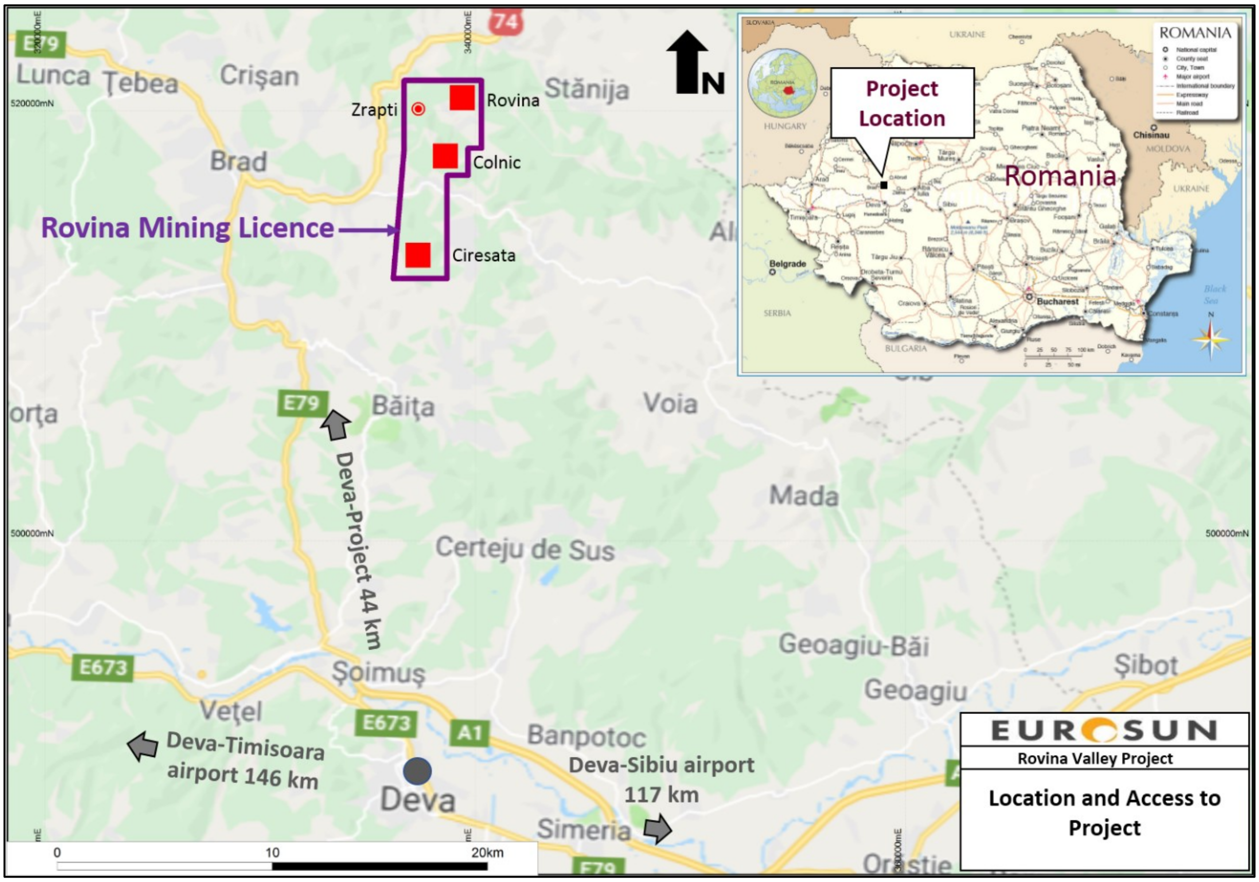
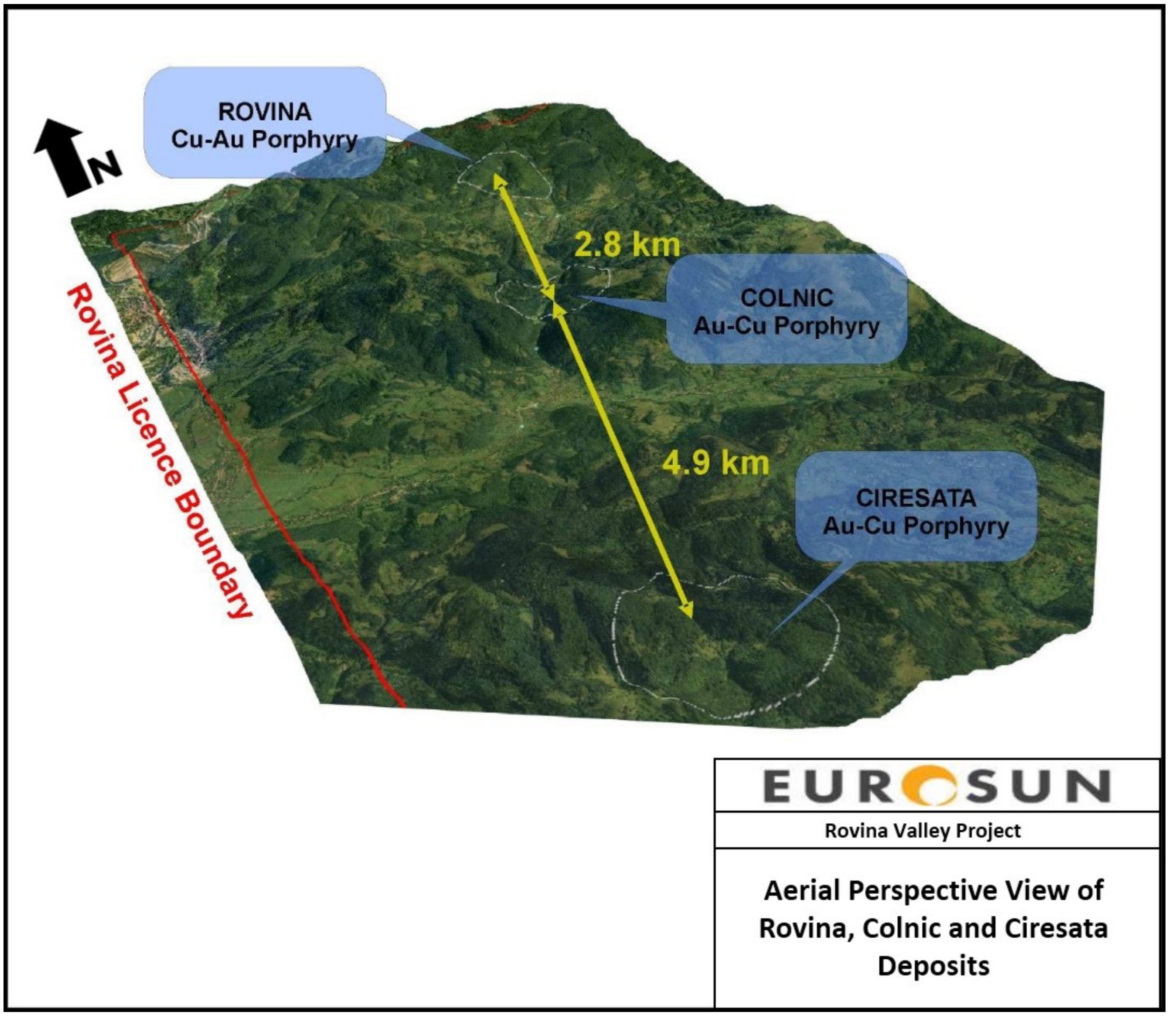


Figure 4-3: Aerial Perspective View of Locations for the Deposits



No exploration or mining activity can be legally carried out without an appropriate permit. All companies seeking to conduct exploration or mining activities must first contact the NAMR.

The rights granted by an exploration or exploitation license are exclusive to the holder, chargeable, defensible against third parties, and are transferable with the consent of NAMR. Applicants are not automatically granted surface rights, and these must be acquired from the existing owner through sale, land exchange, rental, expropriation, concession, association or other process, as allowed by law (Section 4.3.3).

Foreign operators must set up a permanent subsidiary in Romania within 90 days of obtaining any exploration or mining license, and the subsidiary needs to be maintained throughout the period of operation.

There are three types of permits available for exploration and mining activities in Romania: Prospecting, Exploration, or Exploitation, as described in the following sections.

4.2.1 Prospecting Permit

The Mining Law defines prospecting as the performance of studies on the surface of a site required to identify the possible existence of an accumulation of mineral resources. In order to obtain a Prospecting Permit, a company must make a request to NAMR, which must issue a Prospecting Permit within 30 days of receipt of the request. The permit is valid for a maximum three-year period. The Prospecting Permit is non-exclusive, and therefore does not guarantee the applicant will be granted the rights to the exploration or exploitation of any mineral resources located within the license area.

Prospecting Permit holders must pay annual land fees equal to 358 RON/km^2 (approximately US$90/km^2). This land fee may be adjusted for currency inflation. The latest adjustment was made on March 8, 2019. The titleholder of the Prospecting Permit must present annual reports to the NAMR documenting the work completed and the results.

4.2.2 Exploration Licence

The Mining Law defines exploration as including all operations and studies conducted to identify, evaluate, and determine the optimal technical and economic conditions necessary to exploit a particular mineral deposit. The Exploration License is valid for a maximum period of five years, with a renewal right of three years and provides the holder with an exclusive right to carry out operations.

Exploration licenses are granted by the NAMR following a public tender and bid process. Bids are evaluated on a ‘score-card’ list of bid attributes including an obligatory first-year work program. Exploration License holders must pay annual land fees to the Romanian government equal to 1,437 RON/km^2 (approximately US$360/km^2). This fee is doubled after two years and increases five-fold after four years and may be adjusted for currency inflation. In addition, the applicant must submit an appropriate financial guarantee for environmental rehabilitation as set out in an environmental rehabilitation plan.

Proposed yearly work programs must be filed with the NAMR; also, half-yearly and annual reports documenting the work completed and the results, must be submitted as well as annual inspections from an NAMR representative. The holder of an Exploration License has the exclusive right to apply for an Exploitation License within the property boundary.

4.2.3 Exploitation Licence

The Romanian Mining Law defines exploitation as including all operations executed at the surface, and beneath it, for the extraction, treatment, and delivery of mineral resources. An Exploitation License is granted at the discretion of NAMR and can be awarded to an Exploration License holder through directed negotiations or based on a public offer in the case of no current Exploration License. Prior to receiving an Exploitation License, the successful party must submit:

- a feasibility study for the mining operations
- an environmental impact assessment (EIA) and environmental audit
- a minimum investment and development plan
- a mining waste management plan
- a remediation plan to remedy any environmental damage caused by mining operations
- a social impact statement and a social mitigation plan

Holders of an Exploitation License must pay annual land fees of 35,923 RON/km^2 (approximately US$8,980/km^2) of terrain subject to exploitation at surface or underground. This land fee may be adjusted for currency inflation. Latest adjustment was made on March 8, 2019. In addition, a royalty must be paid to the state budget equal to 5% of the value of the polymetallic and 6% for precious metals mineral resources extracted from a particular site and is payable quarterly.

According to Euro Sun, the Exploitation License holder is also subject to the national corporate profits taxation, which is represented by a flat-rate tax of 16%. After-tax profits can be repatriated.

Companies legally engaged in exploration and/or mining activities are exempt from duty on imported equipment required for exploration and/or mining.

4.3 Land Tenure

4.3.1 General

The RVP consists of one Exploitation License (the Rovina Exploitation License, Number 18174/2015 for Cu-Au). The corner coordinates for the Rovina Exploitation License is described in Table 4-1. These corner coordinates are designated by the NAMR and are not surveyed in the field. The total area covered by the Rovina Property is approximately 2,768 ha.

Table 4-1: Rovina License Boundary (Stereo 70 Grid System)

Point	Easting (m)	Northing (m)
1	336200	518250
2	336700	518250
3	336700	521400
4	340300	521400
5	340300	518250
6	339670	518250
7	339670	517000
8	338700	517000
9	338700	512200
10	336200	512200

4.3.2 Agreements

Euro Sun, through intermediary subsidiaries, owns 100% of SAMAX Romania SRL (SAMAX) which in-turn owns 100% of the Rovina Exploitation License. SAMAX is a duly registered company in the city of Criscior, Romania.

4.3.3 Rovina Agreement

The Rovina Property was acquired by Euro Sun, through their wholly owned subsidiary Samax Romania S.R.L., on April 27, 2004 as a one year non-exclusive prospecting permit covering 102.3 km^2. Following an initial exploration campaign, Samax applied for an Exploration License, and following a public tender and bid application process, was officially awarded 100% interest in the Rovina License (covering 9,351 ha) on August 29, 2005, for a period of four years (License Nr. 6386/2005). As provided by the Mining Law, a three-year extension may be granted. SAMAX applied this three year extension which was granted by the NAMR on October 20, 2009 (Act Additional NR. 1, la Licenta De Explorare Nr. 6386/2005), extending the Rovina License expiry to August 28, 2012. The final exploration report and resource estimate for the Rovina License has been submitted and on July 17, 2012 the NAMR accepted this report and resource statement and invited SAMAX to submit documentation required for a Mining License application.

At any time during the valid period of the exploration license, and 90 days thereafter, SAMAX may apply to convert any part of the license to an Exploitation License. In late 2009, SAMAX retained a consortium of Romanian qualified and certified consulting firms to complete the studies required to apply for a Mining License (Section 4.2.3). The topics covered by these studies are listed below:

- Technical Study, to evaluate the economic feasibility of the proposed mining operation with the goal of obtaining state registered reserves.
- Environmental baseline and Impact Assessment Studies, which includes water and soil resources, biodiversity, air quality, landscape, and cultural-heritage resources.
- Health and Safety Baseline and Impact Studies, which includes local population health status, medical resources, local health and safety issues, and possible impacts over the life cycle of the proposed mining operation.
- Social Study, to define baseline community and financial resources and evaluation of the positive and negative impacts of the proposed mining operation with proposed mitigation measures.

The required studies have been completed and were officially submitted to the NAMR on August 14, 2012 comprising the complete Mining License Application (MLA) file. The MLA has been evaluated solely by the NAMR and a Mining License Contract drafted and approved by both parties whereupon ministries approval of the contract is required for final. These studies will provide a foundation for the definitive studies required to obtain the operational permits and Licenses (Section 4.3.7).

SAMAX has signed with NAMR on May 26, 2015 the Rovina Exploitation License Contract (No. 18174/2015) for the "Gold-bearing Copper Ore Exploitation". In compliance with the Romanian Mining Law, the Rovina Exploitation License has been ratified by the Romanian Government on the November 9, 2018 (Governmental Decision No. 900/9 November 2018) and published in the Romanian Official Monitor (Gazette), Part I, No. 970/16 November 2018.

The Rovina Exploitation License is valid for 20 years, starting with November 16, 2018, and renewable for periods of five years.

Upon any production, SAMAX must pay a 5% to 6% (as detailed above) royalty to the Romanian Government, as described above. AGP has been informed by Euro Sun there are no underlying payments or encumbrances to third-person parties relating to the Rovina Property beyond the government requirements of royalties and Mining License taxes.

4.3.4 Name Change

On August 18, 2016, Euro Sun announced a corporate rebranding and name change to Euro Sun to reflect the Company's strengthened management team and focus on the development of its wholly owned Rovina Valley gold and copper project, located in Romania.

4.3.5 Barrick Agreement

On August 12, 2011, Euro Sun closed a private placement with Barrick Gold Corporation for a non-brokered CDN$20 Million private placement to purchase 38,461,538 common shares of the Corporation at a price of $0.52 per share.

Subsequent to the Private Placement, Barrick held approximately 9% of the issued capital of Carpathian. The agreement provided the proceeds to a certain amount be allocated to the advancement of the RVP under the guidance of a joint Technical Advisory Committee. Provided that Barrick does not dispose of common shares of the corporation where its interest would fall below 8.5% in the share capital of the corporation, Barrick has the right to participate in any future equity offerings by the corporation to maintain its pro-rata common share ownership and a right of first refusal, at the asset level only, on any disposition or sale by the corporation of any Romanian property or mineral rights. This agreement does not include any rights to ownership of the RVP (Carpathian News Release dated July 18, 2011 and Annual Information Form 2011 filed on SEDAR.com). Carpathian was subsequently notified by Barrick they had sold their Carpathian shares and thus no longer retain a first right of refusal.

AGP relies on the terms and the land tenure documentation supplied by Euro Sun and Euro Sun's lawyers and has not reviewed the mineral titles or agreements to assess the validity of the stated ownership.

4.3.6 Surface Rights

Euro Sun does not hold any surface rights on their Rovina Property. Romanian law does not vest surface rights with mineral rights and any proposed development requires the developer to either purchase the surface rights or enter into an appropriate agreement with the surface rights owners to have access to the Property. According to Romanian Mining Law, upon conversion of their Exploration Licenses to an Exploitation status, Euro Sun has the right to legally acquire these rights through one of the following processes:

- sale
- land exchange
- rental
- expropriation
- application
- association with an existing owner
- other process allowed by law

Numerous individual local landowners and the state forestry hold surface rights over the Rovina, Colnic, and Ciresata deposits. Exploitation activities that result in surface disturbance require permission from the surface rights owners in addition to the required government permits. Land use in the RVP is predominantly low productive deciduous forests, pastureland in valley bottoms, and vegetable fields near households. There are no houses above the Rovina, Colnic, and Ciresata deposits. Mine-site planning from the PEA (Technical Report, 2010) and in-progress Pre-Feasibility Study are designed with consideration to minimize direct impacts to community with preliminary indications of direct impact on number of isolated houses in the range of 5 to 10.

Euro Sun has initiated a land acquisition program with three phases: 1) public information campaign, 2) surveying and registration of land parcels not officially registered with the local government cadastral map, and 3) acquisition of surface rights using one of the methods listed above. This program is implemented by SAMAX through a Social-Community Relations Manager, Legal Team, and Survey Team. The information campaign is well advanced informing landowners of the legal process of cadastral registration through public postings and public meetings held between 2012 and 2015. Euro Sun informs AGP that public response has been favourable thus far, in part due to SAMAX's long-standing community consultation program during the project's advancement. Due to the large number of un-registered land parcels, SAMAX anticipates 1.5 years to complete all cadastral registrations prior to implementing a land acquisition strategy (Pop, 2012).

4.3.7 Exploration Permits

The Romanian Mining Law requires applicants of exploration licenses to submit an appropriate financial guarantee for environmental rehabilitation, as set out in an environmental rehabilitation plan; however, a more detailed environmental impact assessment (EIA) or social impact statement is not required. All exploration activities that cause surface disturbance (i.e. trenching, drilling, access development) require permitting under an Urbanization Certificate (UC) which serves as a guideline for various other government agency approvals.

AGP is not aware of any other permits that are in place or may have been applied for to advance the project or whether there are any outstanding issues with permits that maybe held by other parties that may affect future activities on the Property.

4.3.8 Mine Permits

The Romanian consulting company EcoTerra SRL has provided to Euro Sun a summary of the regulations and procedures for acquiring operating permits for a mine under the Romanian legislation and regulations (EcoTerra SRL, 2008). SAMAX's Manager of Permitting has developed a timeline flow chart specific to the RVP (Daju, 2012). These requirements are typical of those required by other jurisdictions around the world.

There are three pieces of legislation pertaining to the development of a new mine in Romania:

- legislation governing mining activities
- legislation regarding permits for construction
- legislation concerning environmental protection

Prior to any permitting approvals in Romania, a UC is required. The UC includes a description of the project and contains a guideline of all possible remits required in Romania. Depending on the level of disturbance of the proposed project, the required approvals and permits are selected from the template. Large impact projects also require UC approval by the local county council.

Following the issuance of the UC, the licensing, permitting requirements and procedure for a mine site with significant impact are summarized below:

- Construction License
- land use approval Planul Urbanistic General (PUG) for proposed new categories on a local and regional area basis (involves public meetings for feedback and approval)
- land use approval Planul Urbanistic Zonal (PUZ) for industrial zones including detailed development plans (involves public meetings for feedback and approval)
- environmental procedure requirements through local environmental protection agency
- approved by the local County Council
- Environmental License
- Environmental Impact Assessment Report (EIAR)
- Social Impact Assessment Report (SIAR)
- Closure and Remediation Plan
- Technical Authorizing Committee (TAC) Review (TAC comprising experts and interested parties from recognized institutions)
- Public Hearings for Feedback
- TAC and company review of public feedback (as per spirit of the Equator Principles and Aarhus Convention)
- approved by the Regional Environmental Agency
- Construction Permit Issued – allows construction to begin
- Operational License
- reception note for the construction works to specification

- environmental design requirements met
- health and safety measures in-place
- all additional operating permits
- intervention plans for accidents and natural disasters

Operational/Environmental permit were issued allowing mining operations to begin.

The EIAR is required to have a number of substantiating studies prepared, and these are quite typical of those required in North America. For example, they will include studies on vegetation, water quality, fauna, biodiversity, hydrology and hydrogeology, archaeology, and human health and safety. Additional permits address development of water and power supplies, and dam safety. Prior to issuance of the Construction Permit, all surface rights within the determined industrial zone need to be acquired. In addition, if the proposed project has potential international trans-boundary impacts, under the Espoo Convention, public consultation in neighbouring countries is required.

The Environmental License is issued by the Regional Environmental Agency, following a specified procedure, which includes the setup of a Technical Authorizing Committee, whose decisions are presented to the public (together with the EIAR). The public takes an active part in making the decision, as envisaged under the Aarhus Convention. The Environmental License authorizes the Project.

The final step of issuance of an Environmental Permit requires a Reception Record Note for construction work has been submitted, all requirements of the Environmental License have been met, and the Application Form, Location Report, and Safety Report have been completed. In addition, an Internal Emergency Plan is required to be submitted with the Safety Report. The Environmental Permit authorizes the operation. A water-use license/permit may also be required prior to commencing any activity that requires use of groundwater or surface water.

EcoTerra SRL (2008) has provided a spreadsheet showing the likely timeline for permit acquisition for the Construction Permit and Operations Permit. A permitting timeline developed by EcoTerra starting with the preparation of the Land Use Plan, predicts it will take just over three years to obtain the Construction Permit. A permitting timeline developed by SAMAX Permitting Manager predicts one year for Land Use Plan, two years for Environmental approval followed by six months to obtain the construction permit (Daju, 2012). An important consideration in the permitting timelines is the possibility to conduct required studies and reporting in parallel to obtain different Licenses. For example, much of the work required to obtain the land use re-zoning (PUG and PUZ) is also required for the Environmental License. Under the category of Operations Permit, following the Construction Permit, EcoTerra identified a further two years (including the construction period) to obtain the Environment/Operations Permit.

4.4 Environmental and Socio-Economic Issues

The Golden Quadrilateral Mining District has a long history of mining and contains areas with extensive mining disturbance. State owned and subsidized mining operations were closed in 2007 after a long period of declining investment in operations resulting in legacy environmental issues and high un-employment. The Rovina property lies just east of the Brad-Baraza sub-mining district, which was operated by the state until closing in 2007. On the Rovina Property, there are no previous state-owned mining operations with previous activity restricted to exploration utilizing drilling and limited underground gallery excavations. Previous surface disturbance is restricted to exploration gallery waste dumps at the Rovina deposit from state exploration in the 1980s and several widely spaced exploration galleries – presently collapsed – in the Colnic deposit area from the 19th century. Under the Romanian regulation, Euro Sun does not assume environmental liability for any of the previous exploration activities.

Euro Sun has completed baseline environmental and social studies under the lead of EcoTerra as required for the Mining License Application (Section 4.3.3). These baseline studies serve to document current environmental and social conditions.

Euro Sun has informed AGP an archaeology baseline study directly over the Rovina, Colnic, and Ciresata deposits and over the plant and waste dump locations was commissioned in 2008 and continued in more detail in 2013 and 2016. These studies were completed by the Dacian and Roman Civilization Museum, Deva. No findings were made of archeological or cultural significance (Dacian and Roman Civilization Museum, 2016). Euro Sun, in anticipation of completing an ESIA (Environmental and Social Impact Assessment) to international standards, commissioned and received the following studies for the RVP:

- "Position paper for development of the Rovina License, Romania," Golder Associates Canada Ltd., 2007.
- "Environmental and Socioeconomic Compliance with International Standards," AECOM Canada Ltd., 2009.
- "Rovina Project ESIA Gap Analysis and Work Programme", AMEC Earth and Infrastructure UK Ltd., 2012.

There are several small rural villages within the boundaries of the Property. State-operated mines were the dominant employer in the area prior to closure in 2007. Replacement jobs in the local areas have not been developed and un-employment is high. Many of the local residents are engaged in sustenance agricultural activities or have left the area seeking employment. Although there are no houses recorded in the direct vicinity of the Rovina, Colnic, and Ciresata deposits, isolated houses and farms occur within 1,000 m south of Colnic and 980 m east of Rovina (the village of Rovina).

Euro Sun has informed AGP that as part of its stakeholder engagement approach it is currently active in community partnership programs and project-communication programs with the surrounding communities as well as assisting in the funding of small basic infrastructure improvements for communities near the Colnic and Rovina Deposits. In addition, Euro Sun maintains close contact with the local mayor and villagers as part of their community relation efforts.

Since joining the EU in January 2007, Romania has adopted the General Framework Law 294/2003, which requires a compulsory EIA process for certain projects. The Guidance Document No. 918/2002 (transposing EU Directives) and four Ministerial Ordinances were adopted, which establish competencies, procedural stages, and instructions including public participation. The environmental protection laws and procedures generally meet with international best practices however, governmental institutional capacities are still in the building stage, though recently, experience has been gained from large infrastructure projects and the advancement of permitting on other large mining projects. The Romanian EIA process has adopted some guidelines from the World Bank for public involvement and consultation in project planning.

Romanian Government environmental regulations include the 1995 Environmental Protection Law. The major provisions set out in the environmental code include the following:

- principles and strategic elements that are the basis of the laws
- right to access information on environmental quality
- right to information and consultation on the sitting of industrial facilities as set out in the Law on Environmental Impact Assessment
- implementation of environmental impact assessments, the results of which are to be made available to the public
- establishment of liabilities regarding environmental quality rehabilitation
- management regime for dangerous substances, hazardous waste, chemical fertilizers, and pesticides
- protection against ionizing radiation and safety of radiation sources
- protection of natural resources and biodiversity conservation
- prompt action and reporting when accidental pollution occurs
- prerogatives and responsibilities of the environmental protection authorities, central and local authorities, natural and legal persons
- right to appeal to the administrative or judicial authorities

Following the cyanide spill from the Aural Mine in the Baia Mare Mining District (northern Romania) in 2000, environmental concerns relating to mining activities in Romania and their potential trans-boundary impacts have been heightened. The major areas of environmental concern include soil erosion and degradation, water pollution, air pollution in the south from industrial effluents, and contamination of Danube delta wetlands. The European Union (EU) has reviewed mining practices and developed criteria for responsible mining which are included in the 'EU Mining Waste Directive'. This directive came into force in April 2006. Romania became a full member of the EU on January 1, 2007 and has adopted the EU Mining Waste Directive in 2008. This Directive allows the use of cyanide in mineral processing, providing defined concentration levels of cyanide in tailings management facilities are met.

In Romania, environmental activism in the form of non-governmental organizations (NGOs) is present and mainly dependent on international organizations. Although several thousand non-government organizations are registered, only 100 are active (approximately).

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

5.1 Accessibility

The project lies near three international airports within approximately a 2- to 3-hour drive from the cities of Sibiu, Timisoara and Cluj. The city of Sibiu has the nearest international airport to the property with the most regularly-scheduled commercial flights from various European destinations. From Sibiu, the principal access to the property is via a four-lane highway to Deva and then another 40km via a paved two-lane highway leading to the historic gold mining town of Brad, followed by secondary paved roads eastward for 7 km, passing through the town of Criscior and on to the village of Bucureşci, which is located within the property. These roads provide the principal access to the Rovina, Colnic, and Ciresata deposits. The western boundary of the Rovina Licence is located less than a kilometre east of the town of Criscior (population approx. 3,000), where Euro Sun's main office is located.

Access to other portions of the Rovina Licence is via various paved and gravel roads, with tracks suitable for 4 wheel-drive vehicles, or along footpaths. Access to the property by road is possible year-round; however, short periods of blockage are possible in the winter due to snow, especially in the higher areas of the Apuseni Mountains.

5.2 Climate

The regional climate is regarded as mild temperate continental. Generally, the winter months are from December to March, and snow is common though accumulation is typically less than 30 cm. Mean winter temperatures are in the area of -3°C to -5°C; however, periods of severe temperatures (as low as -20°C) can occur. Although field activities can continue year-round in this part of Romania, occasional heavy snowfalls can hamper access for short periods during the winter months.

Springtime temperatures of 5°C to 10°C may start in early April, but patchy snow cover could last until mid-May in the forested areas. The summer months, from June to September, have temperatures ranging from 10°C to 20°C, with rare maximum highs near 35°C. The typical annual precipitation is 800 to 1,100 mm.

5.3 Local Resources and Infrastructure

The Golden Quadrilateral Mining district, where the Rovina property is located, has a long history of mining activity, with developed infrastructure to provide electrical power and highway and rail transport. The towns of Deva (pop. 61,100) and Brad (pop. 14,500) are the closest major centres to the Rovina Licence and are, respectively, about 1 hour and 20 minutes' drive from the Colnic deposit. The town of Zlatna (pop. 7,500) is situated approximately 30 km east of the property.

Local unemployment is high (approx. 50%). Although the local towns can provide the most basic mining and exploration needs for the early stages of exploration and project development (including accommodation and labour requirements, food, communication services, and other supplies), most mining-related equipment and services for more advanced projects must be obtained from Timisoara (pop. 319,300), Bucharest (pop. 1.9 M), or other European locations. Population figures were sourced from the October 2011 Census.

In the Golden Quadrilateral Mining district, electrical power is distributed from an existing 110 kV utility grid that is connected to regional power producers. The nearest electrical power source to the deposit is in the town of Criscior (Gura Barza, adjacent to the Brad-Barza Mine processing plant), located approximately 5 km to the southwest. Most locations on the property have cellular phone service, except in valleys where signals may be blocked. Most nearby towns have line telephone service, the majority of which are capable of international calls.

The closest rail line available for use is in the town of Brad, 5.3 km by road from Criscior, with another rail line in Deva, located 41 km by road from Criscior. The most significant source of surface water in the Rovina Licence area is the Cris River, which flows just to the north and west of the license boundaries. A civic works water dam on the Cris River is under construction 2.8 km northwest from the Rovina deposit. Within the Rovina License, the smaller, year-round Bucureşci River (south of Colnic) and its tributaries in the property area, have provided an adequate water supply for historic drilling programs.

5.4 Physiography, Flora, and Fauna

The southern Apuseni Mountains are mostly gently-rolling with some abrupt slopes and cliff-forming rock exposures. The highest peaks near the property are the Duba (969 masl), Coasta Mare (786 masl), and Cornetel (695 masl) peaks.

In the areas of the Rovina, Colnic, and Ciresata Deposits, the terrain is hilly to mountainous, with access through relatively gently-sloped narrow valleys with moderately steep slopes to rounded ridges. The minimum and maximum elevation ranges for each of the deposits are Colnic - 350 to 540 m; Rovina - 500 to 680 m, and Ciresata - 420 to 480 m. The property is mostly forested with deciduous trees (beech and oak), with occasional conifers, particularly at higher elevations.

Wildlife on the property includes deer, fox, and wild pigs. Local streams on the property are not known to have fish.

Euro Sun indicated to AGP that to the extent relevant to the mineral project, this report, there is sufficiency of surface rights to support mining operations, potential tailings, and waste disposal plant sites or it would not be unduly withheld as the project advances. With proper upgrades, the property has sufficient sources of power and water to support a mining operation. Since the area has a long history of mining, the workforce will likely be recruited locally.

6 HISTORY

Text for this section was sourced from the 2012 NI43-101 Resource Update Report and edited where necessary.

6.1 Summary

Mining has played a significant role in the history of the Southern Apuseni Mountains and has been traced back to pre-Roman times (~2,000 years). Gold and base metal mining has occurred principally within the Metaliferi Mountains in an area covering 2,400 km^2 and has become known as the Golden Quadrilateral (GQ) for its prolific historic gold production. Initially gold production came from alluvial deposits and high-grade veins in various locations, including Rosia Montana, Baia de Aires, Zlatna, Brad, and Sacaramb. According to studies of early papers and historic documents, the GQ has produced and estimated 55 Moz of gold with approximately half this production attributed to the Roman Period (Vlad and Orlandea, 2004).

The exploration history on the Rovina Property, and particularly on the Colnic, Rovina, and Ciresata Deposit areas, can be divided into the following six work phases:

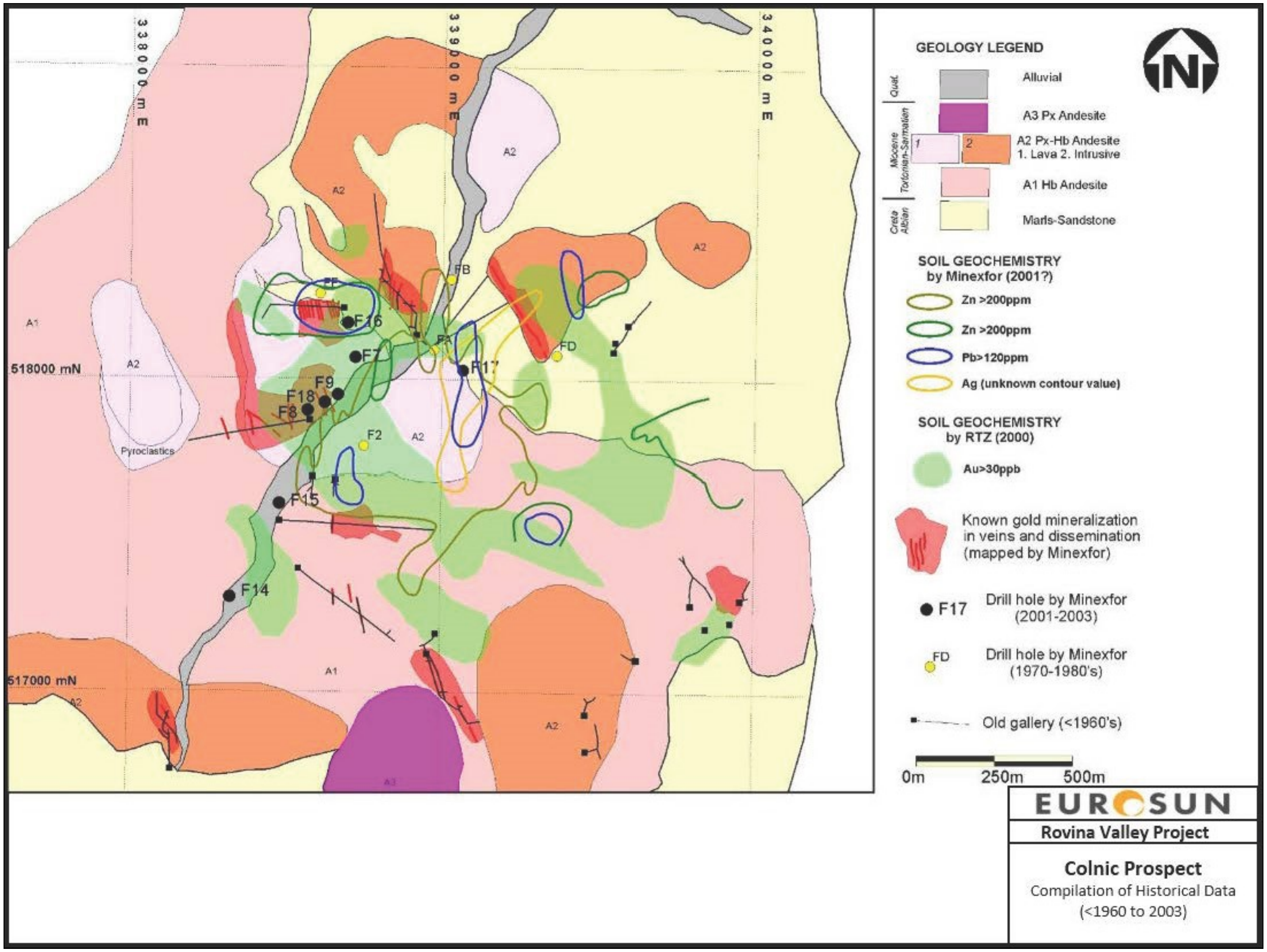
- local prospectors and miners (19th century)
- Romanian government (1960s)
- Minexfor–Deva (mid 1970s to 1997)
- Rio Tinto (1999 to 2000)
- Minexfor–Deva (2000 to 2003)
- Euro Sun (2004 to 2012)

Note Minexfor-Deva is the local Romanian state exploration company

6.2 Local Prospectors and Miners (19th Century)

The first recorded exploration in the area dates back to the 19th century during the Austrio-Hungarian period and was focused on Au–Ag vein-style mineralization. Within the Conic Porphyry alteration halo, 17 documented underground galleries were excavated (Figure 6-1). Few records exist apart from location maps which accurately document their extent; however according to Euro Sun, no significant production was recorded and most of the veins were reportedly determined to be sub-economic.

Figure 6-1: Colnic Deposit – Compilation of Historical Work



6.3 Romanian Government (1960s)

In the 1960s, three additional galleries, Colnic, Ursoi, and Mihai, were completed by the Romanian government within the alteration footprint of the Colnic Porphyry. The Ursoi tunnel was approximately 500 m in length and reportedly intersected 46 north-trending veins, eight of which were tested by crosscuts. Veins were recorded as 3 cm to 1.5 m in width (mainly around 20 cm) and mineralized with pyrite and traces of sphalerite, chalcopyrite, and covellite, in a gangue of calcite, clay, and rare quartz.

In addition, many of the previously excavated galleries from the 19th century were re-opened and sampled. Unfortunately, all of these tunnels are now collapsed and no longer accessible. Euro Sun has obtained some underground assay data for the Colnic and Ursoi tunnels and has incorporated these data into the exploration database.

The Romanian Government initiated porphyry exploration in the South Apuseni Mountains in the early-mid 1970s. This work included airborne geophysics (magnetics) and surface sampling, which led to the discovery of the Rosia Poieni porphyry deposit, located 27 km northeast from the Colnic Porphyry and 3 km from the Rosia Montana gold deposit. This deposit has been mined by the state mining company and is presently active on a limited basis.

6.4 Minexfor-Deva (mid 1970s to 1997 and 2000 to 2003)

Following discovery of the Rosia Poieni deposit, regional work by the Romanian State exploration company, Minexfor–Deva (Minexfor), identified the Colnic and Rovina areas as prospective for porphyry Cu mineralization. In the mid-1970s, Minexfor drilled a 650 m deep vertical hole at Colnic (drill hole F-2; Figure 6-1) targeting a magnetic high anomaly identified from the Romanian Government's airborne survey. Only a summary log was provided to Euro Sun, which documents weakly anomalous Cu grades (averaging 400 ppm) between surface and 240 m depth and stronger anomalies (averaging 1,000 ppm) from 240 m to 650 m depth. There are no gold analyses.

In 1974 Minexfor initiated a diamond drilling program at the Rovina Deposit (referred to as the Bucureşci–Rovina Property in historical documents) to test the extent of the porphyry-style mineralization. Over the next ten years, 34 holes totalling 23,119 m were drilled and sampled for Cu and intermittently for Au, Ag, Pb, Zn, Mo, Fe, and S. Holes were vertical and averaged 680 m in depth. In addition to the drilling, two levels of underground galleries were excavated in the form of grid patterns through the mineralized porphyry body to provide channel sampling and underground drilling stations (Figure 6.2).

In 1976 and 1977 IP/resistivity, natural polarization, and gamma ray geophysical surveys were reportedly completed by the Romanian government at Colnic. The surveys were done over ten north–south-oriented lines, spaced 200 m apart; however, results have not been provided to Euro Sun.

In 1982 Minexfor returned to the Colnic Deposit area to complete 500 m of trenches and surface pits, 500 m of exploration tunnels, and approximately 3,550 m of core drilling. The drilling consisted of four wide-spaced drill holes (FA, FB, FD, FF) located to the north and east of Euro Sun's current drilling (see Figure 6-1). These holes were vertical and drilled to depths ranging from 490 m to 1,200 m. Only summarized details of these holes were provided to Euro Sun; however reportedly long intervals of weakly to moderately anomalous Cu grades (230 ppm to 710 ppm) were intersected, starting at depths generally greater than 300 m. There are no gold analyses.

Minexfor completed additional magnetic and gamma ray geophysical surveys during 1983 to 1984, together with a soil geochemistry survey. Euro Sun did not receive any of the results of these surveys. From 1986 to 1987, Minexfor briefly explored the Rugina intrusive–sediment contact-related prospect. Rugina is defined by anomalous values of lead and zinc from surface sampling and is located approximately 500 m to the northeast of Colnic. Euro Sun has indicated that to the best of its knowledge this prospect was never drill-tested.

Figure 6-2: Underground Portal now Collapsed at Rovina

In 1986, after ten years of drilling at the Rovina Deposit and development of underground access (see above) a resource estimate for copper was completed. Euro Sun purchased this data from the NAMR. As the resource is not CIM-compliant, and has been superseded by more recent estimates, it is not included in this section.

In 2000, Minexfor returned to the Colnic Deposit and completed additional trenching and rock sampling, followed by eight core holes (F7 to F9 and F14 to F18) totalling 1,100 m (Figure 6-1). These holes were drilled at angles ranging from vertical to almost horizontal in the area of Euro Sun's current drilling and intersected stockwork-style mineralization. Gold values appear to be in a similar range as those reported by Euro Sun, but copper was not assayed by Minexfor. Two of the holes (F14 and F15), were drilled to the south and returned only weak Au anomalies. No additional work was reported by Minexfor subsequent to this drilling. Euro Sun purchased the paper drill logs with assay results of this program from the NAMR. Some of this drill core was preserved and Euro Sun reviewed available core. The core was not in good condition; however, key mineralization features were observed.

In 2002-2003, Minexfor completed a diamond drill program in Valea Garzii within the Ciresata area. Six vertical drill holes were completed for 1,200 m of drilling to a maximum depth of 200 m. One of these holes (F-4) contained anomalous Au-mineralization increasing with depth; copper was not assayed. Euro Sun purchased the paper drilling logs with assays of this program from the NAMR.

6.5 Rio Tinto (1999 to 2000)

In 1999, Rio Tinto was granted a non-exclusive prospecting permit by the Romanian government over an area covering approximately 24 km x 30 km. This area included the current boundaries of Euro Sun's Rovina Licence. Subsequent to the completion of a reconnaissance-style exploration program in December of that year, Rio Tinto applied for and was granted an Exploration Licence over this same area. A more detailed exploration program commenced, comprising:

- regional stream sediment geochemical sampling
- grid soil geochemical sampling
- rock chip sampling over selected target areas
- helicopter-borne magnetic/radiometric survey (Furgo Airborne Corp., Canada)

The exploration work by Rio Tinto identified several targets within their license; however, the license was relinquished ahead of schedule after only one-year of exploration. Euro Sun purchased Rio Tinto's final exploration report from the NAMR.

6.6 Euro Sun (2004 to 2012)

In 2004, the Rovina property was acquired by the Euro Sun wholly owned subsidiary, SAMAX Romania SRL, as a one-year non-exclusive Prospecting Permit. That year, Euro Sun purchased and compiled historical data, completed property wide reconnaissance sampling and mapping with a focus on known prospects.

In 2005, Euro Sun applied for an Exploration License and following an open-public tender and application process, was officially awarded the Rovina License (covering 9,351 ha).

Euro Sun completed generative exploration work during 2005-2006, which included reconnaissance style rock chip sampling, geologic mapping, and sampling at 1:5000 scale, soil geochemistry grids and ground magnetometer surveys and IP Resistivity surveys.

In 2006, drilling commenced on the property, and to date has completed 302 diamond drill holes, including geotechnical drilling, for a total of 136,705 m drilled.

In 2007, field programs included geologic mapping and sampling. This was followed up with soil geochemistry, ground magnetometer, and IP Resistivity surveys. In total approximately 34 km^2 of ground magnetometer surveys were completed over the property along with 24.55-line km of IP ground surveys. Over 19 km^2 of soil geochemistry surveys have also been completed on the property.

In 2007, AMEC Americas Limited (AMEC) completed a NI 43-101 mineral resource estimate for the Colnic and Rovina porphyry deposits. Only the drilling completed during 2006 was incorporated into this mineral resource estimate, which included 49 drill holes (15,714 m) from the Colnic deposit and 17 drill holes (8,435 m) from the Rovina deposit.

Following the 2007 generative exploration programs and drilling, the Ciresata deposit was discovered in early 2008 with Au-Cu mineralization occurring 50 m to 100 m below the surface.

In 2009, PEG Mining Consultants Inc. (PEG) completed a NI 43-101 resource estimate for the Colnic, Rovina, and Ciresata Deposits incorporating the late 2007 and 2008 drilling results available as of April 8, 2008 for Rovina and as of September 30, 2008 for Colnic and Ciresata. The effective date of the resources was September 30, 2008. Based on the 2008 resource estimate, PEG completed a PEA in April 2010.

Between 2009 and 2010, Euro Sun interrupted the work on the RVP to focus its exploration effort on the more advance RDM project in Brazil.

Following completion of the PEA in early 2010, Euro Sun returned to Romania and completed four vertical deep drill holes on the Ciresata deposit to assess the continuity of the upper part of the Ciresata deposit as well as the vertical extent of the mineralization.

In preparation to a prefeasibility study, Euro Sun resumed drilling on the property in 2011. The aggressive drill program added 21 drill holes at Ciresata, 18 new in-fill drill holes on the Colnic porphyry, and 19 additional in-fill drill holes on the Rovina porphyry. For Colnic and Rovina the drill program was focused on converting Inferred resources to Indicated.

In September 2011 through an exploration collaboration agreement between Euro Sun and Barrick Gold Corporation initiated drill target generation and drilling program to test depth and lateral extensions at the Ciresata deposit as well as satellite targets. Drilling on the Rovina Exploration License was halted in 2012 as required by the process of conversion to a Mining License. The exploration program conducted by Euro Sun since 2004 is described in detail in the Exploration and Drilling section of the report since this work is relevant to the resource estimate described in this report.

No further exploration activity was conducted on the Rovina Exploration License since the end of the drilling program in July 2012.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geologic and Metallogenic Settings

The majority of the mineral deposits in the Romanian-Hungarian region are located in the Carpathian Fold Belt, an arcuate orogenic belt and part of a much larger belt extending westward into Austria and Switzerland and southward into Serbia and Bulgaria, as shown in Figure 7-1. These belts developed during the late Cretaceous and Tertiary, following closure of the Tethys Ocean, due to the collision of continental fragments of Gondwana with continental Europe and the related subduction of small, intervening oceanic basins (Alderton and Fallick, 2000).

The development of the Carpathian Fold Belt was accompanied by widespread igneous activity; including a suite of late Cretaceous to early Eocene acidic to intermediate intrusive and extrusive rocks known as banatites. These rocks are believed to have formed during the early stages of subduction and are host to several copper-molybdenum-iron porphyry and skarn deposits in southeast Romania and extending northeast to the West Apuseni Mountains. The prominent Z-shaped Carpathian fold-and-thrust belt through Hungary, Slovakia, Ukraine, Romania, and Serbia (Figure 7-1) is associated with the Neogene Alpine orogeny, whereby north-south compressive tectonics in western Europe resulted in the eastward extrusion of the Alpaca and Tisia microplates into present Romania (Neubauer et al. 2005). The South Apuseni Mountains represent a somewhat isolated massif of volcanism and ore deposits within the Carpathian orogenic Belt (Figure 7-1). Neubauer et al. (2005) have proposed a plate tectonic setting for the Carpathian-Panonian orogenic system, whereby the volcanism in the South Apuseni Mountains (which lie approximately 250 km west of the westward-verging subduction front) is related to slab roll-back and break-off. This general subduction tectonic setting, while more complicated than the American Cordillera due to the micro-plate interaction, is typical of most gold (± copper) porphyry deposits worldwide (i.e., Cajamarca Belt, Peru; Maricunga Belt, Chile; Cordillera Central of Luzon, Philippines; [Sillitoe, 2000 and Seedorff, 2005]). Associated with this tectonic event are Neogene volcanic and subvolcanic rocks.

In the South Apuseni Mountains, where the RVP is located, these Neogene volcanic and subvolcanic rocks are subdivided into three main groups (Alderton and Fallick, 2000):

- early Miocene acidic tuffs and ignimbrites
- mid-Miocene to Pliocene calc-alkaline stratovolcanoes (associated with epithermal and porphyry mineralization)
- Pliocene to Pleistocene alkaline volcanic rocks

Figure 7-1: Schematic Drawing of the Carpathian Arc and Associated Mineral Deposits

Source: Euro Sun 2006

These volcanics intrude and overlie a basement of Palaeozoic (and older) metamorphic rocks, Mesozoic ophiolites, and sedimentary flysch rocks. The structural setting in this area is interpreted to be associated with an extension within a strike-slip regime in the Carpatho-Pannonian realm (Milu et al. 2003, Neubauer et al. 2005), which created pull-apart basins. Intersections of these basins with major east–west and northeast-trending pre-Laramian tectono-magmatic lineaments and northwest-trending Laramian lineaments are believed to have concentrated areas of increased Tertiary volcanic and metallogenic activity (Balintoni 1994; Rosu et al. 1997, 2000a in Milu et al. 2003).

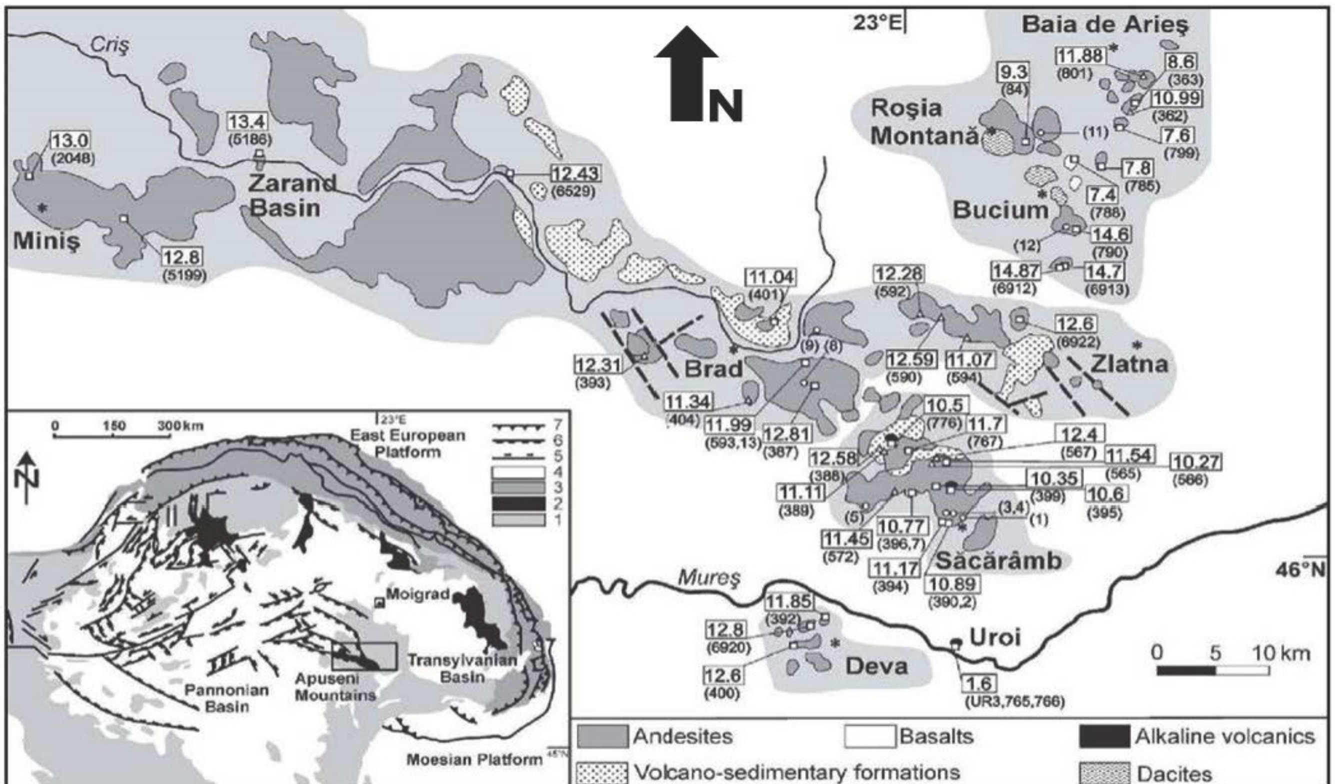
Regional dating studies from various locations within the South Apuseni Mountains indicate several Neogene calc-alkaline volcanic centres, representing three main episodes of volcanism, were active between c. 15 Ma and 1.6 Ma (Rosu et. al., 2004, in Manske and Hedenquist, 2006). Volcanism commenced in the east of the Apuseni Mountains (Rosia Montana-Bucium and areas adjacent to the Brad district), moved westward (into the Zarand basin), and then back eastward (Baia de Aries, Zlatna, Sacaramb, and Deva areas) to the final phase at Uroi (Figure 7-2 and Figure 7-3).

The first volcanic episode was explosive, occurring ca. 15 Ma, is poorly developed/preserved and is represented by rhyodacite to dacitic tuffs that are interbedded with marls and deep-sea pelagic sediments (Cioflica et al. 1996 and Rosu et al. 2000b, in Milu et al. 2003). The second episode (7.4 to 14.8 Ma) is predominantly represented by calc-alkaline intermediate subvolcanic intrusives, with some andesite extrusives and local areas of dacite intrusives. The third episode, at c. 1.6 Ma, consists of deposition of alkaline rocks including trachyandesites (Milu et al. 2003).

Different volcanic products have been described for the episodes, such as lava or extrusive domes, flows, pyroclastic and volcano-sedimentary deposits, in addition to intrusive bodies (dikes, domes, and micro-laccolithes) that partly represent the rooted area of the volcanoes, and a large variety of intrusive breccias (Borcos and Vlad, 1994; Tamas, 2002). The volcanoes have been described as calderas, stratovolcanoes, simple or composite volcanoes, and extrusive domes (Ianovici et al., 1969; Berbeleac, 1975). Generally, the volcanoes preserve less than a third of their superstructure, as they were affected by an intense erosion activity such as in the Sacaramb area, but some domes, like Caraci and Cetras, have retained an original morphology (Borcos in Cioflica et al., 1973).

The first two volcanic–intrusive episodes are associated with the majority of the metallogenic activity. The first, mid-Miocene episode resulted in Au-Ag epithermal mineralization, such as that of the Rosia Montana deposit (Manske and Hedenquist, 2006). The second, mid- to late Miocene episode, is represented by Au-Ag (Te) epithermal mineralization (e.g., Sacaramb, Stanija, Baia de Aries), Pb-Zn-Cu (Au-Ag) mineralization (e.g., Troiuta, Coranda, Hanes) and porphyry Cu (Au-Mo) mineralization (e.g., Rosia Poieni, Deva, Bolcana, and presumably Colnic and Rovina; Milu et al., 2003).

Figure 7-2: Age Dates, Apuseni Mountains Volcanism and Intrusive Activity



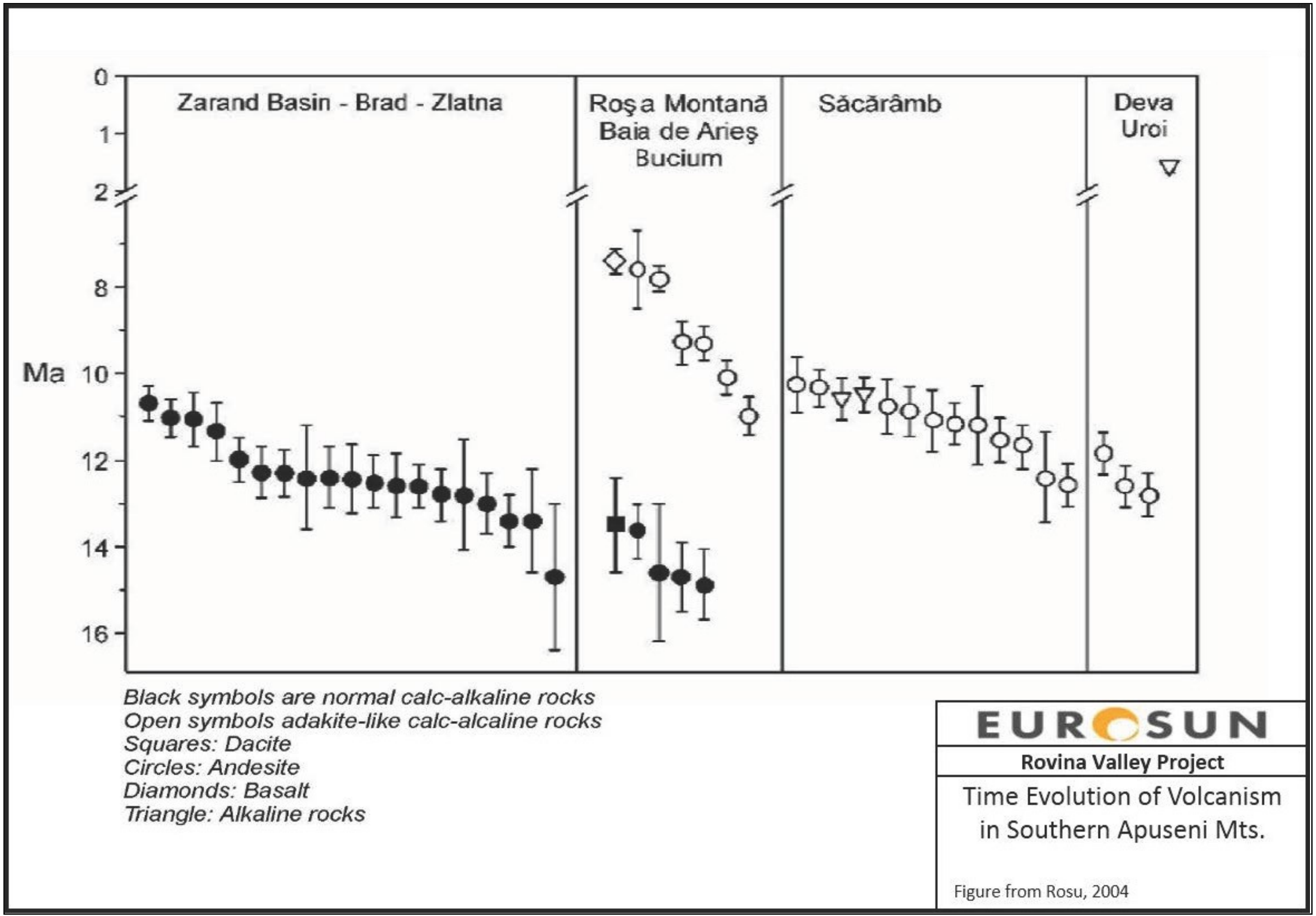
EUROSUN

Rovina Valley Project

Age Dates, Apuseni Volcanics and Intrusives

Figure from Rosu, 2004

Figure 7-3: Time Evolution of Volcanic Activity in the Southern Apuseni Mountains



The porphyry deposits and occurrences in the South Apuseni Mountains were first recognized during the 1970s and 1980s and were interpreted as being centred on shallow subvolcanic intrusions rooted in cupolas of deep-seated dioritic intrusions (Milu et al., 2003).

7.2 Rovina Valley Project Setting

The Rovina property occurs within the defined Golden Quadrilateral Mining District located just east of the Brad-Barza sub-district, and near the northern end of the Sacarimb-Brad volcanic belt (Figure 7-4). The Property covers a sequence of Neogene-aged subvolcanic intermediate intrusive rocks, which in other parts of the Golden Quadrilateral host epithermal- and porphyry-style mineralization. A variety of mineral deposit types are present in the Golden Quadrilateral area, including porphyry copper, epithermal veins (low-sulphidation, and less commonly high-sulphidation), breccia pipes, and replacement bodies. Euro Sun's exploration programs have identified gold-rich porphyry systems (Colnic and Ciresta deposits) and a copper-gold porphyry (Rovina) associated with Neogene subvolcanic intrusive complexes.

7.2.1 Colnic-Rovina-Ciresata Area

The Rovina and Colnic porphyry deposits lie within a northeastern volcanic outlier of the 8-10 km diameter, Neogene-aged, Brad–Barza volcanic field. The Brad-Barza volcanic field is well known for hosting high-grade gold veins with an estimated historic gold production of 11.2 Moz dating back to the Roman period (ca. 2,000 years ago) (Vlad and Orlandea, 2004). The Ciresata porphyry, 4.5 km south of Colnic, lies within the eastern part of the Brad-Barza volcanic field.

The basement stratigraphy and volcanic rocks of the Rovina-Colnic-Ciresata area is regionally similar to that of the Brad-Barza volcanic field (Figure 7-4 and Figure 7-5). The basal sequence comprises an upper Cretaceous flysch, locally termed the "Strate de Piriul Izvorului". This unit consists of tightly-folded siltstones, wackes, and thin interbeds of shale. The regional trend of fold axes is northwest-southeast, with some folds being overturned, resulting in southwest-dipping axial planes (Romania State Geology Map, 1:50,000 scale).

Figure 7-4: Regional Geology

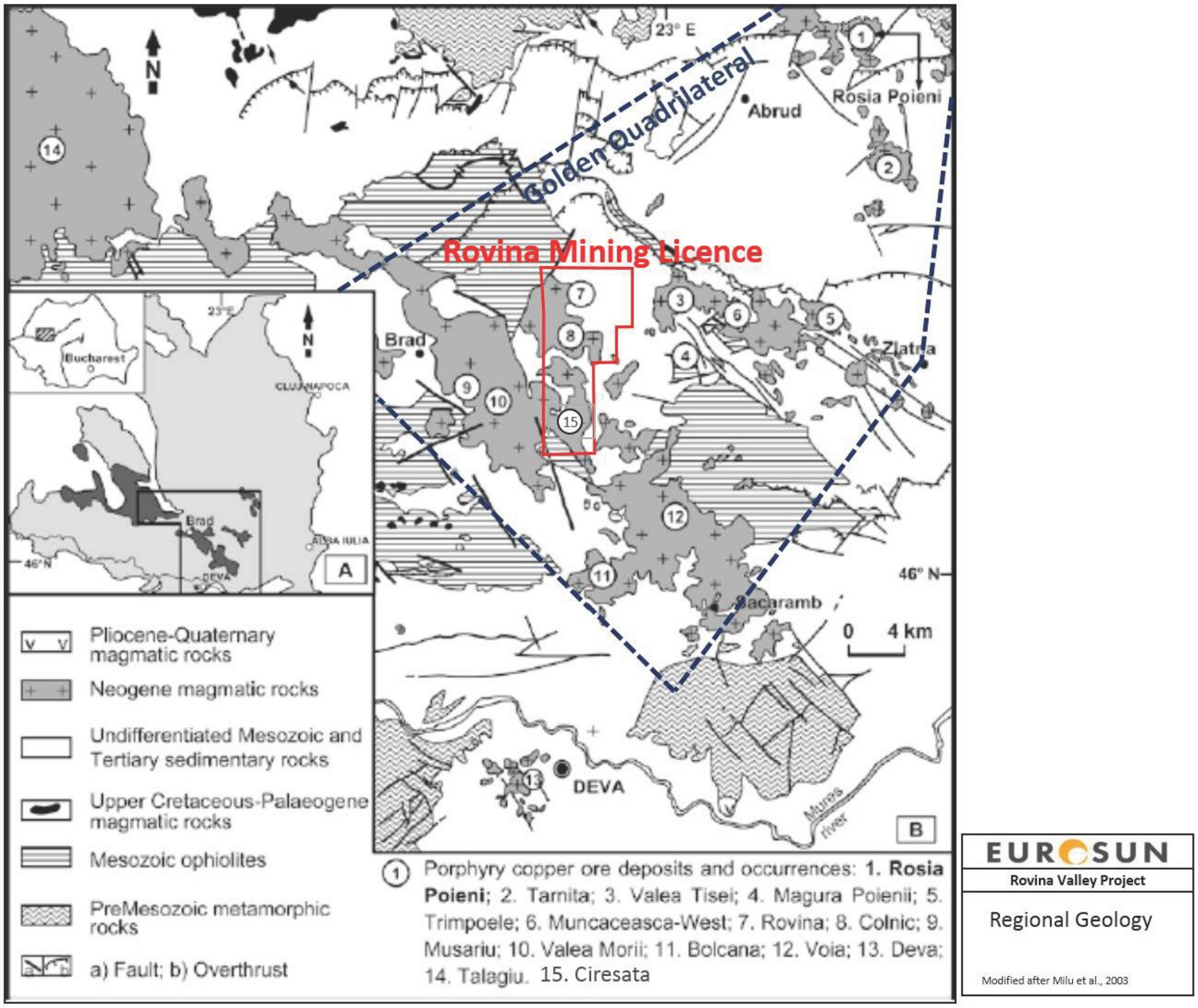
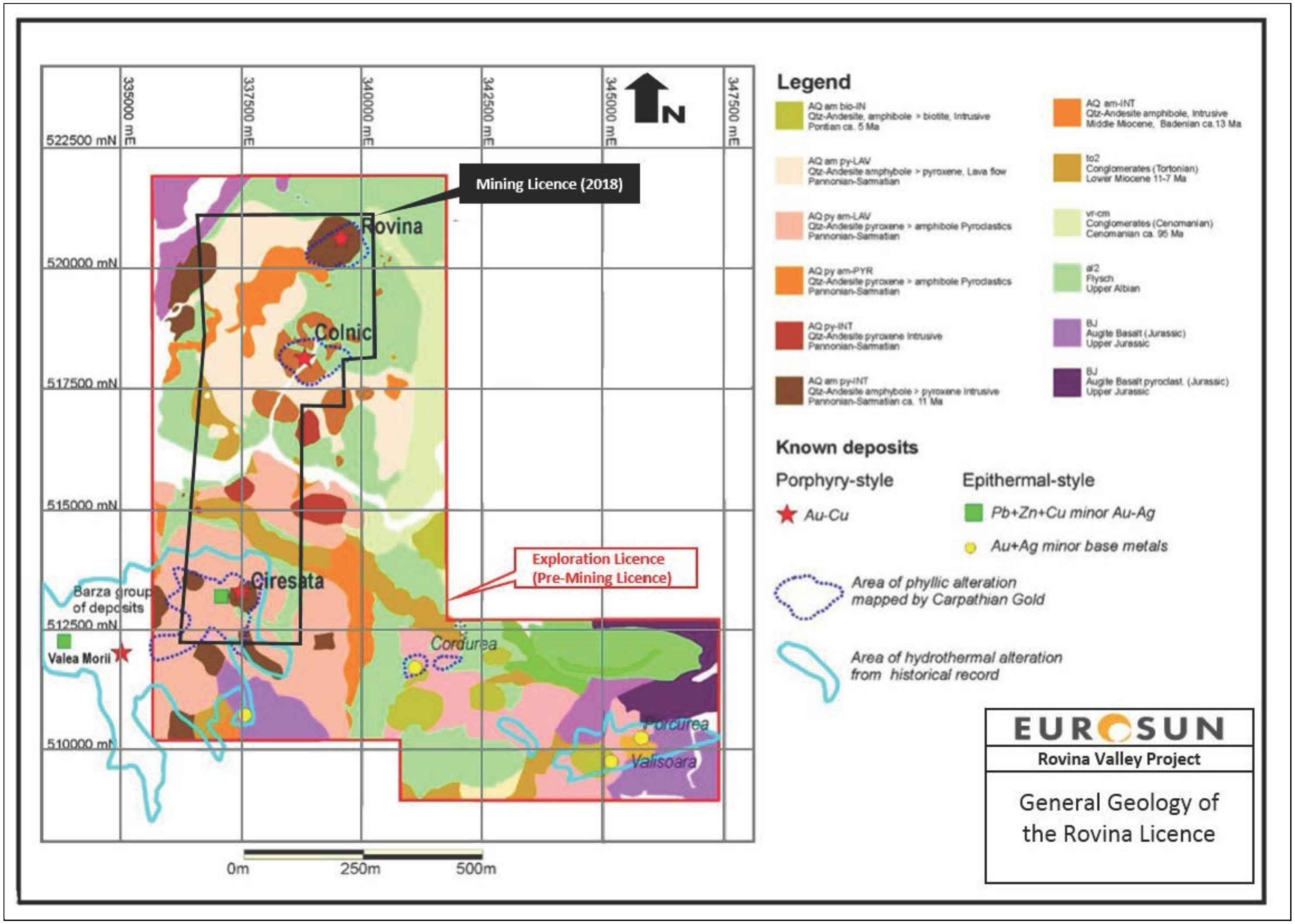


Figure 7-5: Geology of the Rovina License, Euro Sun 2008



Unconformably overlying this unit are a series of Neogene-aged, intermediate composition, sub horizontal volcaniclastics and flows which have limited aerial extent. Common in the area are isolated bodies of massive plagioclase–amphibole ± pyroxene ± biotite andesites (the “Andesite tip Barza”) which are mapped as subvolcanic intrusives (Figure 7-5).

Lava flows and subvolcanic intrusives from the Rovina-Colnic area cover an arcuate-shaped belt that is approximately 7 km long and 2 to 3 km wide (Figure 7-5). The porphyry mineralization at Rovina and Colnic is hosted by porphyritic hornblende-plagioclase ± quartz ± pyroxene diorites (Damian, 2006, in Ruff, 2006); these are interpreted as subvolcanic intrusives. At Ciresata, porphyry mineralization is hosted in hornblende-plagioclase ± quartz diorites and hornfeld Cretaceous sediments (Damian, 2008).

Mapped phyllic alteration halos at Rovina, Colnic, and Ciresata occur in subvolcanic hornblende feldspar porphyries, volcaniclastic units, and locally in Cretaceous sediments.

The Valea Morii Cu-Au porphyry deposit within the Barza magmatic complex, located just outside the Rovina Exploration License (Figure 7-4), has age dates ranging from 11.41 Ma to 11.30 Ma (Kouzmanov et al., 2006). Age dates on proximal barren andesite intrusions cover a wider range, both pre- and post-dating mineralization, at 12.44 Ma, 11.87 Ma, and 10.95 Ma (Kouzmanov et al., 2006).

Geological mapping coupled with ground magnetic surveys by Euro Sun in the Rovina-Colnic area indicate the presence of late-stage hornblende-feldspar porphyries, with primary magnetite occurring within the alteration halo of the Colnic porphyry system at the Cornetel Peak. These are interpreted to represent post-mineralization intrusives. Thus, based on present data, mineralization is bracketed by the basal volcaniclastic unit at Rovina and the post-mineral subvolcanic intrusives at Colnic, and may be of a similar age to the Valea Morii porphyry mineralization (i.e., about 11.4 Ma).

7.3 Deposit Geology

7.3.1 Introduction

Each of the Rovina, Colnic, and Ciresata porphyries share many basic geologic-mineralization attributes. These include association with both subvolcanic intrusives of similar composition and similar alteration suites. The mineralized porphyries at Rovina, Colnic, and Ciresata display moderate to intense potassic hydrothermal altered cores, and strong quartz stockwork veining. The Au-Cu mineralization manifests as stockwork veining and disseminations of pyrite and chalcopyrite, centred on porphyritic, subvolcanic-intrusive complexes of hornblende-plagioclase diorites. The Colnic and Ciresata porphyries classify as gold-rich, with the Rovina porphyry falling within the Cu-Au subtype. All three porphyries contain many of the features common in gold-rich porphyries [i.e. dioritic, calc-alkaline stock associated and abundant magnetite alteration (Sillitoe, 2000)].

Geometry of the mineralization and host porphyries is different for each of the deposits. At Rovina, the host porphyries are generally cylindrical and vertical. At Colnic, the porphyries are lobate, with mineralization decreasing with depth and a phyllic-altered cap locally preserved. Both Rovina and Colnic porphyries intrude extensive igneous-magmatic breccia carapaces, whereas

Ciresata mineralization is centred on a relatively narrow subvolcanic "neck" with a significant amount of mineralization hosted in adjacent hornfelsed sediments.

No significant porphyry-related epithermal or skarn mineralization has been identified, with only minor occurrences of gold ± silver, lead, and zinc in narrow epithermal veins within the phyllic alteration halo at Colnic. In addition, no significant weathering oxidation of hypogene sulphides is observed. Detailed description of the logged lithologies, alteration, and mineralization for each deposit is described in the following sections.

7.3.2 Rovina Deposit Geology

Geology Summary

Copper-gold mineralization at Rovina is hosted in multiple composite plagioclase-hornblende porphyritic subvolcanic intrusives. This mineralization reaches the surface and is exposed in one location as outcrops in the Baroc valley drainage over approximately 300 m (Figure 7-6). The remaining sparse and scattered outcrops are phyllic-altered fragmental volcanics and porphyritic volcanics, which comprise a mapped phyllic alteration halo of 1,000 x 600 m. The mineralized porphyries are cylindrical and vertical, with mineralization extending up to 600 m below surface. At least three mineralized porphyries are recognized. The main porphyry (Rovina Porphyry) intrudes (or is surrounded by) a brecciated porphyritic unit. This breccia unit is locally mineralized and is interpreted as an intrusive magmatic breccia (IMB) carapace to an upper-level intrusive. The last, post-mineral stage of intrusive activity is the emplacement of a phreatomagmatic breccia complex, which cuts earlier porphyry units and is grade destructive. Surface geology (Figure 7-6) and two cross-sections through the Rovina porphyry (Figure 7-7 and Figure 7-8) are shown below. Plan map locations for the cross-sections are shown in Figure 7-6.

Figure 7-6: Rovina Porphyry Surface Geology

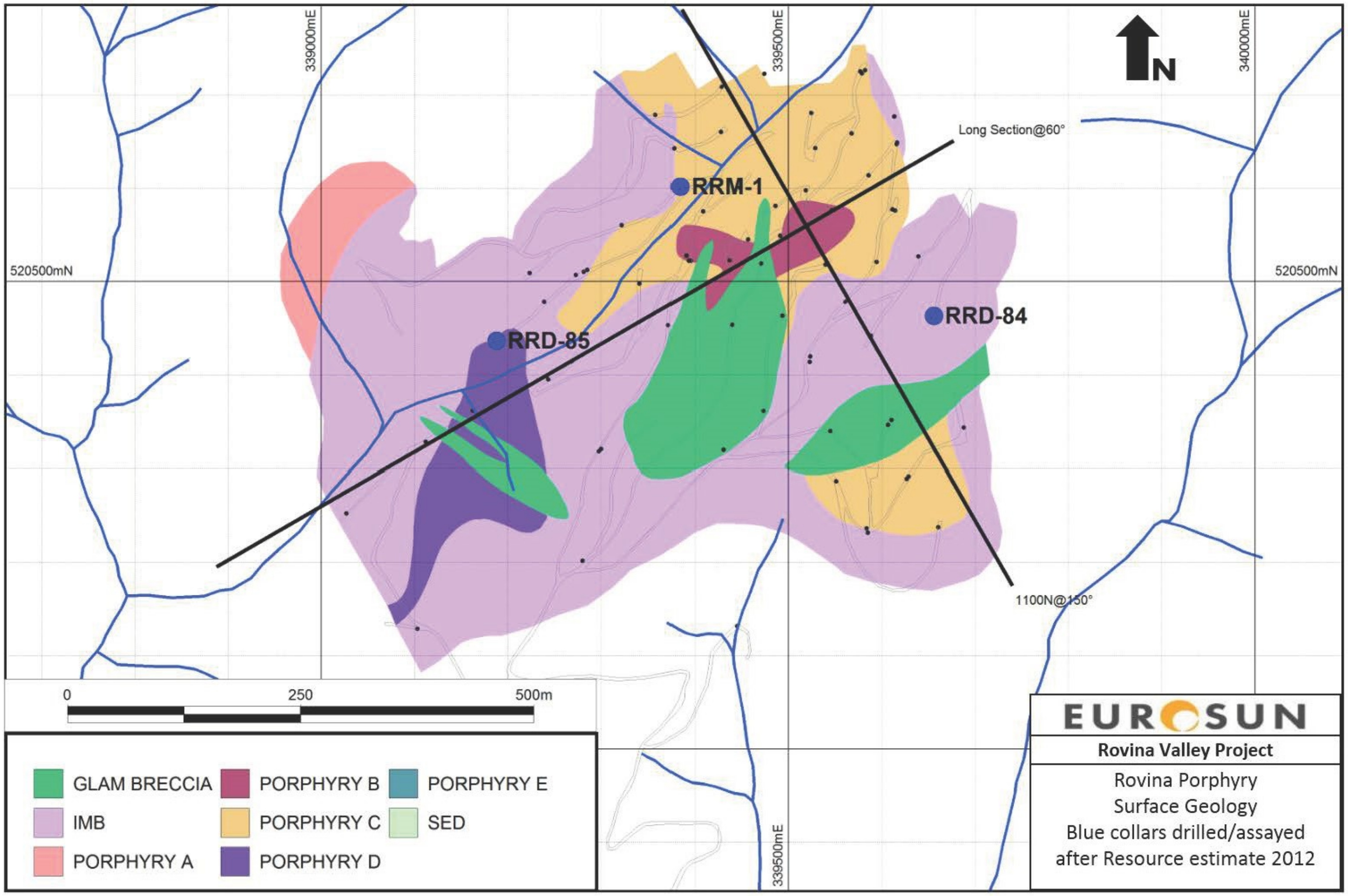


Figure 7-7: Cross-Section of Rovina Porphyry with Major Lithologic Units

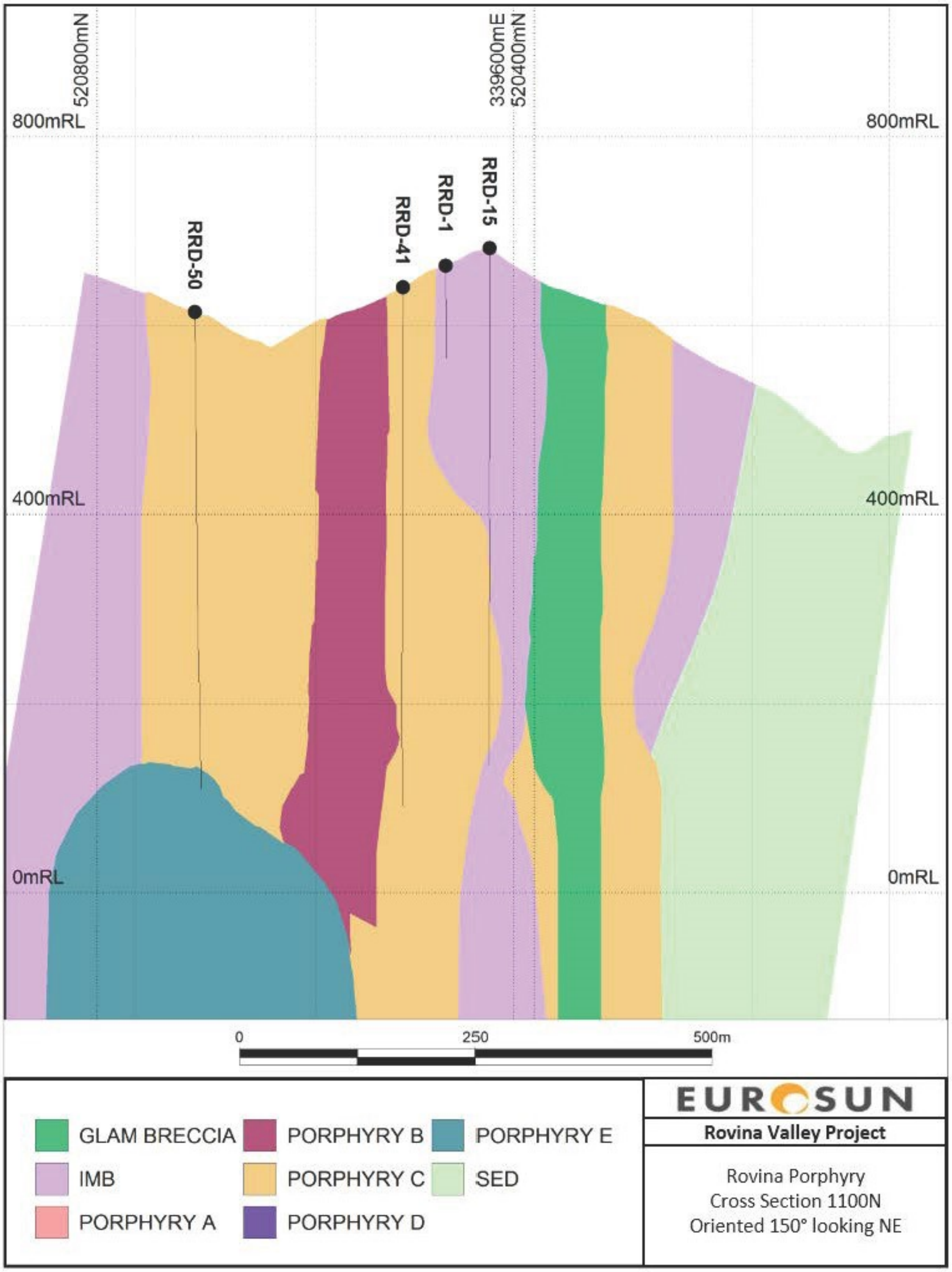
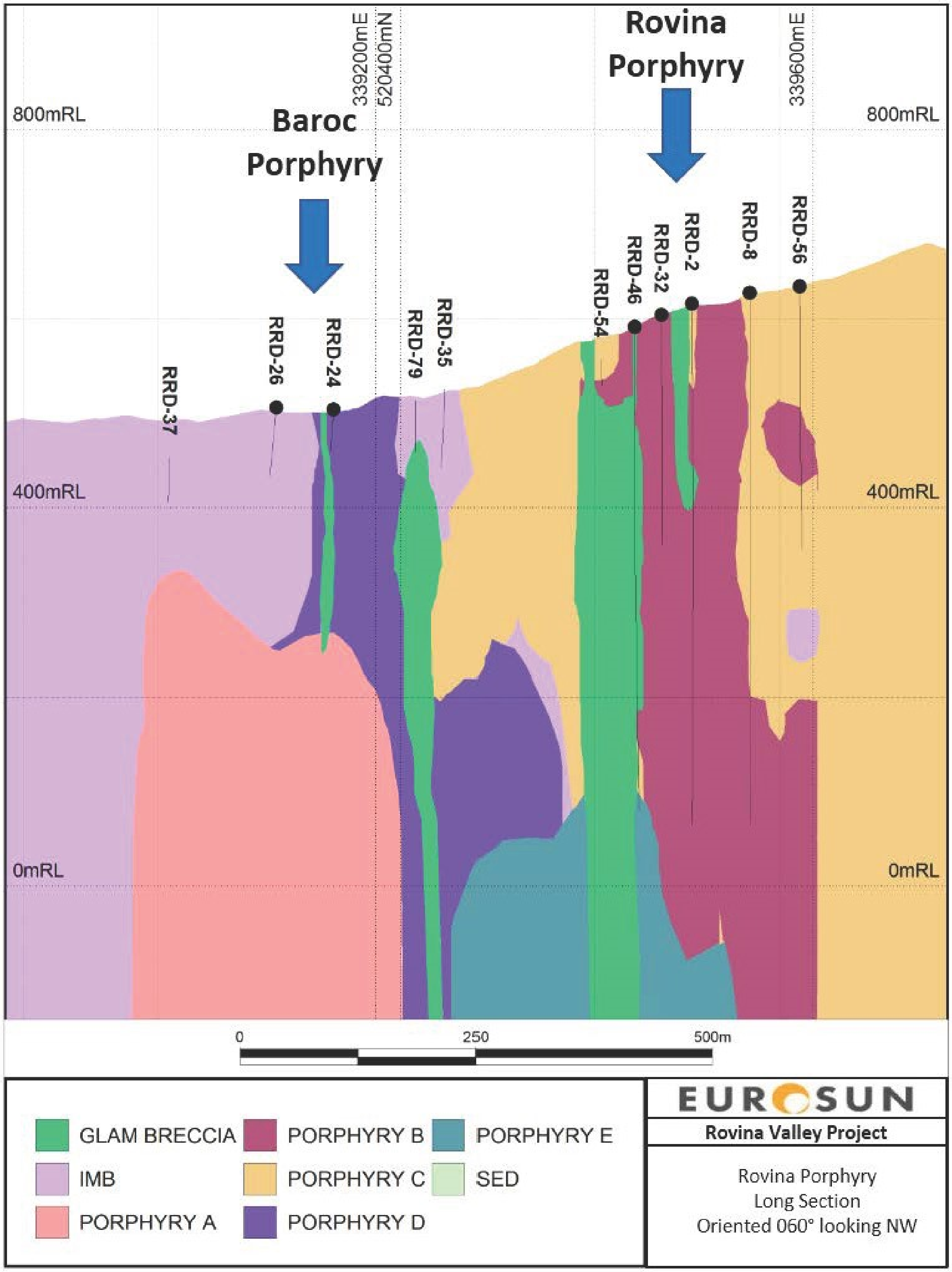


Figure 7-8: Long Section of Rovina Porphyry with Major Lithologic Units



Multiple inter-mineral intrusive phases into the Rovina porphyry have been recognized with features such as breccia clasts of intense stock-worked porphyry within later, less intense stockwork porphyry. An example is Porphyry B intruding the axial position of the Rovina Porphyry, as shown in Figure 7-9, clearly illustrating a contact between the younger inter-mineral Porphyry B and the older Porphyry C (Rovina Porphyry). Intense stockwork veining in Porphyry C contrasts against the moderate stockwork veining in Porphyry B in the upper section of the core. These multiple events lead to complex and overprinting stockwork veining and alteration features, and likely resulted in grade enhancements.

Figure 7-9: Photo of Drill Core from RRD-45 Contact between PoC and PoB

Recognized alteration types associated with mineralization include an early potassic (biotite ± K-spar), magnetite (several events), and magnetite-propylitic (termed MACE, with magnetite, chlorite, and epidote). The MACE alteration often overprints the earlier potassic alteration. Phyllic alteration occurs around the margins of the mineralized porphyries.

Petrographic description samples from the Rovina Porphyry indicate a variably potassic and magnetite-altered plagioclase-hornblende porphyry is host to disseminated and veinlet-controlled chalcopyrite (Table 7-1).

Table 7-1: Petrographic Description of Mineralized Rovina Porphyry

Sample	Petrographic Summary Description
RRD-9-1 (DH RRD-9 at 384.57 m)	Altered plagioclase-amphibole porphyry (dioritic?), with disseminated and fracture-controlled chalcopyrite mineralization associated mainly with potassic alteration (biotite-K-feldspar); early quartz-amphibole-magnetite±carbonate-chalcopyrite-pyrite veinlets are cross-cut by later quartz-chalcopyrite-carbonate-magnetite-pyrite-Au veinlets.
RRD-13-2 (DH RRD-13 at 184.78 m)	Altered plagioclase-amphibole porphyry (dioritic?), with disseminated and fracture-controlled chalcopyrite mineralization associated mainly with potassic alteration (K-feldspar-biotite); magnetite-rich fractures are common, with the assemblage quartz-magnetite-calcite±amphibole-K-feldspar-chalcopyrite.
RRD-18-3 (DH RRD-18 at 165.76 m)	Altered plagioclase-amphibole porphyry (dioritic?), with disseminated chalcopyrite mineralization associated mainly with potassic alteration (biotite±K-feldspar); overprinted by minor quartz-magnetite-biotite-plagioclase-scapolite(?)-chalcopyrite-pyrite veinlets and later quartz-magnetite±pyrite stringers.

Source: Clarke and Kiddie, 2007

Rovina Lithology and Logging Unit Descriptions

The detailed logging protocol of Euro Sun has differentiated the major lithologic units into subunits, based primarily on textural features and on cross-cutting mineralization features in the case of inter-mineral porphyries. Five different porphyries have been interpreted at Rovina and a list of major lithologic units and logging codes is shown in Table 7-2.

Table 7-2: Major Lithologic Units and Logging Codes for Rovina

	Code	Name	Description/Location
Rovina composite hornblende-plagioclase porphyries	64	Rovina Por. (POC: early-mineral)	Principal mineralized porphyry
	65	Intermineral Por. (POB: inter-mineral)	Inter-mineral axial intrusion to POC
	63	Baroc Valley Por. (POD: late-inter-mineral)	Satellite porphyry body
	62	Potassic-silicic Por. (POE: late-mineral)	Deep occurrence
	66	Northwest Por. (POA: late-mineral)	Minor importance
	69	Breccias BX undifferentiated	Minor importance, localized orthomagmatic breccias within Por. Units
Rovina Wall Rocks	67	Intrusive Magmatic Breccia Complex (IMB)	Heterogenous fragmental hornblende-feldspar Por. with similar composition groundmass; predominantly wall rock, locally mineralized
	68	Flysch sediment (SED)	Folded Cretaceous sediments, localized occurrence in southeast, unmineralized
Rovina post-mineral units	61	Glamm Breccia (GBX)	Green rock-flour matrix with polylithic clasts locally derived; phreatomagmatic breccia complex with several facies; grade destructive.

Overburden (OB – 600): The completely oxidized colluvium, alluvium, residual soil, and weathered rock occurring at the top of most drill holes.

Glamm Breccia (GBX – 610): The glamm breccia (phreatomagmatic breccia) tends to have distinct, sharp cross-cutting contacts with the surrounding wall rocks. This unit is generally polylithic, containing sand to cobble scale, rounded to angular clasts of mineralized and barren porphyry, previously formed breccia phases, and vein fragments. This unit appears to have formed post-mineral, and aside from minor locally present carbonate ± base metal mineralization, it has not been cross-cut by mineralized quartz or sulphide veins or overprinted by earlier potassic or MACE alteration. Most of the gold and copper mineralization occurring within the glamm breccia is restricted to clasts of strongly veined porphyritic wall rock that have been incorporated into this unit close to the margins of the breccia pipe. The matrix of the glamm breccia is generally chlorite-clay enriched, giving the unit a characteristic pistachio green to light grey (bleached) colour. The margins of clasts have also been affected by this alteration, resulting in bleached rims. Four texturally distinct sub-categories of glamm breccia have been recognized in drill core, described below.

Crystal Rich Glamm (XGBX – 611): This rock type was previously logged as a late (post-mineral) fine- to medium-grained feldspar-amphibole porphyry because of its homogeneous, porphyritic appearance. It has been interpreted here as an early, crystal-rich phase of the glamm breccia unit, due to its ubiquitous occurrence within this unit, similarities in the style and intensity of chlorite-clay alteration, and complete lack of mineralized veining and potassic/MACE alteration. Crystal-rich glamm generally contains 5–7 modal percent 2–3 mm feldspar, and 5–7 modal percent 2–3 mm mafic phenocrysts, within a much finer grained chlorite-clay enriched matrix. This unit is generally cross-cut by thin glamm breccia shoots, and clasts of crystal-rich glamm are common within younger glamm breccia phases. Locally, a weakly-developed lamination has been observed that may indicate a genetic relationship with the more strongly-banded laminated glamm breccia described below. This rock type is generally unmineralized.

Laminated Glamm (LGBX – 612): This rock type is characterized by a pervasive flow banding consisting of sub-parallel, commonly irregular laminations defined by composition and grain size variation. Previously, laminated glamm breccia was included as part of the matrix-rich glamm. It has been distinguished here due to its porphyritic appearance, which resembles the crystal-rich glamm described above. This unit may also be cross-cut by matrix- or clast-rich glamm breccia shoots, and clasts of this rock type are common within younger glamm breccia phases. This rock type is generally unmineralized.

Clast-Rich Glamm (CGBX – 613): This rock type is generally poorly sorted, containing angular to sub-rounded clasts of strongly altered/mineralized/veined porphyry, barren porphyry, previously formed breccia phases, and vein fragments, within a pistachio green to light grey (bleached) chlorite-clay enriched matrix. Close to the margins of the breccia pipe, clast-rich glamm breccia may contain significant copper/gold mineralization within clasts of mineralized wall rock that has been incorporated into the breccia unit. Where mineralized clasts do not occur, clast-rich glamm breccias are generally unmineralized. Clast-dominated glamm breccias grade into, and are interfingered with, matrix-dominated breccias, suggesting that these two rock types may be related. The Glamm breccias possibly represent the marginal facies to matrix-dominated breccia shoots.

Matrix-Rich Glamm (MGBX - 614): The matrix-dominated glamm breccia is finer grained, better sorted, and more comminuted than the clast-rich glamms described above. The rock is generally macroscopically structureless and has a pistachio green to light grey (bleached) colour due to pervasive chlorite-clay enrichment. Where mineralized clasts do not occur, this rock type is generally unmineralized.

Amphibole-Feldspar Porphyry (Porphyritic Diorite – 620, 630, 640, 650, and 660): The majority of the veining, mineralization, and alteration in the Rovina deposit are hosted by a series of medium- to coarse-grained amphibole-feldspar porphyry stocks. These units generally contain approximately 7 to 10 modal percent 3 to 12 mm black green euhedral prismatic hornblende porphyrocrysts, and 15 to 20 modal percent 1 to 4 mm white/colourless subhedral-blocky prismatic, zoned plagioclase phenocrysts within fine, granular to aphanitic groundmass. The various porphyry stocks at Rovina (POA, POB, POC, POD, and POE) were identified as separate intrusive phases using a combination of observations, including the alignment of phenocrysts adjacent to intrusive margins, truncation of quartz veins within older porphyry phases cross-cut by younger ones, and the incorporation of quartz vein fragments and quartz veined xenoliths within younger porphyry phases that have been emplaced into older, previously veined phases. Decrease in phenocryst size and sudden changes in grade and alteration type were also considered when distinguishing between earlier and later porphyry intrusions. Within each porphyry unit, finer grained (621, 631, 641, 651, and 661) and coarser grained (622, 632, 642, 652, and 662) end-members were identified during logging, as well as intervals displaying magmatic foliation or lamination (623, 633, 643, 653, and 663).

In total, five amphibole-feldspar porphyry stocks were identified at Rovina, namely (from youngest to oldest):

1. Porphyry A (660) – Northwest (Baroc Valley) Porphyry (late mineral)
2. Porphyry E (620) – Potassic-Silicic Porphyry (late mineral)
3. Porphyry D (630) – Baroc Valley Porphyry (late inter-mineral)
4. Porphyry B (650) – Intermineral Porphyry (inter-mineral)
5. Porphyry C (640) – Rovina Porphyry (early mineral).

Intrusive Magmatic Breccia (IMB – 670): The intrusive magmatic breccia is a pre-mineral clastic unit that appears to form the host rocks to the mineralized porphyry stocks at Rovina. This unit generally has a complex texture and contains sub-angular to rounded igneous and sedimentary rock fragments within a fine-grained, granular to porphyritic matrix. This unit is affected by early potassic and MACE alteration and is cross-cut by mineralized quartz and sulphide veining. Where this unit is strongly altered, margins of clasts are poorly defined, giving the rock a clotty/spotted appearance. Intervals displaying well-developed magmatic foliation are common within this unit, suggesting that it may be part of a pre-mineral diatreme breccia or sub-volcanic intrusion that subsequently became the host to the mineralized porphyry stocks at Rovina. In addition to the rock type described above, two texturally distinct sub-categories of intrusive magmatic breccia have been recognized in drill core.

Laminated Intrusive Magmatic Breccia (LIMB – 671): This unit consists of restricted intervals of moderately- to strongly-laminated intrusive magmatic breccia. Lamination is generally defined by clotty/discontinuous sub-parallel layers of magnetite-amphibole-chlorite ± sulphide alteration within a much finer grained matrix. These zones generally grade into and out of more typical intrusive magmatic breccia.

Xenolith Rich Porphyry (XIMB – 672): Intervals of clast-poor intrusive magmatic breccia with a spotty/porphyritic texture also occurs locally. These intervals generally grade into and out of more typical intrusive magmatic breccia.

Flysch Sediment (SED – 680): A locally laminated unit of very fine-grained mudstone to fine-grained sandstone was intersected to the south of the Rovina porphyry in RRD-38. This rock type appears to host the intrusive magmatic breccia unit described above. Adjacent to the contact with the intrusive magmatic breccia, this unit may be strongly fractured and biotite ± sericite/clay-enriched, becoming dark brown to pale grey/beige in colour. Fracture controlled pyrite ± silica may also occur within altered intervals.

Breccia (BX – 690): Poorly defined intervals of early to syn-mineral (possibly orthomagmatic) brecciation occur within all of the described porphyry phases at Rovina. These breccias included zones of monolithic (692) wall rock breccia and polylithic (693) brecciation that may have formed in response to magmatic fluid discharge from inter-mineral or late mineral porphyry phases. Intrusive breccias that appear to form a sheath around inter-mineral and late-mineral porphyry stocks have also been observed. In general, these units are affected by similar alteration and stockwork intensity as the surrounding rocks.

Post Mineral Dike (LD – 700): Weakly altered, un-mineralized late intrusions (dikes) have also been identified locally within the Rovina deposit. However, overall, post-mineral dikes are not common.

Rovina Alteration and Logging Unit Descriptions: Several alteration types are recognized with mineralization mainly associated with the early potassic and locally overprinting MACE alteration. A list of alteration types and logging codes is shown in Table 7-3 followed by the description of the logged alteration style.

Table 7-3: Major Alteration Units and Logging Codes for Rovina

Alteration Style	Logging Code	Description
Potassic	PT (31)	Widespread "biotization" of groundmass, magnetite stringers, minor microscopic K-spar replacements
Magnetite-propylitic	MACE (30)	Common magnetite dissemination and in stringers, quartz, chlorite, edidote, amphibole, and carbonate
Potassic-silicic (bio-K-spar-sil)	PTSI (3139)	At depth, intense '"biotization" of groundmass with silicification, minor microscopic K-spar replacements
Silicic (sil)	SIL (39)	Localized silicification
Phyllic	PH (33)	Broad wall rock halo of sericite, pyrite, quartz
Transitional Phyllic	TRPH (43)	Phyllic overprint of earlier, mostly potassic and MACE alteration; not prevalent
Argillic	A (36)	White clays and pyrite typically associated with late fracture zones
Carbonate	CC (37)	Calcite and clays associated with rare late-stage galena-sphalerite breccia fills
Propylitic	PR (42)	Rare chlorite, carbonate, pyrite in late dikes
Propylitic w/in Glamm Breccia	GM (35)	Pervasive in rock-flour matrix, chlorite, carbonate, pyrite
Weathering oxidation	Fe-Ox (41)	Localized and limited to upper few to tens of metres limonite, goethite, and red-brown hematite with white clays

Oxidation (Fe-Ox – 41): Rusty orange-brown limonite, goethite, red-brown hematite, and white clay-enriched oxidation.

Propylitic Alteration (PR – 42): Propylitic alteration within the Rovina deposit is not widespread and is generally restricted to late intrusive dikes and post-mineral breccias (i.e., Glamm Breccias). Propylitic alteration is generally light green to pistachio green in colour and characterized by a mineral assemblage containing abundant chlorite-carbonate-clay and pyrite. Aside from minor locally-present carbonate ± basemetal ± gold-bearing veins, propylitically altered rocks are generally poorly mineralized.

Propylitic Alteration within Glamm Breccia (GM – 35): The matrix of clast-rich and matrix-rich glamm breccias is generally light green to pistachio green in colour and characterized by a propylitic mineral assemblage containing abundant chlorite-clay-carbonate. Propylitic alteration has also resulted in bleaching of the margins of wall rock clasts occurring within this unit.

Clay-Sericite-Pyrite-Quartz-Carbonate Alteration (CSPQ – 44): To simplify the current alteration model, phyllic alteration (PH – 33) and transitional phyllic alteration (TRPH – 43) occurring peripheral to mineralized parts of the Rovina deposit, and less significant structurally-controlled argillic alteration (A – 36) and base metal-carbonate alteration (CC – 37) occurring along lithological contacts and within fractured/faulted zones throughout the deposit, were correlated together as clay-sericite-pyrite-quartz carbonate alteration (CSPQ). CSPQ alteration is characterized by a dominant assemblage of clay-sericite-quartz-pyrite that is generally consistent with the low-grade peripheral parts of the Rovina deposit. Approximately 5 to 15 % pyrite by volume generally occurs within this alteration type as 3-7 mm clusters of fine-grained aggregates, disseminated grains, and within mm-scale fractures. CSPQ alteration is typically light grey, greenish grey, to pinkish grey in colour.

MACE Alteration (MACE – 30w, 30m, and 30i): Magnetite-amphibole-chlorite-epidote-rich alteration (MACE), also containing K-feldspar, quartz, titanite, anhydrite, and carbonate, appears to be associated with the highest-grade intervals within the Rovina deposit. It is common for rocks within the Rovina deposit to have been potassically altered prior to becoming overprinted by MACE alteration. Therefore, where MACE alteration is less intense, the rock generally has a brownish-green to pinkish-green colour and a mineral assemblage consisting of biotite-amphibole-chlorite-magnetite-quartz-pink K-feldspar and sulphides (cpy-py). Pink, fine-grained K-feldspar is more common in this alteration type than in purely potassic alteration. Where MACE alteration is pervasive, it is texturally destructive, generally giving the rock a dark green to light green colour. The MACE alteration assemblage is typically associated with magnetite stringers and clots, a well-developed quartz-sulphide vein stockwork, and significant fine-grained disseminated cpy-py-mt mineralization.

Potassic Alteration (PT – 31w, 31m, and 31i): Potassic alteration is the most widespread alteration type occurring within the Rovina deposit. Potassic alteration is generally associated with a mineral assemblage that includes biotite-magnetite-quartz-pink K-feldspar ± trace green amphibole and chlorite. The alteration minerals occur as finely disseminated grains in the groundmass of the rock and as granular aggregates of "ratty" biotite-magnetite ± sulphides (cpy-py). Very fine, irregular stringers of magnetite are also associated with this alteration type. The amount of pink-coloured K-feldspar and amphibole/chlorite can vary greatly. Within the Rovina deposit, it is common for potassic alteration to grade into or become overprinted by MACE alteration through a gradual increase of the amount of amphibole, chlorite, and epidote present in the alteration assemblage.

Potassic-Silicic Alteration (PTSI – 3139): Potassic-silicic alteration is characterized by a lack of magnetite and an intense reddish-brown to pale pinkish-brown colour, which distinguishes it from the darker brown colour of potassic alteration. At Rovina, this alteration type is defined by the assemblage of reddish-brown coloured biotite-pink K-feldspar-quartz-epidote-chlorite and sulphides (py-po-mo-cpy). Sulphides occur as fine disseminated grains within the groundmass and within quartz-sulphide veins. The potassic-silicic alteration at Rovina is similar to the deep-seated Colnic potassic core and is characteristically of a low grade.

Silicic Alteration (SIL – 39): Silicification is characterized by pervasive bleaching and quartz enrichment ± minor epidote-chlorite-clay ± pyrite. Silicification generally gives the rock a light grey colour and increased hardness. Pyrite occurs as fine disseminated grains and grain aggregates within the groundmass and within quartz veins. In some places, this alteration type appears to be related to the potassic-silicic alteration described above.

Discussion

Within the Rovina deposit, it is common to observe more than one overprinting alteration phase within a given interval of drill core. In the drill logs, the mineral assemblage and intensity of each alteration type has been recorded, highlighting the dominant alteration type within each logged interval. The dominant alteration type was then assigned to one of 18 logging codes, which were used to create the current alteration model. Considering this, small and/or isolated intervals of alteration occurring within an otherwise homogeneous zone of a different dominant alteration type were not broken out as separate units during interpretation.

To simplify the current alteration model, argillic, phyllic, transitional phyllic, and carbonate-clay alteration were grouped together as clay-sericite-pyrite-quartz alteration (CSPQ). All of these alteration types appear to have formed late, locally overprinting earlier alteration phases. Aside from localized copper and gold mineralization occurring within some carbonate-base metal veins, these alteration types are not associated with significant mineralization.

The initial intrusion of the Rovina Porphyry (PoC) into the intrusive magmatic breccia (IMB) was followed by widespread potassic alteration within the Rovina porphyry and pervasive MACE alteration within the surrounding breccia package. Peripheral to the Rovina porphyry, MACE and potassic alteration were replaced and locally overprinted by phyllic alteration, forming an extensive quartz-sericite-pyrite halo.

Intrusion of the inter-mineral porphyry (PoB) into the Rovina porphyry (PoC) was followed by weak MACE alteration within the inter-mineral porphyry and more intense overprinting MACE alteration within the hosting Rovina porphyry. MACE alteration appears to be most strongly developed within the Rovina porphyry adjacent to the northern margin of the inter-mineral porphyry. In this strongly altered zone, overprinting MACE alteration is texturally destructive, and pre-existing potassic alteration minerals are rarely preserved. Further from the intrusive centre, overprinting MACE alteration decreases in intensity, eventually becoming secondary to the underlying potassic alteration.

Intrusion of the potassic-silicic porphyry (PoE) was followed by pervasive potassic-silicic alteration within this intrusion. However, the potassic-silicic alteration occurring within PoE appears to have had little visible effect on the surrounding wall rocks.

At Rovina, all intrusive rock types have been cross-cut by post-mineral glamm breccias. Subsequent to their formation, the glamm breccia dikes appear to have focused late, low-temperature fluids, resulting in pervasive propylitic alteration of crystal-rich and laminated end-members. Propylitic alteration within the glamm breccia has also affected the matrix to clast-rich and matrix-rich glamms and the margins of wall rock clasts.

Tectonic shattering and brecciation adjacent to intrusive contacts and glamm breccia shoots is often associated with structurally-controlled argillic alteration and/or minor carbonate-base metal veining. Late, low-temperature argillic alteration has also affected the upper parts of glamm breccia dikes and the intrusive magmatic breccia occurring to the south of the Rovina porphyry.

In the southwest, the Baroc Valley porphyry (PoD) is associated with a MACE-altered core, grading into potassic alteration closer to the porphyry's margins. The Northwest (Baroc Valley) porphyry (PoA) is associated with a very weak, propylitic to unaltered core, grading into potassic and potassic-silicic alteration closer to its margins. Overprinting potassic-silicic alteration and silicification occurs within the Baroc Valley porphyry and the intrusive magmatic breccia package adjacent to the eastern and southern margins of the PoA.

The upper parts and margins of the Baroc Valley porphyry and the Northwest (Baroc Valley) porphyry have been overprinted by retrograde phyllic and/or argillic alteration, which becomes more extensive to the southwest. Intrusive magmatic breccia occurring in this area has also been pervasively clay-sericite-pyrite-quartz enriched.

Alteration styles for the Rovina deposit are listed in Table 7-3, with inferred paragenesis and timing of the alteration assemblages shown in Table 7-5.

Mineralization Descriptions – Rovina

Gold-copper mineralization is associated with pyrite-chalcopyrite-magnetite occurring in veinlet stockworks and as finely disseminated grains. Oxidation is restricted to the uppermost few metres, with the exception of a small area in Baroc Valley at the Rovina porphyry where weathering oxidation is 15 to 25 m deep within the copper-gold mineralization. In this area, secondary copper minerals malachite and chrysocolla are observed in the weathering zone, and minor occurrences of supergene copper minerals (chalcocite) occur below the weathering zone, typically associated with short drill hole intervals of elevated copper grades.

Deposit-scale controls to mineralization are the localization of the principal hornblende-plagioclase porphyry intrusion (Rovina Porphyry PoC), which is elongated in a northwesterly direction, measuring approximately 600 m northwest x 350 m northeast. This porphyry has vertical contacts over at least 600 m in depth, and apparently terminates northward in the northeast-trending Baroc Valley zone. Lower-grade copper-gold mineralization extends down the Baroc Valley zone to the southwest, to include the Baroc Valley porphyry as a satellite to the main Rovina porphyry. This intrusive geometry suggests possible northwest structural control for emplacement of the Rovina Porphyry intersecting a northeast structural zone controlling emplacement of the Baroc Valley Porphyry (Table 7-6 for the geology map, and Figure 9-2 for Baroc Valley grade distribution). A similarly oriented structural intersection is interpreted for the Colnic deposit.

At Rovina, two early-stage magmatic-fluid alteration events are recognized (PT, MACE, and a locally occurring magnetite-only alteration). Higher grades of gold-copper mineralization are best developed and associated with broad zones of intense quartz-sulphide stockwork veining (up to 70% of rock mass). Stockwork veining intensity typically correlates with alteration intensity, and in higher-grade zones, such as in the Baroc Valley area, intense stockwork veining with overprinting MACE alteration obscures all primary rock textures. The earliest copper-bearing assemblage is observed in both early magnetite-bearing veinlets/stringers and disseminated in the rock mass and consists of magnetite + chalcopyrite + bornite + minor pyrite. Cross-cutting veinlets indicated multiple fracturing and hydrothermal pulses. Seventeen vein types have been recognized, with five types most common with gold-copper mineralization (Table 7-4). These five vein types are hairline magnetite stringers, quartz veins, quartz-magnetite-sulphide veins, quartz-sulphide veins, and banded quartz-sulphide veins.

Table 7-4: Vein Types and Logging Codes, Rovina Deposit

Vein-Type Code	Relative Importance/Occurrence	Description
mt-st	High	Magnetite stringers
mts-st	High	Magnetite-sulphide-quartz stringers
qs-vn	High	Quartz-sulphide veins
cp-st	High	Chalcopyrite stringers
bq-vn	Medium	Banded quartz-sulphide veins
py-st	Medium	Pyrite stringers
qcs-vn	Medium	Quartz-carbonate-sulphides ± base metals ± barite ± fluorite
dq-vn	Medium-Low	Dark grey quartz vein
q-vn	Medium-Low	Quartz veins
bi-vn	Low	Biotite ± K-feldspar veins
cl-st	Low	Chlorite/amphibole/epidote ± sulphides ± magnetite stringers
kqz-vn	Low	K-feldspar-quartz veins
wq-vn	Low	Irregular early quartz veins, randomly oriented, often discontinuous
po-st	Rare	Pyrrhotite stringers
ca-vn	Low	Carbonate-quartz veins/stringers
tr-st	Low	Tourmaline stringers
anh-vn	Not important	Anhydrite veins
gyp-vn	Not important	Gypsum (after anhydrite) veins
z-vn	Not important	Zeolite (chabazite/stilbite) veins

Intense MACE alteration is common in the higher-grade zones with a pervasive disseminated mineral assemblage; quartz>>>magnetite>cpy>py> amphibole and/or chlorite ± epidote, ± K-feldspar. Most of the high-grade intervals are hosted in the early porphyry (Rovina Porphyry PoC), generally coincident along the vertical margins of late inter-mineral stocks (Porphyry B) which themselves are also host to mineralization, but to a lesser extent (see photo of contact example in Figure 7-9).

In comparison with Colnic, stockwork intensity at Rovina more consistently correlates with copper-gold grade and is coincident with intense MACE alteration. In addition, Rovina does not show an intensive phyllic overprint related to late-stage quartz stockwork, as seen on the upper part of the Colnic porphyry.

Molybdenum mineralization is rarely observed in drill core within quartz-molybdenite veinlets. Worldwide, other gold and gold-copper porphyries tend to be deficient in molybdenum; however, when present, it tends to concentrate as a halo to the copper-gold core (Sillitoe, 2000). Euro Sun has assayed on an extremely limited basis for molybdenum at Rovina, with assay results to date being insignificant (averaging <5 ppm to 20 ppm Mo); however, a localized enrichment of molybdenum cannot be ruled out pending further assay checks. Silver has been regularly assayed, and grades to date are generally exceptionally low throughout (averaging <1 ppm to 2 ppm), and do not constitute economic mineralization.

Table 7-5: Alteration Paragenesis, Rovina

Alteration Phase	Timing - ►	Relative Importance	Sulphide Assemblage	Comment
Potassic (PT)	______	xxxx	Cp, py, (mo)	Deposit-wide, pervasive; some minor late-inter-minera intrusives lack this alteration
Magnetite-Propylitic (MACE)	_______	xxxxxxxx	py, cp (bn)	Deposit-wide, patches
Potassic-Silicic (PTSI)	_____	xxx	py, cp,	Occurs only at depth
Silicification (S)	_________ ________	xx	Py	Common in MACE
Transitional Phyllic (TRPH)	_______		py	Minor occurrences
Phyllic (Ph)	______________________________		py	Broad halo, no mineralization
Propylitic (P)	______		py	Associated with post-mineral phreatomagmatic breccias (glamm breccia)
Carbonate (CC)	--______		py, gal, sph	Associated with minor late-stage epithermal fracture-breccia fill
Argillic (A)	______		py	Minor fracture controlled

Key: cp = chalcopyrite, py = pyrite, bn = bornite, mo = molybdenite, sph = sphalerite, gal = galena, ( ) = rare

7.3.3 Colnic Deposit Geology

Geology Summary

Gold-copper mineralization at Colnic is hosted in multiple composite plagioclase-hornblende porphyritic subvolcanic intrusives. This mineralization reaches the surface in the Rovina Valley and is exposed in outcrops and road-cuts in the valley bottom over a distance of approximately 400 m. The remaining sparse and scattered outcrops are phyllic-altered porphyritic volcanics and Cretaceous sediments, and propylitic-altered hornblende andesites. The Colnic deposit has a large phyllic alteration halo covering 2,000 x 1,700 m. Two mineralized porphyry-centres comprise the bulk of the Colnic deposit; one occurring in the Rovina Valley (Colnic Porphyry) which partially outcrops, and a second centred approximately 200 m southeast on F-2 Hill (F-2 Hill Porphyry). The mineralized porphyries are lobate, with a wider horizontal dimension than vertical extent. These bodies intrude mostly older pre-mineral intrusives, and locally in the northeast Cretaceous flysch sediments. At Colnic, and especially for the F-2 Hill Porphyry, much of the wall rock is a clastic unit of igneous composition with several facies, ranging from flow-laminated silty textures to zenolithic porphyry, which is interpreted to be an intrusive magmatic breccia complex (IMB) related to the emplacement of the porphyry as a marginal carapace. Locally, this unit is altered and mineralized close to its contact with the porphyry, which is shallowly east-dipping on F-2 Hill.

The Colnic Porphyry is more intensely mineralized than the F-2 Hill porphyry and is complicated by an interpreted series of northeast-striking and subvertical inter-mineral dikes and breccias. These inter-mineral dikes and breccias may have been important for grade enhancements in this area, and the Rovina Valley Porphyry is interpreted to be older than the F-2 Hill Porphyry. Surface geology (Figure 7-10) and two cross-sections through the Rovina porphyry (Figure 7-11 and Figure 7-12) are shown below.

Figure 7-10: Surface Geology Map of the Colnic Porphyry

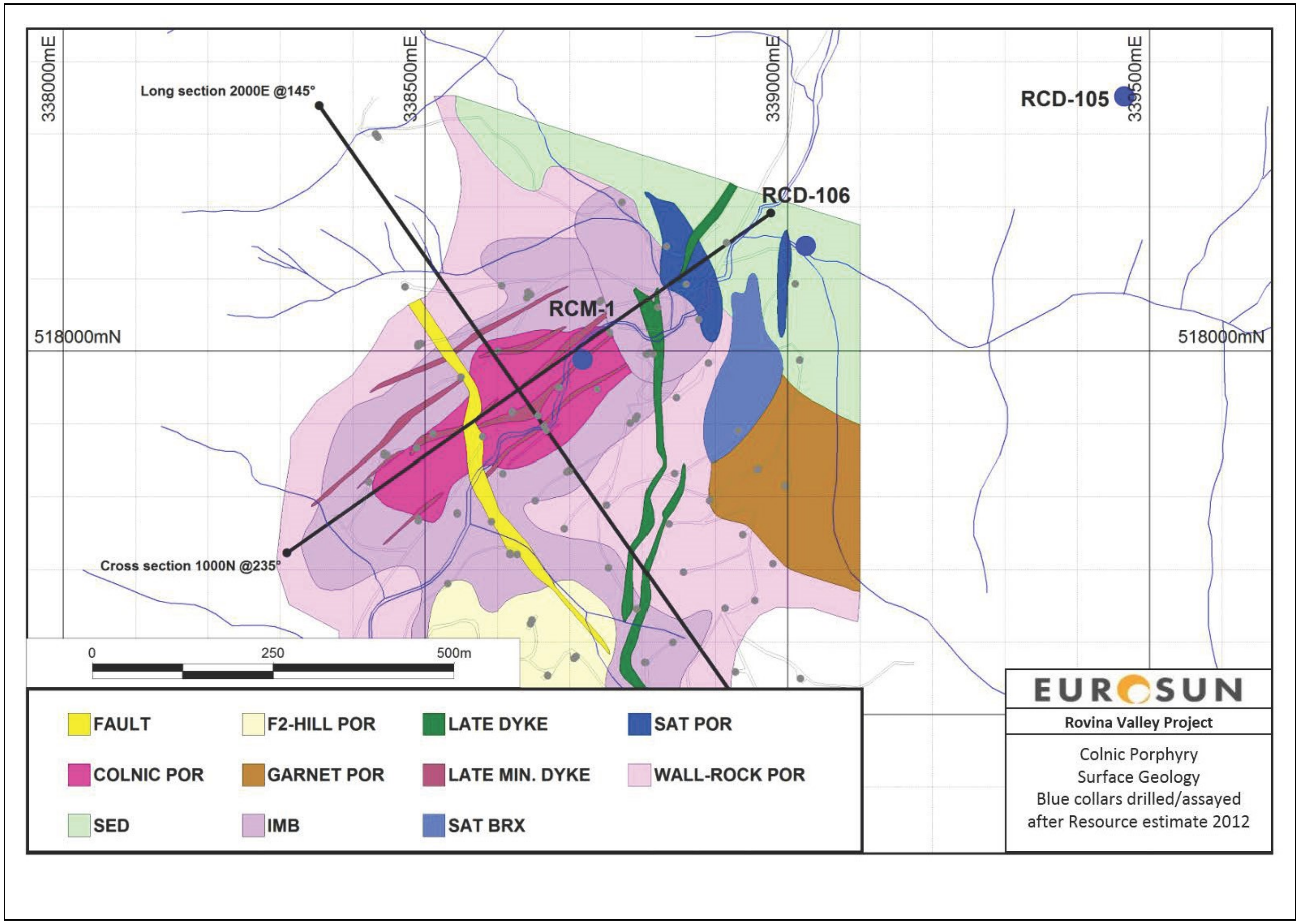


Figure 7-11: Cross-Section through the Colnic Porphyry Deposit with Major Lithologic Units

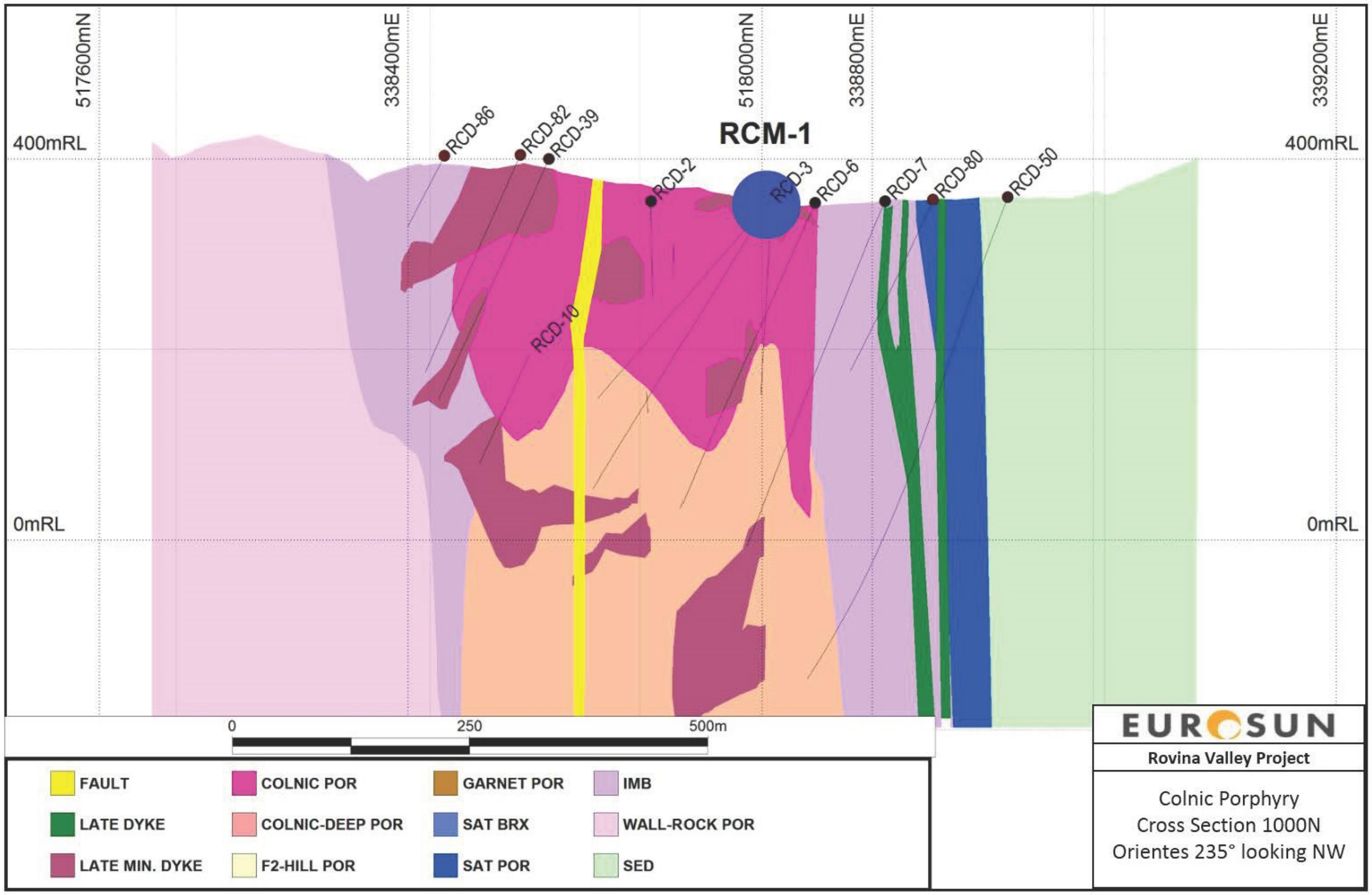
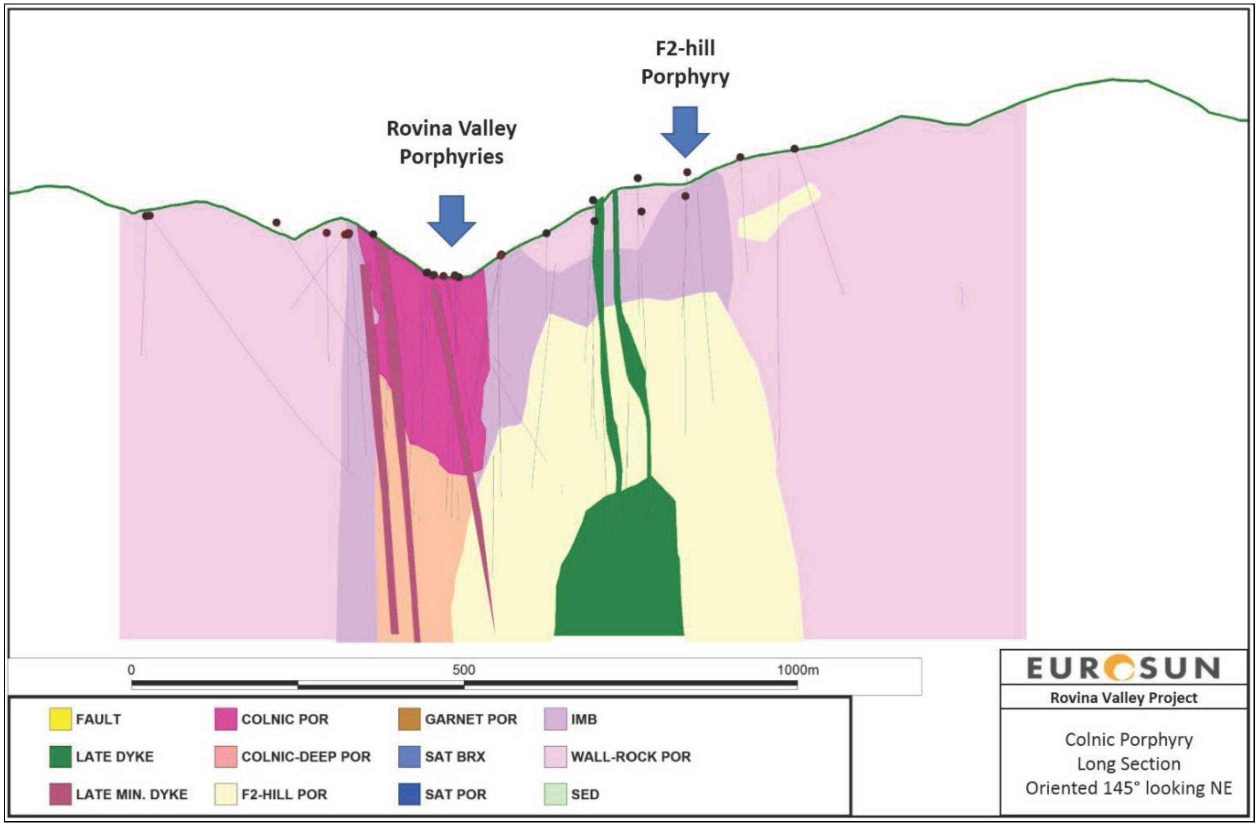


Figure 7-12: Long Section through the Colnic Porphyry Deposit with Major Lithologic Units



At Colnic, overprinting alteration is a quite common feature. Phyllic alteration overprint on gold-copper mineralized potassic alteration is prevalent, especially in the Colnic Porphyry. Recognized alteration types that are associated with mineralization include an early potassic (biotite ± K-spar), magnetite (several events), and magnetite-propylitic (or MACE, with magnetite, chlorite, epidote). Phyllic alteration occurs around the margins of the mineralized porphyries.

Petrographic description of samples from the Colnic porphyry indicates a variably potassic- and magnetite-altered plagioclase-hornblende porphyry, commonly overprinted by phyllic alteration, which is host to disseminated and veinlet-controlled chalcopyrite (Table 7-6). In addition, minor occurrences of sphalerite and pyrrhotite are observed in core and petrography.

Table 7-6: Summary Petrographic Description of Mineralized Colnic Porphyry

Sample	Petrographic Summary Description
DH RCD-3 at 313.3 m	Intensely altered quartz-feldspar-hornblende(?) porphyry, with potassic alteration of K-feldspar-biotite and minor disseminated magnetite, overprinted by vein selvages of phyllic alteration (bleaching of biotite and presence of clays). Early vein set of quartz-pyrite-chalcopyrite-pyrrhotite apparently cut by later pyrite-chalcopyrite veins with phyllic selvage.
DH RCD-10 at 31.7 m	Intensely altered quartz-felpspar-possible mafic relics porphyry; quartz replacement dominant in groundmass. Relics of potassic alteration overprinted by strong phyllic alteration (sericite, clays) and carbonate, with likely silicification of groundmass. Several cross-cutting vein sets with (oldest to youngest): 1) aplitic quartz-pyrite-chalcopyrite; 2) comb quartz-pyrite-chalcopyrite-sphalerite; 3) coarse calcite; 4) fine-grained calcite.
DH RCD-16 at 203.10 m	Intensely altered plagioclase-mafic(?) porphyry with possible secondary quartz in matrix. Brown and green banding resultant from localized overprinting of propylitic assemblage on potassic alteration assemblage. Potassic alteration of biotite alteration of groundmass with magnetite, with minor overprinting of sericite and clays and minor disseminated sphalerite and pyrite. Green bands show extensive replacement of groundmass by green coloured clays and epidote. These are associated with much more intense development of magnetite, followed by pyrite, and then sphalerite plus chalcopyrite.

Note: summarized from Armstrong, 2007.

Colnic Lithology and Logging Unit Descriptions

Four different porphyries have been interpreted at Colnic. Major lithological units are described in detail below. The lithologic units and logging codes are summarized in Table 7-7.

<u>Basement Sediment (SED–13)</u>: Sedimentary rocks occur along the northeastern margin of the Colnic deposit, hosting the satellite porphyry and breccia package, and the garnet-bearing porphyry described below. This unit is made up of laminated, very fine-grained mudstone to fine-grained sandstone. Adjacent to the satellite porphyry, the sediments may be strongly fractured and biotite and/or sericite-clay enriched, becoming dark brown to pale grey/beige in colour. Quartz stockwork veining and minor copper mineralization may be associated with locally altered sediments.

<u>Cornitel (Wall Rock) Porphyry (WR-POR–14)</u>: A coarse-grained porphyry containing 7 to 12 modal percent 5 to 10 mm black-green amphibole phenocrysts and 17 to 26 modal percent 2 to 3 mm white to colourless plagioclase phenocrysts within an aphanitic groundmass occurs to the north,

south, and west of the Colnic deposit. This unit is generally not veined or mineralized and is overprinted by pervasive phyllic to transitional alteration.

Table 7-7: Major Lithologic Units and Logging Codes for Colnic

	Code	Name	Description/Location
Colnic composite hornblende-plagioclase porphyries	5	Colnic Por. C (early mineral)	Higher-grade upper-part of Colnic Por. In Rovina valley, often brecciated
	6	Deep Colnic Por. CD (Early inter-mineral)	Deep coherent part of Colnic Por.
	7	Por. Dikes and breccias LM-POR (inter-mineral)	Parallel set, structurally controlled along trend of Rovina valley, principally in upper Colnic Por. C.
	4	F-2 Hill Por. and breccias F2-POR (inter-mineral)	Southwest of Colnic Por. on F-2 Hill; moderate grade
	12	Garnet bearing Por. G-POR (late-mineral)	Satellite Por, low-grade, minor importance
	11, 9, 10	Satellite Por. and breccia package S-POR, S-IMB, S-BX (late-mineral)	Satellite Por, low-grade, minor importance
Colnic wall rocks	8	Intrusive Magmatic Breccia Complex (IMB)	Heterogenous fragmental hornblende-feldspar Por. with similar composition groundmass, highly variable textures (from igneous zenolithic to silty fluidized banding), predominant wall rock, locally mineralized
	14	Cornitel Wall Rock Por. WR-POR	Older, pre-mineral, and mostly barren
	13	Flysch (basement) sediment SED	Folded Cretaceous sediments, localized occurrence northeast area; barren
Colnic post-mineral units	3	Post-Mineral Por. Stock PM-POR	Deep axial-core intrusive within F-2 Hill Por.
	1	Post-Mineral Dikes LD-1	Principally on F-2 hill, likely related to Post-Mineral Por. Stock.
Faults	2	Chubby's Fault FLT	Northwest-striking, subvertical fault-fracture zone; post-mineral

Intrusive Magmatic Breccia (IMB–8)

At Colnic, the mineralized porphyry stocks are enveloped by a heterogeneous package of clast-rich, laminated, and brecciated porphyry, similar to the IMB unit described in the Rovina deposit. This unit generally has a complex texture and contains sub-angular to rounded igneous rock fragments within a fine grained granular to porphyritic matrix. Intervals displaying well developed magmatic foliation are also common, especially adjacent to the margins of the F2-Hill porphyry. At Colnic, the IMB unit is believed to represent a pre-mineral sub-volcanic intrusion that subsequently became host to mineralized porphyry stocks.

Amphibole-Feldspar Porphyry

Much of the veining, mineralization, and alteration at Colnic is hosted by a series of fine- to coarse-grained amphibole-feldspar porphyry stocks and dikes. However, correlation of the various early-mineral, inter-mineral, late-mineral, and post-mineral intrusions is complicated by the fact that cross-cutting porphyry phases are similar in composition, internally heterogeneous, and can be extensively brecciated, especially at their margins. Alteration associated with subsequent intrusions also masks intrusive contacts. However, using a combination of abrupt changes in geochemistry and alteration intensity and contact relationships observed while logging and re-logging drill core, eight distinct intrusive phases have been identified at Colnic. In general, the coherent porphyry stocks contain 7 to 12 modal percent 1 to 6 mm black-green amphibole phenocrysts, and 17 to 26 modal percent 1 to 2 mm (3 mm max) white to colourless plagioclase phenocrysts within an aphanitic groundmass; however, within each unit variations in phenocryst content and grain size are common.

The following eight phases of amphibole-feldspar porphyry intrusion and brecciation have been identified at Colnic (from oldest to youngest):

- Colnic Porphyry and Breccia Package – C-POR-5 (early-mineral)
- Deep Coherent Colnic Porphyry Stock – CD-POR-6 (early inter-mineral)
- Late-Mineral Porphyry Dikes and Breccias – LM-POR-7 (inter-mineral)
- F2-Hill Porphyry and Breccia Package – F2-POR-4 (inter-mineral)
- Garnet Bearing Porphyry – G-POR-12 (late-mineral)
- Satellite Porphyry and Breccia Package S-POR-11; S-IMB-9; S-BX-10 (late-mineral)
- Post-Mineral Porphyry Stock – PM-POR-3 (post-mineral)
- Post-Mineral Porphyry Dikes – LD-1 (post-mineral)

<u>Colnic Porphyry and Breccia Package (C-POR–5)</u>: This unit represents the earliest intrusive phase at Colnic and is the most important host to quartz stockwork veining, alteration, and mineralization in this area. A significant component of the Colnic porphyry package is made up of breccia (orthomagmatic and/or intrusion related). The remainder appears to consist of a heterogeneous package of medium-grained feldspar-amphibole porphyry; however, several episodes of overprinting alteration and intense quartz stockwork veining make identification of primary textures within this unit difficult.

In drill holes RCD-4, RCD-9, RCD-10, RCD-39, RCD-51, RCD-73, and RCD-82, intervals of micro-diorite have been identified within the Colnic porphyry unit. In general, these zones are fine-grained, weakly altered, and lack the pervasive quartz stockwork veining characteristic of the rest of the Colnic porphyry package. In general, the micro-diorite shoots are extensively brecciated. Where coherent bodies of micro-diorite occur, it is generally dark grey to green/brown in colour and contains 15 to 17 modal percent ±1 mm amphibole, and 25 to 30 modal percent 0.2–0.6 mm plagioclase crystals within an aphanitic groundmass. In RCD-10, RCD-51, and RCD-73, the micro-diorite is cross-cut by a series of sheeted quartz-sulphide veins that may be related to a moderate increase in the copper and gold grades within this unit.

Within the Colnic porphyry package, all drill holes containing micro-diorite, with the exception of RCD-4, occur on cross-section 1000N. In the current model, these intervals are believed to represent a volumetrically-restricted, steeply-dipping shoot of finer-grained igneous rock, emplaced into the Colnic porphyry package at a late stage in its development. Although the grade within these micro-diorite shoots is typically lower than in the surrounding rocks, they do contain moderate copper and gold mineralization. For simplicity in the current interpretation, the micro-diorite has not been modelled separately from the Colnic porphyry package.

Deep Coherent Colnic Porphyry Stock (CD-POR–6): This unit occurs in the deep parts of cross-sections 940N, 1000N, and 1050N, and consists of a coherent, medium-grained feldspar-amphibole porphyry intrusion that has been overprinted by pervasive reddish-brown potassic K3 alteration. Intrusive breccias are commonly associated with the margins of this unit. The deep coherent Colnic porphyry appears to have been emplaced into the older Colnic porphyry package sometime after its formation and has subsequently been cross-cut by the northeast-to-southwest-striking late-mineral dikes and breccias described below.

Late-Mineral Porphyry Dikes and Breccias (LM-POR–7): Several thin (generally 5–15 m thick), north-northeast to northeast-striking, steeply southeast-dipping (65 to 85 degrees) amphibole-feldspar porphyry dikes and breccia zones have been identified within the Colnic porphyry package, outcropping on the northern side of the Rovina Valley, and in holes drilled on cross-sections 940N, 1000N, and 1050N. The dikes and breccia zones are believed to have formed at a late stage in development of the Colnic deposit within a structural corridor running parallel to the Rovina valley. As a consequence, the late dikes and breccias cross-cut both the Colnic porphyry package and the deep coherent porphyry and are responsible for many of the sharp grade breaks occurring in holes drilled in this area. In addition to having unique geochemistry, the late-mineral dikes have been identified in drill core using a number of observations ,including the alignment of phenocrysts adjacent to dike margins, the truncation of quartz veins, the presence of quartz vein fragments and quartz veined xenoliths within the dikes, and a general decrease in phenocryst size, quartz stockwork veining, and alteration intensity within the dikes relative to the surrounding rocks. Intrusion-related brecciation is also commonly associated with the margins of these units.

F2-Hill Porphyry and Breccia Package (F2-POR–4): The F2-Hill porphyry package consists of a heterogeneous assemblage of fine- to medium-grained feldspar-amphibole porphyry, micro-diorite shoots, and orthomagmatic and intrusion-related breccias that occur to the south of the Colnic porphyry package beneath F2 Hill. These rock types appear to be related, and together form the host to the alteration, quartz stockwork veining, and mineralization in this area.

Garnet Bearing Porphyry (G-POR–12): A laminated, garnet-bearing, medium-grained feldspar-amphibole porphyry stock occurs to the east of the F2-Hill porphyry, in contact with the basement sediments. Locally weak to moderate quartz veining and K3 alteration occurs within this unit; however, it is not mineralized.

Satellite Porphyry and Breccia Package (S-POR–11; S-IMB–9; and S-BX–10): A coherent medium- to coarse-grained feldspar-amphibole porphyry stock (11) associated with moderate quartz stockwork veining, K3 alteration, and weak to moderate copper mineralization occurs to the northeast of the Colnic porphyry package. The position of this unit appears to be controlled by the northwest-trending contact between the intrusive magmatic breccia and basement sediments. A package of intrusive breccia (similar to the IMB unit described above) is closely associated with the emplacement of the satellite porphyry stock and has been modelled as S-IMB (9). Cross-cutting zones of matrix- to clast-supported breccia containing strongly veined K3+A (potassic overprinted by argillic) altered sediment and porphyry fragments have also been identified in association with the satellite porphyry stock and modelled separately as S-BX (10). These three units may, however, be related.

Post Mineral Porphyry Stock (PM-POR–3): A post-mineral, propylitically altered, medium-grained porphyry stock has been identified within the F2-Hill porphyry on cross-sections 670N and 740N.

Post Mineral Porphyry Dikes (LD–1): Post mineral, propylitically altered, medium-grained feldspar-amphibole porphyry dikes have also been identified within the Colnic deposit. These dikes may be related to the post-mineral stock described above.

Chubby's Fault (FLT–2)

Chubby's Fault is a roughly north-northwest to northwest-trending zone of fractured rock, gouge, and fault breccia generally associated with intense argillic alteration.

Colnic Alteration and Logging Unit Descriptions

Several alteration types are recognized, with mineralization mainly associated with the early potassic and locally overprinting MACE alteration. A list of alteration types and logging codes is shown in Table 7-8.

Table 7-8: Major Alteration Units and Logging Codes for Colnic

Alteration Style	Logging Code	Description
Potassic	K3	Widespread "biotization" of groundmass, magnetite stringers, minor microscopic K-spar replacements; in parts, a brownish to pinkish colouration
Magnetite-propylitic	K2	Common magnetite diss. and in stringers, quartz, chlorite, edidote, amphibole, and carbonate, resulting in greenish-black color and masking rock texture.
K-Alteration	K	Mixed assemblage of potassic (K3), with patchy overprinting magnetite-propylitic (K2), and overprinted by a structurally controlled (quartz-stockwork associated) phyllic alteration of variable intensity. Occurs mainly in the higher-grade upper Colnic Por.
Phyllic	PH	Broad wall rock halo of sericite, pyrite, quartz, pyrite; note typically, without quartz veinlets
Transitional Phyllic	TRPH	Phyllic overprint of earlier, mostly potassic and magnetite-propylitic alteration; extensive in the F-2 hill area.
Argillic	A	White clays and pyrite typically associated with late fracture zones. Restricted to Chubby's Fault zone
Propylitic	PR	Rare chlorite, carbonate, and pyrite in late dikes and post-mineral intrusives on F-2 Hill.
Potassic + Argillic	K3+A	Mixed early potassic with argillic along contact-zone fractures, exclusively in the Satellite por. package; of minor importance.

K3 Alteration

At Colnic, potassic (K3) alteration is the most common alteration type identified in drill core and thin section. K3 alteration is generally associated with pervasive biotite or K-feldspar alteration of the groundmass, accompanied by quartz, magnetite, and disseminated sulphides (pyrite, pyrrhotite, and chalcopyrite). In porphyritic rocks, mafic phenocrysts are generally replaced by granular aggregates of "ratty" biotite, magnetite, and sulphides, while K-feldspar commonly replaces plagioclase phenocrysts. Depending on whether biotite or K-feldspar is more abundant, K3-altered rocks will have a dark brown or reddish-brown to pink colour, respectively.

Within the Colnic deposit, potassic alteration is best developed within the F2-Hill porphyry and the deep coherent Colnic porphyry units. The late-mineral dikes are also commonly associated with potassic alteration.

K2 Alteration

At Colnic, it is common for K3 alteration to grade into or become overprinted by K2 alteration through a gradual increase of the amount of chlorite, magnetite, epidote, and actinolite present in the alteration assemblage. K2 alteration is generally most strongly developed adjacent to micro-fractures and veins containing magnetite-quartz-chlorite±actinolite and sulphides (pyrite, chalcopyrite). K2 alteration is generally associated with chloritization of biotite, the replacement of plagioclase by epidote and calcite, and a much more intense development of magnetite, followed by pyrite and chalcopyrite. Where K2 alteration is pervasive, it is generally texturally destructive, giving the rock a dark green to light green colour. Where K2 alteration is less intense, the rock has a brownish-green to pinkish-green colour, and a mineral assemblage consisting of biotite-chlorite-magnetite-K-feldspar-quartz-epidote-calcite±actinolite and sulphides (cpy-py).

K Alteration

The alteration occurring within the Colnic porphyry package is characteristically complex, consisting of patchy zones of K3 overprinted by K2 alteration, which in turn is overprinted by structurally controlled phyllic alteration. In addition, rocks occurring adjacent to late- and post-mineral breccias, faults, and fractured zones have been affected by low-temperature argillic alteration. The general term K is used here to describe an alteration package consisting of variable amounts of K2, K3, phyllic, and argillic alteration, typically associated with intense quartz stockwork veining.

TRPH Alteration (Transitional Phyllic)

Transitional phyllic alteration is used to describe intervals where phyllic alteration partially overprints K2 or K3 alteration. Transitional phyllic alteration is most commonly observed in the F2 Hill area.

PH Alteration (Phyllic)

Phyllic alteration is characterized by a dominant assemblage of sericite-quartz-pyrite±clay that is generally consistent with the low-grade peripheral parts of the Colnic deposit. Approximately 5 to 15 modal percent pyrite generally occurs within this alteration type as 3 to 7 mm clusters of fine-grained aggregates, disseminated grains, and within mm-scale fractures. Phyllic alteration is typically pale grey to pinkish grey in colour.

P Alteration (Propylitic)

Propylitic alteration is characterized by the assemblage of chlorite-carbonate-epidote. This alteration type is most commonly observed within the post-mineral stock and dikes and as more pervasive alteration within the wall rocks outside of the phyllic alteration halo.

K3+A Alteration (Potassic-Argillic)

Potassic-argillic alteration has been used to describe alteration associated with the brecciated parts (10) of the satellite porphyry package in which the matrix and margins of K3-altered sediment and porphyry clasts have been overprinted by argillic clays.

A Alteration (Argillic)

Argillic alteration generally occurs in association with late fractured/faulted zones, such as Chubby's Fault, and overprints all earlier alteration types. Argillic alteration is characterized by an assemblage of white clays (illite-smectite), quartz, and pyrite. Pyrite generally occurs as coarse, euhedral crystals.

Colnic Mineralization Descriptions

Gold-copper mineralization is associated with pyrite-chalcopyrite-magnetite occurring in veinlet stockworks and as disseminated grains. Oxidation is restricted to the uppermost few metres of the prospect, and no significant oxide cap or supergene-enriched horizons have been encountered to date.

Deposit-scale controls to mineralization consist of the localization of two hornblende-plagioclase porphyry centres; the Colnic porphyry and the F-2 Hill porphyry. The Colnic porphyry occurs in the Rovina Valley, elongated parallel to the northeast-trending valley over an area approximately 400 m long x 200 m wide. This is interpreted as the older porphyry, and its upper part contains the highest grades at Colnic. The centre of the F-2 Hill porphyry complex occurs approximately 150 m southeast of the Colnic porphyry. Interpreted structural controls on the emplacement of these porphyries are the northeast-trending Rovina Valley (as suggested by an inter-mineral dike and breccia swarm in the upper part of the Colnic porphyry) and the northwest-striking Chubby's Fault/fracture zone (a brittle, post-mineral structure; however, maybe a re-activated older structure, as evidenced by a spatial mineralization association at depth). See Figure 7-6, Figure 7-7, and Figure 7-8 for geology map and two cross-sections.

At Colnic, three early-stage magmatic-fluid alteration events are recognized: K3, K2, and a locally-occurring magnetite-only alteration. Gold–copper mineralization at the Colnic porphyry is best developed within K2 and K3 potassic alteration of quartz diorite porphyry, in particular where multidirectional stockwork vein intensity is highest. The earliest copper-bearing assemblage is observed both in early quartz veins and disseminated in the rock mass. It consists of magnetite+chalcopyrite+bornite+minor pyrite. Cross-cutting veinlets indicated multiple fracturing and hydrothermal pulses. Sixteen vein types have been recognized from detailed core logging, with five principal types associated with gold-copper mineralization (Table 7-9). Overprinting alteration events can obscure earlier events, particularly noted in parts of the higher-grade upper Colnic Porphyry (in Rovina Valley) where phyllic alteration is associated with intense late-stage quartz±pyrite stockwork veining. In some cases, gold-copper mineralization occurs in K2 alteration (and rarely in K3 alteration) without any apparent stock-working.

Table 7-9: Colnic Deposit Vein Types and Logging Codes

Vein Type Code	Relative Importance or Occurrence	Description
Bi-vn	Low	Biotite±K-feldspar veins
Mt-st	High	Magnetite stringers (M-vns)
Mts-st	High	Magnetite-sulphide ± quartz stringers
Cl-st	Low	Chlorite-carbonate ± sulphide ± magnetite stringers
Wq-vn	Low	Irregular early quartz veins, randomly oriented and often discontinuous
Dq-vn	Medium-low	Dark grey quartz veins
q-vn	Medium-low	Quartz veins
Bq-vns	Medium	”Banded” quartz ± sulphide veins
Qs-vn	High	Quartz-sulphide veins
Py-st	Medium	Pyrite stringers
Cp-st	High	Chalcopyrite stringers
Po-st	Low	Pyrrhotite stringers
Qcs-vn	Medium	Quartz-carbonate ± sulphide veins; low temperature (epithermal)
Ca-vn	Low	Carbonate/quartz veins/stringers
Tr-st	Low	Tourmaline stringers
z-vn	Minor	Zeolite veins

Locally, veins occur as sheeted zones, however, the predominant occurrence and appearance in core is as multidirectional stockworks. To evaluate mineralization controls in the upper Colnic Porphyry, which is elongated in the northeast direction and parallel to the angled drill holes of Euro Sun, seven orthogonally-angled drill holes were completed in late 2007. This drilling was instrumental in defining the late-mineral dike and breccia swarm parallel to the northeast-trending Rovina Valley. As part of this orthogonal drilling program, a structural study on oriented core was undertaken on four of these orthogonal drill holes. Drill core was oriented using the spear technique for marking bottom of core. Confidence limits were assigned based on precision of core marks between runs where core breaks could be aligned (as core quality was good, this was quite common). A total of 1,140 confident structural measurements were taken, of which 639 represent mineralization-related veinlets. Results indicated a general multidirectional orientation of veinlets, with a slight bias to a northwest-southeast strike.

Euro Sun routinely assays for zinc, lead, and silver in addition to gold and copper. At Colnic, the gold-copper mineralization contains anomalous zinc ranging from 150 to 600 ppm, with an approximate average of 300 ppm. A zone of elevated zinc + gold mineralization has developed predominantly in or proximal to the transitional phyllic alteration zone (TRPH). Grades in this zone range from approximately 0.1–3 g/t Au and 300–5,000 ppm Zn. The zinc-gold zone is interpreted to represent deposition of remobilized zinc and gold from a collapsing phyllic–potassic alteration front. The more acidic, H2S-bearing fluids associated with the phyllic alteration (PH) may have dissolved gold and re-precipitated the element at the rock-composition redox contact with the magnetite-rich porphyry-style mineralization (K2 and K3). In some cases, the contact zone between the phyllic and mineralized potassic zone grades from pyrite to pyrrhotite to magnetite, representing a possible sulphidation front. Proximal to and within Chubby's Fault/fracture zone, zinc mineralization appears to be related to late-stage quartz–carbonate veinlets.

Molybdenum mineralization is rarely observed in drill core within quartz-molybdenite veinlets, typically in the deeper zones of K3 alteration. Euro Sun has assayed on a limited basis for molybdenum, including some samples selected by visual observation of molybdenite in drill core. Worldwide, other gold and gold-copper porphyries tend to be deficient in molybdenum; however, when present, it tends to concentrate as a halo to the copper-gold core (Sillitoe, 2000). Molybdenum assay results to date at Colnic have been insignificant (averaging <5 ppm to 20 ppm Mo); however, a localized enrichment of molybdenum cannot be ruled out pending further molybdenum assay checks. Silver has been regularly assayed, and grades to date are typical of porphyries worldwide; values are generally very low throughout (averaging <1 ppm to 2 ppm), and do not constitute economic mineralization. Table 7-610 shows an interpreted alteration-mineralization paragenesis.

Table 7-10: Colnic Alteration Paragenesis

Alteration Phase	Timing - ►	Relative Importance	Sulphide Assemblage	Comment
Potassic (K3)	______	xxxxx	cp, po, py, (mo)	Deposit-wide, pervasive; some minor late inter-mineral intrusives lack this alteration
Magnetite-Propylitic (K2)	_______	xxxxxxxx	py, cp, (sph)	Deposit-wide, patches
K-Alteration (K)	_____	xxxxxxxx	py, cp, (sph, gal, Au)	Localized overprint associated with quartz stockwork-related phyllic
Silicification (S)	_________ ________	xx	Py	Pervasive in K2, present in K3
Transitional Phyllic (TRPH)	_______	Au–Zn	py, sph, po	Overprints outer margin of potassic zones
Phyllic (Ph)	______________________________		py, (po)	Broad halo, no mineralization
Propylitic (P)	______		Py	Associated with post-mineral dikes
Argillic (A)	______		py, sph, gal, (cp, Au)	Chubby's Fault zone and rare epithermal veinlets in phyllic halo

Key: cp = chalcopyrite, py = pyrite, po = pyrrhotite, mo = molybdenite, sph = sphalertite, gal = galena, Au = native gold, ( ) = rare

7.3.4 Ciresata Deposit Geology

Geology Summary

Ciresata contains the highest average gold grades in the RVP, with gold-copper mineralization hosted sub-equally in a Neogene subvolcanic ”neck” and adjacent hornfelsed Cretaceous sediments. The subvolcanic intrusion is a relatively coarse-grained hornblende-plagioclase porphyry (Early Mineral Porphyry), with a narrow vertical feeder zone and ”ballooning” at the dipping planar contact between the hornfelsed Cretaceous sediments and an older subvolcanic intrusion (Host Rock Porphyry), approximately 250 m below the present surface. Subsequent inter-mineral and late-mineral dike-like intrusives commonly occur at depth and appear to be related to the occurrence of monolithic and polylithic breccias of surrounding host rock. Locally, some of the late- to post-mineral dikes, which cut mineralization, intrude zones with more intense stockwork veining.

Mineralization occurs as a broad quartz-pyrite-magnetite-chalcopyrite stockwork zone centered on the subvolcanic intrusive ”neck”, and does not reach the present surface, occurring at 50 to 150 m depth. Deep drilling in 2012 targeting the roots of the porphyry intersected gold-copper mineralization 500 m below previous drilling, indicating a vertical extent of mineralization of approximately 1,000 m; however, the presently known mineralization extent indicates the widest lateral mineralization dimension is in the upper part of the deposit, approximately 400 m below the surface, where the Early Mineral Porphyry expands spatially. The older capping porphyry (Host Rock Porphyry) preserves a barren altered litho-cap over the porphyry mineralization, and is intensely phyllic-altered, overprinting an early magnetite alteration.

Surface mapping by Euro Sun recognized a zoned suite of porphyry-style alteration, ranging from magnetite alteration (magnetite stringers) overprinted by phyllic in the litho-cap, outward to potassic, phyllic, and propylitic in a predominant cover of volcanic rocks. The dimensions of the mapped phyllic halo are approximately 1,400 x 1,000 m. The magnetite alteration zone results in a positive magnetic anomaly. Results from outcrop sampling showed weakly anomalous to nil gold and copper mineralization. Figure 7-13 shows the surface geology and a cross-section through the Ciresata porphyry is shown in Figure 7-14.

Figure 7-13: Surface Geology of the Ciresata Porphyry

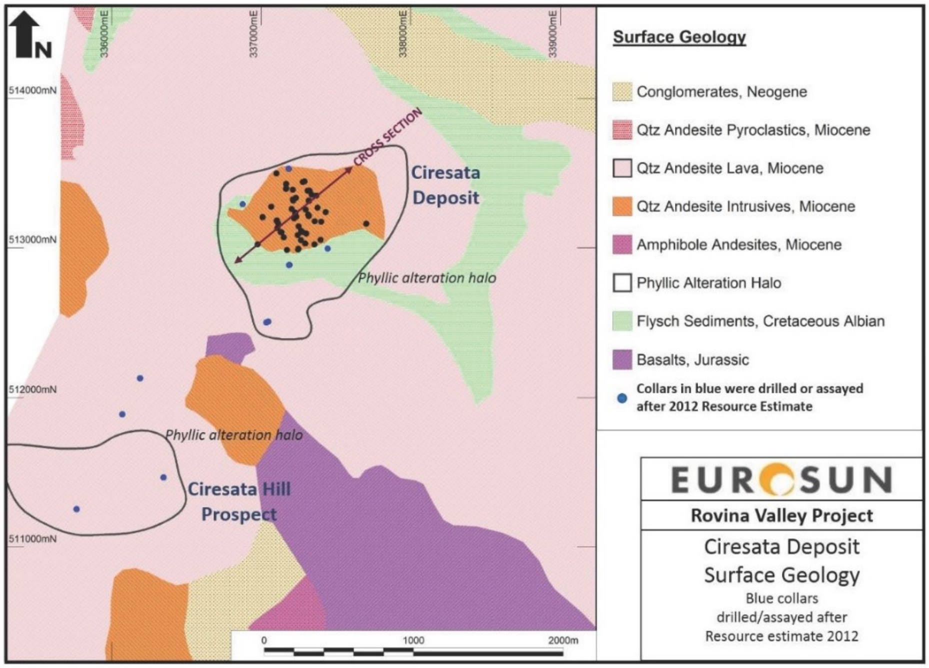
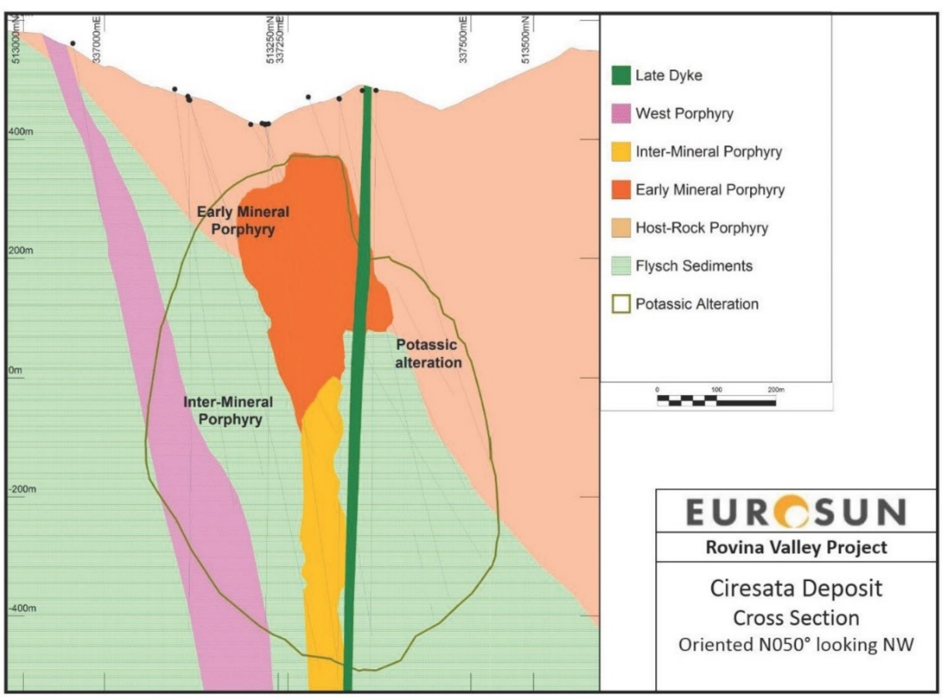


Figure 7-14: Cross-Section through the Ciresata Porphyry



Alteration types associated with mineralization include incipient biotite-potassium feldspar ± magnetite. Amphibole is commonly observed replacing pyroxene. This is interpreted to be an early-stage potassic alteration, and occurs in the Early Mineral Porphyry, Hornfelsed Sediment, and weakly in the Late Mineral Porphyry. A common alteration assemblage associated with higher gold-copper grades (chalcopyrite-pyrite) is quartz-magnetite-chlorite. This magnetite-chlorite alteration occurs in the Early Mineral Porphyry and in the Hornfelsed Sediment and is interpreted to be associated with the main stage mineralization. In the deeper parts of the deposit, some veins have albite alteration selvages, and could represent sodic-calcic alteration (Ruff, et al. 2012).

A late-stage overprinting alteration of quartz-sericite-pyrite (Phyllic) occurs pervasively at the top of the deposit, and at depth, it occurs in fractures with white sericite halos. A late stage but widespread occurrence of weak, incipient replacement of rock-forming minerals by carbonate and kaolinite may be related to infiltration of groundwater during the final cooling of the system (Ruff et al. 2012).

Petrographic description of samples from the Early Mineral porphyry and mineralized Hornfelsed Sediment indicates secondary magnetite is prevalent in both the disseminated potassic alteration and in stockwork veining of quartz-magnetite-chlorite-pyrite-chalcopyrite (Table 7-11).

Table 7-11: Petrographic Description of Mineralized Ciresata Porphyry and Hornfels

Sample	Petrographic summary description
RGD-8 (DH RGD-8 at 510.55 m)	Altered porphyritic microdiorite with cross-cutting millimetric veinlets. Rock-forming minerals are mostly replaced with biotite-K-spar-quartz, with carbonates and sericite forming a potassic alteration assemblage. Opaque minerals are represented by fine-grained disseminated pyrite and chalcopyrite and coarser-grained chalcopyrite-magnetite-pyrite in veinlets
RGD-7 (DH RGD-7 at 396.05 m)	Altered albite-biotite hornfels after clay or siltstone cut by cross-cutting veinlets. Albite-biotite are of contact metamorphic origin, with hydrothermal biotite observed associated with magnetite veins. Opaque minerals include common disseminated magnetite and chalcopyrite. Fissures and veinlets contain magnetite and chalcopyrite and are cross-cut by wider quartz+minor pyrite veins.
RGD-17 (DH RGD-17 at 449.10 m	Altered amphibole-plagioclase microdiorite. Amphibole (up to 3 mm) and plagioclase phenocryst crystals are replaced by sericite and secondary biotite. The crystalline micro-granular groundmass contains abundant disseminated secondary biotite, sericite, and quartz. Disseminated opaque minerals include pyrite-chalcopyrite-magnetite, which are cut by microfractures containing carbonate and quartz. Quartz veinlets contain abundant magnetite, chalcopyrite, and minor pyrite.

Note: summarized from Damian, 2008, 2011

The Ciresata geologic model is relatively simpler than the Rovina and Colnic models, due to less extensive early and inter-mineral stage porphyries. The Early Mineral Porphyry is the principal mineralizing porphyry, with the later Inter-Mineral Porphyry intruding the root feeder zone, which has mineralized the hornfelsed wall rock.

Lithology Units at Ciresata

The Ciresata deposit exhibits an apparently simple intrusive history and fewer lithologic logging and modelling units have been defined compared with Colnic and Rovina. Descriptions of these units are provided below, and a list of major lithologic units and logging codes is shown in Table 7-12.

Table 7-12: Ciresata Major Lithologic Units and Logging Codes

	Code	Name	Description/location
Ciresata mineralized porphyries	64	Early Mineral Por. EM-P	Principal mineralized porphyry; coarse-grained hornblende-plagioclase microdiorite porphyry; narrow dyke-like root zone expanding at the wall rock contact between the hornfelsed sediment and the overlying Host Rock Porphyry.
	65	Inter-Mineral Porphyry (IM-P)	Weakly mineralized amphibole-plagioclase microdiorite porphyry; intrudes the root zone of the EM-P.
Ciresata wall rocks	68	Basement Sediment (SED)	Folded Cretaceous sediments, hornfelsed near contact zone with EMP, where it becomes an important host to mineralization.
	71	Host Rock Porphyry (HR-P)	Highly altered, older capping porphyry, with heterogenous primary textures displaying auto-brecciation and locally fluidized zones.
Ciresata late-post-mineral intrusives	62	Late-Mineral Porphyritic Dikes (LM-P)	Amphibole-plagioclase porphyry occurring as <40 m thick dike intrusives; weak to unmineralized, though wall rock contact zones can have intense pre-existing veining.
	70	West Porphyry (W-P)	Very weakly mineralized dyke-like amphibole-plagioclase porphyritic intrusion west of the deposit

Overburden (OB – 60)

The completely oxidized colluvium, alluvium, residual soil, and weathered rock occurring at the top of most drill holes.

Basement Sediment (SED – 68)

The basement sediments at Ciresata are made up of massive, compact, very fine-grained mudstone and minor fine-grained sandstone that have undergone thermal contact metamorphism prior to an overprinting hydrothermal alteration, which tends to obscure original textures. Altered sedimentary rocks have been intersected in most of the drill holes completed at Ciresata and host the early- and late-mineral intrusions that make up the Ciresata porphyry complex. These intrusive contacts with the SED unit are easily observed in drill core. The SED unit occurring adjacent to the intrusive bodies generally exhibit strong stockwork veining of biotite-magnetite-quartz-pyrite-chalcopyrite and are black in colour. These altered and veined sediments contain some of the most intense veining and highest gold-copper grades at Ciresata. Distal to the intrusions and at depth, the sediments become alternating light grey/beige in colour, with recognizable thin interbeds of sandstone, grading outward into fresh, less compact, and soft sediments.

Host Rock Porphyry (HR-P - 71)

Above the Ciresata deposit and representing the surface expression, is an intensely phyllic-altered, porphyritic volcanic unit with a heterogenous primary texture. The general appearance is of a ”clotty” porphyry, related to alteration of mafic phenocrysts within a rock fabric that includes coherent clasts within an aphanitic, microgranular, and porphyritic matrix suggestive of auto-brecciation. Locally, the matrix material exhibits lamination textures suggestive of fluidized flow during emplacement. Petrographically, the modal mineralogy of this rock differs from the subjacent EM-P, due to the occurrence of primary quartz in the groundmass. The HR-P is weakly- to moderately-mineralized immediately above the EM-P contact and displays extensive early-stage magnetite veinlet alteration that has survived an intense phyllic alteration overprint and is exposed on the present surface above the blind gold-copper mineralization. From surface mapping and drill hole logging, the HR-P has been interpreted to represent the oldest and largest intrusive unit in the Ciresata deposit area, intruding upwards and westward along bedding dip planes of the Cretaceous sediments.

Early-Mineral Porphyry (EM-P – 64)

The Early-Mineral Porphyry at Ciresata is a coarse-grained porphyritic intrusion containing 7 to 12 modal percent 5 to 10 mm black-green hornblende phenocrysts, and 17 to 26 modal percent 2 to 3 mm white to colourless plagioclase phenocrysts within a microcrystalline groundmass. Petrography classifies this rock as a porphyritic microdiorite. This intrusive unit has a narrow dyke feeder zone expanding in volume at the wall rock contact between the SED unit and the capping HR-P unit. The EM-P is commonly associated with intense quartz stockwork veining, pervasive potassic alteration, and significant gold-copper grades, and represents the centre of the Ciresata mineralizing system. A strong phyllic alteration overprint in the upper part of the deposit can locally obscure the contact between the EM-P and the older, capping HR-P.

Inter-Mineral Porphyry (IM-P -65)

A hornblende-plagioclase porphyry, of similar phenocryst and groundmass modal mineralogy to the EM-P with the exception of primary quartz identified in the groundmass, as determined through petrography. The IM-P is relatively weakly-altered, with low to moderate intensity stockwork veining and a visible intrusive contact with the EM-P in drill core. In addition, the IM-P is observed to contain refractory quartz vein fragments and clasts of stockwork-mineralized EM-

P. The IM-P has a restricted occurrence intruding the deeper dyke root zone of the EM-P and hosts low-grade gold-copper mineralization.

West Porphyry (W-P 70)

A hornblende-plagioclase porphyritic dyke-like intruded into the SED unit, west of the Ciresata mineralization and outside of the gold-copper mineralization halo. This unit is very weakly mineralized, with an incipient potassic alteration interpreted to be metosomatic, and a propylitic alteration overprint.

Late-Mineral Porphyry (LM-P – 62)

Locally, sub-vertically dipping, north-south to northwest-striking amphibole-feldspar porphyry dikes and associated intrusion-related breccia zones have been identified within the Ciresata porphyry assemblage. In general, these dikes are <40 m thick and are barren or very weakly mineralized. The dikes have a similar texture and mafic content to the EM-P but appear to contain a higher percentage (typically >30 modal percent) of 1 to 3 mm plagioclase phenocrysts, and contain primary modal quartz in the groundmass, based on petrographic observations. The dikes and breccia zones are late- to post-mineral stage and form a relatively small volume within the Ciresata deposit. Near the surface, the late-mineral dikes are generally light green to grey in colour, and chlorite-clay-magnetite-epidote (propylitic) or clay-sericite-pyrite-quartz (phyllic or argillic) altered; however, at deeper elevations the late-mineral dikes are overprinted by pervasive potassic alteration. Locally, significant gold-copper stockwork mineralization occurs in the SED wall rocks adjacent to the dikes' margins, with the dikes themselves having inclusions of mineralized wall rock clasts; however, the late-mineral dikes in general are weakly mineralized to unmineralized.

Breccias

Breccias occur locally marginal to the Ciresata mineralization core. These breccias include zones of monolithic wall rock breccia and polylithic brecciation that may have formed in response to magmatic fluid discharge from late- to post-mineral porphyry phases. In general, these units are affected by the similar alteration and stockwork intensity as the surrounding rocks and were not modelled separately.

Ciresata Alteration and Logging Unit Descriptions

Alteration associated with mineralization is predominantly potassic+magnetite and magnetite-chlorite (MACE). A list of alteration types and logging codes is shown in Table 7-13.

Table 7-13: Major Alteration Units and Logging Codes for Ciresata

Alteration Style	Logging Code	Description
Potassic	PT (31)	Widespread "biotization" of groundmass; magnetite prevalent as stringers and disseminated; minor microscopic K-spar replacements in both EMP and hornfels. Most important alteration and correlates with gold-copper mineralization.
Magnetite-Chlorite	MACE (30)	Common magnetite-chlorite disseminated and in quartz veinlets, ± edidote, amphibole. Patchy widespread occurrences associated with higher-grade mineralization.
Phyllic	PH	Broad wall rock halo of sericite, pyrite, quartz
Transitional Phyllic	TRPH (43)	Phyllic overprint common in the porphyry cover rocks; appears to overprint a magnetite-rich propylitic alteration in the HR-P.
Argillic	A	White clay alteration halos to pyrite + quartz-bearing micro-fractures; occurs pervasively on a deposit scale, though volumetrically minor (intermediate argillic).
Propylitic	P	Chlorite, carbonate, sericite, pyrite in upper part of late dike intrusives and the EM-P; grades into potassic alteration at depth
Weathering oxidation	TOX (41)	Localised and limited to upper few- to-tens of metres, limonite, goethite, and red-brown hematite with white clays

Total Oxidation (TOX – 41)

Related to surface weathering and comprising rusty orange-brown limonite, goethite, red-brown hematite, and white clay enriched oxidation, located within a few to tens of metres from the surface, and do not affect the deeper gold-copper mineralization.

Potassic Alteration (PT – 31)

Potassic alteration is the most common alteration type occurring within the Ciresata deposit, and effectively outlines the maximum extent of gold-copper mineralization in this area. Potassic alteration is generally associated with a mineral assemblage that includes biotite-quartz±K-feldspar±magnetite and pyrite>chalcopyrite. The alteration minerals occur as finely disseminated grains in the groundmass of porphyritic and sedimentary rocks, and less pervasively as granular aggregates of "ratty" biotite-magnetite±sulphides after mafic phenocrysts in the porphyries. This mineral assemblage gives the rock a dark brown to reddish-brown colour.

Within the Ciresata deposit, elevated gold-copper grades are closely associated with biotite-magnetite enrichment, intensely developed quartz-magnetite-pyrite-chalcopyrite stockwork veining within the early-mineral porphyry, and in a broad halo extending into the adjacent hornfelsed sedimentary rocks.

MACE Alteration (MACE – 30)

MACE alteration at the RVP is a logging term used to describe a magnetite-amphibole-chlorite-epidote alteration imparting a greenish appearance to the drill core, which is commonly associated with gold-copper mineralization. At the Ciresata deposit, the MACE alteration is comprised of quartz-magnetite-chlorite±epidote with pyrite+chalcopyrite. It is common for rocks to have been potassically altered prior to becoming overprinted by MACE alteration. Therefore, where MACE alteration is less intense, the rock generally has a brownish-black colour and a predominant alteration mineral assemblage of biotite and magnetite, whereas the localized MACE alteration consisting of chlorite-magnetite-quartz with associated pyrite-chalcopyrite gives the rock a dark green to light green colour. The MACE alteration assemblage is typically associated with magnetite stringers and clots and well-developed quartz-sulphide vein stockwork, with significant fine-grained disseminated cpy-py-mt mineralization. At Ciresata, the MACE alteration is ”patchy” in its recognized distribution, and thus the PT is a better deposit-wide guide to gold-copper mineralization.

Transitional Alteration (TRPH – 43)

Transitional phyllic alteration is the most common alteration type effecting porphyritic rocks in the upper parts of the Ciresata deposit. This alteration type is characterized by the selective replacement of mafic phenocrysts by clotty zones of chlorite-magnetite-epidote-carbonate and a more pervasive clay-sericite-quartz-pyrite enrichment of the groundmass. Magnetite stringers and clots and weakly developed quartz-sulphide veining are also commonly associated with this alteration type; however, gold-copper grades are generally low.

A Alteration (Argillic)

Argillic alteration occurs as white alteration selvages (ranging from 1 to 2 cm wide to 10 m wide illite-smectite) to planar fractures and breccia-fracture zones. These fractures contain sparse pyrite±quartz/carbonate. This alteration should more appropriately be termed Intermediate Argillic to be consistent with alteration terminology (Seedorff, 2005). These fractures and alteration are late- to post-mineral, locally overprint earlier mineralization/alteration, and in general do not have any effect on gold-copper grade, though in some cases this alteration may have decreased the grade. This fracture-controlled alteration is common throughout the deposit, typically spaced 20 to 30 m apart.

PH Alteration (Phyllic)

Phyllic alteration is characterized by a dominant assemblage of sericite-quartz-pyrite±microcrystalline clay minerals that is generally consistent with the low-grade peripheral parts of the Ciresata deposit. Approximately 5 to 15 modal percent pyrite generally occurs within this alteration type as 3 to 7 mm clusters of fine-grained aggregates, disseminated grains, and within mm-scale stringers. Phyllic alteration typically has a pale grey to pinkish grey colour within porphyritic rocks, and a pale grey-beige colour within sedimentary rocks. In the upper parts of the Ciresata deposit, the phyllic alteration is intense, forming a white rock, and overprints earlier alteration types.

To simplify the current interpretation, phyllic alteration and argillic alteration (Intermediate Argillic) were modelled together as quartz-sericite-pyrite±clay alteration.

P Alteration (Propylitic)

Propylitic alteration is characterized by the assemblage of chlorite-carbonate-sericite±epidote. This alteration type is most commonly observed within and adjacent to the upper parts of the late-mineral dikes.

Sodic Alteration

In some deep drill holes at Ciresata, minor occurrences of sodic alteration have been observed. This alteration occurs as narrow (1 to 5 cm wide) milky-white selvages, to early quartz veins with “wobbly”, or curviplanar boundaries. The white alteration appears to be a replacement of rock minerals which are interpreted to be microcrystalline albite. Due to the rare occurrence of this alteration and its apparently negligible effect on gold-copper mineralization, it has not been modelled.

Discussion

From the observations above, the gold-copper mineralization at Ciresata appears to be bracketed by the Host Rock Porphyry emplacement and the Late Porphyry dyke emplacement. An interpreted sequence of Neogene geologic events is as follows:

- cretaceous sediments (SED) intruded by the Host Rock Porphyry (HR-P), with intrusive contact largely controlled by northeast-dipping bedding planes
- thermal contact metamorphism of SED unit grading outward from the HR-P contact, resulting in hornfels
- vertical emplacement of the narrow, pipe-like Early Mineral Porphyry (EMP) within the SED, expanding at the SED/HR-P contact
- multiple stockwork fracturing events of the EMP-SED and overlying HR-P, with associated alteration and mineralization
- intrusion of the Inter-Mineral Porphyry (IM-P) in the root zone of the EM-P
- post- to very late-stage mineral intrusion of dikes, including the Late-Mineral Porphyry and the West Porphyry
- subsequent cooling and un-roofing of the mineral system

This interpreted sequence of geologic events at the Ciresata deposit with both pre- and post-mineral intrusions is commonly observed in porphyry deposits (Sillitoe, 2000, and Seedorff, 2005). Recognition of inter-mineral porphyry intrusions is important due to their effects on grade but can be difficult to identify due to similar compositions and alteration/mineralization overprints (Sillitoe, 2000). Late- to post-mineral intrusions result in sharp grade breaks. Gold-copper mineralization is presented in the following section.

Mineralization Descriptions - Ciresata

Gold-copper mineralization at Ciresata is associated with magnetite-pyrite-chalcopyrite occurring in veinlet stockworks and as finely disseminated grains over a wide area of approximately 450 m

(NW-SE) by 300 m (NE-SW) and narrowing with depth. Recent deep drilling has intersected mineralization 500 m below previous drilling, suggesting approximately 1,000 vertical metres of mineralization. This mineralization is centered on the Early Mineral Porphyry (EM-P), with approximately 65% hosted in the hornfels sediments (SED) and 35% in the EM-P. In general, grade decreases as a function of distance away from the EM-P-to-SED contact. In the southwest sector of the deposit, SED is the only host, and with the local occurrence of higher grades a deeper mineral porphyry has been postulated but not yet confirmed by drilling.

Gold correlates positively with copper grade and the gold: copper ratio is relatively constant throughout the deposit. Chalcopyrite is the only copper mineral present. Petrography and gold deportment studies show that gold is fine-grained, and associated with grains of chalcopyrite, pyrite, quartz, and rarely with magnetite (Damian, 2011; Wang and Prout, 2008; Sliwinski, 2012). In addition, scanning electron microscope (SEM) analysis of gold grains from Ciresata indicates they are native gold, with an average composition of 94.7% Au and 5.2% Ag. On a deposit scale, marginal to the gold-copper mineralization, anomalous zinc (up to 400 ppm) and lead (up to 40 ppm) occur and appear to be associated with the phyllic alteration halo. Within the mineralization, zinc is anomalous, with an approximate average value of 170 ppm. Limited analysis for molybdenum (670 samples) showed assays ranging from 2.5 to 121 ppm, with an average of 20 ppm. Weathering oxidation is restricted to the uppermost tens of metres, and thus does not affect the gold-copper mineralization.

An early-stage magmatic-fluid alteration event, potassic (PT, biotite+magnetite) is recognized with less extensive overprinting magnetite-chlorite (MACE) alteration. The broad outline of PT alteration correlates well with the outer limit of mineralization in both the SED and porphyry units. Magnetite is a predominant alteration mineral, and the abundance of magnetite coupled with stockwork vein intensity generally correlates with gold-copper grade.

Higher grades of gold-copper mineralization, in the core of the porphyry body and near contacts with dikes and SED, are associated with broad zones of intense quartz-magnetite-pyrite-chalcopyrite stockwork veining (up to 80% of rock volume). Other important vein types recognized are thick-banded (1 to 10 cm) quartz-pyrite-chalcopyrite veins (commonly associated with higher gold grades) and magnetite-chalcopyrite stringers. Cross-cutting veinlets indicated multiple fracturing and hydrothermal pulses. Vein types and logging codes are shown in Table 7-14.

Table 7-14: Vein Types and Logging Codes, Ciresata Deposit

Vein-Type Code	Relative Importance or Occurrence	Description
Bi-vn	Low	Biotite-magnetite±K-feldspar veinlets
Mt-st	High	Magnetite stringers (M-vns)
Mts-st	High	Quartz-magnetite–sulphide veinlets
Wq-vn	Low	Irregular early quartz veinlets; randomly oriented and often discontinuous
Dq-vn	Medium-low	Dark grey quartz veinlets
q-vn	Medium-low	Quartz±sulphides veinlets
Bq-vn	High	Thick-banded quartz-magnetite-sulphide veins
Qs-vn	High	Quartz-sulphide veins
Mq-vn	Low	Thick, irregularly shaped milky quartz veins
Py-st	Low	Pyrite stringers
Cp-st	High	Chalcopyrite stringers
Po-st	Low	Pyrrhotite stringers
Qcs-vn	Low	Quartz-carbonate±sulphide veins; open space, low temperature (epithermal)
Ca-vn	Low	Carbonate/quartz veins/stringers
Tr-st	Rare	Tourmaline stringers
M-vn	Rare	Quartz-Mo veinlet

The Ciresata gold-copper mineralization and associated alteration assemblages correspond to described porphyry models (Sillitoe, 2000, and Seedorff, 2005). Early-stage magmatic-hydrothermal fluids introduced potassium and iron in the form of magnetite (PT alteration), and gold-copper. Distal the core of mineralization, these fluids evolved, resulting in hydrolysis reactions with the calc-silicate wall rocks, and forming a phyllic alteration assemblage (PH). With time and cooling, these distal fluids may collapse on the potassic altered core and overprint with a phyllic assemblage (TRPH), and infiltrate the potassic core through brittle fractures, forming the fracture-controlled intermediate-argillic (A) to phyllic alteration assemblages (PH). Ciresata does not have an epithermal overprint, apart from very sparse open-space-filling quartz-calcite±galena-sphalerite. A timeline alteration paragenesis is shown in Table 7-15.

Table 7-15: Ciresata Alteration Paragenesis

Alteration Phase	Timing →	Relative Importance	Sulphide Assemblage	Comment
Potassic (PT)		xxxx	cp, py, (mo)	Deposit-wide, pervasive
Magnetite-Chlorite		xxxxxxxx	py, cp	Deposit-wide, patches
Sodic (Na)		x	py	Occurs only at depth
Silicification (S)		xx	py	Common in Mag-Chl alt.
Phyllic (Ph)			py	Broad halo, no mineralization
Propylitic (P)			py	Late Mineral porphyry
Carbonate (CC)			py,	Pervasive in vein halos
Argillic (A)			py	Fracture controlled

It is AGP's opinion the level of understanding of the geology, structure, and mineralization of the RVP has advanced to an adequate level to support resource estimation.

8 DEPOSIT TYPES

The principal targets on the Rovina Property are related to the porphyry copper–gold mineral deposit model. Porphyry deposits in general are large, low- to medium-grade deposits in which primary (hypogene) sulphide minerals are dominantly structurally-controlled and which are spatially and genetically related to felsic to intermediate porphyritic intrusions) (Seedorff, et al., 2005). The large size and structural control (e.g., veins, vein sets, stockworks, fractures, 'crackled zones', and breccia pipes) serve to distinguish porphyry deposits from a variety of deposits that may be peripherally associated, including skarns, high-temperature mantos, breccia pipes, peripheral mesothermal veins, and epithermal precious metal deposits. Secondary minerals may be developed in supergene-enriched zones in porphyry Cu deposits by weathering of primary sulphides. Such zones typically have significantly higher Cu grades, thereby enhancing the potential for economic exploitation (Sinclair, 2006).

Porphyry deposits occur throughout the world in a series of extensive, relatively narrow, linear metallogenic provinces. They are predominantly associated with Mesozoic to Cenozoic orogenic collisional belts in western North and South America and around the western margin of the Pacific Basin, particularly within the Southeast Asian Archipelago. However, major deposits also occur within Palaeozoic orogens in Central Asia and eastern North America and, to a lesser extent, within Precambrian terranes (Sinclair, 2006 and Seedorff et al., 2005).

Porphyry deposits are large and the world's most important source of Cu, Mo, and Re, and are major sources of Au, Ag, Sn and significant by-product metals include W, In, Pt, Pd, and Se. They account for approximately 50 to 60% of world Cu production (Sinclair, 2006). Grades for the different metals vary considerably but generally average less than 1%. In porphyry Cu deposits, Cu grades range from 0.2% to more than 1% Cu; Mo content ranges from approximately 0.005 to 0.03% Mo; Au contents range from 0.004 to 0.35 g/t Au; and Ag content ranges from 0.2 to 5 g/t Ag. Re is also a significant by-product from some porphyry Cu deposits. Some Au-rich porphyry Cu deposits have relatively high contents of Pt-group elements (PGE) (Mutschler and Mooney, 1995; Tarkian and Stribrny, 1999 in Sinclair 2006).

8.1 Gold (± Copper) Porphyries

Copper grades in porphyry Au +/- Cu deposits range from negligible to comparable to those of the porphyry Cu +/- Au subtype, but Au contents tend to be consistently higher, averaging between 0.2 to 2.0 g/t Au. Because of the apparent independent relationship between Cu and Au content of porphyry deposits, Sillitoe (2000) suggested that porphyry deposits should contain >0.4 g Au/t to be called Au-rich. Other workers have suggested using an Au-Cu ratio instead of absolute grade to determine an Au-Cu Porphyry subtype (Seedorff et al 2005, and Murakami, et al., 2009). Sillitoe (2000) concludes the geologic features of Au-rich porphyries are very similar to the Cu-Au porphyry subtype. The Au endowment in porphyry deposits is the topic of much of the current porphyry deposit research which is considering tectonic settings and magmatic genesis, basement rock compositions, and emplacement fluid geochemistry processes (Seedorff et al. 2005, Murakami, et al. 2010, Halter, et al 2002).

Most Cu-Au porphyry intrusive complexes consist of a series of both pre- and post-mineralization intrusions. The pre-mineralization intrusions are generally equigranular in texture and genetically related to the porphyry stock, and often intrude along the shoulders of the pre-mineralization intrusion. Post-mineralization dikes and plugs and diatremes are also commonly associated. Various hydrothermal breccias occur as early orthomagmatic (strong K-silicate altered) and/or late phreatic and phreatomagmatic varieties (Sillitoe, 2000, and Seedorff, 2005).

Copper and gold grades in the early orthomagmatic breccias may be substantially higher than in the surrounding porphyry rocks, while later breccia types are generally of sub-economic grade. Large (>0.5 km wide) low-grade or barren diatreme breccias and minor pebble dikes often conclude the evolution of gold-rich porphyry systems (Sillitoe, 2000).

Most Cu-Au porphyry systems consist of varying quantities of six principal alteration types, namely Ca–Na silicate, K-silicate (potassic), propylitic, intermediate argillic (sericite–clay–chlorite), sericitic, and advanced argillic. Colnic, Rovina, and Ciresata all display characteristics of several of these alteration types.

Gold-rich porphyry deposits are typically associated with abundant magnetite in the early K-silicate alteration phase and also in the intermediate mineralization stages (Sillitoe, 2000). Economically-mineralized zones commonly form upright cylinders or bell-shaped zones. Intermediate, sericitic, and advanced argillic zones can also host economic grades of copper and gold, but less frequently than the K-silicate zone. The mid-parts of many porphyry deposits correlate with the highest gold grades, often as high as double that in upper or lateral margin parts. Gold is generally fine grained (<20 µm, and often <100 µm). In pyrite-rich Au porphyry deposits, gold strongly correlates with the pyrite; while in pyrite-poor deposits, gold is commonly associated with chalcopyrite or bornite (Sillitoe, 2000).

In AGP's opinion, the deposits of the RVP area are considered examples of porphyry deposits due to association with the porphyritic intrusive complexes, alteration assemblage, and mineralization style described above. According to Sillitoe, porphyry deposits with average gold grades >0.4 g/t Au can be generalized as "gold-rich". Gold grades returned from the drilling at Colnic and Ciresata tend to average in the range of 0.8 g/t to 1.2 g/t Au, with copper grades averaging around 0.1 to 0.2% Cu. Gold grades at Colnic and Ciresata are >0.4 g/t Au and Au/Cu ratio (Au g/t / Cu %) of 5, which falls under the classification of a true Au–Cu porphyry subtype while Rovina with an Au/Cu ratio of one falls under the Cu-Au porphyry subtype.

9 EXPLORATION

Most of the exploration on the Property has been performed by three companies: Minexfor between 1974 and 1998 and again in 2001, Rio Tinto from 1999 to 2000, and since 2004, Euro Sun. In September 2011, Barrick Gold and Euro Sun formed an exploration collaboration group to evaluate further exploration targets on the Rovina licence. Early-stage exploration focused on property-wide target generation and was dominated by soil and stream sediment geochemical surveys, and regional airborne geophysical programs, undertaken in conjunction with surface and underground geological mapping, trench sampling, and detailed ground geophysical programs. Specific details of previous early-stage programs (Minexfor and Rio Tinto) are not well documented. Euro Sun has purchased available documentation for the Minexfor and Rio Tinto work stages.

Various exploration techniques have been utilized during the exploration stages and are described below.

9.1 Coordinates and Datum

Coordinates used by Euro Sun, Rio Tinto, and Minexfor are in the “Stereo70” grid system, which is the official coordinate system used in Romania. The exploration licences registered with NAMR are also in this grid system. Euro Sun utilizes the Stereo 70 system, which is compatible with standard GIS software packages. When GPS surveys are used, UTM Datum WGS 84 Zone 35 coordinates are converted to Stereo 70.

9.2 Minexfor (1975 to 2000)

9.2.1 Geographic/Grid Control

There is no documentation of the grids constructed by Minexfor, however, it is believed that Colnic and Rovina grids were used as a basis for soil sampling, geophysical surveys, geological mapping, and drilling. All maps, sample locations, and drill hole collars are registered and reported in the Stereo 70 coordinate system.

9.2.2 Topography

There is no reference in the available documents defining the source for the topographic base used by Minexfor. Presented topographic maps are presumed to be from standard government published maps at 1:5000 scale.

9.2.3 Geological Mapping and Related Studies

Geologic mapping completed by previous exploration groups on the property is limited or not well documented. From Minexfor, some prospect-scale geology maps have been obtained by Euro Sun.

9.2.4 Ground Geophysics

The Romanian government had reportedly completed IP/resistivity, natural polarization, and gamma ray geophysical surveys at Colnic in 1977–1978. Those surveys were apparently completed on ten north–south lines, spaced 200 m apart. No additional information is available on these surveys. Those 30-year old data have been superseded by recent work. Additional magnetic and gamma ray geophysical surveys were completed by Minexfor during 1983 to 1984. Euro Sun did not receive copies of any of the results of these surveys.

9.2.5 Drill Core Sampling

As a follow-up to the early stage work, Minexfor tested various geophysical anomalies and surface defined targets at the Colnic Deposit area (14 core holes totalling 4,740 m) and the Rovina Deposit (34 holes totalling 23,119 m). They also tested the Ciresata prospect, located approximately 4.5 km south of Colnic with six wide-spaced core holes totalling 1,200 m.

Details regarding Minexfor drill core sampling programs are very poorly documented and are not discussed in this report. None of the Minexfor core is in a usable format and most of it has been dumped in heaps adjacent to the Rovina deposit. Euro Sun’s purchased historic data package includes hard copies of drill logs with coordinates and hand-written assays for many of the completed holes.

9.3 Rio Tinto (1999 to 2000)

9.3.1 Geographic/Grid Control

Rio Tinto established grids for soil surveys over four separate prospects within the present Euro Sun property as shown in Table 9-1.

All grids were oriented north–south and were designed mainly for soil geochemical sampling. There is no documentation in the data regarding how the grids were surveyed and whether they were physically marked on the ground. All maps, sample locations, and drill hole collars are registered and reported in Stereo 70 coordinate system.

Table 9-1: Rio Tinto Grids

License	Prospect	Area (ha)	Grid Spacing	Purpose	Range of Au Values (g/t)
Rovina	Colnic	220	200 x 200 m and 100 x 100 m in northwest	164 soil samples	0 to 0.69
	Ciresata	1,120	200 x 100 m and 200 x 200 m in southeast	500 soil samples	0 to 0.11

Note: license is the present Euro Sun property; Rio Tinto had a much larger license

9.3.2 Topography

There is no reference in the available documents defining the source for the topographic base used by Rio Tinto. Presented topographic maps are presumed to be from standard government published maps at 1:5000 scale.

9.3.3 Geological Mapping and Related Studies

Exploration reports from Rio Tinto indicate no geologic mapping was completed beyond reconnaissance-style investigations. Work by other groups on the property, prior to Euro Sun, is not well documented.

9.3.4 Airborne Magnetics/Radiometrics Geophysics

In 1999, Rio Tinto completed a helicopter-borne magnetic/radiometric survey (flown by Fugro Airborne Corp. out of Canada) over an area approximately 24 by 30 km. The area covered by the survey included both the Colnic and Rovina porphyries, which were located in the northeastern portion of the Rio Tinto permit.

The airborne survey was completed on east–west-oriented, 150 m-spaced lines using a helicopter elevation of 60 m and a sensor elevation of approximately 35 m. Total survey length was 3,995-line km. In 2005, Euro Sun purchased the digital TIFF-format images for this survey from the NAMR. Seven images were provided, including potassium, thorium, uranium, total magnetic field, reduced-to-pole, analytical signal, and first vertical derivative, but no original raw data. The reduced-to-pole magnetic image revealed a 5 km long arc-shaped zone of magnetic highs and lows, bordered to the west by a strong magnetic low anomaly. The low corresponded to the outer western ring of a circular feature with an 8 km radius.

9.3.5 Geochemistry - Stream Sediment Sampling

Rio Tinto reportedly completed a program of reconnaissance stream sediment sampling over several drainage basins as shown in Table 9-2.

Table 9-2: Rio Tinto Stream Sediment Sampling

Prospect	Number of Samples	Range of Grades (Au g/t)
Colnic	24	0 to 1.04
Ciresata	13	0 to 0.43
Total	**37**	

No details were provided regarding sample collection methodology, sample size, or preparation. Rio Tinto followed-up this first-stage work with soil geochemistry and rock-chip sampling in all these drainage basins. Further work by Euro Sun has superseded these results.

9.3.6 Soil Geochemical Sampling

Rio Tinto reportedly completed a program of grid soil sampling over three separate grids. Few details were provided regarding sample collection methodology, sample size or preparation.

At the Ciresata Prospect, a soil geochemistry survey covering 11.2 km^2 was completed at a spacing of 200 x 100 m, widening to 200 x 200 m on the southeast part of the grid. Results from this survey defined partly-coincident Au (>10 ppb), Cu (>25 ppm), and Mo (>2 ppm) anomalies. In addition, over a prominent magnetic anomaly from geophysical data, there are coincident Au–Cu–Mo soil anomalies that cover an area of approximately 1,200 x 600 m. Within this anomaly, Minexfor reportedly drilled four vertical diamond drill holes.

Rio Tinto's soil geochemical grid at Colnic covered an area of approximately 1.2 x 1.4 km and lines were oriented north–south, spaced 200 m apart with sampling stations every 100 m. In the western part of the grid, line spacing is 100 m. Soil samples were sieved to minus 80 mesh and analyzed by OMAC Laboratory in Ireland for Au and a 45-element suite using ICP-OES.

9.3.7 Rock Chip Sampling

Rio Tinto collected 153 rock chip samples at the Colnic, and Ciresata Prospects, as shown in Table 9-3. This limited reconnaissance-level work has been superseded by surface exploration work subsequently completed by Euro Sun.

Table 9-3: Rio Tinto Rock Chip Sampling

Prospect	Number of Samples	Range of Grades (Au g/t)
Colnic	133	0 to 1.24
Ciresata	14	0.01 to 0.21
Total	**147**	

9.3.8 Drill Core Sampling

Rio Tinto did not report any drilling activities in their exploration reports filed with the NAMR and subsequently purchased by Euro Sun.

9.4 Euro Sun (2004 to 2012)

9.4.1 Geographic/Grid Control

Euro Sun established five grids as shown in Table 9-4. These grids formed the basis of soil sampling surveys and ground geophysical surveys. These grids are generally of temporary nature with only baselines marked with monuments. Subsequent geological mapping and channel sampling were located with government topographic maps, compass and tape surveys, and hand-held GPS units without the utilization of a base station.

Table 9-4: Euro Sun Grids

Prospect	Area	Grid Spacing	Purpose
North part of Rovina License	24 km2	50 m E-W x 50 m N-S	Ground magnetic survey
North part of Rovina License	20 km2	200 m E-W x 100 m N-S	Soil geochemistry survey; includes 100 x 100 m infill grids over the Rovina and Colnic Deposits
Ciresata	9 km2	200 m E-W x 100 m NS	Soil geochemistry
Ciresata	10 km2	50 m E-W x 50 m N-S	Ground Magnetic survey

9.4.2 Topography

The locations and elevations of all geological mapping, channel samples, and drill hole collars are plotted on 1:5000 scale government topographic maps with 10 m elevation contours. Locations of isolated surface samples are obtained through use of hand-held GPS units with detailed surface samples and drill-hole collars located utilizing compass and tape surveying. A professional contract survey company (Belevion Geo-Topo SRL) was utilized to complete and regularly update topographic surveys over Rovina, Colnic, and Ciresata using a total-station instrument. In addition, drill-hole collars and access roads are surveyed by Belevion. From 2010, Euro Sun has utilized another professional contract survey company (Topo-Geo Plus). Locations for all data are in the Romanian “Stereo70” grid coordinates.

9.4.3 Geological Mapping and Related Studies

A regional reconnaissance mapping program at a scale of 1:5,000 was completed over most of the licence, together with a more detailed mapping at a scale of 1:1,000 over the main prospects.

A grid for the mapping and sampling program was not physically established but existing topography maps and hand-held GPS units were used for control.

The geological work carried out by Euro Sun geologists and contractors includes the following:

- Colnic/Rovina Deposits: 1:1,000 scale geology covering an area of 3.9 km2 focusing on the immediate Rovina and Colnic target areas. Mapping was completed by independent contractor Steve Priesmeyer from A.C.A. Howe International Ltd. in 2005 and re-mapped by Euro Sun Geologist Mr. Jim Stemler in 2006.
- Ciresata Deposit: 1,000 scale geology covering an area of 4 km2 in the Ciresata area. Mapping was completed by independent contractor Steve Priesmeyer from A.C.A. Howe International Ltd. in 2005 and re-mapped by Mr. Jim Stemler in 2007.
- Rovina Licence: 1:2,000 scale geology mapping targeting ground magnetic anomalies within a 24 km2 area in the Northern part of the Rovina License. Mapping was completed by independent contractor Steve Priesmeyer from A.C.A. Howe International Ltd. in 2006, and re-mapped by Mr. Jim Stemler at 1:5000 scale in 2007.
- Mapping of drill roads at Rovina and Colnic at 1:1000 scale. Mapping was completed by Euro Sun geologists in 2008.
- Mapping of lithology and alteration in the Ciresata area by Barrick gold geologists.

Much of the relevant data resulting from this work is reported in Sections 7 and 9 respectively, of this report.

9.4.4 Remote Sensing and Satellite Imagery

In July 2002, Euro Sun purchased 1:100,000 scale Satellite LandSat TM imagery from HME Partnership Ltd, Kent, U.K., which cover the entire ‘Golden Quadrilateral’. These data are integrated into a GIS database and have been used to aid in the structural interpretation of the Property and for alteration mapping.

9.4.5 Ground Geophysics

In June 2006, Euro Sun commissioned Belevion SRL from Bucharest to complete a ground magnetic survey totalling 480-line kilometres and covering a 24 km^2 area over the Colnic and Rovina deposits. The survey consisted of east–west-oriented, 50 m spaced lines, with individual stations spaced at 50 m along each line. A summary report prepared by Belevion staff included a total field image. The raw data has been subsequently re-processed and interpreted to evaluate reduced to pole and analytical signal features for interpretation (Morris, 2006). The results of the survey are shown on Figure 9-1 and show several prominent, strongly positive, anomalies.

In October 2007, Euro Sun commissioned Belevion SRL from Bucharest to complete a ground magnetic survey over the Ciresata area. This survey covers 10 km^2 at a 50 x 50 m grid spacing. All of the field maps provided by Belevion were utilized for interpretation.

The known porphyries of Rovina, Colnic, and Ciresata demonstrate a ‘bulls-eye’ feature resulting from a magnetic porphyry core and a surrounding magnetic low, possibly relating to magnetite-destructive retrograde phyllic alteration. Geological mapping and magnetic anomaly 'ground truthing' indicated the presence of several magnetic units including lava flows and volcaniclastic rocks and subvolcanic intrusives with primary magnetite. Several anomalies are present within the coupled magnetic high and adjacent low of the 'bull's eye' pattern. Euro Sun has completed several soil geochemistry surveys over target areas in the north part of the property. Soil geochemistry results coupled with magnetic anomalies are used for guiding field reconnaissance and mapping programs. This method resulted in the identification of subcropping potassic alteration with associated copper mineralization at the Zdrapti Prospect and was instrumental in discovering Ciresata. As part of an alteration mapping program at Ciresata, the prominent high-magnetic anomaly was found to be caused by intense magnetite alteration. Subsequent work has shown this to be the barren magnetite altered cap to the Ciresata mineralization 50 – 150 m below the surface (Figure 9-2). In 2010, the raw magnetic data from both the Rovina-Colnic and Ciresata grids were re-processed and interpreted by Barrick Gold (Hope, et al 2010) utilizing proprietary filters to highlight porphyry targets.

In September 2006, Euro Sun contracted Belevion SRL to complete an I.P./resistivity survey over the Rovina, Colnic, and Zdrapti target areas based on magnetic signature and the occurrence of known surface mineralization and early-stage drilling results. The objective of these surveys was to provide drill-targeting guidance for the definition of the targets.

In May 2008, Euro Sun contracted Belevion SRL to complete a I.P./resistivity survey over the Ciresata target area following encouraging initial drilling results. This survey was centered on the barren magnetitic anomaly.

The surveys utilized an IPC7–2.5 kW SCINTREX transmitter, and an IPR12–SCINTREX receiver. Measurements were collected every 20 m along lines of length variable from 1,000 to 1,500 m. The theoretical depth penetration of the surveys varies from 180 to 310 m (Table 9.5). The IP survey layout and interpretation to date of the results from the Rovina survey were performed by an independent consulting geophysicist, Paolo Costantini, who has visited the projects and advised on line orientation. A 3D interpretation of the results from the Rovina and Zdrapti surveys was completed. At Colnic and Ciresata, Euro Sun has utilized pseudo-sections of inverted data and interpreted by Belevion. The results for Ciresata were inconclusive likely due to limited depth penetration.

Figure 9-1: Ground Magnetic Survey and Soil Geochemistry, Northern Part of License

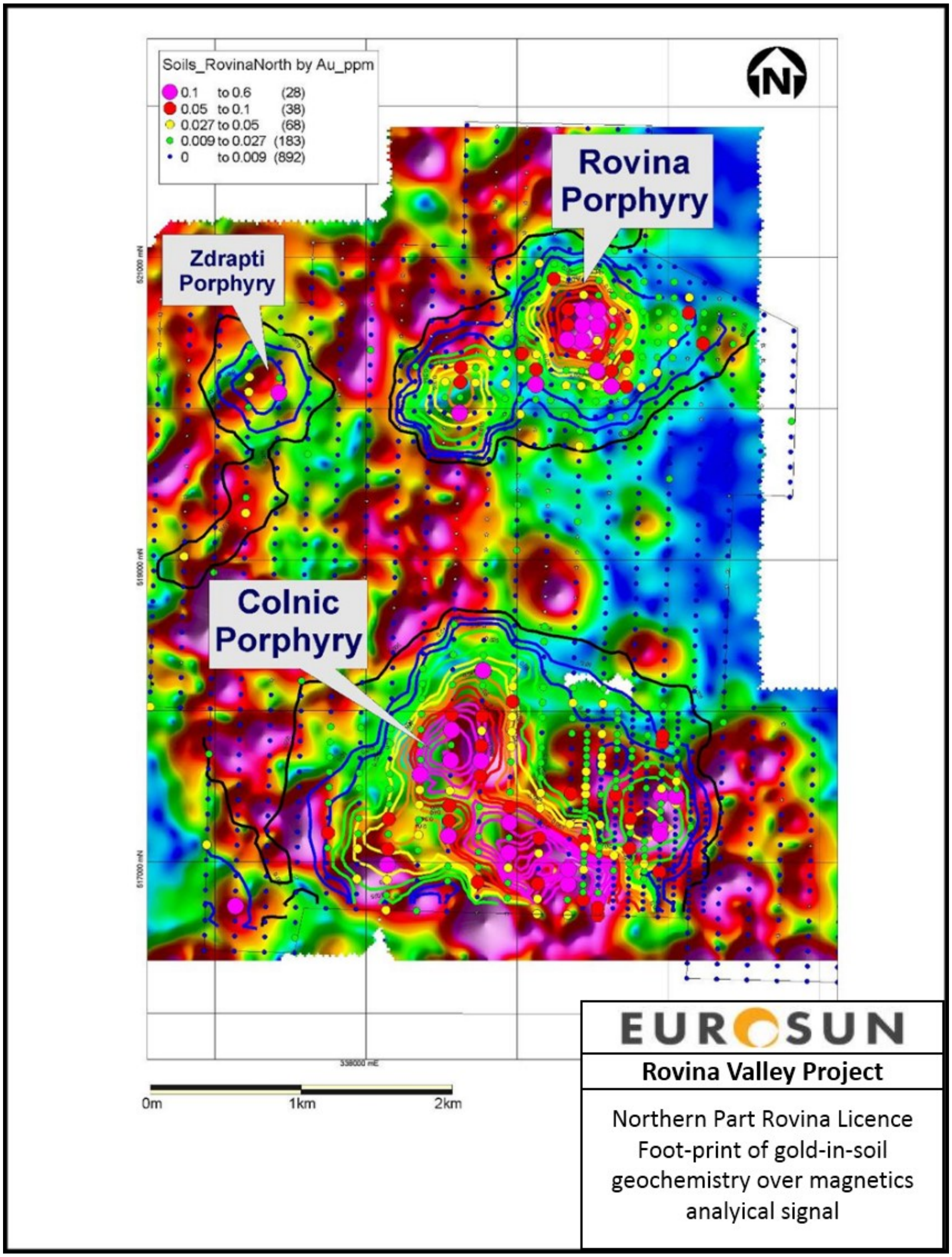


Figure 9-2: Ciresata Area Ground Magnetic Survey and Soil Geochemistry , Southern Part of License

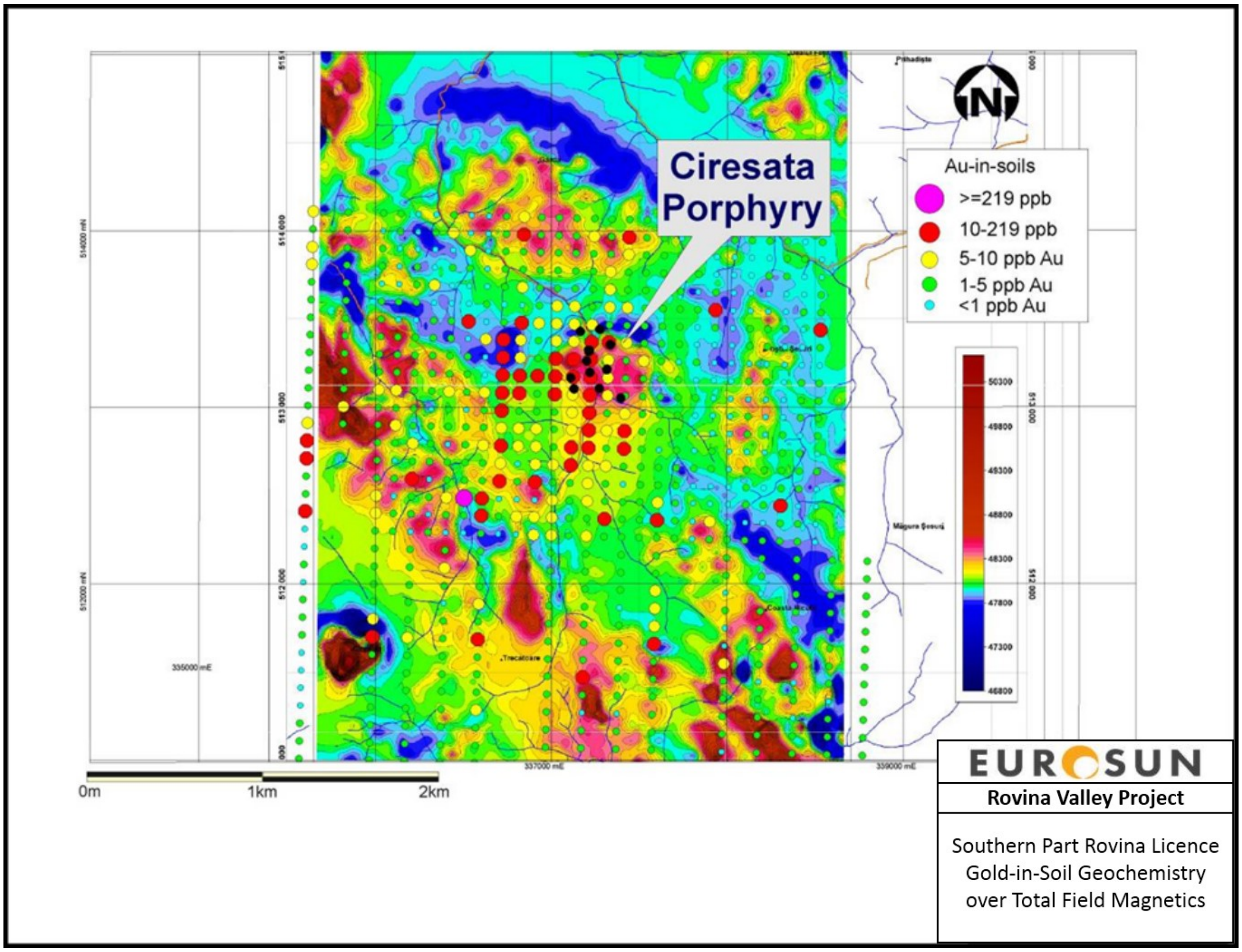


Table 9-5: Euro Sun IP/Resistivity Surveys

Prospect	Survey Dates	Amount (line m)	Depth of Penetration (m)	Comments
Zdrapti	September, 2006	4,200	180	3 lines, 1400 m long, lines spaced 150 m apart
Colnic	Oct 16 - Nov 3, 2006	4,370	180 – 310	2 lines along drill sections and 1 line at 90° to sections over the Colnic deposit
Rovina	March – April, 2007	7,500	310	6 lines, 1.25 km long, lines spaced 125 m apart
Colnic	April – May, 2007	9,000	310	6 lines, 1.5 km long, spaced 300 m apart
Ciresata	May 2008	3,500	200	2 lines, 1.74 km each, in orthogonal cross-pattern
Total		28,570		

9.4.6 Soil Geochemical Sampling

In May 2007, Euro Sun initiated a soil geochemical survey over the northern part of the Rovina licence. The survey grid covered an area of 20 km^2 over the Rovina, Colnic, and Zdrapti prospects on a 200 (east–west) x 100 m (north–south) grid. In addition, infill grids were completed in selected areas with the larger grid. Results highlight coincident Au-Cu ± Mo anomalies over the known porphyry deposits of Rovina and Colnic with a series of satellite gold anomalies within the broad phyllic alteration halo at Colnic (Figure 10-1). Additional anomalies occur at the Zdrapti prospect and other areas. Euro Sun conducted field-follow-ups comprised of mapping and sampling of these and other magnetic anomalies within the grid.

Euro Sun conducted a geochemistry re-survey of the Ciresata area at a closer grid spacing than the Rio Tinto survey to provide better sampling and analytical control. Results from Euro Sun's 100 x 100 m geochemistry survey highlight an Au + Cu anomaly extending 300 m west from the known porphyry mineralization.

9.4.7 Rock Chip Sampling

1,538 surface rock samples were collected from the Rovina property as part of reconnaissance mapping, prospect mapping, and detailed mapping campaigns. These samples include chip-channel, chip, float, waste-dump, and discarded old core. Geologist descriptions include sample type, geology description, and map location and are entered into a GIS database. A tabulation of surface rock sampling by prospect for the Rovina property is shown in Table 9-6. This includes 294 channel-chip samples from outcrops at Colnic for a cumulative 794 m, and 83 channel-chip samples from Rovina for a cumulative 303 m collected during the period of October 2004 to May 2006. At Ciresata, rock sampling includes 109 rock samples and 34 channel samples collected in the period between 2006 and 2008, an additional 558 composited channel samples rock samples collected in 2010, and 126 rock samples collected by Barrick Gold geologists in 2011. Geologic description and assay results from these samples highlighted outcropping porphyry Au-Cu mineralization that subsequent drilling has defined as the Rovina and Colnic porphyry deposits. These samples have not been used in this Resource Estimation due to the extensive drilling completed but do provide surface evidence of the respective porphyry mineralization.

Table 9-6: Surface Rock Sampling on the Rovina Property

Prospect	Rock samples (from outcrops, subcrops, floats, mine dumps)	Channel Chip samples, channel samples, and composite chip channel samples	Underground channel samples	Total
Rovina	98	83		181
Colnic	89	294		383
Ciresata until 2008	109	34		143
Ciresata 2009-2012	126	558		684
Zdrapti	18			18

9.4.8 Drill Core Sampling

Euro Sun has extensively drilled the deposit since 2006. Details of this drilling are discussed in Section 10 of this report.

9.4.9 Mineralogical and Petrographic Studies

A number of petrographic studies were commissioned in 2006, 2007, 2008 and 2011 on hand specimen and drill core samples to Dr. Georghe Damian at North University in Baia Marie, to Dr. Robin Armstrong of the Natural History Museum in London UK, and to Jim Clarke of Cygnus Consulting Inc. in Montreal, Canada. Jon Sliwinski from X-Strata Process Support Center conducted high resolution QEMSCAN analyses on drill core samples from Ciresata and Colnic. Samples were examined for lithology, alteration, paragenetic sequences, and mineralization. Results of the studies were provided as detailed descriptions and photo-micrographs in report format (Damian, 2006 in Ruff, 2006, and Armstrong, 2006 in Ruff, 2007a, Ruff et al., 2012).

9.5 Euro Sun Exploration (2012 – current)

No further exploration has been completed on the Rovina license since the completion of the 2012 drill program.

9.6 AGP's Comment

It is AGP's belief that the exploration effort conducted by Euro Sun is adequate for the style of mineralization investigated. Historical drill samples by Minexfor were not used in the Resource Estimation. More recent data collected by Euro Sun were used for guiding the exploration activities at the RVP however, none of the surface rock chip samples collected by Euro Sun were used in the Resource Estimate.

10 DRILLING

Approximately 165,174 m of drilling has been completed on the Property since 1975. Most of the drilling focused on the Colnic, Rovina, and Ciresata deposits (41,217, 64,851, and 56,430 m, respectively). However, smaller reconnaissance programs have been drilled by Euro Sun at the Zdrapti Prospect. A summary of all drilling is provided in Table 10-1.

Locations of the historical drill holes at the Colnic, Rovina, and Ciresata Deposits are shown on Figure 6-1, Figure 10-1, and Figure 10-2, respectively. The Euro Sun drilling at Rovina, Colnic and Ciresata are shown in Figure 10-4, Figure 10-5, and Figure 10-6, respectively

Table 10-1: Summary of Drilling on the Property

Prospect	Company	Year(s)	DDH Holes	Total (m)	Core Diameter
Colnic	Minexfor	1975	1	650*	diameter unknown
	Minexfor	1982	5	2,990*	diameter unknown
	Minexfor	2000	8	1,100*	diameter unknown
	Euro Sun	2006	49	15,714	72% HQ, 28% NQ
	Euro Sun	2007	39	13,635	59% HQ, 41% NQ
	Euro Sun	2008	1	270	Metallurgical Drill Hole HQ
	Euro Sun	2011	18	4,645	76% HQ, 24% NQ2
	Euro Sun-Barrick	2012	2	1,217	4% PQ, 54% HQ, 42% NQ2
	Euro Sun Geotech	2011-12	4	996	100% HQ
Total Colnic			**127**	**41,217**	
Rovina	Minexfor	1975–86	34	23,119	(diameter unknown)
	Euro Sun	2006	17	8,435	40% HQ, 60% NQ
	Euro Sun	2007	34	15,644	40% HQ, 60% NQ
	Euro Sun	2008	16	7,625	43% HQ, 57% NQ (Includes 1 Metallurgical Hole HQ)
	Euro Sun	2011	4	2,113	43% HQ, 57% NQ2
	Euro Sun	2012	15	5,920	43% HQ, 57% NQ2
	Euro Sun-Barrick	2012	2	851	75% HQ, 25% NQ
	Euro Sun Geotech	2011-12	4	1,144	95% HQ; 5% NQ2
Total Rovina			**126**	**64,851**	
Ciresata	Minexfor	2002-03	6	1,200*	diameter unknown
	Euro Sun	2007	2	552	40% HQ, 60% NQ

Prospect	Company	Year(s)	DDH Hole s	Total (m)	Core Diameter
	Euro Sun	2008	14	7,183	35% HQ, 65% NQ (Includes 1 Metallurgical Hole HQ)
	Euro Sun	2010	4	3,793	21% HQ, 79% NQ
	Euro Sun (includes 3 holes Euro Sun-Barrick)	2011	44	36,159	25% HQ, 75% NQ2
	Euro Sun-Barrick	2011-12	11	7,543	6% PQ, 36% HQ, 58% NQ2
Total Ciresata			**81**	**56,430**	
Zdrapti	Euro Sun	2007	11	2,671	(RB-57), 41% HQ, 59% NQ
Geotechnical (conveyor belt and TMF)	Euro Sun	2011-12	13	5,359	100% HQ
Total Property			**358**	**165,174**	

Note: Historical data may be incomplete
Core diameters: PQ = 85 mm; HQ = 63. 5 mm; NQ =47.6 mm, NQ2 =50.7 mm

10.1 Historical Minexfor Drilling (1974-2003)

10.1.1 Rovina Deposit

Few details are available on the historical drill programs completed by Minexfor at Rovina. All core samples from previous campaigns were dumped in heaps near the Rovina deposit, and therefore cannot be resampled. The most significant program was completed at the Rovina deposit between 1974 and 1986 (Table 10-2).

Table 10-2: Minexfor Historical Drilling – Rovina Deposit

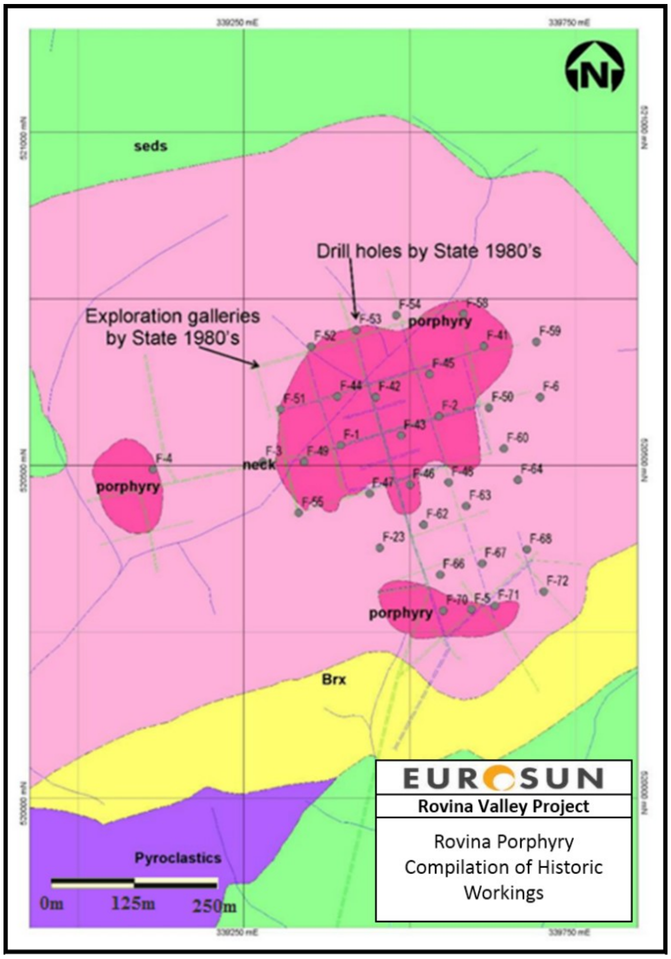
Hole ID	Stereo 70 Coordinates Easting	Stereo 70 Coordinates Northing	Elevation (masl)	Length (m)	Azimuth	Dip	Average Core Recovery (%)
F-1	339,395.930	520,530.373	569.9	750	0°	-90°	N/A
F-2	339,544.001	520,573.579	627.99	1,108	0°	-90°	N/A
F-3	339,278.895	520,504.938	553.27	750	0°	-90°	N/A
F-4	339,113.547	520,494.034	571.24	750	0°	-90°	N/A
F-5	339,592.436	520,283.889	635.64	750	0°	-90°	N/A
F-6	339,696.495	520,602.333	681.58	750	0°	-90°	N/A
F-23	339,454.987	520,375.845	623.71	720	0°	-90°	N/A
F-41	339,611.239	520,679.343	635.24	650	0°	-90°	N/A
F-42	339,448.855	520,602.642	580.56	550	0°	-90°	N/A
F-43	339,487.212	520,544.766	616.09	550	0°	-90°	N/A
F-44	339,390.956	520,603.637	575.21	560	0°	-90°	N/A
F-45	339,529.848	520,637.297	605.8	546	0°	-90°	N/A
F-46	339,500.432	520,471.261	638.16	550	0°	-90°	N/A
F-47	339,439.521	520,457.703	612.88	575	0°	-90°	N/A
F-48	339,558.643	520,474.819	663.89	550	0°	-90°	N/A
F-49	339,341.018	520,504.800	548.42	700	0°	-90°	N/A
F-50	339,618.911	520,586.622	653.83	650	0°	-90°	N/A
F-51	339,306.152	520,583.488	596.25	800	0°	-90°	N/A
F-52	339,351.864	520,678.107	617.39	785	0°	-90°	N/A
F-53	339,420.278	520,701.746	616	900	0°	-90°	N/A
F-54	339,479.677	520,725.688	610.96	800	0°	-90°	N/A
F-55	339,332.935	520,429.126	554.01	560	0°	-90°	N/A
F-58	339,581.110	520,727.755	612.48	800	0°	-90°	N/A
F-59	339,690.427	520,685.909	674.65	650	0°	-90°	N/A
F-60	339,641.932	520,524.957	679.76	515	0°	-90°	N/A
F-62	339,520.845	520,410.476	661.43	650	0°	-90°	N/A
F-63	339,585.283	520,438.784	682.24	650	0°	-90°	N/A
F-64	NA	NA	654.7	650	0°	-90°	N/A
F-66	339,545.557	520,335.422	634.13	650	0°	-90°	N/A
F-67	339,608.958	520,352.685	644.04	650	0°	-90°	N/A
F-68	339,676.792	520,373.739	604.98	650	0°	-90°	N/A
F-70	339,550.562	520,281.563	617.11	650	0°	-90°	N/A
F-71	339,628.186	520,289.111	617.2	650	0°	-90°	N/A
F-72	339,701.934	520,310.237	597.04	650	0°	-90°	N/A
			Total	**23,119**			

Minexfor drilled 34 core holes ranging in depth between 515 and 1,108 m (average depth 680 m), for a total of 23,119 m. All holes were collared vertically, and nominally spaced between 60 and 90 m along seven east–northeast-oriented, 100-m spaced grid lines. Drilling was very slow and averaged about 5 m/d over a 12-year period.

Euro Sun was provided with paper copies of simplified drill logs showing generalized lithology and alteration, and 15 m composite assays for copper, reportedly derived from 1 m assays. Gold was only sporadically reported on the drill logs at 15 m intervals, reportedly derived from composited samples averaging 5 m. The drill logs also contain sporadic results for silver, lead, zinc, molybdenum, iron, and sulphur along with occasional specific gravity measurements. The header of each log also recorded the average recovery for the hole. Collars were reported surveyed with 3-decimal accuracy.

Figure 10-1 shows the location of the drill collar and exploration galleries at the Rovina deposit. AGP notes no historical drill holes were used in the resource estimate.

Figure 10-1: Minexfor Historical Drill Holes at the Rovina Deposit



10.1.2 Colnic Deposit

Between 1975 and 2000, Minexfor drilled 14 holes totalling 4,740 m at the Colnic deposit (Table 10-3). Few details were provided to Euro Sun regarding this drilling campaign. Most of these holes were drilled in the area of Euro Sun's drilling at Colnic, and ranged in depth from 100 to 1,200 m, averaging 340 m. Most holes were widely spaced (100 to 500 m), and no specific grid pattern was used for the drilling. Holes were restricted to an area covering approximately 2,000 x 800 m, targeting geophysical and surface geological targets.

The first hole drilled in the area (diamond drill hole F-2) was drilled in 1975 and was the first hole to intersect porphyry-style mineralization at Colnic. The hole was collared vertically and continued to a depth of 650 m. This hole gives the name to the hill hosting the central-eastern part of the Colnic deposit (F-2 Hill).

Table 10-3: Minexfor Historical Drilling (1975-2003), Colnic Deposit

Hole IDr	Stereo 70 Coordinates		Elevation (masl)	Length (m)	Azimuth	Dip	Average Core Recovery (%)
	Easting	Northing					
F-2	338,737.4	517,772.3	463.34	650	0°	-90°	N/A
FA	338,974.4	518,093.1	361.13	1,200	0°	-90°	N/A
FB	339,027.5	518,320.2	367.1	650	0°	-90°	N/A
FD	339,368.1	518,077.4	390.31	490	0°	-90°	N/A
FF	338,607.7	518,273.3	367.01	650	0°	-90°	N/A
F7	338,725	518,063	358	200	255°	-5°	N/A
F8	338,571	517,885	355	200	248°	-15°	N/A
F9	338,673	517,945	350.5	200	235°	-45°	N/A
F14	338,327.61	517,300.6	338.89	100	0°	-90°	N/A
F15	338,487.29	517,598.5	343.13	100	0°	-90°	N/A
F16	338,703.86	518,172.9	366.39	100	288°	-72°	N/A
F17	339,067.88	518,027.7	373.07	100	99°	-60°	N/A
F18	338,623	517,919	353.8	100	0°	-90°	N/A
S2	?	?	?	Poorly documented			
F12	?	?	?	Poorly documented			
F13	?	?	?	Poorly documented			
			Total	**4,740***			

Only a summary log for this Colnic drilling was provided to Euro Sun, which documents weakly anomalous copper grades (averaging 400 ppm), between zero and 240 m depth, and stronger anomalies (averaging 1,000 ppm) from 240 to 650 m depth. Gold was apparently not analyzed.

Several years later, in the mid-1980s, Minexfor drilled core holes FA, FB, FD, and FF which were wide-spaced and located to the north and east of Euro Sun's current drilling. These holes were collared vertically, and continued to depths ranging from 490 to 1,200 m. Only summarized details of these holes were provided to Euro Sun; however, long intervals of weakly to moderately-anomalous copper grades (230 to 710 ppm) were reportedly intersected, starting at depths generally greater than 300 m. Gold was apparently not analyzed in these holes. For the holes drilled in 1975 and the early 1980s, Euro Sun received only generalized descriptions of the drill logs.

In 2000, Minexfor completed eight additional core holes at Colnic (F7 to F9, and F14 to F18), totalling 1,100 m. These holes were drilled at angles ranging from -5° to -72° and at azimuths ranging between 235° to 288°, except for one hole drilled at an azimuth of 99°. The holes were all in the vicinity of Euro Sun's current drilling and intersected porphyry-style mineralization. Gold values appear to be in a similar range to those reported by Euro Sun, but copper grades were not included in the data provided to Euro Sun. Two additional holes to the south (F14 and F15) returned only weak gold anomalies. No additional work was reported by Minexfor subsequent to this drilling. Euro Sun purchased the drill log data with assays reported in paper format, which showed generalized lithology and alteration, and 1 m assays for gold and silver. Copper, lead, and zinc were only sporadically reported on the drill logs.

Collars were surveyed based on the 3-decimal accuracy of the collar coordinates in the database; however, the survey methodology was not documented. No holes from the Minexfor drill campaign at Colnic were used in the resource estimate.

10.1.3 Ciresata Prospect

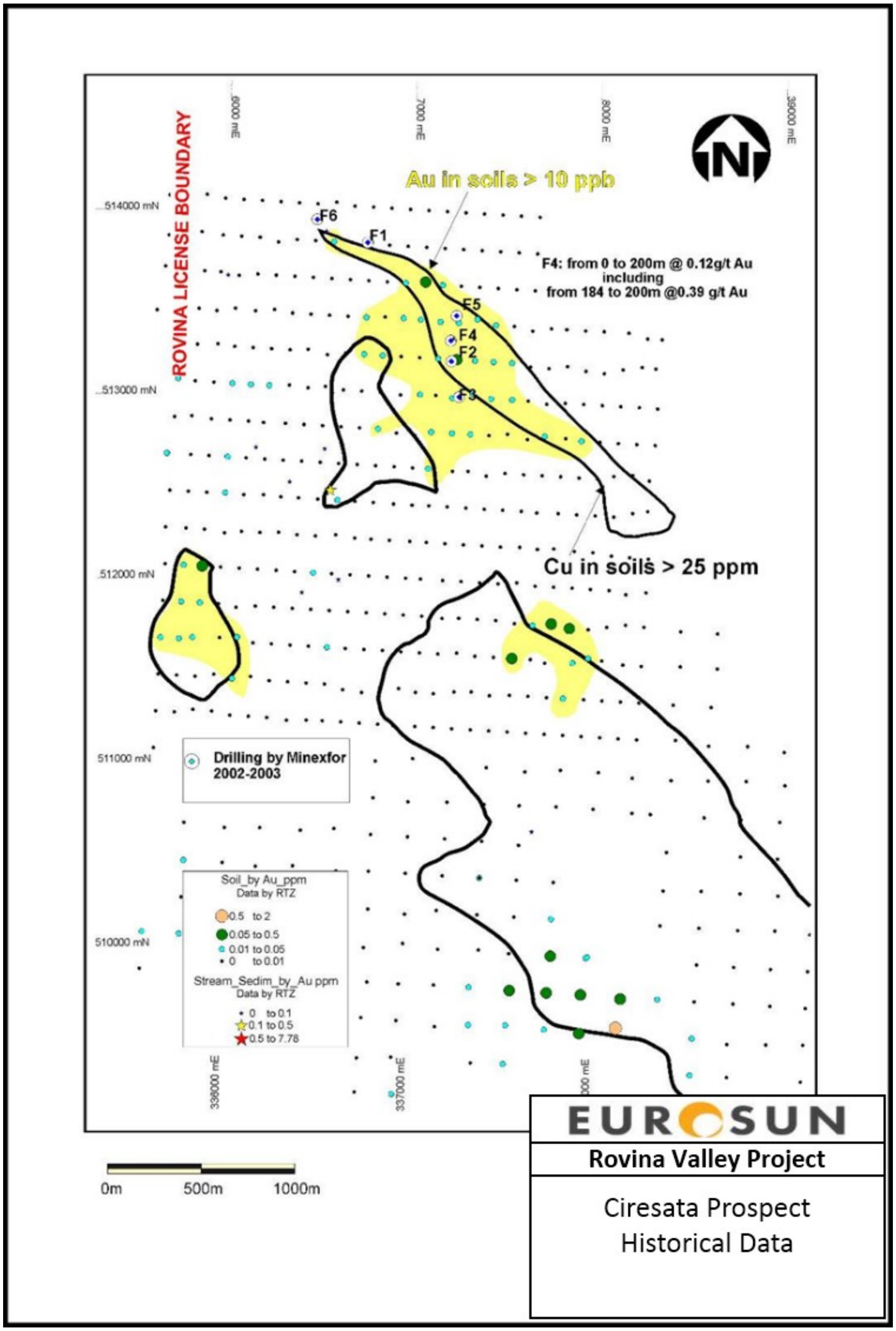
Between 2002 and 2003, Minexfor drilled six core holes totalling 1,200 m at the Ciresata Prospect (see Table 10-4 and Figure 10-2), approximately 4.5 km south of Colnic. Few details were provided to Euro Sun regarding the drilling campaign. No specific grid pattern was adhered to for the drilling, and holes were generally wide-spaced and presumably targeted geophysical anomalies. Hole lengths were all recorded as 200 m.

Table 10-4: Minexfor Historical Drilling (2002 to 2003), Ciresata Prospect

Hole IDr	Stereo 70 Coordinates		Elevation (masl)	Length (m)	Azimuth	Dip	Average Core Recovery (%)
	Easting	Northing					
F1	336,745.12	513,834.9	400.5	200	0	-90	N/A
F2	337,205.05	513,194.4	430.15	200	0	-90	N/A
F3	337,249.48	513,001.5	433.12	200	0	-90	N/A
F4	337,200.17	513,306.2	428.88	200	0	-90	N/A
F5	337,230.15	513,441.1	418.2	200	0	-90	N/A
F6	336,471.26	513,957.8	388.97	200	0	-90	N/A
			Total	**1,200**			

Euro Sun purchased this data from the National Agency for Mineral Resources (NAMR), and it consisted of paper drill logs of geology and reported gold assay results. Euro Sun computerized this data for use in drill hole software. Few anomalous results were reported apart from weak scattered gold anomalies ranging between 0.25 and 0.68 g/t Au throughout hole F4. The final 16 m of the drill hole (184 to 200 m, the end of the hole) yielded a length-weighted average of 0.39 g/t Au. Only occasional copper analyses were completed and reported.

Figure 10-2: Minexfor Historical Drill Holes and Rio Tinto Soil Geochemistry at Ciresata



10.2 Euro Sun Drilling

Drill core handling procedures observed during the site visit conducted by AGP were found to be very efficient and to industry standards.

10.2.1 Drill Contractors

Drilling at the RVP was carried out by SC-Genfor S.R.L. (Genfor), a Romanian–based contractor. From 2006 to 2010, Genfor utilized two Warman-1000 rigs and a Longyear 45 rig, both with depth capabilities of around 600 m, and a B-57 drill rig capable of depths up to 300 m. Since Genfor was retained as drilling contractor, using a fleet of tophead drive-drill rigs on tracks from the Korean Hanjin Drilling Co. Ltd. for drilling at the Project. The following four rigs were used: Hanjin 4000 SD-RC (depth capability of around 500 m), Hanjin 6000SD-RC and HANJIN Doosan 6000 SD (both with depth capability of around 1000 m) and Hanjin Doosan 7000SD (depth capability of 2000 m).

10.2.2 Core Handling Procedures

Once drilled, core is removed from the core barrel by the drillers, washed and placed in galvanized steel core boxes. These boxes could cause some very low-level zinc contamination. No specific tests were conducted to see if this possible zinc contamination was occurring, but AGP considers it extremely unlikely this process would induce a bias in the zinc resource model sufficient to interfere with the quality of the copper concentrates proposed for the project.

All boxes are clearly identified with the hole number, metres from/to, and box number written in permanent marker on the front. Individual drill runs are identified with small wooden blocks, where the depth (m) and hole number are recorded. Unsampled core is never left unattended at the rig.

Drill holes are left open; a piece of PVC pipe is inserted into the hole, and the hole is clearly marked with a cement monument showing the hole number.

10.2.3 Collar Survey

After completion of each hole, the collars are surveyed by tape and compass method, and by GPS. Euro Sun commissioned a detailed topographic survey of the Property in November 2006, during which time all drill hole collars drilled prior to November were resurveyed. Euro Sun has now contracted a surveyor to routinely survey the collar positions using a total station. AGP comments that collar survey methodology is to industry standards.

10.2.4 Logging and Sampling

Euro Sun owns a permanent building surrounded by a fence and gate in the town of Criscior, which performs double duty as a core logging facility and a field office and is manned 24 hours a day by Euro Sun personnel. Core boxes are transported from the rig to this core logging facility under a geologists' supervision several times a day using a 4-wheel drive truck.

As soon as the core arrives at the core logging facility, it is measured, logged for recovery and RQD, marked for sampling, and photographed. The core is then split with a diamond saw and both halves of the core are reinserted in the core box for sampling of the right-hand side of half-core, typically on 1 m intervals. Euro Sun has a rigorous process of double-checking all sample intervals and tags to avoid mislabelling samples. QA/QC samples are inserted in the sampling chain at that time.

The geologist logs the core using a fresh split face along with the surface generated by the drill bit. Logs are typically entered on paper that is subsequently transferred to a computerized database.

Euro Sun geologists record the following information:

- structure graphic log
- veining
- veining comprising intensity and thickness; orientation is recorded on holes that were oriented
- lithology
- alteration assemblage, intensity, mode of occurrence, and predominant alteration
- mineralization, comprising occurrences and percentages
- magnetic susceptibility (selectively)

Once logged and sampled, the core is moved to a permanent storage facility located 1.5 km from the field office. This storage area is surrounded by a locked fence and monitored 24 hours a day by security cameras and a guard. The new core drilled under Euro Sun's supervision is in excellent condition. All drill cores are stored in covered core racks (as shown in Figure 10-3) and can be easily examined.

Figure 10-3: Permanent Core Storage Facility

In general, core recoveries obtained by the drilling contractor have been very good, exceeding 97%, except in localized areas of faulting or fracturing. Due to the high average recoveries, AGP did not exclude any intervals from the database for use in exploratory data analysis (EDA), compositing, and interpolation as part of resource estimation.

10.2.5 Euro Sun Down-Hole Survey

Downhole surveys are systematically conducted at approximately 50 m intervals along each hole using a Reflex EZ-Shot system. The EZ-Shot instrument uses a compass to record the azimuth of the drill hole; these types of instruments are sensitive to the presence of magnetic minerals in the rock such as magnetite and pyrrhotite. For that reason, the results of the surveys should be interpreted with care. From March 2011 onward, Euro Sun surveyed all holes using a Reflex Gyroscope system. The Reflex Gyro instrument has the advantages of conducting surveys without being influenced by magnetic rocks and provides directional data (azimuth and dip) plus twelve parameters that are continuously recorded throughout the survey to track the path of the drill holes. Euro Sun used a configuration that recorded directional data every 5 m downhole. Two different software programs were used to record data according to the dip of the hole: one for holes dipping between -40 and -80 degrees, and one for subvertical holes dipping steeper than -

80 degrees. Each hole was surveyed at collar using a total station by a contractor survey team to set the initial parameters (azimuth and dip) on which subsequent readings from the Gyro are based.

AGP reviewed the downhole survey files prior to resource estimation to check for abrupt azimuth or dip changes that might suggest the presence of false deviations from magnetic interferences or inappropriately collected readings. With some rare exceptions, all down-hole survey data appeared to be reasonable and suitable for resource estimation. AGP also noted that Euro Sun corrects all azimuth reading by adding 4°E to the magnetic azimuth read by the downhole instrument to account for compass magnetic declination.

10.2.6 Euro Sun Dry Bulk Density Measurements

Euro Sun has collected 1,125 specific gravity measurements from drill programs. A total of 412 samples were collected from Rovina, 368 from Colnic, and 345 samples from Ciresata. Samples for specific gravity determination were taken at downhole intervals of between 10 and 50 m, both in mineralized and waste rocks. The samples were sent to the ALS Laboratory at Gura Rosiei where all samples were dried, coated in a thin layer of lacquer or shellac, then weighed in air (W1) and in water (W2). The specific gravity is calculated using the following formula:

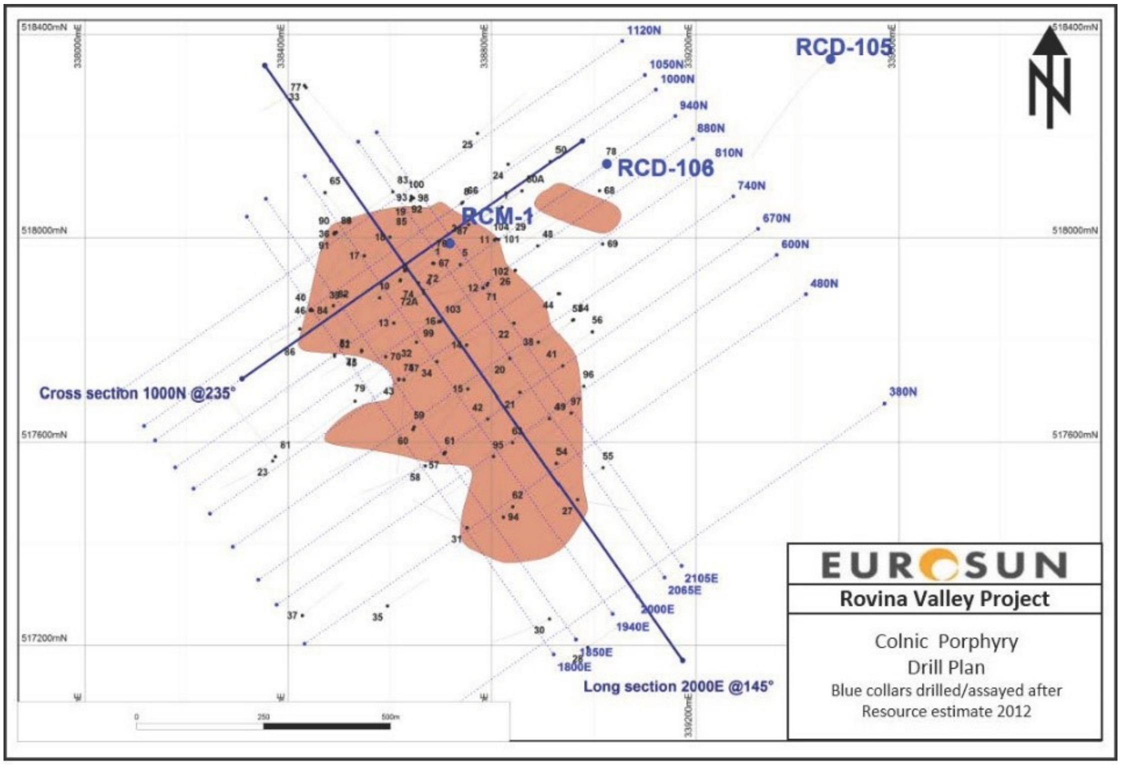
$$\frac{W1}{(W1-W2)}$$

The volume of shellac or lacquer is too small to significantly affect the density determination, so no correction was required.

No adjustment was applied for variation in water temperature as the measurements were taken indoors at the laboratory where temperature fluctuations were considered to be minimal and therefore not significantly affecting the final determination. The rock types found are generally non-porous, and AGP therefore believes the specific gravity determinations are representative of the in-situ bulk density of the rock types and sufficient for resource estimation purposes.

10.2.7 Rovina Deposit

Euro Sun's current drilling program at the Rovina Deposit commenced on May 26, 2006. Drilling has been performed on 12, nominally southeast-oriented (150˚), 55 to 85 m spaced sections, over an area of approximately 550 x 700 m (Figure 10-3).Figure 10-4: Colnic Porphyry Drill Plan



Note: Locations of Cross-Sections shown in Sections 7 and 9

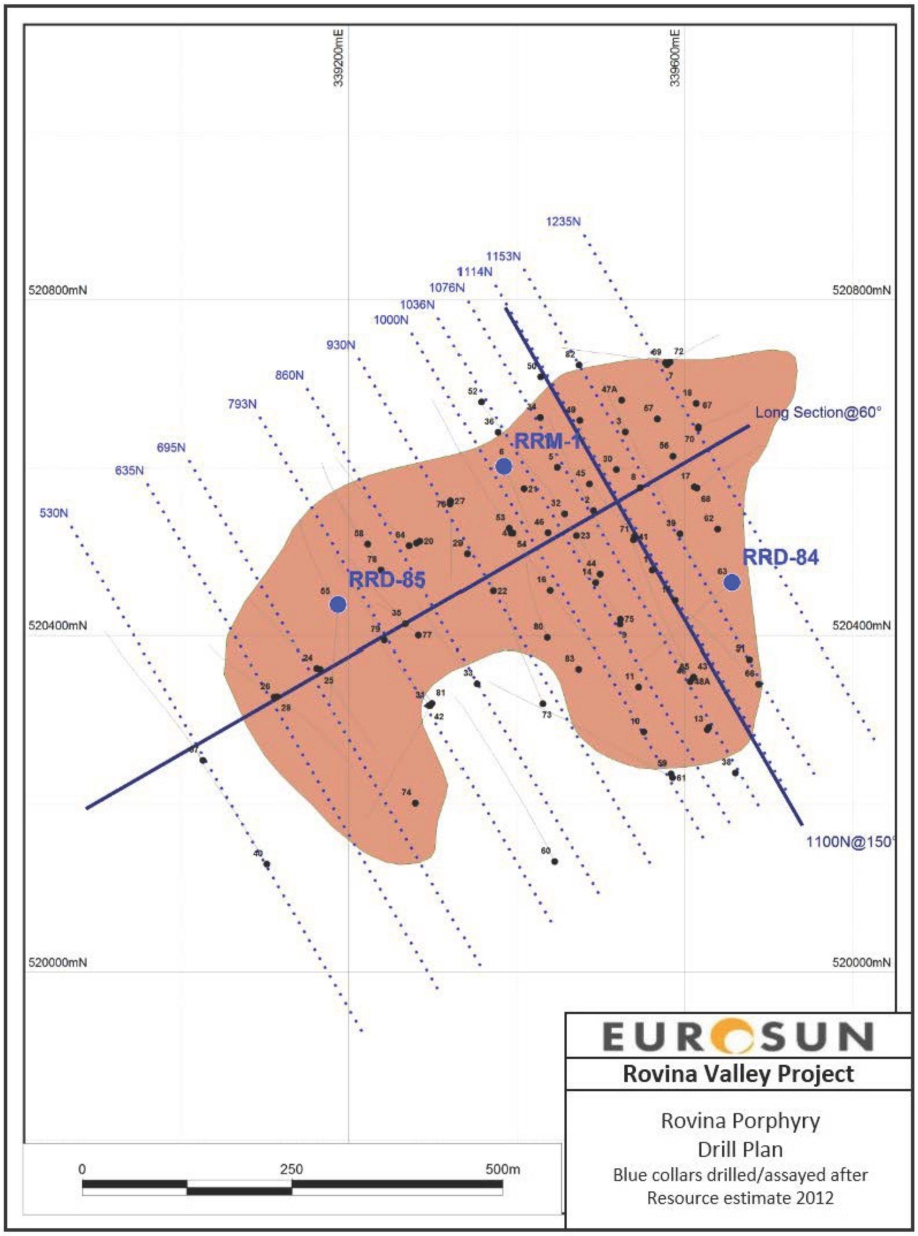
Appendix A summarizes the holes drilled by Euro Sun.

Core drilled at the Rovina deposit is collared using HQ diameter and reduced to NQ or NQ2 (47.6 and 50.7 mm, respectively) at depths ranging between 124 and 286 m. Currently, 40% of the drilling is with HQ diameter and 60% is with NQ or NQ2.

Most of the holes (60%) were collared vertically and drilled to depths ranging between 100 and 660 m, averaging approximately 474 m.

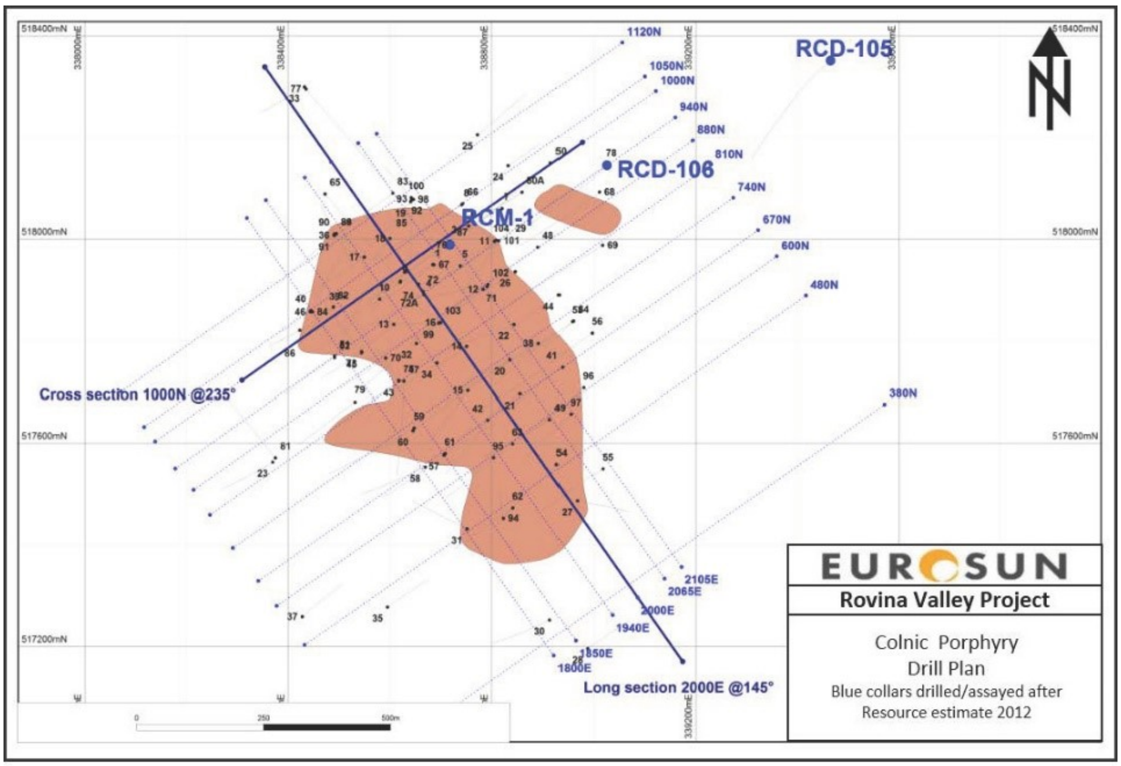
In 2012, as part of the Euro Sun-Barrick exploration collaboration, two in fill diamond drill holes (RRD-84 and RRD-85) were completed at Rovina, totalling 451 m (core size 75% HQ and 25% NQ). These holes were completed after the resource data cut-off and were not included in the current resource estimate. These holes are highlighted in blue on Figure 10-4.

Figure 10-3: Rovina Porphyry Drill Plan



10.2.8 Colnic Deposit

Euro Sun commenced drilling at Colnic on February 7, 2006. As shown in Figure 10-5, drilling has been performed on 11 nominally southwest-oriented (235°), 30 to 85 m spaced sections over an area of approximately 700 m (northwest) by 600 m (northeast). Drilling was also carried out on a perpendicular set of six sections, 60 to 80 m spaced, nominally southeast-oriented (145°), over the same drill area. Appendix A summarizes the holes drilled by Euro Sun. Figure 10-4: Colnic Porphyry Drill Plan



Note: Locations of Cross-Sections shown in Sections 7 and 9

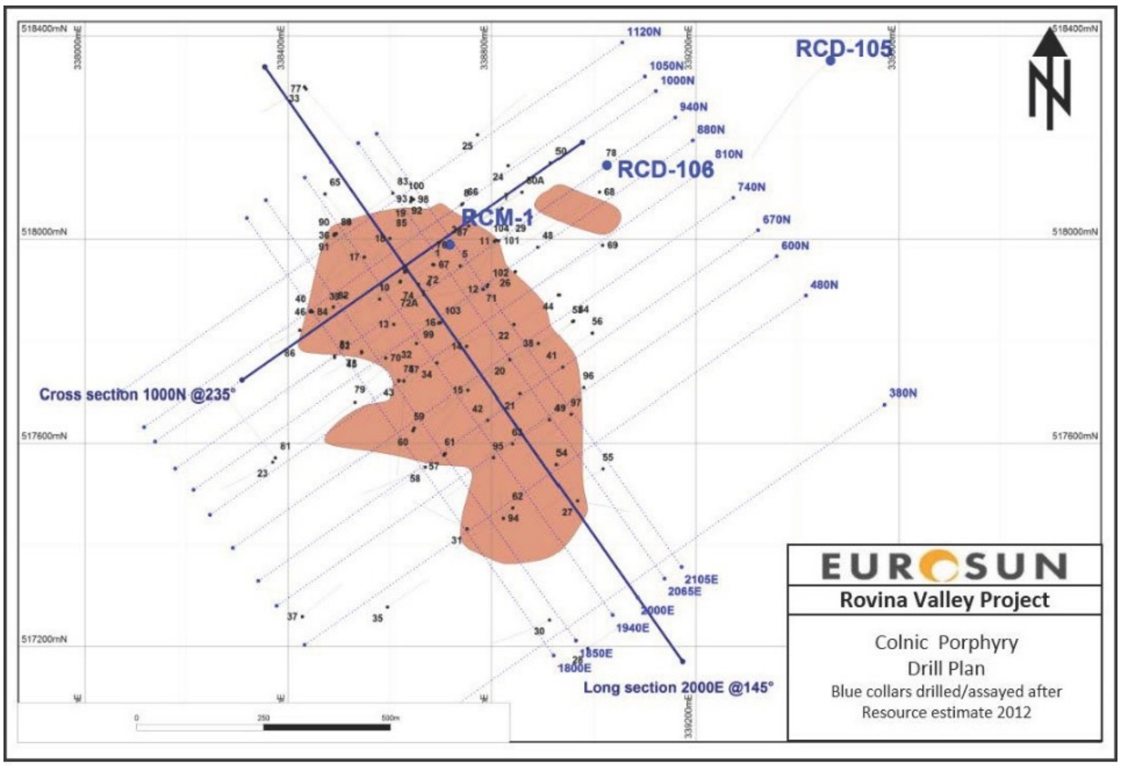
Core drilling at Colnic during the 2006 drill program was undertaken by Genfor using track-mounted GNK 850, RB-57, and RB-58 drill rigs, each with depth capabilities of approximately 600 m. During the 2011-2012 program, Genfor used the following four Hanjin rigs: Hanjin 4000 SD-RC, Hanjin 6000 SD-RC and Hanjin Doosan 6000 SD and Hanjin Doosan 7000 SD.

Core diameter is generally HQ (63.5 mm), and some holes continue to depths of 435 m using this diameter core. Holes are reduced to NQ or NQ2 core diameter at depths ranging between 105 and 435 m, as required, but are typically reduced at a depth of approximately 200 m. Currently, 69% of the drilling is with HQ diameter, and 37% is with NQ or NQ2.

Most holes are inclined -50° to -70° and oriented at 220° to 260°. Holes have been drilled to depths ranging between 100 and 550 m, and average approximately 320 m.

In 2012, as part of the Euro Sun-Barrick exploration collaboration, one in fill diamond drill hole (RCD-106) and one exploration hole 500 m NE of the Colnic deposit (RCD-105) were completed at Colnic, totalling 1,217 m (core size: 4% PQ, 54% HQ, and 42% NQ2). These holes were completed after the resource data cut-off and were not included in the current resource estimate. These holes are highlighted in blue on Figure 10-6.

Figure 10-4: Colnic Porphyry Drill Plan



Note: Locations of Cross-Sections shown in Sections 7 and 9

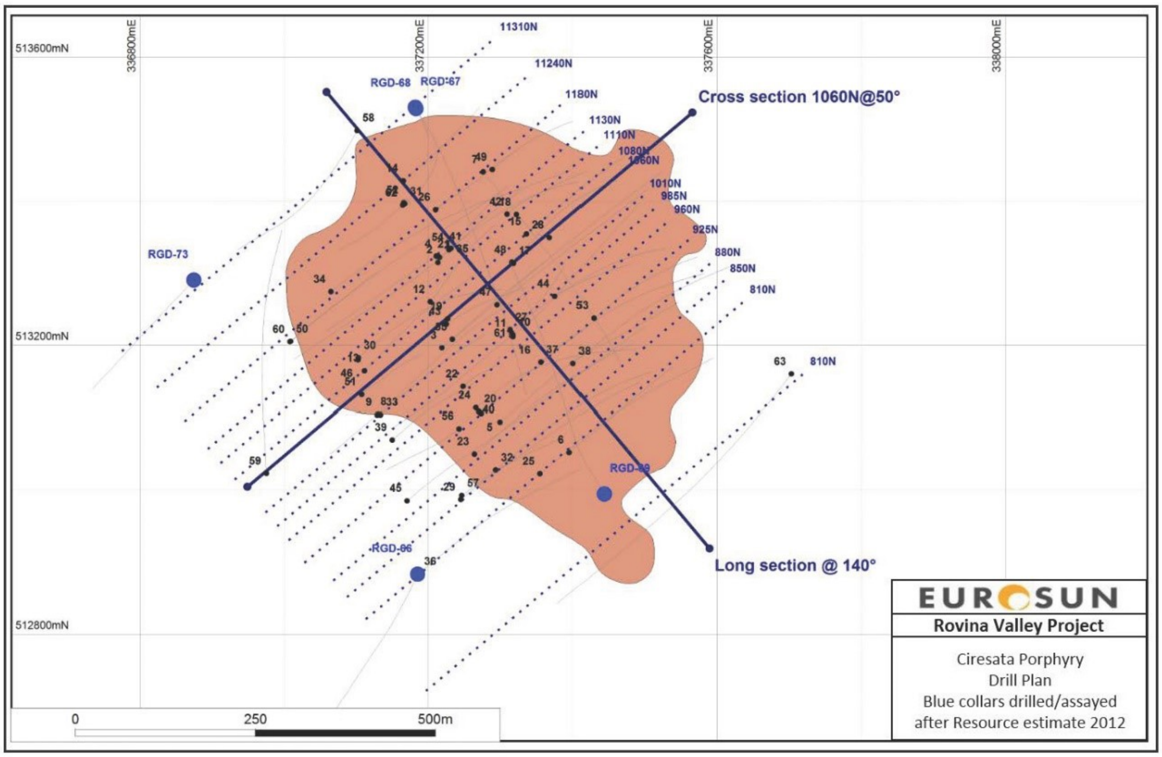
10.2.9 Ciresata Deposit

Euro Sun's drilling program at the Ciresata deposit commenced in December 2007. Drilling has been performed on 15 nominally northeast-oriented (50°), 30 to 130 m spaced sections (but typically 40 m apart), over an area of approximately 600 x 600 m (Figure 10-7).

Appendix A summarizes the holes drilled by Euro Sun. Core drilling at the Ciresata deposit was undertaken by Genfor mainly using an RB-57 rig and a Longyear 45 rig, with depth capabilities of approximately 300 and 600 m, respectively. During the 2010-2011 program, Genfor used the same four Hanjin rigs.

Core drilled at the Ciresata deposit is collared using HQ diameter and reduced to NQ or NQ2 at depths ranging between 102 and 301 m, but typically reduced at a depth of approximately 200 m. Currently, 33% of the drilling is with HQ diameter and 67% is with NQ or NQ2.

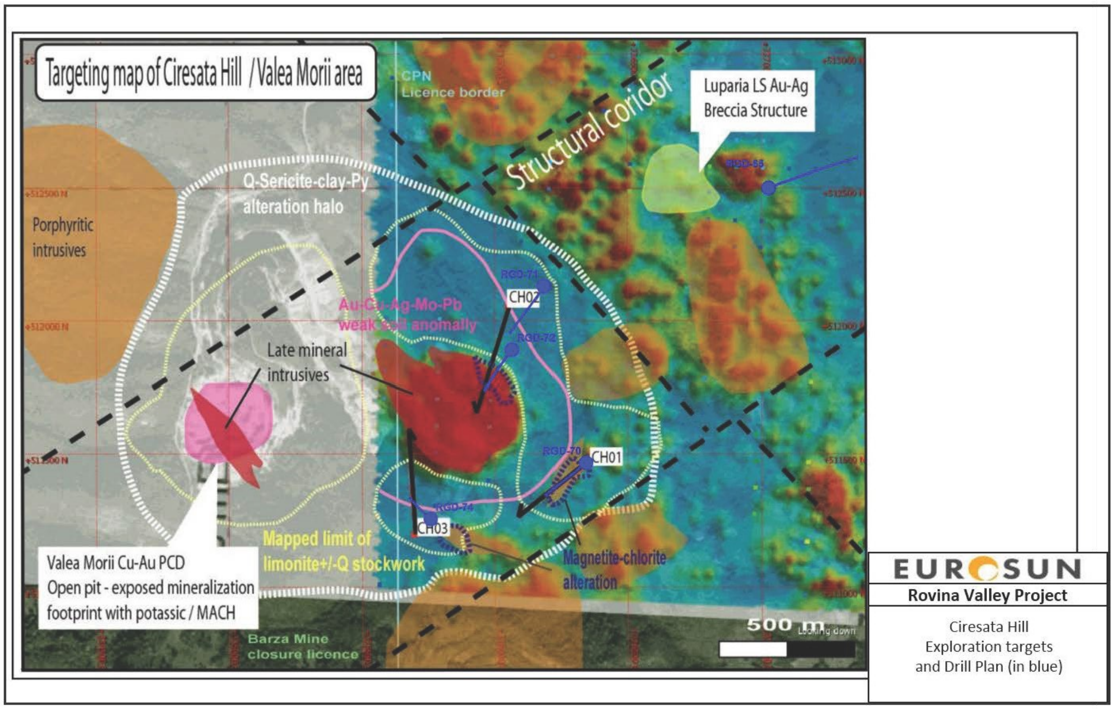
Figure 10-5: Ciresata Porphyry Drill Plan



Note: Locations of Cross-Sections shown in Sections 7 and 9 of this report.

In 2011-2012, as part of the Euro Sun-Barrick exploration collaboration, 14 diamond drill holes were completed at and around the Ciresata deposit and at the Ciresata-hill prospect exploration site, for a total drill program of 10,472 m. Of these 14 holes, three were incorporated in the current resource estimate (RGD-58, RGD-59, and RGD-63, a combined total of 2,930 m, and an average depth of 977 m). The other 11 holes, totalling 7,543 m in depth, were completed after the resource data cut-off and were not included in the current resource estimate. The average depth of these 11 holes was 750 m, with two holes (RGD-68 and RGD-69) testing the Ciresata deposit to an average depth of 1,500 m. Five of these holes are in and around the deposit and are highlighted in blue on Figure 10-5. The other six holes were drilled to test exploration targets in the South-West of the Ciresata porphyry at the Ciresata Hill Prospect (Figure 10-7).

Figure 10-6: Ciresata Hill Exploration Drilling (extra figure)



10.2.10 Zdrapti Prospect

Euro Sun's drilling program at the Zdrapti Prospect began in January 2007, and 11 holes totalling 2,671 m have been drilled to test sub-cropping potassic alteration with a coincident ground magnetic anomaly.

Core drilling at the Zdrapti Prospect has been carried out by Genfor using an RB-57 drill rig capable of depths up to 300 m. Core diameter is generally HQ, and some holes continue to depths of 400 m using this diameter core. Holes are reduced to NQ at depths ranging between 100 and 110 m, as necessary. Currently, 40% of the drilling (to the end of hole RZD-4) is with HQ diameter, and 60% is with NQ.

10.2.11 Geotechnical and Hydrological Drilling

A geotechnical drilling program was completed between October 2011 and March 2012. This program totaled 3,055 m of diamond core. The program consisted of:

- Four drill holes at the Rovina deposit testing the proposed pit walls, totalling 1,144 m. These holes were drilled to depths ranging from 268 to 300 m and averaging 286 m.

- Four drill holes at the Colnic deposit testing the proposed pit walls, totalling 996 m. These holes were drilled to depths ranging from 180 to 300 m, and averaging 249 m.
- Two drill holes in the Bucureşci Valley above the proposed ore-conveyor gallery, for a total of 320 m; average depth is 160 m.
- Eleven drill holes in the area of the proposed tailings management facility totalling 595 m. These holes were drilled to depths ranging from 30 to 100 m and average 54 m in depth.

10.2.12 Metallurgical Drilling

In 2008, three holes totalling 1,114 m, were drilled, one in each of the Rovina, Colnic, and Ciresata deposits, for potential future use in a pilot plant. At Rovina, hole RRM-1 (HQ core size), (Figure 10-3) was drilled to a depth of 282 m. At Colnic, RCM-1 (HQ core size) (Figure 10-4) was drilled to a depth of 270 m. At Ciresata, RGM-1 was drilled 562 m with a HQ core size to 301 m and NQ from 301 m to the bottom of the hole.

Euro Sun’s 2011-2012 metallurgical program uses widely distributed samples from half-core from resource drilling to represent selected geo-metallurgical units.

It is AGP's opinion the drill azimuth and dips are appropriate for the style of mineralization and the general orientation of the deposit. For the most part, the drill spacing is sufficient for resources in the Measured and Indicated categories, with Inferred in the fringe of the deposits. From the information reviewed, AGP does not believe there is any material factors identified that could affect the mineral resource estimation.

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

All routine sample preparation and analyses of the Euro Sun samples are performed by ALS Chemex Romania (ALS), a laboratory in the town of Gura Rosiei (where the Rosia Montana Project is located), about 45 minutes' drive northwest of the project area. Between 1997 and the end of 2005, the lab was operated by Analabs, an Australian-based company which at the time was part of the SGS Group. SGS is an internationally recognized organization that operates over 320 laboratories worldwide and has ISO 9002 certification for many of its laboratories. The Analabs Laboratory was installed as a dedicated facility for the Gabriel Resources' Rosia Montana Project during the resource definition stage. At the start of 2006, SGS pulled out of the management role of the laboratory due to decreased activity. The name was then changed to ROM Analize S.R.L. (ROM Analize), and for the first half of 2006 was run as a privately-operated independent laboratory, managed by Hidi Francis.

In September 2006, ALS Chemex purchased ROM Analize and now manages the operation of the laboratory. There was a transition period until ALS Chemex analytical methods were adopted, and the change from ROM Analize to ALS Chemex is formally considered in this document as of 28 November 2006. ALS Chemex is an internationally recognized organization, independent of the issuer, which operates an integrated network of 70 laboratories worldwide, and has ISO 9002 certification for many of its laboratories, including the laboratory in Romania where Euro Sun samples are processed. In May 2012, the ALS Chemex Romanian laboratory was accredited by the Standard Council of Canada with an ISO 17025 certification, which is the highest level of accreditation a laboratory can obtain. All rock and drill samples since Euro Sun acquired the Rovina Property have been submitted to this laboratory, either under the management of Analabs, ROM Analize, or ALS Chemex.

11.1 Euro Sun Sample Preparation

11.1.1 Sample Preparation for Soil Samples

Soil samples from Euro Sun's Rovina Property soil program were prepared by the laboratory at Gura Rosiei. The samples were logged, weighed, and dried before sieving to -80 mesh. Both size fractions were retained. Subsequently the sieved -80 mesh fraction was pulverized to 85% passing 75 µm or better. A 100 g portion of the final prepared samples was then shipped to the ALS Chemex laboratory in Vancouver, Canada.

11.1.2 Sample Preparation of Rock Chip and Drill Core Samples

All rock chip and core samples are prepared and analyzed at the ALS Chemex laboratory. For the 2007 Technical Report by AMEC, they visited the laboratory on January 23, 2007 and briefly reviewed the sample preparation and analytical protocols. According to the AMEC report, all equipment, laboratory procedures, and QA/QC protocols were established by SGS and ALS and the facility was deemed well-equipped, and the staff well-trained. The laboratory can process about 3,000 samples per month from various clients, although the maximum capacity is reportedly between 700 and 800 per day. Most weighing and data measurements are automatically recorded, reducing the possibility of data entry errors.

The laboratory has one large drying oven with automatic temperature control, one jaw crusher, and six 5 kg capacity LM5 pulverisers. Each of these has forced air extraction and compressed air for cleaning the crushers and pulverisers.

The preparation protocol for Euro Sun samples is as follows:

- coding: an internal laboratory code is assigned to each sample at reception
- weighing: all samples are weighed
- drying: the samples are dried at 105ºC for as long as 24 hours
- crushing: the entire sample is crushed to obtain nominal 85% at 5 mm (from February 2006 to July 2007); from August 2007 to present day the entire sample is crushed to obtain nominal 85% at 2 mm
- pulverization: from February 2006 until October 17 , 2006 the entire sample was pulverized for 6 to 11 minutes to achieve better than 85% passing 75 microns and a 150 to 200 g sample was collected from the pulveriser; from October 23, 2006 until July 2007, 1 kg split of the 5 mm crushed samples were pulverized to achieve better than 85% passing 75 µm; from August 2007 to present day, 1 kg split of 2 mm crushed samples is pulverized to achieve better than 85% passing 75 µm.
- storing and submitting: the coarse rejects, pulps, and pulp rejects are stored on site for 30 days and then returned to Euro Sun and achieved in a dedicated storage facility.

Wet sieve checks are conducted regularly by ALS Chemex (every 15 to 20 samples). Every five samples on average, the equipment is cleaned by passing local sterile rock, and occasionally coarse pure feldspar, through the crushers and the pulveriser.

In addition to the sieve tests, ALS Chemex completes the following internal QA/QC protocols during the sample preparation:

- pulp blank: 1 inserted every 50 samples
- certified reference material (CRM): 2 inserted every 50 samples (5 CRMs in use ranging between 0.76 and 5.12 g/t Au)
- pulp duplicates: 1 every 12 samples
- pulp re-assay: 4 every 40 samples

All pulps are automatically labelled with the job number, sequence number, and sample number. Duplicate samples are returned to Euro Sun along with the other pulps but are in a different coloured bag (black as opposed to brown).

11.2 Euro Sun Sample Analysis

11.2.1 Sample Analysis for Soil Samples

During the Euro Sun soil sampling program in 2007 and 2008, a total of 2,536 samples were analyzed at ALS Chemex in Vancouver for gold, and 35 other elements using the following analytical methods:

- Au analyses by a fire assay method (method Au-ICP21) followed by an ICP-AES reading with a 1 ppb detection limit
- 35-element suite: analyzed by ICP-AES after aqua regia digestion (method ME-ICP41)

11.2.2 Sample Analyses of Rock Chip and Drill Core Samples

ROM Analize was the principle laboratory for all Euro Sun exploration and drilling programs. At ROM Analize, for gold analysis approximately 50 g of the pulp was weighed with automatic digital data capture of the results to a computer. For base metals, approximately 0.40 g of pulp was weighed on a separate scale, with similar automatic data captured to the computer. All samples were assayed for Au by 50 g Fire Assay with AAS finish (0.01 g/t detection). Base metals, Cu (2 ppm detection), Pb (3 ppm detection), Zn (2 ppm detection), and Ag (1 ppm detection) were analyzed by AAS methods using an aqua regia digestion. A Varian SpectrAA AAS instrument was used for Au and Cu readings while a separate instrument was used for Ag and other base metals.

During this time period, ALS Chemex in Vancouver was the secondary laboratory used for check assays. The samples were assayed for gold by 50 g Fire Assay with AAS finish (0.001 g/t detection, method code AA24). Base metals were analyzed by an AAS method (method code AA45) using an aqua regia digestion.

After ALS took over the operation of the laboratory at Gura Rosiei, the analytical method changed to the ALS methods of AA26 (50 g fire assay for gold) and AA45 for base metals. The same Varian SpectrAA AAS instrument was used for Au and Cu readings while a separate instrument was used for Ag and other base metals.

During this period, the OMAC Laboratory was used for check assays. The samples were assayed for gold by 50 g Fire Assay with AAS finish (0.01 g/t detection) method A4. A 45-element suite including base metals was analyzed by an ICP-AES method using an aqua regia digestion.

Both primary and secondary laboratories reported the results digitally to Euro Sun via email, complete with signed paper certificates. General turn-around varied from approximately three days to several weeks. AGP briefly reviewed certificates from the primary laboratories while on site and completed an audit of these against the digital database prior to resource estimation. AGP did not visit the laboratory used by Euro Sun.

11.3 Euro Sun's Drilling Programs

Euro Sun's drilling programs at the Colnic, Rovina, and Ciresata deposits have exclusively used diamond-core drilling methods. Recovery, on average, has been in excess of 97% and all core has been split and sampled on mostly 1 m intervals.

In May 2006, AMEC reviewed the Euro Sun QA/QC program and recommended some adjustments be made in order to monitor various essential elements of the sampling-assaying sequence, in an effort to control or minimize any possible errors (Cinits, 2006b). These elements included:

- sample collection and splitting (sampling variance, or sampling precision)
- sample preparation and sub-sampling (sub-sampling variance, or sub-sampling precision; contamination during preparation)
- analytical accuracy, analytical precision, and analytical contamination
- reporting (clerical or data transfer) accuracy

Starting in early July 2006 Euro Sun adjusted the QA/QC protocols and incorporated most of AMEC's recommendations. AMEC's review in 2007 of the QA/QC programs indicated a much-improved program was put into place and continued through 2007 to present.

Euro Sun QA/QC program since January 2007 consists of:

- pulp duplicate, 3% of all assayed core samples
- core twin samples, 3% of all assayed core samples
- coarse blank samples, 3% of all assayed core samples
- pulp blank samples, 3% of all assayed core samples
- coarse rejects, 2.6% of all assayed core samples
- gold standard reference material, 3.4% of all assayed core samples
- copper standard reference material, 2.2% of all assayed core samples

11.3.1 Summary of the 2006 QA/QC Results by AMEC

Until November 22, 2006, Euro Sun used ROM Analize as the primary laboratory and ALS Chemex as a secondary laboratory. Based on the QA/QC review conducted on the 2006 Rovina Apuseni drilling program, AMEC concluded that:

- The sampling precision for Au and Cu during the last portion of the 2006 exploration campaign (July to November 2006) was satisfactory. The sampling precision prior to July 2006 was not assessed.
- Because the entire sample was pulverized during the period of February to October 2006, sub-sampling variance at ROM Analize were not assessed, nor required. For the period of October to November 28, 2006, when the core samples were split at the 85% passing 5 mm crushing stage, the sub-sampling variance was found to be adequate.
- Analytical precision for Au and Cu at ROM Analize during the last portion of the 2006 campaign (July to November 2006) was satisfactory, although various sample mix-ups

appear to have occurred. Analytical variance prior to July 2006 was not assessed. On the basis of the partial results however, and as a result of the evaluation of the check samples, AMEC infers the analytical precision is likely to be within acceptable limits.

- The gold analytical accuracy at ROM Analize was within the acceptable ranges. Although Euro Sun did not include Cu CRMs on the batches, as a result of the evaluation of the check samples, AMEC concludes the Cu analytical accuracy at ROM Analize was also satisfactory.
- In spite of the original insufficiencies of the QA/QC program implemented at the Rovina project, AMEC was of the opinion the Au and Cu assays of the 2006 drilling exploration campaign were sufficiently precise and accurate for resource and reserve estimation purposes.

11.3.2 Summary of the Late 2006 - Early 2007 QA/QC Results by AMEC

Starting November 28, 2006, Euro Sun used ALS Chemex (Romania) as its primary laboratory and OMAC (Ireland) as a secondary laboratory.

Based on the QA/QC review conducted on the Colnic and Rovina drilling program that was completed during late 2006 to May 2007, AMEC concluded that:

- the sub-sampling sampling variance for Au and Cu was satisfactory
- the analytical variance for Au and Cu at ALS Chemex was satisfactory, although some sample mix-ups appear to have occurred
- the Au and Cu analytical accuracies at ALS Chemex were within the acceptable ranges
- no significant cross-contamination for Au and Cu was detected during preparation and assaying at ALS Chemex during the late 2006-2007 exploration campaign
- the Au and Cu assays of the late 2006-2007 drilling exploration campaign at Rovina were considered to be sufficiently precise and accurate for resource and reserve estimation purposes

AMEC recommended the implementation of the following measures during the continuation of the exploration at the Colnic and Rovina deposits:

- Euro Sun must investigate the source of pulp sample mix-ups that appear to have occurred.
- Euro Sun should revise the sample preparation procedure to include crushing to a finer particle size (85% passing 10 mesh), and splitting the samples after this size reduction rather than at a particle size of 5 mm.

11.3.3 Summary of the PEG Review of the Late 2007 - 2008 QA/QC Results

During the period of 2007-2008 Euro Sun used ALS Chemex (Romania) as a primary laboratory and OMAC (Ireland) as secondary laboratory. Based on the QA/QC review conducted on the 2007/2008 Rovina drilling program, PEG concluded that:

- The sampling precision for Au and Cu during the late 2007-2008 exploration campaign was satisfactory.
- The gold analytical accuracy at ROM Analize was within the acceptable ranges. Close monitoring of the SRM results need to be implemented with partial batch resubmission for bracketing the samples surrounding a two-standard deviation failure.
- The Au and Cu analytical accuracies at ALS Chemex were within the acceptable ranges throughout the 2007-2008 exploration program. The pulp duplicate results indicated a slight degradation in precision near the end of the exploration program that should be monitored closely.
- No significant cross-contamination for Au and Cu was detected during preparation and assaying at ALS Chemex during the 2007-2008 exploration campaign.
- The Au and Cu assays of the late 2007-2008 drilling exploration campaign at Rovina are considered to be sufficiently precise and accurate for resource and reserve estimation purposes.

11.3.4 AGP Review of the 2010 - 2012 QA/QC Results

During the 2010-2012 drill campaign, Euro Sun's primary laboratory remained the same. The secondary laboratory was changed due to ALS Chemex purchasing the facility in Ireland. Check samples are now submitted to the SGS laboratory in Chelopech, Bulgaria. Carpathian routinely charts all QA/QC samples every third or fourth batch report from the laboratory. If a trend is noticed or samples are deviating from the norm, the batches are resubmitted. No other changes took place in regard to the analytical procedure.

Coarse and Pulp Blanks

AGP reviewed control charts provided by Euro Sun. Cross-contamination would be considered significant if the blank value exceeded five times the detection limit for the element.

The crushable coarse blank material consists of pyroxene andesite collected on the property and is the same material used by Euro Sun since 1999. Results of the coarse blank show one gold failure and one copper failure exceed five times detection out of 1,461 samples.

The crushable pulp blank material consists of the same material for the coarse blank but is pulverized at the laboratory. Results of the pulp blank show zero gold failure and zero copper failure exceed five times detection out of 1,465 samples. All assays are well below twice the detection limit.

No trend or pattern was noticeable from the data examine.

Core Twin

Euro Sun no longer submitted ¼ core twin to the laboratory during the 2010-2012 drill program as per AMEC's recommendation.

Coarse Rejects

A total of 1,430 coarse rejects were re-inserted in the sample stream. Of these, 71 rejects originated from the 2008 drill program.

Gold pulp duplicate shows good agreement with the paired sampled. The R^2 value is very good at 0.98 and the slope of the regression is 0.984 after nine outliers were removed. The data shows a good distribution on either side of the parity line.

Copper is a little better with an R^2 of 0.99 and a slope of regression of 1.001. Data shows good distribution on either side of the parity line after 11 outliers were removed.

Pulp Duplicates

A total of 1,464 pulp duplicates have been submitted since the end of the 2008 drill program. Gold pulp duplicates show good agreement with the paired sampled. The R^2 value is very good at 0.95 and the slope of the regression is 1.041. The data also shows a good distribution on either side of the parity line. Copper is virtually the same with an R^2 of 0.92 and a slope of regression of 0.99. Data shows good distribution on either side of the parity line.

Standard Reference Material (SRM) Samples

For the 2010 to 2012 drill program Euro Sun used three gold only standards purchased from Rocklabs (SG31, SH35, SE29), and seven gold and copper standards purchased from CDN Laboratory (CM-11A, CGS-22, CGS-16, CGS-13, CGS-24, CM-3, CM-16). The origin of the material for CRM CM-8, CM-11A, and CGS-13 most closely matched the type of mineralization at Euro Sun. For evaluation of the SRMs, AGP examined the gold and copper control charts produced by Euro Sun.

The standard performance of 1,378 assays for gold is considered excellent by AGP for the period reviewed. The CDN SRMs appear to be more stable and consistent than the Rocklabs SRMs. The low-grade SRMs are both provisional and indicate low bias for CGS-16 and a high bias for CM-16 although the failure rate is very low. The higher grade SRMs through 2010-2012 show an average of 0.59% low bias with a very low failure rate (Table 11-1).

Table 11-1: Summary of Gold Best Values and Performance of SRMs

Au STD	No. of Samples	Best Value	Average	Bias (%)	Fail 3 Sigma	Fail 2 Sigma (2 Seq)
SE29	39	0.597	0.589	-1.36%	0	0
CDN-CM-8*	294	0.910	0.901	-1.00%	0	0
CDN-CGS-24	296	0.487	0.496	1.81%	0	0
SG31	38	0.996	0.989	-0.71%	0	0
SH35	18	1.323	1.269	-4.26%	1	0
CDN-CGS-16 (indicated mean)	364	0.140	0.157	-10.83%	1	0
CDN-CGS-13*	78	1.010	0.998	-1.20%	0	0
CDN-CM-11A*	86	1.014	1.017	+0.29%	0	0
CDN-CM-16 (provisional)	90	0.294	0.323	+8.98%	0	0
CDN-CGS-22	75	0.640	0.651	-1.69%	0	0

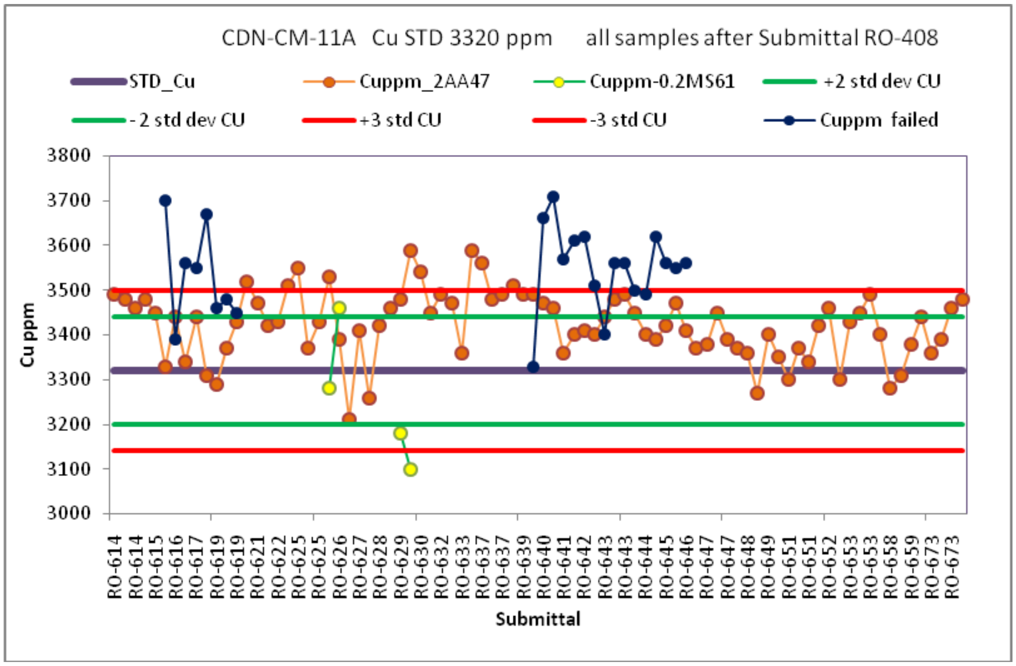
For copper, a total of 1,283 sample results were reviewed. Euro Sun used seven gold and copper standards purchased from the CDN Resources Laboratory. The data for the 2010 to 2012 drill program indicated a failure rate greater than three times standard deviation of 4.4% (Table 11-2). The CDN-CGS-16 SRM shows an abnormally high failure rate despite Euro Sun re-submitting a number of re-assayed batches. Eliminating the CGS-16 SRM from the list, the average failure rate is reduced from 4.4% to 1.9%. AGP notes the high bias (averaging 2.3%) is shown for all SRMs analyzed. When compared to the 2007-2008 data, the bias at that time averaged 0.70%. AGP is of the opinion Carpathian needs to investigate the source of possible bias prior to submitting more samples to the ALS Chemex facility and contract an audit of the facility with a specialist in lab procedures.

Table 11-2: Summary of Copper SRMs (2010-2012)

Cu STD	No. of Samples	Best Value	Average	Bias (%)	Fail 3 Sigma	Fail 2 Sigma (2 Seq)
CDN-CM-16	90	1840	1893	2.80%	0	0
CDN-CM-8*	294	3640	3792	4.01%	8	5
CDN-CGS-24	296	4860	5000	2.80%	3	1
CDN-CM-11A*	86	3320	3454	3.88%	9	19
CDN-CGS-22	75	7250	7316	0.90%	4	0
CDN-CGS-16	364	1120	1134	1.23%	32	10
CDN-CGS-13*	78	3290	3303	0.39%	1	1

In March 2012, Euro Sun asked ALS Romania to investigate a high bias and failure rate for two routinely submitted copper SRM's during the January to March 2012 period. ALS Romania concluded from their internal QC investigation, that improper calibration fluids during this period resulted in a high-bias for copper. This problem was corrected and documented in a complete report (Quality Investigation into Carpathian Gold QA Issues, May 2015, ALS Romania SRL report to Euro Sun). Euro Sun re-submitted ten batches for re-assay that were affected by the bias for a total of 2,376 samples. These re-assays were utilised in the resource estimate. Results from the re-assay corrected the problem as shown in Figure 11-1; however, the high bias will be readily noticed.

Figure 11-1: CM-11A SRM Batch Re-Submission



Check Samples

During the 2006-2008 campaign, Euro Sun utilized the OMAC laboratory in Ireland for check assays. For the 2010-12 drill program a total of 1,354 sample pulps from the ALS Chemex Gura Rosiei facility were submitted to the SGS Laboratory in Chelopech, Bulgaria for check assays. Results indicate after excluding 15 outliers for gold, the regression shows an R^2 value of 0.981 with a good distribution around the parity line. Slope of the regression is approaching 1 at 0.996.

For copper, results indicate after excluding 13 outliers, the regression shows an R^2 value of 0.986 with a good distribution around the parity line. Slope of the regression is lower at 0.917 and the frequency distribution of the regression residual show a high bias for the sample analyzed at the Gura Rosiei facility when compared to the sample analyzed at the Chelopech facility.

At the time of writing, Euro Sun is currently investigating this discrepancy since the SRMs submitted with the batch indicated a low bias of 4% at the Chelopech facility. AGP noted a high bias for copper assays appears to substantiate the high bias seen in Carpathian's SRM, although this could be coincidental and made worse by the low bias seen at the check laboratory.

Based on the QA/QC review conducted on the 2010-2012 Rovina Valley drilling program, AGP concluded that:

- The sampling precision as indicated by the pulp and coarse duplicate for gold and copper during the 2010-2012 exploration campaign was satisfactory.
- The gold analytical accuracy at ALS Chemex was within the acceptable ranges. The copper analytical accuracy at ALS Chemex shows a high bias with an abnormally high rate of failure of the SRMs. This was followed by Carpathian's re-submittal of ten batches containing a total of 2,376 samples, which corrected the failures. This needs to be investigated further by Carpathian.
- Check assays from the secondary laboratory indicated the gold analytical accuracies at ALS Chemex were within the acceptable ranges throughout the 2010-2012 exploration program. The SRMs submitted with the check assay samples indicated a low bias for Cu from the secondary laboratory. This may have been a factor in the results for copper, which indicated a high bias for samples originating from Carpathian's primary laboratory. At the time of writing this report, this issue was being investigated by Euro Sun.
- No significant cross-contamination for Au and Cu was detected during preparation and assaying at ALS Chemex during the 2010-2012 exploration campaign.
- The Au and Cu assays of the late 2010-2012 drilling exploration campaign at the RVP are considered to be sufficiently precise and accurate for resource estimation purposes. A copper bias of +2.3% during the 2010-2012 program has been detected. This bias needs to be addressed by Euro Sun before the next resource update.

11.4 Security

All of the sample collection and handling is carried out by Euro Sun staff at the field office in Criscior. Euro Sun uses a double-checking method during sampling which eliminates most of the sample mix-up. As stated earlier, the facility is surrounded by a fence and Euro Sun staff is present on site 24 hours per day.

AGP visited the Euro Sun core storage facility in Criscior and discovered the core is stored in a secure storage location with fences and monitored 24/7 via video equipment and a security guard.

11.5 Database Content and Integrity

11.5.1 Database Management

Euro Sun is currently entering all of its geological and geotechnical data (including relevant historical data) into a combination of Excel, MSAccess® (Access), MapInfo, and Micromine databases. Sampling data recorded in the field are manually introduced into Excel files by a technician. Following this, the files are transferred to the database manager in Criscior, who incorporates them into the project Access database. Sampling data is then transferred independently to the Micromine database. Assay data is not manually entered on site because they are digitally sent from the laboratory to Euro Sun and imported into the Access and Micromine databases. Euro Sun visually checks each assay on the signed paper certificate against that in the digital databases.

Geological data from the geological logs are entered from the hardcopy logs into the Micromine database and are then transferred to the Access database in Criscior. Down hole surveys with any Reflex instruments are digitally recorded by the instrument on the surface and transferred by the drill contractor to Euro Sun and then imported into Access and Micromine. Drill hole collar survey data is not manually entered because they are digitally sent by the surveyor to Euro Sun and imported into the Access and Micromine databases.

Euro Sun generates up-to-date drill sections. For the drill hole results up to the end of the 2008 drill program, manual section interpretations (on paper) were reconciled to level plans and longitudinal sections to ensure the domains (3D wireframes) were properly constructed and the interpretations were sound. Sections and levels were reviewed on a regular basis to ensure all holes have crossed the target as planned, and sufficient data density exists to make an appropriate interpretation. Three-dimensional wireframe models of all lithologies and alteration types were constructed from sections and plans. For the 2011 and 2012 drill campaign, the 3D wireframe models were updated directly in the Micromine software.

PEG audited the databases that form the basis of the updated resource estimates and found them to be well-organized and transparent. The databases are duplicated in the Euro Sun office in Criscior for security. Euro Sun dedicates one or two people for the majority of the data entry, including collar data, survey data, drill logs, assay data, etc. The database was subsequently audited by AGP as part of the data validation and AGP arrived at the same conclusion as PEG.

12 DATA VERIFICATION

Euro Sun geological staff have made a strong commitment to the geological and assay database and have, as far as is possible, produced a database that is complete, well documented, and traceable.

12.1 AGP Assessment 2008 and 2011

12.1.1 Site Visit

Mr. Pierre Desautels visited the Rovina Valley property, accompanied by Mr. Randall K. Ruff, Euro Sun's Executive Vice-President, Exploration, between August 26 and August 30, 2008 under the banner of PEG to support the 2008 resource estimate. For the resource update, the subject of this report, Mr. Pierre Desautels re-visited the property between July 26 and July 29, 2011. The following section combines the information gathered during these two site visits by the QP.

The site visits entailed brief reviews of the following:

- overview of the geology and exploration history of the Colnic and Rovina Porphyries (presented by Euro Sun geologists Mr. Randall K. Ruff and Dr. Barbara Stefanini)
- exploration program at Ciresata (drill hole orientation, depth, number of holes, etc.)
- in-fill drill program for resource category conversion for Rovina and Colnic
- visits to operating drill rig and drill hole collars at the Colnic, Rovina (2008), and Ciresata Porphyries (2011) accompanied by Sorin Halga
- drill rig procedures including core handling on site
- surveying (topography, collar, and downhole deviations)
- sample collection protocols at the core logging facility
- sample transportation and sample chain of custody and security
- core recovery
- QA/QC program (insertion of standards, blanks, duplicates, etc.)
- monitoring of the QA/QC program
- review of diamond drill core, core logging sheets, and core logging procedures (the review included commentary on typical lithologies, alteration and mineralization styles, and contact relationships at the various lithological boundaries; the 2011 site visit focused on the newly discovered geological features of the Ciresata deposit)
- density sample collection
- geological and geotechnical database structure and all procedures associated with populating the final assay database with information returned from the laboratory
- change of ownership of Euro Sun primary laboratory

The three-character samples collected during the 2008 site visit were supplemented by three additional samples collected during the 2011 site visit. Character samples consisted of quarter-core duplicate of selected Euro Sun sampling intervals. The QP retained full custody of the sample from Rovina Valley to the AGP office in Barrie, ON where the samples were shipped to Activation Laboratories Ltd. located at 1428 Sandhill Drive, Ancaster, ON. The main intent of analyzing these samples was to confirm the gold and copper presence on the deposit by an independent laboratory not previously used by Euro Sun. These samples were analyzed for gold by 50 g fire assay with AA finish and total copper using ICP.

From the assay results shown in Table 12-1, AGP concluded the general range of values returned by the samples corresponded well with those reported by Euro Sun. From the samples collected, gold and copper grade appeared to be very consistent exhibiting a good repeatability between the original 1/2 core sample and the 1/4 core sample.

Table 12-1: Character Sample Results

Sample Nb	Au (g/t)	Cu (%)	Carpathian Nb	Au (g/t)	Cu (%)	Au Diff. (g/t)	Cu Diff. (%)
00901 (2008)	2.000	0.950	RRD12257	2.27	0.972	0.27	0.022
00902 (2008)	1.850	0.424	RCD1514	1.75	0.472	-0.1	0.048
00903 (2008)	1.220	0.225	RGD4408	1.00	0.190	-0.22	-0.035
00951 (2011)	0.982	0.135	RGD-10004	0.92	0.134	-0.062	-0.001
00952 (2011)	2.000	0.271	RGD-10183	2.15	0.285	0.15	0.014
00953 (2011)	5.33	0.465	RGD-6690	5.23	0.501	-0.1	0.036

The on-site core handling was found to be very efficient. The core is collected at the drill rigs daily and brought to the Euro Sun office in Criscior where it is immediately laid out on a large table, measured, and prepared for photographing. The core is then moved inside the core facility for geotechnical logging. Once the geotechnical data acquisition is complete, the core is cut with a diamond saw and sampled prior to logging. The saw blade in the cutting operation is continuously cooled by fresh water (not re-circulated water). It was noted the geotechnical logs are much improved since the 2008 site visit. Although the QP is not qualified to assess their suitability, the logs are now similar to what is seen at other operations.

Following the cutting operation, the core is sampled. The computer-generated sample intervals are typically 1 m but can reach 2 m in the upper part of Ciresata where the deposit is poorly mineralized. Euro Sun typically samples across lithological boundaries. This is not considered by the QP to be an issue in a porphyries system. Similarly, to the 2008 site visit, the logs are completed on paper and then transcribed to computer.

The insertion of the purchased standard, pulp blank, coarse blank, and pulp duplicate in the sampling chain was observed during the core logging facility visit. In 2008, the gold and copper assay standards observed on-site originated from the CDN resource lab numbers CDN-CGS16, CDN-CGS13, and CDN-CM3. Other gold standards from Rocklabs and copper standards from Geostats PTY Ltd. are also used. In 2011, Euro Sun used the CDN resource laboratory standard CDN-CGS-16, CDN-CM-8, and CDN-CGS-24 and during 2012 used the CDN resource laboratory standards CDN-CM-16, CDN-CM-11A, and CDN-CGS-22.

Geologists responsible for logging can roughly estimate (high/low) the grade of the core visually by the chalcopyrite content, the stockwork intensity, and to a lesser extent the alteration. Sharp contacts are often seen at the lithological boundaries (depending on the unit) as long as the contact has not been obscured by alteration. For example, during the core review at Rovina, the contact between the PoB and PoC was transitional over a distance of 7 m while the contact between the Glam Breccia and PoC was sharp. The alteration boundaries are more difficult to pinpoint due to the overprinting of multiple alteration phases. Euro Sun geologists commented on the K2/K3 boundary that can be determined within ± 3-5 m accuracy while the argillic/phyllic contact can be determined to ±1 m accuracy. Phyllic and K2 boundary is usually sharp.

Figure 12-1 displays a few photographs taken during the 2011 site visit.

Figure 12-1: Site Visit Photos

Core Cutting in Progress

Drill Rig at Ciresata (Hole RGD-41)

Hole RGD-26 GPS Coordinate

QA/QC Samples Ready for Insertion

Inter Mineral Porphyry and Sediment Contact in Hole RGD-17 @ 454 m

Pulp Storage Area

12.1.2 Database Validation

Following the site visit and prior to the resource evaluation, AGP carried out an internal validation of the drill holes in the Rovina Valley database used in the September 2008 resource estimate. Data validation had been done by AMEC in 2006 and 2007, prior to the completion of the 2007 drill campaign, and did not include any of the 2008 drill data. The hole selection for the validation was heavily weighted on the 2007/2008 drilling with spot checks of the earlier holes verified by AMEC. At that time, a total of 46 holes were partially or completely validated amounting to 10,938 individual samples out of a total of 61,329 (17.8%) that were either checked against paper copies of the original signed certificate or against the electronic version of the certificate provided by the issuing laboratory.

In 2012, the database was validated by first restoring the archived version of the 2008 resource database and comparing the collar coordinate, survey, lithology, and assays. No changes were noted on the holes validated in 2008 therefore the drill hole selection for AGP's validation was restricted to the 2010/2012 drilling.

12.1.3 Collar Coordinate Validation

Collar coordinates were validated with the aid of a hand-held Garmin GPS Map, Model 60CSx. A series of collars was randomly selected, and the GPS position was recorded. The difference with the Gems database was calculated in an X-Y 2D plane using the following formula:

$$X - Y\ difference = \sqrt{(\Delta\mathrm{East})^2 + (\Delta\mathrm{North}^2)}$$

As shown on Table 12-2**Error! Reference source not found.**, results indicated an average d ifference in the X-Y plane of 10.2 m for the nine holes where the instrument was located on the monument and 20.2 m in the Z-plane. The overall average difference of the eighteen holes surveyed amounted to 11 m in the X-Y plane and -15 m in the Z-plane. Elevation difference is normal as hand-held GPSs are notoriously inaccurate in elevation. RDG-21 and RGD-26 displayed a rather large X-Y difference. These two holes were re-surveyed in the field by Euro Sun Geologists using two different hand-held GPS units and also using a tape and compass from hole RGD-1. The database collar coordinate was confirmed. The differences seen are well within the accuracy of the hand-held GPS unit used. The instrument reported "accuracy" between 3.5 to 9 m at most field locations surveyed. This is typically influenced by vegetation cover and number of satellites seen on the day the survey is taken.

Table 12-2: Collar Coordinate Verification

Hole-ID	Site Visit	GEMS Database Entry			Garmin GPS Map 60CSx Reading			Difference (m)	Difference (m)	Comment
		Easting	Northing	Elevation	Easting	Northing	Elevation	(X,Y - 2D Plane)	Elevation	
					339340	519790	467			Lower Portal
RRD-21	2008	339409	520575	571	339396	520575	597	12.5	-26	Approximate location
RRD-49	2008	339475	520656	584	339467	520663	606	10.3	-22	On monument
RRD-34	2008	339428	520660	595	339421	520651	626	11.3	-31	On monument
RRD-43	2008	339611	520352	644	339602	520356	655	9.9	-11	On monument
RRD-48	2008	339607	520347	644	339598	520341	659	10.3	-15	Approximate location
RCD-72	2008	338665	517897	351	338661	517906	393	10.1	-42	On monument
RCD-74	2008	338656	517911	351	338660	517932	382	21.1	-31	Approximate location
RCD-67	2008	338687	517950	352	338674	517955	378	13.6	-26	On monument
RCD-72	2008	338665	517897	351	338668	517905	384	8.7	-33	Approximate location
RCD-9	2008	338620	517916	356	338624	517913	396	4.6	-40	Approximate location
RCD-59	2008	338648	517630	404	338638	517636	426	11.5	-22	On monument
RCD-57	2008	338706	517577	434	338694	517587	463	15.9	-29	Approximate location
RGD-7	2008	337276	513440	432	337264	513451	443	16.2	-11	Approximate location
RGD-1	2008	337216	513322	422	337206	513323	441	10.0	-19	On monument
RGD-15	2008	337337	513354	482	337329	513354	499	7.5	-17	Approximate location
RGD-13	2008	337112	513165	472	337106	513165	484	5.5	-12	On monument
RGD-8	2008	337130	513104	479	337119	513105	488	11.4	-9	On monument
RGD-9	2008	337129	513104	479	337121	513106	485	8.2	-6	On monument
RCD-2	2011	338621	517917	356	338638	517917	370	17.4	-14	On monument
RGD-22	2011	337248	513143	429	337254	513161	422	19.8	7	On monument
RGD-21	2011	337214	513323	422	337186	513293	531	40.8	-109	On monument
RGD-24	2011	337266	513113	430	337269	513119	433	6.1	-3	On monument
RGD-26	2011	337210	513388	420	337182	513344	577	51.6	-157	On monument
RGD-40	2011	337299	513094	435	337304	513102	438	9.5	-3	Beside casing

Hole-ID	Site Visit	GEMS Database Entry			Garmin GPS Map 60CSx Reading			Difference (m)	Difference (m)	Comment
		Easting	Northing	Elevation	Easting	Northing	Elevation	(X,Y - 2D Plane)	Elevation	
RGD-41	2011	337230	513334	424	337226	513324	435	10.4	-11	Approximate location
RGD-43	2011	337225	513229	426	337222	513224	494	5.7	-68	Approximate location
			Average difference (Instrument on Monument) - less the two outliers					11	-16	

12.1.4 Down-Hole Survey Validation

The down-hole survey data was validated by searching for large discrepancies between dip and azimuth reading against the previous reading. A total of 11,128 readings were evaluated. Vertical holes were separated from the incline holes to be evaluated separately. The absolute differences between the readings were calculated along with the statistical summary at the 10th, 25th, 50th, 75th, 90th, and 99th percentile. Measurements deviating excessively (> 99th percentile) from the previous reading were manually reviewed. Out of the 20 azimuths manually reviewed, eight were considered suspect. For dip measurements, out of the 16 manually reviewed, five were considered suspect. All suspected values were forwarded to Dr. Barbara Stefanini for validation against the original down hole instrument value. None were corrected as the database entry coincided with the instrument reading.

12.1.5 Assay Validation

Assay validation proceeded as follows:

During the 2008 review:

- validation of GEMS database entry against the PDF copies of the original signed laboratory certificated for a limited number of holes
- validation of the electronic version of the certificates against the Gems database entry
- electronic comparison of the database maintained by Euro Sun Information Technology (IT) Department against the Micromine database maintained by Dr. Barbara Stefanini

During the 2011 review:

- comparing the 2012 assay database against the archive copy of the database used in the 2008 resource estimate
- validating the electronic version of the certificate against the GEMS database entry for any assays following the 2008 data cut-off date

The validation against the original signed PDF copies of the certificate consisted of three holes RCD-1, RCD-10, and RRD-2 with 1083 assays re-typed in an XLS spreadsheet. No errors were found.

The validation against the electronic version of the certificates consisted of comparing the values on the certificate against the GEMS database entry.

In 2008, 39 certificates were requested from the ALS Chemex (Euro Sun's principal laboratory) in Gura Rosiei, Romania via Mr. Randall K. Ruff of Euro Sun. ALS Chemex issued the requested certificates as a series of text files in space delimited format (SIF) directly to the author's email address. A total of 13,030 assay results covering 43 drill holes were compiled from the certificates onto an Excel spreadsheet and matched against the sample number in the GEMS database. A total of 3,175 QA/QC assays did not find a matching sample number in the GEMS database with the remaining 9,855 sample numbers successfully matched.

The 2012 database assay entries for the portion of the data that was used in the 2008 resource estimate were found to be same; therefore, the 2012 validation could focus solely on the data that was added after the 2008 data cut-off date.

An additional 21 certificates were requested from the ALS Chemex in Gura Rosiei, Romania via Mr. Randall K. Ruff of Euro Sun. ALS Chemex issued the requested certificates in comma delimited format (CSV) directly to the author's email address. The certificates were preferentially selected to cover the highest gold grade value and also to be representative of the assay distribution between deposits. A total of 5,299 assay results covering 50 drill holes were compiled from the certificates onto an Excel spreadsheet and matched against the sample number in the GEMS database. A total of 572 QA/QC assays did not find a matching sample number in the GEMS database with the remaining 4,727 sample numbers successfully matched.

In 2008, out of the 9,855 sample numbers, only two gold and two copper entries did not match the certificate value, and these were corrected in the 2012 database. Assay validation covers 16% of the entire database with a total of 27% coverage for the 2007-2008 data not previously validated by AMEC. In 2012, no error was found (Table 12-3).

Table 12-3: Assay Verification Statistics

	2008	2012	2008 and 2012
Total number of assays in lab cert	13,030	5,299	18,329
Number of lab cert with no matching number in GEMS (QA/QC samples)	3,175	572	3,747
Total number of lab cert with matching sample number	9,855	4,727	14,582
Total number of assays in GEMS database	60,268	53,761	114,029
Percent checked against total	16%	9%	13%
Number of errors found (gold)	2 (corrected 2012)	0	0
Number of errors found (copper)	2 (corrected 2012)	0	0

12.1.6 Assessment of the Drill Holes Completed after the 2012 Data Cut-off Date

When the PEA update study on the Colnic deposit was commissioned, the 2012 Resource Model had to be reviewed for suitability. Following the May 31, 2012 data cut-off date, a total of nine holes were added on the Ciresata deposit, three holes on Colnic and three holes on Rovina. AGP assessed the possible impact to the resources from the additional drill holes. Not all holes intersected the 2102 resource model; Table 12-4 shows the drill holes completed after the data cut-off.

Table 12-4: Drill holes added after the 2012 data cut-off date.

Deposit	Hole-ID	Comments
Rovina	RRD-85	Hole in mineralized POD
Rovina	RRM-1	Metallurgical hole - in mineralized POB
Rovina	RRD-84	Hole in mineralized IMB but on the immediate contact with un-mineralized GLAM
Colnic	RCD-105	Drilled outside the resource model
Colnic	RCD-106	Drilled on the edge of the deposit in poorly mineralized SED and SAT-POR
Colnic	RCM-1	Metallurgical hole drilled in high grade C-POR. Near twin of RCD-3
Ciresata	RDG-65	Not intersecting resource model
Ciresata	RDG-66	Edge of interpolated blocks (only first 300m in resource model) - waste
Ciresata	RDG-67	Abandon
Ciresata	RDG-68	Hole in high grade material HRP and SED extend 369m pass the resource model lower elevation
Ciresata	RDG-69	Hole in high grade material SED extend 278m pass the resource model lower elevation
Ciresata	RDG-70	Not intersecting resource model
Ciresata	RDG-71	Not intersecting resource model
Ciresata	RDG-72	Not intersecting resource model
Ciresata	RDG-73	Edge of interpolated blocks (only first 113m in resource model) - waste
Ciresata	RDG-74	Not intersecting resource model

In order to asses the possible impact the new holes may have on the resources, the drill holes were composited to match the block model benches (or levels). The corresponding block model data was selected using a 5 m radius tube around each drill hole. Bench composite values were then compared with the block model grade.

The grade difference between the drill hole and the block model was compiled for the mean, and the distribution was also compared at 5th, 10th, 25th, 59th, 75th, 90th, and 95th percentiles. The difference between the grade of the drillhole and the grade of the block model was typically less than 0.1 g/t AU and less than 0.05% Cu. The holes showing the most variations (> +/- 0.1 g/t) for gold were Hole RCM-1 at Rovina, RRM-1 at Colnic, and RGD-69 at Ciresata. For copper, the holes showing the most variation (> +/-0.05% Cu) were RRD-84 and RRD-85 (Figure 12-2 and Figure 12-3).

Table 12-3: Gold Grade Difference Distribution

Gold Grade Difference	ALL	Rovina		Colnic			Ciresata			
		RCD-106	RCM-1	RRD-84	RRD-85	RRM-1	RGD-66	RGD-68	RGD-69	RGD-73
Mean	0.00	-0.03	-0.06	0.01	0.02	0.02	-0.01	-0.02	-0.12	0.03
5th percentile	-0.01	0.01		0.00	0.00	-0.18	0.00	0.00	-0.02	0.00
10th percentile	-0.03	0.00	-0.17	0.01	0.00	-0.09	-0.01	-0.03	-0.03	0.00
25th percentile	-0.08	0.00	-0.28	-0.06	0.00	-0.03	-0.01	-0.09	-0.06	0.00
Median	-0.09	-0.04	-0.09	-0.11	-0.01	-0.05	0.00	-0.06	-0.14	0.01
75th percentile	-0.04	-0.06	-0.06	0.03	0.02	0.13	0.00	-0.05	-0.18	0.03
90th percentile	-0.08	-0.06	0.36	0.23	0.09	0.22	-0.03	0.08	-0.28	0.12
95th percentile	-0.10	-0.07		0.41	0.12	0.19	-0.03	0.15	-0.03	0.16
Count > +/- 0.1 g/t	0	0	3	2	1	3	0	1	3	2

Table 12-4: Copper Grade Difference Distribution

Copper Grade Differences	ALL	Rovina		Colnic			Ciresata			
		RCD-106	RCM-1	RRD-84	RRD-85	RRM-1	RGD-66	RGD-68	RGD-69	RGD-73
Mean	-0.01	-0.01	0.00	-0.03	0.05	0.01	0.00	-0.01	-0.02	0.00
5th percentile	0.00	0.00		0.00	0.00	-0.04	0.00	-0.01	0.00	0.00
10th percentile	0.00	0.00	-0.02	0.00	0.00	-0.03	0.00	-0.03	-0.01	0.00
25th percentile	-0.02	0.00	-0.04	-0.03	0.03	0.07	0.00	-0.02	-0.03	0.00
Median	-0.01	0.00	0.01	-0.09	0.03	0.02	0.00	-0.01	-0.02	0.00
75th percentile	-0.02	-0.05	0.01	-0.05	0.09	0.02	0.00	-0.02	-0.01	0.00
90th percentile	0.00	-0.03	0.00	0.04	0.13	0.03	0.00	0.00	-0.04	0.00
95th percentile	0.04	-0.02		0.05	0.14	0.04	0.00	0.02	-0.02	0.00
Count > +/- 0.05 g/t	0	0	0	1	3	1	0	0	0	0

Composite drill holes graded by bench were also plotted against the block model grade. Graphs indicated the drill hole grade follows the resource model grade relatively well when taking into consideration the inherent smoothing of the grade distribution from kriging composite points. A few example graphs are shown below.

Hole RGD-69 at Ciresata and hole RCM-1 at Colnic both display a very good correlation when compared to the block model grade (Figure 12-4 and Figure 12-5)

Figure 12-4: RGD-69 versus Resource Model

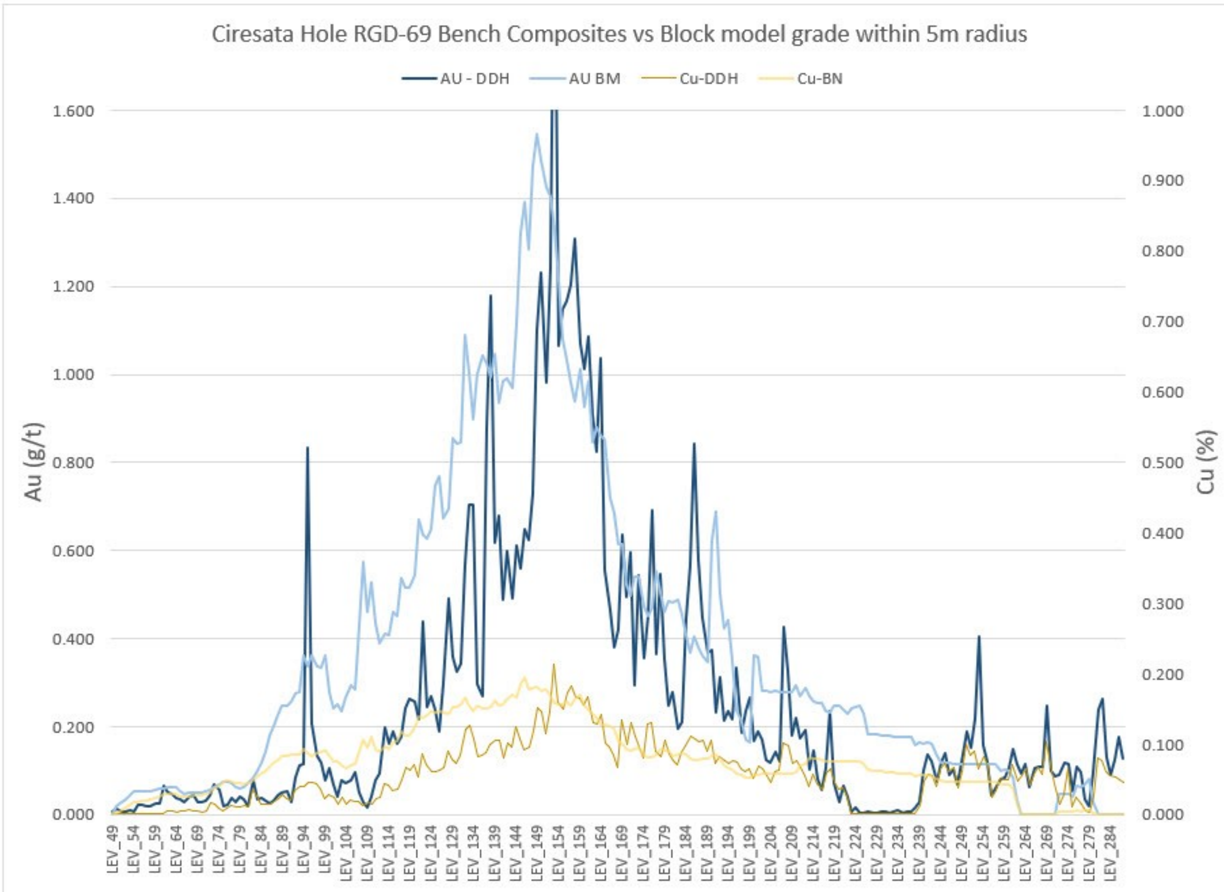
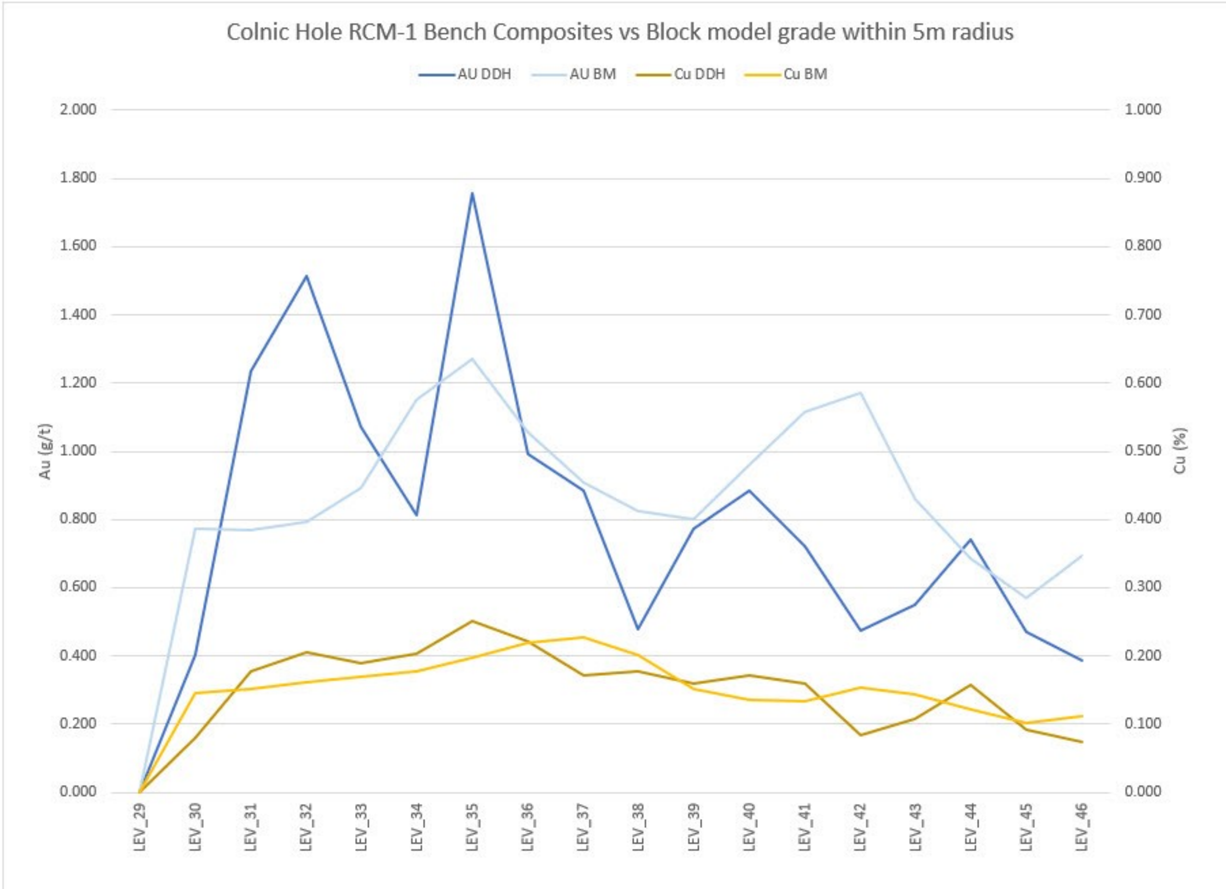


Figure 12-5 RCM-1 versus Resource Model



Hole RRD-84 displays the worst results. The data clearly shows where the drillhole exited the higher grade IMB/POC lithology earlier than anticipated by the 2012 interpretation. As a result, the lower drill hole grade in the GLAM lithology beyond LEV_31 is not reflected in the resource model (Figure 12-6).

Figure 12-6 RRD-84 versus Resource Model

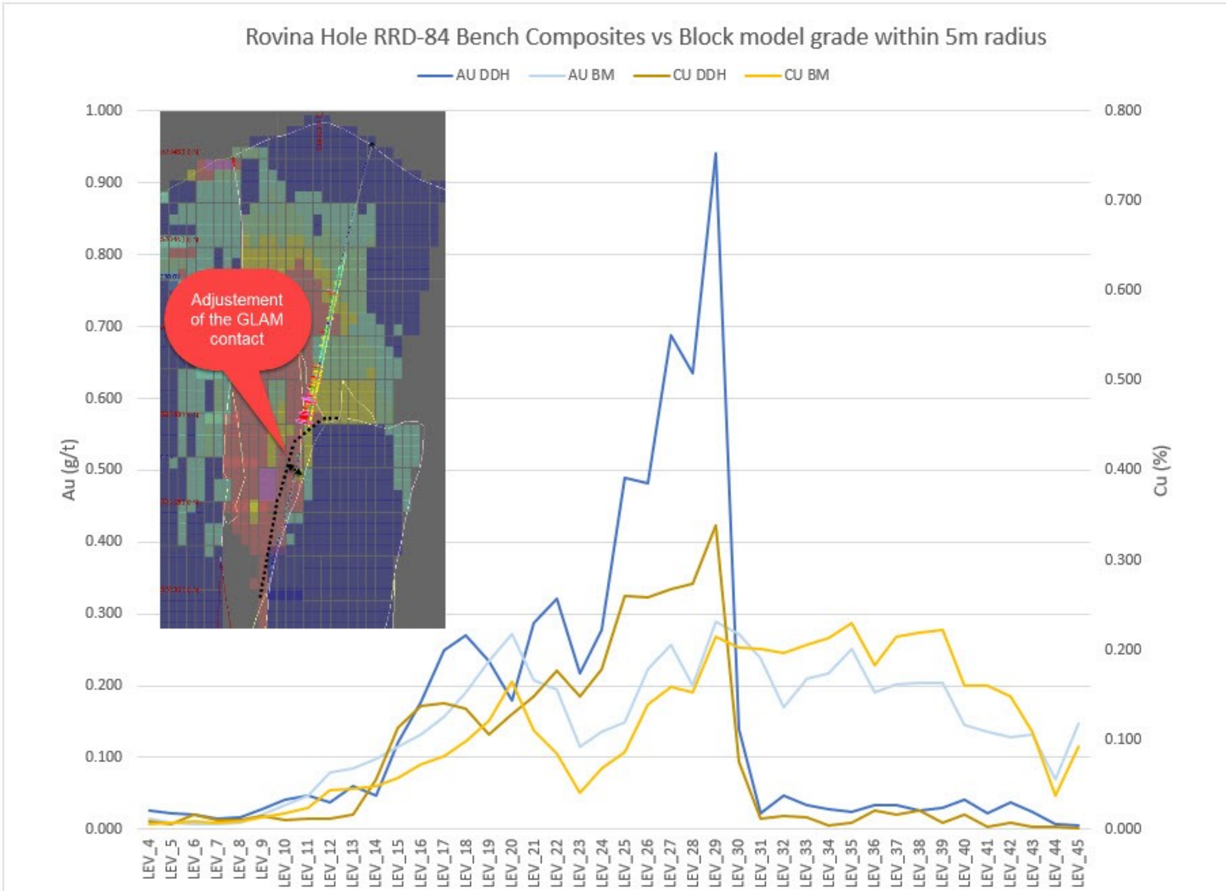


Table 12-5 shows the expected impact to the 2012 Resource Model due to the additional drill holes completed after the data cut-off date. Except for hole RRD-84, it is expected the new holes added would have no material impact to the 2012 Resource Estimate that would justify a complete update. Adjusting the wireframe for hole RRD-84 would only affect a small volume likely to be insignificant considering the total volume contained in the Rovina deposit. AGP therefore recommends Euro Sun not update the grade model or classification model until more holes are added.

Table 12-5 Drill holes added after the 2012 data cut-off date.

Deposit	Hole-ID	Comments
Rovina	RRD-85	No material impact on the resource model expected
Rovina	RRM-1	No material impact on the resource model expected
Rovina	RRD-84	Minor impact expected below 448m elevation affecting a very limited volume.
Colnic	RCD-106	No material impact on the resource model expected
Colnic	RCM-1	No material impact on the resource model expected
Ciresata	RDG-66	No material impact on the resource model expected (First 300m)
Ciresata	RDG-68	No material impact on the resource model expected. Hole could possibly extent the mineralization below the current resource model lower elevation with additional drilling.
Ciresata	RDG-69	No material impact on the resource model expected. Hole is also unlikely to extent the mineralization below the current resource model lower elevation.
Ciresata	RDG-73	No material impact on the resource model expected

12.1.7 Qualified Person Comments

No material sample bias was identified by the QP during the review of the drill data and assays. The data collected by Euro Sun adequately represents the style of mineralization present on the RVP. The error rate in the drill database for the data that was validated by the QP was found to be virtually 0%. The QP regards the sampling, sample preparation, security, and assay procedures reviewed adequate to support the mineral resource without restriction on classification. Holes completed after the data cut-off date are unlikely to have a significant impact on the resources and therefore AGP recommends Euro Sun not update the 2012 grade or classification model until more holes are added to the resource.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 General

The following section summarizes mineral processing and metallurgical test work mainly related to the Colnic deposit and covers recently completed metallurgical test work by Eriez. The samples tested to date exhibit metallurgical characteristics considered typical of copper porphyry mineralization with almost all copper typically occurring as chalcopyrite. Pyrite is the main sulphide gangue component and is present in concentrations varying from 1% to approximately 7%. Occasional pyrrhotite is noted within the Colnic deposit. Limited mineralogy has defined a gold population consisting of discrete and fine-grained particles associated mainly with chalcopyrite and pyrite, but also locked within silicate minerals.

The results of the recent metallurgical test program were used to develop the preliminary flowsheet configuration, primary circuit grinding targets, reagent addition, and metallurgical predictions.

13.2 Historical Test Work

Table 13-1 summarizes historical metallurgical test work reports. Relevant test work and the results from the Eriez test work are discussed further below.

Table 13-1: Historical Test Work Reports

Document	Date	Report Reference	Source
An investigation into the recovery of copper and gold from a Cu/Au porphyry deposit	1 May 2007	11413-001	SGS
The mineralogical investigation of three head samples	12 Oct 2006	11413-001	SGS
A deportment study of gold in composite MET-10 and 11	15 Sep 2008	11992-001	SGS
Grinding, flotation and leaching testwork for gold ore samples from Colnic, Rovina, and Ciresata	28 Feb 2009	-	GEOSOL
An Investigation into the flotation testing of ores from the RVP	Apr 2010	12342-001	SGS
Geometallurgical Study of the Rovina Valley Deposit – Mineralogical Characterisation – FINAL	27 May 2013	4011812.00	XSTRATA
Fine copper/gold column flotation study	11 May 2017	MTR 16-314	ERIEZ
Euro Sun RVP - copper and gold flotation pilot plant report	1 Nov 2018	MTR 17-266	ERIEZ

13.3 Fine Copper/Gold Column Flotation Study, Eriez – May 2017

Eriez investigated the column flotation response of Colnic MET-38. Originally, a total of four feed samples were provided (Colnic and Rovina), but Colnic MET-38 was utilized to first investigate the benefit of employing column flotation technology.

In terms of composition, the gold and copper in Colnic Met-38 consisted of quartz (SiO_2), feldspar ($KAlSi_3O_8$ – $NaAlSi_3O_8$ – $CaAl2Si_2O_8$), pyrite (FeS_2), sphalerite (ZnS), aluminum clay minerals, chalcopyrite ($CuFeS_2$) and gold.

The core samples were crushed to 850 µm prior to the column flotation tests. The crusher product was then ground using a laboratory rod mill to provide a rougher-scavenger flotation feed of P_{80} of 53 µm. Previous testwork conducted by third-party laboratories had determined a rougher-scavenger feed particle size of P_{80} of 53 µm was necessary to achieve acceptable gold recovery.

Following rougher and scavenger flotation, a bulk cleaner circuit feed material was prepared by milling the bulk rougher-scavenger concentrate to a P_{80} of 20 µm to improve liberation of gold from pyrite and decrease gold recovery losses.

13.3.1 Conventional Flotation Testing

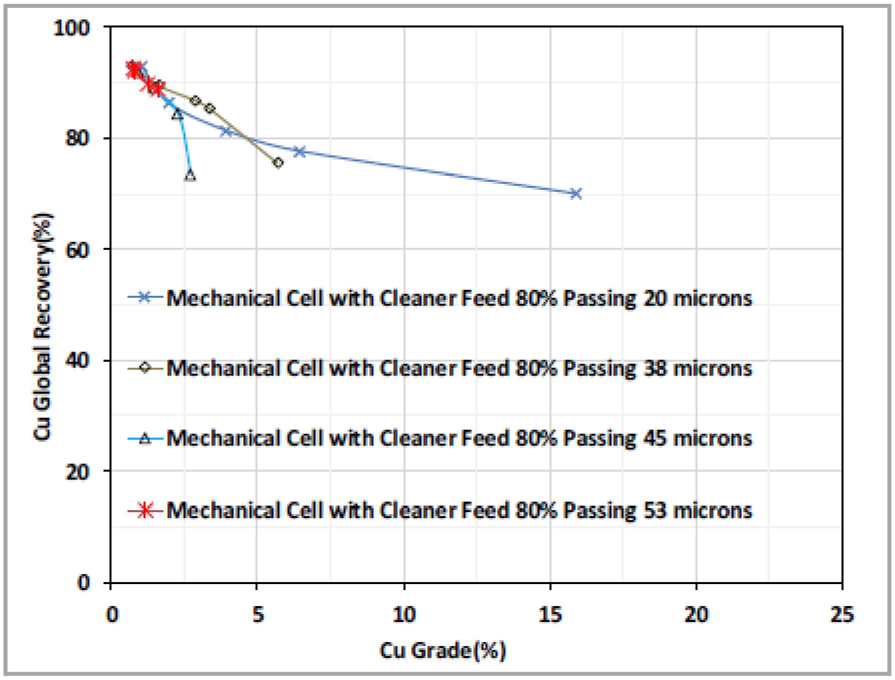
Initially, bench-top Denver D12 mechanical/conventional flotation tests were carried out to verify the reagent chemistry, to optimize operating parameters, including air rate and wash water rate, and to test the flotation response of unique cleaner feed particle size distributions. The results from this test work were also used for comparison to the subsequent column flotation tests.

The effect of the cleaner feed particle size distribution on the grade and recovery relationship was investigated using cleaner feed of P_{80} of 53, 45, 38, and 20 µm. As shown in Table 13-2 and Figure 13-1, increasing the fineness of the cleaner feed size distribution, increased flotation recovery was achieved at a given concentrate grade. Therefore, a cleaner feed of P_{80} of 20 µm was selected for the subsequent column flotation test program to maximize the concentrate grade, and to avoid a significant drop in gold recovery throughout cleaner flotation testing.

Table 13-2: Bench-scale Mechanical Cell Results as a function of Grind Size

Feed PSD: 80% passing minus 53 microns for both rougher-scavenger and cleaners										
Streams	**3418A(g/t)**	**PAX(g/t)**	**Frother(g/t)**	**pH**	**Mass(g)**	**Mass(%)**	**Cu %**	**Cu Distribution**	**Concentrate Cu(%)**	**Cu Recovery(%)**
Rougher-Scav. Tail	10	7.5	15	10.0	749.7	75.45	0.011	7.28		
1st Cleaner Tail	0	0	0	10.5	83	8.35	0.009	0.66	0.77	92.72
2nd Cleaner Tail	0	0	5	11.0	79	7.95	0.033	2.30	0.79	92.06
3rd Cleaner Tail	0	0	5	11.3	19	1.91	0.051	0.86	1.24	89.75
3rd Cleaner Concentrate					62.9	6.33	1.6	88.90	1.60	88.90
Total	10	7.5	25		993.6	100	0.11	100		
Feed PSD: 80% passing minus 53 microns for rougher-scavenger and 80% passing 45 microns for cleaners										
Streams	**3418A(g/t)**	**PAX(g/t)**	**Frother(g/t)**	**pH**	**Mass(g)**	**Mass(%)**	**Cu %**	**Cu Distribution**	**Concentrate Cu(%)**	**Cu Recovery(%)**
Rougher-Scav. Tail	10	7.5	15	10	766.9	81.44	0.012	8.12		
1st Cleaner Tail	0	0	0	10.5	95.6	10.15	0.034	2.87	0.95	91.88
2nd Cleaner Tail	0	0	5	11	37.1	3.94	0.14	4.58	1.44	89.02
3rd Cleaner Tail	0	0	5	11.3	11.2	1.19	1.1	10.86	2.27	84.44
3rd Cleaner Concentrate					30.9	3.28	2.7	73.57	2.70	73.57
Total	10	7.5	25		941.7	100.00	0.12	100		
Feed PSD: 80% passing minus 53 microns for rougher-scavenger and 80% passing 38 microns for cleaners										
Streams	**3418A(g/t)**	**PAX(g/t)**	**Frother(g/t)**	**pH**	**Mass(g)**	**Mass(%)**	**Cu %**	**Cu Distribution**	**Concentrate Cu(%)**	**Cu Recovery(%)**
Rougher-Scav. Tail	10	7.5	15	10	754	76.12	0.012	6.85		
1st Cleaner Tail	0	0	0	10.5	138	13.93	0.035	3.66	0.69	93.15
2nd Cleaner Tail	0	0	0	11	44	4.44	0.080	2.66	1.62	89.49
3rd Cleaner Tail	0	0	5	11.3	21	2.12	0.095	1.51	2.85	86.83
4th Cleaner Tail	0	0	5	11.5	16	1.62	0.81	9.81	3.36	85.32
4th Cleaner Concentrate					17.5	1.77	5.7	75.51	5.7	75.51
Total	10	7.5	25		990.5	100.00	0.13	100.00		
Feed PSD: 80% passing minus 53 microns for rougher-scavenger and 80% passing 20 microns for cleaners										
Streams	**3418A(g/t)**	**PAX(g/t)**	**Frother(g/t)**	**pH**	**Mass(g)**	**Mass(%)**	**Cu %**	**Cu Distribution**	**Concentrate Cu(%)**	**Cu Recovery(%)**
Rougher-Scav. Tail	10	7.5	15	10	752.1	83.34	0.011	7.01		
1st Cleaner Tail	0	0	0	10.5	74	8.20	0.11	6.58	1.06	92.99
2nd Cleaner Tail	0	0	0	11	39.5	4.38	0.15	5.02	1.98	86.41
3rd Cleaner Tail	0	0	5	11.3	22.7	2.52	0.20	3.75	3.94	81.39
4th Cleaner Tail	0	0	5	11.5	9	1.00	1.0	7.62	6.46	77.65
4th Cleaner Concentrate					5.2	0.58	15.9	70.02	15.9	70.02
Total	10	7.5	25		902.5	100.00	0.13	100.00		

Figure 13-1: Conventional Flotation Copper Grade and Recovery Relationships



Reference: Fine Copper/Gold Column Flotation Study, Eriez – May 2017

13.3.2 Column Flotation Tests

A three-inch (75 mm) diameter laboratory scale flotation column was employed to perform conventional rougher-scavenger and 3-stage cleaner flotation testing. These tests aimed the investigation of the flotation response of Colnic MET-38 (P_{80} of 53 µm and 20 µm). The feed slurry was prepared at the desired 30% solids by weight and dosed with the gold collector (Cytec 3418A) and the copper collector (PAX). In terms of conditioning time, previous flotation test results indicated an increase in conditioning time from 4 to 12 min had no significant effect on the flotation performance. Table 13-3 summarizes the results collected from treatment of two MET-38 samples using column flotation.

Table 13-2: Rougher-Scavenger and Cleaner 1-3 Column Flotation Results

Eriez Column Rougher-Scavenger and Cleaners Flotation Results									
Bulk Run 1	**Concentrate Yield, Copper Grade and Recovery (%)**					**Gold Grade(g/t) and Recovery(%)**			
Streams	Feed	Tail	Concentrate	Conc. Yield	Recovery	Feed	Tail	Conc	Recovery
Rougher-Scavenger	0.12	0.01	1.31	8.67	95.40	0.73	0.10	7.38	87.27
1st Cleaner	1.33	0.04	3.85	33.74	98.00	7.20	0.17	21.01	98.45
2nd Cleaner	3.93	0.30	8.20	45.96	95.83	20.85	0.18	45.16	99.54
3rd Cleaner	8.05	0.40	19.48	40.09	97.02	45.97	3.73	109.11	95.16
Combined (Global)	0.12		**19.48**	0.54	**86.9**	0.73		109.1	81.4
Bulk Run 2	**Concentrate Yield, Copper Grade and Recovery (%)**					**Gold Grade(g/t) and Recovery(%)**			
Streams	Feed	Tail	Concentrate	Conc. Yield	Recovery	Feed	Tail	Conc	Recovery
Rougher-Scavenger	0.12	0.01	1.39	8.24	95.41	0.73	0.09	7.84	88.56
1st Cleaner	1.45	0.04	4.08	35.01	98.21	7.76	0.19	21.81	98.37
2nd Cleaner	4.11	0.17	8.45	47.67	97.85	21.58	0.20	45.05	99.50
3rd Cleaner	8.17	0.40	21.31	37.15	96.90	46.50	3.89	118.58	94.74
Combined (Global)	0.12		**21.31**	0.51	**88.85**	0.73		118.58	**82.12**

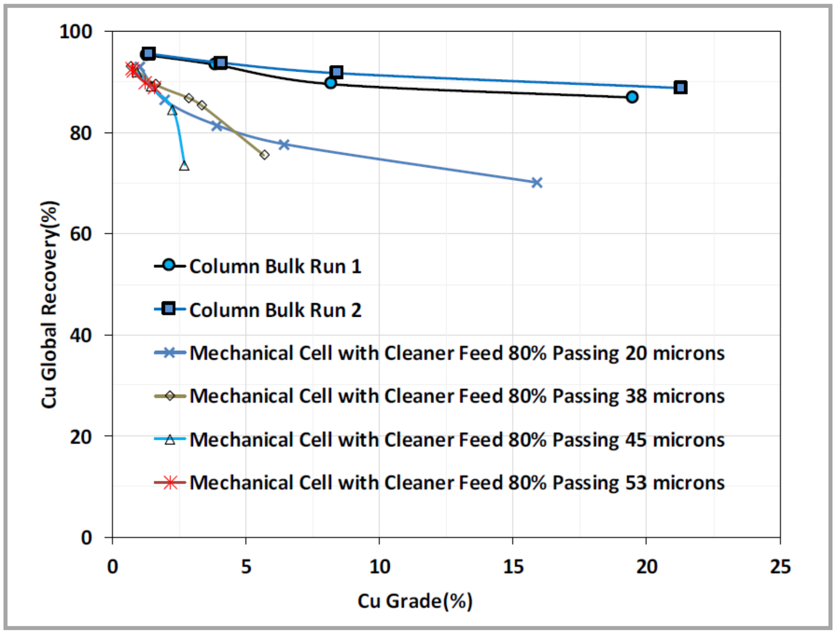
Reference: Fine Copper/Gold Column Flotation Study, Eriez – May 2017

In this table, each flotation stage has been mass balanced independently as each flotation stage was investigated individually. As such, there are minor variations between concentrate and subsequent flotation stage feed assays. An open circuit copper recovery of 86.9% at a grade of 19.48% Cu and gold recovery of 81.4% at a grade of 109.1 g/t were achieved in Bulk Run 1. In Bulk Run 2, open circuit copper and gold recoveries of 88.9% and 82.1%, respectively, were achieved, with corresponding final concentrate copper and gold grades of 21.3% Cu and 118.6 g/t gold.

Cleaner testing was not optimized due to limited sample availability but showed column flotation is capable of significantly improving gold recovery when treating this ultra-fine material.

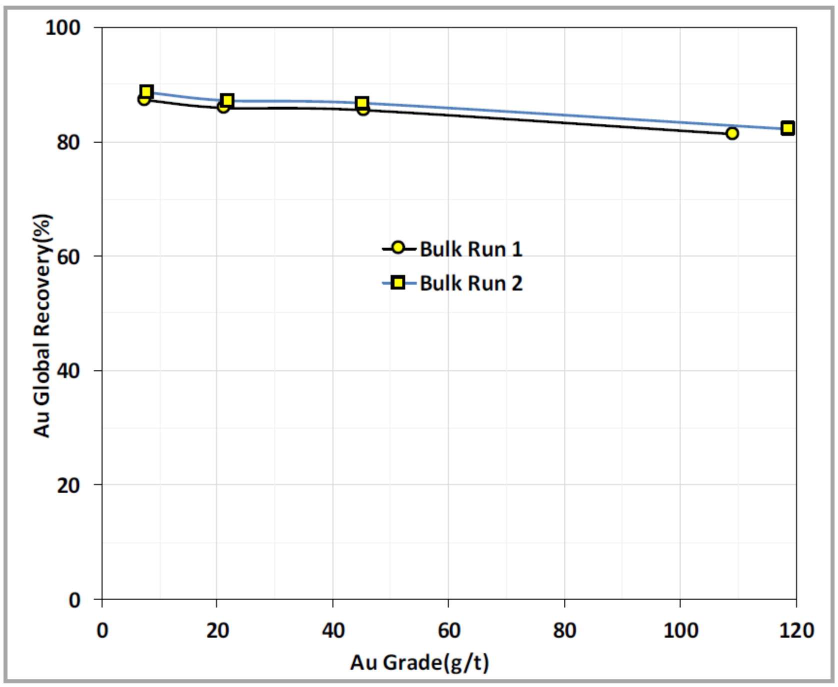
show the grade and global recovery relationships for copper and gold, respectively. For comparison, the copper grade and recovery achieved in mechanical cell flotation tests are also presented in Figure 13-2 and Figure 13-3. These results confirmed that using column flotation under similar feed conditions, final copper and gold grades, mass yields, and recoveries are significantly improved. This is consistent with what was expected (i.e. column flotation typically offers higher metallurgical selectivity when treating fine and ultrafine material).

Figure 13-2: Copper Grade vs. Recovery for Column and Mechanical Cell Flotation



Reference: Fine Copper/Gold Column Flotation Study, Eriez – May 2017

Figure 13-3: Gold Grade vs. Recovery for Column Flotation



Reference: Fine Copper/Gold Column Flotation Study, Eriez – May 2017

As a conclusion, the results of this testwork demonstrated that application of the column flotation technology can be beneficial for the treatment of a Colnic gold and copper bearing material.

13.3.3 Flotation Pilot Plant Report, Eriez – Nov 2018

A pilot plant test program was performed to investigate the column flotation response of the two major geometallurgical domains previously defined for Colnic as shown below. Large composite samples (~3,000 kg each) designated as MET-42 (Colnic K1 Domain) and MET-44 (Colnic K2K3 Domain) were prepared from core samples to represent each of the domains with respect to copper and gold grade, lithology, and composition. Although another core sample from the Rovina region, designated as MET-43 (Rovina Domain), was also tested, the discussion hereafter focusses on the results for the Colnic samples (MET-42 and MET-44).

Initially, the core samples were stage crushed. Representative samples were cut and subjected to grinding studies employing a laboratory rod mill for generating feed material for bench scale flotation tests.

13.3.4 Benchtop Mechanical Cell Flotation

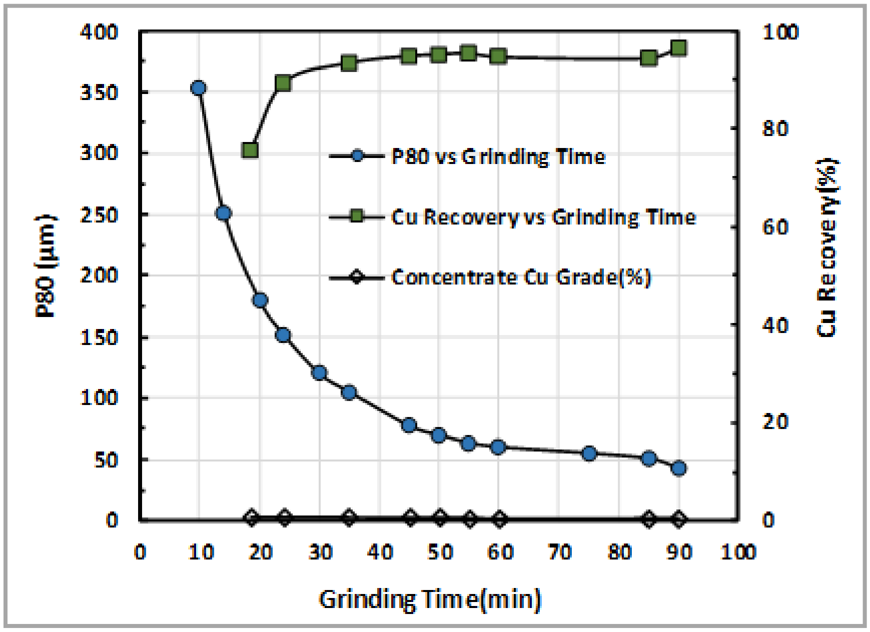
Mechanical cell conventional flotation tests were carried out on MET-42 and MET-44 samples to identify the most optimal flotation particle size distributions of rougher-scavenger and cleaner feed, circuit configuration, and reagent chemistry scheme as well as addition rates.

13.3.5 Rougher and Scavenger Benchtop Mechanical Flotation Testing

Based on previous test work carried out by Eriez and third-party laboratories, the rougher-scavenger flotation reagent scheme and addition rates for higher pyrite content MET-42 and MET-44 samples, rougher-scavenger benchtop flotation reagent addition rates were 12.5 g/t Cytec 3418A collector, 7.5g/t PAX, 20g/t glycol frother, and a pH of 10 using CaO. The effect of the cleaner feed particle size distribution on the grade and recovery relationships was also investigated.

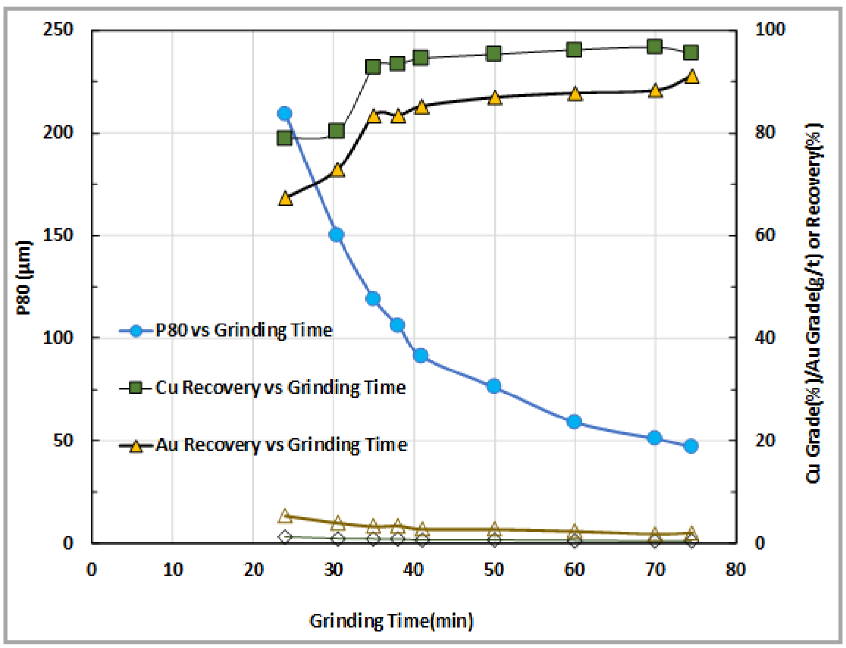
MET-42 and MET-44 rougher-scavenger benchtop flotation test results are shown in Figure 13-4 and Figure 13-5, respectively. It can be seen that the flotation copper recovery increases with decreasing the rougher-scavenger feed particle size. In order to achieve a high copper flotation recovery, the rougher-scavenger feed was ground to P_{80} of 75 µm. Considering both flotation performance and grinding energy consumption, a rougher-scavenger feed of P_{80} of 75 µm was determined optimal for subsequent column flotation testing for MET-42 and MET-44. A copper recovery of nearly 95% was achieved during treatment of a P_{80} of 75 µm of MET-42 and MET-44 samples.

Figure 13-4: ME-42 Rougher-Scavenger Copper Recovery vs Feed Grinding Time with Mechanical Cells



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

Figure 13-5: ME-44 Rougher-Scavenger Copper Recovery vs Feed Grinding Time with Mechanical Cells



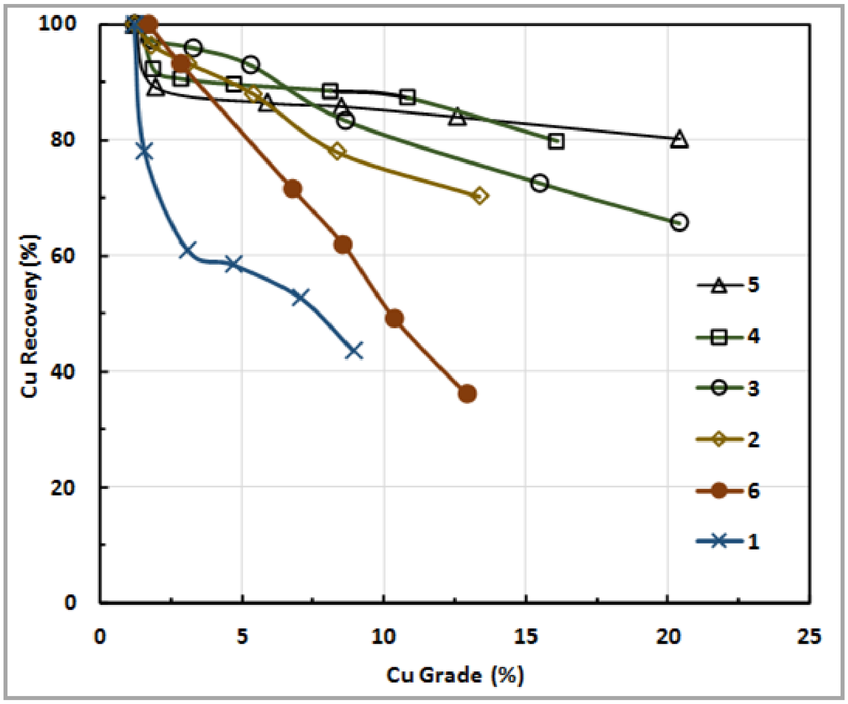
Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

13.3.6 Cleaner Benchtop Mechanical Flotation Testing

Benchtop mechanical cell cleaner flotation results for MET-42 are shown below from Figure 13-6 to Figure 13-16, while Figure 13-9 and Figure 13-10 depict the results for MET 44. Cleaner flotation tests were performed on feed P_{80} particle sizes decreasing from 23 µm to 13.8 µm for MET 42, and from 15.2 µm to 12.4 µm for MET-44.

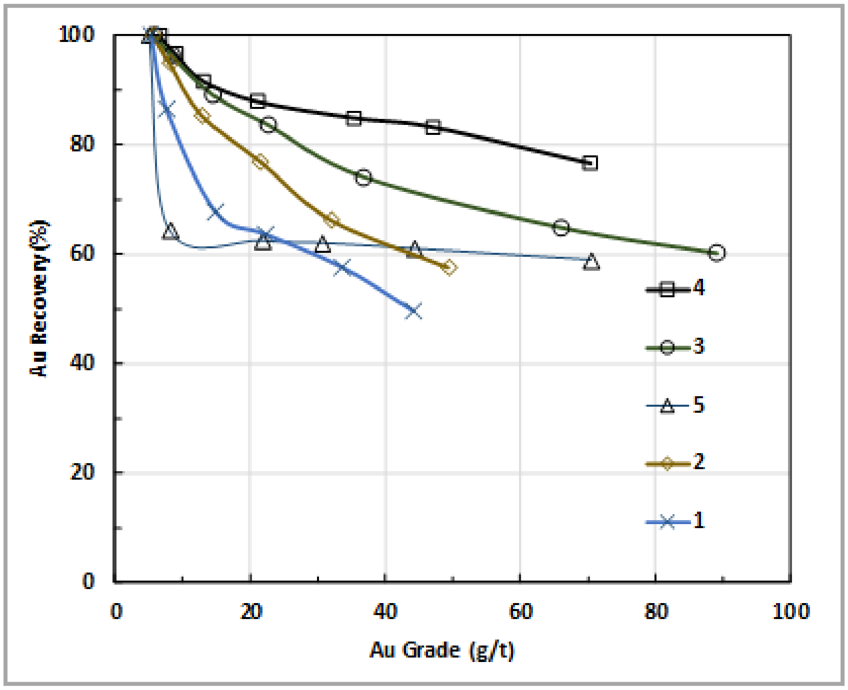
It can be seen the copper and gold grades and recoveries increased with decreasing the cleaner feed P_{80} from 23 µm to 17 µm and 13.8 µm for MET-42 in Figure 13-6 and Figure 13-7. Optimal cleaner feed P_{80} particle size for cleaner column flotation was determined as 13.8 µm and 13.0 µm for MET-42 and MET-44, respectively, to achieve high copper and gold flotation recoveries.

Figure 13-6: MET42 Mechanical Cell Cleaner Copper Grade vs. Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

Figure 13-7: MET-42 Mechanical Cell Cleaner Gold Grade vs. Recovery

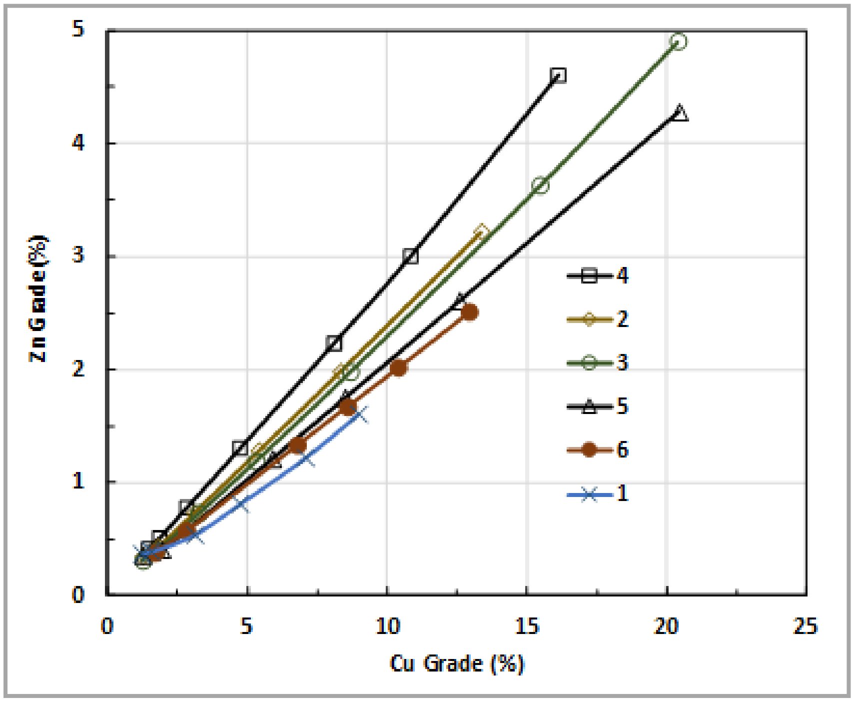


Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

Flotation performance using sodium carbonate only was not as good as when lime was used and can be concluded that depression of pyrite using sodium carbonate is not as efficient as lime. Zinc sulfate was used to depress zinc minerals in a couple of flotation tests.

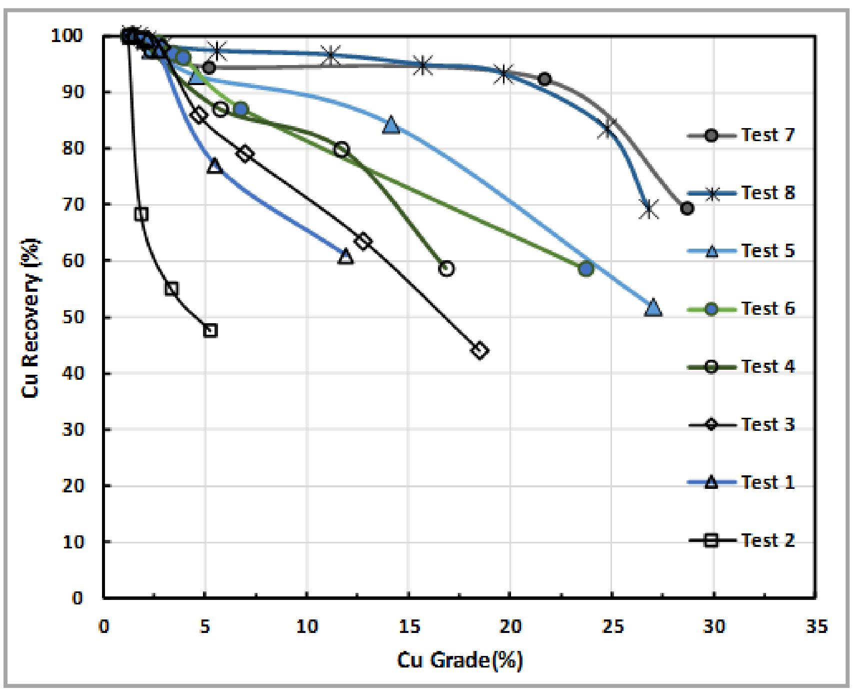
Figure 13-8 shows that for MET-42, zinc sulfate may slightly decrease Zn content in the concentrate and depress gold mineral flotation at the same time, while the zinc sulfate showed higher Zn depression efficiency on MET-44 (Figure 13-10). This could be due to differences in mineralogical characteristics between MET-42 and MET-44, such as presence of unique secondary copper mineral (i.e. bornite, covellite and digenite) or the occurrence of silver, arsenic or other ions, which come from sulfosalts and could activate sphalerite. It is possible the depressed zinc minerals contain gold.

Figure 13-8: MET-42 Mechanical Cell Cleaner Concentrate Cu Grade and Zn Content



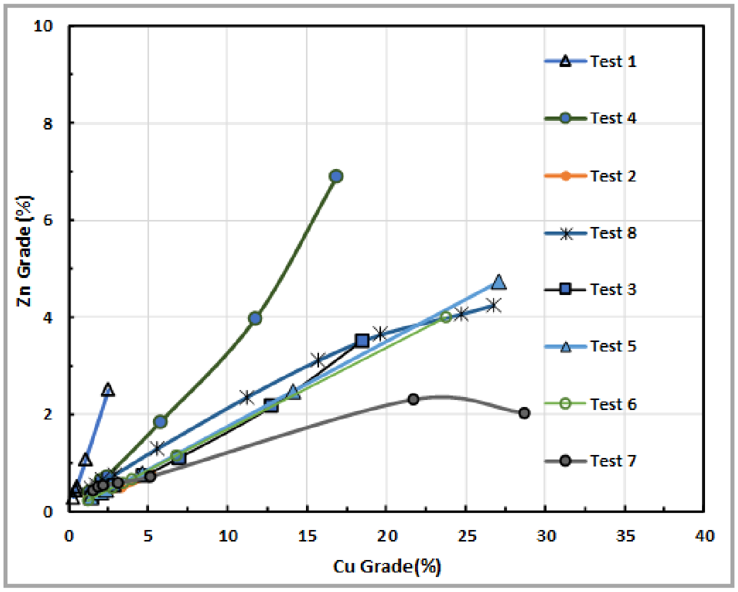
Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

Figure 13-9: MET-44 Mechanical Cell Cleaner Copper Grade vs. Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

Figure 13-10: MET-44 Mechanical Cell Cleaner Zn Grade and Cu Relationships



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

13.3.7 Column Flotation

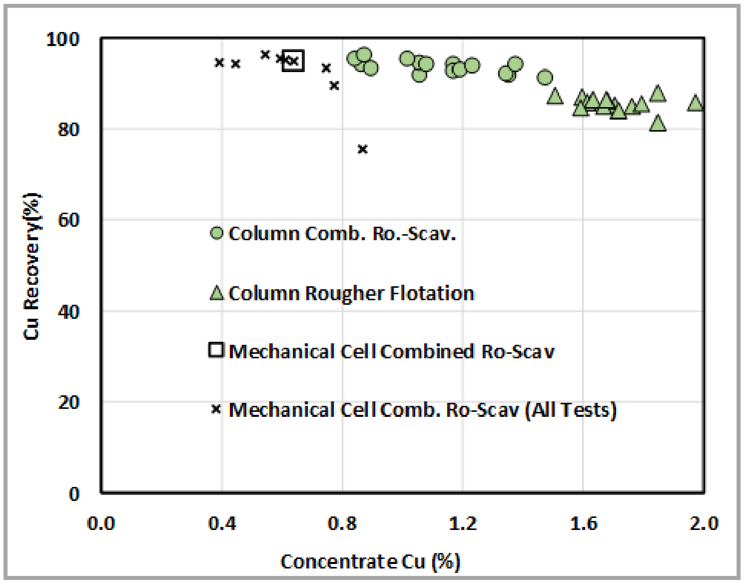
Following the completion of bench-top flotation studies and the optimization of rougher and scavenger operating parameters, including feed particle size distribution, feed rate, reagent addition, air rate, wash water rate, and froth interface level, prepared samples of MET-42 and MET-44 were treated using the Eriez pilot column cells under steady-state conditions to generate a bulk cleaner circuit feed material. Three stages of cleaning for MET-42 and MET-44 were carried out on the rougher-scavenger bulk concentrates. In terms of conditioning time, it was found that from 4 to 12 minutes there was no significant effect on flotation performance.

13.3.8 Rougher and Scavenger Column Flotation

The rougher-scavenger column flotation tests on MET-42 and MET-44 samples were performed separately. As determined by mechanical flotation results, a rougher-scavenger of P_{80} of 75 µm for MET-42 and MET-44 was deemed optimal.

For Colnic MET-42, Cytec 3418A and Potassium Amyl Xanthate (PAX) collector dosages were varied between 9.5 to 13.7 g/t and 6.5 to 10.5 g/t, respectively during the rougher-scavenger column flotation tests. The overall copper and gold recoveries of 16 rougher-scavenger column flotation tests were 93.5% and 84.0%, respectively for Colnic MET-42 sample. Figure 13-11 shows the MET-42 rougher and scavenger flotation concentrate copper grade and recovery relationship. For comparison purpose, MET-42 mechanical cell rougher and scavenger flotation data are also presented in the same figure. When comparing the corresponding benchtop mechanical cell flotation results with these column flotation results, the copper grade and mass recovery are significantly improved using column flotation with wash water addition.

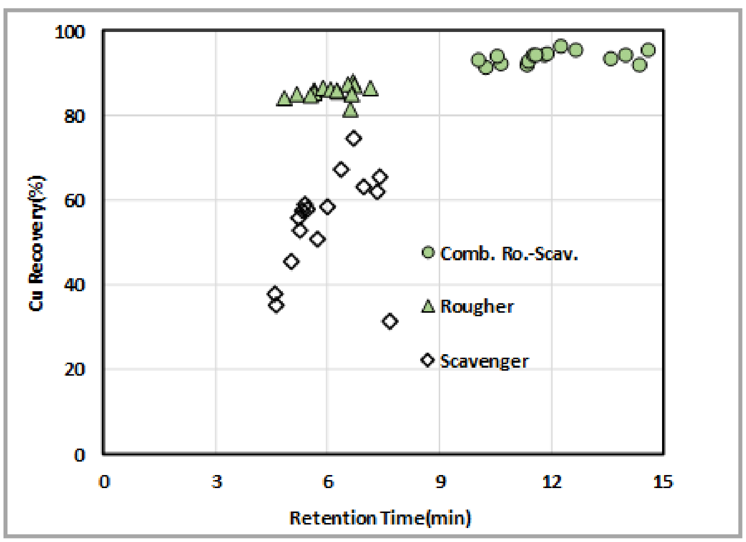
Figure 13-11: MET-42 Column Cell Rougher-Scavenger Cu Grade-Recovery Relationships



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

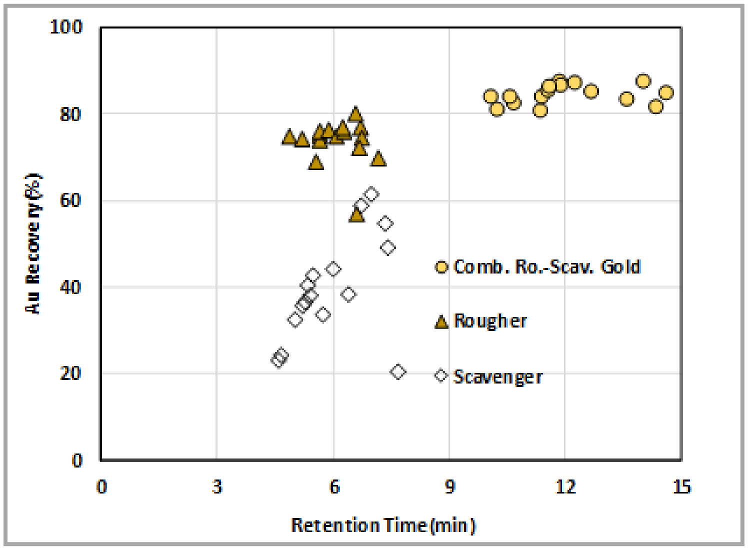
Figure 13-12 and Figure 13-13 show the effects of column flotation retention time on the flotation recoveries of copper and gold, respectively for Colnic MET-42. These figures show an increase in scavenger flotation retention time from 4 to 8 minutes had a significant effect on the scavenger flotation recovery. The total rougher-scavenger flotation retention time was approximately 14 minutes.

Figure 13-12: MET-42 Column Cell Rougher-Scavenger Cu Recovery vs. Flotation Time



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

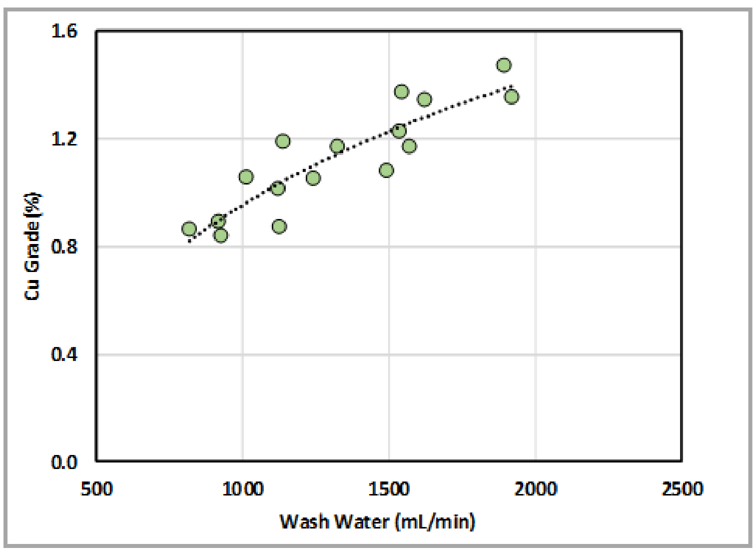
Figure 13-13: MET-42 Column Cell Rougher-Scavenger Au Recovery vs. Flotation Time



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

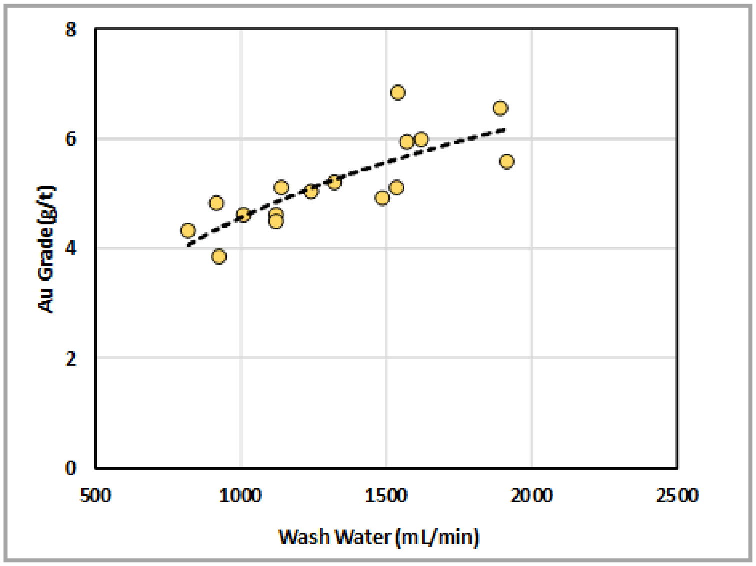
As shown in Figure 13-14 and Figure 13-15, the combined rougher-scavenger concentrate copper and gold grades were increased using 820-1800 ml/min wash water from 0.8% to 1.5 % and 3.8 g/t to 6.6 g/t, respectively. This is a result of reduced entrainment of silicate and slime within the froth zone.

Figure 13-14: MET-42 Column Cell Rougher-Scavenger Concentrate Cu Grade vs. Wash Water



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

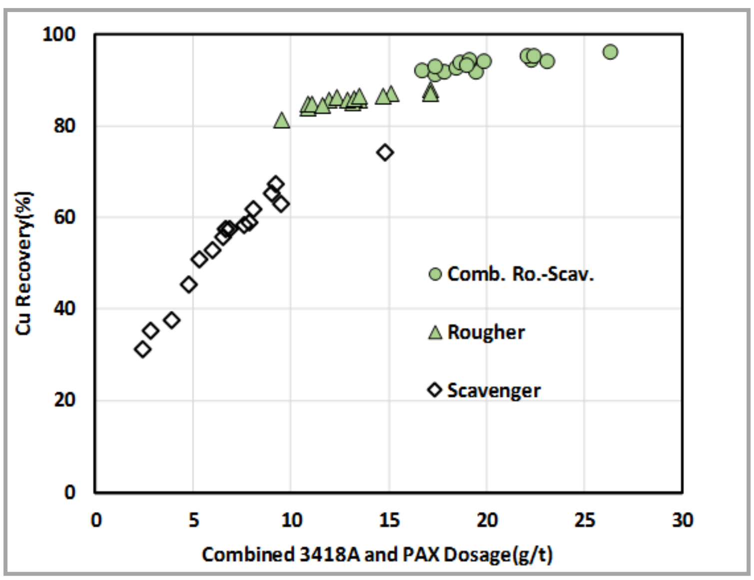
Figure 13-15: MET-42 Column Cell Rougher-Scavenger Concentrate Au Grade vs. Wash Water



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

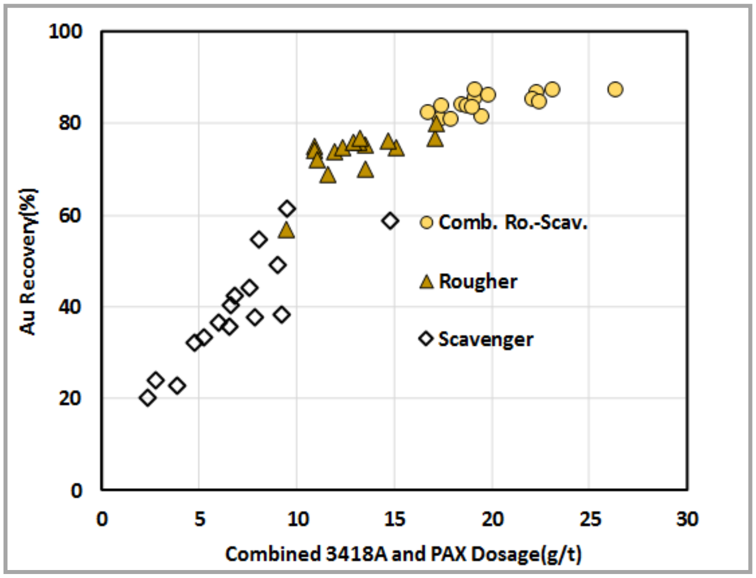
In addition, it was found both copper and gold flotation recoveries increase with increasing rougher flotation combined Solvay (Cytec) 3418A and PAX collector dosages ranging from 9.5 to 17.1 g/t and scavenger flotation collector dosages ranging from 2.4 to 14.8 g/t. To maximize copper and gold flotation recoveries, the overall required rougher-scavenger flotation collector dosage was approximately 23.5 g/t (12.5 g/t Solvay 3418A and 11 g/t PAX). These results are demonstrated in Figure 13-16 and Figure 13-17.

Figure 13-16: MET-42 Column Cell Effect of Combined 3418A & PAX Dosage on Cu Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

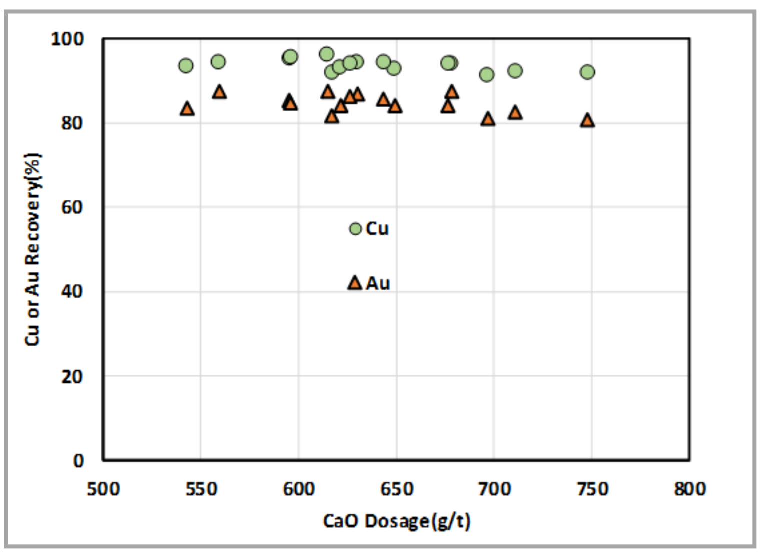
Figure 13-17: MET 42 Column Cell Effect of Combined 3418A & PAX Dosage on Au Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

The highest rougher-scavenger column flotation copper and gold recoveries were 96.1% and 87.2%, respectively, for Colnic MET-42 in the 16 column flotation tests. In terms of lime dosage, an increase from 500 to 650 g/t showed no significant effect on copper and gold flotation recovery. However, higher lime dosages (to 750 g/t) showed a slight decrease in the gold flotation recovery. Figure 13-18 illustrates the effect of the CaO dosage in the copper and gold recovery.

Figure 13-18: MET 42 Column Cell Effect of CaO dosage on Cu and Au Recovery

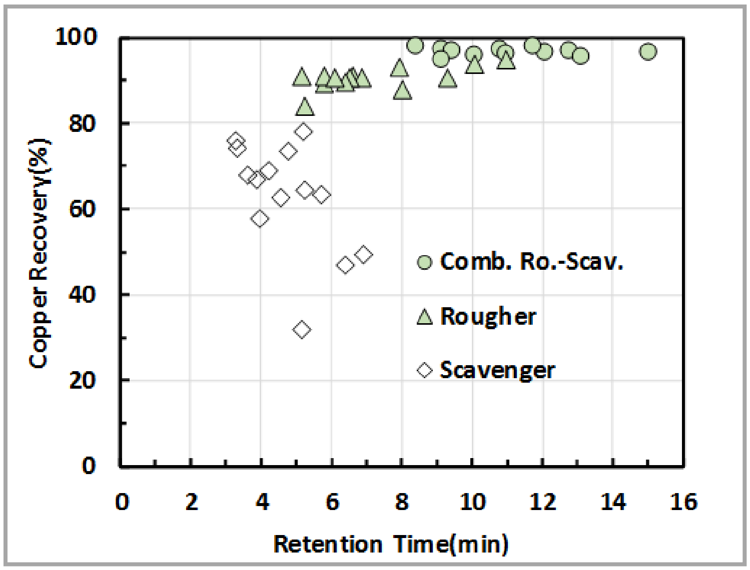


Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

For Colnic MET-44, the rougher-scavenger column flotation testing was carried out similarly to that performed on Colnic MET-42. Interestingly, a flotation feed P_{80} of 75 µm was also found optimal during bench-scale flotation testing. Cytec 3418A and Potassium Amyl Xanthate (PAX) collector dosages were varied between 4.3 to 16.8 g/t and 3.3 to 14.4 g/t, respectively during the rougher-scavenger column flotation tests.

Figure 13-19 depicts the effect of flotation retention time on rougher, scavenger, and combined rougher-scavenger flotation copper recoveries for the column circuit. The most significant effect of flotation retention time on copper recovery was observed within the rougher flotation stage. Flotation residence times of nearly 11 and 15 minutes were found optimal for rougher and combined rougher-scavenger flotation, respectively.

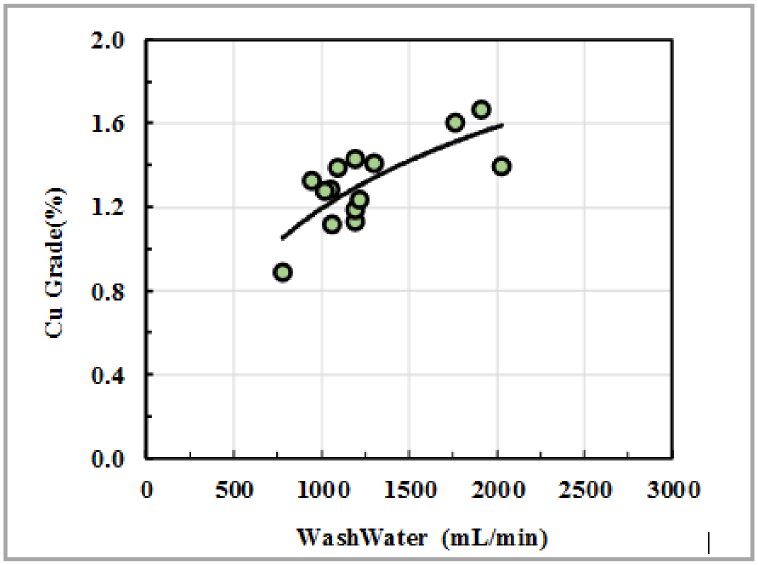
Figure 13-19: MET-44 Column Cel Rougher-Scavenger Flotation Cu Recovery vs. Retention Time



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

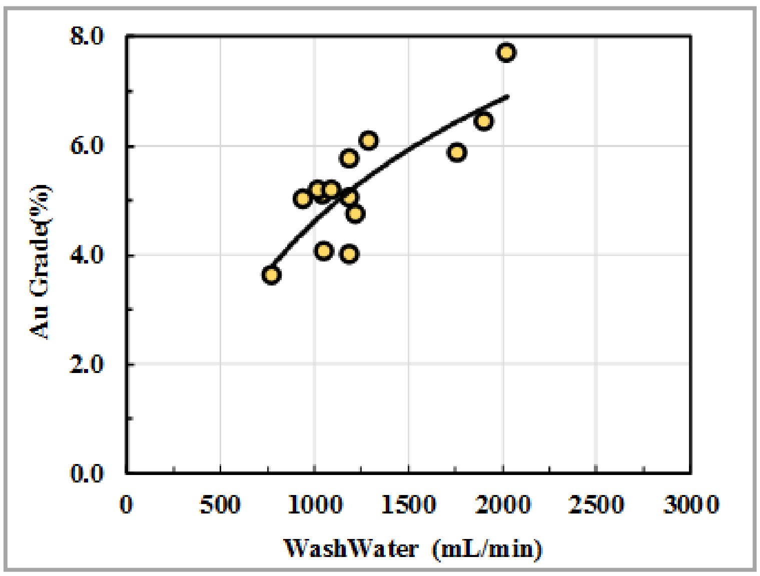
From Figure 13-20 and Figure 13-21, it can be concluded increased wash water meaningfully improved column rougher-scavenger concentrate copper and gold grades, respectively for Colnic MET-44 samples. Copper and gold concentrations increased from 0.8 to 1.6% and 4.0 to 7.5 g/t, respectively using wash water rates ranging from 600 to 2000 mL/min.

Figure 13-20: MET-44 Column Cell Rougher-Scavenger Flotation Cu Grade vs. Wash Water Rate



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

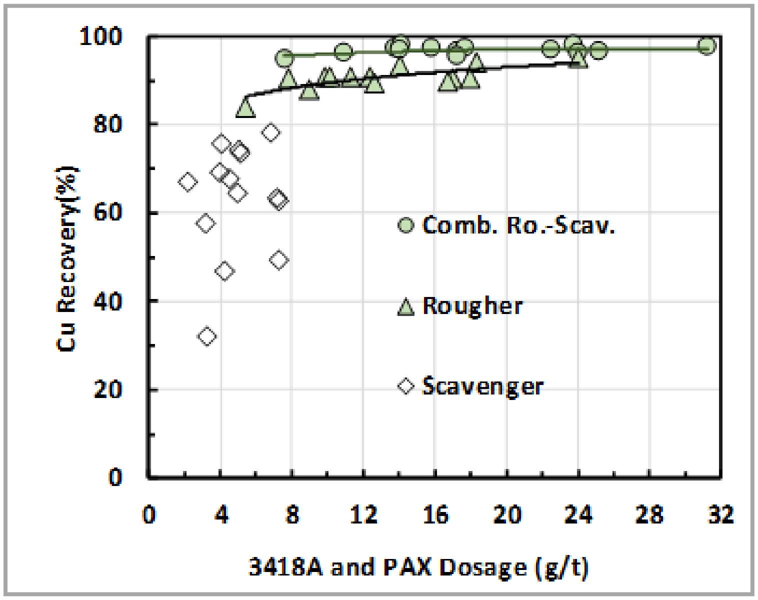
Figure 13-21: MET-44 Column Cell Rougher-Scavenger Flotation Au Grade vs. Wash Water Rate



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

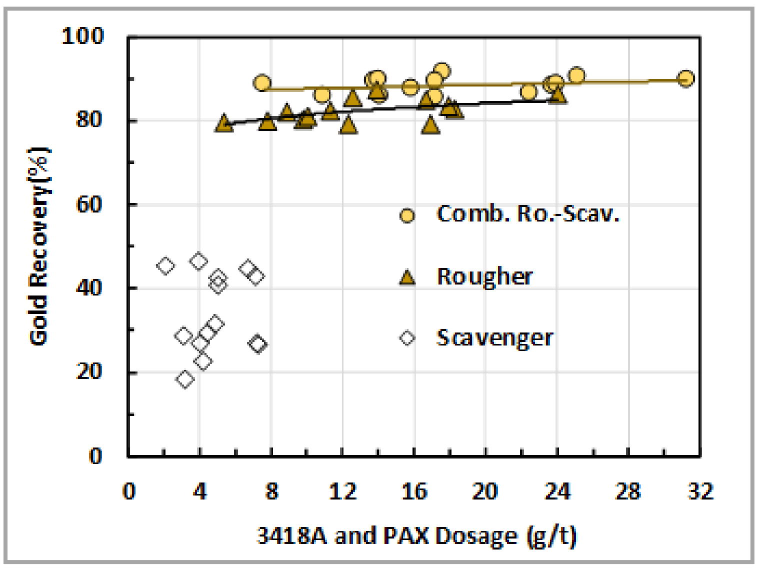
The effect of the combined Solvay (Cytec) 3418A and PAX collector dosages on copper and gold flotation recoveries respectively, is illustrated in Figure 13-22 and Figure 13-23. Upon increasing the combined 3418A and PAX collector dosage from 5.4 to 24 g/t, rougher flotation recoveries of copper and gold were slightly increased. The increase of the combined 3418A and PAX collector dosage from 2.2 to 7.2 g/t had a significant effect on the scavenger copper flotation recovery, but not on the overall rougher-scavenger flotation recovery. This might be explained by the flotation occurrence of the majority of copper in the rougher flotation stage.

Figure 13-22: MET-44 Column Cell Effect of Combined 3418A & PAX Dosage on Cu Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

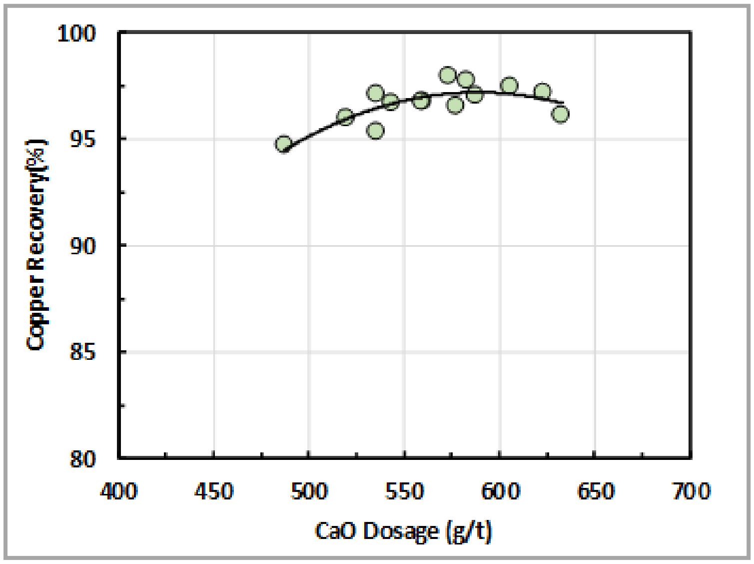
Figure 13-23: MET-44 Column Cell Effect of Combined 3418A & PAX Dosage on Au Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

Rougher-scavenger column flotation copper and gold recoveries were 96.6% and 88.5%, respectively, for Colnic MET-44. In terms of lime dosage, the combined column rougher-scavenger copper flotation recovery increased with increase in CaO dosage from 480 g/t to approximately 580 g/t. This could be due to the characteristics of the lime working as a frother modifier and improving froth stability. Lime can form more soluble ions (i.e. Cu_{2+}, Fe_{2+}) to be precipitated, and thus improve collector adsorption and increase copper flotation recovery. The solution pH was in the range of 9.5 to 10. Figure 13-24 shows the effect of the lime addition.

Figure 13-24: MET 44 Column Cell Effect of CaO Dosage on Cu Recovery



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

13.3.9 Cleaner Column Flotation

Following column rougher-scavenger flotation, MET-42 and MET-44 concentrates were reground to a P_{80} of 13.5-13.8 µm to improve liberation of gold from pyrite and decrease gold recovery losses. Finally, three stage column cleaner flotation tests were performed on MET-42 and MET-44 samples.

For Colnic MET-42, a rougher-scavenger-cleaner circuit copper recovery of 84% at a grade of 20-22% Cu and gold recovery of 75% at a grade of over 100 g/t were achieved.

In the case of Colnic MET-44, a rougher-scavenger copper recovery of 97.2% at a grade of 1.4% Cu and gold recovery of 91.4% at a grade of 7.7 g/t were reached. A cleaner circuit improved the copper recovery to 94.8-97.1% at a grade of 21.1-22.4% Cu and gold recovery of 94.8-97.1% at a grade of over 79-83 g/t.

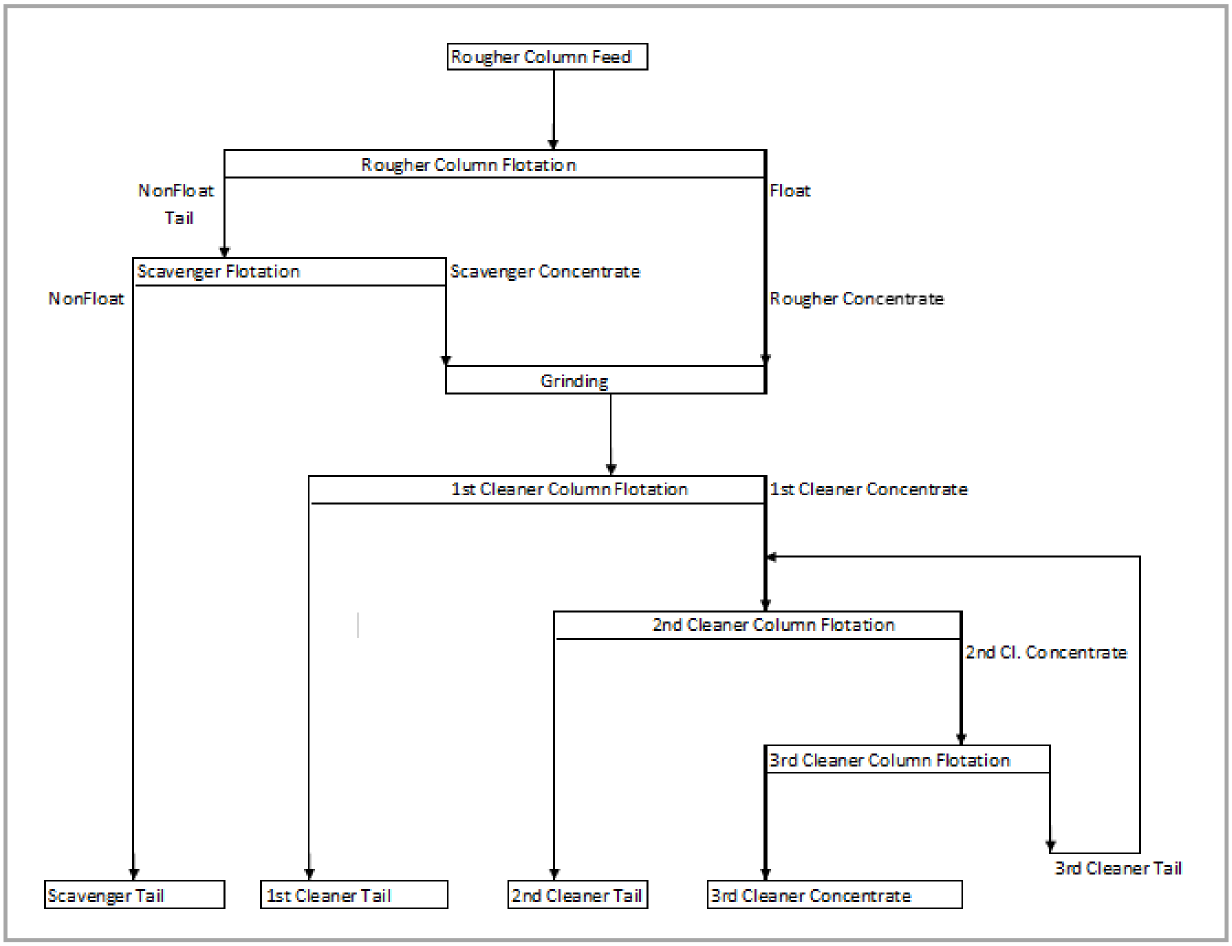
From the Eriez column flotation testwork, it can be concluded that:

- Laboratory pilot plant column flotation results showed column flotation technology can be advantageously used for gold and copper flotation of Colnic MET-42, and Colnic MET-44 samples.
- Column flotation, with use of wash water, provided greater results compared to conventional mechanical flotation.
- For Colnic MET-42, an overall copper recovery of 93.5% and overall gold recovery of 84% were achieved in bulk rougher-scavenger column flotation. However, the combined rougher-scavenger and cleaner circuit copper and gold flotation recoveries were approximately 82.8% at a copper grade of 22.2%, and 77.6% at a gold grade of 109 g/t, respectively. The average zinc grade in the final concentrate was 4.2%.
- For Colnic MET-44, rougher-scavenger column flotation copper and gold recoveries were 96.6% and 88.5%, respectively. The average rougher-scavenger and cleaner circuit copper

recovery was 94.3% at the copper grade of 21.2%. The corresponding rougher-scavenger and cleaner circuit gold recovery was 85.5% at the final concentrate gold grade of 83 g/t. The zinc grade in the final concentrate averaged 1.6%.

- Based on the flotation results, the flowsheet shown in Figure 13-25 was the recommended flowsheet for treatment of the Colnic MET-42 and the Colnic MET-44 samples.
- Recirculation of the first cleaner tailings to the rougher flotation circuit could be beneficial upon industrial scale up. On the contrary, the second cleaner tailings contain a high pyrite content and recirculation of it is not recommended.

Figure 13-25: Recommended Rougher-Scavenger and Cleaner Column Flotation Flowsheet



Reference: Flotation Pilot Plant Report, Eriez – Nov 2018

13.4 Sample Selection

13.4.1 Colnic MET-42

The following figures show the sample selection maps for Colnic MET-42.

Figure 13-27: Colnic Porphyry: K1-alteration Domain in Colnic Valley: Plan View (MET-42 in yellow)

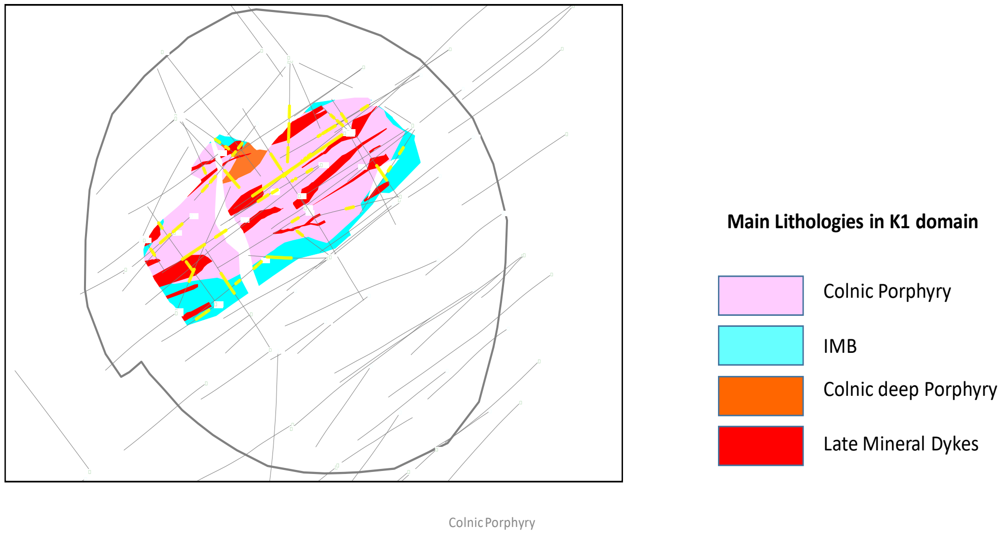


Figure 13-28: K1-alteration Domain in Colnic Valley: Cross Section @ 150° looking NW (MET-42 in yellow)

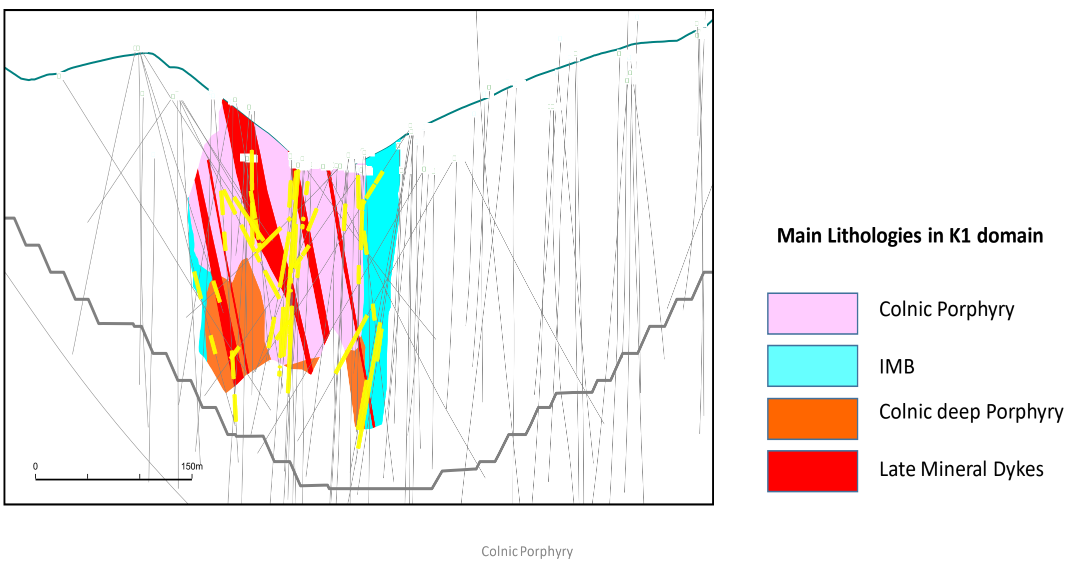
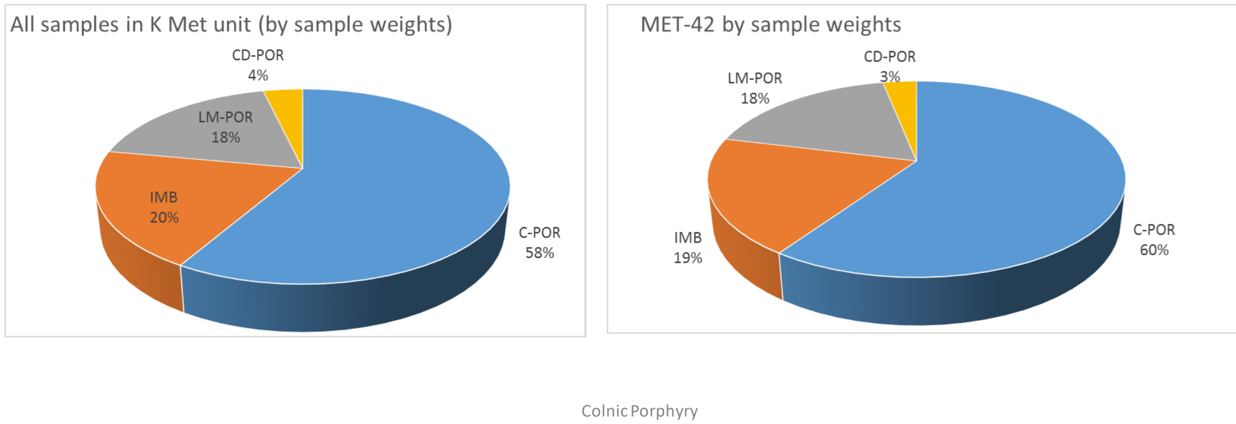


Figure 13-29: Matching Lithology (percentage of each litho in-situ represented)



13.4.2 Colnic MET-44

The following figures show the sample selection maps for Colnic MET-44.

Figure 13-30: Colnic Porphyry: K2-K3-alteration Domain in Colnic Hill: Plan View (MET-44 in black)

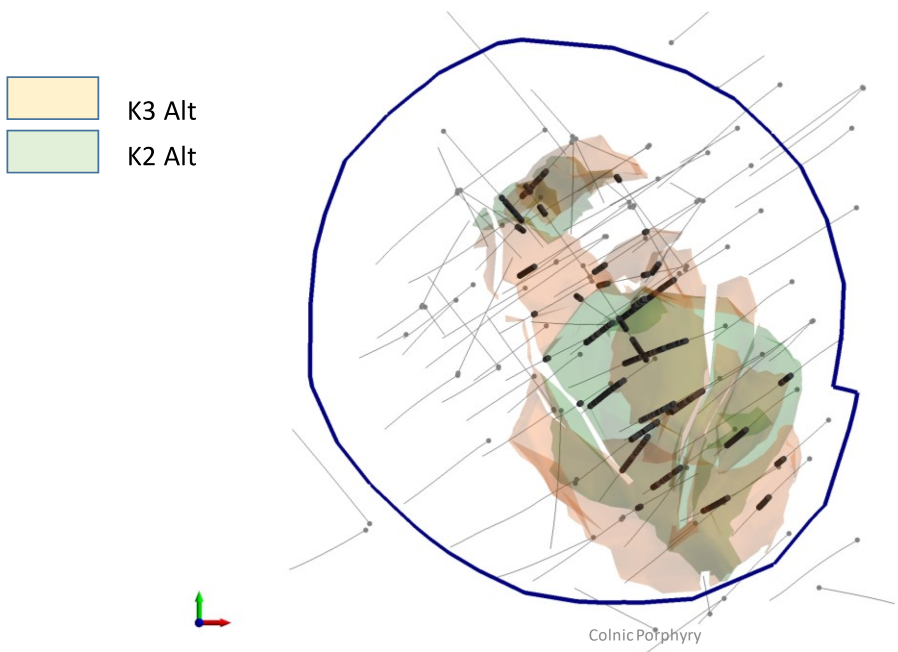


Figure 13-31: K2-K3-alteration Domain in Colnic Valley: Cross Section @ 150° Looking NW (MET-44 in black)

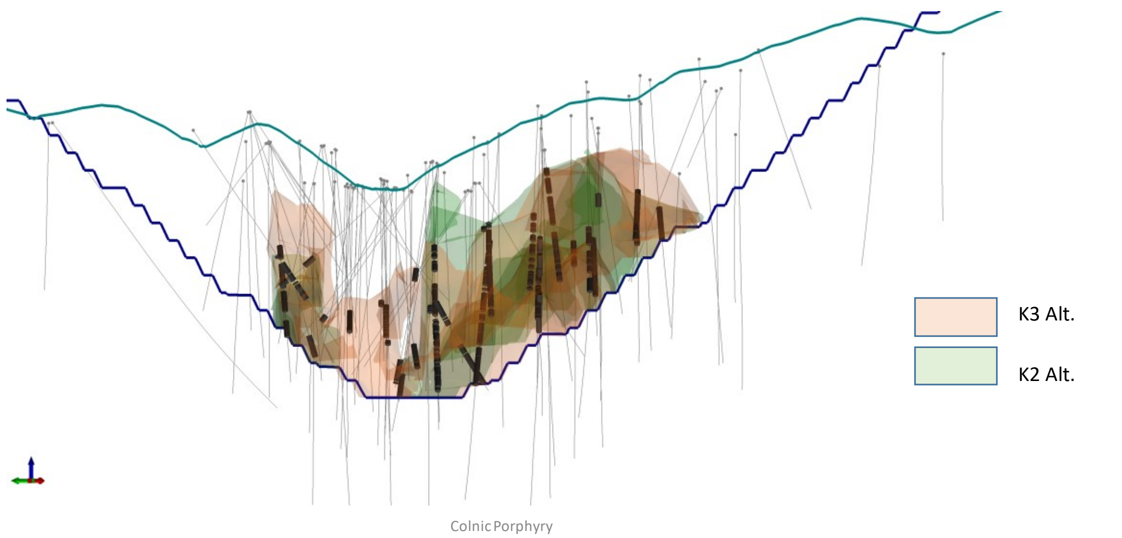
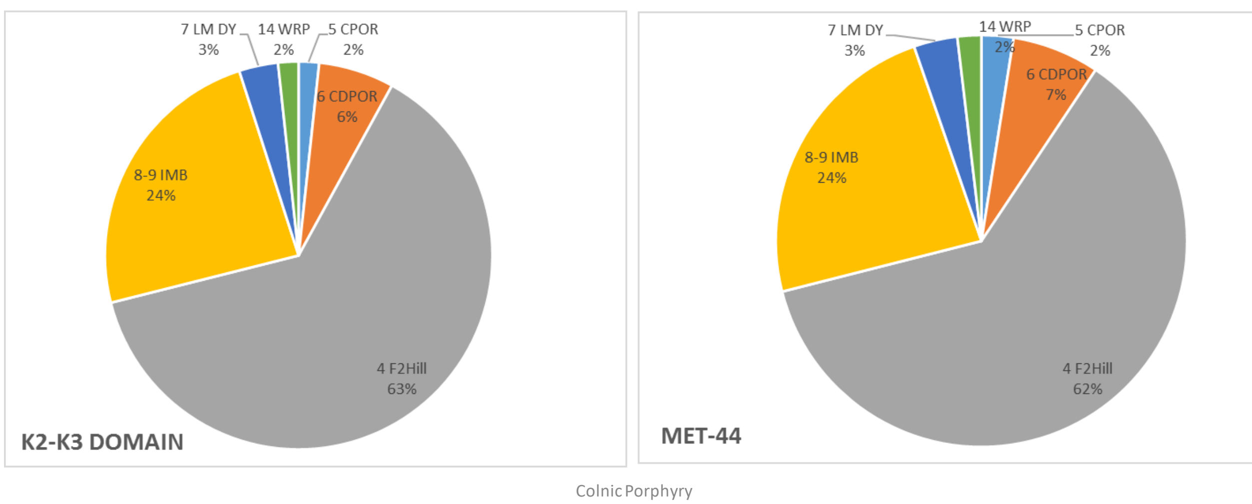


Figure 13-32: Matching Lithology (percentage of each litho in-situ represented)



13.5 Recommendations for Future Testwork

13.5.1 Flotation Configuration

Comprehensive testwork programs have been carried out on Colnic samples over the years with variable results; however, further flotation testwork is recommended in order to confirm and validate the process flowsheet and equipment sizing, while minimizing capital and operational costs. Also, there is an opportunity to improve copper and gold recovery predictions applied to the economic model in the presence of additional testwork. These future investigations should cover the following:

- An investigation of the mineralogical characteristics of high Zn content and the corresponding flotation reagent schemes, to effectively depress Zn without decreasing gold recovery. Rougher-scavenger and cleaner column flotation tests are recommended for higher zinc content material.
- Comminution testwork needs to be carried out for the next phase to gather sufficient information for optimization of the grinding circuit.
- Variability testwork to investigate the impact of head grade, rock type and redox.

13.5.2 Flotation Concentrate Filtration

No formal laboratory and pilot solid-liquid separation investigations on flotation concentrate filtration were undertaken under the scope of this PEA and benchmarks from vendors were used. It is recommended to undertake filtration laboratory/pilot tests on flotation concentrate generated from Colnic samples. Testwork should be related mainly to the rheological characterization and the filterability of the material, as functions of the sample characteristics, elemental analysis, and particle size distribution.

13.5.3 Thickened Flotation Tailings Filtration

For the PEA, no solid-liquid separation testwork on flotation tailings using Colnic samples were undertaken. However, the application of the ceramic disc-vacuum filters technology for copper thickened flotation tailings appears to be a suitable option as benchmarked vendor information was used for the PEA.

Laboratory/pilot plant investigations are recommended during the next study phase to support the appropriate filtration technology and include the following:

- mineralogical composition
- particle size distribution
- physical and rheological characteristics (slurries)
- filterability, including filter cake thickness, filtration rate, cake moisture content, wash efficiency
- tailings settling, dewatering and consolidation testing

Finally, this testwork should include considerations of optimization and variability of upstream process conditions.

14 MINERAL RESOURCE ESTIMATES

AGP completed mineral resource estimates for Euro Sun's Rovina-Apuseni porphyry gold copper property. The three deposits are located in the Golden Quadrilateral of the Apuseni Mountains in Western Romania, approximately centered at latitude 46°07' N and longitude 22° 54' E, 140 km east-northeast of the city of Timisoara. The closest settlement is the village of Criscior, located less than 10 km from the deposits.

Gemcom software GEMS 6.3.1™ was used for the resource estimate, in conjunction with Sage 2001 for the variography. The metals of interest at Rovina Valley are copper and gold. Minor amounts of zinc and molybdenum are also present. The gold and copper resources for all three deposits were estimated by Pierre Desautels P. Geo., who is the QP for the purposes of this report. Zinc, while not reported as a resource, was nevertheless estimated in the model due to a smelter penalty associated with a high zinc tenor in the concentrate.

Euro Sun provided the digital data files as a series of XLS spreadsheets, in stages as drilling progressed. Ciresata data was provided on December 12, 2011, Colnic data was provided on February 15, 2012, and Rovina data was provided on May 31, 2012. The digital data files consisted of drill hole collar, survey, lithology, alteration, and assay tables, along with 3D triangulations representing the latest interpretation for the lithological and alteration units. Topographical and overburden bottom surfaces were also provided.

As shown in Table 17-1, the effective data cut-off date for the resource estimation is May 31, 2012. At that time, the provided database consisted of 82 drill holes on the Rovina deposit, 106 holes on the Colnic porphyry, and 63 holes on the Ciresata porphyry. On the Rovina porphyry, three holes (RRD-12, -19 and -47) were abandoned due to ground conditions and re-drilled with a new number by Euro Sun. An additional 16 drill holes were added after the data cut-off date in 2012. Three holes at Rovina, three holes at Colnic, and ten holes at Ciresata. Historical holes drilled by Minexfor were not used in the estimate. Table 14-1 summarizes the number of holes from each deposit used in the resource estimate. A listing of all holes in the database can be found in Appendix A.

The three deposits in the RVP were divided into several lithological units superimposed in various alteration phases.

Table 14-1: Total Number of Holes Used

	No. of Holes	No. Unused Holes in Resource	Total Core Length	No. of Assays	Core Length per Assay	Last Holes in Database
Rovina	82	3 (re-drilled)	39,133	37,888	1.03	RRD-83
Colnic	106	0	33,994	32,789	1.04	RCD-104
Ciresata	63	0	47,129	43,079	1.09	RGD-63
Total	**251**	**3**	**120,256**	**113,756**	**1.06**	
Holes Added After the Data Cut-off Date						
Rovina	3	3	1,133	1,034	1.09	RRD-85

14.1 Geological Interpretation

For all deposits, a series of 3D wireframe models were provided by Euro Sun, each consisting of a detailed lithology model and a separate alteration model based on the dominant alteration logged in the drill core. The alteration is typically complex, with more than one overprinting alteration type present. Where a number of alteration phases coexist, the dominant alteration type was assigned a logging code based on mineralogy and intensity; these were then grouped into units from which the alteration model was created.

In 2008, Euro Sun geologists first modelled the deposit on a series of cross-sections, followed by a series of longitudinal sections and plans. The lithological and alteration boundaries were adjusted to coincide in all three orientations. The paper sections and plans were then digitized and tied together and wireframed in 3D on the computer. In 2012, these models were updated directly in the Micromine™ software. The complete list of the lithology and alteration wireframe components is shown in Table 14-2.

Table 14-2: Lithology and Alteration Wireframe Name

Rovina Lithology	Name	Rovina Alteration	Name
Glamm Breccia	GLAM	Oxidation (Fe-Ox)	OXIDE
Porphyry E (Potassic-Silicic Porphyry)	PoE	Propylitic Alteration within Glamm Breccia	GLAM-POT
Porphyry D (Baroc Valley Porphyry)	PoD	Phyllic Alteration (Ser-Py-Qtz)	PHYLLIC
Porphyry C (Rovina Porphyry)	PoC	MACE Alteration (Mag-Qtz-Amph-Chl-Ep-Carb)	MACE
Porphyry B (Late Mineral Porphyry)	PoB	Potassic Alteration (Bio-Kspar)	POT
Porphyry A (North West Baroc Porphyry)	PoA	Silicification (Silica)	SILICIC
Intrusive Magmatic Breccia	IMB	Potassic-Silicic Alteration (Bio-Kspar-Sil+/-Po)	KSIL
Flysch Sediment	SED		
Post Mineral Dyke (Late Intrusion)	LD		
Colnic Lithology	Name	Colnic Alteration	Name
Basement Sediment	SED	Oxidation (Fe-Ox)	OXIDE
Cornitel (Wallrock) Porphyry	WR_POR	K3 Alteration (Bio-Kspar, Qtz, Mag, diss. sulph.)	K3
Intrusive Magmatic Breccia	IMB	K2 Alteration (Chl-Ep, Carb, Mag, Py, Cpx)	K2
Colnic Porphyry and Breccia Package	C_POR	K Alteration (K2, K3, phyllic, and argillic mix)	K
Deep Coherent Colnic Porphyry Stock	CD_POR	Transitional Phyllic Alteration	TRPH
F2-Hill Porphyry and Breccia Package	F2_POR	Phyllic Alteration (Ser-Py-Qtz)	PHYLLIC
Late Mineral Dikes	LM_POR	Potassic-Argillic Alteration - Satellite breccia	K3_ARG
Garnet Bearing Porphyry	G_POR	Argillic Alteration - in Chubby fault	ARG
Satellite Porphyry and Breccia Package	S_POR	Propylitic Alteration - in LD dikes	PROP_D
	S_BX		
Post Mineral Porphyry Dykes and Plug	LD		
Chubby's Fault	FLT		
Ciresata Lithology	Name	Ciresata Alteration	Name
Early mineral porphyry	EM_P	Potassic Alteration (Bio-Kspar)	POT
Basement Sediment	SED	Phyllic Alteration (Ser-Py-Qtz)	PHYLLIC
Inter Mineral Porphyry	IM-P		

Rovina Lithology	Name	Rovina Alteration	Name
West Porphyry	WP		
Host Rock Porphyry	HR-P		
Late-Mineral Porphyry Dykes	LM_P		

The lithology and alteration solids are shown in Figure 14-1 through Figure 14-6. AGP validated the completed solids for interpretational consistency. The solids honour the drill hole data and interpreted geology. The solids were used to code the drill hole data prior to final domain definition. Identical colour profiles were assigned to the solids and drill hole data and the two datasets were visually inspected on sections and plans to ensure the proper assignment of domains to drill holes.

Figure 14-1: Rovina Lithology Domains

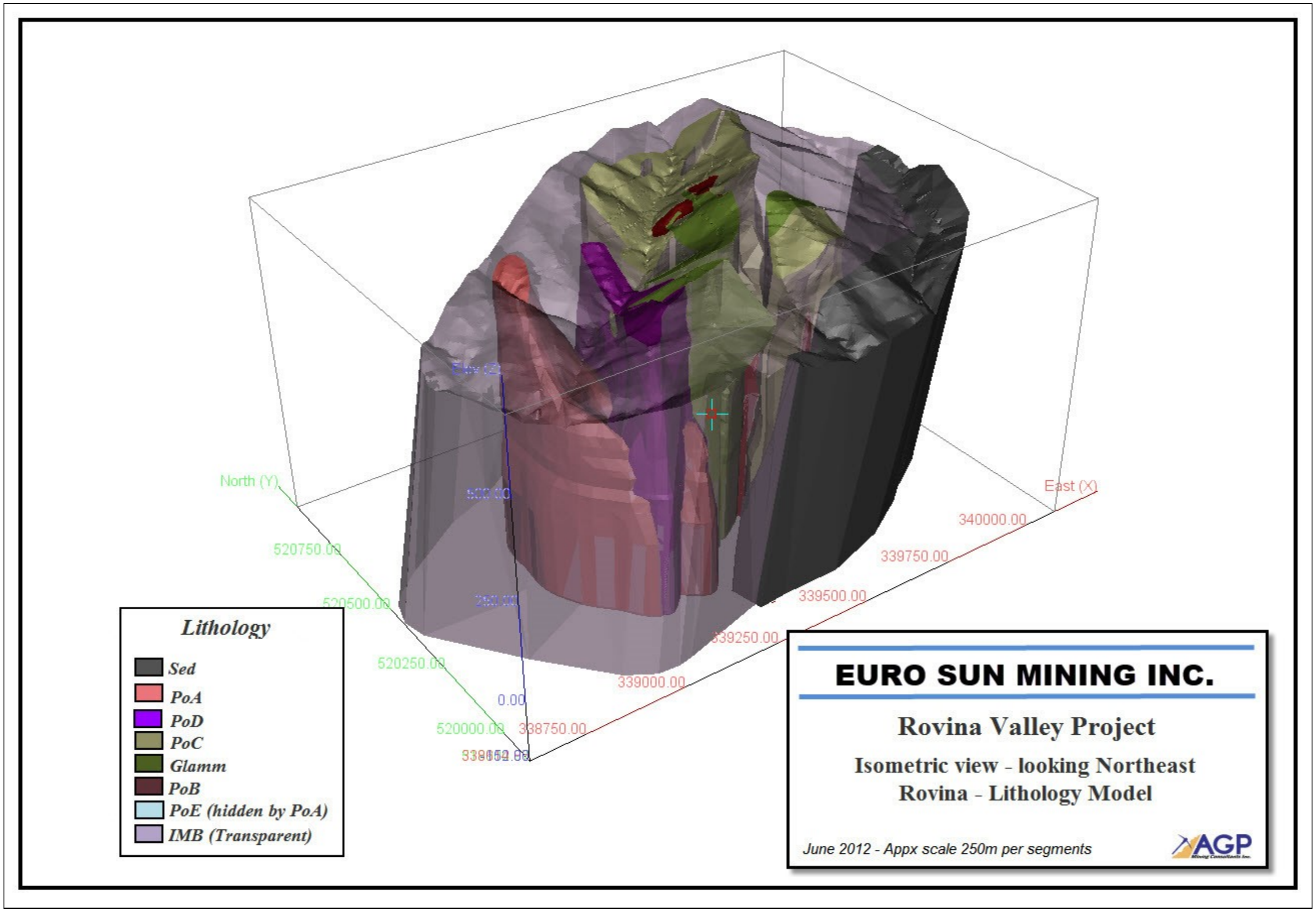


Figure 14-2: Rovina Alteration Domains

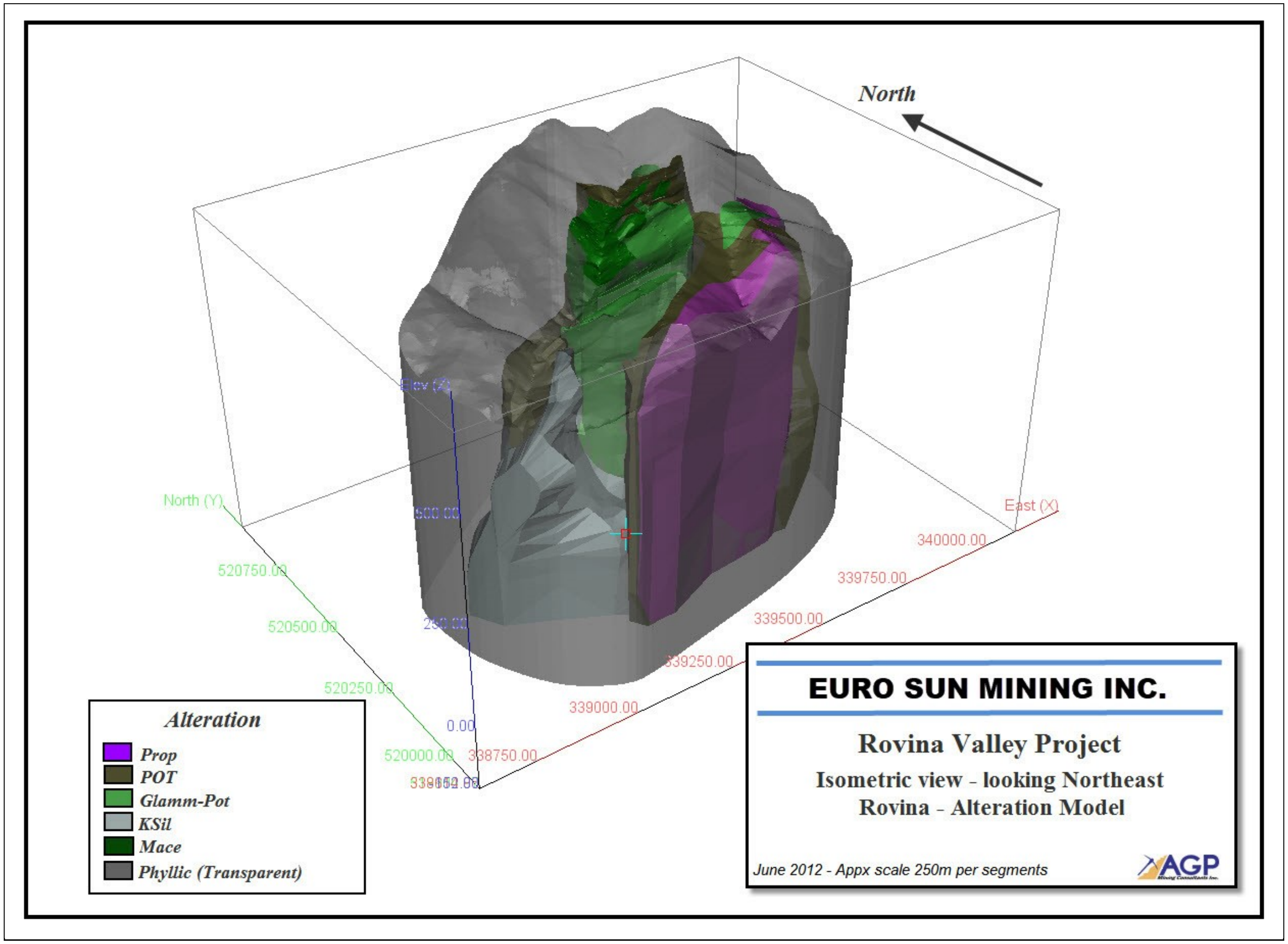


Figure 14-3: Colnic Lithology Domains

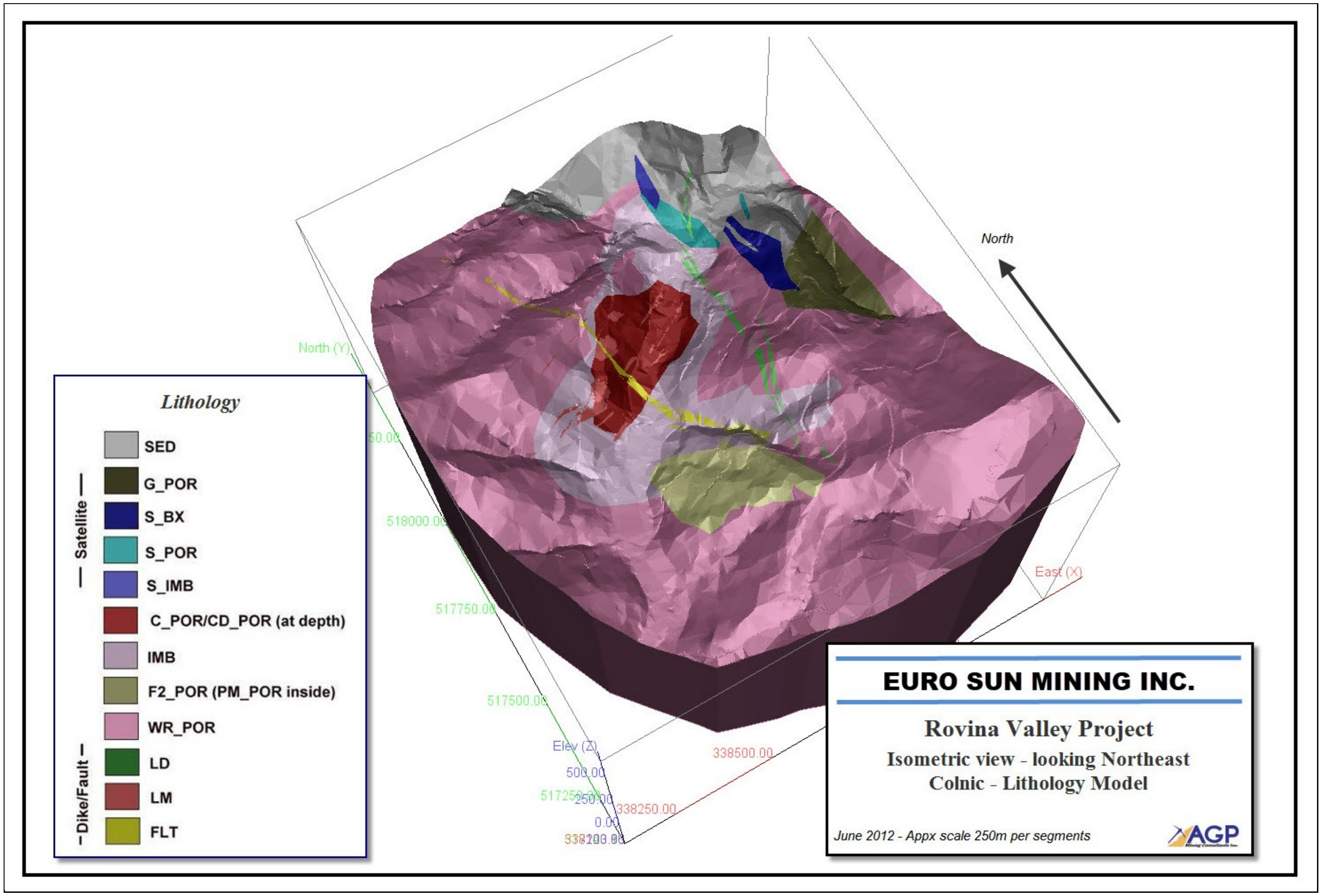


Figure 14-4: Colnic Alteration Domains

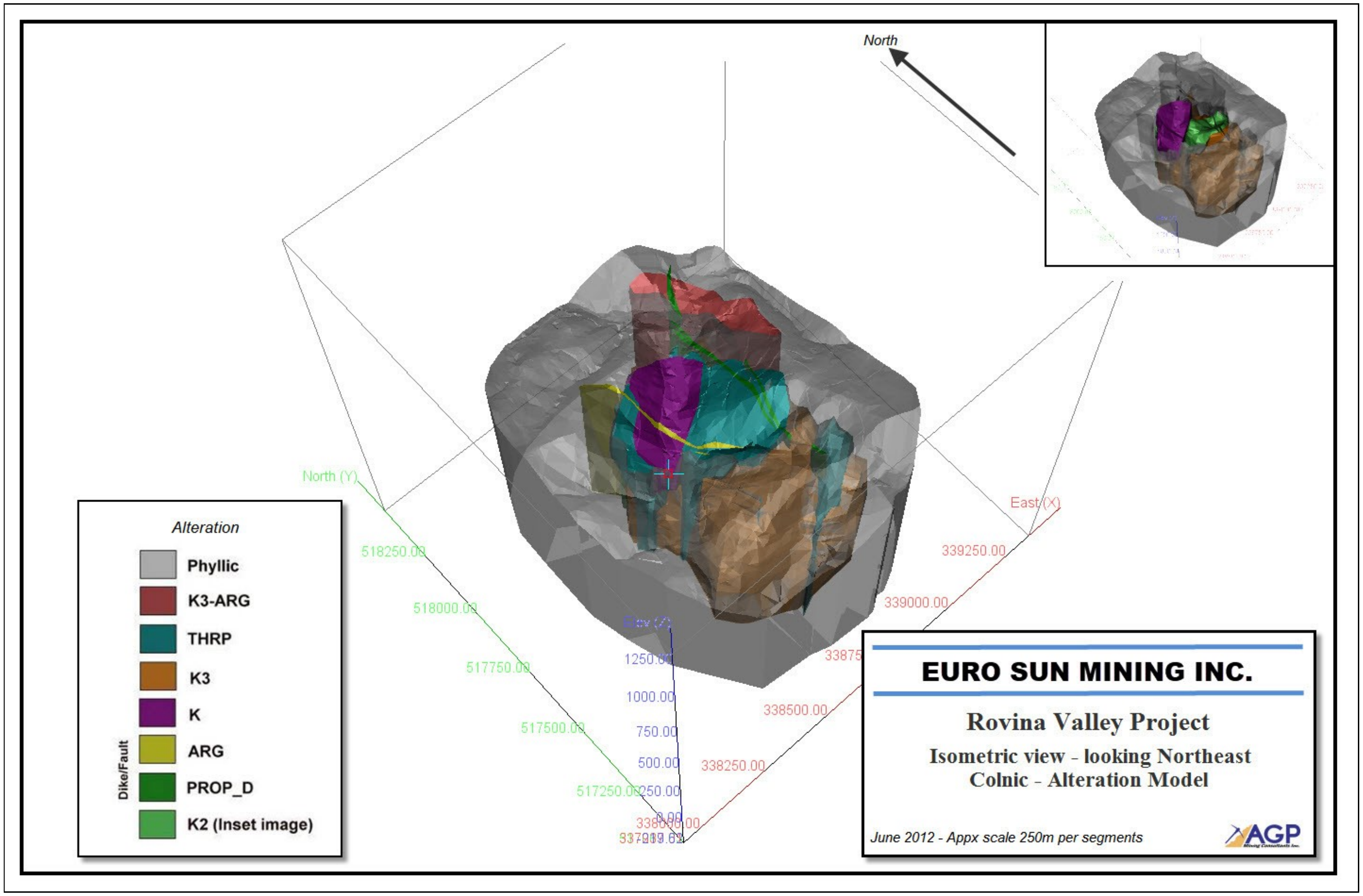


Figure 14-5: Ciresata Lithology Domains

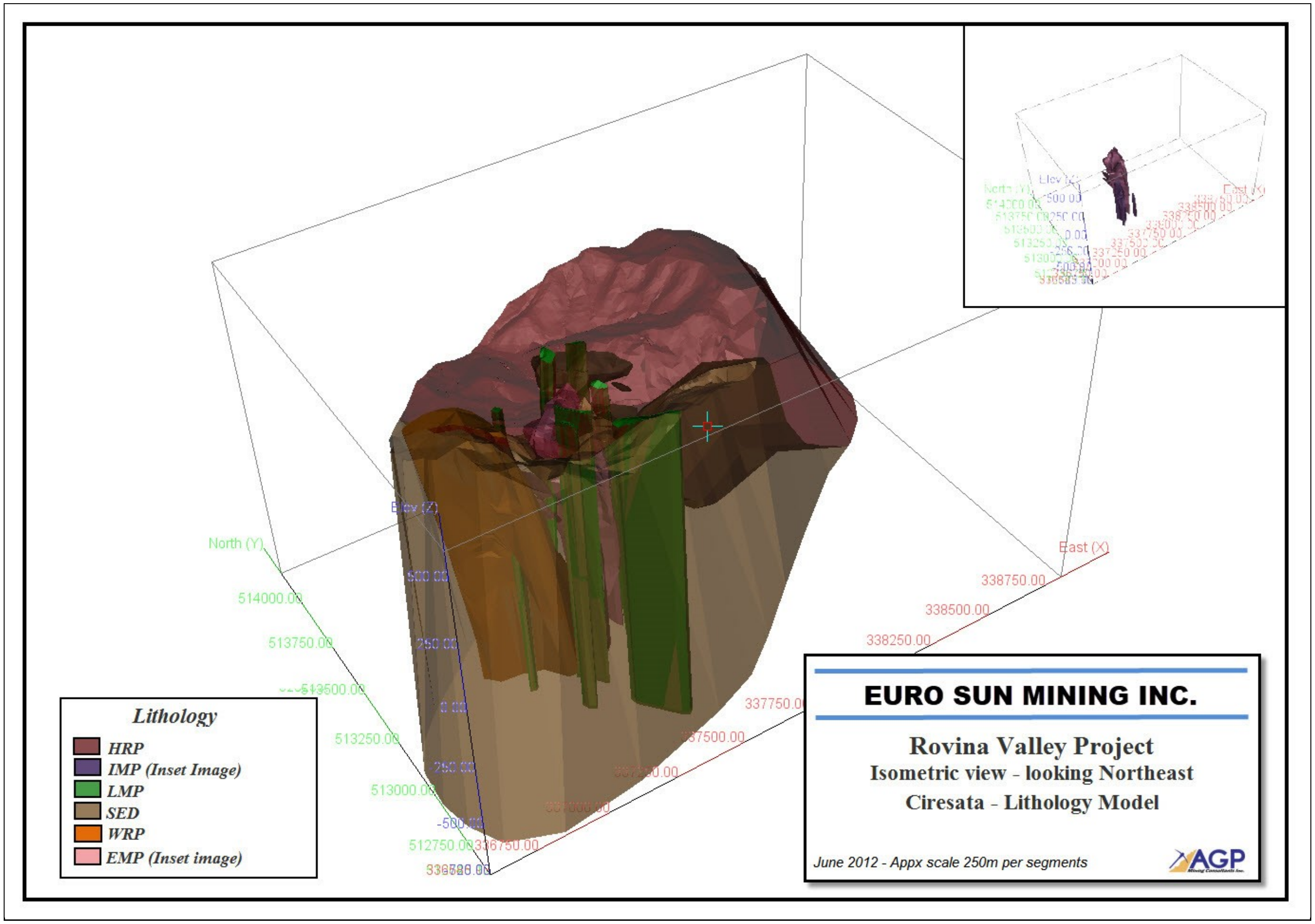
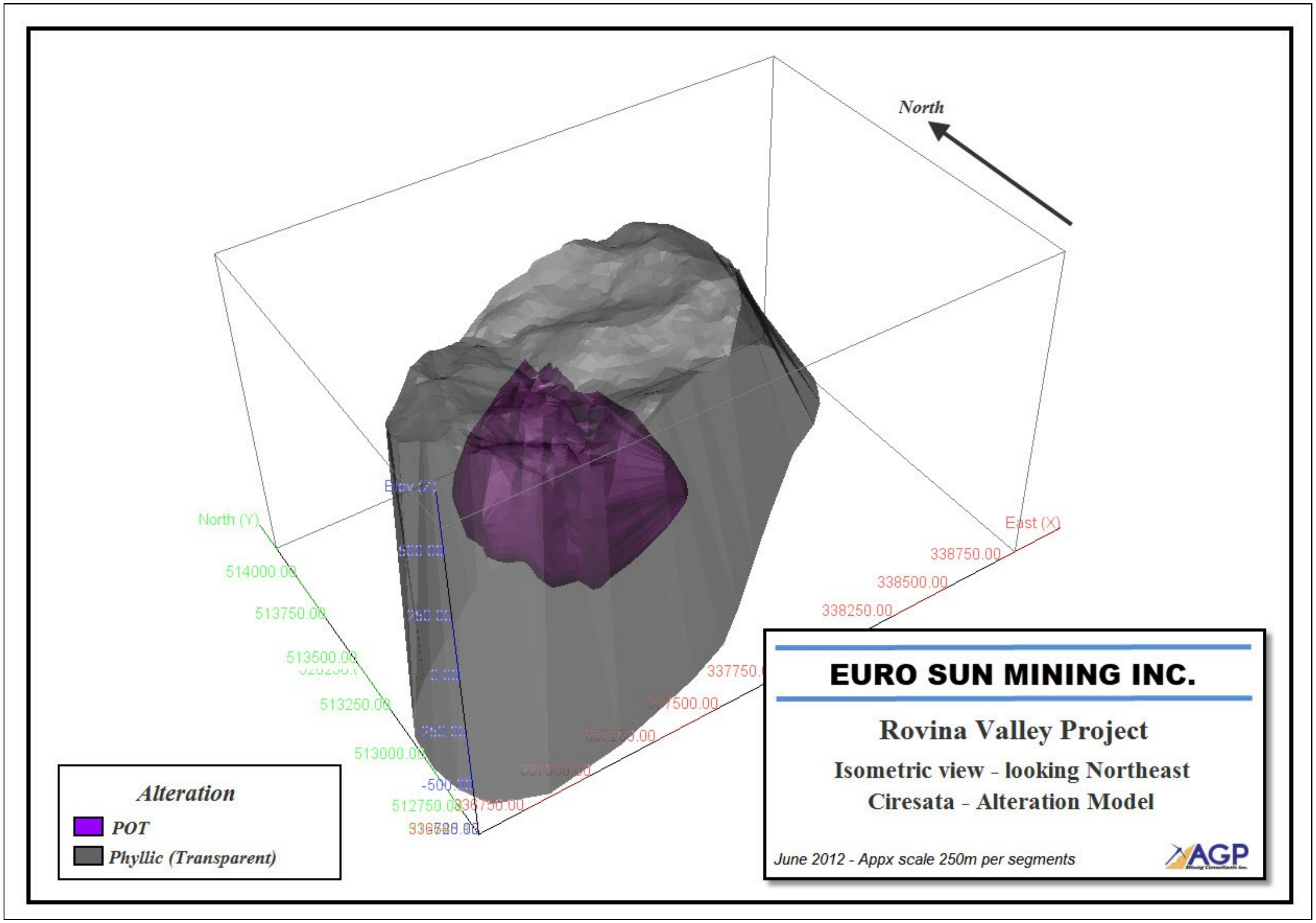


Figure 14-6: Ciresata Alteration Domains



14.2 Exploratory Data Analysis

Exploratory data analysis is the application of various statistical tools to characterize the statistical behaviour or grade distributions of the data set. In this case, the objective is to understand the population distribution of the grade elements in the various units using such tools as histograms, descriptive statistics, probability plots, and contact profiles.

Statistical analysis of the data was performed on each of the lithology and alteration units and also the combination of lithology and alteration units in order to assist in the selection of the statistical domains used in the interpolation.

14.2.1 Domain Definition

For all three deposits, the delineation of the statistical domains was based primarily on field information gathered from the project geologists along with an examination of the drill core. It also relied heavily on the following statistical tools for confirmation of the field observation:

- mean value statistics by lithology, alteration, and a combination of the lithology and alteration units
- box plot statistics by lithology alteration and a combination of the lithology and alteration units
- contact profiles to assist in understanding the grade distribution at the boundaries between the different units
- analysis of variance (ANOVA), which aided separation of the low-grade lithological/alteration combination units from the high-grade units

Rovina

The box plots for gold and copper by lithology show PoB, PoC, and PoD as separate entities, each with higher values for copper. While the PoE unit could fall in that group as well, it is not as clearly defined.

The box plots by alterations show the MACE, POT, and SILICIC alterations as a separate domain for both gold and copper. Note that the SILICIC alteration is only located below the MACEB alteration unit.

The box plot with the combined alteration and lithology codes shows some dominant features, but properly ranking them is difficult. ANOVA was used to assist in the separation of the combination domains. While this statistical tool optimally functions with normally distributed data, it was used in this study as a guide for classification, cross-referencing with the box plot and mean data. During the ANOVA analysis, a table was produced showing the critical differences in the variances within the group pairs along with the calculation of their significance (P value). A second table was then produced that calculated subsets of the grouping variables, which are significantly different from each other.

From the information obtained during the site visit, the box plot, mean values, and analysis of variance, the following conclusions were reached:

- The lithological units appear to have the most weight in determining the grade of the deposit; however, the MACE and POT alteration cannot be discounted as the best grade is located in the MACE.

- The KSIL alteration is deep-seated, affecting only the POE lithological unit.
- It was impossible to group the MACE alteration in its own domain encompassing all lithologies. Each lithological unit in MACE forms its own separate domain, due to relatively large grade variations between the lithology/MACE combination units.
- GLAM is a brecciated unit with high-grade values in the clasts; this unit was treated as a separate domain.

The Rovina domains for gold and copper suggested by this work are:

- OXIDE cap
- GLAM breccia
- PoA in all alterations
- IMB in all alterations – except MACE and POT
- IMB in MACE
- IMB in POT
- PoB in MACE
- PoB in POT
- PoC in all alterations – except MACE and POT
- PoC in MACE
- PoC in POT
- PoD in all alterations – except MACE and POT
- PoD in MACE
- PoD in POT
- PoE (in all alterations, but primarily KSIL alteration)

Colnic

The box plots for gold by lithology shows C_Por, Cd_Por, IMB, F2_Por, and PM_Por clearly stand out as separate entities with higher gold values. Copper values are similar to gold, except for the satellite area, which shows elevated copper values. The CD_Por unit is viewed as an extension of the C_Por unit at depth, even though the grade is generally lower in this unit. The Chubby's Fault, LM, and LD dike units show elevated values and form their own domains.

The box plots sorted by alteration show the highest elevated values for gold and copper is in the K alteration, followed by K2_MACE, K3, and TRPH. The distribution for gold and copper is similar, with the exception of the K3_ARG alteration located in the Satellite porphyry area, which shows elevated copper values.

ANOVA was also used at Colnic to assist in the separation of the statistical domains.

From the information obtained during the site visit, the box plot, the mean values, and the analysis of variance, the following conclusions were reached:

- The lithological units appear to have the most weight in determining the grade of the deposit; however, the K, K2_MACE, and K3_TRPH alterations cannot be discounted.
- The F2_POR and IMB are adjacent to each other, with contact profiles suggesting a soft boundary. The mean values are also very similar; however, from the description "…magmatic foliations are also common, especially adjacent to the margins of the F2-Hill porphyry" it appears the contact is fairly distinguishable in the core and therefore they were modelled as two separate domains.

- The LD_POR is a low-grade propylitic alteration plug inside the F2_POR with radiating dikes extending away from the F2_POR. The contact profile shows a sharp boundary with the F2_POR.
- Similar to Rovina, the K3_ARG and PHILLIC alteration are adjacent to each other and show a soft boundary for copper, but not for gold. Grades are very low, regardless of the lithological unit.
- The satellite porphyry area is located mostly in the K3_ARG and PHYLLIC alterations, by using the lithology as the main control for the domains. The gold and copper variation in the K3_ARG and PHYLLIC alterations will be automatically honoured.
- In 3D space, the K3 and TRPH alterations are adjacent to each other. Contact profiles suggest soft to semi-soft boundaries for both gold and copper; however, the copper grade difference between these two alterations suggest they should be interpolated separately. This contrasts with gold, where the grade variations are minor, and they can therefore be safely combined together.

The Colnic domains suggested by this work are:

- OXIDE cap
- C_Por in K alteration
- C_Por in K2_MACE alteration
- C_Por in K3+TRPH alteration combination for gold
- C_Por in K3 alteration for copper
- C_Por in TRPH alteration for copper
- F2_Por in all alterations except K2_MACE and K3+TRPH combination
- F2_Por in K2_MACE alteration
- F2_Por in K3 and TRPH alteration combination for gold
- F2_Por in K3 alteration for copper
- F2_Por in TRPH alteration for copper
- IMB in all alterations except K, K2_MACE, and K3+TRPH combination
- IMB in K alteration
- IMB in K2_MACE alteration
- IMB in K3 and TRPH alteration combination for gold
- IMB_Por in K3 alteration for copper
- IMB_Por in TRPH alteration for copper
- WR_Por in all alterations except K, K2_MACE, and K3+TRPH combination
- WR_Por in K2_MACE alteration
- WR_Por in K3 and TRPH alteration combination for gold
- WR_Por in K3 alteration for copper
- WR_Por in TRPH alteration for copper
- SED in all alterations

Satellite porphyry area:

- G_Por in all alterations
- S_BX in all alterations
- S_POR in all alterations

Pre- and post-mineralized dikes and faults have their own separate domains:

- FLT – Chubby's Fault
- LD – mostly barren dike
- LM – medium to high grade late mineralized dike swarm

Ciresata

At Ciresata the lithological and alteration domains were much simpler, with an EM_P central core surrounded by HR_P and SED and cut by late mineralized (LM) dikes and an IMP plug at depth. Alteration is simple, with a high-grade potassic (K) central core surrounded by a phyllic halo.

The Ciresata domains were defined by simply combining the lithology and the alterations. The late mineralized dike and IMP lithologies in K and PH alterations were grouped together in order to provide a sufficient number of data points. Copper and gold were statistically correlated, therefore the domains for these two elements were shared. The final domains were defined as follows:

- EM_P in K alteration
- EM_P in PH alteration
- EM_P in K and PH for the Northeast dike-like domain
- HR_P in K alteration
- HR_P in PH alteration
- IMP in K and PH alterations
- SED in K alteration
- SED in PH alteration
- WP in K alteration
- WP in PH alteration
- Late-mineralized dikes
- LM_P in K and PH alterations

14.2.2 Assays

In general, the units have low coefficient of variation values, confirming the low variability of grades in the main mineralized units.

Table 14-3 shows the mean assay values for the different statistical domains. The gold and copper distribution in the Rovina Valley can be described as follows:

- Rovina is a copper/gold deposit, with an Au:Cu ratio of 1.3:1
- Colnic is a gold-rich deposit with minor copper, with an Au:Cu ratio of 5.3:1
- Ciresata is also gold-rich with minor copper, with an Au:Cu ratio of 4.7:1

Table 14-3: Raw Assay Mean Grade Statistics

Rovina – Mean Value by Domains				Colnic – Mean Value by Domains				Ciresata – Mean Value by Domains			
Domains	Nb	Au (g/t)	Cu (%)	Domains	Nb	Au (g/t)	Cu (%)	Domains	Nb	Au (g/t)	Cu (%)
GLAM	6,628	0.154	0.082	C_POR+K	3,726	0.826	0.144	WP+PH	730	0.061	0.010
IMB+ALL	3,872	0.071	0.043	C_POR+K2_MACE	195	0.491	0.122	HR-P+PH	6,157	0.104	0.026
IMB+MACE	2,077	0.210	0.149	C_POR+K3/TRPH	1647	0.405	0.087	SED+PH	3,349	0.139	0.035
IMB+POT	1,473	0.153	0.135	F2_POR+all	1,248	0.097	0.008	LM-P+PH	717	0.163	0.032
POA	1,085	0.064	0.060	F2_POR+K2_MACE	1,940	0.442	0.110	IMP+PH	227	0.233	0.040
POB+MACE	2,798	0.559	0.247	F2_POR+K3/TRPH	3,171	0.285	0.076	LM-P+K	951	0.272	0.045
POB+POT	795	0.267	0.227	FLT	773	0.499	0.065	HR-P+K	4,074	0.355	0.090
POC+ALL	2,608	0.102	0.096	G_POR	403	0.019	0.005	WP+K	900	0.358	0.071
POC+MACE	3,935	0.353	0.320	IMB+all	3,368	0.102	0.010	IMP+K	966	0.538	0.094
POC+POT	8,870	0.202	0.216	IMB+K	1,160	0.579	0.112	SED+K	21,031	0.541	0.117
POD+ALL	1,689	0.114	0.132	IMB+K2_MACE	680	0.592	0.096	EM-P+PH	87	0.616	0.112
POD+MACE	277	0.310	0.214	IMB+K3/TRPH	3,857	0.339	0.044	EM-P+K	3882	0.945	0.161
POD+POT	791	0.196	0.159	LD	1,323	0.143	0.026	-	-	-	-
POE+ALL	809	0.088	0.096	LM	1,526	0.411	0.077	-	-	-	-
SED	188	0.034	0.014	OXIDE	55	0.113	0.022	-	-	-	-
-	-	-	-	S_BX	400	0.102	0.045	-	-	-	-
-	-	-	-	S_POR	354	0.053	0.041	-	-	-	-
-	-	-	-	SED	451	0.047	0.049	-	-	-	-
-	-	-	-	WR_POR+all	5114	0.045	0.008	-	-	-	-
-	-	-	-	WR_POR+K2_MACE	122	0.438	0.051	-	-	-	-
-	-	-	-	WR_POR+K3/TRPH	1276	0.209	0.043	-	-	-	-

Rovina - Entire Data Set			Colnic - Entire Data Set			Ciresata - Entire Data Set		
	Au	Cu		Au	Cu		Au	Cu
Valid cases	38,169	38,169	Valid cases	32,789	32,789	Valid cases	43,071	43,071
Mean	0.204	0.160	Mean	0.314	0.059	Mean	0.440	0.093
Std. Deviation	0.303	0.148	Std. Deviation	0.542	0.066	Std. Deviation	0.512	0.074
Variation Coeficient	1.485	0.927	Variation Coeficient	1.728	1.114	Variation Coefficient	1.162	0.801
Minimum	0.000	0.000	Minimum	0.005	0.000	Minimum	0.005	0.000
Maximum	15.200	3.220	Maximum	25.200	2.380	Maximum	25.000	1.385
25th percentile	0.050	0.038	25th percentile	0.030	0.005	25th percentile	0.110	0.034
Median	0.120	0.134	Median	0.160	0.037	Median	0.320	0.081
75th percentile	0.260	0.235	75th percentile	0.420	0.097	75th percentile	0.620	0.136
90th percentile	0.470	0.349	90th percentile	0.780	0.149	90th percentile	0.988	0.192
95th percentile	0.650	0.431	95th percentile	1.090	0.181	95th percentile	1.270	0.227
99th percentile	1.250	0.612	99th percentile	1.921	0.252	99th percentile	2.080	0.299

14.2.3 Capping

In a resource model, high-grade outliers can contribute excessively to the total metal content of the deposit. AGP evaluated probability plots and conducted a decile analysis to define grade outliers for gold and copper. A decile is any of the nine values that divide the sorted data into ten equal parts so that each part represents one tenth of the sample or population.

Typically, in a decile analysis capping is warranted if:

- the last decile has more than 40% of the metal
- the last decile contains more than 2.3 times the metal quantity contained in the penultimate decile
- the last centile contains more than 10% of the metal
- the last centile contains more than 1.75 times the metal quantity contained in the penultime centile

Each statistical domain was evaluated separately for gold and copper, and a combination of grade capping and search restrictions imposed on threshold values was used to restrict the influence of the outliers. Results of the analysis indicate that, with a few exceptions, no grade capping was warranted for copper at Colnic and Ciresata due to the near-normal distribution observed and low variability of the grade. In all three deposits, gold required some form of restriction. Due to the higher copper content, Rovina required some form of outlier restriction.

For gold, AGP controlled the outlier population by using a high cap value on raw assays combined with a search restriction applied to the “mild” outliers. With a search restriction, composites above a given threshold are used at face value, but their range of influence is limited to a localized area. The range and grade threshold selected were based primarily on a series of indicator variograms. At Rovina, 0.8% of the composites had a grade value at or above the threshold used in the search restriction. For Colnic and Ciresata, the percentages were 0.9% and 1.3%, respectively. For copper, AGP elected to use a simple cap value with no search restriction.

All assays were capped prior to compositing; capping levels are tabulated in Table 14-4, along with the number of samples that were affected.

Table 14-4: Outlier Strategy

Prospect	Domain Name > Code	Au Cap Level (g/t)	Nb Au of Samples affected by Capping	Au SR (grade g/t – Range m)	Cu Cap Level (%)	Nb Cu of Samples Affected by Capping
Rovina	GLAM -->6100	2.5	19	Not used	0.75	12
Rovina	IMB+ALL -->6700	0.7	10	0.45 – 75 m	0.4	11
Rovina	IMB+MACE -->6730	1.5	14	1.3 – 50 m	0.5	15
Rovina	IMB+POT -->6731	1.5	3	1.3 – 50 m	0.5	2
Rovina	POA -->6600	0.7	2	0.45 – 75 m	0.4	0
Rovina	POB+MACE -->6530	3.0	14	1.3 – 50 m	1.2	4
Rovina	POB+POT -->6531	1.7	4	1.3 – 50 m	0.75	4
Rovina	POC+ALL -->6400	0.7	10	0.45 – 75 m	0.5	5
Rovina	POC+MACE -->6430	1.5	12	1.3 – 50 m	1.0	10

Prospect	Domain Name > Code	Au Cap Level (g/t)	Nb Au of Samples affected by Capping	Au SR (grade g/t – Range m)	Cu Cap Level (%)	Nb Cu of Samples Affected by Capping
Rovina	POC+POT -->6431	1.5	19	1.3 – 50 m	1.0	24
Rovina	POD+ALL -->6300	0.7	10	0.45 – 75 m	0.6	3
Rovina	POD+MACE -->6330	1.0	2	1.0 – 50 m	0.5	3
Rovina	POD+POT -->6331	1.2	3	1.2 – 50 m	0.6	7
Rovina	POE+ALL -->6200	1.5	3	0.45 – 75 m	0.5	3
Rovina	SED -->6800	No Cap	0	Not used	0.1	1
Colnic	C_POR+K -->5012	4.0	12	2.0 – 25 m	0.50	4
Colnic	C_POR+K2_MACE -->5011	1.5	3	1.5 – 40 m	0.15	41
Colnic	C_POR+K3/TRPH -->5010	2.0	12	1.5 – 40 m	0.30	3
Colnic	F2_POR+all -->4030	3.5	1	1.5 – 40 m	0.10	1
Colnic	F2_POR+K2_MACE -->4011	5.0	2	1.5 – 40 m	0.25	22
Colnic	F2_POR+K3/TRPH -->4010	5.0	3	1.5 – 40 m	0.35	5
Colnic	FLT -->2000	2.0	11	Not used	0.30	4
Colnic	G_POR -->1200	0.3	3	Not use	0.03	4
Colnic	IMB+all -->8030	5.0	1	1.5 – 40 m	0.1	17
Colnic	IMB+K -->8012	4.0	2	2.0 – 25 m	0.35	5
Colnic	IMB+K2_MACE -->8011	2.0	18	1.5 – 40 m	0.25	4
Colnic	IMB+K3/TRPH -->8010	5.0	7	1.5 – 40 m	0.25	10
Colnic	LD -->1500	4.0	2	Not use	0.25	0
Colnic	LM -->7000	5.0	1	Not used	0.25	14
Colnic	OXIDE -->1600	1.8	0	Not used	0.18	1
Colnic	S_BX -->1000	0.6	3	Not used	0.20	15
Colnic	S_POR -->1100	1.5	1	Not used	0.25	0
Colnic	SED -->1300	0.3	3	Not used	0.25	3
Colnic	WR_POR+all -->1430	4.0	2	1.5 – 40 m	0.11	22
Colnic	WR_POR+K2_MACE -->1411	2.0	0	1.5 – 40 m	0.11	7
Colnic	WR_POR+K3/TRPH -->1410	2.0	6	1.5 – 40 m	0.11	76
Ciresata	EM-P +K -->1012	5.0	9	2.4 – 50 m	0.5	8
Ciresata	EM-P +PH -->1030	2.0	1	0.5 – 50 m	0.5	
Ciresata	HR-P +K -->3012	1.1	66	2.4 – 50 m	0.25	18
Ciresata	HR-P +PH -->3030	1.4	11	0.5 – 50 m	0.25	
Ciresata	LM-P +K -->2012	8.0	1	1.0 – 50 m	0.25	9
Ciresata	LM-P +PH -->2030	3.5	2	1.0 – 50 m	0.25	
Ciresata	SED + K -->4012	3.5	45	2.4 – 50 m	0.35	100
Ciresata	SED +PH -->4030	2.0	5	0.5 – 50 m	0.35	
Ciresata	IMP + K -->5012	2.3	9	1.0 – 50 m	0.3	4
Ciresata	IMP +PH -->5030	1.0	3	1.0 - 50 m	0.3	
Ciresata	WP + K -->6012	1.2	15	2.4 – 50 m	0.25	1
Ciresata	WP +PH -->6030	0.5	4	0.5 – 50 m	0.25	

14.2.4 Composites

Sampling intervals on the RVP average 1.0 m. The upper third quartile of the sampling length shows a value close to 1.0 m.

AGP elected to use a composite length consistent with the bulk mining scenario suggested in the 2008 PEA study. At Rovina and Colnic, a 4 m composite size was selected, which provides for three data points in the 10 x 10 x 12 m block model matrix selected. At Ciresata, a 5 m composite was selected to provide one data point in the 10 x 10 x 5 m block model matrix selected. AGP believes the composite sizes, combined with a new block size, will result in a model that will be more representative of the grade that could be expected from the bulk-mining scenario envisaged for the RVP. Assays were length-weighted averaged, and as stated above, any grade capping was applied to the raw assay data prior to compositing.

The composite intervals were created in a downward fashion from the collar of the holes toward the hole bottoms, resetting the composite intervals at the lithological boundaries. Composite remnants (composites under half the nominal composite length) were backstitched to the previous interval.

Six holes intersected historical underground exploration drifts at Rovina, and the sampling gaps created by these intersections were ignored during the compositing process; all other gaps in sampling were assigned a “0” grade.

Summary statistics for composite grades are shown in Table 14-5.

Table 14-5: Composite Grade Statistics

Rovina - Mean Value by Domain				Colnic - Mean Value by Domain				Ciresata - Mean Value by Domain			
Domain Name/Code	No	Au Cap (g/t)	Cu Cap (%)	Domain Name/Code	No	Au Cap (g/t)	Cu Cap (%)	Domain Name/Code	No	Au Cap (g/t)	Cu Cap (%)
GLAM -->6100	1,706	0.145	0.079	C_POR+K --> 5012	932	0.819	0.144	WP+PH --> 6030	151	0.058	0.010
IMB+ALL -->6700	1,026	0.067	0.041	C_POR+K2_MACE --> 5011	50	0.485	0.112	HR-P+PH --> 3030	1862	0.085	0.021
IMB+MACE -->6730	520	0.208	0.148	C_POR+K3/TRPH --> 5010	411	0.400	0.087	SED+PH --> 4030	780	0.125	0.032
IMB+POT -->6731	378	0.147	0.132	F2_POR+all --> 4030	321	0.094	0.008	LM-P+PH --> 2030	145	0.162	0.032
OXI -->41	193	0.101	0.059	F2_POR+K2_MACE --> 4011	484	0.424	0.110	IMP+PH --> 5030	46	0.229	0.040
POA -->6600	271	0.063	0.060	F2_POR+K3/TRPH --> 4010	801	0.277	0.075	LM-P+K --> 2012	191	0.264	0.044
POB+MACE -->6530	695	0.557	0.248	FLT --> 2000	195	0.486	0.064	HR-P+K --> 3012	832	0.348	0.089
POB+POT -->6531	199	0.263	0.226	G_POR --> 1200	123	0.018	0.005	WP+K --> 6012	180	0.355	0.071
POC+ALL -->6400	647	0.100	0.096	IMB+all --> 8030	849	0.098	0.010	IMP+K --> 5012	195	0.538	0.094
POC+MACE -->6430	984	0.350	0.319	IMB+K --> 8012	292	0.574	0.112	SED+K --> 4012	4235	0.533	0.116
POC+POT -->6431	2,196	0.197	0.216	IMB+K2_MACE --> 8011	170	0.565	0.095	EM-P+PH --> 1030	18	0.592	0.106
POD+ALL -->6300	419	0.113	0.132	IMB+K3/TRPH --> 8010	969	0.331	0.043	EM-P+K --> 1012	775	0.933	0.161
POD+MACE -->6330	69	0.307	0.213	LD --> 1500	336	0.138	0.026	-	-	-	-
POD+POT -->6331	200	0.197	0.159	LM --> 7000	388	0.399	0.077	-	-	-	-
POE+ALL -->6200	203	0.084	0.094	OXIDE --> 1600	26	0.048	0.010	-	-	-	-
SED -->6800	47	0.034	0.014	S_BX --> 1000	103	0.067	0.044	-	-	-	-
-	-	-	-	S_POR --> 1100	90	0.051	0.040	-	-	-	-
-	-	-	-	SED --> 1300	116	0.049	0.050	-	-	-	-
-	-	-	-	WR_POR+all --> 1430	1318	0.044	0.007	-	-	-	-
-	-	-	-	WR_POR+K2_MACE --> 1411	35	0.418	0.046	-	-	-	-
-	-	-	-	WR_POR+K3/TRPH --> 1410	318	0.200	0.041	-	-	-	-

Rovina – Entire Dataset			Colnic – Entire Dataset			Colnic – Entire Dataset		
	Au (g/t)	Cu (%)		Au (g/t)	Cu (%)		Au (g/t)	Cu (%)
Valid Cases	9,753	9,753	Valid Cases	8,327	8,327	Valid Cases	9,435	9,435
Mean	0.197	0.156	Mean	0.304	0.058	Mean	0.403	0.085
Std. Deviation	0.230	0.135	Std. Deviation	0.366	0.060	Std. Deviation	0.402	0.068
Variation Coeficient.	1.166	0.870	Variation Coef.	1.206	1.037	Variation Coeficient	0.997	0.801
Minimum	0.000	0.000	Minimum	0.000	0.000	Minimum	0.000	0.000
Maximum	2.760	1.006	Maximum	4.596	0.366	Maximum	4.550	0.390
25th percentile	0.050	0.036	25th percentile	0.032	0.005	25th percentile	0.086	0.025
Median	0.124	0.137	Median	0.177	0.038	Median	0.293	0.074
75th percentile	0.260	0.233	75th percentile	0.446	0.098	75th percentile	0.595	0.132
90th percentile	0.468	0.339	90th percentile	0.774	0.145	90th percentile	0.932	0.181
95th percentile	0.619	0.410	95th percentile	1.029	0.171	95th percentile	1.186	0.211
99th percentile	1.095	0.561	99th percentile	1.677	0.225	99th percentile	1.741	0.269

14.3 Bulk Density

Euro Sun's database contains a total of 1,125 specific gravity (SG) measurements. The sampling collection averaged one measurement per 95 m, 92 m, and 137 m of core at Rovina, Colnic, and Ciresata, respectively.

As mentioned previously, the samples were sent to the ALS Laboratory at Gura Rosiei where all samples were dried and coated in a thin layer of lacquer or shellac before being weighed in air (W1) and in water (W2). The specific gravities were calculated using the standard formula:

$$SG = W1/(W1-W2)$$

The rock types found at Colnic and Rovina are generally non-porous. Results from the statistical study indicated the specific gravity is fairly consistent; it was noted the alteration phases had more control on the overall density of the deposit than the lithology. Table 14-6 shows the overall SG measurements collected by Euro Sun.

Table 14-6: Specific Gravity by Deposit

Deposit	Count	Minimum	Maximum	Average	Standard Deviation
Ciresata	345	2.22	2.87	2.69	0.08
Colnic	368	2.37	2.88	2.65	0.08
Rovina	412	2.20	3.18	2.64	0.10

AGP elected to assign density values to blocks based on the combined lithological and alteration codes in the model. An exception was made for domains for which there were an insufficient number of measurements; in these cases, an average density was used, as indicated in Table 14-7.

Taking into consideration the low variability of the specific density, AGP is of the opinion the determinations are representative of the in-situ bulk density of the deposit, and sufficient for resource estimation purposes.

Table 14-7: Bulk Density Values

Rovina Density			Colnic Density			Ciresata Density		
Domain Name —> Code	SG	No. of Readings	Domain Name —> Code	SG	No. of Readings	Domain Name —> Code	SG	No. of Readings
Oxidation	2.64 (Avg)	0	C_POR+K - 5012	2.67	58	EM-P+K - 1012	2.72	50
GLAM - 6100	2.55	69	C_POR+K3/TRPH - 5010	2.68	27	EM-P+PH - 1030	2.61 (PH avg)	1
POE-ALL - 6200	2.68	14	F2_POR+all - 4030	2.66	5	HR-P+K - 3012	2.71	37
POD-ALL - 6300	2.69	21	F2_POR+K2_MACE - 4011	2.69	27	HR-P+PH - 3030	2.61	45
POD+MACE - 6330	2.64 (Avg)	5	F2_POR+K3/TRPH - 4010	2.68	39	IMP+K - 5012	2.72 (K avg)	10
POD+POT - 6331	2.64 (Avg)	2	FLT - 2000	2.63	20	IMP+PH - 5030	2.61 (PH avg)	2
POC+ALL - 6400	2.61	12	G_POR - 1200	2.54	7	LM-P+K - 2012	2.72 (K avg)	9
POC+MACE - 6430	2.64	61	IMB+all - 8030	2.6	21	LM-P+PH - 2030	2.61 (PH avg)	6
POC+POT - 6431	2.65	95	IMB+K - 8012	2.69	9	SED+K - 4012	2.73	146
POB_MACE - 6530	2.67	52	IMB+K2_MACE - 8011	2.67	17	SED+PH - 4030	2.58	26
POB+POT - 6531	2.67	14	IMB+K3/TRPH - 8010	2.64	45	WP+K - 6012	2.72 (K avg)	8
POA - 6600	2.75	8	LD - 1500	2.67	28	WP+PH - 6030	2.61 (PH avg)	5
IMB+ALL - 6700	2.61	17	LM - 7000	2.65	20	-	-	-
IMB+MACE - 6730	2.68	28	S_BX - 1000	2.53	9	-	-	-
IMB+POT - 6731	2.75	12	S_POR - 1100	2.61	4	-	-	-
Sed - 6800	2.67	2	SED - 1300	2.69	3	-	-	-
-	-	-	WR_POR+all - 1430	2.58	9	-	-	-
-	-	-	WR_POR+K2_MACE - 1411	2.68	1	-	-	-
-	-	-	WR_POR+K3/TRPH - 1410	2.61	19	-	-	-
Average SG/Total No.	**2.64**	**412**	**Average SG/Total No.**	**2.65**	**368**	**Average SG/Total No.**	**2.69**	**345**

14.4 Spatial Analysis

Geostatisticians use a variety of tools to describe the pattern of spatial continuity, or strength of the spatial similarity of a variable with separation distance and direction. The correlogram measures the correlation between data values as a function of their separation distance and direction. If we compare samples that are close together, it is common to observe their values are quite similar, and the correlation coefficient for closely spaced samples is near 1.0. As the separation between samples increases, there is less similarity in the values, and the correlogram tends to decrease toward 0.0. The distance at which the correlogram reaches zero is called the "range of correlation", or simply the range. The range of the correlogram corresponds roughly to the more qualitative notion of the "range of influence" of a sample; it is the distance over which sample values show some persistence of correlation. The shape of the correlogram describes the pattern of spatial continuity. A very rapid decrease near the origin is indicative of short scale variability. A more gradual decrease moving away from the origin suggests longer scale continuity.

Using Sage 2001 software, directional sample correlograms were calculated for gold and copper using a variable lag distance. After fitting the variance parameters, the algorithm then fits an ellipsoid to all ranges from the directional models for each structure. The final models of anisotropy are given by the lengths and orientations of the axes of the ellipsoids.

Variography was attempted for lithological and alteration combinations. Adjoining domains with similar statistical characteristics were combined to provide sufficient data points. Generally, the best variograms were obtained in the core of each deposit. The phyllic halo was difficult to model since the data points were distributed around the core, which led to poor results.

All anisotropy models generated by SAGE 2001 were visually inspected in Gems to compare output with the expected geological controls on the mineralization. A variogram was considered inconclusive if the anisotropy range and angle did not appear to coincide with any known or expected trend in the mineralization.

Table 14-8, Table 14-9, and Table 14-10 summarize the results of the variography for the domains that returned a conclusive variogram. The traditional exponential range R in the tables is defined as Gam(3R) = 0.95 * Sill as defined by the first edition of GSLIB (Deutsch and Journel). The order and direction of the rotations around the three axes are:

- The first rotation is around the Z axis; the direction is given by the right-hand rule.
- The second rotation is around the rotated Y axis; the direction is given by the right-hand rule.
- The third rotation is around the rotated Z axis; the direction is given by the right-hand rule.

Rovina

In general terms, Rovina indicated a preferred continuity in the 300° to 330° azimuth with a near vertical dip. Variography was conclusive for PoB in MACE and POT alterations, IMB+POC+POD in Mace, and IMB+POC+POD in POT domain. Variography was inconclusive for the GLAM breccia and

IMB+POA+POC+POD+POE in the phyllic halo. The SED and the OXIDE layer did not have sufficient data points.

Table 14-8: Variogram Components – Rovina

Variogram/(Domain Codes)	Component	Value	Rotation	Angle1	Angle2	Angle3	Range1	Range2	Range3
ICD_M_AU (6331, 6431, 6731)	Nugget C0	0.193							
	Exponential C1	0.807	ZXZ	-63	10	32	29.6	88.3	157.7
ICD_P_AU (6330, 6430, 6730)	Nugget C0	0.240							
	Exponential C1	0.760	ZXZ	-51	3	-8	16.9	56.5	116.8
POB_AU (6530, 6531)	Nugget C0	0.083							
	Exponential C1	0.917	ZXZ	-17	1	-67	13	14.7	70.1
ICD_M_CU (6331, 6431, 6731)	Nugget C0	0.145							
	Exponential C1	0.855	ZXZ	-63	10	-10	28.4	42.6	108.8
ICD_P_CU (6330, 6430, 6730)	Nugget C0	0.198							
	Exponential C1	0.802	ZXZ	-4	0	33	57.9	20.1	139.4
POB_CU (6530, 6531)	Nugget C0	0.257							
	Exponential C1	0.743	ZXZ	0	87	4	9.8	67.5	9.4

Colnic

Variograms for Colnic were not as consistent as Rovina, due in part to the sub-domain subdivisions limiting the number of usable data points for each domain, and also to the circular configuration of some of the weakly drilled, external domains, such as the SED unit. Variography was conclusive for the combination C_POR + IMB in K alteration, C_POR + F2_POR + IMB + WR_POR in K2_MACE and K3/TRPH alterations, and F2_POR + IMB + WR_POR in Phyllic. Variography was inconclusive for the FLT, G_POR, LD, LM, SED and all satellite porphyry (S_BX and S_POR). In general terms, the variograms are all steeply–dipping, with an elongated component pointing down dip. In the K alteration, the variogram returned an elongated ellipsoid pointing more or less in the northeast direction. In the K2_MACE and K3/TRPH, the long axis pointed toward the 350-degree azimuth.

Table 14-9: Variogram Components – Colnic

Variogram/(Domain Codes)	Component	Value	Rotation	Angle1	Angle2	Angle3	Range1	Range2	Range3
S1-Au (5012, 8012)	Nugget C0	0.334	-	-	-	-	-	-	-
	Spherical C1	0.666	ZXZ	48	5	-7	55.3	45.5	90.3
S2-Au (1410, 1411, 4010, 4011, 5010, 5011, 8010, 8011)	Nugget C0	0.302	-	-	-	-	-	-	-
	Exponential C1	0.439	ZXZ	-53	-20	71	25.6	50.9	38.8
	Exponential C2	0.259	ZXZ	48	71	47	28.7	59.5	248.3
S3-Au (1430, 4030, 8030)	Nugget C0	0.472	-	-	-	-	-	-	-
	Exponential C1	0.528	ZXZ	-40	78	-11	11.1	112.8	29
S1-Cu (5012, 8012)	Nugget C0	0.334	-	-	-	-	-	-	-
	Spherical C1	0.666	ZXZ	57	58	-3	14.3	35.5	26.3
S2-Cu (1410, 1411, 1420, 1430, 4010, 4011, 4030, 5010, 5011, 8010, 8011, 8020)	Nugget C0	0.302	-	-	-	-	-	-	-
	Spherical C1	0.439	ZXZ	-62	-19	-56	231.7	76.3	245.6
	Spherical C2	0.259	ZXZ	34	-85	12	194.3	345.1	1,104.9
S3-Cu (8030)	Nugget C0	0.472	-	-	-	-	-	-	-
	Exponential C1	0.528	ZXZ	109	23	-46	32.4	17.2	240.1

Ciresata

Variography for Ciresata was conclusive for EM-P + HR-P + SED in POT alteration, and also for EM-P + HR-P + SED in Phyllic alteration. In general terms, the variogram in the POT alteration pointed in the 130-310 azimuth. The anisotropy does not display the strong elongated vertical component seen in Rovina and Colnic.

Table 14-10: Variogram Components – Ciresata

Variogram/(Domain Codes)	Component	Value	Rotation	Angle1	Angle2	Angle3	Range1	Range2	Range3
Au- in K (1012, 3012, 4012, 6012)	Nugget C0	0.038	-	-	-	-	-	-	-
	Exponential C1	0.774	ZXZ	31	-42	15	53.5	82.6	88.3
	Exponential C2	0.188	ZXZ	10	-89	9	71.8	93.8	42.5
Au- in PH (1030, 3030, 4030, 6030)	Nugget C0	0.189	-	-	-	-	-	-	-
	Exponential C1	0.811	ZXZ	21	46	-49	96	66.4	112
Cu- in K (1012, 3012, 4012, 6012)	Nugget C0	0.100	-	-	-	-	-	-	-
	Exponential C1	0.348	ZXZ	-3	-5	-50	80	103.7	345.7
	Exponential C2	0.552	ZXZ	-15	10	-24	377.6	159.9	320.7
Cu- in PH (1030, 3030, 4030, 6030)	Nugget C0	0.240	-	-	-	-	-	-	-
	Exponential C1	0.760	ZXZ	-26	52	-17	518.7	200.8	439.2

14.5 Resource Block Model

One block model was constructed in Gemcom's GEMS version 6.31™ software for each of the deposits. For Rovina and Colnic, a 10 x 10 x 12 m block size was selected, based on open pit mining selectivity considerations. For Ciresata, a 10 x 10 x 5 m block size was selected, based on mining selectivity in a bulk underground mining scenario.

The block model matrix for all three deposits was defined on the Romanian Dealul Piscului 1970/Stereo 70 coordinate reference system with no rotation.

Table 14-11 lists the model's upper southeast corner and is defined on the block edge.

Table 14-11: Block Model Definition (Block Edge)

	Rovina	Colnic	Ciresata
Easting	338,450	338,010	336,550
Northing	519,650	517,110	512,600
Top Elevation	700	700	700
Rotation Angle(degree)	-	-	-
Block size (X, Y, Z)	10 x 10 x 12	10 x 10 x 12	10 x 10 x 5
Number of Blocks in the X Direction	180	127	230
Number of Blocks in the Y Direction	180	132	160
Number of Blocks in the Z Direction	80	80	287

For all deposits, the lithology and alteration models were coded using the lithology and alteration wireframes using a 50:50 rule. For all blocks in the model with a lithology code greater than zero, the alteration code was added in order to obtain the combination code. For example, in Colnic the C_POR (code 5000) in K3 alteration (code 12) resulted in combination code 5012. The combination codes were exported to Microsoft Access (MSAccess) and manipulated using a dictionary replacement approach in order to generate the final domain codes used to control the grade interpolation. The final domain model was re-imported into GEMS and verified for accuracy against the wireframes. These domains were used to control the gold and copper interpolations. For Colnic, a special domain model was constructed to handle the interpolation of the copper and zinc grades where the combined K3/TRPH for gold was split into its individual component (K3 and TRPH) alterations. The additional domain accounted for the larger difference in grade between the K3 and TRPH alterations for copper and zinc, which did not exist for gold, as shown in Table 14-12.

Table 14-12: Mean Grade in TRPH and K3 Alterations

	Au (g/t)	Cu (%)	Zn (ppm)
TRPH	0.290	0.032	514
K3	0.328	0.081	198
Percent Change	-12%	-60%	+160%

At Colnic and Ciresata, a partial (percent) model was used in order to handle dilution associated with the blocks overlapping the contact of the narrow LM dike swarm, the LD dike, the Chubby's Fault at Colnic, and the dike-like EMP and LMP lithologies at Ciresata.

For Rovina, most of the gold and copper mineralization occurring within the glamm breccia is restricted to clasts of strongly-veined porphyritic wallrock that have been incorporated into this unit close to the margins of the breccia pipe. Due to the random occurrences of the clasts, an indicator model was used to generate the domain codes for gold and copper. The model was built using indicator cut-off sf 0.4 g/t Au and 0.25% Cu. A value between zero and 1 was interpolated in the gold and copper indicator model representing the percentage of the block higher than the indicator value. An indicator value of 0.5 was used to separate the glamm domain model into high-grade and low-grade components. The final domain codes are representative of the high/low grades and the general position of the wireframe, which was used to optimize the search ellipsoid orientation. For example in Table 14-13, the GLAM_HN is in the north portion of the glamm high-grade domain.

Table 14-13: Block Model Codes

Rovina – Main Model		Colnic – Main Model		Ciresata – Main Model	
Domain	**Code in Model**	**Domain**	**Code in Model**	**Domain**	**Code in Model**
OXIDE	41	S_BX	1000	EMP+K	1012
POE	6200	S_POR	1100	EMP+PH	1030
POD+ALL	6300	G_POR	1200	HRP+K	3012
POD+MACE	6330	SED	1300	HRP+PH	3030
POD+POT	6331	WR_POR+K3/TRPH (gold only)	1410	SED+K	4012
POC+ALL	6400	WR_POR+TRPH (copper and zinc)	1420	SED+PH	4030
POC+MACE	6430	WR_POR+K3 (copper and zinc)	1410	WP+K	6012
POC+POT	6431	WR_POR+K2_MACE	1411	WP+PH	6030
POD+MACE	6530	WR_POR+all	1430	-	-
POD+POT	6531	F2_POR+K3/TRPH (gold only)	4010	-	-
POA	6600	F2_POR+TRPH (copper and zinc)	4020	-	-
IMB+ALL	6700	F2_POR+K3 (copper and zinc)	4010	-	-
IMB+MACE	6730	F2_POR+K2_MACE	4011	-	-
IMB+POT	6731	F2_POR+all	4030	-	-
SED	6800	C_POR+K3/TRPH (gold only)	5010	-	-
		C_POR+TRPH (copper and zinc)	5020	-	-
		C_POR+K3 (copper and zinc)	5010	-	-
		C_POR+K2_MACE	5011	-	-
		C_POR+K	5012	-	-
		IMB+K3/TRPH (gold only)	8010	-	-
		IMB+TRPH (copper and zinc)	8020	-	-
		IMB+K3 (copper and zinc)	8010	-	-
		IMB+K2_MACE	8011	-	-
		IMB+K	8012	-	-
		IMB+all	8030	-	-
Rovina – Glamm Model		**Colnic – Dike Model**		**Ciresata – Dike Model**	
Domain	**Code in Model**	**Domain**	**Code in Model**	**Domain**	**Code in Model**
GLAM_HN	6122	FLT	2000	EMP (Subdomain 1)	1001
GLAM_LN	6112	LM-P	7000	LMP (Subdomain 1)	2001
GLAM_HE	6123	LD	1500	LMP (Subdomain 2)	2002
GLAM_LE	6113	OXIDE	1600	LMP (Subdomain 3)	2003
GLAM_HW	6121			IMP (Subdomain 1)	5001
GLAM_LW	6111			IMP (Subdomain 2)	5002
				IMP (Subdomain 3)	5003

14.6 Interpolation Plan

The interpolation was carried out using a multi-pass approach, with an increasing search dimension interpolating only the blocks that were not interpolated in the earlier pass. Ordinary kriging was used for all domains in Rovina, Colnic, and Ciresata where the variography could be relied upon. For domains where the variography was inconclusive, an inverse distance cubed, anisotropic-weighted methodology was employed, and the value interpolated was written to the ordinary krige element in the model to differentiate it from the full inverse distance check model. The pass number and the distance to the closest samples was written back to the model to assist in the classification of the blocks.

For Colnic and Ciresata, the final model grade was calculated by weighting the dike grade with the grade in the ordinary krige model using the volume of the dike as a weighting factor.

A full Inverse Distance Squared model (ID^2) with a true distance weighting, and a Nearest Neighbour (NN) model were also interpolated for validation purposes.

14.7 Boundary Treatment

As part of the domain definition, AGP examined the boundary relationship between the individual lithology+alteration unit combinations. Gold and copper were treated separately for this study.

Boundary relationships can be used to determine the inclusion or exclusion of sample data points used in the interpolation of one particular grade domain, and also to assist in confirming geological interpretations. A gradational contact (or soft boundary) generally allows the interpolation parameters to include a limited number of samples from the adjoining domain, while a sharp contact (or hard boundary) will restrict the sample points used in the interpolation to its own domain.

Results from the analysis guided the inclusion (or exclusion) of the composites in the adjacent units during the interpolation. A semi-soft boundary was allowed to include composites from the adjacent domains for any blocks overlapping the boundary in a special Pass 0. A soft boundary was allowed to include samples from the adjacent domains for the most restrictive Pass 1. For the subsequent Passes 2 and 3, the composites used were restricted to their domains in order to prevent smearing of “distant” high-grade intercepts in one domain with the values in another. The sample inclusion matrices are included in Appendix B.

14.8 Search Parameters

The search ellipsoids’ orientations and dips were loosely based on the variography results and manually adjusted to coincide with the geological units. The search ranges were based on the density of the diamond drilling for the first pass to a maximum range based on roughly 95 to 98% of the sill value. Generally, the ratio between the major, semi-minor, and minor axes were kept similar to the ratio of the three-variogram axis. Where variography was inconclusive, the search ellipsoid dimension and orientation were based on the size and shape of the 3D wireframe. Ellipsoid dimensions for various domains are listed in Table 14-14. The Gemcom ZXZ rotation angle follows the right-hand rule convention.

Table 14-14: Search Ellipsoid Dimensions by Domains

Deposit	Domain	Element	Rotation Z, X, Z (degrees)	Pass 1 Range X, Y, Z (m)	Pass 2 Range X, Y, Z (m)	Pass 3 Range X, Y, Z (m)
Rovina	IMB+POC+POD in all alterations	Au - Cu	-57, 6.5, 12	20, 48, 113	37, 86, 203	66, 156, 365
	IMB+POC+POD in POT	Au - Cu	-51, 3, -8	26, 51, 105	46, 92, 189	83, 165, 340
	IMB+POC+POD in MACE	Au - Cu	-63, 10, 32	43, 75, 200	64, 113, 300	96, 169, 450
	POB in all alterations	Au - Cu	-17, 1, -67	20, 23, 105	29, 34, 158	44, 51, 236
	POE in all alterations	Au - Cu	-50, 0, 0	60, 36, 48	90, 54, 72	135, 81, 108
	POA in all alterations	Au - Cu	-80, 3, 15	60, 30, 100	90, 45, 150	153, 77, 255
	GLAM Search Ellipsoid East	Au - Cu	28, 0, 0	39, 31, 161	55, 43, 225	77, 60, 316
	GLAM Search Ellipsoid North	Au - Cu	58, 0, 0	39, 31, 161	55, 43, 225	77, 60, 316
	GLAM Search Ellipsoid West	Au - Cu	-28, 0, 0	39, 31, 161	55, 43, 225	77, 60, 316
	SED in all alteration	Au - Cu	25, -80, 0	60, 80, 24	96, 128, 38	154, 205, 61
Colnic	C_POR+K and IMB+K	Au - Cu	38, -83, -5	30, 60, 24	54, 108, 43	97, 194, 78
	All lithos. in K2_Mace and K3/TRPH	Au - Cu	-40, -55, -22	68, 53, 38	135, 105, 75	270, 210, 150
	Phillic alteration in all lithologies	Au - Cu	-83, 78, -11	20, 100, 50	34, 170, 85	58, 289, 145
	Chubby's Fault	Au - Cu	-65, 87, 0	50, 75, 10	75, 113, 15	150, 225, 30
	Satellite area GxP, SED	Au - Cu	-31, -63, 0	45, 60, 27	77, 102, 46	130, 173, 78
	Satellite area SBx	Au - Cu	-83, -85, 0	45, 60, 27	77, 102, 46	130, 173, 78
	Satellite area SAT_POR	Au - Cu	-72, -85, 0	45, 60, 27	77, 102, 46	130, 173, 78
	LD dikes	Au - Cu	88, 86, 0	63, 113, 38	100, 180, 60	160, 288, 96
	LM	Au - Cu	32, 79, 0	90, 60, 40	162, 108, 72	275, 184, 122
Colnic	K in all lithologies	Au - Cu	40, -42, 12	36, 51, 57	58, 82, 91	161, 228, 255
	PH in all lithologies	Au - Cu	21, 46, -49	67, 46, 78	108, 74, 125	183, 126, 213
	LMP in K + PH Sub-domain 1	Au - Cu	-52, -87, 0	60, 60, 15	180, 180, 27	194, 194, 49
	LMP in K + PH Sub-domain 2	Au - Cu	-50, -78, 0	60, 60, 15	180, 180, 27	194, 194, 49
	LMP in K + PH Sub-domain 3	Au - Cu	-88, 83, 0	60, 60, 15	180, 180, 27	194, 194, 49

14.9 Mineral Resource Classification

Several factors are considered in the definition of a resource classification:

- Canadian Institute of Mining (CIM) requirements and guidelines (2014)
- experience with similar deposits
- spatial continuity
- confidence limit analysis
- geology

No environmental, permitting, legal, title, taxation, socio-economic, marketing or other relevant issues are known to the author that may currently affect the estimate of mineral resources. Mineral Reserves can only be estimated on the basis of an economic evaluation used in a

Prefeasibility or Feasibility Study of a mineral project, thus no reserves have been estimated. Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability.

Typically, the confidence level for a grade in the block model is reduced with the increase in the search ellipsoid size, along with the diminishing restriction on the number of samples used for the grade interpolation. This is essentially controlled via the pass number of the interpolation plan, as described in the previous section. A common technique is to categorize a model based on the pass number and distance to the closest sample.

For the RVP, AGP elected to primarily classify the mineral resource using the pass number from the interpolation plan with assistance from a drill holes density map and the actual position of the drill holes, in order to minimize having blocks in the Measured category in close proximity to blocks in the Inferred category. Two additional models were created to be used in the categorization and are described as follows:

- A model in the block model matrix representing the drill position (Inside_DDH) was created first by assigning the percentage of the blocks inside a 50 m extruded drill hole trace. The model contains values from zero to 100%, representing the volume occupied by the extruded drill hole trace, where 100% means the block is fully within the trace of the drill hole.
- A second model representing the drill density called NB Holes was created in the block model matrix and contains the number of drill holes visible from a given block. The model contains values from 0 to 15, representing the number of drill holes visible within a 75 m search bubble from the block centre for Rovina, Colnic, and Ciresata.
- The pass number was the primary driver to define the Measured, Indicated, and Inferred category. Drill density and drill position models were used to adjust the categorization according to the parameters in Table 14-15.

Table 14-15: Classification Parameters

Pass Number	Retained As	Downgraded To
Pass 1	Measured if number of DDH ≥ 7	Indicated if number of drill holes within a 75 m search was less than 7
Pass 2	Indicated if number of DDH ≥2 and block is within a drill hole trace	Inferred if number of DDH < 3 and block is outside a drill hole trace
Pass 3	Inferred if the number of DDH between 0 and 2	Code 4 if no drill hole was present within a 75 m search. These blocks do not contribute to the resources.

Final adjustments to the classification of individual block values are often required to create areas suitable for mine planning. This is accomplished by adjusting the confidence values of isolated blocks to create contiguous resource blocks with reasonably smooth class values and also to eliminate any small pockets of Inferred mineralization within the most densely drilled portion of the deposit where, in the QP's opinion, additional drilling would not materially improve the estimate. A GEMS™ Cypress-enabled script adjusts, or "grooms", isolated blocks. Individual blocks were upgraded or downgraded, depending on the category value of the 26 surrounding blocks. Small pockets of Inferred resource were upgraded to Indicated if they were located in the most densely drilled portion of the deposit using a core area model.

Three confidence categories exist in the model. The usual CIM guideline classes of Measured, Indicated, and Inferred are coded 1, 2, and 3, respectively. A special Code 4 represents material outside of the criteria used to classify the resources. The assigned Code 4 was kept in the resource model files solely to aid Euro Sun staff in conducting its exploration activity.

AGP checked the final block classification values by visual comparison. AGP also generated histograms of the distance to the closest composites versus the class model value to evaluate the class model for reasonableness. Table 14-16 shows the statistical distribution of the distance to the nearest composite by class for all deposits.

On the basis of the criteria outlined above, of the blocks estimated for Rovina, Colnic, and Ciresata, on average 2% are classified as Measured, 14% as Indicated, and 13% as Inferred. The remaining blocks are either non-interpolated or flagged as Code 4. Table 14-17 shows the distribution of the resource classification by deposits within the block model matrix.

Table 14-16: Distance to the Nearest Composite Distribution

	Measured (m)	Indicated (m)	Inferred (m)
Mean	27	42	84
25th percentile	15	25	59
Median	24	37	78
75th percentile	36	55	103

Table 14-17: Resource Classification by Deposit in Block Model Matrix

	Rovina	Colnic	Ciresata
Measured	2%	2%	2%
Indicated	13%	19%	11%
Inferred	18%	14%	7%
Code 4 or non-interpolated	56%	65%	80%

14.10 Metal Equivalent Formula

Metal equivalent value is calculated as follows:

- for each element, a factor is calculated:

  copper (expressed in %):
  Factor = Net Metal Price * Recovery * (Conversion % to lb * 100)

  gold (expressed in g/t):
  Factor = Net Metal Price * Recovery * Conversion g to oz.

Recoveries were assumed at 100%

- for all elements, the value per tonne is calculated in US$
  Value/tonnes = grade * factor

Total MV is the addition of the value per tonne expressed in US$ for each element: MV = Value/tonnes Cu + Value/tonnes Au.

The copper equivalent for Rovina is calculated by dividing the MV by the copper price and multiplying by the %-to-pound conversion factor.

The gold equivalent for Colnic and Ciresata is calculated by dividing the MV by the gold price and then dividing by the grams-to-ounces conversion factor.

Table 14-18 lists the 2019 prices and recoveries used in the calculation. Metal prices were derived London Metal Exchange (LME) 3-year trailing average + 10%.

Conversion factors used are:

- % to pounds, multiplied by 22.04622
- ppm to %, multiplied by 0.0001
- grams to troy ounces, multiplied by 0.03215074 or (1/ 31.1034768)

Table 14-18: MV Input Parameters (2019)

Metal in Model	Metal Price Unit	Metal Price	Recovery
Copper (%)	US$/lb.	$3.30	100%
Gold (g/t)	US$/troy oz	$1,500	100%

14.11 Resource Tabulation

Effective February 20, 2019, AGP has updated the resource estimates for the RVP to reflect the current metal prices. Rovina and Colnic were constrained within a pit shell using the Lerchs-Grossman algorithm in MineSight software. The Geovia GEMS resource model was exported in an ASCII file and a new MineSight model created for mine planning purposes. The tonnes and grade of the global resource were compared to ensure the model had transferred correctly. Ciresata was not amenable to open pit mining due to potential pre-stripping depths and no pit shell was developed.

As shown in Table 14-19, the following parameters were used to develop the resource constraining pit shells.

Table 14-19: Resource Constraining Pit Shells Parameters

Design Parameter	Units	Rovina	Colnic
Metal Prices			
Copper (World Price)	US$/lb.	3.30	3.30
Copper (Net Price after charges)	US$/lb.	2.61	2.61
Gold (World Price)	US$/oz	1500	1500
Gold (Net Price after charges)	US$/oz	1,384	1,384
Recoveries			
Copper Recovery	%	88.5	88.5
Gold Recovery	%	81.5	81.5
Operating Costs			
Base Elevation for Costs	masl	496	365
Mining Cost – Waste (Base Cost)	$/t material	1.50	1.50
Incremental Cost above base	$/t/ 12m bench	0.01	0.01
Incremental Cost below base	$/t/ 12m bench	0.02	0.02
Mining Cost – Plant Feed	$/t material	1.50	1.50
Incremental Cost above base	$/t/ 12m bench	0.01	0.01
Incremental Cost below base	$/t/ 12m bench	0.02	0.02
Processing Cost	$/t feed	6.32	6.32
General and Administrative Cost	$/t feed	0.25	0.25
Geotechnical			
Overall Wall Slope Angle	degrees	45	45

The cost estimate parameters and recoveries were determined by the mine engineering group working with the process group and Euro Sun management.

The RVP total Measured resources amounted to 89.8 million tonnes grading at 0.62 g/t Au and 0.19 % Cu, containing 1.78 million ounces of gold and 385 million pounds of copper. Indicated resources amounted to an additional 306.6 million tonnes grading 0.53 g/t Au and 0.15 % Cu, containing 5.26 million ounces of gold and 1,006 million pounds of copper. The total Measured and Indicated resources amounted to 396.5 million tonnes grading at 0.55 g/t Au and 0.16 % Cu, containing 7.05 million ounces of gold and 1,391 million pounds of copper. Inferred resources added an additional 28.2 million tonnes grading 0.37 g/t Au and 0.16 % Cu, containing 0.33 million gold ounces and 98 million pounds of copper.

Table 14-20 summarizes the weighted average results of the mineral resource estimates for all three porphyry deposits in the RVP.

Table 14-20: Weighted Average Rovina Valley Resource Estimates 2019

Resource Category / (method)	Tonnage (MM t)	Au (g/t)	Cu (%)	Au (M oz)	Cu (M lb.)	AuEq* (M oz)
Measured						
Rovina (open pit)	32.1	0.36	0.29	0.37	208	0.83
Colnic (open pit)	29.2	0.65	0.12	0.61	74	0.77
Ciresata (underground)	28.5	0.88	0.16	0.81	102	1.03
Total Measured	**89.8**	**0.62**	**0.19**	**1.78**	**385**	**2.63**
Indicated						
Rovina (open pit)	74.2	0.27	0.22	0.64	365	1.44
Colnic (open pit)	106.5	0.47	0.10	1.62	228	2.12
Ciresata (underground)	125.9	0.74	0.15	3.01	413	3.92
Total Indicated	**306.6**	**0.53**	**0.15**	**5.26**	**1,006**	**7.47**
Total Measured + Indicated	**396.5**	**0.55**	**0.16**	**7.05**	**1,391**	**10.11**
Inferred						
Rovina (open pit)	14.9	0.19	0.19	0.09	62	0.22
Colnic (open pit)	4.7	0.34	0.10	0.05	10	0.07
Ciresata (underground)	8.6	0.70	0.14	0.19	26	0.25
Total Inferred	**28.2**	**0.37**	**0.16**	**0.33**	**98**	**0.55**

Notes: *AuEq determined by using a long-term gold price of US$1,500/oz and a copper price of US$3.30/lb. These prices are the 10-year trailing averages as of November 26, 2018 plus 10% for copper and 15% for gold. Metallurgical recoveries are not taken into account for AuEq.
Base case cut-offs used in the table are 0.35 g/t AuEq for the Colnic deposit and 0.25% CuEq for the Rovina deposit (both of which are amenable to open-pit mining), and 0.65 g/t AuEq for the Ciresata deposit, which is amenable to underground bulk mining.

For the Rovina and Colnic porphyries, the resources are pit-shell constrained using Lerchs-Grossmann algorithm pit optimizer and market metal values of $1,500/oz Au price and $3.30/lb Cu price, with net prices after smelter payables, concentrate transport, smelter charges, and royalty of US$1,384/oz Au and US$2.61/lb Cu for Colnic and Rovina. Flotation metallurgical recoveries used are: Colnic 81.5% gold, 88.5% copper and Rovina 81.5% gold, 88.5% copper.

AGP is required to inform the public that the quantity and grade of Inferred Resources reported above are conceptual in nature and are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply, but not verify, geological and grade or quality continuity. For these reasons, an Inferred Mineral Resources has a lower level of confidence than an Indicated Mineral Resources and it is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grade, and contained metal content.

Table 14-21 to Table 14-23 show sensitivity of the model to changes in cut-offs for all three deposits. The resources for Colnic and Rovina remain constrained within the above-mentioned pit shells. In the following tables, rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grades, and contained metal.

Table 14-21: Rovina Sensitivity to Cut-off - Base Case at 0.25% CuEq Cut-Off (2019)

Resource Category	CuEq Cut-Off (%)	Tonnage (MM t)	Au (g/t)	Cu (%)	Au (MM oz)	Cu (MM lb.)
Measured	> 0.70	5.7	0.60	0.41	0.11	51
	> 0.60	11.7	0.51	0.38	0.19	99
	> 0.50	17.5	0.46	0.36	0.26	138
	> 0.45	20.1	0.44	0.35	0.29	154
	> 0.40	23.1	0.42	0.34	0.31	171
	> 0.35	26.2	0.40	0.32	0.33	186
	> 0.30	29.1	0.38	0.31	0.35	198
	> 0.25	32.1	0.36	0.29	0.37	208
	> 0.20	34.5	0.35	0.28	0.38	215
	> 0.15	36.5	0.33	0.27	0.39	218
Indicated	> 0.70	3.3	0.77	0.35	0.08	25
	> 0.60	5.9	0.65	0.33	0.12	43
	> 0.50	12.8	0.51	0.31	0.21	87
	> 0.45	19.2	0.44	0.29	0.27	123
	> 0.40	28.2	0.39	0.28	0.35	171
	> 0.35	39.8	0.34	0.26	0.44	228
	> 0.30	55.8	0.30	0.24	0.54	297
	> 0.25	74.2	0.27	0.22	0.64	365
	> 0.20	94.4	0.24	0.20	0.72	426
	> 0.15	113.7	0.22	0.19	0.79	468
Inferred	> 0.50	0.3	0.38	0.29	0.00	2
	> 0.45	0.6	0.36	0.26	0.01	3
	> 0.40	1.5	0.34	0.23	0.02	8
	> 0.35	2.6	0.29	0.23	0.02	13
	> 0.30	6.4	0.22	0.22	0.05	31
	> 0.25	14.9	0.19	0.19	0.09	62
	> 0.20	23.0	0.17	0.17	0.12	86
	> 0.15	33.1	0.15	0.15	0.16	109

Table 14-22: Colnic Sensitivity to Cut-off - Base Case at 0.35 g/t AuEq Cut-Off (2019)

Resource Category	AuEq Cut-Off (g/t)	Tonnage (MM t)	Au (g/t)	Cu (%)	Au (MM oz)	Cu (MM lb.)
Measured	> 0.70	17.9	0.79	0.13	0.46	53
	> 0.60	21.9	0.74	0.13	0.52	62
	> 0.55	23.7	0.72	0.13	0.55	65
	> 0.50	25.3	0.70	0.12	0.57	68
	> 0.45	26.8	0.68	0.12	0.58	71
	> 0.40	28.0	0.66	0.12	0.60	73
	> 0.35	29.2	0.65	0.12	0.61	74
	> 0.30	30.2	0.63	0.11	0.62	76
	> 0.25	31.3	0.62	0.11	0.62	76
Indicated	> 0.70	28.9	0.73	0.12	0.68	77
	> 0.60	46.4	0.64	0.11	0.95	117
	> 0.55	57.4	0.60	0.11	1.10	142
	> 0.50	69.0	0.56	0.11	1.25	165
	> 0.45	80.6	0.53	0.10	1.38	187
	> 0.40	93.3	0.50	0.10	1.51	208
	> 0.35	106.5	0.47	0.10	1.62	228
	> 0.30	120.6	0.44	0.09	1.73	247
	> 0.25	134.6	0.42	0.09	1.82	261
Inferred	> 0.70	0.1	0.59	0.11	0.00	0
	> 0.60	0.6	0.52	0.10	0.01	1
	> 0.55	1.3	0.48	0.09	0.02	3
	> 0.50	1.8	0.45	0.10	0.03	4
	> 0.45	2.4	0.42	0.10	0.03	5
	> 0.40	3.2	0.38	0.10	0.04	7
	> 0.35	4.7	0.34	0.10	0.05	10
	> 0.30	5.8	0.31	0.09	0.06	12
	> 0.25	6.7	0.30	0.09	0.06	13

Table 14-23: Ciresata Sensitivity to Cut-off - Base Case at 0.65 g/t AuEq Cut-Off (2019)

Resource Category	AuEq Cut-Off (g/t)	Tonnage (MM t)	Au (g/t)	Cu (%)	Au (MM oz)	Cu (MM lb.)
Measured	> 2.0	0.6	1.94	0.24	0.04	3
	> 1.0	16.4	1.08	0.18	0.57	66
	> 0.9	19.7	1.02	0.18	0.64	77
	> 0.8	22.9	0.96	0.17	0.71	87
	> 0.7	26.6	0.91	0.17	0.78	97
	> 0.65	28.5	0.88	0.16	0.81	102
	> 0.6	30.6	0.85	0.16	0.84	107
	> 0.5	34.4	0.80	0.15	0.89	116
	> 0.4	37.6	0.76	0.15	0.92	122
Indicated	> 2.0	0.9	1.80	0.22	0.05	4
	> 1.0	42.2	1.02	0.18	1.39	171
	> 0.9	58.3	0.94	0.17	1.76	225
	> 0.8	80.3	0.86	0.16	2.21	292
	> 0.7	109.7	0.78	0.15	2.74	373
	> 0.65	125.9	0.74	0.15	3.01	413
	> 0.6	143.2	0.71	0.14	3.26	453
	> 0.5	180.5	0.65	0.13	3.75	531
	> 0.4	219.7	0.59	0.12	4.17	599
Inferred	> 1.0	2.0	1.05	0.17	0.07	8
	> 0.9	3.3	0.93	0.16	0.10	12
	> 0.8	4.6	0.84	0.15	0.13	16
	> 0.7	7.0	0.74	0.15	0.17	22
	> 0.65	8.6	0.70	0.14	0.19	26
	> 0.6	10.8	0.65	0.13	0.23	32
	> 0.5	17.6	0.56	0.12	0.32	45
	> 0.4	32.9	0.45	0.10	0.48	71

14.12 Block Model Validation

The Rovina Valley grade models were validated by three methods:

1. Visual comparison of colour-coded block model grades with composite grades on section plots.
2. Comparison of the global mean block grades for ordinary kriging, inverse distance, NN models, composite grades, and raw assay grades.
3. Comparison using grade profiles or swath plots in the X, Y, and Z directions, inspecting the results for local bias in the estimate.

14.12.1 Visual Comparisons

The visual comparisons of block model grades with composite grades showed a reasonable correlation between the values. No significant discrepancies were apparent from the sections and plans reviewed.

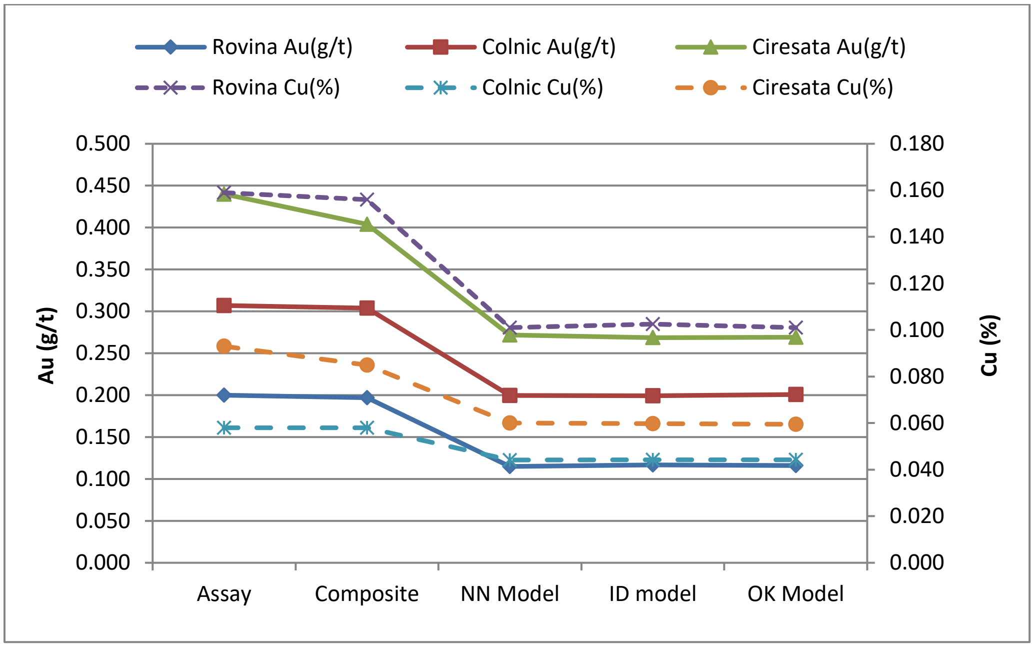
14.12.2 Global Comparisons

The grade statistics for the raw assay, composite, ordinary kriging, nearest neighbour, and inverse distance models are shown in Table 14-25; Figure 14-7 and Figure 14-8 graph the differences. Grade statistics for the composite mean grades compared very well to raw assay grades. The block model mean grades when compared against the composites, showed a fairly steep reduction in values for gold and copper. This is primarily due to the wireframe extending at or beyond the limit of the drilling, which introduced a series of un-interpolated blocks that are reported in the global comparison at "0" grade.

Table 14-24: Global Comparison (all lithologies and major ore bearing lithologies)

	Rovina		Colnic		Ciresata	
	Au (g/t)	Cu (%)	Au (g/t)	Cu (%)	Au (g/t)	Cu (%)
Within all lithologies @ 0.00 Au g/t Cut-Off – Cat 0-3						
Assay	0.200	0.159	0.307	0.058	0.440	0.093
Composite	0.197	0.156	0.304	0.058	0.404	0.085
NN Model	0.115	0.101	0.200	0.044	0.272	0.060
ID model	0.117	0.103	0.199	0.044	0.269	0.060
OK Model	0.116	0.101	0.201	0.044	0.269	0.060
Major ore-bearing lithologies @ 0.00 Au g/t Cut-Off - Cat 0-3						
Assay	0.275	0.225	0.458	0.089	0.563	0.118
Composite	0.275	0.225	0.458	0.088	0.554	0.117
NN Model	0.218	0.194	0.361	0.080	0.463	0.099
ID model	0.222	0.197	0.360	0.081	0.460	0.099
OK Model	0.219	0.195	0.361	0.080	0.461	0.099

Figure 14-7: Global Comparison – All Lithologies @ 0.00 Cut-Off

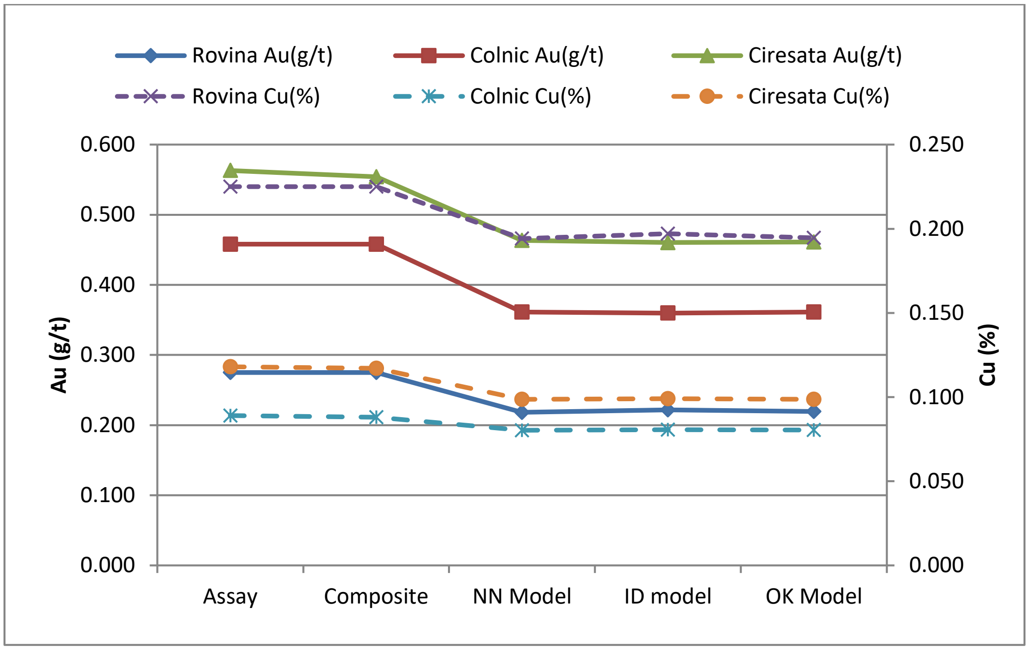


The global comparison was extended to include only the main ore-bearing horizons listed in Table 14-246. Reduction in grade between the composites and the interpolated grade is still apparent but not as severe (Figure 14-8). This is due to normal smoothing of the grade distribution and a volume variance effect.

Table 14-25: Main Ore-Bearing Domains

Rovina	Colnic	Ciresata
IMB+MACE	CXP_K	EMP-K
IMB+POT	CXP_K3T	HRP-K
POB+MACE	CXP_MACE	SED-K
POB+POT	F2P_K3T	WP_K
POC+MACE	F2P_MACE	
POC+POT	IMB_K	
POD+MACE	IMB_K3T	
POD+POT	IMB_MACE	
	WRP_K3T	
	WRP_MACE	

Figure 14-8: Global Comparison - Main Ore Bearing Lithologies @ 0.00 Cut-Off



Globally, the NN, inverse distance, and ordinary krige models all compared very well indicating no global bias was introduced during the kriging process.

14.12.3 Local Comparisons – Swath Plots

Comparison of the grade profiles (swath plots) of the raw assay, composites, and estimated grades allows for a visual verification of an over- or under-estimation of the model at the global and local scales. A qualitative assessment of the smoothing and variability of the estimates can also be observed from the plots. The output consists of three swath plots generated at 50 m intervals in each of the X, Y and vertical directions for gold and copper models.

Both, the inverse distance and krige estimates should be smoother than the NN estimate; the NN estimate should fluctuate around the inverse distance estimate on the plots or display a slightly higher grade. The composite line is generally located between the assay and the interpolated grade if there are a significant number of composites. A model with good composite distribution should show very few crossovers between the composite and the interpolated grade line on the plots. In the fringes of the deposits, as composite data points become sparse, crossovers are often unavoidable. The swath size also controls this effect to a certain extent; if the swaths are too small, then fewer composites will be encountered, which usually results in a very erratic line pattern on the plots.

Due to the elongated cylinder nature of the deposits, there are no preferred orientations for the swath plots. In general, the swath plots show agreement between the three interpolation methodologies used, with no major local bias. At Colnic, the resource model appears to return higher grades in the northeast corner of the deposit than the composite data, possibly indicating smearing of the high-grade values. This trend is similar to the 2008 resource estimate, and more than likely resulted from the presence of the LD dike in that area of the model, which would significantly lower the composite average in that region. The reduced data coverage in the satellite area of the model may also have contributed to this trend.

Figure 14-9, Figure 14-10, and Figure 14-11 show examples of the swath plots for the main pay elements in the Z direction. The complete set of swath plots is included in Appendix C.

Figure 14-9: Rovina Copper Swath Plot – Z Direction

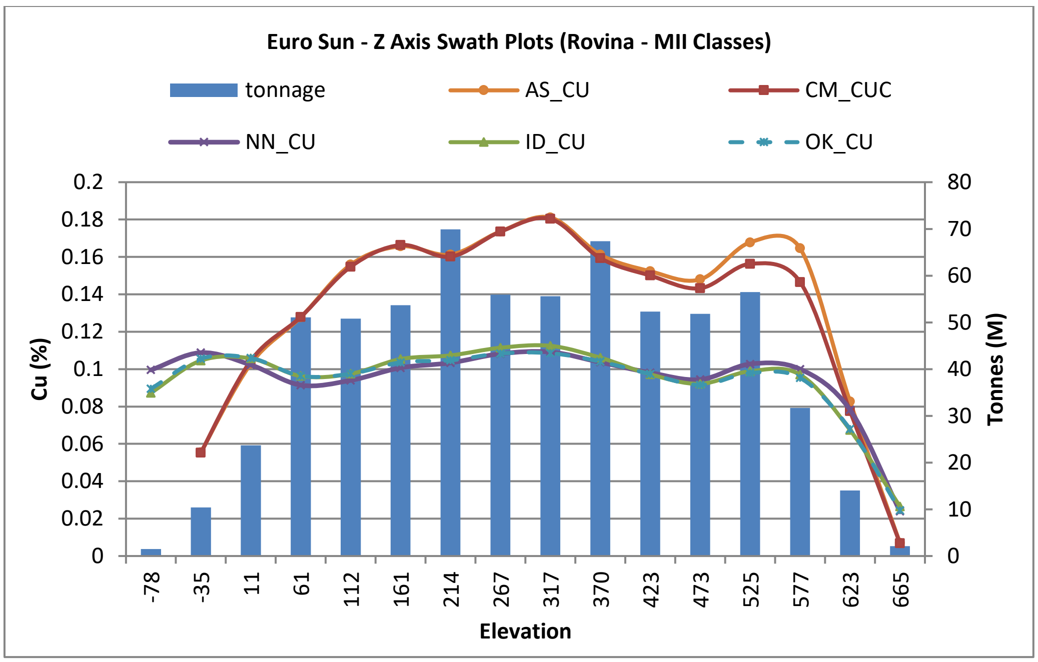


Figure 14-10: Colnic Gold Swath Plot – Z Direction

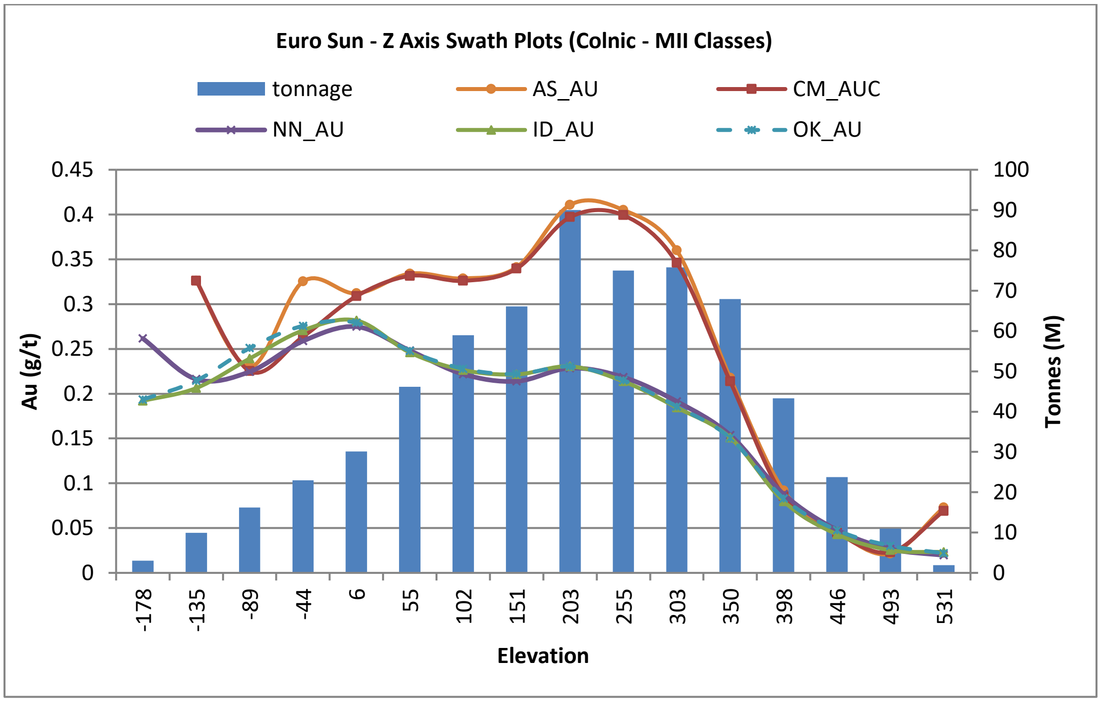
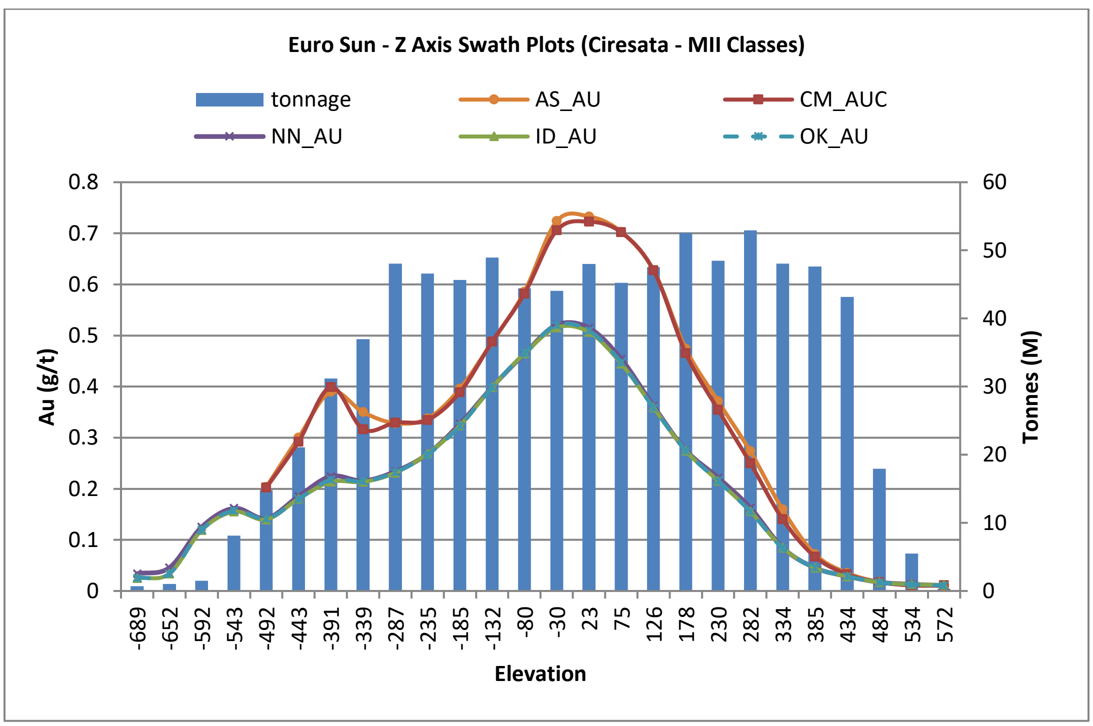


Figure 14-11: Ciresata Gold Swath Plot – Z Direction



14.12.4 Block Model Comparison with the Previous Resource Estimate

The July 2012 Resource Estimate was compared with the figures listed in Table 17-22 of the PEG report dated January 2009. Additionally, the July 2012 resource estimate was compared to this February 2019 update.

In 2008, the gold and copper equivalent cut-offs were determined using a gold price of US$675/oz and a copper price of $1.80/lb. PEG did not take metallurgical recoveries into account, and the resource figures were not constrained within a conceptual pit shell. In contrast, in 2012 AGP used US$1,370/oz for gold and $3.52/lb for copper. Volumes and tonnages were constrained within a resource shell for Rovina and Colnic. Ciresata is not constrained by a resource shell since this deposit is amendable to underground extraction. For this 2019 Resource Update the grade models remained unchanged from the 2012 estimate. The pricing scenario was brought up to date and the resource constraining shells for Rovina and Colnic were updated. Table 14-26 shows the differences in parameters between the various resource statements.

Table 14-26: Differences between Resource Statements

Item	AGP (Feb 20, 2019)	AGP (July 17, 2012)	PEG (Nov 17, 2008)
Gold Price	U$S1,500/oz	U$S1,370/oz	U$S675/oz
Copper Price	$3.30/lb.	$3.52/lb.	$1.80/lb.
Recovery	Not taken into account	Not taken into account	Not taken into account
Conceptual Pit Shell (Rovina - Colnic)	Yes	Yes	No
Rovina Cut-Off	0.25% CuEq	0.25% CuEq	0.30% CuEq
Colnic Cut-Off	0.35 g/t AuEq	0.35 g/t AuEq	0.45 g/t AuEq
Ciresata cut-Off	0.65 g/t AuEq	0.65 g/t AuEq	0.70 g/t AuEq

Because of these differences, the comparison in this section is intended to present an order of magnitude only. Table 14-27 shows the percentage change between the two models. Overall, between 2008 and 2012, Euro Sun was successful at converting Inferred tonnes to the Indicated and Measured categories. The overall grade between the two resources is comparable in the Measured+Indicated category. The change is tonnages is primarily driven by the expanded resource at Ciresata.

Table 14-27: Rovina Valley Resource Estimate - AGP 2012 versus PEG 2008

	Tonnage (Mt)	Au (g/t)	Cu %	AuEq (g/t)	Au (Moz)	Cu (Mlb)	AuEq (Moz)
AGP 2012 – Measured	90.9	0.62	0.19	0.96	1.8	389	2.8
PEG 2008 – Measured	22.0	0.55	0.24	1.00	0.4	117	0.7
Percentage Change – Measured	313%	12%	-19%	-4%	363%	232%	301%
AGP 2012 – Indicated	315.0	0.53	0.15	0.79	5.4	1,031	8.0
PEG 2008 – Indicated	171.1	0.49	0.17	0.80	2.7	642	4.4
Percentage Change – Indicated	84%	9%	-13%	-1%	101%	61%	83%
AGP 2012 – Measured + Indicated	405.9	0.55	0.16	0.83	7.2	1,420	10.8
PEG 2008 – Measured + Indicated	193.1	0.49	0.18	0.82	3.1	759	5.1
Percentage Change – Measured + Indicated	110%	12%	-11.8%	1%	134%	87%	113%
AGP 2012 – Inferred	26.8	0.38	0.16	0.67	0.3	97	0.6
PEG 2008 – Inferred	177.7	0.68	0.17	0.99	3.9	663	5.7
Percentage Change - Inferred	-85%	-44%	-3.7%	-32%	-92%	-85%	-90%

A gold and copper equivalent were calculated using the 2008 pricing scenario in the 2012 model in order to facilitate comparison between the AGP and PEG models using similar pricing and cut-off. Overall, the 2012 model shows a modest increase in total metal in the Measured+Indicated category. Although grade tends to be lower, this is attributed to the increase in composite size combined with the larger blocks.

Table 14-28 shows the differences between the 2012 and 2008 estimates using the same pricing scenario.

Table 14-28: Resource Compared 2008 versus 2012 using the 2008 Metal Prices

	Tonnage (Mt)	Au (g/t)	Cu (%)	Au (Moz)	Cu (M lb)
Rovina Model Using a 0.3 % CuEq Cut-Off					
AGP 2012 Measured+Indicated	87.2	0.333	0.27	0.93	517
PEG 2008 Measured+Indicated	77.9	0.370	0.25	0.92	489
Percentage Change	12%	-	-	1%	6%
AGP 2012 Inferred	17.346	0.243	0.24	0.14	90.7
PEG 2008 Inferred	35.1	0.330	0.25	0.37	192
Percentage Change	-51%	-	-	-62%	-53%
Colnic Model Using a 0.45 g/t AuEq Cut-Off					
AGP 2012 Measured+Indicated	128.8	0.536	0.11	2.22	301
PEG 2008 Measured+Indicated	115.2	0.580	0.11	2.15	270
Percentage Change	12%	-	-	3%	11%
AGP 2012 Inferred	27.9	0.381	0.10	0.34	62
PEG 2008 Inferred	41.2	0.440	0.10	0.58	89
Percentage Change	-32%	-	-	-41%	-30%
Ciresata Model Using a 0.70 g/t AuEq Cut-Off					
AGP 2012 Measured+Indicated	149.2	0.777	0.15	3.73	503
PEG 2008 Measured+Indicated	-	-	-	-	-
AGP 2012 Inferred	8.153	0.709	0.14	0.19	25
PEG 2008 Inferred	101.3	0.903	0.17	2.94	382
Percentage Change	-92%	-	-	-94%	-93%

Since the resource grade models did not change, the small differences between the AGP 2012 model and the AGP 2019 model update are driven in part, by the changes in metal prices since 2012, and also by the use of a revised resource constraining shells. Consequently, the AGP 2012 model versus the AGP 2019 model compares well and the resulting percent change in metal is within 2% (Table 14-30).

Table 14-30: Resource Compared – AGP 2012 versus AGP 2019

	Tonnage (Mt)	Au (g/t)	Cu (%)	Au (Moz)	Cu (M lb)
Measured					
AGP 2019 Measured	89.8	0.62	0.19	1.78	385
AGP 2012 Measured	90.9	0.62	0.19	1.80	389
Percentage Change	-1%	0%	2%	-1%	-1%
Indicated					
AGP 2019 Indicated	306.6	0.53	0.15	5.26	1,006
AGP 2012 Indicated	315.0	0.53	0.15	5.38	1,031
Percentage Change	-3%	1%	-1%	-2%	-2%
Measured + Indicated					
AGP 2019 Measured+Indicated	396.5	0.55	0.16	7.05	1,391
AGP 2012 Measured+Indicated	405.9	0.55	0.16	7.19	1,420
Percentage Change	-2%	1%	-0.6%	-2%	-2%
Inferred					
AGP 2019 Inferred	28.2	0.37	0.16	0.33	98
AGP 2012 Inferred	26.8	0.38	0.16	0.33	97
Percentage Change	5%	-3%	-1.3%	1%	1%

15 MINERAL RESERVE ESTIMATES

The RVP is at a PEA level of study and therefore currently has no reserves.

16 MINING METHODS

Mine design and planning for the Colnic Pit are based on the AGP resource as detailed in Section 14 of this report. Mine planning and optimization results are based on Measured, Indicated, and Inferred resources for gold (Au) and copper (Cu).

This section outlines the parameters and procedures used to perform pit optimization and subsequent mine planning work for the Colnic pit only. The Rovina and Ciresata resources are not being evaluated in this PEA.

16.1 Overview

The deposit will be a conventional truck-and-shovel operation. A mill feed of approximately 20,000 t/d is planned over a 14.1-year project life. There will be pre-strip material in Years -2 and -1, with production ramp-up in Year 1.

The mine design and planning, cut-off grade reporting, and optimization were completed using Maptek Vulcan^{TM} v9.1.1 software. Optimization was performed using the Vulcan^{TM} Lerchs-Grossman (LG) algorithm to determine an optimized shell. The ultimate pit and phases were designed to develop the LOM plan.

Table 16-1 shows the key results from the LOM plan.

Table 16-1: LOM Plan Key Results

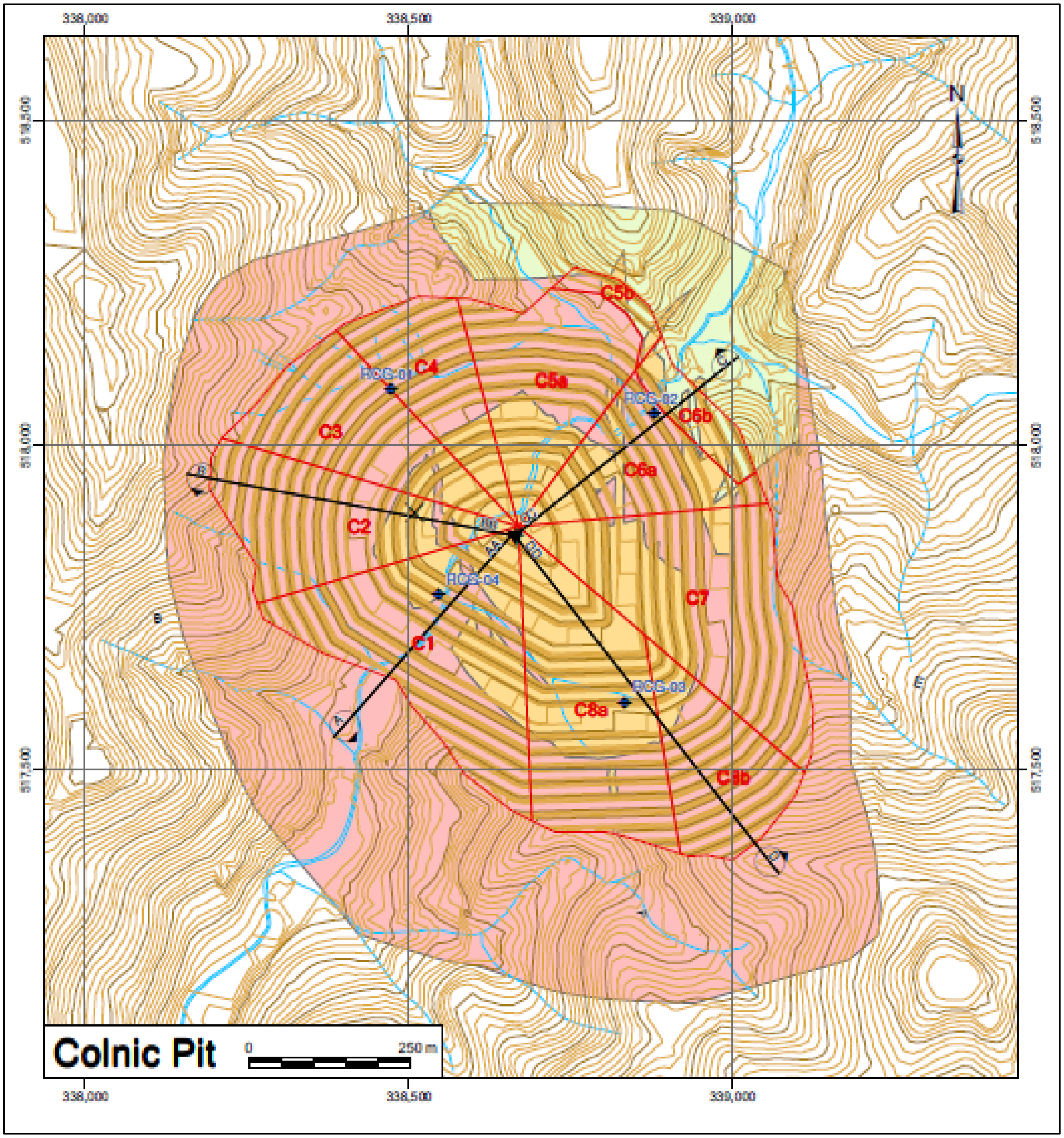
Description	Unit	Value
Mineral Resource Material Mined	Mt	85.7
Average Cu Grade	%	0.10
Average Au Grade	g/t	0.57
Average Zn Grade	ppm	403
Average Value per tonne mill	$/t	13.46
Waste	Mt	165.2
Strip Ratio	W:R	1.9
Milling Rate	t/d	20,000
Project Life (Pre-strip and Production)	years	14.1

Notes: Mt = million tonnes; % = percent; t/d = tonnes per day; $/t = US dollar per tonne,
w:r = waste: resource

16.2 Geotechnical

Pit wall slope recommendations were provided in a December 2012 drawing by Klohn Crippen Berger, “Pre-Feasibility Geotechnical Assessment of Rovina and Colnic Open Pits – Draft Rev B” as shown in Figure 16-1.

Figure 16-1: Colnic Pit - Geotechnical Assessment of Design Sectors



16.2.1 Open Pit Design Wall Slope Parameters

Table 16-2 shows the recommended slope configuration for the Colnic pit design wall slope parameters.

Table 16-2: Colnic Pit – Recommended Wall Slope Design Parameters

Design Sector	Bench Face Angle (“)	Bench Height (m)	Bench Width (m)	Inter-ramp Angle (“)	Max Inter-ramp Height (m)
C1	65	24	14	43.5	120
C2	65	24	12.5	45.5	120
C3	65	24	12.5	45.5	120
C4	65	24	12.5	45.5	120
C5a	65	24	10	48.5	120
C5b	65	24	10	48.5	48
C6a	65	24	10	48.5	120
C6b	65	24	10	48.5	48
C7	65	24	10	48.5	120
C8a	65	24	14	43.5	120
C8b	65	24	12	46.0	120

16.3 Open Pit LG Optimization

16.3.1 Open LG Optimization Wall Slope Parameters

The recommend wall slope parameters were modified to take into account the number of ramps that crossed the pit slope wall. Using a 3-ramp crossing, the adjust parameters are shown in the Table 16-3.

Table 16-3: LG Overall Wall Slopes by Sector

Design Sectors	Overall Wall Slope (degrees)
C1	40
C2	41
C3	41
C4	41
C5a	41
C5b	40
C6a	43
C6b	40
C7	43
C8a	41
C8b	45

16.3.2 Open Pit LG Optimization Parameters

The block model was transferred from AGP’s geology group in an ASCII format with a 10 m (X) by 10 m (Y) by 12 m (Z) block size and transferred into Maptek Vulcan^{TM} software.

The LG parameters used for economic shell development are outlined in Table 16-4.

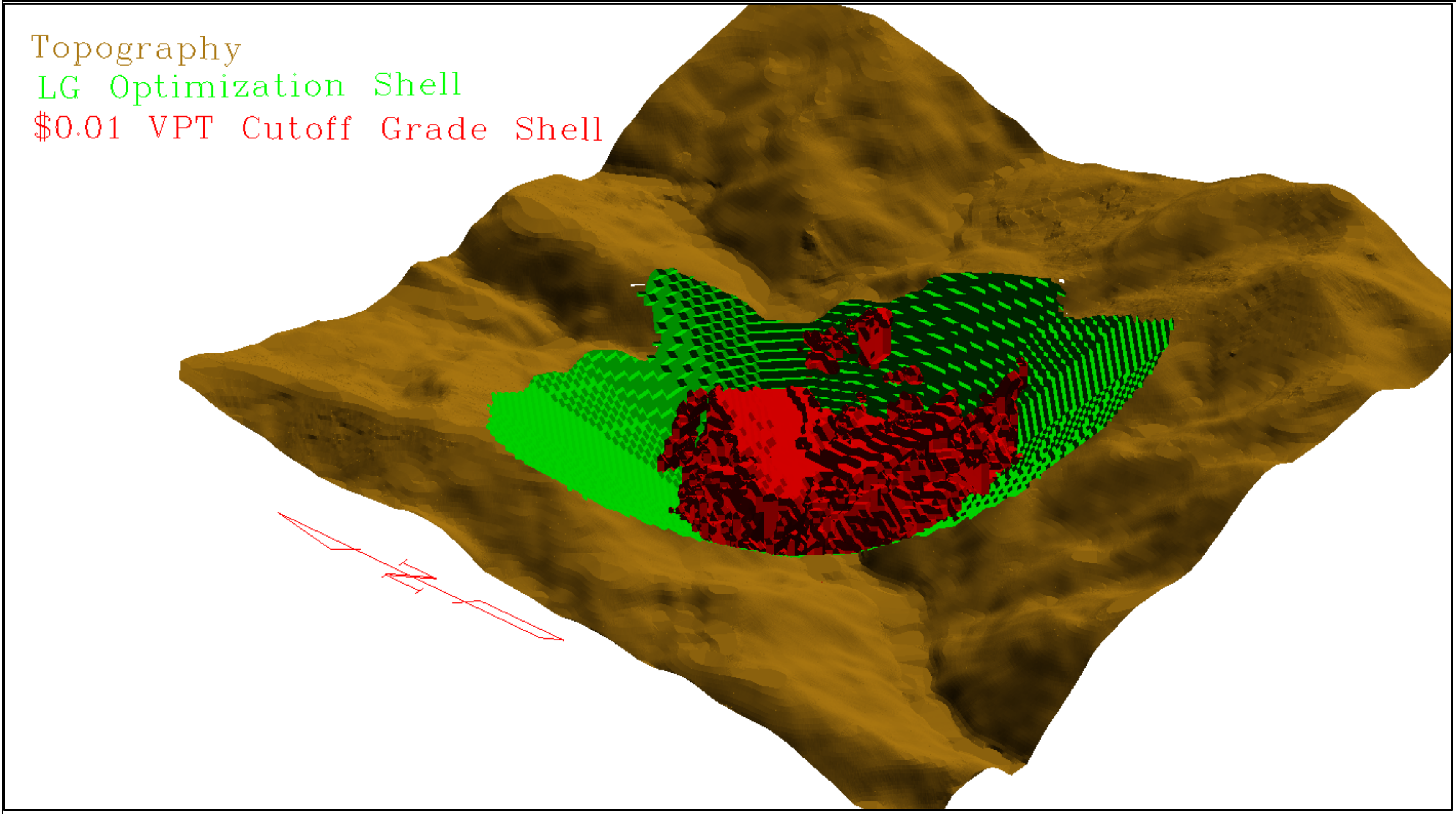
Table 16-4: Open Pit Optimization Parameters

Parameters	Unit	Value
Au Price (TCRC costs removed, Base Price $1300)	US$/t	1198.97
Cu Price (TCRC costs removed, Base Price, $3.00)	US$/t	2.34
Milling + G&A Costs	US$/t milled	8.82
Cu Recovery	%	88.5
Au Recovery	%	81.5
Mill Feed Reference Mining Costs (Ref Elev 370)	US$/t mined	1.67
Mill Feed Mining Costs Above/Below (12m Bench)	US$/t mined	0.01/0.03
Waste Reference Mining Costs (Ref Elev 370)	US$/t mined	1.82
Waste Mining Costs Above/Below (12m Bench)	US$/t mined	0.01/0.03
Pit Slopes Overall	degrees	by Geotech section

16.3.3 Open Pit Optimization Results

The LG optimization shell resulted in a resource of 81.62 Mt grading at 0.096% Cu, 0.576 Au, 409.6 ppm Zm using a $0.01 value per tonne (VPT) mill cut-off. Waste material totalled 162.8 Mt with an overall strip ratio of 2.0:1 (waste: mill feed). Comparing the LG optimization shell with the pit design, the material difference in resource and waste tonnes was 5% and 1.4%, respectively. This is within a ‘rule of thumb’ of 5% for material differences between LG optimization shell and pit design. Figure 16-2 shows the LG optimization shell with a $0.01 VPT Mill cut-off grade shell.

Figure 16-2: Isometric View - LG Optimization Shell with $0.01 VPT Mill Cut-off Grade Shell – Looking NORTHEAST



16.4 Mine Planning

16.4.1 Mine Design

The key focus of this PEA was to examine the economic potential of the Colnic deposit as part of the RVP and to show "reasonable prospects of eventual economic extraction". The final pit was designed based on the economic factors used in the optimization work, as shown in Table 16-4. The pit phase designs for this study were completed following the design parameters shown in Table 16-5.

Mining will be performed on a bench height of 12 m and the design has safety bench placement every 24m. The Colnic pit final design is shown in Figure 16-5. Two additional phases, with minimum mining width of 60 meters were also completed for production scheduling, also shown in Figure 16-3, Figure 16-4 and cross section Figure 16-6.

Table 16-5: Open Pit Design Parameters

Parameter	Value
Bench Height (Single/Double)	12 m / 24 m
Catchment Width	Variable by Geotech sector
Ramp Gradient	10%
Ramp Width (Dual/Single)	32.2 m / 24.6 m
Bench Face Angle	65 degrees

Notes: m = metres; % = percent

Figure 16-3: Colnic Pit – Phase 1 Design

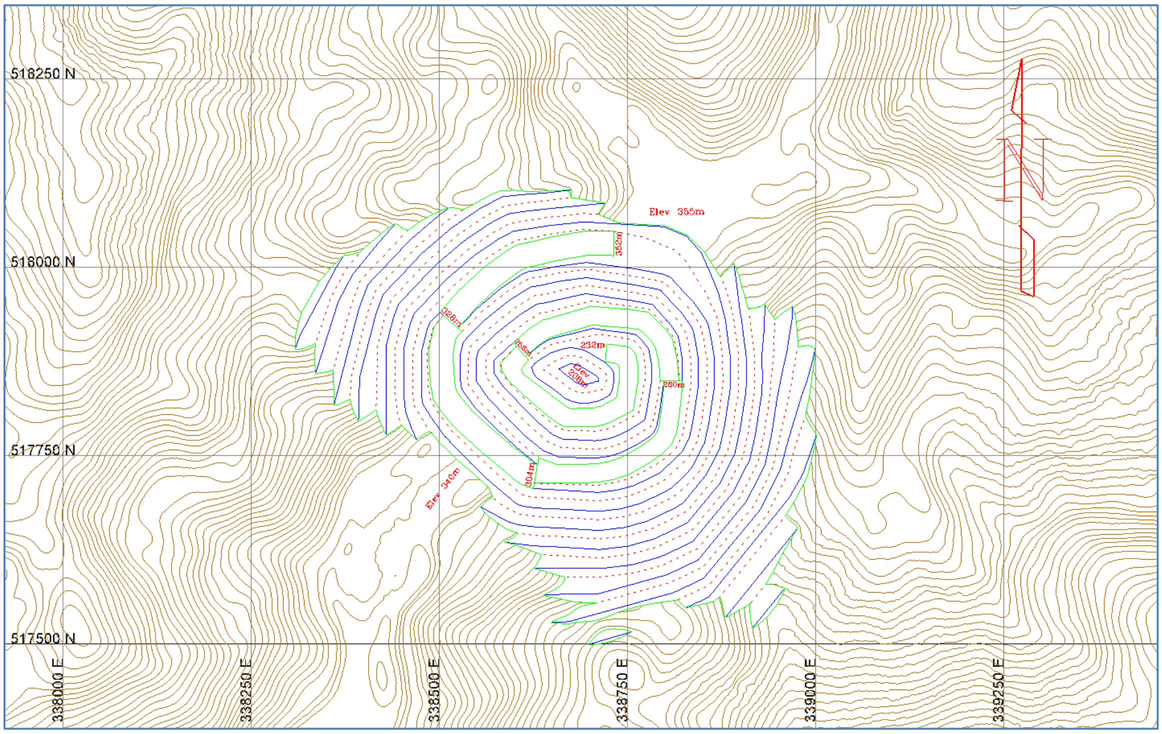


Figure 16-4: Colnic Pit – Phase 2 Design

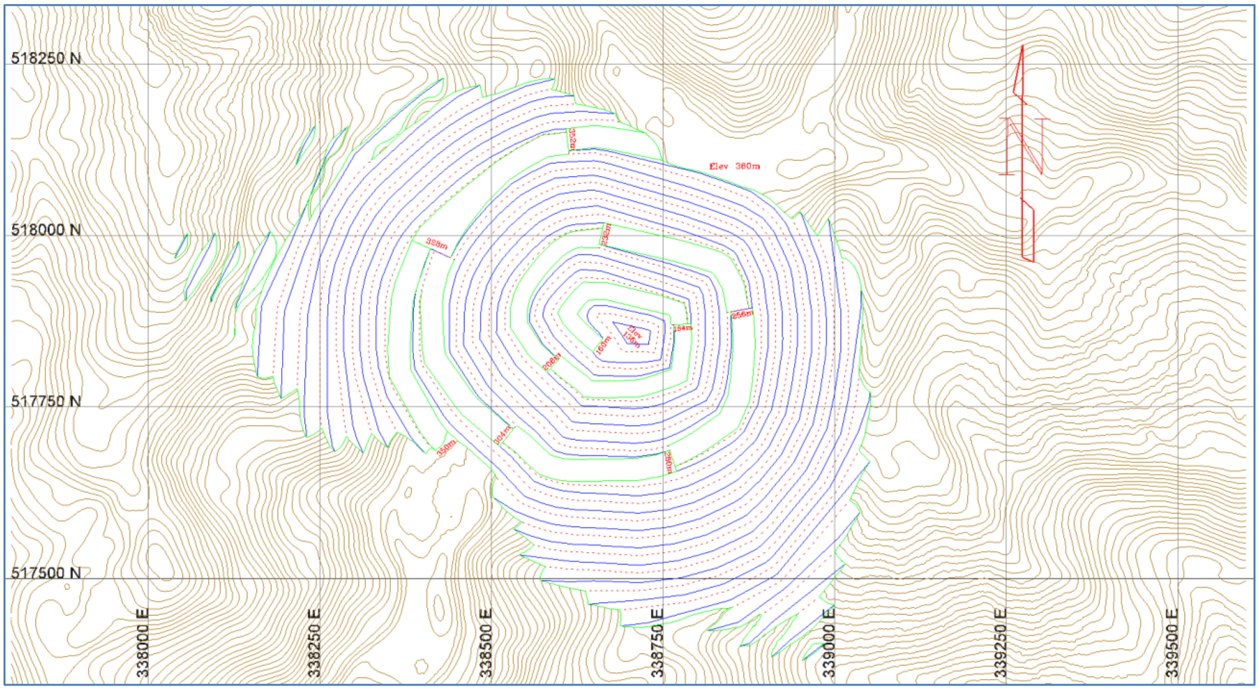


Figure 16-5: Colnic Pit - Final Design

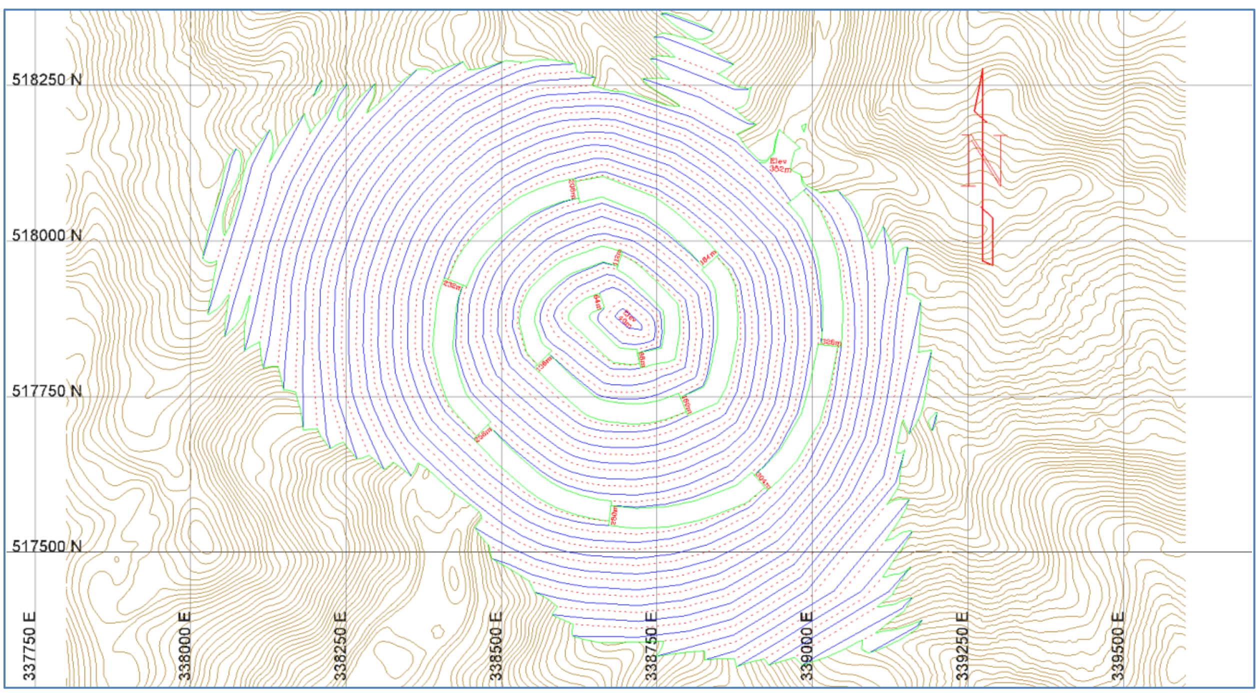
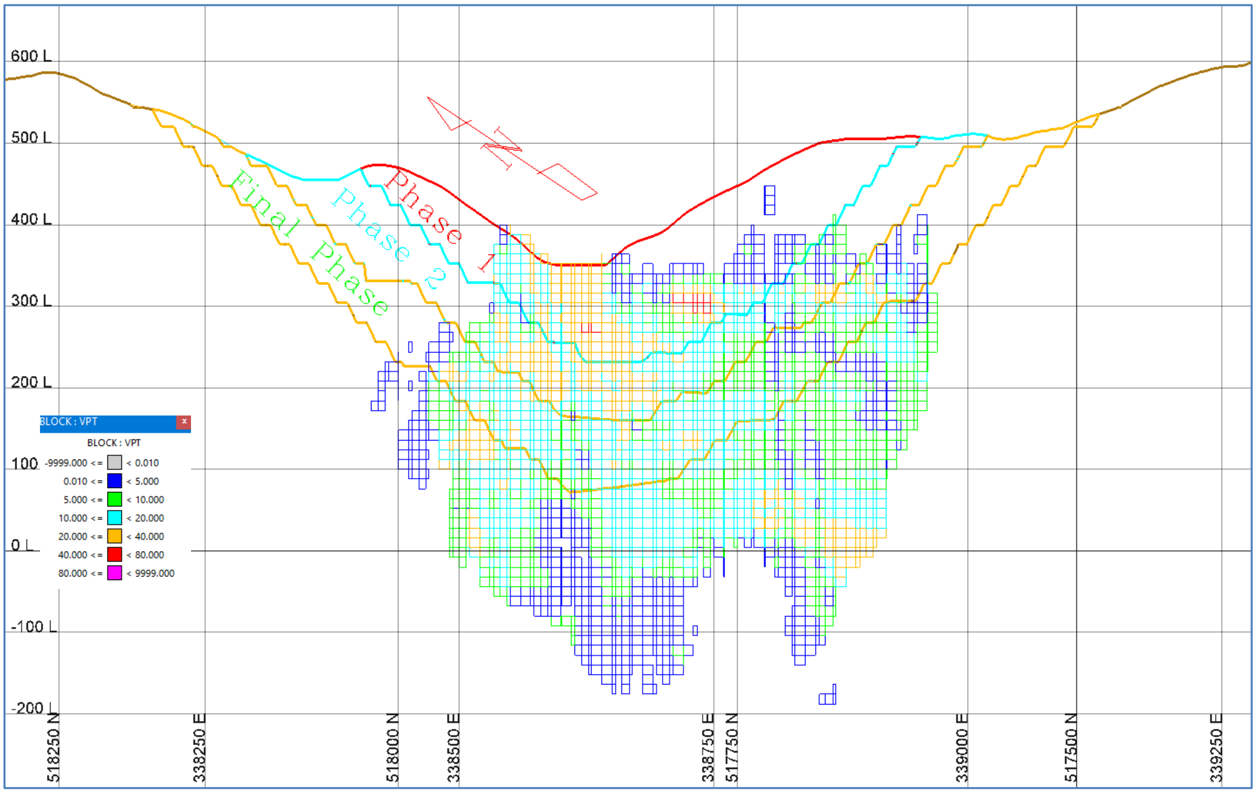


Figure 16-6: Colnic Pit – Cross section looking Northeast – Phase Designs and VPT Mill >$0.01/t cut-off grade shell



16.4.2 Haul Ramp Design

The ramp design width follows the guidelines set out in the Health, Safety and Reclamation Codes for Mines in British Columbia, some of the most stringent in the world, which calls for "a travel width where dual traffic exists of not less than three times, or where single lane traffic exists, of not less than two times the width of the widest haulage vehicle used on the road, and the shoulder barrier at least ¾ of the height of the largest tire on any vehicle hauling on the road." The current design uses a Komatsu HD1500 (150 tonne) haul truck as the largest vehicle traveling on the ramp, with a truck width of 7.6 m. Tire size is based on the 33.00R51, with an overall height of 3.1 m. The calculated operating width for dual lane ramps is 32.1 m, and for single lanes is 24.6 m. These include a 2.5 m ditch for water runoff and snow containment.

16.4.3 Value Per Tonne (VPT) Cut-off Calculation

The value per tonne calculation for all areas was completed as follows:

- Value per Tonne = (Block Revenue – Milling Cost – G&A Cost)/Resource Tonnes
- Where:
- Block Revenue = Resource tonnes x Grades x Recovery x Net Price for each metal
- Milling Cost = Resource tonnes x Milling Cost per tonne
- G&A Cost = Resource tonnes x G&A Cost per tonne

This calculation is sometimes referred to as the milling cut-off because the mining cost is not considered. The mining cut-off uses a similar calculation but includes the mining cost. The mining cut-off is used to determine the boundary of an economic pit shell and the milling cut-off has been used in this case for the determination of the resource contained within that same shell.

For the resources, the value per tonne mill cut-off was equal to or greater than a value of $0.01/t then the block was considered as mill feed. If the value was less than this, the block was considered as waste.

16.4.4 Resource Loss and Dilution

No additional estimate has been made for dilution and mill feed loss for the PEA due to the gradational nature of the deposit and the whole block basis of the model. AGP believes that the mill feed loss and dilution would balance one another. At this level of study, to determine "reasonable prospects of eventual economic extraction", it was assumed that the current geological model incorporates some level of dilution. The in-pit mine resources tabulated in Section 16.4.5 therefore do not at this time include dilution or resource loss, but it will be recommended to include them at the next level of study.

16.4.5 Pit Phase Mill Feed Tonnages

The mill feed tonnages and grades by phase using a $0.01 VPT mill cut-off are shown in Table 16-6.

16.4.6 Mine Production Schedule

The mining production schedule was developed based on a plant capacity of approximately 20,000 t/d (7.2 Mt/a). The Project life is 14.1 years, with two years of pre stripping followed by 12.1 years of operations. This includes 10 years of LOM operations with the final 2.1 years re-handling lower grade material through the mill. The mill throughput rate is assumed to achieve 80% in Year 1 and reach full capacity by Year 2 of operations. Table 16-7 and Figure 16-7 outline the mine production schedule by year, and Figure 16-8 outlines the mill production with tonnes and grade by year.

Table 16-6: Mill Feed by Phase - $0.01 VPT Mill Cut-off

Pit	Mill Feed					Waste (MT)	Total Ex-Pit Material (Mt)	Strip Ratio (waste: feed)
	Tonnage (Mt)	Cu (%)	Au (%)	Zn (ppm)	VPT ($/t)			
Ph 1	21.5	0.09	0.64	574.50	15.54	22.5	44.0	1.0
Ph 2	25.4	0.10	0.60	385.56	14.59	47.7	73.1	1.9
Final	38.9	0.10	0.51	319.38	11.57	95.0	133.9	2.4
Total	85.7	0.10	0.57	402.96	13.46	165.2	250.9	1.9

Notes:
1. Tonnages are reported to the nearest million tonnes, and grades are rounded to the nearest two decimal places.
2. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade, and contained metal.
Mt = million tonnes; % = percent; $/t = US dollar per tonne; w:r = waste: resource

Table 16-7: Mine Production Schedule

Year	Mill Feed					Waste Ex-Pit (Kt)	Mill Feed Mined (Kt)	Mine to Stockpile (Kt)	Stockpile to Mill (Kt)	Total Material Ex-Pit (Kt)	Strip Ratio Ex-Pit (w:r)
	Tonnage (Kt)	Cu (%)	Au (%)	Zn (ppm)	VPT ($/t)						
-2						1,461	0	0	-	1,462	3,967
-1	-	-	-	-	-	10,016	849	849	-	10,865	11.80
1	5,760	0.08	0.62	666.26	14.55	9,353	6,434	1,201	527	15,787	1.45
2	7,200	0.10	0.73	563.87	18.91	18,880	8,635	1,435	-	27,515	2.19
3	7,200	0.09	0.69	571.54	17.02	27,476	8,155	955	-	35,631	3.37
4	7,200	0.10	0.58	404.04	14.09	22,362	8,619	3,091	-	32,653	2.17
5	7,200	0.11	0.69	386.94	17.75	22,454	7,490	1,419	-	31,073	2.61
6	7,200	0.11	0.67	391.37	17.08	27,096	16,356	1,436	1,147	34,586	3.62
7	7,200	0.09	0.51	372.56	11.10	21,189	0	1,745	545	29,589	2.52
8	7,200	0.11	0.58	308.55	14.21	4,703	849	9,156	-	21,059	0.29
9	7,200	0.13	0.54	178.01	14.08	214	6,434	2,265	-	9,678	0.02
10	7,200	0.11	0.60	364.08	15.09	-	8,635	1	6,156	1,045	-
11	7,200	0.08	0.46	418.53	9.36	-	-	-	7,200	-	-
12	7,200	0.05	0.26	429.35	1.46	-	-	-	7,200	-	-
13	779	0.05	0.26	429.35	1.46	-	-	-	779	-	-
Total	85,739	0.10	0.58	417.22	13.60	165,205	-	-	-	250,944	1.93

Notes:
1. Tonnages are reported to the nearest kilotonne, and grades are rounded to the nearest two decimal places.
2. Rounding as required by reporting guidelines may result in apparent summation differences between tonnes and grade.
kt = thousand tonnes; % = percent; $/t = US dollar per tonne; w:r = waste: resource.

Figure 16-7: Mine Production Schedule and Strip Ratio

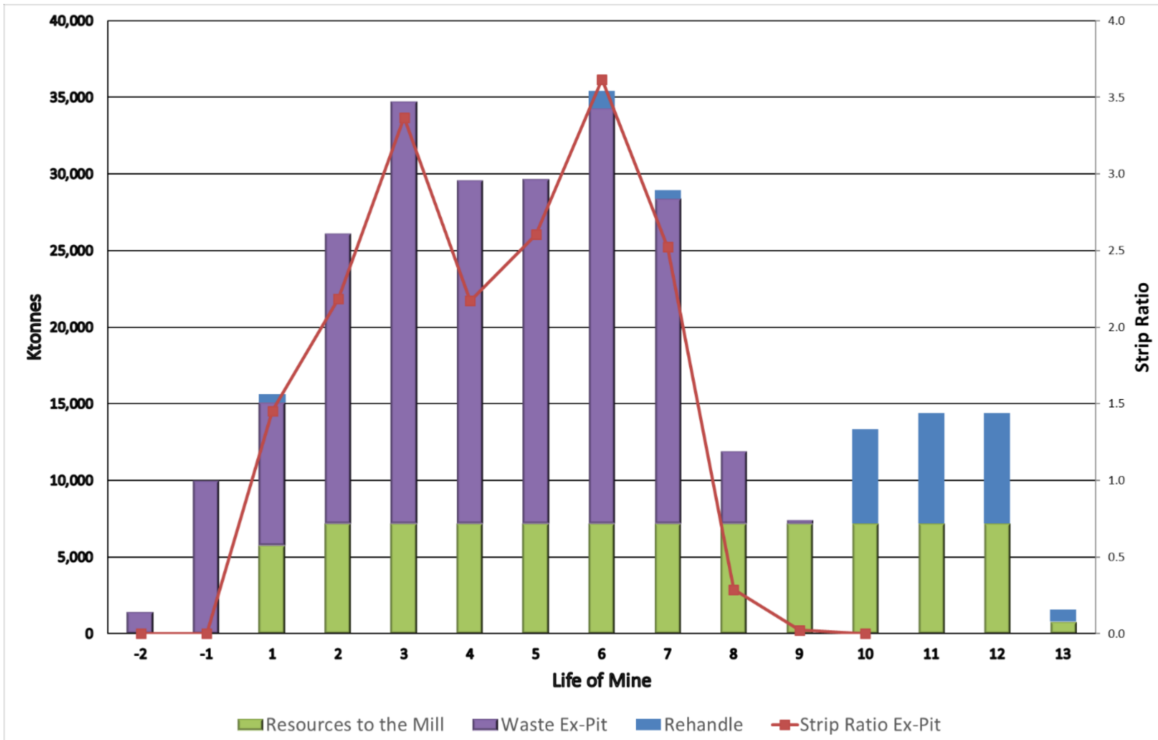
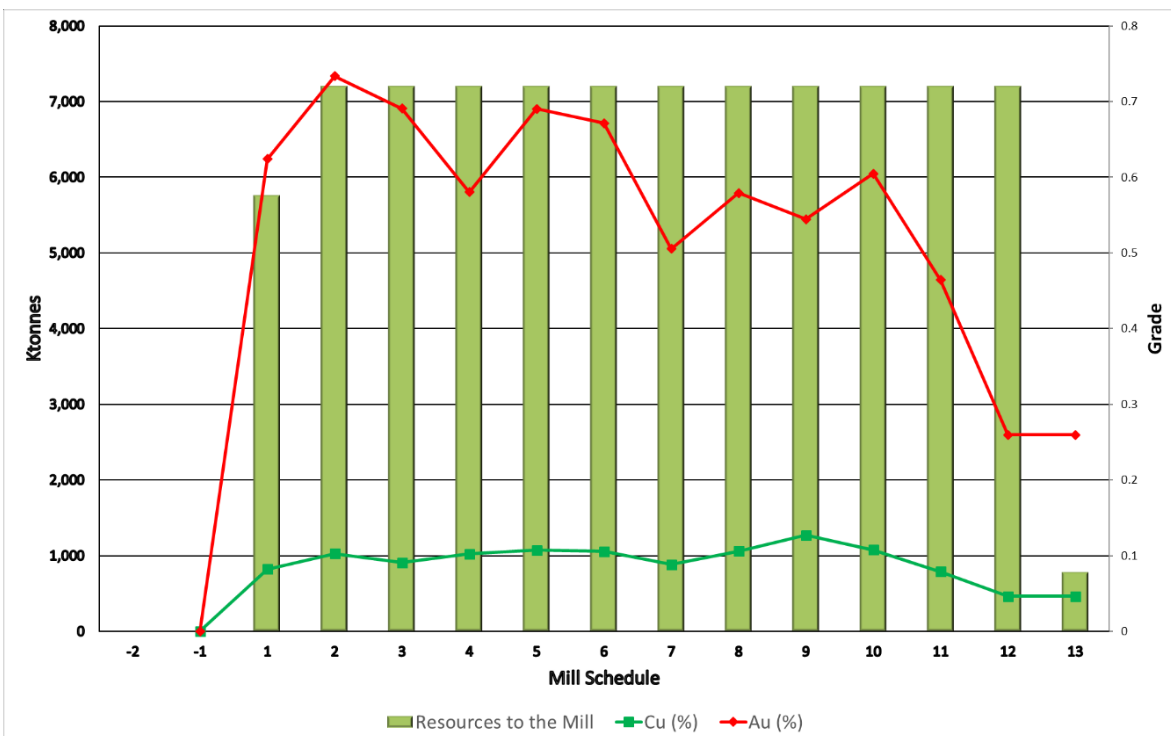


Figure 16-8: Mill Production Schedule, Cu and Au Grade



For the mine schedule, the tonnages for each phase were broken into high- and low-grade categories. The "high-grade" material was any material that had an VPT Mill value of $3.00/t and greater, and the 'low-grade' material is between $0.01/t and $3.00/t VPT Mill and was scheduled when high-grade material was not available and as remaining material processed later in the mine life.

16.5 Mine Rock Management

Over the LOM, the open pit will produce approximately 165.2 Mt (80.7 Mm3) of ex-pit waste rock and 85.7 Mt (40.6 Mm3) of dry stack tails that equates to a total of approximately 251 Mt (121.4 Mm3) of storage required. A certain amount of PAG rock is known to exist from previous test work and would be co-mingled with the dry stack tailings and regular waste rock. A certain amount of buffering from the tailing's material is expected and will be examined in later more detailed studies and sequencing plans recommended as the project advances.

The waste rock facility was designed using following parameters in Table 16-8.

Table 16-8: Waste Rock Facility Design Parameters

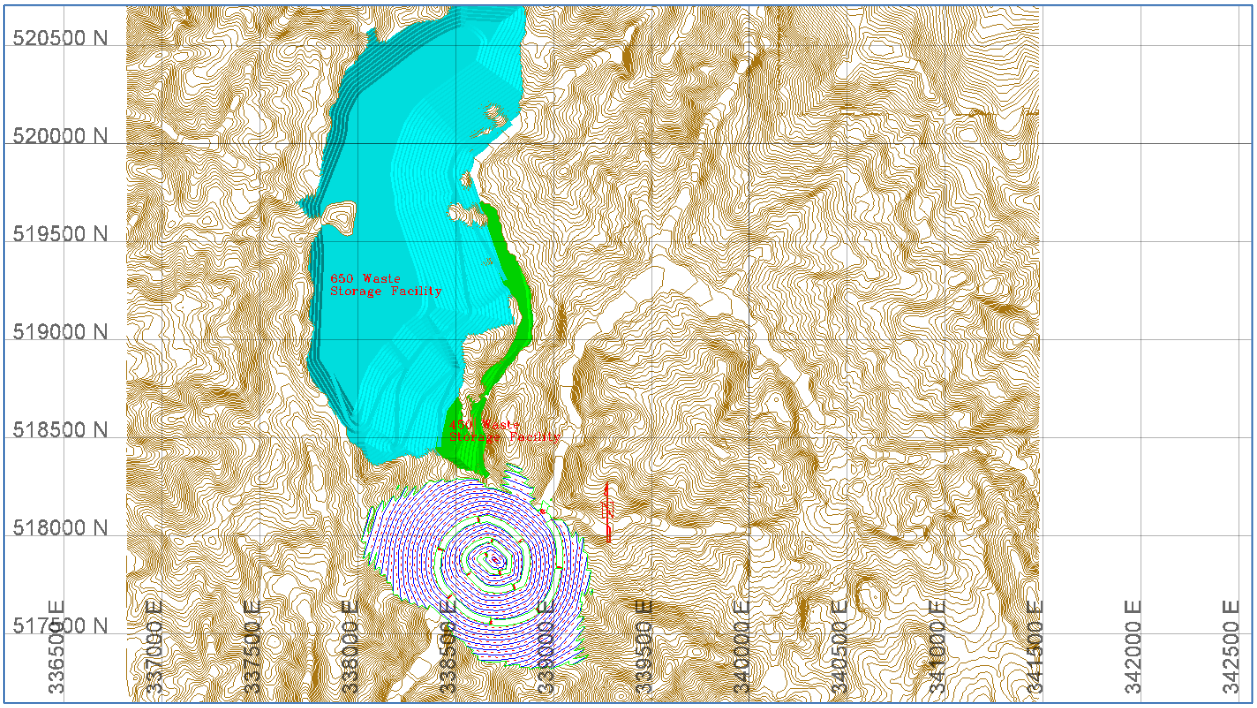
Parameters	Value
Waste Dump Face Angle	38 degrees (Angle of Repose)
Bench Lift	10 m
Swell Factor	30%
Overall Slope	26.6 degrees (2:1 Horizontal: Vertical)
Mine Waste Swell Factor	30%
Mine Waste Stack SG	2.05 t/m3
Dry Stack SG	2.11 t/m3

Two waste rock facilities were designed, one main facility at maximum design elevation of 650 masl, a second minor rock storage facilities with a maximum design elevation of 450 masl. The designs accommodate the full volume of tailings and waste rock required for the PEA study.

The 450 masl facility will be constructed early in the mine life as it provides access to the primary crusher and stockpiling areas.

The proposed development is north of the Colnic Pit, as part of the overall mine plan, shown in Figure 16-9.

Figure 16-9: Waste Rock Storage Facility Proposed Location North of Colnic Pit.



The capacities of the following waste storage facilities are as follows:

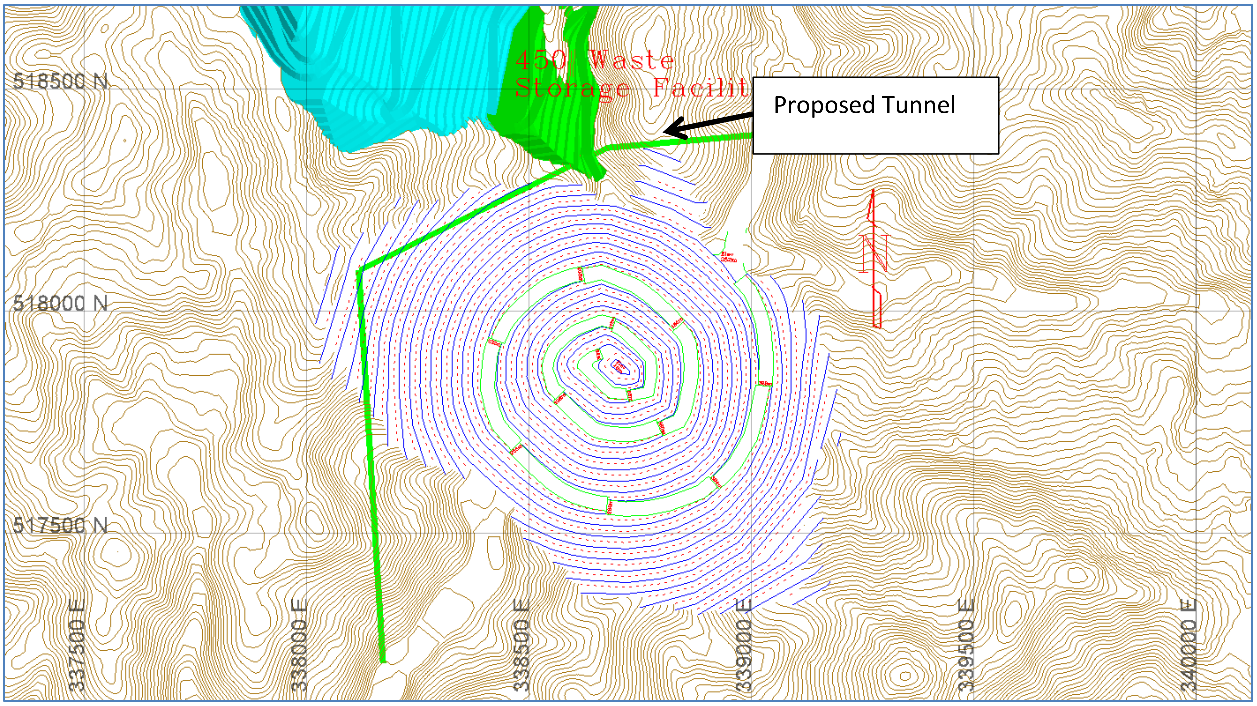
4. 450 Waste Rock Facility – 5.13 Mt (2.5 Mm3) capacity
5. 650 Waste Rock Facility – 245.9 Mt (125.7 Mm3) capacity

Excess waste rock storage capacity exists South of the Colnic pit and on the east side of the valley opposite the 650 and 450 waste storage facilities but are not required for the PEA study. The 650 and 450 rock storage facilities have been designed at 2(H):1(V) slopes to be reclaimed concurrently with mining and tailings placement.

16.6 Rovina Creek Diversion Tunnel

A proposed diversion tunnel will be developed for the Rovina creek. Currently the Rovina creek cuts through the middle of the Colnic pit design as shown in Figure 16-10. This tunnel would be constructed in pre-production.

Figure 16-10: Rovina Creek Proposed Diversion Tunnel



The proposed tunnel will be developed around the Colnic pit starting on the North side, west of the 450-waste storage facility, following along the northwest side of the pit, ending with a total length of 1.85 Km, south of the Colnic pit. The proposed tunnel will be developed as a 4.5m high x 4.5m wide drift with a concrete lined channel.

16.7 Mine Equipment

This operation will be a conventional, open pit, truck-and-shovel operation. The equipment description in this section provides general information of the size and/or capacity of the selected equipment. Standard 136-tonne class trucks, 22.0 m3 class hydraulic shovels and a 20 m3 front-end wheel-loaders for open pit hauling and loading. The front-end wheel loader is preferred for its mobility and ability to manage mill feed loading, while the hydraulic-shovel will be mainly used for waste loading. A track-mounted rotary drill is proposed for blasthole drilling, capable of drilling 200 mm diameter holes. Due to the size of the operation, all equipment on site will be diesel powered to provide greater mobility within the pit . The mine will operate 24 hours per day, 365 days per year.

Table 16-9 lists major mine equipment to be provided by Euro Sun.

Table 16-9: Major Mine Equipment Requirements

Equipment Type	Pre-Production	Life-of-Mine
Track Mounted Rotary drill, 200 mm dia.	2	2
22.0 m3 hydraulic shovel	1	2
20.0 m3 wheel loader	1	1
13.0 m3 wheel loader	2	3
150-tonne class haul trucks	5	25
470KW-class track dozer (15.5’ Blade) w/Ripper	4	4
220KW-class grader (16’ Blade)	2	2

Notes: m3 = cubic metres; mm = millimetre; dia. = diameter

The mine support equipment will consist of:

- Support Backhoe + rock hammer
- Water Truck
- Tire Manipulator
- Lube/Fuel Truck
- Mechanics Truck
- Welding Truck
- Blasting Loader
- Blasters Truck
- Pump Truck
- Integrated Tool Carrier
- Compactor
- Lighting Plants
- Lowboy (75-100 ton) and tractor

16.8 Mineral Resources Mined

The mineral resources mined in the PEA study have been shown in Table 16-10.

Table 16-10: Mineral Resources by Phase

Category/Phase	Mill Feed				
	Tonnage (Mt)	Cu (%)	Au (%)	Zn (ppm)	VPT ($/t)
Measured					
Ph 1	6.15	0.11	0.73	461.4	19.24
Ph 2	10.07	0.12	0.68	359.4	18.10
Final	10.46	0.11	0.58	271.5	14.34
Total Measured	**26.68**	**0.11**	**0.65**	**348.4**	**16.89**
Indicated					
Ph 1	15.34	0.08	0.61	619.3	14.07
Ph 2	15.28	0.09	0.55	403.0	12.29
Final	28.29	0.09	0.49	336.7	10.59
Total Indicated	**58.90**	**0.09**	**0.53**	**427.5**	**11.94**
Measured & Indicated					
Ph 1	21.48	0.09	0.65	574.1	15.55
Ph 2	25.35	0.10	0.60	385.7	14.60
Final	38.75	0.10	0.51	319.1	11.60
Total Measured & Indicated	**85.58**	**0.10**	**0.57**	**402.8**	**13.48**
Inferred					
Ph 1	0.03	0.05	0.54	848.2	10.38
Ph 2	0.01	0.02	0.27	163.3	0.62
Final	0.12	0.09	0.19	416.9	1.28
Total Inferred	**0.16**	**0.08**	**0.26**	**472.5**	**2.79**

16.9 Important Caution Regarding Mine Planning

The PEA is preliminary in nature, in that it includes Inferred Mineral Resources in the mine design and planning that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there is no certainty that the PEA will be realized.

17 RECOVERY METHODS

17.1 Process Design

The Rovina process plant design is based on a robust metallurgical flowsheet to produce a copper-gold concentrate at optimum recovery while minimizing initial capital expenditure and operating costs. The flowsheet comprises primary crushing, milling (SAG and ball mills), rougher, scavenger, cleaner and re-cleaner flotation, regrinding, concentrate dewatering, concentrate bagging, and tailings dewatering for dry stacking.

The key criteria for equipment selection are suitability for duty, reliability, and ease of maintenance. The plant layout is conceived to provide ease of access to all equipment for operating and maintenance requirements while, in turn maintaining a layout that will facilitate construction progress in multiple areas concurrently.

The key project design criteria for the plant are:

- nominal throughput of 21,000 tpd material
- crushing plant availability of 4,115 hours per annum and process plant availability of 8,230 hours per annum through the use of standby equipment in critical areas and reliable grid power supply
- the comminution circuit has been sized to produce grind size of P80 of 75 µm, and regrinding mill will grind rougher-scavenger concentrate to a P80 of 13 µm to recover an estimated 89% of the contained copper and 82% of the contained gold
- copper-gold concentrate will be filtered, and the filter cake will be bagged
- scavenger tailings will be filtered and disposed as ‘dry’ tailings and stored together with the mine waste rock
- sufficient automation and plant control will be incorporated to minimize the need for continuous operator intervention but to allow manual override and control if and when required.

For the process flowsheet selection, the study design documents have been prepared incorporating engineering and key metallurgical design criteria derived from the results of historic and recent metallurgical test work programs. The test work is described in Section 13 of this report.

17.1.1 Selected Process Flowsheet

The process plant has been designed for a throughput of 21,000 dry mtpd . The overall flowsheet includes the following steps:

- ROM material fed through a ROM pocket providing 225 t surge capacity, (i.e. 1.5 times the capacity of each truck)
- primary crusher (gyratory) located adjacent to the open pit mine, apron feeder and rope conveyor to the crushed material stockpile located near the process plant
- crushed material stockpile providing a 16-hour live capacity and a 70-hour total surge capacity

- crushed material reclaims pan feeder drawing from the stockpile to a SAG mill feed conveyor feeding the milling circuit
- SAG mill in closed circuit with pebble crushing
- ball mill, in closed circuit with hydro-cyclones, to produce a grind size P80 of 75 µm, and an overflow slurry density of 38.5% solids in weight in the direct feed to the flotation circuit
- rougher and scavenger flotation
- rougher and scavenger concentrate regrinding
- cleaner flotation, using three stages of cleaning
- concentrate thickening, filtration, and bagging
- a tailings thickener for process water recovery and to provide an optimum slurry density for filtration
- plate and frame pressure concentrate filter
- ceramic disc-vacuum filters to produce filtered tailings
- conveyors and radial stacker for transporting filtered tailings to the waste dump area

The overall process flow diagram showing major unit operations is shown in Figure 17.1 and conceptual plant general arrangement shown in Figure 17.2.

Figure 17-1: Overall Process Flow Diagram

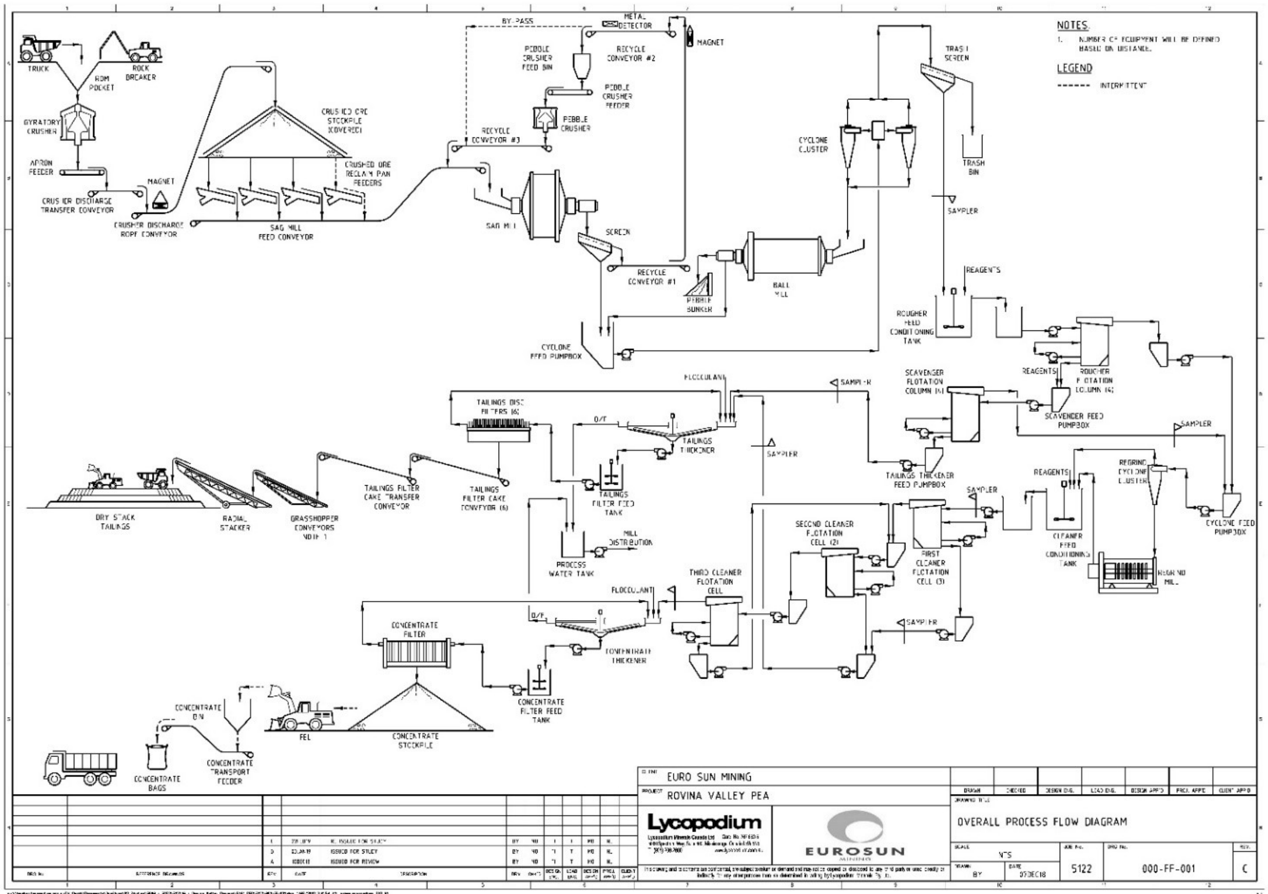
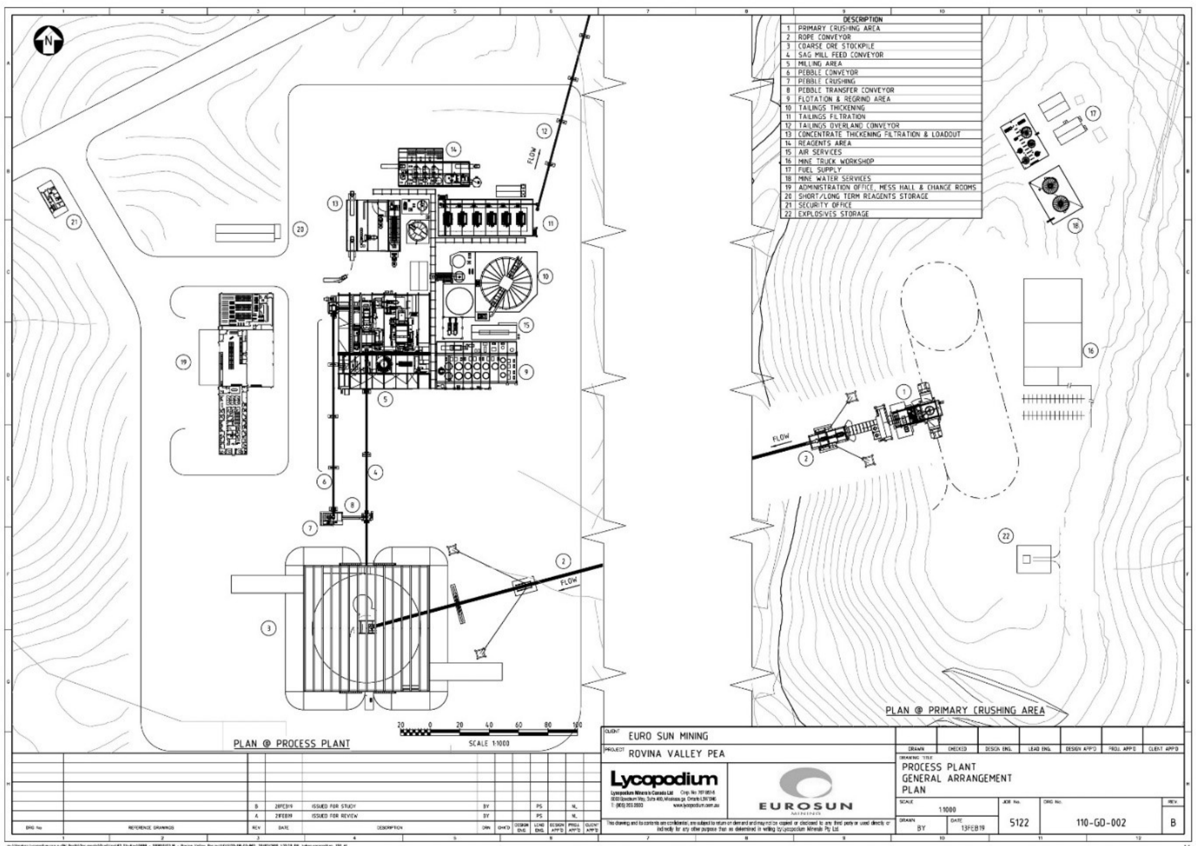


Figure 17-2: Process Plant General Arrangement



17.2 Process Plant Description

17.2.1 Key Process Design Criteria

The key process design criteria are listed in Table 17-1. Process parameters selected are based on metallurgical test work (bench and pilot plant) carried out at Eriez in November 2018 with consideration of the design head grade, stage, and overall mass pull. Eriez metallurgical test work confirmed process selection and number of flotation stages however, flotation residence time, flowsheet configuration and reagents may need adjustments based on future metallurgical test work. The average result of MET 42 (Colnic K1 Domain) and MET 44 (Colnic K2K3 Domain) was selected for design head grade, concentrate grade, and percent recovery.

Table 17-1: Key Process Design Criteria

Parameter	Units	Value	Source
Plant Throughput	tpa	7,200,000	Euro Sun
	tpd	21,000	Euro Sun
Head Grade – LOM	% Cu	0.138	Euro Sun
Head Grade - Design	% Cu	0.145	Euro Sun
	g/t Ag	0.77	Euro Sun
Material Moisture Content	%	3.0	Euro Sun
Material Specific Density	t/m³	2.77	Test work
Concentrate Specific Density	t/m³	4.06	Lycopodium
Operating Schedule			
Crushing Plant Operating Time	hr.	4,115	Lycopodium
Plant Operating Time	hr.	8,230	Lycopodium
Bond Crusher Work Index (CWi)	kWh/t	20	Lycopodium
Bond Ball Mill Work Index (BWi)	kWh/t	16.6	Test work
SMC Axb		24.7	Test work
Bond Abrasion Index (Ai)	g	0.446	Test work
Grind Size (P80)	µm	75	Test work
Rougher Residence Time – Laboratory	min	5.5	Test work
Scavenger Residence Time – Laboratory	min	4.4	Test work
Cleaner 1 Residence Time – Laboratory	min	9.6	Test work
Cleaner 2 Residence Time – Laboratory	min	4.1	Test work

Parameter	Units	Value	Source
Cleaner 3 Residence Time – Laboratory	min	4.5	Test work
Regrind Mill Product Size (P80)	µm	13.5	Test work
Concentrate Production Rate	t/h	4.9	Lycopodium
Target Copper Concentrate Grade	% Cu	21.69	Test work
Target Copper Overall Recovery	%	88.9	Test work
Target Gold Concentrate Grade	g/t Au	96.1	Test work
Target Gold Overall Recovery	%	82.0	Test work
Concentrate Thickener Solids Loading	$t/m^2.h$	0.20	Lycopodium
Concentrate Thickener Underflow Density	%	55	Euro Sun
Concentrate Filter Solids Loading	$kg/m^2.h$	190	Lycopodium
Concentrate Cake Moisture	%	8.5	Euro Sun
Tailings Thickener Solids Loading	t/m2.h	0.90	Lycopodium
Tailings Thickener Underflow Density	%	55	Euro Sun
Tailings Filter Solids Loading	$kg/m^2.h$	1,060	Lycopodium
Tailings Cake Moisture	%	14.3	Euro Sun
Lime Consumption*	g/t material	450	Test work
Aerophine C-3418A - Design	g/t material	20	Test work
PAX - Design	g/t material	15	Test work
Aerofroth 65 - Design	g/t material	20	Test work

*NOTE: lime addition based on 90% active CaO content in the supplied quicklime

17.2.2 Run-of-Mine Material Receiving and Crushing

Run-of-Mine (ROM) material will be transported to the plant by trucks of up to 150 t capacity (CAT 785). The trucks will tip directly into the ROM bin through a ROM pocket. A rock breaker will be used to break and clear any build-up of material from the pocket should this occur.

The ROM bin will have a live capacity of approximately 225 t (equivalent to 1.5 times a truckload). Material from the ROM pocket discharges into the gyratory crusher. The primary crushing circuit will reduce the underground and open pit ROM material from a top size of 700 mm to a product size of 140 mm as P_{80}. The gyratory crusher is a MK-III 50-65 or equivalent with a 450-kW motor. Crushed material from the crusher will be drawn, by a variable speed apron feeder, discharging into the crusher discharge rope conveyor via crusher discharge transfer conveyor, which will convey the crusher product to the crushed material stockpile.

17.2.3 *Crushed Material Stockpile*

The covered stockpile has a live storage capacity of 14,000 t (equivalent to approximately 16 hours of mill feed rate) and total capacity of 61,000 t (equivalent to approximately 70 hours of mill feed rate). Crushed material will be withdrawn from the material stockpile, by the variable speed crushed material reclaim pan feeders. The feeders will discharge onto the SAG mill feed conveyor, which will convey the crushed material to the SAG mill feed chute.

17.2.4 *Grinding and Classification*

The primary grinding circuit consists of a SAG mill (11.6 m diameter and 5.75 m EGL) with a 16 MW variable speed drive. The SAG mill will operate in closed circuit with a pebble crusher. Product from the SAG mill will discharge over a grate. Grate discharge gravitate to the SAG mill discharge screen. The screen will be a single deck inclined screen with a width of 3.0 m and length of 7.3 m. The screen deck will have an aperture of 15 mm x 30 mm. Oversize from the SAG mill discharge screen will be transported to the pebble crusher feed bin via a set of recycle conveyors. Pebbles will be withdrawn from the pebble crusher feed bin by a variable speed pebble crusher feeder and from the pebble crusher, the pebbles will discharge into the SAG mill feed conveyor via recycle conveyor, which will convey the crusher product to the SAG mill feed chute.

Undersize from the SAG mill discharge screen will gravitate to the cyclone feed pump box, from where it will be pumped to the classifying hydro-cyclones by one of two cyclone feed pumps (one standby). The hydro-cyclone overflow will gravitate to a trash screen while cyclone underflow will gravitate to the ball mill feed chute for further grinding. The secondary grinding circuit consists of a ball mill (7.92 m diameter and 10.97 m EGL) with a 14 MW fixed speed drive. The ball mill will operate in closed circuit with hydro-cyclones. The ball mill has been designed to be capable of achieving the required grind size to P_{80} of 75 µm. The mill will operate with a nominal 28.6% (maximum 34.5%) by volume ball charge.

17.2.5 *Rougher and Scavenger Flotation Column*

The vibrating trash screen is included in the flowsheet to remove foreign material prior to flotation. The removed trash (wood chips etc.) will be discharged to a trash bin for disposal. Screen undersize will gravitate to the agitated rougher conditioner tank. A sampler will be installed on the screen underflow line to take a sample for metallurgical, process control, and particle size measurement purposes.

Flotation reagents including Solvay (Cytec) Aerophine C-3418A, PAX, Aerofroth 65, and hydrated lime will be added into the rougher conditioner tank.

Overflow from the rougher conditioning tank will be pumped to the rougher flotation columns, which consists of four 4.5 m diameter x 10.0 m height columns in parallel. Rougher concentrate discharged from all flotation cells will be collected and pumped to regrind circuits.

The rougher tailings will be collected and pumped to the scavenger flotation column, which will consist of four 4.5 m diameter x 10.0 m height columns in parallel. Scavenger concentrate will gravitate to regrind circuits. A sampler will be installed on the scavenger concentrate discharge line for plant control and metallurgical accounting purposes.

Scavenger tailings will be collected and pumped to tailings thickener feed box. A sampler will be installed on this line to take a sample for plant control and metallurgical accounting purposes.

17.2.6 Regrind

Rougher concentrate and scavenger concentrate will report to the regrind cyclone feed pump box. The slurry will be pumped to the regrind cyclone cluster by one of the two regrind cyclone feed pumps (one standby). The cyclone underflow will gravitate to the regrind mill. The regrind mill circuit consists of an ISA mill (2.43 m diameter and 5.012 m EGL) with a 3.0 MW drive. The ISA mill will operate in open circuit with discharge feeding to cleaner conditioning tank. The ISA mill has been designed to be capable of achieving the required grind size to P_{80} of 13 µm. The mill will operate with a maximum 75% by volume ceramic ball charge.

Regrind cyclone overflow will gravitate to the agitated cleaner feed conditioning tank. Solvay C-3418A, PAX, Aerofroth 65, and hydrated lime will be added into the conditioner tank if required.

17.2.7 Cleaner Column Flotation

Overflow from the cleaner column feed conditioning tank will be pumped to the cleaner column flotation circuit, which consists of three stages of cleaning. The first and second cleaning stages are open circuit while the third stage is in closed circuit. A sampler will be installed on the first cleaner flotation feed line for plant control and metallurgical accounting purposes. First cleaner flotation will have three 4.0 m diameter x 8.0 m height columns in parallel. Concentrate from these columns will be collected together with tailings from third cleaner flotation columns and pumped to second column flotation. Tailings from first cleaner column flotation will be collected together with tailings from second cleaner column flotation and pumped to tailing thickener feed box. A sampler will be installed on the first cleaner tailings line for plant control and metallurgical accounting purposes. Another sampler will also be installed on the first and second cleaner combined tailings line for similar purposes.

Second cleaner flotation will have two 3.0 m diameter x 8.0 m height columns in parallel. Concentrate from these columns will be collected and pumped to third column flotation.

Third cleaner flotation will have one 3.0 m diameter x 8.0 m height column. Concentrate from these columns will gravitate to concentrate thickener feed box. A sampler will be installed on the third cleaner concentrate line for plant control and metallurgical accounting purposes.

17.2.8 Concentrate Thickening

Concentrate from the third cleaner column flotation will gravitate along with filtrate return from the concentrate filtration area to the 7.5 m diameter high rate concentrate thickener prior to filtration. An automatic slurry sampler installed on this line will collect a representative sample of the cleaner concentrate stream for plant control and metallurgical accounting purposes.

Flocculant will be added to the concentrate thickener. Concentrate thickener overflow will gravitate to the process water tank to be reused as plant process water. Concentrate thickener underflow, at approximately 55% solids w/w, will be pumped to the agitated concentrate filter feed tank.

17.2.9 Concentrate Dewatering and Bagging

The thickener underflow will be stored in a filter feed tank with a nominal 10 hours surge storage capacity and will be fed batch wise to the plate and frame pressure filter.

The filter will remove water from the concentrate to meet the target moisture of approximately 8.5% w/w using a series of pressing and air blowing steps. After the desired filtration time, the filter press will open, and discharge concentrate directly to the floor of the concentrate shed.

Following discharge of concentrate, the filter cloth will be washed prior to the next cycle using raw water. Filtrate which includes manifold flush and cloth wash will return to tailings thickener by gravity.

Filter cake from each filter will discharge onto a concentrate stockpile. A front-end loader (FEL) will be used to remove the concentrate from beneath the filter press and transfer it to the adjacent concentrate loadout system. Concentrates will be loaded into the bags via concentrate bin and transport feeder.

17.2.10 Tailings Thickening

Tailing from the scavenger flotation column will be pumped along with filtrate return from the tailings filtration area to the 42 m diameter high rate tailings thickener prior to filtration. Tailing from the first and second cleaner column flotation will be collected and pumped to the same tailing's thickener. An automatic slurry sampler installed on this line will collect a representative sample of the scavenger tailings stream for plant control and metallurgical accounting purposes. Another automatic slurry sampler installed on this line will collect a representative sample of the cleaner tailings stream for plant control and metallurgical accounting purposes.

Flocculant will be added to the tailings thickener to enhance settling rate. Tailings thickener overflow will flow to the process water tank to be reused as plant process water. Tailings thickener underflow slurry at approximately 55% solids w/w, will be pumped to the agitated filter feed tank.

17.2.11 Tailings Dewatering and Dry Stacking

Thickened tailings (thickener underflow) will be stored in a filter feed tank with nominal 2-hour surge storage capacity, before being fed continuously to the six ceramic vacuum disc tailings filters.

The filter will remove water from the tailings to meet the target moisture of approximately 14.3 w/w using a series of vacuum disc filters. Filter cake will continuously discharge directly to the tailings filter discharge conveyor.

Vacuum pump and tubing will be used to create a vacuum inside the ceramic disc. Liquid, which includes manifold flush and filtrate, will return to tailings thickener. Filter disc will be washed with a solution of 0.5% – 1.0 % w/w nitric acid for one hour in every 8-hour shift.

Filter cake from each filter will be discharged onto a filter discharge conveyor. The discharge conveyors, radial stacker and grasshopper conveyors will transport the filtered tailings to the waste dump area.

17.3 Reagents

17.3.1 Aerophine 3418A

Aerophine 3418A will be delivered in intermediate bulk containers (IBC) and stored in the reagent shed until required. A permanent tank will be installed to provide storage capacity local to the flotation area. 3418A will be dosed neat, without dilution. Multiple diaphragm style dosing pumps will deliver the reagent to the required locations within the flotation circuit. Top up of the permanent tank will be carried out manually as required.

17.3.2 Potassium Amyl Xanthate (PAX)

PAX will be delivered in pellet form in bulk bags within boxes and stored in the reagent shed. Raw water will be added to an agitated mixing tank. The solid reagent will mix into the tank and be dissolved in water to achieve the required dosing concentration. PAX solution will be transferred to a storage tank. Both the mixing and storage tanks will be ventilated to remove carbon disulphide gas.

PAX will be pumped to the flotation circuit and actuated control valves will provide to maintain flowrates.

17.3.3 Aerofroth 65 (A-65)

A-65 will be delivered in IBCs and stored in the reagent shed until required. A permanent storage tank will be installed to provide storage capacity local to the flotation area. A-65 will be dosed neat, without dilution. Multiple diaphragm style dosing pumps will deliver the reagent to the flotation circuit. Top up of the permanent storage tank will be carried out manually as required.

17.3.4 Flocculant

Flocculant will be delivered to site in 25-kg bags and stored in the reagent shed. A mixing and dosing system will be installed. Powder flocculant will be mixed with water to 0.25% w/v flocculant solution and will be agitated in the mixing tank. Once mixing is complete, the flocculant will be pumped to the flocculant storage tank.

Flocculant will be dosed to the concentrate thickener and tailings thickener. Flocculant will be further diluted to approximately 0.025% w/v just prior to the addition point.

17.3.5 Hydrated Lime

Hydrated lime will be delivered to site in a 20-t tanker and will be pneumatically conveyed from the tanker to the lime storage silo. The hydrated lime will be extracted from the lime storage silo, and discharge into the lime slurry storage tank. Raw water will also be added to the slurry storage tank to achieve the desired lime density.

The lime slurry from the lime storage tank will be distributed throughout the process plant as required.

17.3.6 Nitric Acid

Nitric acid will be delivered to site in a 20-ft sea container. From this container the 65% w/w concentrated acid is delivered to a 26 m^3 vendor supplied storage tank located at an elevated level. Concentrated nitric acid will be mixed in a vendor supplied 1-m^3 dilution tank with raw water to achieve the desired solution strength of 0.5 – 1.0 % w/w.

The diluted acid from the dilution tank will be distributed to the ceramic disc filters for one hour in every 8-hour shift.

17.4 Services and Utilities

17.4.1 Plant and Column Flotation Air

High pressure air at 750 kPa(g) will be provided by two high pressure air compressors, operating in a lead-lag configuration. The entire high-pressure air supply will be dried and can be used to satisfy both plant air and instrument air demand. Dried air will be distributed via the plant air receiver.

High pressure column flotation air at 650 kPa(g) will be provided by four high pressure air compressors - three operating and one standby. Flotation air will be distributed via the air receivers.

17.5 Water Supply

17.5.1 Raw Water Supply System

Raw water is supplied to a raw water storage tank from a nearby dam. Raw water is used for all purposes requiring clean water with low dissolved solids, primarily as follows:

- fire water for use in the sprinkler and hydrant system
- cooling water for mill motors and mill lubrication systems
- gland water for pumps
- reagent make-up
- feed for the potable water plant

- raw water will be treated and stored in the potable water storage tank for use in safety showers and other similar applications

17.5.2 Process Water Supply System

Concentrate and tailings thickeners overflow will meet the main process water requirements. Raw water will provide any additional make-up water requirements.

18 PROJECT INFRASTRUCTURE

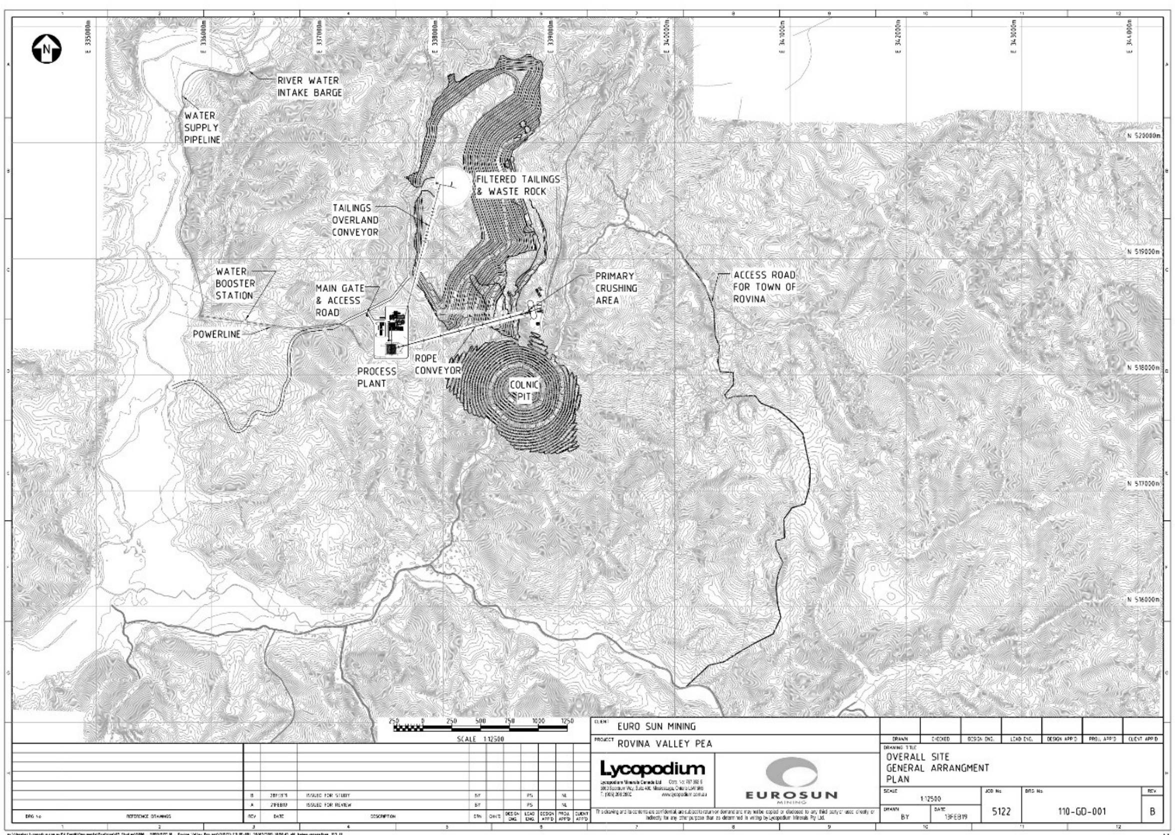
18.1 Overall Site

The overall site plan is shown in Figure 18.1 and includes major facilities of the Project including the Colnic open pit mine, primary crushing and overland conveying, process plant, filtered tailings and waste rock facility, raw water supply, powerline, mine services, and access roads.

Access to the facility is from the west side of the property off an existing road. Main access will be via the main security gate near the process plant.

Grid power will be provided from an incoming HV line from the west side of the property. Raw water will be provided from a dam northwest of the property.

Figure 18-1: Overall Site Plan Roads



Access to the site is from the west, off an existing access road. Plant internal roads will provide access between the administration area, process plant facilities, and mine services area.

18.2 Power Supply

Site power will be provided from an HV line at the project boundary that will be provided by the local power authority. A connected load of approximately 48MW and peak demand of approximately 37MW is required for the facility.

The SAG and ball mills at the flotation plant are the largest loads. The SAG and ball mills have been specified with variable frequency drives to reduce the load surge during start-up.

18.3 Fuel Supply

Diesel fuel will be stored on site near the mine services area for heavy and light vehicle refuelling. Diesel fuel storage and supply will be provided by a fuel supplier and include fuel storage tanks, offloading pumps, dispensing pumps, associated piping, and electronic fuel control/tracking.

18.4 Support Buildings

The following support buildings will be provided for the facility:

- primary crushing buildings
- stockpile cover
- flotation plant building
- reagent building
- truck shop
- warehouse
- maintenance shop
- explosives storage and handling
- fuel station
- plant administration building
- laboratory
- security gate/change facility
- MCCs

18.5 Site Geotechnical

Limited site-wide geotechnical information has been collected for the Project, and specific geotechnical investigations have yet to be completed. The Project will require significant development throughout the property to support the infrastructures such as roads, buildings, tailings/waste rock facilities, sedimentation ponds, etc.

To advance the project into pre-feasibility and feasibility stages, further geotechnical investigations through the overburden and bedrock are recommended. These investigations should include both test pit and borehole methods to establish the subsurface conditions. From this information, assessments can be completed to provide appropriate foundation recommendations for the various infrastructure components for the site.

18.6 Water Systems

18.6.1 Raw Water Supply System

It is assumed raw water will be obtained from the nearby dam. Fresh water will be supplied by raw water pumps and overland pipeline to an atmospheric, vented, fresh water tank at the process plant. Raw water will be provided from the raw water tank for use as fire water, feed to the potable water treatment plant, and other uses at the process plants.

18.6.2 Fire Water Supply System

Fire water will be piped to all main facilities via buried underground fire water ring mains around each of the facilities. In addition, all buildings will be equipped with hose cabinets and supplemented with hand held fire extinguishers of two types: (1) general purpose extinguishers for inside plant areas, and (2) dry type extinguishers for inside electrical and control rooms. Ancillary buildings will be provided with automatic wet sprinkler systems throughout the buildings.

18.6.3 Potable Water Supply

The potable water treatment plant will be designed to local drinking water guidelines. The plant is expected to include multimedia filtration for reduction of turbidity, followed by ultraviolet disinfection for primary disinfection, and the addition of sodium hypochlorite for secondary disinfection. Treatment residuals from the potable water treatment plant (e.g. multimedia filtration backwash) will be sent to the tailing's thickener for ultimate disposal within the tailings/waste rock facility. Treated potable water from the potable water treatment plant will be stored in the plant potable water tank and the safety shower water tank. Treated potable water from the plant potable water tank will be distributed via the plant potable water pump in a piping ring main to serve all potable water users, in all facilities. Treated potable water from the safety shower water tank will be distributed via the safety shower water pumps to drinking fountains, eye wash stations, and safety showers.

Potable water piping in the plant area will either be buried below the frost line, routed through heated buildings, or heat traced and insulated. Manual drain points will be included to allow emptying of pipelines should conditions dictate.

18.6.4 Process Water Supply

Process water will be provided from the flotation concentrate thickener overflow and tailings thickener overflow. Raw water will provide any additional make-up water requirements.

18.7 Sewage Treatment

Sewage generated within the project site will be collected via an underground sanitary sewer network to a common location where it will be treated by an above grade mechanical sewage treatment plant (vendor package). Treated sewage effluent will be discharged to the environment meeting local permit requirements. Sludge generated as a by-product of the treatment of sewage will be disposed of off-site by a licensed contractor.

18.8 Staff Accommodation

There is no provision for an onsite accommodation camp, and it is assumed staff will reside in nearby towns.

18.9 Waste and Dry Stack Tailings Storage

Tailings will be co-mingled with the waste from the Colnic pit in the waste storage area north of the plant. The material will be placed and compacted in lifts with mine rock waste. An estimated 40.6 million loose cubic metres of tailings will be co-mingled with 80.7 million loose cubic metres of rock waste.

Waste rock volumes are estimated using an average density of 2.66 t/m3 and a swell factor of 30% to achieve a placement density of 2.05 t/m3. The dry stack tailings have a higher inherent moisture content and have an assumed placement density of 2.11 t/m3.

The waste and dry stack storage facility has been designed to accommodate the full volumes; the top of the facility will be at 650 masl.

18.10 River Diversion Tunnel

To accommodate mining of the Colnic pit, the current river from Rovina needs to be diverted. The PEA considers a 1.85 km tunnel around the western side of the Colnic pit. The dimensions of this tunnel for the study are assumed at 4.5 x 4.5 m with a concrete channel in the floor and access along the side of the tunnel for maintenance crews.

The river will be diverted with a small dam upstream of the Colnic pit. The discharge of the tunnel will be into the existing river bed.

19 MARKET STUDIES AND CONTRACTS

This section examines potential smelting and refining terms for the copper concentrate and the gold in the concentrate expected to be generated from the Colnic pit and affect the net revenue flow of the project.

Increased demand for copper in the Asian markets, commencing during the late 1990s, has stimulated the expansion of processing capacities for copper raw materials in Asia, and rationalized reduction and/or elimination of similar existing processing capacities elsewhere in the international market. The balancing of supply and demand is expected to continue where newly created processing capacity should absorb much of the new copper concentrate production capacity that will be realized.

The quality of the mine's product will influence the targeted regions for consumption, therefore stressing the importance of the Asian smelting and refining growth on the overall copper concentrate market.

The quantity and estimated value of the mine's product will allow movement of product to multiple regions, therefore, the regions and consumers providing the least commercial risk and the optimum return to the Project should be considered. Considering the higher gold content of the concentrate, those locations providing payables for gold need to be properly considered.

The objective is to establish the estimated smelting and refining terms and conditions for the mine's products based on the analysis provided, and to predict the estimated value for the Project.

19.1 General Considerations

The consolidation of major participants in the copper mining, smelting, and refining market will influence the characteristics of the copper market but should not adversely affect market demand for the mine's product. The product will be clean with an average copper content of 21.7% but high gold grade of 122 g/t. The annual quantity of product is average, and the mine life is reasonable at 13 years.

The mine should not compete directly with major producers such as BHP-B, RTZ, Codelco, Freeport, Vale, Anglo, Teck, Antofagasta, Xstrata or Grupo Mexico; however, it will be influenced by this group's interaction with the major consumers in China, India, Japan, Korea, and the Philippines. Many of the above producer's control or influence the operations of copper smelting and refining complexes.

AGP recommends the mine focus upon selective smelting and refining complexes that currently process copper concentrates in Europe, or along the Pacific Rim, to maximize the gold value obtained from the concentrate sales.

Handling considerations will be slightly different than normal concentrate in bulk as this is bagged to minimize the losses of gold during transportation.

Logistics must be examined however; freight costs should not greatly influence the value of the concentrate. The mine is well located for access to port or rail facilities to allow transport of the product.

Normal deviations in moisture content and the methods established to sample and determine the settlement dry weight must be closely examined and controlled. Moisture samples should be taken when product is weighed and sampled for assays. Care must be taken to immediately seal the moisture samples and follow the established procedures for drying and determination of dry weight. Sampling for assay determination should be examined but will likely follow normal procedures. Samples are taken from the bags when departing the mine area, and possibly again upon loading of the carrying vessel. Here, a frequently calibrated static scale will be utilized before the trailers or cars are discharged at the storage area, prior to loading of the vessel. The trailers or cars must be recorded for tare weight as well as total weight. The storage area for loading the carrying vessels must be very secure.

Assaying, exchange of assay results, and the splitting limits for determination of settlement results must be professionally managed. The use of bagged concentrate should avoid unnecessary losses in handling and transport.

19.2 Terms and Conditions Discussion

19.2.1 Accountable Metals

The actual recovery of payable metals varies by smelting processes, treatment of precious metals and by-product streams, concentration of payable elements within the standard smelting bed (the desired blend of concentrates entering the process), and the impact of deleterious elements on processing efficiency, payable metal recovery, and deleterious element containment costs. A smelter with minimal precious metal in their overall feedstock will struggle to achieve modest recovery of the precious metals when compared to a smelter with above average precious metals in their feedstock. Some smelters have efficient slag cleaning furnaces, while older facilities are not physically able to improve precious metal recovery.

For the purposes of this study, the assumption was made that the gold contained within the copper concentrate would be payable at 99% of the contained metal.

19.2.2 Smelting and Refining Charges

The proposed smelting and refining terms for each product are consistent with anticipated market trends, reflecting a rise in mine production to compensate for the immediate market shortages and higher than usual prices for each accountable metal. No direct contact or definitive smelter agreements have been obtained for the concentrate, although, the concentrate would not be difficult to market. This is due in part to the higher gold grade in the copper concentrate and apparent lack of deleterious elements. No penalties need to be applied in the terms for the concentrate.

Table 19-1 shows the terms applied to the study for determining net metal values and metal revenue. These terms are considered reasonable for the purposes of the PEA study.

Table 19-1: Smelting and Refining Terms

Term	Unit	Copper	Gold
Cu, Au Minimum Deduction	%, g/dmt	1.0	1.0
Base Smelting Charge	$/dmt	85.00	-
Cu Refining Charge	$/lb payable	0.085	-
Payable Gold	%	-	99.0
Refining Charge	$/oz	-	5.00
Concentrate Grade	% g/t	21.7%	122 gpt
Concentrate Moisture	%	8	-

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

In compliance with the Romanian Mining Law's requirement for the Mining License Application, a series of environmental and social-economic studies have been developed mainly between 2012 and 2014. In addition, a series of more detailed studies, related to biodiversity, were produced after 2014. A list of these studies is shown in Table 20-1 below.

Table 20-1: Completed Studies

Description	Date Published	Author
Archaeological Diagnosis Report (I)	2009	Museum of Dacian and Roman Civilisation, Deva
Geochemical Characterization of Ore and Waste by Static Testing	2012	Lawrence Consulting Ltd, Vancouver
Rovina Project ESIA Gap Analysis and Work Programme	2012	AMEC UK
Geochemical Characterization of Ore and Waste by Kinetic Testing	2013	Lawrence Consulting Ltd, Vancouver
Archaeological Diagnosis Report (II)	2013	Museum of Dacian and Roman Civilisation, Deva
Social Impact Assessment and Social Impact Mitigation Plan	2014	Tripart Consulting SRL, Baia Mare
Report on the Environmental Impact Assessment Study	2014	Ecoterra Ing. SRL, Baia Mare
Technical Design for the Environmental Rehabilitation	2014	Research and Development National Institute for Metals and Radioactive Resources, Bucharest
Environmental Rehabilitation Plan	2014	Ecoterra Ing. SRL, Baia Mare
Risk Assessment Preliminary Study	2014	Ocon Ecorisc SRL, Turda
Waste Management Plan	2014	Research and Development National Institute for Metals and Radioactive Resources, Bucharest
Preventive Archaeological Report	2016	Museum of Dacian and Roman Civilisation, Deva
Biodiversity Study - Invertebrates, Batrachians and Reptiles, Non-forest Flora, Birds	2018	Technical University, Cluj-Napoca
Small Mammals Study	2018	Transivania University, Brasov
Forestry and Large Mammals Study	2017/2018	National Institute for Research and Development in Forestry, Bucharest

20.1 Water

20.1.1 Site Hydrogeological Conditions

For the Colnic Project, the hydrogeologic system consists of a network of permanent and non-permanent water courses and the aquifers of the deposit and adjacent area associated with the Crisul watershed.

The main characteristics of the hydrogeological systems for the deposits are:

- the oxidation zone is incomplete and at an initial stage
- faults are rare and are generally closed
- the rocks composing the geological structures hosting the deposit can be defined as impervious with very low active porosity
- hydrothermal alterations affecting the lithological structure is reducing the active porosity of the system

The permanent water courses, for which the quality was tested during exploration and will be monitored during the mining project, are Rovina Valley and Bucureşci Valley. These water courses can influence the quality of the Crisul Alb river.

During the exploration program, sediment samples and groundwater samples were collected and analyzed within the Colnic Project area to define the initial conditions.

20.1.2 Water Sources, Drainage, Improvement, Management

There are currently no centralized water supply sources in the license area.

The project proposes the construction of a water supply system from the Mihaileni water dam (located on the administrative territory of Buces commune on the Crisul Alb River) for the industrial and domestic consumers within the mine license area and also for the water consumers in the localities of Rovina , Merişor, Curechiu, Şesuri, and Bucureşci.

The water will be captured from Mihaileni pond and transported via pipeline to the process plant site and further supplied to the raw industrial water users and water treatment (purification) plant.

Potable water supply to the consumers within the license area, as well as of the people in the localities of Rovina, Merişor, Curechiu, Şesuri, and Bucureşci, will be achieved by treatment of the water from the Mihaileni pond in a water purification plant constructed within the ore treatment plant site.

Industrial water for the users in the license area will be supplied from the Mihaileni pond. The ore process plant will use water from the water impoundment to be constructed downstream of Colnic open pit.

Currently there are no drainage and improvement systems within the license area. The Colnic deposit is located in the Rovina Valley and exploitation of the Colnic Pit will disrupt the Rovina Valley creek's course.

The completion of the mining works will involve:

- Construction of an impoundment downstream of the Colnic open pit that will collect the potentially contaminated water from the sump and the run-off water from the low-grade ore stockpile and pyrite stockpile .
- Construction of a collection system (ditches and channels) for the potentially contaminated water (collected from Colnic open pit and surface of the mining waste and tailings stockpiles, pyrite deposit, and low-grade ore deposit) and diversion to the impoundment downstream of Colnic open pit.
- Construction of a water treatment plant downstream of the impoundment which will be used as required; either for the treatment of water used by the process plant or for the treatment of the stored water prior to discharge into Rovina Valley.
- Construction of a collection system for the conventionally clean water and diversion of the small creek into the Rovina Valley downstream of Colnic pit.
- Construction of a sump (located upstream of Colnic pit) where the potentially contaminated storm water from the dumps will be collected and discharged via a ditch system into the impoundment located downstream of Colnic Pit.
- Construction of a ditch system to ensure the continuity of flow of the Rovina Valley creek (discontinued by the Colnic Pit construction) and for the transport of the potentially contaminated water to the impoundment/catchment downstream of Colnic Pit.
- Channels/ditches whereby the potentially contaminated water washing the low-grade ore deposit and pyrite deposit is directed into the impoundment downstream of Colnic Pit.
- Water from the impoundment downstream of Colnic Pit will be returned for use in the process plant.

The Colnic project will not use well water. The only groundwater used will be the groundwater collected naturally from the Colnic open pit; this water will be collected together with the storm water and will be stored in catchment tanks near the open pit and used as part of the water requirement for mine hole drilling. The excess water will be discharged in the sump.

The water collection and discharge system for the conventionally clean water will consist of the following:

- diversion ditches upstream of Colnic Pit, waste dumps, pyrite deposit, and low-grade ore deposit
- drains and pipes along the water courses
- re-routing the Rovina Valley creek water flow and discharge the Rovina Valley flow downstream of the impoundment into the Bucureşci Valley

Water from the process plant site (plant site, workshop, fuel storage facility, parking platform, restrooms etc.) will be discharged into the Bucureşci sewerage system, as follows:

- process wastewater resulting from the treatment process (water from the tailings filtering, water from the filtering of the mining concentrate and pyrite) after a pre-treatment in a designated plant located at the plant site
- wastewater from restrooms, with no prior treatment
- domestic wastewater from food preparation/heating (canteen) after prior treatment in fat separators
- water from the truck wash after prior treatment in decanter-product separator
- stormwater from roadways, after prior treatment in decanter-light product separator

20.1.3 Wastewater / Potentially Contaminated Water Management

All mining facilities which can generate potentially contaminated water will be located in the Rovina Valley watershed.

The wastewater sources within the license area are:

- process wastewater from the ore treatment operation and obtaining of the mining concentrate
- discharged water purges from press filters of process tailings
- wastewater from administrative buildings, change rooms, restrooms and canteen
- process wastewater from the machinery/equipment maintenance activity

A treatment plant will be constructed at the plant site for the wastewater treatment to ensure compliance with quality standards for discharge into the Bucureşci sewerage system.

The potentially contaminated water sources generated by the mining activity undertaken in the mine license area are as follows:

- groundwater and storm water collected naturally in the Colnic open pit
- run-off water from the waste dumps, low-grade ore deposit and pyrite deposit
- run-off water from the platforms and access roads constructed in the open pits and deposits
- domestic wastewater resulting at the plant site

The potentially contaminated water discharged from the Colnic Pit and the potentially contaminated run-off water from the waste dumps and storm water from the platforms and roads within the mining project will be discharged directly into the sump.

Part of the wastewater from the filtering of the mining concentrate, pyrite and process tailings water will be reused in the ore treatment process, while the other part will be treated (to ensure compliance with quality standards for discharging) and further discharged into the Bucureşci sewerage system.

In order to protect the surface water quality in the Rovina Valley watershed, the project proposes the following:

- construction of drains and casing of water courses (permanent and non-permanent)

- construction of a diversion ditch which will collect the water and the potentially contaminated water
- construction of a sump upstream of Colnic Pit which will collect the potentially contaminated water from the waste stockpiles
- construction of an abutment wall between the waste dump and the sump upstream of Colnic pit
- construction of a sub-crossing channel for the contact water
- collection of run-off water from the pyrite stockpile area and low-grade ore deposit, and diversion to the impoundment downstream of Colnic pit
- construction of a water treatment plant at the impoundment downstream of Colnic pit, to ensure the quality of the water supplied to the process plant and if necessary, the quality of the water discharged into the Bucureşci stream
- construction of a wastewater treatment plant at the ore process plant
- construction of guard ditches along the perimeter of all mining works which will collect the stormwater and divert it downstream of the respective works
- decanter- petroleum product separator for wastewater generated by the truck wash facility and stormwater from the road/process sites
- oil and fat separators for domestic wastewater generated by food preparation activities
- monitoring point for the Rovina Valley water quality placed downstream of Colnic Pit

The process wastewater resulting from washing, maintenance activities, and stormwater collected from the road/technical platforms and fuel station platform will be treated in facilities where part of the suspended particles and part of the petroleum products will be retained.

20.1.4 Impact Forecast and Mitigation Measures

The water supply source for the water consumers within the license area was designed to provide water supply to a number of localities in the Hunedoara County and also to all potential industrial water consumers within the Mihaileni dam site. Therefore, no negative impact on the water supply source of the proposed project is foreseen.

Due to the water supply sources to be used, the characteristics of wastewaters and the collection, treatment, and discharge of wastewater, no changes of the site hydrological and hydrogeological conditions are estimated.

The project does not foresee any wastewater/potentially contaminated wastewater discharge into the natural receptors.

The presence of water consumers/wastewater sources associated with the project area operations will not generate changes in the water body ecosystems within the impact area, therefore no negative effects on the water bodies can be estimated.

In the mining project assessment, no situations where potential accidental discharges of contaminated water in the water bodies were identified.

Water discharged from the mining project site into the Crisul Alb watershed will not affect the quality of the rivers. Therefore, it can be assessed that the mining project operations will not affect the quality of the receptor (Crisul Alb) and will not bear any transboundary impact.

The volume of water taken from the water source for the mining operation will be controlled through measuring systems installed at the proposed facility.

Mitigation of the impact on the water source will be achieved by minimizing the volume of water taken from the water source.

Minimization of the supplied water volume will be performed by using:

- water recycled from the process flow sheet
- potentially contaminated water from the proposed operations

The accidental water pollution prevention measures will be assured by construction facilities of the mine site (casings, tunnel, sump and impoundment, treatment plant, and equipment) according to the wastewater management plan.

20.2 Air

The project area is not characterized by the presence of major pollution sources. The only current air pollution sources are related to the use of solid fuel for household heating in the localities of Criscior, Bucureşci, Merisor, and Rovina and road traffic along DN 74 Abrud-Brad and DJ 741 Crişcior-Curechiu.

Industrial activities are not well represented in the area and are not significantly affecting the air quality.

Within the project area and adjacent areas there are a number of old waste dumps and tailings deposition ponds, however, most of them are partly covered by vegetation and raise no significant concerns in terms of airborne dust emissions.

The mining operation within the project area will include the following activities generating air pollutant emissions:

- ore and waste stripping in the Colnic Pit using explosives
- loading in trucks of the ore and waste blasted in the open pit
- ore crushing near the Colnic pit
- waste transport from the Colnic pit to the waste storage facilities
- storage of the crushed ore at the process plant site

The air emission generating activities carried out within the project area will be considered and reviewed as surface sources generating diffuse air pollution. The primary ore crushing operation will be assimilated with a point air emission source. Similarly, the ore depositing operation in the low-grade ore deposit will be assimilated with a point air emission source.

The ore transport operations by trucks will be considered linear/mobile pollution sources.

All air pollution sources related to the Colnic pit mining operations will be diffuse air pollution sources. The nature of the air pollution sources within the project area operations does not allow the use of emission control installations. However, a series of techniques designed to reduce the air pollutant emissions, particularly dust emissions, are available and will have to be applied. For all these operations the dust emissions will be controlled and minimized.

Dust retention equipment is provided for the ore crushing facilities.

20.3 Soil

The pedogenetic factors within the Crisul Alb watershed resulted in the development of an edaphic layer with mosaic aspect which includes zonal soils and a-zonal soils.

The current characteristics of the soils in the area are defined mainly as a result of anthropic activities carried out for a long time. Due to the presence of the ore deposits in the area, metal elements (mostly heavy metals are present in the soil).

No anthropic activities determining significant changes in the soil quality were carried out strictly within the contour of the Colnic Project.

At the Colnic pit site there are some old adits and mine waste dumps. The dumps are relatively small, and the dump material is covered entirely or partly by vegetation. The soil in the mining work area does not seem affected by the historical activities.

No areas with potentially polluted soils by previous activities were identified for any of the proposed work/mining facility sites.

The proposed mining operation within the project area may impact on the soil quality as follows:

- soil excavation in the Colnic pit site
- deposition on the soil surface of mining waste (waste rock and tailings)
- soil excavation for the various project constructions (industrial roads, process plant site, technical platform)
- potential fuel, lubricant, flotation reagent leaks on soil

Occurrence of geomorphological changes within the site is estimated, such as:

- modification of lands as a result of engineering, mining, excavation and earth works
- potential ARD generation
- increased land erosion by changes in the topsoil
- impacts on the hydraulic geometry and solid material flowrate through the construction of dams and other hydrotechnical works in the riverbed

The impact of the proposed operation on the soil quality will consist mainly in the change, at least temporarily, of the land use categories within the mining works and facilities area.

The proposed works for soil quality protection are:

- top soil stripping from the proposed mining facility sites and its storage in a stockpile
- completion of surface water management diversion/collection structures
- construction of diversions along the waste dumps, low-grade ore deposit, pyrite deposit and discharge of the water collected in the ditches downstream of the mining deposits, along the surface water flowing direction
- recovery of pyrite from ore and storage in a designated area
- construction of stockpiles for low-grade ore ensuring that the material will not come into contact with the soil
- implementation of mine waste deposition techniques which will facilitate strict monitoring and the inhibition of ARD generation
- storage of the of fuel tanks without any uncontrolled fuel leaks
- lubricant and flotation reagent storage without contact with the soil
- implementation of a strict monitoring system for the technical condition of the installations, equipment, machinery and facilities

During the mining closure phase, part of the areas affected by soil removal will be covered back with soil and re-vegetated, some will have new functions according to a territorial development plan well justified and agreed by the local communities.

20.4 Biodiversity

The detailed biodiversity studies concluded the following:

- The forestry study shows the biodiversity of wood plant species (trees and shrubs) does not stand out as anything special. No rare endemic species, or species requiring special protection or care/ conservation measures were identified. The existing species are common species, widely spread at national level.
- The large mammal study concluded these species manifest their sporadic presence in the area, especially for marking territorial boundaries. No signs of usage as hunting or multiplication area in the project area were identified.
- The small mammals study shows no endangered or vulnerable species in the Colnic area have been identified.
- The Invertebrates, Batrachians, Reptiles, and non-forest flora and birds study concluded that no protected, vulnerable, or endangered species have been identified in the area.

20.5 Socio-Economics

20.5.1 Colnic Project Area Socio-Economic Context and Impact

The Colnic Project is located in the Northern part of Hunedoara County, in the Golden Quadrilateral Mining District/Apuseni Mountains, which has a long mining history and tradition of being the former main resource of local development. Less than 4 km southwest is the Romanian State operated Brad-Barza sub-mining district, until closing in 2006 resulting in legacy environmental issues (underground mine water, waste deposits, industrial brown fields) and high unemployment (5,000 workers being employed during peak operations).

The Colnic project footprint (about 170 ha) covers areas from Bucureşci Commune (pop. 1,553) with the Rovina (pop. 214) satellite community, including Colnic Deposit. The City of Brad, (pop. 17,000) located 10 km west of the Project, represents the socio-economic center of the area.

The general landscape is rural with broadleaf secondary forests covering approximately 85% of the area, rewilding intensively former agricultural fields on the hills. Scattered small rural settlements are present on the property, comprising subsistence agricultural activities, mostly on the gentler low-elevation slopes, and in the river valleys. The valleys contain open land, which is used for pasture, and houses with small garden-sized vegetable plots. There are no houses recorded in the direct vicinity of the Colnic Deposit.

Many of the residents (mainly elderly persons and a significant number of retired miners) are engaged in subsistence agricultural activities or have left the area seeking employment or to complete their education. The project is expected to employ approximately 400 employees directly from the Zarand area (historical region with its center in Brad). It is estimated a further 1,800 jobs will be created during construction and in services related to mining activities.

20.5.2 Social License of Operation

Concept, Principles, Legacy

”Sustainable Mining” is the concept based on its five key principles:

- financially viable
- environmentally sound
- socially responsible
- implemented with sound governance
- to bring lasting benefits especially for local communities

Sustainable mining matches values of sustainable development with the mining best practice of management and operations. Fortunately, Brad mining had a historical sustainable mining best practice legacy of” MICA” Brad - mining society (1920 - 1948).

Methodological Approach

Euro Sun acts as a responsible member of local community and a corporate citizen at the national level of the mineral and mining sector. This approach is the process component of each stage of mining project life.

Results

The Colnic project applied participative tools of mining project design, working in direct contact with all ongoing identified stakeholders; locals or external, public or private. Starting in 2012, Euro Sun went through four different project design scenarios based on direct (public meetings, focus groups, semi structured/interviews, door to door Q&A) and indirect (on line networking, info materials), positive or negative inputs from stakeholders.

Euro Sun carefully applies European Union regulations transposed into the Romanian legal framework and international best practices regarding public access to information, consultation and participation in the decision-making process, during all the mining project stages, including The Exploitation Mining License Governmental Decision (Nov.2018).

Euro Sun prepared a Social Impact Study and Social Impact Mitigation Implementation Plan for the Mining License Application. This document represents:

- a baseline study designing a social data base/framework
- defines the necessary detailed specific fields of future social research and development planning
- integrates the project into the administrative local-regional development and also into the national mineral & mining sector development

Euro Sun, in partnership with Bucureşci Town Hall, implemented a Land Ownership Registration Campaign in the mining project area, supported by the company and promoting stakeholder's direct engagement.

Euro Sun sustains, on a yearly prioritization basis, the Neighborhood Social Action Plan in the main fields of action; Stakeholders Engagement, Community Capacity Building, Small Infrastructure, Social Life, Academic Networking - Research & Development.

20.6 Archaeology

Archaeological investigations have been conducted by the Deva Museum of Dacian and Roman Civilisation during three field campaigns (2008-2009, 2012-2013, 2015-2016) for a total of 166 archaeological trenches being excavated.

Detailed archaeological investigations were carried out in 2015 over two areas previously identified with archaeological potential. Here, the archaeologists identified some bronze-age artifacts around what has been considered two seasonal habitation areas. All the artifacts have been collected by the Deva Museum, the conclusion being that these areas can be archaeologically discharged.

Beside these two, no other pre-historical or roman period vestiges have been identified in the Colnic Project.

20.7 Risks

The conclusion of the qualitative risk assessment shows the majority of the accident scenarios taken into consideration pose a low to very low risk; only the accidental explosions on handling/transporting explosives and diesel fuel tank fires pose a moderate risk involving implementation of special response procedures.

Therefore, a more detailed assessment based on quantitative risk assessment for these accident scenarios that may be deemed potentially major accidents will be developed.

Accidents resulting in the loss of waste rock dump stability could pose environmental risks due to the size of these waste facilities and content of toxic substances in the dumped material. This will be evaluated during the detailed project technical design.

20.8 Waste Management

The mining operation in the license area will generate two categories of waste:

- mining waste generated by ore mining and processing
- non-mining waste generated by auxiliary operations to mining

20.8.1 Mining Waste

The mining operation to be undertaken within the license area will generate two categories of waste:

- mining waste from the open pit
- filtered tailings from ore processing

Both categories of mining waste (waste rock and process tailings) will be co-deposited in waste rock dumps using trucks and conveyor belts. The filtered process tailings will be incorporated in the waste rock body and in the waste rock, minimizing the risk of acid rock drainage in the dumps.

Co-deposition of mining waste and filtered process tailings in the same waste dumps takes into account the need to minimize ARD and ensure the stability of the deposited material. The areas selected for the waste storage facilities provide the required design storage capacity for the life of the mine, plus an additional contingency capacity.

Drains will be set-up in the waste rock dump location, and surface water courses will be directed through permanent or non-permanent pipelines.

The active line of the dump faces will be split into four sectors:

- sectors for ongoing stockpiling
- sectors for deformation (slide-settlement)
- sectors under settling
- sectors under preparation

The waste rock dump deformation will be detected and monitored by visual observations and periodical topographical surveys. Photogrammetric measurements by laser telemetry will be conducted to determine the movement direction and size of the various points on the upper berm, embankment, and bottom of the dump.

20.8.2 Non-Mining Waste

Non-mining industrial waste (i.e. oil, tires, batteries, etc.) will be generated throughout the Life of Project. These will be collected by specialized contractors according to Romanian and European waste management regulations.

20.9 Mine Closure

The mine closure activities will consist of the following:

20.9.1 Colnic Open Pit

- adjustment of the pit slope gradients
- deposition of topsoil at the upper part of the pit slopes
- deposition of a compacted clay layer with a width of minimum 1.5 m over the entire surface of the open pit
- construction of a spillway in the southern part of the pit
- planting of forestry vegetation on the pit slopes
- Rovina creek will be diverted in the open pit to create a lake

20.9.2 Waste Dump

- slope adjustment works
- cleaning of the dump surface from oversized material
- waste rock dump stabilization through forestry plantations, full forestation of the dump platforms and slopes with forest
- stabilization and consolidation of dump slopes with wattle coastal fences along the contour lines
- deposition of a clay layer and compaction of the dump sites to ensure waterproofing
- support walls at the waste dumps
- guard ditches (over several sections)
- monitoring works - completion of geotechnical works and constructions for dump stabilization (installation of survey pegs for deformation monitoring)
- maintenance and revision work of plantations, gap fill

20.9.3 Plant and Infrastructure

- demolition of structures
- removal of equipment foundations
- backfilling of voids
- clearing of site rubble and total removal of unacceptable materials
- land levelling

21 CAPITAL AND OPERATING COSTS

21.1 Capital Cost Summary

The initial and LOM capital cost estimate for the Project is summarized in Table 21-1 with detail on the sustaining capital cost estimate summarized in Table 21-2.

All costs are expressed in USD unless otherwise stated and are based on Q1 2019 pricing and deemed to have an overall accuracy of ±40%. The capital cost estimate conforms to AACEI Class 5 estimate standards as prescribed in recommended practice 47R11.

The capital cost estimate was based on an engineering, procurement and construction management ("EPCM") implementation approach and typical construction contract packaging. Equipment pricing was based on quotations and actual equipment costs from recent similar Lycopodium projects considered representative of the Project.

Table 21-1: Capital Cost Estimate (Q1 2019, ±40%)

Area	USD (Excluding Duties and Taxes)
Pre-strip (capitalized)	$33,505,000
Mining*	$19,561,000
Process Plant	$264,671,000
Infrastructure	$16,966,000
Project Owners Costs	$5,000,000
Subtotal	$339,703,000
Sustaining Capital	$12,207,000
Total	**$351,910,000**

NOTE: Mining capital costs are based on leased mining equipment and the initial capital includes a 20% down payment for the mine fleet.

Table 21-2: Sustaining Capital Cost Estimate (Q1 2019, ±40%)

Area	USD (Excluding Duties and Taxes)
Mining	$12,207,000
Closure Costs	$20,000,000
Salvage Costs	-$20,000,000
Total	**$12,207,000**

The following exchange rates have been used in the compilation of the estimate:

Table 21-3: Currency Exchange Rate

Forex	USD
EUR	1.15
CAD	0.75
USD	1.00

21.2 Mine Capital Costs

The mining equipment capital costs reflect the use of financing. Base capital costs were obtained and developed with options, then financing parameters were applied. A 20% down payment is the only cost being included in the capital cost while the remainder was distributed in the mine operating cost discussed later in Section 21.

To provide background on the equipment cost derivation, the full capital cost and timing are shown in addition to the timing of the lease costs. The down payment for the finance cost was assumed to be paid at the time the equipment was ordered.

Equipment pricing was based on quotations from local vendors and information in AGP's database from recent projects.

The base costs provided by the vendors are included in the calculation for each unit cost and options were added to that as shown in Table 21-4 with the full finance cost and down payment; all costs shown do not include tax.

Table 21-4: Major Mine Equipment – Capital Cost, Full Finance Cost and Down Payment

Equipment	Unit	Capacity	Capital Cost ($)	Full Finance Cost ($)	Down Payment ($)
Production Drill	mm	127	3,637,000	3,830,300	751,400
Production Loader	m^3	20	1,537,000	1,619,400	307,400
Hydraulic Shovel	m^3	22	4,943,000	5,207,900	988,600
Haulage Truck (Rigid)	t	136	1,885,000	1,986,000	377,000
Crusher Loader	m^3	13	687,000	723,800	137,400
Tracked Dozer	kW	474	928,000	977,700	185,600
Grader	kW	163	584,000	615,300	116,800

In the case of the haulage trucks, spare boxes are included in the cost. The estimate is one spare box will be required for every four trucks. This cost is factored into the unit cost of each truck.

The distribution of the capital cost is completed using the units required within a period. If new or replacement units are needed, that number of units, by unit cost, determines the capital cost for that period. There is no allowance for escalation in any of these costs. Timing of major capital equipment costs is one year in advance of the need for that piece of equipment. Therefore, if the equipment is required in Year 1, the cost is charged in Year -1. The finance calculation adjusts that, so the cost of the down payment is in the year the order is placed and considers delivery time.

The number of units are determined by operating cost estimate for operating hours. These were balanced over periods of time so if there are fluctuations in the hours from period to period, or year to year, they are distributed for the entire equipment fleet to balance the hours.

Replacement times for the equipment are average values from AGP's experience. Options around rebuilds and recertification of equipment like track dozers is not considered, nor is used equipment, although that should be considered during the purchase of the mine fleet.

The balancing of equipment units based on operating hours is completed for each major piece of mine equipment. The smaller equipment was based on number of units required, based on operational experience. This includes such things as pickup trucks (dependent on the field crews), lighting plants, mechanics trucks, etc.

The most significant piece of major mine equipment is the haulage trucks. At the peak of mining, 25 units are necessary to maintain mine production. This happens from Year 5 onwards. The maximum hours per truck/per year are set at 6,000. There are periods where the maximum hours per unit are below what the maximum possible can be. In those situations, increasing the maximum on the number of trucks still leaves residual hours required to complete the material movement, therefore, the number of total trucks is unchanged. In these cases, the hours required are distributed evenly across the number of trucks.

The other major mine equipment is determined in the same manner. Therefore, in some instances the loaders have a longer period of life (same number of hours between replacements) due to the sharing of hours with the other units in the fleet.

The support equipment is usually replaced on a number of year's basis. For example, pickup trucks are replaced every three years, with the older units possibly being passed down to other departments on the minesite, but for capital cost estimating new units are considered for mine operations, engineering, and geology.

The timing of equipment purchases, initial and sustaining, are shown in Environmental

Euro Sun has advanced their environmental program well beyond what is normally associated with a PEA study. The progression towards and receipt of the mining licence is indicative of this.

In compliance with the Romanian Mining Law's requirement for the Mining License Application, a series of environmental and social-economic studies have been developed mainly between 2012 and 2014. In addition, a series of more detailed studies, related to biodiversity, were produced after 2014.

The detailed biodiversity studies concluded the following:

The forestry study shows the biodiversity of wood plant species (trees and shrubs) does not stand out as anything special. No rare endemic species, or species requiring special protection or care/ conservation measures were identified. The existing species are common species, widely spread at national level.

- The large mammal study concluded these species manifest their sporadic presence in the area, especially for marking territorial boundaries. No signs of usage such as hunting or multiplication area in the project area were identified.
- The small mammals study shows no endangered or vulnerable species in the Colnic area have been identified.
- The Invertebrates, Batrachians, Reptiles, and non-forest flora and birds study concluded that no protected, vulnerable, or endangered species have been identified in the area.

The Colnic project applied participative tools of mining project design, working in direct contact with all ongoing identified stakeholders; locals or external, public or private. Starting in 2012, Euro Sun went through four different project design scenarios based on direct (public meetings, focus groups, semi structured/interviews, door to door Q&A) and indirect (on line networking, info materials), positive or negative inputs from stakeholders.

Euro Sun prepared a Social Impact Study and Social Impact Mitigation Implementation Plan for the Mining License Application. Euro Sun, in partnership with Bucureşci Town Hall, implemented a Land Ownership Registration Campaign in the mining project area, supported by the company and promoting stakeholder's direct engagement

Archaeological investigations have been conducted by the Deva Museum of Dacian and Roman Civilization during three field campaigns (2008-2009, 2012-2013, 2015-2016) for a total of 166 archaeological trenches being excavated.

Detailed archaeological investigations were carried out in 2015 over two areas previously identified with archaeological potential. Here, the archaeologists identified some bronze-age artifacts around what has been considered two seasonal habitation areas. All the artifacts have been collected by the Deva Museum, the conclusion being that these areas can be archaeologically discharged.

21.3 Recommendations and Proposed Budget

Based on the results of the PEA study, AGP recommends that Euro Sun continue proceeding forward with additional studies and a feasibility leading to a potential project execution decision. The recommendations, and associated budgets, are described below.

The Rovina and Ciresata deposits, while not a component of the PEA study, represent an opportunity for Euro Sun to expand the project as it is currently envisaged.

21.3.1 Geotechnical

Additional drilling should focus on areas required to support a feasibility study using the mining scenario developed in this PEA. Such areas consist of:

- Colnic open pit geotechnical/hydrogeologic drilling,
- Infrastructure geotechnical drilling for process plant, crushing stations, and ancillary ore haulage conveyors,
- Condemnation drilling below planned infrastructure and waste storage facility.

21.3.2 Geology

Euro Sun should increase the drill density in selected areas. The main objectives of this drilling program would be:

- Upgrade existing resources to Measured in areas affected by the first 1- to 3-years of mining for the Colnic deposit. A similar program should be considered for the Rovina deposit when it will be considered in a possible PEA or feasibility study.
- Complete the delineation of mineralization limits at Rovina prior to inclusion in a future feasibility study.
- In preparation for a feasibility study, AGP recommends a conditional simulation run to quantify the degree of risk in the resource for an estimated cost of $20,000 for a pilot run.
- Provide new assay and geologic data through detailed drill core logging and interpretation to address any weaknesses in the current resource models following the conditional simulation model.

21.3.3 Open Pit Mining

Significant work has been completed to date on the open pit designs and this work demonstrates the potential for economic development of the Project. There are still some areas that require further definition prior to mine operation and can be handled as separate studies or part of a future feasibility study.

- Grade control procedures for proper material categorization
- Pit dewatering requirements
- Wall slope analysis to determine if steeper slopes are possible

21.3.4 Metallurgy

The following is proposed for future metallurgical work:

- Flotation configuration
- Flotation Concentrate Filtration
- Thickened Flotation Tailings Filtration

21.3.5 Infrastructure

Additional studies are required with respect to:

- Rope conveyor and its alignment
- Detailed surveys of the plant site location, road accesses and water pipeline
- Power study
- Waste and tailings placement facility
- River diversion dam and tunnel design and investigation
- Site wide water balance

This work will also include incorporation of the geotechnical work discussed early into the designs.

21.3.6 Environmental

Additional background information needs to be collected, especially in regard to the creek diversion and dry stacking of tailings. Further study will assist in providing regulators with all the required information.

21.3.7 Estimated Budget

The total estimated cost for Euro Sun to advance the project to a feasibility study are shown in Table 1-7.

Table 1-7: Summary of Recommendation Budgets

	Recommended Budget ($)
Geotechnical Drilling	Part of geology budget
Geology	3,476,000
Mining	575,000
Metallurgy	450,000
Infrastructure	400,000
Environmental	300,000
Feasibility Study	3,000,000
Total	**8,201,000**

for the finance down payment. If the project was to advance without financing, the quantity of units would be identical. The expected operating life of each unit is also shown in the table.

Finance down payments are initial capital in Years -2 and -1. Finance down payments from Year 1 onwards have been allocated to sustaining capital; interest for the financing is included in the operating cost.

Table 21-5: Equipment Financing Timing – Initial and Sustaining

Equipment	Unit Life	Yr -1	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11
Production Drill	25,000 hrs	1	1	-	1	1	-	-	-	-	-	-	-
Production Loader	35,000 hrs	1	-	-	-	-	-	-	-	-	-	-	1
Hydraulic Shovel	60,000 hrs	1	-	-	1	-	-	-	-	-	-	-	-
Haulage Truck (Rigid)	60,000 hrs	4	1	1	5	7	1	1	5	-	-	-	-
Crusher Loader	25,000 hrs	2	1	-	-	-	-	-	2	-	-	-	-
Tracked Dozer	35,000 hrs	4	-	-	-	-	-	-	-	-	-	-	-
Grader	20,000 hrs	2	-	-	-	-	-	-	-	-	-	-	-

The portion of the mining equipment capital cost not covered under the financing or the initial down payment costs, plus the other capital items are shown in Table 21-6.

Table 21-6: Mining Capital Cost Estimate

Equipment	Total ($)	Preproduction Year -2, -1 ($)	Sustaining ($)
Mining Equipment			
Major Equipment	14,038,300	4,431,800	9,606,500
Support Equipment	3,333,600	1,590,400	1,743,200
Subtotal – Mining Equipment	17,371,900	6,022,200	11,349,700
Miscellaneous Mine Capital			
Engineering Office Equipment	1,200,000	1,200,000	-
Pit Dewatering - Pumps/Piping	1,216,000	358,400	857,600
Waste Dump Preparation	250,000	250,000	-
Diversion Dam	500,000	500,000	-
Downstream Settling Pond	250,000	250,000	-
Haulroad to East Side of Pit – 3.2 km	2,400,000	2,400,000	-
Haulroad to West Side of Pit – 2.3 km	1,380,000	1,380,000	-
River Diversion Tunnel	7,200,000	7,200,000	-
Subtotal – Miscellaneous Mine Capital	14,396,000	13,538,400	857,600
Pre-Production Stripping	33,505,100	33,505,100	-
Total Mine Capital	65,273,000	53,065,700	12,207,300

21.3.8 Miscellaneous Mine Capital

The miscellaneous mine capital includes various separate line items in the costing:

- Engineering Office Equipment
- Pit Dewatering – Pumps/Piping
- Waste Dump Preparation
- Diversion Dam
- Downstream Settling Pond
- Haulroad to the East Side of the Pit
- Haulroad to the West Side of the Pit
- River Diversion Tunnel

The engineering office equipment includes such items as desktop computers, a plotter, digitizer, copies of mining and geology software, and survey equipment with associated peripherals. This cost is estimated at $1.2 M with the majority of the cost being the mining software.

The dewatering system consists of a set of pumps for in the pit, with piping to bring it to the pit rim for disposal at final discharge points of the settling ponds.

Waste dump preparation includes the removal of merchantable timber, plus grubbing and topsoil stockpiling. As the waste dump is developed from the bottom up, this can be staged, and a portion of this activity falls under normal operating costs for dump development.

The diversion dam is a small water dam to divert the river/creek from Rovina to the tunnel. It is not intended to store significant water flows but rather divert them to the tunnel.

The settling ponds are located below the open pit to allow polishing of the pit water prior to discharge to the river system. These allow for settling and monitoring of water quality.

A series of haulroads will be required from the plant location to the upper reaches of the west and east sides of the pit. The costs have been estimated on a preliminary design. The eastern haulroad is designed for mill feed and waste haulage and has been estimated to cost $750,000 per km to construct. The western haulroad is for initial access and will be widened/improved with mine material so this cost is reduced to $600,000 per km.

The river diversion tunnel is 1.85 km long and designed to divert the river flow from the north side of Colnic pit to the south side. The tunnel is envisaged as a 4.5 x 4.5 m opening with a concrete channel in the bottom.

21.3.9 Pre-Production Stripping

The mine is scheduled to initiate mining in Year -2. The material moved will be used to develop the mine roads and provide mill feed for the stockpile. A total of 12.3 million tonnes will be mined in this time period and the costs are being attributed to capital. This is expected to cost $33.5M. This cost includes all associated management, dewatering, drilling and blasting, loading, hauling, support, engineering and geology department labour, and grade control costs.

The mining during this time includes the development of the initial phases, widening/improving of haul roads, initiation of the waste dumps, material for the primary crusher foundations, and stockpiling of initial ore.

21.4 Process Plant and Infrastructure Capital Costs

21.4.1 Overview

The capital costs for the process plant and infrastructure capital are based on the facilities described in Sections 17 and 18 and prepared by Lycopodium.

The purpose of the capital cost estimate is to provide substantiated costs which can be utilized to assess the preliminary economics of the Project. The capital cost estimate is based on an EPCM implementation approach and horizontal (discipline based) construction contract packaging.

Equipment pricing was based on quotations and actual equipment costs from other recent similar Lycopodium projects considered representative of the Project.

The capital cost estimate is expressed in USD unless otherwise stated and are based on the Q1 2019 pricing and deemed to have an overall accuracy of ±40%. The capital cost estimate conforms to AACEI Class 5 estimate standards, as prescribed in recommended practice 47R11.

Cost details per area are provided in Table 21-8.

Table 21-7: Capital Estimate Summary by Area (Q1 2019, ±40%)

Area	Total Cost USD$
10 Site Earthworks	$6,749,195
11 Primary Crushing	$6,885,636
12 Rope Conveyor	$13,651,683
13 Stockpiling and Reclaim	$7,917,672
14 SAG Mill Feed Conveyor	$422,264
15 SAG Mill	$25,156,504
16 Pebble Crushing	$4,031,693
17 Classification	$2,041,046
18 Ball Mill	$24,251,862
19 Trash Screening	$868,612
20 Rougher Flotation	$6,381,058
21 Scavenger Flotation	$6,537,050
22 Regrind Mill	$13,591,402
23 1-St Cleaner Flotation	$2,292,397
24 2-Nd Cleaner Flotation	$1,233,576
25 3-Rd Cleaner Flotation	$810,090
26 Concentrate Thickening	$770,702
27 Concentrate Filtration	$1,830,345
28 Concentrate Loadout and Packaging	$138,515
29 Tailings Thickening	$2,995,809
30 Tailings Filtration	$11,738,376
31 Tailings Loadout and Stacking	$4,266,991
32 Water Management	$5,416,913
33 Reagents	$919,728
34 Utilities	$2,850,024
40 Overland Piping	$756,000
50 Buildings	$5,433,292
60 Infrastructure-Electrical	$1,550,000
Sub Total Direct Cost	$161,488,434
900 EPCM	$19,378,612
905 Construction Support Temporary Services Allowance	$12,919,075
910 Contractor Indirects , Mob/Demob, Overheads	$16,148,843
920 Vendor Reps	$1,167,953
930 Heavy Lift Cranes (Incl. Mob/Demob)	$1,500,000
935 Mobile Equipment	$1,000,000

Area	Total Cost USD$
940 Startup and Commissioning Support	$1,946,588
950 First Fills	$2,335,906
960 Spare Parts	$3,893,176
970 Freight and Transportation	$12,919,075
Sub Total Indirect Cost	$73,209,228
Contingency	$46,939,532
Grand Total	$281,637,194
Owner's Team	$5,000,000

21.4.2 Estimating Methodology

The capital estimate was based on the process design criteria, overall process flow diagram, conceptual 3D model, and preliminary plant general arrangement drawing and overall site plan.

The preliminary plant general arrangement drawing, and site plan enabled the assessment of preliminary engineering quantities and factors for earthworks, concrete, steelwork, mechanical, and electrical for the processing plant and infrastructure.

The plant layout was based on Lycopodium's facility designs, modified construction, and as-built drawings of past project facilities, as well as initial concept drawings.

Unit rates were established for bulk materials, capital equipment, and labour from current in-house data.

21.4.3 Quantity Development

The Project works were quantified to represent the defined scope of work and to enable the application of rates to determine costs.

Quantity information was derived from a combination of sources and categorized to reflect the maturity of design information as follows:

- Study Engineering: includes quantities derived from concept or preliminary engineering for the purpose of the study
- Estimated: includes quantities derived from sketches or redline mark-ups of previous project drawings/data by estimating or similar projects
- Factored: quantities derived from percentages applied as a factor based on experience

The derivation of quantities weighted by value of the direct permanent works (i.e. excluding temporary works, construction services, commissioning assistance, engineering costs, escalation and contingency) is provided in Table 21-9.

.

Table 21-8: Derivation of Quantities

Discipline	Study Engineering %	Estimated %	Factored %
Earthworks	53%		47%
Concrete			100%
Structural			100%
Mechanical	100%		
Piping	8%		92%
Electrical	5%		95%
Instrumentation			100%
Building		100%	

21.4.4 Pricing Basis

Estimate pricing was derived from a combination of the following sources:

- Budget Quotation: budget pricing solicited specifically for the study or project estimate
- Database: historical database pricing that is less than six months old
- Estimated: historical database pricing older than six months, escalated to the current estimate base date
- Factored: factored from costs with a basis

Table 21-9Table 21-10 summarizes the source of supply pricing by major commodity, weighted by value of the direct permanent works (excluding temporary works, construction services, commissioning assistance, EPCM costs, installation and contingency).

Table 21-9: Source of Pricing

Discipline	Budget Quotation %	Database %	Estimated %	Allowance/ Factored %
Earthworks			38%	62%
Concrete				100%
Structural				100%
Mechanical	67%		21%	12%
Piping		8%		92%
Electrical		5%		95%
Instrumentation				100%
Building		100%		

21.4.5 Direct Costs

Bulk Materials

This component covers all other materials, normally purchased in bulk form, for installation on the project. Costs include the purchase price ex-works, any off-site fabrication, and transport to site (unless otherwise stated), and over-supply for anticipated wastage.

Plant Equipment

This component represents prefabricated, pre-assembled, off-the-shelf types of mechanical or electrical equipment item. Pricing is inclusive of all costs necessary to purchase the goods ex-works; this generally excludes delivery to site (unless otherwise stated) but includes operating and maintenance manuals. Vendor representation and commissioning spares have been allowed for separately within the estimate.

Installation

This component represents the cost to install the plant equipment and bulk materials on site or to perform site activities.

The installation costs were estimated as a percentage of supply costs and validated against historical data from similar projects.

21.4.6 In-Directs Costs

Contractor In-Direct Costs

Contractor indirect costs encompass the remaining cost of installation. It is based on a percentage of plant project costs and is about 10%. It includes items such as offsite management, onsite staff and supervision above trade level, crane drivers, construction equipment and labour mobilization and demobilization.

Construction indirect costs for all direct labour is included for all works in the capital estimate. This is inclusive of PPE, travel, and clothing. Earthworks rates are inclusive of fuel, maintenance, and running costs of machinery.

Construction Support Temporary Services Allowance

Before work can begin on the construction site, a number of services must be temporarily set up. This is in addition to the permanent services that will be required for the completed development and temporary site facilities that are required for the welfare of workers.

A provision for temporary services has been included in the estimate. It is based on a percentage of total directs costs and is approximately 8%; these services include:

- constant and reliable electricity supply
- water distribution and drainage
- sanitary conveniences, washing facilities and drinking water
- suitable artificial lighting
- temporary site offices and warehouse
- internet connection, Wi-Fi, a local area network, telephones
- perimeter security
- locating and connecting to or divert existing services on the site

Mobile Equipment and Heavy Lift Crane

An allowance has been included in the estimate to cover the purchase of mobile equipment and is based on Lycopodium's experience.

A provision for a heavy lift crane, including mobilization and demobilization, has also been included in the estimate.

Vendor Representatives

Some equipment will require vendor representation during construction and or commissioning. A provision has been included in the estimate to cover the vendor representatives' services, including mob/demob and site expenses. This provision is based on a percentage of total process mechanical supply cost and is approximately 1.5%.

First Fills

A provision for first fill consumables (grinding media, lubricants, fuels, and reagents) has been included in the estimate based on a percentage of total process mechanical supply cost and is approximately 3%.

Spares Parts

A provision for spares parts has been included in the estimate and it is approximately 5% of the process mechanical supply cost.

Freight

A provision for freight has been included in the estimate and it is approximately 8% of the plant project costs.

Engineering Services

The estimate for engineering design and construction management services was factored based on previous Lycopodium experience for similar sized projects and based on percentage of plant project costs; it is approximately 12%.

21.4.7 Contingency

An amount of contingency has been provided in the estimate to cover anticipated variances between the specific items allowed in the estimate and the final total installed project cost. The contingency does not cover scope changes, etc., or the listed qualifications and exclusions.

Contingency has been applied to the estimate as a percentage allowance and is approximately 20%. It should be noted that contingency is not a function of the specified estimate accuracy which should be measured against the project total that includes contingency.

21.4.8 Owner's Costs

An owner's cost allowance of $5M has been included to cover the following:

- permits and licences
- project team and expenses
- pre-production labour

- head office fees, expenses and consultants

Only the preproduction years are included in the initial capital cost; future owner's costs are not carried in initial capital.

Duties and Taxes

The capital estimate excludes all government and local taxes and duties.

Project Insurances

Project insurances have been excluded from the estimate.

21.4.9 Escalation

There is no allowance for project escalation in the capital cost estimate.

21.4.10 Qualifications and Assumptions

The capital estimate is qualified by the following assumptions:

- The base date for the bulk of pricing for the estimate is Q1 2019.
- Prices of materials and equipment with an imported content have been converted to USD at the rate of exchange stated previously in this section. All pricing received has been entered into the estimate utilizing native currencies wherever possible.
- The earthworks are based on the assumption that suitable construction/fill materials will be available from borrow pits within 2 km of the work fronts.
- There is no allowance for unforeseen blasting in the bulk earthworks cost estimates.

21.4.11 Exclusions

The following items are specifically excluded from the plant and infrastructure capital cost estimate:

- permits and licences
- project sunk costs
- government and local taxes and duties
- exchange rate variations
- sustaining capital costs
- mining capital costs

21.5 Overall Operating Costs

The estimated LOM operating cost per tonne of material processed is summarized in Table 21-11.

Table 21-10: LOM Operating Costs (Q1 2019)

	Total Cost ($M) from first gold pour	$/t Processed
Mining	$624	$7.28/t
Processing	$603	$7.03/t
G&A	$43	$0.50/t
Transport, Smelting, Refining Costs	$60	$0.70/t
Gold & Copper Royalties	$127	$1.48/t
Credit from Copper Sales	-$491	-$5.72/t
Total Operating Costs	$967	$11.28/t

21.5.1 Mine Operating Costs

Mine operating costs are estimated from base principles. The exchange rate for the Romanian leu to the USD is set at 4.0 RON: USD.

Key inputs to the mine cost are fuel and labour. The fuel cost is estimated using quotations from local vendors provided to Euro Sun. A value of $1.25/l is used in the operating cost calculation. The mine fleet is entirely diesel powered.

Labour costs for the various job classifications were obtained from Euro Sun and their in-country team. They consulted other operations to determine reasonable rates for the PEA study. A burden rate of 75% was applied to all rates. Labour was estimated both for staff and hourly on an 8-hour shift basis. Staff on a 5 x 2 straight days rotation, and hourly on a day, afternoons, nights rotation. Mine positions and salaries are shown in Table 21-12.

Table 21-11: Mine Staffing Requirements and Annual Employee Salaries (Year 5)

Staff Position	Employees	Annual Salary ($/a)
Mine Maintenance		
Maintenance General Foreman	1	43,000
Maintenance Shift Foremen	4	31,500
Maintenance Planner/Contract Admin	2	24,200
Clerk/Secretary	1	13,100
Subtotal	8	
Mine Operations		
Mine Ops/Technical Superintendent	1	98,400
Mine Operations General Foreman	1	44,100
Mine Shift Foreman	4	31,500
Junior Shift Foreman	4	28,400
Trainers	1	29,400
Road Crew/Services Foreman	1	31,500
Clerk/Secretary	1	13,100
Subtotal	13	
Mine Engineering		
Chief Engineer	1	39,900
Senior Engineer	1	31,500
Open Pit Planning Engineer	2	29,400
Geotech Engineer	1	29,400
Blasting Engineer	1	29,400
Blasting/Geotech Technician	1	25,200
Surveyor/Mining Technician	4	23,200
Surveyor/Mine Technician Helper	4	21,900
Subtotal	16	
Geology		
Chief Geologist	1	36,800
Senior Geologist	1	31,500
Grade Control Geologist/Modeler	2	29,400
Sampling/Geology Technician	4	23,200
Subtotal	9	
Total Mine Staff	**46**	

The mine staff labour remains consistent for the mine life after the initial recruitment in the pre-production period (Year -2). This level plateaus at 46 staff in Year 1, including Mine Operations, Maintenance, Engineering, and Geology. As the mine is completed, the staff is reduced; this begins in Year 8. The Training Foreman is no longer required after Year 5.

Hourly employee labour force levels in the mine operations and maintenance departments fluctuate with production requirements and are shown in Table 12-13.

Table 21-12: Hourly Manpower Requirements and Annual Salaries (Year 5)

Hourly Position	Employees	Annual Salary ($/a)
Mine General		
Road/Pump Crew	2	18,500
General Mine Laborer	4	17,500
Trainee	4	15,700
Light Duty Mechanic	2	21,200
Tire Man	4	21,200
Lube Truck Driver	4	17,500
Subtotal	20	
Mine Operations		
Driller	12	19,900
Blaster	2	19,900
Blaster's Helper	4	17,500
Loader Operator	4	21,200
Hydraulic Shovel Operator	8	21,200
Haul Truck Driver	80	19,900
Dozer Operator	8	20,100
Grader Operator	3	20,100
Water Truck Driver	4	19,900
Backhoe Operator	1	20,100
Subtotal	126	
Mine Maintenance		
Heavy Duty Mechanic	30	21,200
Welder	15	21,200
Electrician	2	21,200
Apprentice	8	18,500
Subtotal	55	
Total Hourly	**201**	

Labour costs are based on an owner operated scenario. Euro Sun is responsible for the maintenance of the equipment with its own employees.

Over seeing all of the mine operations, maintenance, engineering, and geology functions is a Technical Superintendent. This person would have the Mine and Maintenance General Foremen reporting to them, as well as the Chief Engineer and Chief Geologist.

The Mine General Foreman would have the shift foremen report directly to him.

The mine has four mine operations crews, each with a Senior Shift Foremen who has one Junior Shift Foreman reporting to him. For the mine life, there is also a Road Crew/Services Foreman responsible for roads, drainage, and pumping around the mine. This person would also be a backup Senior Mine Shift Foreman. The Training Foreman is only required on site until the end of Year 5, at which time the position is eliminated. The Mine Operations department has its own clerk/secretary.

The Chief Engineer has one Senior Engineer and two open pit engineers reporting to him. The Blasting Engineer is included in the short-range planning group and would double as drill and blast foreman as required. The Geotechnical engineer would cover all aspects of the wall slopes and waste dumps together with a shared technician in blasting.

The short-range planning group in engineering also has four surveyor/mine technicians and four surveyors/mine helpers. These people will assist in the field with staking, surveying, and sample collection with the geology group; they will have a clerk/secretary to assist the team.

In the Geology department, there is one Senior Geologist reporting to the Chief Engineer. There are also two grade control geologists/modellers; one will be in short range and grade control drilling, and the other will be in long range/reserves. There are also four grade control geologists (one per mine operations crew) and one clerk/secretary.

Four Mine Maintenance Shift Foremen will report to the Maintenance General Foreman. As well, there are two maintenance planners/contract administrators and a clerk.

The hourly labour force includes positions for the tool crib, light duty mechanic, tire men, and lube truck drivers. These positions all report to Maintenance. There are generally one of each position per crew. Other general labour includes general mine labourers (one per crew) and trainees (one per crew).

The drilling labour force is based on one operator per drill, per crew while operating. This peaks at 16 drillers in Year 3 and holds there until Year 8 when it drops down over time as the drilling hours are diminished.

Shovel and loader operators peak at 12 in Year 2 and hold at that level until Year 12. Haulage truck drivers peak at 100 in Year 6 and then taper off to the end of the mine life.

Maintenance factors are used to determine the number of heavy-duty mechanics, welders and electricians are required and are based on the number of drill operators. Heavy duty mechanics work out to 0.25 mechanics required for each drill operator. Welders are 0.25 per drill operator and electricians are 0.05 per drill operator. This method of estimating maintenance requirements is used for each category of the mine operating cost and is summarized in Table 21-14.

Table 21-13: Maintenance Labour Factors (Maintenance per Operator)

Maintenance Job Class	Drilling	Loading	Hauling	Mine Operations Support
Heavy Duty Mechanic	0.25	0.25	0.25	0.25
Welder	0.250	0.25	0.25	0.25
Electrician	0.05	0.01	-	-
Apprentice	-	-	-	0.25

The number of loaders, trucks, and support equipment operators is estimated using the projected equipment operating hours. The maximum number of employees is four per unit to match the mine crews.

The vendors provided repair and maintenance (R&M) costs for each piece of equipment. These came in the quotations for the capital cost. Fuel consumption rates are also estimated for the conditions expected at Rovina and are used in the detail costs for the mine equipment. The costs for the R&M are expressed in a $/h form.

The various suppliers provided the costs for different tire sizes that will be used during the project. Estimates of the tire life are based on AGP's experience and conversations with mine operators. The operating cost of the tires is expressed in a $/h form. The life of the haulage truck tires is estimated at 5,000 hours per tire with proper rotation from front to back. On the haulage trucks each tire costs $21,000 so the cost per hour for tires is $25.20/hr for the truck using six tires in the calculation.

Ground Engaging Tool (GET) costing is estimated from other projects and conversations with personnel at other operations. This is an area of cost that is expected to be fine-tuned during mine operations.

Drill consumables were estimated as a complete drill string using the parts list and component lives provided by the vendor. Drill productivity for both mill feed and waste is estimated at 26 m/hr. Equipment costs used in the estimate are shown in Table 21-15.

Table 21-14: Major Equipment Operating Costs – No labour ($/hr)

Equipment	Fuel	Lube/ Oil	Tires	Under-Carriage	Repair & Maint.	GET/ Consumables	Total
Production Drill	137.50	13.75	-	6.00	92.00	53.86	303.11
Production Loader	205.00	30.75	48.57	-	113.56	15.00	412.88
Hydraulic Shovel	325.00	32.50	-	-	142.50	12.00	512.00
Haulage Truck – 136 t	110.00	11.00	25.20	-	49.82	4.00	200.02
Crusher Loader	93.75	9.38	24.56	-	47.88	10.00	185.57
Track Dozer	100.00	10.00	-	-	27.36	5.00	142.36
Grader	37.50	3.75	2.92	-	34.30	5.00	83.47

Drilling in the open pit will be performed using conventional rotary blasthole rigs with 200 mm bits. The pattern size varies between mill feed and waste and are blasted with recognition that the mine equipment is smaller, and finer material improves productivity and reduces maintenance costs as well as improved plant performance. The drill pattern parameters are shown in Table 21-16.

Table 21-15: Drill Pattern Specifications

Specification	Unit	Ore	Waste
Bench Height	m	12	12
Sub-Drill	m	1.1	1.1
Blasthole Diameter	mm	200	200
Pattern Spacing – Staggered	m	6.3	6.4
Pattern Burden – Staggered	m	5.5	5.6
Hole Depth	m	13.1	13.1

The sub-drill was included to allow for caving of the holes in the weaker zones, avoiding re-drilling of the holes or short holes that would affect bench floor conditions and thereby increasing tire and overall maintenance costs.

Table 21-17 outlines the parameters used for estimating drill productivity. The drill is configured for single pass drilling of the 13.1 m hole.

Table 21-16: Drill Productivity Criteria

Drill Activity	Unit	Ore	Waste
Pure Penetration Rate	m/min	0.50	0.50
Hole Depth	m	13.1	13.1
Drill Time	min	26.20	26.20
Move, Spot, and Collar Blasthole	min	3.00	3.00
Level Drill	min	0.50	0.50
Add Steel	min	-	-
Pull Drill Rods	min	0.50	0.50
Total Setup/Breakdown Time	min	4.00	4.00
Total Drill Time per Hole	min	30.2	30.2
Drill Productivity	m/h	26.0	26.0

An emulsion product will be used for blasting to provide water protection. With the high rainfall known to occur in the region, it is expected that a water-resistant explosive will be required. The powder factors used in the explosive's calculation are shown in Table 21-18.

Table 21-17: Design Powder Factors

	Unit	Ore	Waste
Powder Factor	kg/m3	0.839	0.805
Powder Factor	kg/t	0.303	0.304

The blasting cost is estimated using quotations from a local vendor. The emulsion price is $143.00/100 kg. The mine is responsible for guiding the loading process, including placement of boosters/Nonels, and stemming and firing the shot.

The explosives vendor also leases the explosives and accessories magazines to Euro Sun at a cost of $9,500/month. An additional service charge of $24,000/month for the vendor's pickup trucks, pumps, and labour is also applied and covers the cost of the explosives plant.

Mill feed and waste loading costs were estimated using the front-end loaders and hydraulic shovels as the only loading units. The shovels are the primary diggers for mill feed and waste, with the front-end loaders being used as backup. The average percentage of each material type that the various loading units are responsible for is shown in Table 21-19. This highlights the focus on the shovels over the loaders.

Table 21-18: Loading Parameters – Year 5

	Unit	Front-End Loader	Hydraulic Shovel
Bucket Capacity	m3	20.0	22.0
Truck Capacity Loaded	T	134.3	136
Waste Tonnage Loaded	%	25	75
Mill Feed Tonnage Mined	%	25	75
Bucket Fill Factor	%	95	95
Cycle Time	Sec	40	38
Trucks Present at the Loading Unit	%	80	80
Loading Time	Min	2.70	2.60

The trucks present at the loading unit refers to the percentage of time a truck is available to be loaded. To maximize truck productivity and reduce operating costs, it is more efficient to slightly under-truck the loader or shovel. The single largest operating cost item is haulage and minimizing this cost by maximizing truck productivity is crucial to lower operating costs. The value of 80% comes from the standby time shovels typically encounter due to a lack of trucks.

Haulage profiles were determined for each pit phase for the primary crusher or the waste rock management facility destinations. Cycle times were generated for the appropriate period tonnage by destination and phase to estimate the haulage costs. Maximum speed on trucks is limited to 50 km/h for tire life and safety reasons. Calculations speeds for various segments are shown in Table 21-20.

Table 21-19: Haulage Cycle Speeds

	Flat (0%) on surface	Flat (0%) Inpit, Crusher, Dump	Slope Up (8%)	Slope Up (10%)	Slope Down (8%)	Slope Down (10%)	Acceleration or Deceleration
Loaded (km/h)	50	40	16	12.1	30	30	20
Empty (km/h)	50	40	35	25	35	35	20

Support equipment hours and costs are determined using the percentages shown in Table 21-21.

Table 21-20: Support Equipment Operating Factors

Mine Equipment	Factor	Factor Units
Track Dozer	25%	Of haulage hours to a maximum of 3 dozers
Grader	10%	Of haulage hours to a maximum of 2 graders
Crusher Loader	12	Hours/day
Support Backhoe	1%	Of loading hours to maximum of 1 backhoes
Water Truck	5%	Of truck hours
Tire Manipulator	1	hours/day
Lube/Fuel Truck	8	hours/day
Mechanic's Truck	10	hours/day
Welding Truck	5	hours/day
Blasting Loader	8	hours/day
Blaster's Truck	8	hours/day
Integrated Tool Carrier	2	hours/day
Compactor	12	hours/day
Lighting Plants	12	hours/day
Pickup Trucks	12	hours/day
Dump Truck – 20 ton	12	hours/day

These percentages resulted in the need for three track dozers, two graders, and one support backhoe. Their tasks include cleanup of the loader faces, roads, dumps, and blast patterns. The graders will maintain the ore and waste haul routes. In addition, water trucks have the responsibility for patrolling the haul roads and controlling fugitive dust for safety and environmental reasons. The small backhoe will be responsible for cleaning out sedimentation ponds and water ditch repairs.

These hours are applied to the individual operating costs for each piece of equipment. Many of these units are support equipment so no direct labour force is allocated to them due to their function.

Grade Control

Grade control will be accomplished with blasthole cuttings. These will be assayed on site for copper and gold content and the assay cost is estimated at $15/sample. The number of samples for costing is based on 100% of the mill feed and 15% of the waste material to help define the contacts.

The annual number of samples varies from 21,000 in Year 1 to a peak of 52,500 in Year 8 and then tapers off to the end of the mine life.

Leasing

Leasing of the mine fleet is considered a viable option to reduce initial capital. Various vendors offer this as an option to help select their equipment. Both Caterpillar and Komatsu have the ability, and desire, to allow leasing of their product lines.

Indicative terms for leasing provided by the vendors are:

- Down payment = 20% of equipment cost
- Term Length = 3 years
- Interest Rate = LIBOR plus a percentage
- Residual = $0

The proposed interest rate is used to calculate a multiplier on the amount being leased. The multiplier is 1.067 to equate to the rate. It does not consider a declining balance on the interest but rather the full amount of interest paid over 3 years, equally distributed over those 3 years. The calculation is as follows:

Annual Lease Cost = {[(Initial Capital Cost) x 80%] x 1.067} / 3 years

The initial capital, down payments, and annual leasing costs were shown previously in the capital cost area of this section. Table 21-4 has this information tabulated already.

The support equipment fleet is calculated in the same manner as the major mining equipment.

All of the major mine equipment, and the majority of the support equipment where it was considered reasonable, was leased. If the equipment has a life greater than the three-year lease term, then the fourth year onwards of the lease does not have a lease payment applied. In the case of the mine trucks, with an approximate 10-year working life, the lease would be complete, and the trucks would simply incur operating costs after that time. For this reason, the operating cost would vary annually depending on the equipment replacement schedule and timing of the leases.

Utilizing the leasing option adds $0.28/t to the mine operating cost over the life of the mine. On a cost per tonne of ore basis, it was $0.91/t ore.

Dewatering

Pit dewatering is an important part of mining at Colnic particularly since the pit will be below the river level. Efficient and cost-effective dewatering will play a role in the Colnic mine development. Dewatered slopes may allow a reduction in the strip ratio by permitting steeper inter-ramp angles that would also be inherently safer.

It is estimated that 250 m3/day will need to be pumped from within the pit. From there, it will need to be pumped to the required discharge point near the settling ponds. Storm events have the potential to impact mining operations, and an estimate of 1,000 m3/day of pumping may be required for a short period of time to recover from one of these storm events. The capital cost estimate has considered this in the calculation for the number of pumps required on site to handle such an event.

The dewatering system includes the pumps, sumps, and pipelines responsible for moving water from the pit to the discharge points. Labour for this is already included in the General and Mine Engineering category of the mine operating cost. The mine has a dedicated pump crew and pump crew foreman.

Additional dewatering in the form of horizontal drain holes are also part of the dewatering operating costs. These holes will be drilled in annual campaigns starting in Year 2. The design concept is a series of holes 50 m in length, angled up slightly and drilled into the highwalls. They will allow the water behind the wall to drain freely and prevent pore water pressure buildup.

The horizontal drill holes are considered as a capital cost for a total of $1.8 M over the life of the mine.

The dewatering operating cost is estimated at $485,000 over the mine life.

Total Mine Costs

The total LOM operating costs per tonne of material moved and per tonne of mill feed processed are shown in Table 21-22 and Table 21-23.

Table 21-21: Open Pit Mine Operating Costs – with Leasing ($/t Total Material)

Open Pit Operating Category	Unit	Year 1	Year 3	Year 5	LOM Average Cost
General Mine and Engineering	$/t	0.14	0.06	0.07	0.08
Drilling	$/t	0.17	0.17	0.17	0.16
Blasting	$/t	0.53	0.52	0.52	0.50
Loading	$/t	0.25	0.24	0.24	0.26
Hauling	$/t	0.47	0.64	0.80	0.77
Support	$/t	0.41	0.21	0.24	0.29
Grade Control	$/t	0.02	0.01	0.01	0.02
Leasing Costs	$/t	0.60	0.22	0.36	0.28
Dewatering	$/t	0.00	0.01	0.01	0.01
Total	**$/t**	**2.60**	**2.07**	**2.41**	**2.35**

Table 21-22: Open Pit Mine Operating Costs – with Leasing ($/t Mill Feed)

Open Pit Operating Category	Unit	Year 1	Year 3	Year 5	LOM Average Cost
General Mine and Engineering	$/t ore	0.37	0.30	0.30	0.25
Drilling	$/t ore	0.47	0.83	0.72	0.50
Blasting	$/t ore	1.46	2.55	2.23	1.53
Loading	$/t ore	0.70	1.19	1.05	0.80
Hauling	$/t ore	1.29	3.18	3.47	2.31
Support	$/t ore	1.12	1.02	1.02	0.92
Grade Control	$/t ore	0.05	0.05	0.06	0.05
Leasing Costs	$/t ore	1.66	1.09	1.54	0.91
Dewatering	$/t ore	0.01	0.03	0.03	0.02
Total	**$/t ore**	**7.13**	**10.24**	**10.41**	**7.28**

21.5.2 Process Operating Costs

The process plant operating costs have been developed based on a design processing rate of 7.2 Mtpa of material. The plant will normally operate 24 hrs/day - 365 days/year with 4,114 hrs/year for the primary crusher and 8,230 hrs/year for grinding circuit and flotation plant.

All costs are expressed in USD unless otherwise stated, to an accuracy of ±35% and are based on Q1 2019 pricing. The process plant operating costs are summarized in Table 21-24.

Table 21-23: Process Operating Cost Summary (7.2 Mtpa Nominal Process Rate)

Cost Centre Operating Consumables	Process Operating Cost	
	$/year	$/t Material
Crushing Plant	278,494	0.04
Grinding	15,435,894	2.14
Flotation	4,367,571	0.61
Thickening and Filtration	4,451,326	0.62
Miscellaneous	472,471	0.07
Subtotal	25,005,755	3.47
Plant Maintenance	1,667,382	0.23
Laboratory (Plant)	151,481	0.02
Power	20,568,326	2.86
Labour (Plant Operations & Maintenance	1,800,285	0.25
Subtotal	24,187,478	3.36
Filtered Tails Transport Cost to Waste Rock Area	1,440,000	0.20
Total Operating Costs	**50,633,230**	**7.03**

The process operating costs were developed in accordance with industry practice for PEA of copper and gold processing plants. Quantities and cost data were compiled from a variety of sources including:

- metallurgical testwork
- consumable prices from suppliers
- advice from Euro Sun
- Lycopodium internal data
- first principle calculations

The operating cost estimate includes the following major categories and are discussed in more detail below:

- operating consumables
- plant maintenance costs
- power
- labour (operation and maintenance)
- laboratory costs

Operating Consumables

The consumables category includes reagents, diesel fuel, and operating consumables such as mill liners, grinding media, cyclone parts, screen panels crusher and mill lubricants, and tailings filter consumables. It excludes general maintenance consumables such as greases and lubricants, equipment spare parts, and pump wear parts which are covered in maintenance costs.

Consumption rates and pricing for consumables and reagents have been estimated based on the following:

- Comminution consumables (mill liners and grinding media) were predicted based on the material bond abrasion index values and the mill power consumption.
- Reagent consumptions were derived from laboratory testwork values and adjusted, where experience deemed necessary, for plant operating practice. In the absence of testwork data, consumption rates are assumed based on Lycopodium experience, or generally accepted practice within the industry.
- Diesel fuel consumption for the mobile equipment is based on standard equipment consumption rates and equipment utilization. Diesel price of US$1.25/L was used in the estimate.
- Reagents prices were obtained through supplier quotes, or Lycopodium database for costs of minor items.

Maintenance

Maintenance costs, excluding labour and consumable costs, were estimated by applying factors between 1% and 3% to the mechanical equipment supply cost in each area of the plant. The factors applied are based on industry norms and Lycopodium's experience on similar projects.

Gyratory crusher, pebble crusher, and ISA mill wear parts are included in the consumables estimate.

Power

The plant site electricity consumption was based on the installed motor size of individual items of equipment, excluding standby equipment adjusted by efficiency, and load and utilization factors to arrive at the annual average power draw. This is then multiplied by the total hours operated per annum and the electricity price to obtain the power cost.

The overall average plant power consumption is estimated at 35.1MW. The estimated installed power and peak continuous draws are 48MW and 37MW respectively.

Euro Sun provided a unit price of US$66.94/MWh which was used as the cost of power.

Labour

The process plant operating, and maintenance labour costs were estimated from first principles based on an organization chart developed specifically for the project, and labour rates supplied by Euro Sun. The process plant labour includes a combination of day and shift work. Table 21-25 summarizes the total plant labour by department.

Table 21-24: Plant Labour Summary

Department	No. of Employees
Management	2
Metallurgy	7
Laboratory / Sample Preparation	8
Operations	47
Maintenance	38
Total:	**102**

The labour rates were developed based on the following rotations:

- professional/skilled employees: 5 days on/2 days off
- operating and maintenance staff: 12 hour shifts on a 4 days on/4 days off rotation

The costs include all overheads including allowances, overtime payments, bonus, leave, medical, and government taxes and levies.

Laboratory Costs

Laboratory costs are associated with analysis of routine plant samples to monitor plant metallurgical performance and include sample preparation, fire assay, and chemical analyses of samples. Grade control costs are captured under mining. The average cost is $0.02/t material processed.

Qualifications

The operating cost estimate includes all direct costs associated with the processing plant from crushing to production of concentrate.

The estimate excludes the following:

- all sunk costs
- ROM and any material re-handling costs
- government monitoring/compliance costs
- all head office costs and corporate overheads
- withholding taxes and other taxes such as GST/HST or VAT
- any impact from fluctuations in foreign exchange rates
- any escalation from the date of the estimate
- project finance costs
- interest charges
- corporate overheads
- insurance
- plant rehabilitation costs
- any costs related to communities
- licence fees
- no allowance for contingency
- any business interruption costs
- union fees

21.5.3 General and Administrative Costs

The general and administration (G&A) costs were based on $0.50/t material processed.

21.5.4 Transport, Smelting, and Refining Costs

Concentrate transport costs were based on $50/t (wet) of concentrate. Concentrate moisture is assumed at 8%.

Smelting costs were based $85/t (dry) of concentrate.

Refining costs were based on $5.00/oz for gold and $0.085 /lb copper.

21.5.5 Royalties

Royalties were calculated at 5% on copper revenues (99% payable), and 6% on gold revenues (99% payable); they were then applied as an operating expense.

21.5.6 Copper Credits

Revenue from copper in the gold concentrate was applied as a credit to annual operating costs and was based on 99% payable for copper in the concentrate, and $3.10/lb copper. Economic Analysis

22 ECONOMIC ANALYSIS

22.1 Introduction

A PEA of the RVP has been conducted using a simple pre and post-tax cash flow model prepared by Lycopodium on behalf of Euro Sun. The model was structured using an EXCEL workbook.

The PEA was prepared in accordance with NI 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101"). Readers are cautioned that the PEA is preliminary in nature. It includes inferred mineral resources considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, socio-political, marketing, or other relevant issues.

Input data was provided from a variety of sources, including various consultants' contributions to this PEA, pricing obtained from external suppliers, and exchange rates and project specific financial data received from Euro Sun. The assessment was based upon:

- capital cost estimates and expenditure schedules prepared by Lycopodium and AGP
- mine schedule and mining operation cost estimates based on the mining operations being owner-operated but leased equipment, as developed by AGP for the PEA
- process operating and general and administration cost estimates prepared by Lycopodium
- preliminary metallurgical performance characterised by previous test work
- sustaining capital cost estimates for the mine development provided by AGP
- owner's capital cost estimate was estimated by Lycopodium and Euro Sun
- royalty, tax, discount rates and other model inputs provided by Euro Sun
- closure costs provided by Euro Sun
- salvage costs estimated by Lycopodium
- the cash flow analysis excludes any effects due to inflation and all dollars are expressed in real USD as at Q1 2019
- the forecast gold price of $1,325 /oz and copper price of $3.10 /lb for the LOM was agreed with Euro Sun
- the cash flow analysis is based on full equity funding and any cost of borrowing is excluded

The cash flow model reports:

- all costs in real USD exclusive of escalation or inflation
- a net present value (NPV) at a 5% discount rate
- an internal rate-of-return (IRR) based on pre and post-tax net cash flows
- payback

Table 22-1 presents a summary of the production information on which the cash flow model is based.

The LOM capital cost for the project is estimated at $352M, with an initial capital expenditure of $340M which includes $33.5M pre-strip costs which are capitalized.

Table 22-2 shows the project cash flow summary. At a gold price of $1,325/oz and copper price of $3.10/lb, the project is estimated to have an after-tax IRR of 13.5% and a pay-back period of 5.62 years after start of production. At a discount rate of 5%, the after tax NPV is estimated at $169M. The project economics have been summarized in Table 22-3.

Table 22-1: Production Summary

	Value
Material processed	85.7 Mt
Total material mined	251 Mt
Average gold head grade	0.575 g/t Au
Average copper head grade	0.095% Cu
Contained gold in material	1.6 Moz
Total gold recovered	1.3 Moz
Average gold recovery	82%
Contained copper in material	178 Mlb
Total copper recovered	160 Mlb
Average copper recovery	89%
Production life (processing)	12.1 years
Nominal annual processing rate	7.2 Mtpa

Table 22-2: Net Profit after Tax Summary

	$M	$/t Processed	$/oz Au
Revenue	$1,707	$19.91	$1,312
Mine Operating Cost[1]	$624	$7.28	$480
Processing Cost	$603	$7.03	$463
G&A Cost	$43	$0.50	$33
Transport, Smelting, Refining Costs	$60	$0.70	$46
Royalties	$127	$1.48	$98
Copper Credit	-$491	-$5.72	-$377
Total Operating Cost	$967	$11.28	$743
EBITDA	$740	$8.63	$569
Capital & Stockpile Working Costs	$318	$3.71	$244
Gross Profit before tax	$422	$4.92	$324
Income Tax Payable	$73	$0.86	$56
Net Profit after tax	$349	$4.07	$268

Note: Includes pre-strip costs during pre-production

Table 22-3: Financial Summary

	Value
Revenue from gold	$1,707M
AOC	$743/oz Au
Initial Capital	$340M
Sustaining capital	$12M
Closure costs	$20M
Salvage costs	-$20M
Pre-Tax Economics:	
IRR	15.4%
NPV (5%)	$218M
Payback	5.31 years
After-Tax Economics:	
IRR	13.5%
NPV (5%)	$169M
Payback	5.62 years

22.2 Assumptions and Qualifications

The cash flow analysis is based on the following:

- The cash flow model has been based on a two-year project development period, but all cash-outflows commence in Year -1, and that concentrate production commences in month one of Year 1. The model has considered only cash flows from project 'go-ahead'. Any previous expenditure (sunk costs) have not been carried forward or included in the model.
- Sunk costs have been included in the tax model.
- Annual mined tonnage and head grade have been based on the mining schedule as presented in Section 16, and process plant throughput and production rates as presented in Section 17.
- The mining, processing and administration costs are based on the operating cost estimates presented in Section 21.
- Gold recovery is based on testwork and interpretation presented in Section 13.
- The capital costs are based on the estimates presented in Section 21.
- A provision for closure and rehabilitation costs of $20M has been allowed.
- An estimated asset residual sale value of $20M has been included.
- No provision was made for VAT or custom duties.
- The treatment of depreciation and company taxes are based on a simple depreciation schedule and 16% corporate tax rate. The QP of this chapter is not a tax professional and has not applied the tax code and requirements of Romania.

22.3 Depreciation

All capital expenditure is depreciated depending on the class of asset.

22.4 Company Tax

Provision has been made for corporate income tax at 16% of taxable income as advised by Euro Sun.

22.5 Metal Prices

A gold price of $1,325 /oz and copper price of $3.10/ lb has been applied in the cash flow model.

22.6 Smelter, Refining and Transportation Terms

- gold is assumed to be payable at 99%
- smelting charge is assumed to be $85/t concentrate (dry basis) and 8% moisture
- refining charge is assumed to be $0.085 per gold oz and copper lb
- concentrate trucking and rail cost is assumed to be $50/t wet concentrate

22.7 Royalties

- gold and copper at 5% each

22.8 General

- the cash flow model assumes full equity funding
- no provision has been made for interest on cost of capital
- no provision has been made for corporate head office costs during operations
- no provision has been made for escalation or inflation
- no provision has been made for VAT payable
- no provision has been made for Customs import duty
- the NPV calculation is based on payments occurring mid-year

22.9 Sensitivity Analysis

The project value was assessed by undertaking sensitivity analyses on metal prices, metal recoveries, operating and capital costs. The results of all sensitivity analyses are presented in Table 22-4 and Table 22-5, and in Figure 22-1 and Figure 22-2.

The project is most sensitive to changes in metal prices, metal recovery and operating costs.

Table 22-4: NPV Sensitivity Analysis (Pre-Tax)

	Lower	Base Case	Higher
Gold Price (±5%)	$70.3M	$218.1M	$373.4M
CAPEX (±25%)	$218M	$218.1M	$218.1M
OPEX (±25%)	$394M	$218.1M	$42.2M
Metal Recovery (±5%)	$70.8M	$218.1M	$365.3M

Table 22-5: IRR Sensitivity Analysis (Pre-Tax)

	Lower	Base Case	Higher
Gold Price (±5%)	9%	15%	22%
CAPEX (±25%)	15%	15%	15%
OPEX (±25%)	23%	15%	7%
Metal Recovery (±5%)	9%	15%	22%

Figure 22-1: NPV Sensitivity Analysis (Pre-Tax)

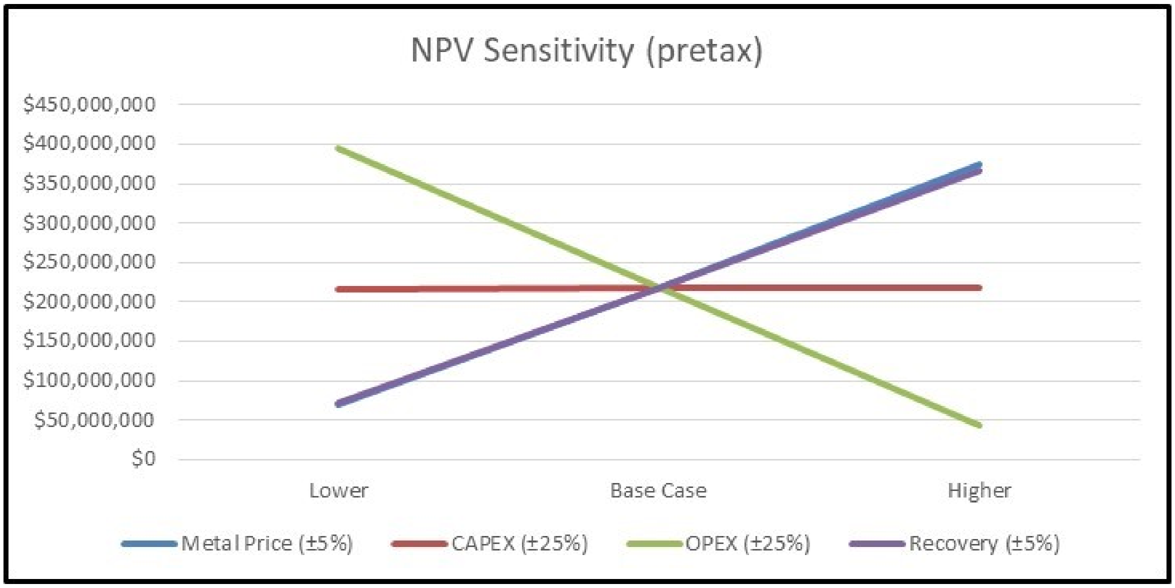
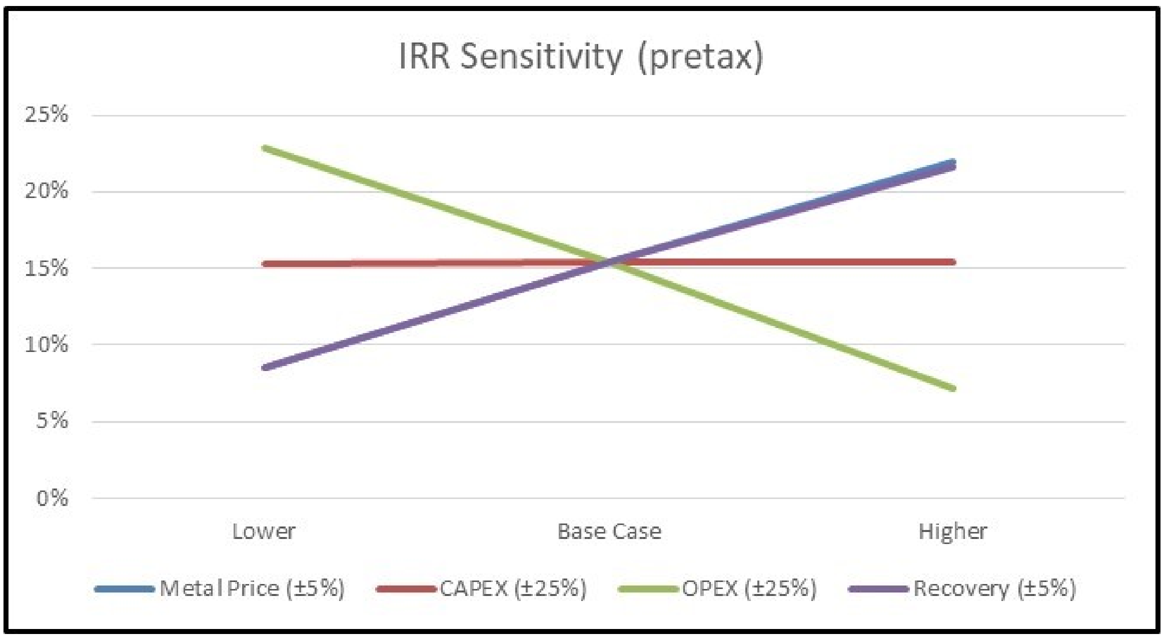


Figure 22-2: IRR Sensitivity Analysis (Pre-Tax)



23 ADJACENT PROPERTIES

The material presented in this section is from publicly available information referenced below. No information is available to the authors to permit verification of this data. AGP cautioned that the information below is not necessarily indicative of the mineralization on the RVP.

One deposit within the Golden Quadrilateral area of Romania, in the immediate vicinity of the Property is at an advanced-stage exploration phase: the Certej deposit, located 15 km southeast of Ciresata, which is now held by Eldorado Gold (80.5%) and Minvest (19.5%), and is in the permitting phase. In addition, recent drilling completed by Eldorado Gold on its 100% owned Bolcana-Troita Exploration License has resulted in a brownfields discovery and an initial resource estimate located 11 km south of the Ciresata deposit.

23.1 Certej

Certej is an epithermal gold/silver deposit. Mineralization occupies a sub-horizontal pipe-like zone, located across and deformed around, the Baiaga Andesite. It is localized by an east–west trending dilatational jog, locally offset by later north–south faulting. Styles of mineralization recognized in the deposit to date include disseminated and breccia-hosted gold–silver, and vein-hosted base metal (± gold–silver) mineralization. There are three main mineralized zones, Hondol, Baiaga, and Dealul Grozii (Warries et al., 2006).

As of September 30, 2018 Eldorado Gold reported a Proven + Probable reserve of 44.3 Mt grading 1.69 g/t Au, 11 g/t Ag for 2.4 M oz Au, and 15.5 M oz Ag; (Eldorado Gold web site). Eldorado Gold has finalized a feasibility study and is well underway to the final permitting of the project. The mine life is stated at 15 years. AGP comments that the deposit type and style of mineralization is different from Euro Sun's RVP. The QP has been unable to verify the information reported by Eldorado Gold and that the information is not necessarily indicative of the mineralization on the property that is the subject of this technical report

23.2 Bolcana

The Bolcana deposit is a gold-rich copper porphyry with geologic similarities to Euro Sun’s Rovina Valley porphyry deposits. On November 26th, 2018, Eldorado Gold announced a maiden resource estimate for Bolcana from which the information below is taken.

The maiden resource estimate for the Bolcana gold-copper porphyry project in Romania is based on 98 diamond drill holes totalling over 61,995 metres completed by Eldorado mainly in 2017/2018 and 17 drill holes totalling 4,609 metres and 4,224 metres of underground channel samples collected by European Goldfields from 2002 to 2004.

The Bolcana porphyry system includes three shallow mineralized zones (North, Central and South) over a strike extent of greater than one kilometre, which coalesce at depth into a north-plunging high-grade mineralized core. Highest grades coincide with late-stage gold-rich dikes that are superimposed on an earlier gold-copper porphyry that intrudes broadly coeval breccias and andesitic country rocks. Stockwork veins and disseminations of chalcopyrite and subordinate bornite are hosted in the dikes and associated breccias. Alteration includes potassic assemblages (biotite-feldspar-magnetite) and a shallow pyrite-white mica-clay domain, with a magnetite-albite-chlorite-epidote overprint related to the late-stage dikes.

The Bolcana resource is classified as an inferred mineral resource and is based on an open-pit and an underground component. The open-pit portion, which contains just over half the inferred resources, is constrained by a conceptual pit design with a depth of approximately 720 m average depth. All resources outside this pit shell were available to be classified as underground inferred resources. Inferred open-pit and underground resources total 381 Mt at 0.58 g/t gold and 0.18% copper, containing 6.5 Moz gold.

Preliminary rougher flotation testing on a suite of nine samples representative of the alteration and mineralogical variability in the deposit achieved recoveries of up to 90 per cent for copper and 86 per cent for Au.

23.3 Sacaramb

The historic Sacaramb deposit (also known as Nagyag or Szekeremb) is also contained within the European Goldfields' Certej property. When production ceased in 1935, about 85 t of combined silver and gold was reported to have been produced (Patrick and Jackson, 2004).

Epithermal gold–silver telluride mineralization is developed in Neogene andesite flows and breccias. Gold occurs as disseminations within breccias and in mineralised linear alteration zones associated with fracturing and traditionally described as veins. Bonanza high-grade zones at vein junctions formed pipe-like zones that have been mined to surface. Over 230 individual mineralized veins are known, which have been traced along strike for up to 2,000 m, and down dip for 1,000 m (Patrick and Jackson, 2004).

European Goldfields drill-tested the deposit in 2002, and partially sampled seven levels of historic workings, as part of an assessment of the open pit potential of the deposit (Patrick and Jackson, 2004). In 2012 Eldorado Gold acquired European Goldfields.

23.4 Valea Morii

The Valea Morii deposit comprises earlier porphyry copper–gold and later epithermal gold-silver mineralization associated with a shallow subvolcanic body of andesitic to dioritic composition (Grancea et al., 2001). The top of the porphyry copper system is crosscut by low-sulphidation epithermal veins, with a paragenetic sequence from early veining related to propylitic alteration, followed by a second composite stage, characterized by the emplacement of barren, centimetre-thick, quartz-rich veins followed by millimetre-thick quartz-rich copper–gold mineralized veins. This porphyry-related stockwork-style mineralization is partly overprinted by quartz ± calcite ±

barite epithermal veins, hosting gold–silver mineralization (Rosetti et al, 1999; Andre-Meyer et al., 2001). Valea Morii is located 2.5 km west of the Ciresata deposit.

24 OTHER RELEVANT DATA AND INFORMATION

24.1 AMEC Site Visit Assessment 2007

The AMEC site visit assessment is considered relevant to the deposit since it offers a second verification from an independent QP other than the assessment by AGP described in Section 12 of this report. The text below was summarized from a technical report authored by David G. Thomas, MAusIMM, Robert Cinits, P.Geo. titled "Technical Report on Resource Estimation on the Colnic and Rovina Deposits NI 43-101" dated, May 24, 2007.

As part of the independent expert review, AMEC conducted the following verification checks on the Rovina Property:

- site visits
- review of the geological and mineralization interpretations
- geological model
- review of the exploration programs
- review of data that supports the resource model. The review covered drill core samples including drill site inspection, drill collar coordinates, drill core inspection, review of core logging, sampling and assay protocols and methods, and review of sample security measures and sample storage
- review of QA/QC data protocols and methods, and data validation

According to the AMEC NI 43-101 report dated May 2007, Mr. Thomas of AMEC visited the property in 2007 and Mr. Cinits also of AMEC visited the site in 2006. The 2007 site visit by AMEC covered the following items:

- overview of the geology and exploration history of the Colnic and Rovina Porphyries (presented by Euro Sun geologists, Mr. Randall K. Ruff, Dr. Barbara Stefanini, and Sorin Halga)
- current exploration program design (drill hole orientation, depth, number of holes, etc.)
- visits to operating drill rig and drill hole collars at the Colnic and Rovina Porphyries
- drill rig procedures including core handling
- surveying (topography, collar, and downhole deviations)
- sample collection protocols
- sample transportation and sample chain of custody and security
- core recovery
- QA/QC program (insertion of standards, blanks, duplicates, etc.)
- inspection of the ALS Chemex Laboratory at Gura Rosiei
- laboratory sample preparation and analytical procedures
- review of diamond drill core, core logging sheets, and core logging procedures (selected core from eight representative drill holes from Colnic and four drill holes from Rovina).

The review included commentary on typical lithologies, alteration and mineralization styles, and crosscutting relationships

- density sampling
- management of geological and geotechnical data and database structure

During the 2007 visit, 30 quarter-core samples (20 from Colnic and 10 from Rovina) and one pulp duplicate sample were collected by AMEC. The appropriate control samples were inserted by AMEC and the samples were submitted to ALS Chemex (Euro Sun's principal laboratory) in Gura Rosiei, Romania. From these character samples, AMEC concluded the following:

> *"…that the general range of values returned by the AMEC samples corresponds well with those reported from previous exploration programs, and at the completion of the site visit, AMEC is confident that the general range of gold and copper values reported from drilling by Carpathian are representative of the values that can be expected from these deposits".*

AMEC visited the drill rig on 21 January 2007 and took hand-held GPS coordinates of six drill hole collars to verify a selection of Euro Sun's collar coordinates. The two sets of coordinates corresponded reasonably well with the differences within the level of accuracy expected from hand-held GPS measurements.

24.1.1 Database Validation by AMEC 2007

AMEC verified the coordinate locations of the drill hole collars by comparing the original spreadsheet of drill hole collar coordinates from the survey contractor with the drill hole collars entered into the database.

AMEC randomly selected 5% of the downhole surveys from 5% of the drill holes entered in the drill hole database and manually checked them against hard copies of the original down-hole survey records from the drill contractor.

AMEC verified the drill hole assay database by manually checking a randomly selected 5% of all hard copies of the original assay certificates against the assays entered in the database. AMEC also manually checked the highest 5% of copper and gold assays in the database against hard copies of the original laboratory certificates.

At the completion of its review, AMEC found the 2007 database acceptably accurate and error-free for use in mineral resource estimation.

24.2 Other Relevant Data

AGP is not aware of any current risks that negate reasonable prospects for economic extraction.

25 INTERPRETATION AND CONCLUSIONS

25.1 Geology

The RVP is located in the Golden Quadrilateral Mining District of the South Apuseni Mountains in West Central Romania, approximately 300 km northwest of the Romanian capital city of Bucharest, and 140 km east-northeast of the city of Timisoara.

The Property, which consists of one exploration licence, is centered at approximately latitude 46°05’ N and longitude 22° 54’E, and lies in the development region of Transylvania, within the County of Hunedoara. The Property is 100% controlled through Euro Sun’s wholly-owned subsidiary, SAMAX Romania SRL. On November 09, 2018, Euro Sun announced it was granted a mining license by the Romanian Government. The license was granted for 20 years and can be renewed in five-year increments. The Rovina, Colnic, and Ciresata porphyry copper-gold deposits are the principal exploration targets on the Property.

Porphyry deposits are generally large, low- to medium-grade deposits, in which primary (hypogene) sulphide minerals are dominantly structurally-controlled and are spatially and genetically related to felsic to intermediate porphyritic intrusions.

The Rovina, Colnic, and Ciresata deposits are associated with porphyritic subvolcanic intrusives, and lie within a northeastern outlier of the 8 to 10 km diameter, Neogene-aged, Brad-Barza volcanic field of the South Apuseni Mountains. Gold-copper mineralization at the three deposits is hypogene, with the weathering/oxidation profile poorly developed and usually <10 m thick. Locally at Rovina, minor secondary copper-oxide minerals are observed in the upper 15 m.

AGP draws the following conclusions:

- AGP has reviewed the methods and procedures to collect and compile geological, geotechnical, and assaying information for the Rovina, Colnic, and Ciresata porphyry deposits, and found that they met accepted industry standards for an advanced stage project and were suitable for the style of mineralization found on the property.
- While other companies conducted work on the property, only Euro Sun's data was used in the resource estimate. This ensured modern assaying techniques and proper QA/QC protocols were in place for the entire drill program and eliminated any need to rely on historical data.
- A QA/QC program utilizing industry standard blanks, standards, and duplicate samples has been used on the Project since the beginning of the Euro Sun exploration program. QA/QC submission rates meet industry-accepted standards. In AGP's opinion, Euro Sun exceeds standards by re-inserting coarse and pulp rejects in the sample stream to monitor the accuracy of the laboratory assays. In addition, a select suite of pulps are analysed at a secondary laboratory.

- An apparent high bias in the copper assays was noted for the 2010 to 2012 drill campaign during the QA/QC monitoring program which did not exist in the 2006 to 2008 program. Euro Sun queried its principal laboratory on this bias and a subsequent QC investigation concluded an error with calibration fluids was responsible and corrected. A total of 2,376 samples from Rovina were re-assayed and utilised for the resource estimation
- Data verification was performed by AGP through site visits, collection of independent character samples, and a database audit prior to mineral resource estimation. AGP found the database to be exceptionally well maintained, error free, and suitable for use in mineral resource estimation.
- Although additional sampling may be beneficial, AGP is of the opinion that with the samples currently available, the specific gravity determinations are representative of the in-situ bulk density of the rock types.
- Sampling and analysis programs using standard practices provided acceptable results. AGP believes the resulting data can effectively be used in the estimation of resources.
- Core handling, core storage, and chain of custody are consistent with industry standards.
- In AGP's opinion, the current drill hole database is sufficient for interpolating grade models for use in resource estimation.
- In AGP's opinion, further improvement to the flotation flowsheet is considered probable, and further examination of different mixed-collector regimes is strongly encouraged. This is particularly true of the Ciresata deposit, where gold recoveries could likely be improved through advances in pyrite flotation control.
- Minor element analysis of the locked-cycle test products highlighted that, with the exception of zinc in the concentrate from Colnic, all deleterious elements are within downstream treatment allowances.
- A high zinc concentration in the Colnic flotation concentrate (1.6%) should be monitored as testwork progresses; however, in practice, AGP believes blending with low zinc concentrates from Rovina and Ciresata would dilute this element to acceptable (sub-penalty) levels.
- Mineral resources were classified using logic consistent with the 2014 CIM definitions referred to in NI 43-101. At Rovina, Colnic, and Ciresata, the mineralization, density, and position of the drill holes satisfy sufficient criteria to be classified into the Measured, Indicated, and Inferred categories.
- This independent mineral resource estimate by AGP supports the February 20, 2019, disclosure by Euro Sun of the mineral resource statement for the RVP.

AGP concludes that, effective February 20, 2019, and utilizing approximately 120,256 m of diamond drill hole data drilled by Euro Sun from 2006 through 2012, the mineral resource of the RVP amounts to 89.8 million tonnes of Measured Resources grading at 0.62 g/t Au and 0.19 % Cu containing 1.78 million ounces of gold and 385 million pounds of copper. Indicated resources amounted to an additional 306.6 million tonnes grading 0.53 g/t Au and 0.15 % Cu containing 5.26 million ounces of gold and 1,006 million pounds of copper. The total Measured and Indicated resources amounted to 396.5 million tonnes grading at 0.55 g/t Au and 0.16 g/t Cu containing 7.05 million ounces of gold and 1,391 pounds of copper. Inferred resources added an additional

28.2 million tonnes grading 0.37 g/t Au and 0.16 % Cu containing 0.33 million gold ounces and 98 million pounds of copper. Table 25-1 summarizes the weighted average results of the mineral resource estimate for all three porphyry deposits of the RVP.

Table 25-1: Weighted Average Rovina Valley Resource Estimate (2019)

Resource Category	Tonnage (MM t)	Au (g/t)	Cu (%)	Gold (M oz)	Copper (M lb)	AuEq* (M oz)
Measured						
Rovina (open-pit)	32.1	0.36	0.29	0.37	208	0.83
Colnic (open-pit)	29.2	0.65	0.12	0.61	74	0.77
Ciresata (underground)	28.5	0.88	0.16	0.81	102	1.03
Total Measured	**89.8**	**0.62**	**0.19**	**1.78**	**385**	**2.63**
Indicated						
Rovina (open-pit)	74.2	0.27	0.22	0.64	365	1.44
Colnic (open-pit)	106.5	0.47	0.10	1.62	228	2.12
Ciresata (underground)	125.9	0.74	0.15	3.01	413	3.92
Total Indicated	306.6	0.53	0.15	5.26	1,006	7.47
Total Measured + Indicated	**396.5**	**0.55**	**0.16**	**7.05**	**1,391**	**10.11**
Inferred						
Rovina (open-pit)	14.9	0.19	0.19	0.09	62	0.22
Colnic (open-pit)	4.7	0.34	0.10	0.05	10	0.07
Ciresata (underground)	8.6	0.70	0.14	0.19	26	0.25
Total Inferred	**28.2**	**0.37**	**0.16**	**0.33**	**98**	**0.55**

Notes: *AuEq determined by using a long-term gold price of US$1,500/oz, and a copper price of US$3.30/lb. These prices are the 10-year trailing averages as of November 26, 2019 plus 10% for copper and 15% for gold. Metallurgical recoveries are not taken into account for AuEq. Base case cut-offs used in the table are 0.35 g/t AuEq for the Colnic deposit and 0.25% CuEq for the Rovina deposit (both of which are amenable to open-pit mining), and 0.65 g/t AuEq for the Ciresata deposit, which is amenable to underground bulk mining.

For the Rovina and Colnic porphyries, the resources are pit-shell constrained using Lerchs-Grossmann algorithm pit optimizer and market metal values of $1,500/oz Au price and $3.30/lb Cu price, with net prices after smelter payables, concentrate transport, smelter charges, and royalty of US$1,384/oz Au and US$2.61/lb Cu for Colnic were used to generate the shell and Rovina which also included flotation metallurgical recoveries of 81.5% for gold and 88.5% for copper for Colnic and Rovina.

The quantity and grade of Inferred Resources reported above are conceptual in nature and are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply, but not verify, geological and grade or quality continuity. For these reasons, an Inferred Mineral Resource has a lower level of confidence than an Indicated Mineral Resource and it is reasonably expected the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grade, and contained metal content.

25.2 Open Pit Mining

The PEA is based on solely on the Colnic open pit. The Rovina or Ciresata deposits are not considered at this time for the study.

The Colnic pit design is split into three phases. These provides a total of 85.7 Mt of mill feed grading 0.10% copper and 0.57 gpt gold. Waste movement from these phases amounts to 165.2 Mt giving a strip ratio of 1.9:1 (waste: mill feed).

The mill feed cut-off is based on a value per tonne which is often referred to as the milling cut-off. This is determined as:

(Block Revenue – Milling Cost – G&A Cost)/Block Tonnage

The lower cut-off used is any block with a value per tonne equal to or greater than $0.01 /t. A higher-grade cut-off of $3.00 /t was also used to segregate the mill feed material and assist in the project economics.

The phases are scheduled to provide 21,000 t/d of feed to the mill over a 12.1 operating mine life after 2 years of pre-production stripping. The pits are sequenced to minimize initial stripping and provide higher feed grades in the early years of the mine life. This is accomplished with stockpiling of lower grade material.

The pits are built on 12 metre benches with safety berm placement each 24 metres. Minimum mining widths of 60 metres were maintained in the design. Ramps are at 10% gradient and vary in width from 24.6 m (single lane width) to 32.2 m (double lane width). They have been designed for 136 t haulage trucks.

The mine equipment fleet is anticipated to be leased to lower capital requirements. The fleet will be comprised of four 200mm rotary drills, two 22 m3 hydraulic shovels and one 20 m3 front end loader. The truck fleet will peak at 25 trucks in Year 6. This is due to the long hauls anticipated from the pit bottom to the higher dump elevations. The usual assortment of dozers, graders, small backhoes and other support equipment is considered in the equipment costing. Three smaller front-end loaders (13 m3) will share duties at the primary crusher and also tramming and placing of dry stack tailings on the waste dumps from the grasshopper conveyors.

The waste dumps will fill the valley from the primary crusher to the plant to the north of Colnic. There are two major lifts in the waste dump; the initial lift at 450 masl and the final lift which climbs to 650 masl. These will accommodate all the waste rock from mining and the dry stack tailings from the mill. A total of 128.2 Mm3 has been designed and it is sufficient for the mine needs.

Material from the mine will have a portion that is expected to be PAG. This will be comingled with the dry stack tailings and the waste rock in the dump. The exact sequencing and placement plan will need to be defined in later studies.

The LOM operating cost is estimated at $2.35/t of material mined. This includes equipment leasing of $0.28/t of material mined.

Pre-production stripping costs of $33.5 million are capitalized. Initial mine equipment capital is $6.0 million with sustaining capital of $11.4 million.

Additional capital in the mining category includes the river diversion dam and tunnel, plus pumps, settling ponds, haulroads, etc. for a total of $13.5 million initially and $0.86 million for sustaining. The Rovina creek will be diverted around the pit with the 4.5m x 4.5m tunnel to avoid it interacting with the mining operation.

25.3 Metallurgy and Process

The PEA is based on metallurgical test work related to the Colnic deposit and the results of recently completed metallurgical test work by Eriez. The samples tested to date exhibit metallurgical characteristics considered typical of copper porphyry mineralization with almost all copper typically occurring as chalcopyrite. Pyrite is the main sulphide gangue component and is present in concentrations varying from 1% to approximately 7%. Occasional pyrrhotite is noted within the Colnic deposit. Limited mineralogy has defined a gold population consisting of discrete and fine-grained particles associated mainly with chalcopyrite and pyrite, but also locked within silicate minerals. The Eriez test work involved benchtop mechanical cell conventional flotation tests followed by a pilot plant test program to investigate column flotation response of the two major geometallurgical domains previously defined for Colnic. Large composite samples (~3,000 kg each) designated as MET-42 (Colnic K1 Domain) and MET-44 (Colnic K2K3 Domain) were prepared from core samples to represent each of the domains with respect to copper and gold grade, lithology, and composition.

From the Eriez column flotation testwork, it can be concluded that:

- Laboratory pilot plant column flotation results showed column flotation technology can be advantageously used for gold and copper flotation of Colnic MET-42, and Colnic MET-44 samples.
- Column flotation, with use of wash water, provided greater results compared to conventional mechanical flotation.
- For Colnic MET-42, an overall copper recovery of 93.5% and overall gold recovery of 84% were achieved in bulk rougher-scavenger column flotation. However, the combined rougher-scavenger and cleaner circuit copper and gold flotation recoveries were approximately 82.8% at a copper grade of 22.2%, and 77.6% at a gold grade of 109 g/t, respectively. The average zinc grade in the final concentrate was 4.2%.
- For Colnic MET-44, rougher-scavenger column flotation copper and gold recoveries were 96.6% and 88.5%, respectively. The average rougher-scavenger and cleaner circuit copper

recovery was 94.3% at the copper grade of 21.2%. The corresponding rougher-scavenger and cleaner circuit gold recovery was 85.5% at the final concentrate gold grade of 83 g/t. The zinc grade in the final concentrate averaged 1.6%.

The Rovina process plant design is based on a robust metallurgical flowsheet, recent Eriez test work and some historical test work to produce a copper-gold concentrate at optimum recovery while minimizing initial capital expenditure and operating costs. The flowsheet comprises primary crushing, milling (SAG and ball mills), rougher, scavenger, cleaner and re-cleaner flotation, regrinding, concentrate dewatering, concentrate bagging, and tailings dewatering for dry stacking.

The key criteria for equipment selection are suitability for duty, reliability, and ease of maintenance. The plant layout is conceived to provide ease of access to all equipment for operating and maintenance requirements while, in turn maintaining a layout that will facilitate construction progress in multiple areas concurrently.

The key project design criteria for the plant are:

- nominal throughput of 21,000 t/d material
- crushing plant availability of 4,115 hours per annum and process plant availability of 8,230 hours per annum through the use of standby equipment in critical areas and reliable grid power supply
- the comminution circuit has been sized to produce grind size of P80 of 75 µm, and regrinding mill will grind rougher-scavenger concentrate to a P80 of 13 µm to recover an estimated 89% of the contained copper and 82% of the contained gold
- copper-gold concentrate will be filtered, and the filter cake will be bagged
- scavenger tailings will be filtered and disposed as ‘dry’ tailings and stored together with the mine waste rock
- sufficient automation and plant control will be incorporated to minimize the need for continuous operator intervention but to allow manual override and control if and when required.

25.4 Infrastructure and Site Layout

The infrastructure and site layout take into consideration Euro Sun’s commitment to minimize disturbance to the area and commitment for environmental stewardship.

The site infrastructure includes major items for the project such as:

- primary crushing and rope conveyor system
- process plant
- filtered tailings and waste rock storage facility
- mine shop facilities
- raw water supply
- powerline tie in
- access roads

- river diversion dam and tunnel

The primary crusher will be located adjacent to the Colnic pit and above the Rovina valley floor. From there the ore will be transported up the side of the valley by a rope conveyor system working 12 hours per day to minimize the noise to the local population at night time.

The 7.2 Mtpa process plant is located in a valley west of the Colnic pit and above the local towns to be out of sight of the local population. It will be built into the slopes to minimize cut-and-fill quantities.

Tailings from the process plant will be filtered and conveyed into the Rovina valley to the waste dump facility. This will be comingled with the waste rock. A series of grasshopper conveyors are part of the system to aid placement as the dump increases in height.

Mine shop facilities are located in the small valley to the north of the Colnic pit and adjacent to the primary crusher. This is for easy access to the pit.

Water for the process plant will come from a dam located north of the project and piped to the plant.

Power will come from the main high voltage line to the west of the project. A connected load of 48 MW is proposed for the project with a peak demand of 37 MW.

Various access roads need to be constructed for access to the project. These include the main access road from the west to the process plant. This will be for supplies and concentrate haulage. From the plant site, access roads will be built to the valley bottom in the Colnic pit and also to the eastern side of the pit. This road system will also be used to service the primary crusher and rope conveyor systems.

The Rovina creek will be diverted around the Colnic Pit by the use of a small diversion dam and tunnel. The 1.85 km tunnel will be 4.5m x 4.5m and have a concrete channel for the water to flow unimpeded.

25.5 Economic Analysis

Readers are cautioned that the PEA is preliminary in nature. It includes inferred mineral resources considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, socio-political, marketing, or other relevant issues.

The LOM capital cost for the project is estimated at $352M, with an initial capital expenditure of $340M which includes $33.5M pre-strip costs which are capitalized.

At a gold price of $1,325/oz and copper price of $3.10/lb, the project is estimated to have an after-tax IRR of 13.5% and a pay-back period of 5.62 years after start of production. At a discount rate of 5%, the after tax NPV is estimated at $169M.

The cash flow model has been based on a two-year project development period, but all cash-outflows commence in Year -1, and that concentrate production commences in month one of Year 1. The model has considered only cash flows from project 'go-ahead'. Any previous expenditure (sunk costs) have not been carried forward or included in the model. Sunk costs have been included in the tax model.

Provision has been made for corporate income tax at 16% of taxable income. Royalties are 5% each for copper and gold.

The cashflow model assumes full equity financing with no provision for interest on the cost of capital.

The project is most sensitive to changes in metal prices, metal recovery then operating costs.

26 RECOMMENDATIONS

26.1 Introduction

Based on the results of the PEA study, AGP recommends that Euro Sun continue proceeding forward with additional studies and a feasibility leading to a potential project execution decision. The recommendations, and associated budgets, are described in the section below.

The Rovina and Ciresata deposits, while not a component of the PEA study, represent an opportunity for Euro Sun to expand the project as it is currently envisaged.

26.2 Geotechnical and Infrastructure Drilling for the Colnic Deposit

- Additional drilling should focus on areas required to support a feasibility study using the mining scenario developed in this PEA. Such areas consist of condemnation drilling below the location of the planned infrastructure, and additional geotechnical drill holes as required to support foundation design.
- Colnic open pit geotechnical/hydrogeologic drilling: a provisional estimate pending further engineering guidance is 12 drill holes with average depths of 200 m.
- Infrastructure geotechnical drilling for process plant, crushing stations, and ancillary ore haulage conveyors: provisional estimate of 20 drill holes with average depth 40 m.
- Condemnation drilling below planned infrastructure and waste storage facility: provisional estimate of 10 drill holes with average depth of 500 m.

26.3 Geology

Euro Sun should increase the drill density in selected areas. The main objectives of this drilling program would be:

- Upgrade existing resources to Measured in areas affected by the first 1- to 3-year mine plan for the Colnic deposit. A similar program should be considered for the Rovina deposit when it will be considered in a possible PEA or feasibility study.
- Complete the delineation of mineralization limits at Rovina prior to inclusion in a future feasibility study.
- In preparation for a feasibility study, AGP recommends a conditional simulation run to quantify the degree of risk in the resource for an estimated cost of $20,000 for a pilot run.
- Provide new assay and geologic data through detailed drill core logging and interpretation to address any weaknesses in the current resource models following the conditional simulation model.

Provisionally, pending further guidance on mine scheduling, the following infill drill program is recommended: Colnic porphyry, 20 HQ/NQ drill holes with an average length of 150 m, for a total of 3,000 m. This drilling is expected to increase the amount of resource in the Measured category for the first three years of planned open pit production.

At the Rovina porphyry, geologic evaluation suggests the potential for deeper porphyry mineralization in the southwest sector of the current resource. Euro Sun should evaluate the depth of this potential target and drill if warranted. AGP recommends a limited drill program to evaluate the target with more drilling once the open pit is in production. Drilling should focus in areas where the drill collar location could potentially be lost due to mining.

Other porphyry targets in the Rovina project area should be evaluated and ranked by Euro Sun's generative exploration program. Drill testing of these targets is recommended, especially near the Colnic deposit (Table 26-1). A total of 2,000 m of diamond drilling (approximately five drill holes) has been allocated for reconnaissance drilling.

Table 26-1: Recommended Drill Budget

Description	Details	Estimated Cost (US$)
Geotechnical feasibility drilling Colnic Pit	**2,400 m @ US$250/m Includes supervision**	600,000
Infrastructure geotechnical drilling	800 m @ US$250/m includes supervision	200,000
Condemnation feasibility drilling	5,000 m @ US$180/m	900,000
Rovina Deep target drilling + In-fill	3,000 m @ US$180/m	540,000
Colnic Resource In-fill	3,000 m @ US$180/m	540,000
Reconnaissance Drilling	2,000 m @ US$180/m	360,000
Analytical Costs	Includes provision for 20% QA/QC samples and independent sampling. Analytical costs of US$35 per sample, total of 9,600 samples	336,000
	TOTAL	**3,476,000**

26.4 Open Pit Mining

Significant work has been completed to date on the open pit designs and costing for the project. This work demonstrates the potential for economic development of the Project. There are still some areas that require further definition prior to mine operation and can be handled as separate studies or part of a future feasibility study.

26.4.1 Grade Control Procedures

The PEA worked on the assumption that blasthole sampling would be the preferred grade control method. With the lower copper grades and higher gold values of Colnic, proper categorization of material will be key to the economic success of the Project. Sample sizes, methodology of sample selection and assaying procedures need to be properly defined to properly assess the cost of grade control. The is a separate study that is estimated to cost $75,000.

26.4.2 Pit Dewatering

With the Colnic pit mining through the Rovina creek, a proper understanding of pumping requirements and the hydrogeology is critical. Further work assessing this is required. To assess this properly a budget cost of $200,000 is estimated for analysis, testing and reporting.

26.4.3 Wall Slopes

A detailed examination of the slopes to reduce stripping while still providing a safe work environment is required. Detailed mapping of the slopes and recommendations and further analysis is required. This is would take the information obtained in the geology recommended drill budget and be analyzed. This is estimated to cost an additional $300,000 over the geotechnical drilling.

26.4.4 Total Budget

The total estimated cost of additional studies, not including a future feasibility study is $575,000.

26.5 Metallurgy

The following is proposed for future metallurgical work.

26.5.1 Flotation Configuration

Comprehensive testwork programs have been carried out on Colnic samples over the years with variable results; however, further flotation testwork is recommended in order to confirm and validate the process flowsheet and equipment sizing, while minimizing capital and operational costs. Also, there is an opportunity to improve copper and gold recovery predictions applied to the economic model in the presence of additional testwork. These future investigations should cover the following:

- An investigation of the mineralogical characteristics of high Zn content and the corresponding flotation reagent schemes, to effectively depress Zn without decreasing gold recovery. Rougher-scavenger and cleaner column flotation tests are recommended for higher zinc content material.
- Comminution testwork needs to be carried out for the next phase to gather sufficient information for optimization of the grinding circuit.
- Variability testwork to investigate the impact of head grade, rock type and redox.

26.5.2 Flotation Concentrate Filtration

No formal laboratory and pilot solid-liquid separation investigations on flotation concentrate filtration were undertaken under the scope of this PEA and benchmarks from vendors were used. It is recommended to undertake filtration laboratory/pilot tests on flotation concentrate generated from Colnic samples. Testwork should be related mainly to the rheological characterization and the filterability of the material, as functions of the sample characteristics, elemental analysis, and particle size distribution.

26.5.3 Thickened Flotation Tailings Filtration

For the PEA, no solid-liquid separation testwork on flotation tailings using Colnic samples were undertaken. However, the application of the ceramic disc-vacuum filters technology for copper thickened flotation tailings appears to be a suitable option as benchmarked vendor information was used for the PEA.

Laboratory/pilot plant investigations are recommended during the next study phase to support the appropriate filtration technology and include the following:

- mineralogical composition
- particle size distribution
- physical and rheological characteristics (slurries)
- filterability, including filter cake thickness, filtration rate, cake moisture content, wash efficiency
- tailings settling, dewatering and consolidation testing

Finally, this testwork should include considerations of optimization and variability of upstream process conditions.

26.5.4 Metallurgical Testwork Budget

Table 26-2 summarizes the proposed budget for future metallurgical testwork.

Table 26-2: Proposed Metallurgical Budget

Task	Est. Cost
Comminution	$50,000
Variability Testwork	$200,000
Filtration Characterization (concentrate/tailings)	$200,000
Total	**$450,000**

26.6 Infrastructure

Additional studies are required with respect to:

- rope conveyor and its alignment
- detailed surveys of the plant site location, road accesses and water pipeline
- power study
- waste and tailings placement facility
- river diversion dam and tunnel design and investigation
- site wide water balance

This work will also include incorporation of the geotechnical work discussed early into the designs.

These studies and surveys are estimated to cost $400,000.

26.7 Environmental

Euro Sun has advanced their environmental program well beyond what is normally associated with a PEA study. The progression towards and receipt of the mining licence is indicative of this.

Additional background information needs to be collected, especially in regard to the creek diversion and dry stacking of tailings. Further study will assist in providing regulators with all the required information.

This additional study work is estimated at $300,000.

26.8 Recommendations and Estimated Budget

Table 26-3 shows a summary of recommendations per discipline and the estimated total costs.

Table 26-3: Summary of Recommendation Budgets

	Recommended Budget ($)
Geotechnical drilling	Part of geology budget
Geology	3,476,000
Mining	575,000
Metallurgy	450,000
Infrastructure	400,000
Environmental	300,000
Feasibility Study	3,000,000
Total	**8,201,000**

27 REFERENCES

About Romania, 2006: Romania Geography: About Romania.com, <http://www.aboutromania.com/>, accessed 28 June 2007.

Alderton, D.H.M. and Fallick, A.E., 2000: The Nature and Genesis of Gold-Silver-Tellurium Mineralization in the Metaliferi Mountains of Western Romania, in Economic Geology Vol. 95/Number 3, May 2000.

André-Mayer, A-S., Leroy, J.L., Marcoux, E., and Lerougec, C., 2001: Fluid Inclusions and Sulphur Isotopes of the Valea Morii Ore Deposit (Apuseni Mountains, Romania): Telescoping between Porphyry and Low-sulfidation Epithermal Ore Deposits: 13 p. <http://hal.ccsd.cnrs.fr/docs/00/08/96/99/PDF/Andre-Mayer-CRAS-2001.pdf#search=%22valea%20morii%20gold%22> accessed 28 June 2007.

Armstrong, R., 2006: Petrographic Report: unpublished internal report from London Natrural History Museum, Londan, U.K. to Carpathian Gold Inc., cited in Ruff, 2007.

Armstrong, R., 2008: Petrographic Report: unpublished internal report from London Natrural History Museum, London, UK to Carpathian Gold Inc.

Borcos M., and Vlad S., 1994: Plate Tectonics and Metallogeny in the East Carpathians and Apuseni Mountains: IGCPP Project No. 356, Bucharest: June 7-19, 1994, 43 p. Cited in Seghedi, I., 2004. Geological Evolution of the Apuseni Mountains with Emphasis on the Neogene Magmatism – a Review in N.J. Cook & C.L. Ciobanu (Eds.), 2004: Au-Ag-telluride Deposits of the Golden Quadrilateral, Apuseni Mts., Romania: Guidebook of the International Field Workshop of IGCP project 486, Alba Iulia, Romania, 31 August–7 September 2004, IAGOD Guidebook Series 11.

Carpathian Gold Inc., 2006: Romania Locations: Carpathian Gold website, <http://www.carpathiangold.com/site06/nbspnbspProjects/Romania/tabid/68/Default.aspx>; accessed 28 June 2007.

CIA World Factbook, 2006: The World Fact Book: Romania, June 2006 update: <http://www.cia.gov/cia/publications/factbook/geos/ro.html>, accessed 28 June 2007.

Cinits, R.A. 2006a: A Review of the Colnic Au–Cu Porphyry Deposit and QA/QC Procedures, AMEC (Peru) S.A. in-house memo RC-013-06 prepared for Carpathian Gold Inc., June 2, 2006.

Cinits, R.A., 2006b: Technical Report on the Apuseni–Rovina Property: report prepared for Carpathian Gold Inc by AMEC Peru S.A., effective date 1 September 2006.

Cioflica, G., Savu, H., Borcos, M., Stefan, A., and Istrate, G., 1973: Alpine Volcanism and Metallogenesis in the Apuseni Mountains. Symposium on Volcanism and Metallogenesis, Excursion Guide 3AB, IGG, Bucharest, 70 p. Cited in Seghedi, I., 2004. Geological Evolution of the Apuseni Mountains with Emphasis on the Neogene Magmatism – a Review in N.J. Cook & C.L. Ciobanu (Eds.), 2004: Au-Ag-telluride Deposits of the Golden Quadrilateral, Apuseni Mts., Romania : Guidebook of the International Field Workshop of IGCP project 486, Alba Iulia, Romania, 31 August–7 September 2004, IAGOD Guidebook Series 11.

Clarke, J. and Kiddie, A., 2007: Petrographic Report: unpublished internal report from Cygnus Consulting Inc., Montreal, Canada to Carpathian Gold Inc.

Damian, G., 2006: Petrographic Report: unpublished internal report to Carpathian Gold Inc., cited in Ruff, 2006.

Damian, G., 2008: Petrographic Report: unpublished internal report from North University, Baia Mare, Romania to Carpathian Gold Inc.

Damian, G., 2011: Petrographic analyses of thin and polished section of the Ciresata porphyry deposit. Unpublished internal report from North University, Baia Mare, Romania to SAMAX SRL.

Desautels, P., P.Geo., 2009: Technical Report on the Rovina Valley Project, Romania, PEG Mining Consultants Inc

Desautels, P., P. Geo. and Zurowski, G., P.Eng., 2012: Carpathian Gold Inc. Rovina Valley Project, West-Central Romania, NI43-101 Technical Report Mineral Resources Estimate Update, AGP Mining Consultants Inc

Eurogold Limited, 2006a: Details of Mining Operations and Exploration: Eurogold website, <http://www.eurogold.com.au/html/operations.html#Details%20operations>; accessed 28 June 2007.

Eurogold Limited, 2006b: Gold in the Carpathian Mountains: Eurogold website, <http://www.eurogold.com.au/html/operations.html>, accessed 28 June 2007.

European Goldfields Ltd., 2006c: Reserves Announced for Certej Project: unpublished release to Toronto Stock Exchange, 10 April 2006, 5 p.

European Goldfields Ltd., 2006d: Clear Path for Permits at Certej: unpublished release to Toronto Stock Exchange, 2 August 2006, 4 p.

European Goldfields Ltd., 2006e: Certej Project, Romania: European Goldfields website, <http://www.egoldfields.com/goldfields/projects.jsp?ref=8>, accessed 28 June 2007.

European Goldfields Ltd., 2007: Certej Project, Romania, Turning the corner: European Goldfields website, http://www.egoldfields.com/goldfields/projects.jsp?ref=8, accessed 28 June 2007.

Gabriel Resources Ltd, 2006: Rosia Montana project: Gabriel Resources website, <http://www.gabrielresources.com/prj-rosia.htm>, accessed 28 June 2007.

Grancea L., Cuney, M., and Leroy, J.L., 2001: Mineralised versus barren intrusions: a melt inclusion study in Romania's Gold Quadrilateral: Earth and Planetary Sciences vol 333, p. 705–710.

Halter, W. E., Pettke, T., Heinrich, C. A., 2002. The Orgin of Cu/Au Ratios in Porphyry-Type Ore Deposits: Science, v. 296, pp. 1844-1846.

Harkonen E, P.Eng. et al. 2010 NI 43-101 Technical Report of the Rovina Exploration Property, South Apuseni Mountains, West-Central Romania, PEG Mining Consultants Inc.

Hope, M., Ivascanu, P., Fletcher, T., 2010: Appraisal of magnetic data and targets over the Ciresata, Rovina, Colnic area and Ciresata field/core review by Barrick Gold Eurasia. Report to Carpathian Gold Inc.

Ianovici, V., Giusca, D., Ghitulescu, T.P., Borcos, M., Lupu, M., Bleahu, M., and Savu, H. 1969: Evolutia Geologica a Muntilor Metaliferi. Ed. Acad. Rep. Soc. România, 741 p. Cited in Seghedi, I., 2004. Geological Evolution of the Apuseni Mountains with Emphasis on the Neogene Magmatism – a Review in N.J. Cook & C.L. Ciobanu (Eds.), 2004: Au-Ag-telluride Deposits of the Golden Quadrilateral, Apuseni Mts., Romania: Guidebook of the International Field Workshop of IGCP project 486, Alba Iulia, Romania, 31 August–7 September 2004, IAGOD Guidebook Series 11.

IBP Publishing and Conferences, 2006: Romanian Business Digest, March 2006: 296 p. <http://rbd.doingbusiness.ro/home.htm>, accessed 28 June 2007.

Long, S.D., 2005, Assay Quality Assurance-Quality Control Program for Drilling Projects at the Pre-Feasibility to Feasibility Report Level (4th edition), AMEC Mining Consulting Group.

Manske, S.L. and Hedenquist, J.W., 2006: Rosia Montana, Romania: Europe´s Largest Gold Deposit, SEG Newsletter Number 64, Society of Economic Geologists.

Milieukontact Oost- Europa, 2006: Romania: Milieukontact website, <http://www.milieukontakt.nl/index.php?show=general&country_id=11>, accessed 28 June 2007.

Milu, V., Milesi, J.P. and Leroy, J.L., 2004: Rosia Poieni Copper Deposit, Apuseni Mountains, Romania: Advanced Argillic Overprint of a Porphyry System: Mineralium Deposita, Volume 39: p. 173–188.

Morris, R., 2006: Review of ground magnetic data from the Rovina property, western Romania. Report to Carpathian Gold Inc.

Murakami, H., Seo, J. H., Heinrich, C. A., 2010, The relation between Cu/Au ratio and formation depth of porphyry-style Cu-Au +/- Mo deposits: Mineralum Deposita, v. 45, pp. 11-21.

Neubauer, F., Lips, A., Kouzmanov, K., Lexa, J., Ivascanu, P., 2005, Subduction, slab detachement and mineralization: The Neogene in the Apuseni Mountains and Carpathians: Ore Geology Reviews, v. 27, pp. 13-44.

Patrick, D.J., and Jackson, T., 2004: Technical Review of a Portfolio of Properties in Romania for European Goldfields Ltd by A C A Howe International Limited: unpublished report to Toronto Stock Exchange, 10 March 2004, 237 p.

Richards, J.P., 2000: Lineaments Revisited: SEG Newsletter Number 42, Society of Economic Geologists.

Rossetti. P., Colombo, F., Cioflica, G., and Lupulescu, M., 1999: Relationships between Porphyry Type and Epithermal Deposits in the Valea Morii Nova Mine (Apuseni Mountains, Romania): Fluid Inclusions Preliminary Data: Symposium H01 Geodynamic Control of Ore Deposit Formation in the Alpine-Carpathian-Dinari-Balkan Region, 28th March - 1st April, 1999 Strasbourg, France, Journal of Conference Abstracts Volume 4 Number 1.

Rosu, E., Seghedi, I., Alderton, D., Szakács, A., Pécskay, Z., Panaiotu, C., and Nedelcu, L., 2004: Extension-related Miocene Calc-alkaline Magmatism in the Apuseni Mountains, Romania: Origin of Magmas: Schweizerische Mineralogische und Petrographische Mitteilungen, Vol 84, p. 153–172.

Ruff, R., 2006: Rovina–Colnic Prospect Geology: unpublished internal document, Carpathian Gold Inc., 21 September 2006. 9 p.

Ruff, R., 2007: Colnic Porphyry Geology and Exploration, Rovina Exploration License, South Apuseni Mountains, Romania, July 2007: unpublished internal report, Carpathian Gold Inc., 40 p.

Ruff, R.K., Stefanini B., Halga S., 2012: Geology and petrography of the gold-rich porphyry deposit, Metaliferi Mountains, Romania: Romanian Journal of Mineral Deposits, Vol 85, N.1 Geologic Institute of Romania, Society of Economic Geology of Romania, Bucharest 2012.

S.C. Rosia Montana Gold Corporation S.A., 2004: Project Presentation Report: unpublished Technical Report to Toronto Stock Exchange, 196 p.

Seedorff, E., Dilles, J. H., Proffett, J. M., Einaudi, M., T., Zurciier, L., Stavast, W. J., Johnson, D.A., Barton, M.D., 2005; Porphyry deposits: Characteristics and origin of hypogene features, in Economic Geology 100th Anniversary Volume, pp. 251-298, society of Economic Geologists Inc.

Sillitoe, R.H., 2000: Gold-Rich Porphyry Deposits: Descriptive and Genetic Models and their Role in Exploration and Discover, in Gold in 2000, Reviews in Economic Geology, Vol. 13, Society of Economic Geologists.

Sinclair, W.D., 2006: Consolidation and Synthesis of Mineral Deposits Knowledge - Porphyry Deposits: report posted to Natural Resources Canada website 30 January 2006, 14 p., <http://gsc.nrcan.gc.ca/mindep/synth_dep/porph/index_e.php>, accessed 28 June 2007.

Steblez, W., 2001: The Mineral Industries of Bulgaria and Romania, 2001: <http://minerals.usgs.gov/minerals/pubs/country/2001/buromyb01.pdf> accessed 28 June 2007.

Steblez, W., 2002: The Mineral Industries of Bulgaria and Romania, 2002: <http://minerals.usgs.gov/minerals/pubs/country/2001/buromyb02.pdf> accessed 28 June 2007.

Steblez, W., 2003: The Mineral Industries of Bulgaria and Romania, 2003: <http://minerals.usgs.gov/minerals/pubs/country/2001/buromyb03.pdf>, accessed 28 June 2007.

Tamas C., 2002: "Breccia Pipe" Structures Associated with Some Hydrothermal Ore Deposits in Romania. Ph.D. Thesis, Univ. Babes- Bolyai, Cluj-Napoca (in Romanian), 186 p. Cited in Seghedi, I., 2004. Geological Evolution of the Apuseni Mountains with Emphasis on the Neogene Magmatism – a Review in N.J. Cook & C.L. Ciobanu (Eds.), 2004: Au-Ag-telluride Deposits of the Golden Quadrilateral, Apuseni Mts., Romania : Guidebook of the International Field Workshop of IGCP project 486, Alba Iulia, Romania, 31 August–7 September 2004, IAGOD Guidebook Series 11.

Udubasa, G., Rosu, E., Seghedi, I., and Ivascanu, M.P., 2001: The "Golden Quadrangle" in the Metaliferi Mountains, Romania: What Does This Really Mean? Rom. J. Mineral Deposits 79/2: 24-34. Cited in Seghedi, I., 2004. Geological Evolution of the Apuseni Mountains with Emphasis on the Neogene Magmatism – a Review in N.J. Cook & C.L. Ciobanu (Eds.), 2004: Au-Ag-telluride Deposits of the Golden Quadrilateral, Apuseni Mts., Romania : Guidebook of the International Field Workshop of IGCP project 486, Alba Iulia, Romania, 31 August–7 September 2004, IAGOD Guidebook Series 11.

United Nations Economic Commission for Europe, 2000: Legal and Policy Framework, Institutional Arrangements and Environmental Regulations, Romania: <http://www.unece.org/env/epr/studies/romania/chapter01.pdf>, 15 p. accessed 28 June 2007.

Vlad, S. N., Orlandea, E., 2004, Metallogeny of the Gold Quadrilateral: Style and characteristics of epithermal-subvolcanic mineralized structures, South Apuseni Mts., Romania: Romania Journal of Mineral Deposits, Special Issue, v. 81, pp. 15-31.

Warries, H., Cloutt, B., Palich, B., De Visser, J., Gossage, B., and Monaghan, B., 2006: Certej Gold Silver Project, Romania, Technical Report by RSG Global on behalf of European Goldfields Limited and Deva Gold S.A.: unpublished report to Toronto Stock Exchange, 26 April 2006, 139 p.

28 CERTIFICATE OF AUTHORS

28.1 Pierre Desautels, P.Geo.

I, Pierre Desautels, P.Geo. am employed as a Principal Resource Geologist with AGP Mining Consultants Inc. located at 246-132K Commerce Park Dr., Barrie ON L4N 0Z7. This certificate applies to the technical report titled Rovina Valley Project Preliminary Economic Assessment, NI 43-101, Rovina Valley, Romania (the "Technical Report") with an effective date of February 20, 2019 and a report date of April 01, 2019 and I do hereby certify that:

- I am a member in good standing of The Association of Professional Geoscientists of Ontario, membership #1362.
- I graduated from Ottawa University (B.Sc. Hons.) in 1978.
- I have practiced my profession continuously since graduation.
- I visited the project site from August 26 to 30, 2008, July 26 to 29, 2009, and again in July 2011.
- I have read the definition of "Qualified Persons" set out in National Instrument 43–101 (NI 43-101) and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.
- I have been directly involved in the mining sector covering database, mine geology, grade control, and resource modelling for more than 30 years. As a result of my experience and qualifications, I am a Qualified Person as defined in NI 43–101.
- I am responsible for Sections 1.1, 1.2, 1.10.2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 23, 24, 25.1, 26.3, and 27 of the Technical Report.
- I am independent of Euro Sun Mining Corporation as described by Section 1.5 of the instrument.
- I have had no previous involvement with Euro Sun Mining Inc.

As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections of the Technical Report that I am responsible for, contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: April 01, 2019

"Signed and sealed"

Pierre Desautels, P.Geo.

28.2 Gordon Zurowski, P.Eng.

I, Gordon Zurowski, P.Eng. am employed as a Principal Mine Engineer with AGP Mining Consultants Inc. located at 246-132K Commerce Park Dr., Barrie ON L4N 0Z7. This certificate applies to the technical report titled Rovina Valley Project Preliminary Economic Assessment, NI 43-101, Rovina Valley, Romania (the "Technical Report") with an effective date of February 20, 2019 and a report date of April 01, 2019 and I do hereby certify that:

- I am a member in good standing of Professional Engineers of Ontario, membership #100077750.
- I graduated from the University of Saskatchewan, (B.Sc. Geological Engineering) in 1989.
- I have practiced my profession in the mining industry continuously since graduation.
- I have visited the project site on numerous occasions since July 2007, the most recent visit being from January 23 to February 1, 2012.
- I have read the definition of "Qualified Persons" set out in National Instrument 43–101 (NI 43-101) and the sections of the technical report for which I am responsible have been prepared in compliance with that Instrument.
- I have been directly involved in the mining industry, in particular design and evaluation of open pit mines, for more than 25 years. As a result of my experience and qualifications, I am a Qualified Person as defined in NI 43–101.
- I am responsible for Sections 1 (Summary), 1.3, 1.9, 1.10.1, 1.10.3, 1.10.6, 1.10.7, 2, 3, 15, 16, 19, 20, 21.2, 21.4.1, 25.2, 26.1, 26.2, 26.4, 26.7, and 26.8 of the Technical Report.
- I am independent of Euro Sun Mining Inc. as described by Section 1.5 of the instrument.
- I have had no previous involvement with Euro Sun Mining Inc.

As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections of the Technical Report that I am responsible for, contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: April 01, 2019

"Signed and sealed"

Gordon Zurowski, P.Eng.

28.3 Neil Lincoln, P.Eng.

I, Neil Lincoln, of Oakville, Ontario, Canada, do hereby certify, as one of authors of the report entitled Rovina Valley Project Preliminary Economic Assessment, NI 43-101, Rovina Valley, Romania (the "Technical Report") April 1, 2019 and having an effective date of February 20, 2019 prepared for Euro Sun Mining Corporation (the "issuer"), that:

1. I am an independent metallurgical consultant with an address of 383 Allan Street, Oakville, ON, Canada and formerly employed as the VP Business Development and Studies with Lycopodium Minerals Canada Ltd, 5060 Spectrum Way, Suite 400, Mississauga, ON, Canada.
2. I graduated from the University of the Witwatersrand, South Africa, in 1994 with a Bachelor of Science in Metallurgy and Materials Engineering (Minerals Process Engineering) degree.
3. I am a professional engineer in good standing with the Professional Engineers Ontario (PEO) in Canada (no. 100039153).
4. I have practiced my profession continuously as a metallurgist for 23 years.
5. I am responsible for sections 1.4, 1.5, 1.6, 1.7, 1.8, 1.10.4, 1.10.5, 13, 17, 18, 21.1, 21.3, 21.4 (except 21.4.1), 22, 25.3, 25.4, 25.5, 26.5, and 26.6 of the Technical Report.
6. 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 am a "qualified person" for the purpose of NI 43-101.
7. I have not visited the site.
8. I am independent of the issuer in accordance with the application of Section 1.5 of National Instrument 43-101.
9. I have not had any prior involvement with the Euro Sun Mining Inc.
10. I have read National Instrument 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with same.
11. 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 April 01, 2019 at Oakville, Ontario, Canada.

"Signed and sealed"

Neil Lincoln, P.Eng.