CSA Global
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NI 43-101 TECHNICAL REPORT

Mineral Resource and Mineral Reserve Update

Chelopech Mine – Chelopech, Bulgaria

REPORT NO. R160.2022
EFFECTIVE DATE: 31 March 2022

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Report prepared for

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Signature Pages and Certificates of Qualified Persons

The effective date of this report is March 31, 2022. The issue date of this report is March 31, 2022. Below are the certificates of qualified persons. These certificates are considered the date and signature of this report in accordance with Form 43-101F1.

Certificate of Qualified Person – Galen White

As a Qualified Person of this Technical Report on the Chelopech Mine of Dundee Precious Metals – Chelopech, Bulgaria, I, Galen White do hereby certify that:

1) I am a Partner and Principal Consultant of CSA Global (UK) Limited and completed this work for CSA Global (UK) Limited, Springfield House, Suite 2 First Floor, Horsham, West Sussex, RH12 2RG, United Kingdom, telephone: (+44) 1403 255 969, email: csauk@csaglobal.com.
2) The Technical Report to which this certificate applies is titled "NI 43-101 Technical Report, Mineral Resource and Mineral Reserve Update, Chelopech Mine, Chelopech, Bulgaria" with an effective date of 31 March 2022 (the "Technical Report") prepared for Dundee Precious Metals Inc. ("the Issuer").
3) I hold a BSc degree in Geology from the University of Portsmouth, UK and am a registered Fellow in good standing of the Australasian Institute of Mining and Metallurgy (AusIMM). I am familiar with National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and, by reason of education, experience in the exploration, evaluation, and mining of epithermal and vein hosted mineral deposits in Europe, Australia and Africa, and professional registration; I fulfil the requirements of a Qualified Person as defined in NI 43-101. My experience includes over 25 years continuous experience in the mining industry which includes significant experience Mineral Resource evaluation.
4) I have inspected the property that is the subject of this Technical Report, for a period of three days between 7 March 2022 and 9 March 2022.
5) I am responsible for Sections 1 to 12, 14, 20, 23 to 27 of this Technical Report.
6) I am independent of the issuer as described in Section 1.5 of NI 43-101.
7) I have had prior involvement with the property that is the subject of this Technical Report in the capacity of technical peer reviewer of previous Mineral Resource disclosure on behalf of CSA Global via the preparation of NI 43-101 Technical Reports in 2018, 2019 and 2020.
8) I have read NI 43-101 and the sections of the Technical Report I am responsible for have been prepared in compliance with NI 43-101.
9) As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make this report not misleading.

Dated this 31st day of March 2022

"signed and sealed"

Galen White BSc (Hons), FAusIMM
Partner and Principal Consultant
CSA Global (UK) Limited

Certificate of Qualified Person – Andrew Sharp

As a Qualified Person of this Technical Report on the Chelopech Mine of Dundee Precious Metals – Chelopech, Bulgaria, I, Andrew Sharp do hereby certify that:

1) I am currently employed as Director Mining Engineering with CSA Global Consultants Canada Limited with an office at 1000-1100 Melville St, Vancouver, BC V6E 4A6, CANADA.
2) This certificate applies to the Technical Report titled "NI 43-101 Technical Report, Mineral Resource and Mineral Reserve Update, Chelopech Mine, Chelopech, Bulgaria", with an Effective Date of 31 March 2022 (the "Technical Report") prepared for Dundee Precious Metals Inc. ("the Issuer").
3) I am registered as a professional engineer in good standing with Engineers and Geoscientists BC (#47907) and I am a Fellow in good standing of the Australian Institute of Mining and Metallurgy (#112949). I am a graduate from the University of Curtin, Kalgoorlie (1987). I have been involved or associated with the mining industry since 1987, in Australia, Malaysia, Bulgaria, Ghana, Mexico, Papua New Guinea, Argentina, Bolivia, Colombia, Chile and Canada in production roles for 28 years and an additional six years in consulting. In particular to the Chelopech Mine, I have more than five years applied to flotation plants, underground mining utilising open stoping and the metal commodities being produced at Chelopech. I have previous experience as lead consultant on a pre-feasibility for a gold mine project in Bulgaria.
4) I completed a personal inspection of the Chelopech Mine and facilities for three days from 7 March 2022 to 9 March 2022.
5) I am responsible for Sections 15, 16, 18, 19, 21 and 22 of the Technical Report.
6) I am independent of the Issuer and related companies applying all of the tests in Section 1.5 of the NI 43-101.
7) I have had no prior involvement with the property that is the subject of the Technical Report.
8) I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
9) As of the effective date of the Technical Report and the date of this certificate, to the best of my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 31st day of March 2022

"signed and sealed"

Andrew Willis Sharp, B.Eng. (Mining), P.Eng. (BC), FAusIMM
Principal Consultant
CSA Global Consultants Canada Limited

Certificate of Qualified Person – Gary Patrick

As a Qualified Person of this Technical Report on the Chelopech Mine of Dundee Precious Metals – Chelopech, Bulgaria, I, Gary Patrick do hereby certify that:

1) I am the Principal Consultant of Metallurg Pty Ltd; Liman Mah, 25 Sokak, Sila Apartman 15-D-10, Konyaalti, Antalya, Turkey, 07070; telephone +7 985 063 54 81, email: metallurg@powerdsl.com.au.
1) The Technical Report to which this certificate applies is titled "NI 43-101 Technical Report, Mineral Resource and Reserve Update, Chelopech Mine, Chelopech, Bulgaria" and is dated effective 31 March 2022 (the "Technical Report") prepared for Dundee Precious Metals Inc. ("the Issuer").
2) I hold a BSc. (Chemistry/Extractive Metallurgy) and am a registered Member of the Australasian Institute of Mining and Metallurgy (CP Met, #108090). I am familiar with NI 43-101 and, by reason of education, experience in exploration, evaluation and mining of gold deposits and professional registration; I fulfil the requirements of a Qualified Person as defined in NI 43-101. My experience includes 30 years in operations, metallurgical testwork supervision, flowsheet development, and study work.
3) I have not visited or completed a personal inspection of the property that is the subject of this Technical Report.
4) I am responsible for Sections 13 and 17 of this Technical Report.
5) I am independent of the issuer as described in Section 1.5 of NI 43-101.
6) I have had no prior involvement with the property that is the subject of this Technical Report.
7) I have read NI 43-101, and the sections of the Technical Report I am responsible for have been prepared in compliance with NI 43-101.
8) As of the effective date of the Technical Report to the best of my knowledge, information and belief, the sections of Technical Report that I am responsible for contains all scientific and technical information that is required to be disclosed to make this report not misleading.

Dated this 31st day of March 2022

"signed and sealed"

Gary Patrick, BSc., MAusIMM, CP (Met)
Principal Consultant
Metallurg Pty Ltd

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List of Abbreviations

%	percent
°	degrees
°C	degrees Celsius
€	Euros
µm	micrometre, or 0.000001 metre
1D, 2D, 3D	one-dimensional, two-dimensional, three-dimensional (model or data)
AAS	atomic absorption spectrometry
ACT	Advance Control Tool
Ag	silver (grade measured in parts per million)
As	arsenic (grade measured in parts per million)
Au	gold (grade measured in parts per million)
AuEq	gold equivalent
BGN	Bulgaria's local currency, the Lev which is pegged to the Euro
CC	correlation coefficient
CCPC	Chelopech Copper Processing Company
CCTV	closed-circuit television
CDA	Canadian Dam Association
CEFTA	Central European Free Trade Associated
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CITA	Corporate Income Tax Act
cm	centimetre(s)
CMP	Control and Monitoring Plan
CRM	certified reference material
CSA Global	CSA Global (UK) Limited
CSAMT	Controlled Source Audio-Magnetotelluric
Cu	Cu (total copper grade as a % of the sample mass, sometimes written as TCu)
CV	coefficient of variation; in statistics, the normalised variation value in a sample population
DCIP	direct current induced polarisation
DDP	Detailed Design Permit
dmt	dry metric tonne(s)
DPM	Dundee Precious Metals Inc.
DPMC	Dundee Precious Metals Chelopech
DPMT	Dundee Precious Metals Tsumeb (Pty) Ltd
DTM	digital terrain model (three-dimensional wireframe surface model, e.g. topography)
E (X)	Easting. Coordinate axis (X) for metre-based projection, typically UTM; refers specifically to metres east of a reference point (0,0)
EBITDA	earnings before interest tax, depreciation, and amortisation
EFTA	European Free Trade Associated
EIA	Environmental Impact Assessment
EMIT	electromagnetic imaging technology
EU	European Union
g	gram(s)
g/m³	grams per cubic metre

g/t	grams per tonne
GAAP	Generally Accepted Accounting Principles
GIMS	Geological Information Management System
HQ2	Size of diamond drill rod/bit/core
hr	hour(s)
HS	high-sulphidation
ICP-MS	inductively coupled plasma-mass spectrometry
ICP-OES	inductively coupled plasma-optical emission spectrometry
IFRS	International Financial Reporting Standards
IPA	Investment Promotion Act
IRR	internal rate of return
ISO	International Standards Organisation
JORC	Joint Ore Reserves Committee (The AusIMM)
kg	kilogram(s)
kg/t	kilogram per tonne
km, km^2	kilometre(s), square kilometre(s)
KNA	kriging neighbourhood analysis
koz	thousand ounces
kt	kilo-tonnes (or thousand tonnes)
ktpa	kilo-tonnes (or thousand tonnes) per annum
kV	kilovolts
kW	kilowatts
kWh/t	kilowatt hours per tonne
lb	pound(s)
LDL	lower detection limit
LHOS	long-hole open stoping (method of underground mining)
LiDAR	light detection and ranging (survey)
LM2	Labtechnics 2 kg (nominal) pulverising mill
LME	London Metal Exchange
LOD	limit of detection
LOM	life of mine
M	million(s)
m, m^2, m^3	metre(s), square metre(s), cubic metre(s)
Ma	million years
masl	metres above sea level
MCE	maximum credible earthquake
m(E)	metres East
mg	milligram(s)
ml	millilitre(s)
Mlb	million pound
mm	millimetre
m(N)	metres North
MoE	Ministry of Energy
MoEET	Ministry of Economics, Energy and Tourism
MoEW	Ministry of Environment and Water

Moz	million ounces
MRE	Mineral Resource estimate
m(RL)	metres Relative Level
MSC	management system control
Mt	million tonnes
MT	magnetotellurics
Mtpa	million tonnes per annum
MVA	megavolt ampere
MWMP	Mine Waste Management Plan
N (Y)	Northing. Coordinate axis (Y) for metre-based projection, typically UTM; refers specifically to metres north of a reference point (0,0)
Navan	Navan Chelopech AD
NI 43-101	National Instrument 43-101 Standards of Disclosure for Mineral Projects
NPV	net present value or net present worth (NPW)
NQ	A diamond drill core diameter of 75.7 mm (outside of bit) and 47.6 mm (inside of bit)
NSR	net smelter return
OBE	operational basis earthquake
OREAS	Ore Research & Exploration
oz	troy ounce(s) (31.1034768 grams)
P80 -75 µm	Measure of pulverisation (80% passing 75 microns)
PAX	potassium amyl xanthate
PEA	preliminary economic assessment
ppm	parts per million
Q1, Q2, Q3, Q4	quarter 1, quarter 2, quarter 3, quarter 4
QAQC	quality assurance/quality control
QP	Qualified Person
Q-Q	quantile-quantile plot
RIEW	Regional Inspectorates of Environment and Water
RL (Z)	Reduced Level; elevation of the collar of a drillhole, a trench or a pit bench above the sea level
RMS	root mean squared
ROM	run of mine
RQD	rock quality designation
RSG	RSG Global
S	sulphur
SAG	semi-autogenous grinding
SD	standard deviation
SFR	staged flotation reactor
SG	specific gravity
SGE	Sofia Geological Exploration
SGS	Société Générale de Surveillance International laboratory group
SiO_2	silicon dioxide
SO_2	sulphur dioxide
SOR	slope of regression
SQL	structured query language
SSF	Sample Submission Form
SWIR	shortwave infrared

t	tonne(s)
TEM	time domain electromagnetics
tpa	tonnes per annum
tpd	tonnes per day
tph	tonnes per hour
TMF	tailings management facility
™	Trademark
UCS	unconfined compressive strength
UDL	upper detection limit
US$	United States of America dollars
UTM	Universal Transverse Mercator
VAT	value added tax
WGS	World Geodetic System
w:o	waste to ore ratio
wt%	percentage by weight
WTO	World Trade Organization
XGC	Xiangguang Copper Co.

1 Summary

1.1 Introduction

CSA Global (UK) Limited (CSA Global), an ERM Group company, was requested by Dundee Precious Metals Chelopech EAD (DPMC), a subsidiary of Dundee Precious Metals Inc. ("DPM" or "the Company"), to verify data collected during recent in-mine Mineral Resource development drilling completed between October 2020 and September 2021 and to supervise the preparation of, and validate, a Mineral Resource estimate (MRE) update as well as review technical study elements completed by DPMC resulting in the update of the Mineral Reserve estimate for its Chelopech underground copper and gold mine. The change being reported in this NI 43-101 Technical Report is an update to the Mineral Resource and Mineral Reserve estimates previously reported by DPM in 2020 and includes an update to net smelter return (NSR) assumptions.

DPM is a public company headquartered in Toronto, Canada and is listed on the Toronto Stock Exchange (TSX: DPM). This report has been prepared for DPM to fulfil the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) on properties owned and controlled by DPM and its subsidiaries. Mineral Resources and Mineral Reserves for the Chelopech Mine have been prepared in accordance with CIM guidelines.

The MRE reported herein is current as of 31 December 2021 and has been used as the basis for estimating the Mineral Reserve estimate as outlined in this document, current as of 31 December 2021. The mined volumes used to deplete the Mineral Resource are as of 31 December 2021.

1.2 Property Description and Location

1.2.1 Summary

The Chelopech Mine is situated adjacent to the village of the same name, in the Sofia District of Bulgaria, 75 km east of the capital, Sofia. It is situated approximately 350 km west of the Black Sea port of Burgas. The village is located at the foot of the Balkan Mountains, at an elevation of approximately 700 m above sea level. The mine area is bounded to the north by the foothills of the Balkan Range, to the east by a government-owned road maintenance organisation and residential housing, and by agricultural land to the south and west.

1.2.2 Mineral Rights and Tenement Description

The Chelopech Mine Concession covers an area of 266 hectares which includes the area of the Chelopech deposit, where extraction and additional exploration area is allowed, and the areas for the additional auxiliary activities. Further exploration is allowed within the deposit boundaries. DPMC has 100% ownership of the surface land upon which the facilities are constructed. DPMC operates under a Concession Contract signed with the Council of Ministers in 1999 granting concession rights to DPMC for a period of 30 years.

Surrounding the Mining Licence to the north, east and west is the exploration area called Sveta Petka covering approximately 4.61 km^2. The southern border of the Mine Concession abuts with the Brevene exploration area which surrounds both the Chelopech Concession and Sveta Petka licence area, encapsulating an area of 34.39 km^2.

DPMC pays a royalty to the State in compliance with the terms under the Concession Contract (1999), which is equal to 1.5% on the gross value of the metals (copper, gold, and silver) contained in the ore mined, based on the arithmetic mean metal price for the preceding six-month period using the London Metal Exchange price list.

1.2.3 Environmental Liabilities

The first requirement for obtaining approval to undertake new or major expansion projects is the approval of the appropriate Environmental Impact Assessment (EIA) procedure. Approval of expansion and modernisation of the mill and mine was done by environmental authorities with letter no. OBOC-1512/25.06.2010 by the Ministry of Environment and Water (MoEW).

The amount of the financial guarantee for closure and rehabilitation of the site was determined, as part of the Closure and Rehabilitation Plan, initially completed and coordinated with the Regional Inspectorates of Environment and Water (RIEW), MoEW and Ministry of Economics, Energy and Tourism (MoEET – currently Ministry of Energy [MoE)) in April and May 2010. Additional approval of expansion of the underground mine and mill to a capacity of 2.2 Mtpa was approved by the REIW – Sofia in March 2016. In May 2017, the RIEW – Sofia, issued a positive decision for the investment proposal referred to as "TMF Chelopech 630 level upgrade".

In December 2015, competent authorities approved and updated the Closure and Rehabilitation Plan with a revised value. The financial guarantee was separated into two bank guarantees – one for the mine and surface infrastructure and other for the tailings management facility (TMF) closure activities. In 2018, the Chelopech TMF overall Closure and Rehabilitation Plan was updated in connection with the TMF upgrade project to level 630. The plan was approved by the MoE. In September 2018, the Chelopech TMF overall Closure and Rehabilitation Plan was updated with a revised value of €9.4 million. The mine and surface infrastructure closure bank guarantee remains at €6.3 million. In November 2021, the financial guarantees were also renewed for a year (the financial guarantees must be renewed on annual basis) with no changes to the terms of the agreement.

1.2.4 Royalties

The royalty is fixed at a rate of 1.5% for each concession year based on the gross value of the metals (copper, gold and silver) contained in the ore mined, calculated based on the arithmetic mean metal price for the preceding six-month period using the London Metal Exchange price list.

1.2.5 Risks

On February 24, 2022, Russia launched an invasion of Ukraine which, as of the date hereof, is still ongoing and although Bulgaria does not share a border with either Russia or Ukraine, DPM's future operations may be affected by the war between Russia and Ukraine. As a result of the invasion, the international community has responded with a variety of sanctions on Russia and companies have withdrawn products and services from Russia. The impact on DPM's operations in Bulgaria has been limited to increased costs for energy, fuel and other supplies. Any further escalation of the conflict, including outbreak of and/or expansion of hostilities in other countries or regions may have a material adverse effect on DPM's Eastern European operations due to, among other factors, disruption in DPM's supply chain, increased input costs, and increased risk (or perceived increased risk) in the profile of DPM's operations in Eastern Europe. DPM continues to monitor and will proactively manage the situation, although there is no assurance that the operations will not be adversely affected by current geopolitical tensions and it may be determined as a force majeure.

To the extent known, the authors of this Technical Report recognise COVID-19 as a potential risk to DPMC being able to perform its obligations under the Concession Agreement. DPM continues to successfully apply control methods onsite and Chelopech has remained in operation throughout the pandemic. However, in the advent of a more virulent strain of COVID-19 occurring, it may be determined as a force majeure in concession and exploration contracts.

The definition of force majeure is an extraordinary event or circumstance beyond the control of the Parties occurring after the effective date of the Concession Contract including an intervening act of God or public enemy, such as fire, epidemic, flooding, earthquake, unfavourable weather conditions or other natural disaster, hostile acts or environment arising from or relating to acts of war or active hostilities (whether declared or not), civil commotions, revolution, strike, riot or other public disorder, lockouts, etc.

If DPMC cannot perform its concession and exploration obligations as a result of COVID-19, the Company shall promptly notify the MoE. The performance of the affected obligations shall be suspended for the duration of the force majeure. Additional agreements in writing shall be concluded to make arrangement for the period of suspension.

The Concession Agreement expires on 26 July 2029. According to Bulgarian legislation, the concessionaire (DPMC) has the right to request an extension to the Chelopech Concession Agreement for a further period of time equal to the remaining Mineral Reserves at the time of application. The current extraction and processing plan of the Mineral Reserves for the whole of 2030 require an extension to the Concession Agreement from July 2029 to the end of 2030 to effect full value. It is understood that normal course legal mechanisms are in place to allow an application for the extension to the Concession Agreement.

DPM has not yet commenced application but will be required to do so before 26 July 2028. It is the opinion of DPM legal representatives, upon whose opinion the Qualified Persons rely, that the application should be successful based on precedent of other agreement applications, but this cannot be guaranteed. Given the lack of guarantee, no Proven Mineral Reserve should exist in the last year of mining. It has been verified that only Probable Mineral Reserve exists in the 2030 mine extraction plan and so no downgrading of Mineral Reserve status was required. It is important to note that all Mineral Resources will require an extension to the Mineral Agreement for those to be affected. Given the lack of extension guarantee, expiry of the Concession Agreement represents a risk, however unlikely, and is therefore set out as a risk in Sections 4.4.5, 16.2 and 25.11.

1.3 Accessibility, Local Resources and Infrastructure

Access to the Chelopech Mine is via sealed major roads from the national capital of Sofia, approximately 75 km to the west. The principal rail and road links between Sofia and the country's largest port, Burgas, located on the Black Sea pass through the village of Chelopech and the Chelopech Mine.

There has been a long history of mining in the local region around the mine, with several large mines producing concentrate to feed a copper smelter at Pirdop, which is 10 km from the mine site.

Chelopech is well serviced with close proximity to major roads and rail, powerlines, communication facilities, water sources and the town of Pirdop. The mine obtains power from the Bulgarian power grid and is permitted to obtain its water requirements from nearby storage facilities. The village of Chelopech, located approximately 1 km from the mine, has a population of approximately 1,700.

Chelopech lies at the base of a range of hills on gently undulating terrain. The plant site is located at approximately 730 m above sea level. The area has the climate of subtropical Europe, featuring markedly higher winter and substantially lower summer precipitation. Winters are mild with -2°C average temperature, but during intensive cold spells temperatures may fall to -19°C. Summers are hot, reaching 36°C in warmer spells and exceeding 40°C in some locations. Mining operations are conducted all-year round.

1.4 History

The mineral potential of the Chelopech area was first recognised in the mid-19th century and the outcrop area was worked prior to the start of the Second World War. Renewed interest in the mineral deposit commenced in 1953, following drilling by Sofia Geological Exploration (SGE).

Beginning in 1956, exploration shafts were excavated, and diamond holes were drilled, with underground production commencing in 1964. The mine, then part of several state-owned enterprises, was fully operational between 1970 and 1990, producing bulk copper-gold and pyrite concentrates.

In 1990, the Bulgarian Government decreed that due to the high arsenic content, the concentrates could no longer be treated. In 1994, operations were restarted by Navan Bulgarian Mining BV, a Dutch registered subsidiary of Navan Mining Plc. Navan Bulgarian Mining BV operated the Chelopech Mine until late 2002, when the company went into receivership. The operations continued under the direct control of an administrator appointed by Deutsche Bank AG of London. Mining operations continued whilst DPM negotiated the acquisition of the Bulgarian assets from Navan Mining Plc, including the mine.

The acquisition of Chelopech by DPM was completed in September 2003.

1.5 Geological Setting and Mineralisation

Bulgaria is located on the southeast part of the Balkan Peninsula, which lies within the Alpine geosynclinal belt. Late Cretaceous, island-arc type, magmatic evolution resulted in the formation of the Srednogorie volcanic intrusive zone. The Chelopech mineral deposit is located within the Panagyurishte metallogenic district, a central part of the Srednogorie zone.

The geology of the Panagyurishte metallogenic district comprises a basement of Precambrian granitoid gneisses intruded by Palaeozoic granites and overlain by Upper Cretaceous magmatic and sedimentary sequences. In some parts of the district, these rocks are overlain by upper Cretaceous to Palaeogene/Neogene foreland sediments.

Within the region, the Precambrian metamorphic basement consists of gneisses, amphibolites, and metasediments with the overlying Upper Cretaceous, volcano-sedimentary sequences hosting the Chelopech formation; the primary host to mineralisation. The Chelopech Formation reaches thicknesses of up to 2,000 m and consists of Lower and Upper units.

1.6 Deposit Types

Mineralisation is hosted within the Lower Chelopech Formation and is characterised by typical epithermal, high-sulphidation (HS) alteration. Alteration and mineralisation are typically zonal with central, high-grade units associated with well-developed stockworks and massive sulphide mineralisation. These units are surrounded by lower-grade haloes dominated by disseminated sulphides and pervasive silica overprinting. These two zones are respectively referred to as “Stockwork” and “Silica Envelopes” and are used as hard boundaries during the estimation of Mineral Resources.

The mineralisation occurs in a range of different morphologies, including lens-like, pipe-like and columnar bodies that typically dip steeply towards the south. In gross terms, about 45% of the copper is in the form of arsenides and sulfosalts, 50% as chalcopyrite, and 5% as oxides. Gold occurs in a variety of forms but is dominated by refractory species and is typically fine-grained averaging 5–20 microns in diameter.

1.7 Exploration

Given the long exploration and operational history at Chelopech, a variety of drilling and sampling methods have been implemented (Table 1-1).

Table 1-1: Pre-DPMC and DPMC drill exploration and operational statistics (as of 30 September 2021)

Data type	Number of drillholes	Total metres
Pre-DPMC surface drillholes	448	267,177
Pre-DPMC underground drillholes	717	55,672
DPMC surface drillholes	201	117,901
DPMC underground drillholes	3,401	726,717
TOTAL	**4,767**	**1,167,467**
Total Pre-DPMC	**1,165**	**322,849**
Total DPMC	**3,602**	**844,618**

Geophysical surveys at Chelopech include:

- In 2021 a total of 17.0 km of Ground Electrical Survey – Controlled Source Audio-magnetotelluric (CSAMT) survey was accomplished along eleven profiles covering prospective domains around the main Chelopech mineralised system (Figure 9-1). Based on two-dimensional inverted results for apparent resistivity, the survey identified additional targets at the periphery of the system up to a depth of 1000m below surface. Subsequently, the results of all geophysical works were incorporated into a 3D geological model for further analysis and interpretation.

1.8 Drilling

Mineral resource development drilling at Chelopech has been completed at a nominal hole spacing of between 50 m x 50 m and 25 m x 25 m. Data provided for the MRE was supplied at a cut-off date of 30 September 2021. In summary, the database consisted of a total of:

- 4,767 diamond drillholes for a total of 1,167,467 m (see Table 1-1)
- 39,956 face samples
- 112,849 drillhole density samples
- 4,403 face sample density values.

1.8.1 Pre-DPMC Drilling

The Chelopech Copper Processing Company (CCPC), Navan Chelopech AD (Navan) and Homestake completed underground diamond drilling during the pre-DPMC period. SGE carried out surface diamond drilling at the Chelopech copper-gold deposit from 1956 onwards.

1.8.2 DPMC Drilling

A total of 3,602 drillholes (surface and underground, exploration and grade control) have been drilled for a total metreage of 844,618 since 2003.

Historically, surface drilling has targeted a geophysical anomaly north of the mine on the adjacent Smolsko exploration lease. The main objective of underground drilling is resource development and grade control drilling and currently four drill rigs are in use; two for exploration drilling and two for grade control drilling.

The drill core is logged by competent geological personnel in a core shed established for this purpose. All logging information is collected digitally on tablet computers using Field Marshall software and Microsoft Excel template files before uploading in to an acQuire database.

1.8.3 Core Orientation and Structural Logging

In a period between May 2009 and May 2015, the Ezy-Mark™ system was used for core orientation.

Between May 2015 and October 2021, core orientation was conducted using the Orifinder DS1 tool and a DeviCore BBT instrument has been used since November 2020.

1.8.4 Pre-DPMC Surveying

Pre-DPMC surveying of collars was undertaken using optical methods, with theodolites and survey traverses. Pre-DPMC downhole surveying was undertaken using a gyroscope, prior to 1994 and a Reflex Maxibore tool until 1999. Insignificant measured deviations resulted in dips and azimuths being measured at the collar and extended to depth between 1999 and 2002.

1.8.5 DPMC Surveying

DPMC collar surveying has previously utilised a Leica TCRA 1203 and currently utilises a Leica TS15 and TS16 total station surveying tools. The risk of significant error associated with the drill collar surveys is low. Downhole surveys since 2003 have been undertaken using a REFLEX tools – REFLEX EZ-SHOT (single shot) and REFLEX EZ-TRAC™, but not all underground drilling completed since 2005 has been systematically downhole surveyed.

1.9 Sample Preparation, Analyses and Security

1.9.1 Sampling Procedure

Drill core sampling methods are consistent with good industry practice and are appropriate for use in the estimation of Mineral Resources.

Face samples are taken as horizontal panel chips on a 20 cm grid over the bottom half of each development drive advance. Each sample area is an average of 3 m in length. The samples are usually chosen based on different mineralisation and geological characteristics. These are considered to have the same statistical weighting in the estimation of resources as 3 m drill composite lengths.

The underground face sampling procedures and checks are considered appropriate with field duplicates, blanks and standards submitted for analysis as per the diamond core sampling protocols.

1.9.2 Analyses Procedure

Most sample preparation has been completed on site at the Chelopech laboratory. Up to early 2003, most analyses were completed on site at Chelopech; however, between 2003 and 2004, all drillhole analyses were completed at Ultra Trace in Perth, Australia. Since late 2004, most of the drillhole samples have been analysed at the SGS operated laboratory on site at Chelopech with a small amount of exploration drillhole samples analysed at SGS Bor, Serbia. A detailed list of laboratories used is provided in Table 11-1. Both the Chelopech and Bor laboratories are under fulltime management by SGS Bulgaria Ltd and are independent in their activities, with an SGS qualified laboratory manager on site at all times.

1.9.3 Assay QAQC

Quality assurance/quality control (QAQC) prior to DPMC's involvement in 2003 consisted of field and laboratory duplicate checks where no significant bias was noted. DPMC implemented a QAQC program to provide confidence that sample assay results are reliable, accurate and precise. The following material is included in the DPMC QAQC program:

- Three non-certified blanks (quartz sand, quartzites and dolomitic limestone)
- Site-specific certified reference materials (CRMs) developed and certified by Geostats, together with commercially available Geostats and Ore Research & Exploration (OREAS) CRMs were used
- Site field duplicate samples.
- Internal (prep-lab) duplicates sent to SGS Chelopech and SGS Bor.
- External (umpire) duplicates sent to ALS Romania.

Face sample and drillhole QAQC results in the previous reporting periods for gold, copper and sulphur were acceptable, whilst silver and arsenic had some issues which were mostly related to the analytical method detection limits and sensitivity.

Previous review of annual QAQC programs completed by DPMC are contained in previous reports (CSA, 2019, 2020). Results of the QAQC program for the current reporting period (1 October 2020 to 30 September 2021) are discussed in in Sections 11.3.1 and 11.3.2 and are summarised below:

- The QAQC procedures implemented at Chelopech are adequate to assess the accuracy and precision of the assay results obtained.
- Overall blank results show no significant indications of contamination except for one Cu blank. Where failures were noted, these tended to be in non-certified blanks or at low grades relative to economic levels of mineralisation and laboratory lower detection limits.
- No fatal flaws were noted with the accuracy results. Bias and failures were noted in individual CRMs, but this was not systematic (i.e. some bias is positive and some negative).
- Field, preparation and pulp duplicates as well as external check (umpire) results were compared for face samples (FS) and drill samples (DDH) for primary samples submitted to SGS Chelopech and SGS Bor and external check samples sent to ALS Rosia Montana. Precision was acceptable with no material bias for the SGS Chelopech duplicates. External check samples had good precision with no significant bias.

1.9.4 Security

Samples collected from underground development, underground drilling and surface drilling operations are transported to the site-based geology core shed, where the samples are geologically logged and are prepared for chemical analysis. The sampling procedures are appropriate and adequate security exists on the site to minimise any risk of contamination or inappropriate mixing of samples. Sample tagging and a laboratory barcode system is in use to digitally track sample progress through to final chemical analysis. The chain of custody was reviewed on site during a personal inspection completed by the Qualified Person (QP).

1.10 Data Verification

DPM implemented an acQuire GIMS (Geological Informational Management System) in 2004, for managing all the drillhole and face sampling data. Data undergoes further validation by CSA Global through a series of Datamine™ loading macros. The QP, who relies upon this work, has reviewed the data and believes the data verification procedures undertaken adequately support the geological interpretations and the analytical and database quality, and therefore support the use of the data in Mineral Resource estimation.

Data collection methods, regression analysis and QAQC procedures for density data have been reviewed and are considered appropriate for use in the MRE.

The Chelopech database contains surface diamond drillholes, underground diamond drillholes and underground face samples. A series of investigations have been completed at various times to test the appropriateness of combining the datasets for grade estimation (2007, 2013, 2019) and conclusions made then remain current and relevant to this report.

CSA Global QPs Mr. Galen White and Mr. Andrew Sharp completed a site visit to Chelopech between 7 March 2022 and 9 March 2022 during which time a tour of the operation was completed, data and information reviewed, data collection procedures reviewed, and discussions held with key technical personnel on site within operational departments and the Technical Services department.

1.11 Mineral Processing and Metallurgical Testing

A comprehensive testwork program was completed on drill core samples of representative mineralisation from each mining block of potential future material as part of the original 2005 Definitive Feasibility Study (DPM, 2005). The metallurgical testwork characterised the hardness and flotation parameters of each sample and the work confirmed that the process flowsheet currently in operation was optimum to produce copper/gold concentrates, and no changes were recommended. An additional test program was completed in 2012 which confirmed the current flowsheet performance for the copper circuit and led to the development of the pyrite recovery circuit which was subsequently commissioned at the end of 2014.

The expanded material treatment process facility completed in early 2012 comprises crushing the mined material in the underground primary jaw crushing circuit, grinding in a semi-autogenous grinding (SAG) milling circuit, primary rougher/scavenger and three-stage cleaner flotation and concentrate dewatering. Tailings from the concentrator are thickened at the plant, pumped, and then filtered at the backfill plant, from which they are then used as underground fill. When not being directed to the backfill plant, the tailings report to the current flotation TMF.

A geomet and flowsheet optimisation flotation testwork program at XPS (Sudbury) was concluded in 2017. The geomet testwork considered the metallurgical variability of the eight identified domains at Chelopech – 151 Block Upper, Middle and Lower; 150 Block Upper and Lower; 103 Block East and West; 19 Block. The findings of the geomet testwork were inconclusive on quantifying the variability in pyrite quality between the domains. Other information gathered was nonetheless useful and further enhanced the understanding of the geo-metallurgical properties and variability between the domains.

Sub-division by DPMC lead to the distinction of three ore types in order to apply suitable recovery assumptions within NSR calculations. The three ore types that have been determined through their composition and distinct metallurgical performance are the pyrite-gold type (Block 152), the pyrite—gold-barite type (Block 700) and all other mineralisation (pyrite-copper sulphosalt type).

The recovery models are moderated with current performance factors and are revised in a continual improvement program. The same formula is consistently used in the long-term and short-term mine plans and are also present in the mill control room as guides for process control targets.

The 2021 annual review of the recovery models versus the actual plant performance indicate that the current models are still able to accurately predict the plant recovery performance for the expected future plant feed grades, with the exception of Block 152 where the recovery models were updated due to low copper and high pyrite mineralisation. The other exception is Block 700, which produces only a gold-pyrite concentrate.

A technical-economic assessment concluded that it would be economically optimal to produce a copper containing gold concentrate (~9-11% Cu, 15-30g/t Au, <3.5% As) instead of the historic 16% Cu copper concentrate in current market conditions. Extensive plant trials during 2021 proved the technical and economic feasibility of this production strategy.

1.12 Mineral Resource Estimates

Data provided for use in the MRE was supplied as of 30 September 2021. Mineral Resources were estimated by DPMC personnel and all stages of the Mineral Resource estimation workflow were interrogated and validated by CSA Global under the supervision of Galen White (CSA Global Principal Consultant and QP) assisted by additional CSA Global Resource Geologists as appropriate.

In June 2021, DPMC ceased using GEMS software to complete Mineral Resource estimation workflows and began using Datamine™ software. This change was implemented to streamline integration with downstream mine planning and scheduling activities and some benefits with respect to ease of Datamine™ software were considered important to the geological and Mineral Resource evaluation work at Chelopech. DPMC resource geologists received significant training in the use of Datamine™ software and embarked on a mid-year review study (June 2021) to ensure that the workflows completed in GEMS could be mapped across to Datamine™ confidently. Accordingly, the 2020 Mineral Resource estimation workflows completed in GEMS were replicated in Datamine™ and validated. CSA Global completed a review of this migration (July 2021) and performed comparative analysis with the previous GEMS model and advised on improvements to be incorporated into the subsequent Mineral Resource update to ensure reliability. Thereafter, the Datamine™ workflows were implemented for the MRE update set out in this Technical Report.

A 3D block model using 10 m(E) x 10 m(N) x 10 m(RL) cell dimensions was created. This model honours wireframe volumes and was based on geological interpretations for the two styles of mineralisation. Grade estimation of economic elements of interest, namely copper, gold and silver were completed, with the addition of potentially deleterious elements (sulphur and arsenic) using ordinary kriging. Block tonnage was estimated from the material in-situ dry bulk density values by using ordinary kriging where adequate density samples were available, and from the positive relationship to sulphur grade where density sampling was limited.

In addition to the geological model, a void model was constructed to represent the underground development and production as of 31 December 2021. This volume was depleted from the MRE. Material assumed to be sterilised through previous mining, to a distance of 3 m around existing depletion is also removed from the reported MRE.

Mineral Resources have been classified in accordance with the May 2014 Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards on Mineral Resources and Mineral Reserves standards as defined in NI 43-101. Mineral Resource classification criteria used to classify the Mineral Resources were based on the robustness and confidence of the input data, the confidence in the geological interpretation, assessment of grade continuity, sample spacing, geostatistical service variables such as slope of regression and estimation variance, and review of mine performance (reconciliation).

The MRE for the Chelopech deposit is presented in The MRE is reported exclusive of Mineral Reserves. The MRE has an effective date of 31 December 2021 and is reported based on a Net Smelter Return (NSR) less costs cut-off greater than US$0. The Net Smelter Return (NSR) formula is in use at the mine and so supports reasonable chances of eventual economic extraction and utilising conservative metal prices of US$1,400/oz gold, US$17/oz silver, and US$2.75/lb copper.

In addition to economic elements, levels of sulphur in Measured, Indicated and Inferred Mineral Resources are 12.8%, 11.5% and 10.1% respectively, and levels of arsenic are 0.27%, 0.22% and 0.14% respectively which do not drive revenue other than through being partial controls for recovery and penalties.

Table 1-2. The MRE is reported exclusive of Mineral Reserves. The MRE has an effective date of 31 December 2021 and is reported based on a Net Smelter Return (NSR) less costs cut-off greater than US$0. The Net Smelter Return (NSR) formula is in use at the mine and so supports reasonable chances of eventual economic extraction and utilising conservative metal prices of US$1,400/oz gold, US$17/oz silver, and US$2.75/lb copper.

In addition to economic elements, levels of sulphur in Measured, Indicated and Inferred Mineral Resources are 12.8%, 11.5% and 10.1% respectively, and levels of arsenic are 0.27%, 0.22% and 0.14% respectively which do not drive revenue other than through being partial controls for recovery and penalties.

Table 1-2:Chelopech MRE with an effective date as of 31 December 2021

Dundee Precious Metals – Chelopech							
Chelopech Mineral Resource Estimate as of 31 December 2021							
Resource Category	**Mt**	**Grades**			**Metal content**		
		Au (g/t)	**Ag (g/t)**	**Cu (%)**	**Au (Moz)**	**Ag (Moz)**	**Cu (Mlb)**
Measured	7.0	2.95	9.30	0.96	0.665	2.098	148
Indicated	6.8	2.73	11.88	0.82	0.593	2.581	122
Total Measured + Indicated	**13.8**	**2.84**	**10.56**	**0.89**	**1.258**	**4.679**	**270**
Inferred	2.9	2.36	9.20	0.82	0.223	0.869	53

Notes:

- *The Mineral Resources disclosed herein have been estimated in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (CIM, 2014).*
- *Mineral Resources have been estimated using an NSR-less-costs cut-off of US$0/t in support of reasonable prospects of eventual economic extraction.*
- *Tonnages are rounded to the nearest 0.1 million tonnes to reflect that this is an estimate.*
- *Metal content is rounded to the nearest 1 thousand ounces or 1 million pounds to reflect that this is an estimate.*
- *The Mineral Resources are reported exclusive of Mineral Reserves.*
- *Mineral Resources are based on a NSR-less-costs cut-off of US$0/t. The total cost applied was approximately $45/t which is a sum of operational costs of approximately $40/t and sustaining capital of $5/t.*
- *All blocks include a complex NSR (Net Smelter Return) formula that differs for the three ore types. The NSR formula utilises long term metal price, metallurgical recoveries, payability terms. treatment charges, refining charges, penalty charges, concentrate transport costs, and royalties. For clarity of understanding of ore value, a simplified formula is presented here that correlates to the complex formula to within 1%. The simplified formulas per ore type are:*
  - *Block 700 NSR US$/t = 0.00 x Cu% + 0.00 x Ag_gpt + 14.24 x Au_gpt*
  - *Block 152 NSR US$/t = 21.08 x Cu% + 0.32 x Ag_gpt + 33.96 x Au_gpt*
  - *General NSR US$/t = 16.72 x Cu% + 0.23 x Ag_gpt + 29.18 x Au_gpt*

It is the QP's opinion that the Chelopech MRE has a low risk of being materially affected by factors such as geological understanding, data management or estimation methodology. The deposit geology is well understood, has been appropriately modelled in 3D and has adequate sampling data to support the grade and tonnage estimates. Recent reconciliation with production has informed the assessment of the quality of the MRE.

CSA Global does not believe that the estimate of Mineral Resources may be materially affected by metallurgical, environmental, permitting, legal, title, taxation, socio-economic, marketing, or political issues. However, an observed risk to the Mineral Resource estimate is that all of the Mineral Resource and 1.5 years of the current Mineral Reserves extend beyond the mining licence agreement. MREs for the Chelopech mine may be materially affected if DPMC is unable to secure permits to extend mining operations. This is discussed further in Sections 4.4.5, 16.2 and 25.11.

Comparison of the 2021 MRE with the previously reported 2020 MRE, after depletion of Mineral Reserves, is presented in Table 14-20. The updated MRE shows the following:

- A reduction of 20.7% in tonnage, an increase of 7.9% in copper grade and 8.1% in gold grade, a 14% reduction in metal content for both gold and copper in Measured and Indicated Mineral Resource categories. This reduction in Measured and Indicated Mineral Resources is largely attributed to:
  - Conversion of Mineral Resources to Mineral Reserves.
  - Updated MRE classification approach.
  - Changes to grade estimation parameters.
  - Updated NSR parameters. The annual review of the NSR input parameters resulted in adjustments to recovery calculations, concentrate pay factors, treatment charges/refining charges, and sustaining capital contributions.
- Inferred Mineral Resource tonnage has increased by 77 % (2.9 Mt from 1.7 Mt), in comparison to the end-of-year 2020 MRE which is attributed to:
  - Updated MRE classification approach.
  - Corrections to the NSR script. Upon retrospective review, an error was detected in the YE2020 NSR calculation that resulted in the omission of approximately 0.8Mt of Inferred Mineral Resource from the Mineral Resource statement at that time which has been corrected for in the current Mineral Resource statement.

1.13 Mineral Reserves Estimates

The Chelopech Mine is an economically viable underground mining operation. The Mineral Reserve estimate is based on the Measured and Indicated categories of the Mineral Resource contained within the mine design. The Mineral Reserve estimate has considered all modifying factors appropriate to the Chelopech Mine.

The reference point at which the Mineral Reserves are defined is where the ore is delivered to the process plant primary crusher.

There is no known mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the estimate. It is however important to note that the total mine life is 1.5 years longer than the current permit (15% of the Mineral Reserve).

The Concession Agreement expires on 26th July 2029. According to Bulgarian legislation, the concessionaire (DPMC) has the right to request an extension to the Chelopech concession agreement for a further period of time equal to the remaining Mineral Reserves at the time of application. The current extraction and processing plan of the Mineral Reserves for the whole 2030 require an extension to the Concession Agreement from July 2029 to the end of 2030 to effect full value. It is understood that normal course legal mechanisms are in place to allow an application for the extension to the Concession Agreement.

The Mineral Reserves identified in Table 1-3 comply with CIM classification of resource and reserve definitions and standards.

Table 1-3: Chelopech Mineral Reserves with an effective date as of 31 December 2021

Chelopech Mineral Reserve Estimate (effective date of 31 December 2021)								
Ore type	**Reserve Classification**	**Mt**	**Grades**			**Metal content**		
			Au (g/t)	**Ag (g/t)**	**Cu (%)**	**Au (Moz)**	**Ag (Moz)**	**Cu (Mlb)**
General	Proven	5.8	2.72	6.8	0.85	0.51	1.27	108.9
	Probable	13.1	2.67	7.5	0.80	1.12	3.17	230.8
Block 700	Probable	0.1	3.89	57.5	0.02	0.02	0.22	0.1
Block 152	Probable	0.4	4.19	4.6	0.23	0.05	0.06	2.1
All	**Proven**	**5.8**	**2.72**	**6.8**	**0.85**	**0.51**	**1.27**	**108.9**
	Probable	**13.6**	**2.72**	**7.9**	**0.78**	**1.19**	**3.45**	**233.0**
TOTAL		**19.3**	**2.72**	**7.6**	**0.80**	**1.70**	**4.72**	**341.9**

Notes:

- *The Mineral Reserves disclosed herein have been estimated in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (CIM, 2014).*
- *Mineral Resources are reported exclusive of Mineral Reserves.*
- *Mineral Reserves has been depleted for mining as of 31 December 2021.*
- *The Inferred Mineral Resources do not contribute to the financial performance of the project and are treated in the same way as waste.*
- *The reference point at which the Mineral Reserves are defined is where the ore is delivered to the crusher.*
- *Long term metal prices assumed for the evaluation of the Mineral Reserves and Mineral Resources are $1,400/oz for gold, $17.00/oz for silver, and $2.75/lb for copper.*
- *Mineral Reserves are based on a NSR-less-costs cut-off value of US$0/t. The total cost applied was approximately $45/t which is a sum of operational costs of approximately $40/t (variable by stope location) and sustaining capital of $5/t.*
- *All blocks include a complex NSR (Net Smelter Return) formula that differs for the three ore types. The NSR formula utilizes long term metal price, metallurgical recoveries, payability terms, treatment charges, refining charges, penalty charges (deleterious arsenic), concentrate transport costs, and royalties. For clarity of understanding of ore value, a simplified formula is presented here that correlates to the complex formula to within 1%. The simplified formulas per ore type are:*
  - *Block 700 NSR US$/t = 0.00 x Cu% + 0.00 x Ag_gpt + 14.24 x Au_gpt*
  - *Block 152 NSR US$/t = 21.08 x Cu% + 0.32 x Ag_gpt + 33.96 x Au_gpt*
  - *General NSR US$/t = 16.72 x Cu% + 0.23 x Ag_gpt + 29.18 x Au_gpt*
- *Mineral Reserves account for unplanned mining dilution and ore loss that varies by orebody dimension and experience per mining block area. The average values are 10.0% for unplanned mining loss and 9.7% for unplanned dilution.*
- *Mineral Reserves account for planned mining dilution and mining recovery through stope optimisation and stope design. The stopes are optimized to maximise net cashflow within the constraints of dilution and orebody extractable geometry. The planned dilution and recovery alter depending on geotechnical, mineralisation continuity controls and ore zone dimensions.*
- *All stopes have been verified that they are profitable after the application of the cost of capital development.*
- *There is no known likely value of mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the estimate. The final 1.5 years of operation occurs after the termination of the mining concession agreement ends. It is the opinion of DPMC that the mining permit will be extended*
- *The Proven Mineral Reserve includes broken stocks of 28 kt at 3.30 g/t Au, 5.2 g/t Ag and 0.91% Cu as well as stockpiles of 13 kt at 3.05 g/t Au, 6.7 g/t Ag and 0.96% Cu.*
- *Sum of individual table values may not equal due to rounding.*

Net changes in tonnes and contained metals from the 2020 to the 2021 Mineral Reserves estimate show an increase of 825,000 in tonnage, reduction of 29,000 ounces of gold, increase of 105,000 ounces of silver and reduction of 2.5 Mlb of copper. The corresponding percentage changes are a 4% increase in tonnes, a 2% reduction in gold content, a 2% increase in silver content and a 1% reduction in copper content. The increase in tonnage is net of 2021 depletion and increases are attributed to the reduction in cut-off value to $0/t.

The Mineral Reserves at Chelopech were estimated by including several technical, economic, and other factors. A change to any of the inputs would therefore have some effect on the overall results. CSA Global is comfortable that sufficient work has been done by DPMC to ensure that minor changes in the mining and metallurgy factors are not likely to have any material effect on Mineral Reserves. CSA Global relies on information as presented in Section 3 of this Technical Report with respect to legal and environmental considerations.

CSA Global does not believe that the estimate of Mineral Reserves may be materially affected by metallurgical, environmental, permit application, legal, title, taxation, socio-economic, marketing, or political issues. However, CSA Global relies on information (as presented in Section 3) of this Technical Report in relation to legal and environmental considerations.

1.14 Development and Operations

With the Chelopech Mine having reached its mine/mill expansion design rate of 2.2 Mtpa in late 2015, the mine is expected to produce, in gold-copper concentrate, a total of 0.93 Moz of gold, 2.37 Moz of silver, and 289 Mlb of copper over the mine life. An additional 0.4 Moz of contained gold will be produced in pyrite concentrate.

Planned mining operations primarily uses conventional long-hole open stoping (LHOS) with paste fill. Sublevel caving is planned to be used for some crown pillar recovery where ground conditions do not permit the use of LHOS. All ore mined is transported to the surface after primary crushing using a conveyor belt. Ore is sometimes transported to surface in trucks.

Primary ore development occurs at a constant level of activity until 2026 where it will begin reduction unless further Mineral Resources are converted to Mineral Reserves.

Current ore treatment processes comprise conventional crushing of run-of-mine (ROM) ore in a primary jaw crushing circuit, grinding in a SAG milling circuit, rougher/scavenger and three-stage cleaner flotation and concentrate dewatering to produce both a copper/gold concentrate and a pyrite/gold concentrate. Copper concentrate is shipped to the DPM Tsumeb smelter in Namibia, and to smelters in China. The grade of the copper concentrate is altered to maximize total value depending on the receiving smelter in plant campaigns. The current plan includes diverting additional concentrate from Tsumeb to global smelters as this maximizes total project return. To this effect the Mineral Reserve model has been analysed assuming 100% use of Chinese smelters. The ideal copper concentrate grade for the Chinese smelter has been determined through studies to be 10%.

Tailings from the concentrator are thickened and directed to the mine backfill plant, with the balance discharged to the flotation TMF.

The concentrator operates 24 hours per day, seven days per week, and is designed to process 275 tph at an operating availability of 92%, with an average annual ore throughput capacity of 2.2 Mt.

1.15 Financial Summary

Based on the projected 2022–2030 ore production schedule, operating costs, and metal prices of US$1,400 per troy ounce price for gold, US$2.75 per pound for copper, and US$17 per troy ounce for silver, the life-of-mine (LOM) after-tax net present value (NPV) is estimated at US$461 million when using a discount rate of 5.0%.

1.16 Interpretations and Conclusions

1.16.1 Geology and Sampling Procedures

During site visits by CSA Global in 2013, 2014, 2015, 2016, 2017, 2019, 2020 and 2022, meetings have been held with DPMC staff and the SGS laboratory manager. Data and procedures were reviewed in the mine office, underground operations, core yard, processing plant, and SGS laboratory. Conclusions based on these site visits were that procedures are consistent with good mining industry practice and have been continually reviewed over time and improved as appropriate.

1.16.2 Geological Model

CSA Global believes the current understanding of geology and mineralisation controls is good, and that the current MRE model adequately predicts the in-situ grades and tonnes realised during underground development and mine production. Good comparison between the short-term planning model, incorporating updated grade control geology mapping, sampling and drilling data with the MRE model, demonstrates the robustness of the MRE model.

1.16.3 Assay QAQC

No fatal flaws were noted with the quality control results. The QAQC procedures implemented at Chelopech are suitable and fit for purpose to assess the accuracy and precision of the assay results obtained and the assay results should accurately reflect the grade of the samples. Results of the QAQC review are summarised below:

- Overall blank results show no significant indications of contamination except for one Cu blank. Where failures were noted, these tended to be in non-certified blanks or at low grades relative to economic levels of mineralisation and laboratory lower detection limits.

- No fatal flaws were noted with the accuracy results. Bias and failures were noted in individual CRMs, but this was not systematic (i.e. some bias is positive and some negative).
- Field, preparation and pulp duplicates as well as external check (umpire) results were compared for face samples (FS) and drill samples (DDH) for primary samples submitted to SGS Chelopech and SGS Bor and external check samples sent to ALS Rosia Montana. Precision was acceptable with no material bias for the SGS Chelopech duplicates. External check samples had good precision with no significant bias.

1.16.4 Database Validation

DPMC captures data daily into the acQuire GIMS, ensuring that the data is validated using constraints and triggers. Verification checks are also conducted on surveys, collar coordinates, lithology, and assay data.

Data undergoes further validation by CSA Global through a series of Datamine™ loading macros. The QP has reviewed the reports and believes the data verification procedures undertaken on the data collected from DPMC adequately support the geological interpretations and the analytical and database quality, and therefore supports the use of the data in Mineral Resource and Mineral Reserve estimation.

1.16.5 Bulk Density

CSA Global concludes that the in-situ dry bulk density data is collected using appropriate sampling methods and analysis procedures. The methods used to estimate density to determine the Mineral Resource tonnage, through a combination of ordinary kriging in areas of detailed sampling, and by application of the relationship between sulphur grade and density where insufficient samples are available, are suitable for this style of deposit and mineralisation.

1.16.6 Mineral Resource Estimation

The MRE for the Chelopech deposit has been classified as Measured, Indicated and Inferred Mineral Resources following the 2014 definition standards specified by the CIM and in accordance with NI 43-101. The MRE has been reported using a NSR-less-costs cut-off of >US$0.

The Mineral Resource estimate has been depleted for mining as of 31 December 2021. A 3 m buffer around existing depletion has also been removed from the Mineral Resource estimate, on the assumption that if it has not already been mined out, it no longer satisfies reasonable prospects for eventual economic extraction, given its proximity to existing development.

Validation of the estimated model using swath plots, histograms and probability plots of inputs and outputs and visual validation of cross sections showed that estimated block grades reflect the grade tenor of input data. In addition, comparison with 2021 production for common volume has been reviewed and reconciliation is good.

In 2021, a total of 43,208 m of Mineral Resource development diamond drilling was completed in the Chelopech concession.

Mineral Resource development extensional drilling was concentrated on the upper levels of Blocks 8, 10 and 700 in the Central area and Block 148 and Target 147 North were tested in the Western area, with the objective of expanding the current mineralisation body extents and increasing confidence of Mineral Resources.

DPMC's operational Mineral Resource development drilling strategy for 2021 combined resource definition drilling designed to a 30 m x 30 m drilling grid with infill grade control holes. Wider spaced Mineral Resource definition drilling was employed to define Indicated Mineral Resources. Whilst operational infill drilling on a 15 m x 15 m drilling grid is designed to upgrade Indicated Mineral Resources to the Measured Mineral Resource category, to allow detailed production design and scheduling works.

1.16.7 Mine Operations

The Chelopech Mine is a mature steady-state operation with a high level of planning and management control, up-to-date equipment and a workforce that can operate the systems adequately. There are some signs that unplanned dilution and mining loss may be increasing above predicted levels that may be a product of mining narrower orebodies and/or the higher mining rate over the last four years. Further root cause analysis would be beneficial that could be attended by the currently existing operational excellence team.

Crown pillar extraction, which was identified as a previous risk, has been proven to be achievable. Plans for other crown pillar extractions are being currently considered. The current success and learnings will provide a good basis for future success.

It is CSA Global's belief that operations will continue at current levels, given the quality of management and technical support. Mining equipment is expected to be replaced and updated on a regular basis to ensure planned mechanical availability.

1.16.8 Process Plant

The process plant continues to run consistently at its design parameters of 275 tph at around 92% availability, treating 2.199 Mt of ore during 2021. This resulted in a production of 109,915 tonnes of copper concentrate containing 15,734 tonnes of copper and 116,434 troy ounces of gold and 269,084 tonnes of pyrite concentrate containing 60,569 troy ounces of gold. The 2022 production forecast indicates ~2.2 Mt ore treated at a throughput of 275 tph generating ~120-130 kt of primary concentrate and ~250-260 kt of secondary pyrite concentrate containing a total of 170,000-180,000 troy ounces of gold.

1.16.9 Qualitative Risk Analysis

Table 1-4 summarises the areas of uncertainty and/or risk associated with the mine and has been prepared from reviews completed by CSA Global and informed by the conclusions and recommendations outlined in this Technical Report.

Table 1-4: Project-specific risks

Project risk area	Summary	Outcome	Mitigation
Mining: Unplanned dilution and ore loss increase	There are four years data of increasing unplanned ore loss and mining dilution. This trend requires further investigation.	Higher dilution and mining loss leads to reductions in profitability which may be eroding some of the benefits of a faster mining rate.	Root cause analysis followed by analysis of appropriate solutions in order to develop the best value path going forwards.
World inflation	Higher input costs through inflation and worker unrest through loss of purchase power.	Cost increase will erode profitability and may require revision of mining and process methods to ensure adaptation rather than acceptance. Worker unrest may lead to production disruption.	Continuous improvement programs that are focused on looking for alternative supplies, replacement materials or changes in operational practices. Worker liaison and engagement is critical to smooth operations. Elective costs could be postponed during a period of major increase as some pressures such as that caused by COVID-19 may be short-lived.
Force majeure (including COVID-19)	Could affect labour and supply chain which could impact capital and operating costs. Could affect obligations under the concession and exploration contracts.	Could impact on the mining and exploration schedule.	Managing inventories and reviewing alternative supply options should any disruptions occur. Focus on managing outbound supply chains, including, by considering multiple sale and transportation outlet. Written notice to MoE for temporary suspension of the concession contract for the period of force majeure. Additional agreements for extending the exploration contract terms and extension of other contracts for land use.
Russia-Ukraine War	Current exposure has been limited to increased costs for	Increased costs, disruption to DPMC's supply chains,	Continue to monitor, proactively manage in areas of control

	energy, fuel and other supplies. Further escalation could see more diverse exposure	increased perceived or actual risk in the profile of DPMC.	

1.17 Recommendations

1.17.1 Assay QAQC

A QAQC program has been implemented by DPMC to provide confidence that sample assay results are reliable, accurate and precise. No fatal flaws were observed, and the following is recommended:

- The failed CRMs should be investigated as a matter of course, for completeness.
- For the SGS_BO CRM for silver (analysed by 4A_ICEPS), the CRM value is higher than the upper detection limit (UDL) for method IMS40B. CSA Global recommends that DPMC should either have a CRM in line with the detection limit, or another appropriate analyses method.
- Notable poor precision at SGS Bor, which could be due to pulverisation and/or homogenisation issues at the laboratory should be investigated. Initial investigation steps should include the following:
  - The sample preparation procedures for SGS Bor and SGS Chelopech should be compared to confirm that they are the same. Pulverisation and homogenisation processes should be checked.
  - The subsample selection method should be checked to see whether this could be introducing bias, and check whether the process is the same for primary and duplicate samples and is indeed appropriate.

1.17.2 Geology and Mineral Resources

- In conjunction with exploration drilling, grade control drilling to delineate the orebody boundaries should continue to improve the location of the ore boundaries and reduce the risk ore dilution and loss.
- Continue to review and monitor the "representivity" of face samples for use in ongoing MRE work. A review in 2020 found that 30% of ore developments were shotcreted due to geomechanical factors, mainly in Block 149. It is suggested that in 2022 an analysis be undertaken relating to the risk of contamination so that the inclusion of face sampling data in Mineral Resource estimation can be assessed further.
- Continue to review estimation workflow in Datamine™ software to ensure that subtleties noted in the GEMS workflow migration are fully understood (e.g. discretization and kriging statistics).
- Continue to review sub-block resolution for use in depletion and look at refinements.
- Continue to review Mineral Resource classification approach with respect to Datamine™ outputs considered. Look to refine the approach and tie in with improvements expected to be made in Chelopech reconciliation tracking in 2022 (F-Factor approach) such that reconciliation on a domain block basis can be used to more easily test the robustness of the Mineral Resource model.
- Continue with structural data mapping and development of the structural model, to determine the paragenesis, pre-, syn- and post-mineralisation structures. Review the potential impact or application this structural data as an enhancement to the MRE modelling process.
- Use the structural model to assist exploration drill targeting.
- Further development of litho-geochemical vectoring approaches, as used in recent DPM exploration drilling programs, to generate exploration targets in areas where geophysics has not identified anomalies. In addition, investigate if multi-element geochemistry can be used to define geotechnical domains in the mineral resource model, particularly in relation to hardness which is useful information for the plant.
- A 3 m buffer wireframe used to sterilise mined out areas is currently created using an automated process. It is recommended that moving forward, as part of end of month finalisation of mined-out volumes, that the surveyor and mining engineer identify zones that are not amenable to mining, and include those in

mined-out volumes, so that the 3 m buffer assumption can be replaced with a more refined approach that is informed by the experience of the mining engineer.

1.17.3 Mining and Processing

- Continue attention to the planning detail that has been successful at demonstrating continuous improvement at the Chelopech Mine.
- Examine adding unplanned mining dilution and mining loss into the stope optimisation process before running the MSO.
- Re-examine the strategic planning exercise of 2021 in relationship to optimising net present value for NSR-less-costs cut-off for values very close to or even below zero with solid verification of stope value.
- Investigate in detail using the reconciliation and investigative tools being refined for determining the root cause analysis of the trend in unplanned dilution and unplanning mining loss.
- Develop a strategic plan for the application of the extension of the mining concession.
- Continue current design and operating procedures to mitigate risks in extracting crown pillars.
- Maintain the use of modern technology in equipment sourcing and utilisation.
- The positive attitude of the Chelopech personnel and their interest in continually improving should continue to be encouraged.
- Ensure designed operational practices are always adhered to.

1.17.4 2022 Operational Resource Development Drilling

The 2022 Mineral Resource development strategy for Chelopech will focus on the upper levels of Blocks 25, 144, 145, 147 and 149.

Positive results from drilling in Blocks 25, 5 and 17 are reason to continue this campaign and assess the zone between Blocks 25 and 19. Sporadic high-grade gold intersections south of Block 700 are considered atypical for the Chelopech mineralisation and will be a subject for further investigation.

Additionally, DPMC plans to test the following targets:

- Extensional drilling:
  - Extensional diamond drilling in upper levels areas close to Blocks 8 and 10 where several narrower HG zones were defined
  - Target 19 NE will be assessed from a drill cuddy developed specifically for drilling in the north area of Block 19 where the target is a high potential zone with a narrow lens of massive mineralisation without the typical alteration halo.
  - Area North, northwest from Block 147, will be assessed. This peripheral part of the deposit is prospective, with lithological and structural characteristics suggesting a steep lens shape of mineralisation in the contact zone between a breccia body and coherent magmatic rock.
  - Extensional drilling in the volume between Blocks 25 and 19 near to the boundary between volcanics and post mineral unit will be tested for high grade mineralisation.
- Grade control drilling:
  - Grade control drilling in Blocks 151 and 149 South to test the current mineralisation contours and possibly extend them.
  - Additional grade control drilling is scheduled to define the bottom of Blocks 149 and 147.
  - Based on the 24-month production plan, grade control drilling will support all active mining areas and will provide higher resolution in ore interpretation process.

For 2022, a total 44,000 m of operational resource development drilling has been planned to cover the targets described above. A total of 170 m of exploration development are planned to allow access to more distal targets. DPMC intends to spend US$2.2 million for operational resource development drilling during 2022.

CSA Global believes this planned work to be an appropriate resource development and grade control plan for the coming year.

2 Introduction

2.1 Issuer

Dundee Precious Metals Inc. (DPM) is a public company headquartered in Toronto, Canada and is listed on the Toronto Stock Exchange (TSX: DPM). This report has been prepared for DPM to fulfil the requirements of NI 43-101 on properties owned and controlled by DPM and its subsidiaries. Mineral Resources and Mineral Reserves have been prepared in accordance with CIM guidelines.

2.2 Terms of Reference – CSA Global

CSA Global was requested by Dundee Precious Metals Chelopech EAD (DPMC), a subsidiary of DPM, to verify data collected during recent in-mine resource development drilling completed between October 2020 and September 2021 and to supervise the preparation of, and validate, a MRE update as well as review technical study elements completed by DPMC resulting in the update of the Mineral Reserve estimate for its Chelopech underground copper and gold mine.

The change being reported in this NI 43-101 Technical Report is an update to the Mineral Resource and Mineral Reserve estimates previously reported by DPM in 2021 and includes an update to net smelter return (NSR) assumptions.

This technical report is prepared in accordance with the disclosure and reporting requirements set forth in NI 43-101, including Companion Policy 43-101CP and Form 43-101F1.

The authors of this Technical Report do not disclaim any responsibility for the content contained herein and make appropriate caveats under Section 3 (Reliance on Other Experts).

CSA Global (including its directors and employees) does not have nor hold:

- Any vested interests in any concessions held by DPM
- Any rights to subscribe to any interests in any of the concessions held by DPM either now or in the future
- Any vested interests either in any concessions held by DPM, or any adjacent concessions
- Any right to subscribe to any interests or concessions adjacent to those held by DPM either now or in the future.

CSA Global's only financial interest is the right to charge professional fees at normal commercial rates, plus normal overhead costs, for work carried out in connection with the investigations reported here. Payment of professional fees is not dependent either on project success or project financing.

DPMC technical staff used geological data and interpretations, data relating to underground development and mined areas, drilling and assay data and other relevant technical data.

2.3 Principal Sources of Information

Information and data used to update the estimate of Mineral Resources and Mineral Reserves reported herein is current as of 30 September 2021 with respect to Mineral Resources. The MRE has an effective date of 31 December 2021. The mined volumes used to deplete the Mineral Resource are as of 31 December 2021. The updated Mineral Resource has been used as the basis for the Mineral Reserve estimate as outlined in this document, with an effective date of 31 December 2021.

This Technical Report is an update to the NI 43-101 Technical Report dated 31 March 2020 (DPM, 2020).

2.4 Units

All units of measurement used in this report are metric unless otherwise stated, and are contained in the List of Abbreviations in this Technical Report.

2.5 Site Visit

2.5.1 Personal Inspection (1) – Geology, Sampling and Mineral Resources

CSA Global Principal Consultant and report Author (QP), Mr Galen White visited the Chelopech site between 7 and 9 March 2022 for the purposes of reviewing mining activity, practises, drilling activity, facilities (including a tour of the processing lant, information centre, tailings management facility) and on-site assay laboratory. The visit was preceded by review of data collection procedures, a QAQC audit and collaborative Mineral Resource estimation technical review with DPMC resource geologists at various times between June 2021 and February 2022. Site discussions were held with key personnel and various aspects of data collection, management, chain of custody and resource estimation workflow was reviewed.

Mr Galen White found all requests for access to locations and information to be willingly obliged and all information supplied supportive of observations. Mr Galen White considers that the proper amount of review through reports, technical data, interviews and physical presence has been completed to support this report.

2.5.2 Personal Inspection (2) – Mining and Mineral Reserves

CSA Global Principal Mining Engineer and report Author (QP), Mr Andrew Sharp visited the Chelopech site between 7 and 9 March 2022 for the purposes of reviewing the mining activity, practices, equipment, facilities (including the processing plant, information centre, tailings management facility, and paste fill plant), mine planning processes, and work management system. The visit was preceded with review of key operational documentation and a process of open communication was completed throughout the documentation process with further explanation supplied as required by the right DPM technical team members.

Review of mining activity included visiting an active secondary open stope mucking point (review of brow, open void, semi-remote operators' station), grade control drill chamber and rig, jumbo drill rig development, support activities (bolting meshing and shotcrete), fill barricade, crusher pockets and underground crusher station, and the underground conveyor system.

Mr Andrew Sharp found all requests for access to locations and information to be willingly obliged and all information supplied supportive of observations. Mr Andrew Sharp considers that the proper amount of review through reports, interviews and physical presence has been completed to support this report.

2.6 Cautionary Statements

2.6.1 Forward-Looking Statements

This Technical Report contains "forward-looking information" or "forward-looking statements" that involve several risks and uncertainties. Forward-looking information and forward-looking statements include, but are not limited to, statements with respect to the future prices of gold and other metals, the estimation of Mineral Resources and Reserves, the realisation of mineral estimates, the timing and amount of estimated future production, costs of production, capital expenditures, costs (including capital costs, operating costs, cash cost per gold and silver ounce and per copper pound and other costs) and timing of the development of new mineral deposits, success of exploration activities, permitting time lines, economic analysis, LOM, rates of production, annual revenues, internal rate of return (IRR), NPV, currency fluctuations, requirements for additional capital, government regulation of mining operations.

Often, but not always, forward-looking statements can be identified by the use of words such as "plans", "expects", or "does not expect", "is expected", "budget", "scheduled", "estimates", "forecasts", "intends", "anticipates", or "does not anticipate", or "believes", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would", "might" or "will" be taken, occur or be achieved.

Forward-looking statements are based on the opinions, estimates and assumptions of contributors to this report. Certain key assumptions are discussed in more detail herein. Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of DPM to be materially different from any other future results, performance or achievements expressed or implied by the forward-looking statements.

Such factors include, among others: the actual results of current exploration activities; actual results of reclamation activities; conclusions of economic evaluations; changes in project parameters as plans continue to be refined; future prices of gold and other metals; possible variations in grade or recovery rates; failure of plant, equipment or processes to operate as anticipated; accidents, labour disputes and other risks of the mining industry; delays in obtaining governmental approvals or financing or in the completion of development or construction activities, fluctuations in metal prices; shortages of labour and materials, the impact on the supply chain and other complications associated with the war in Ukraine and/or COVID-19 pandemic; as well as those risk factors discussed or referred to in this report and in DPM's latest annual information form under the heading "Risk Factors" and other documents filed from time to time with the securities regulatory authorities in all provinces and territories of Canada and available at www.sedar.com.

There may be factors other than those identified that could cause actual actions, events, or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be anticipated, estimated or intended. 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. Accordingly, readers are cautioned not to place undue reliance on forward-looking statements. Unless required by securities laws, the authors undertake no obligation to update the forward-looking statements if circumstances or opinions should change.

3 Reliance on Other Experts

The authors of this Technical Report have reviewed available Company documentation relating to the project and other public and private information as listed in Section 27 (References) at the end of this report. In addition, this information has been augmented by first-hand review and on-site observation and data collection conducted by the authors.

With reference to Items 3 (a) of NI43-101F1, the QP includes a limited disclaimer of responsibility with respect to:

- Opinion provided by DPM (pers. comm., Ross Overall, 21 March 2022 based on DPM legal opinion) in relation to the mechanism of Concession Agreement renewal that the QP has relied upon and which has informed conclusions reached with respect to the risk to the final 1.5 years of mine life, as discussed in Sections 1.2.5, 4.4.5, 16.2 and 25.11.

CSA Global was dependent on information provided by DPM relating to legal, political, environmental and tax matters relevant to this Technical Report. The QPs take responsibility for all other scientific and technical content of this Technical Report and believe it is accurate and complete in all material aspects.

4 Property Description and Location

4.1 Background Information

Bulgaria is a Slavic Republic in south-eastern Europe, bounded to the north by Romania, to the west by Serbia and Macedonia, to the south by Greece and Turkey, and to the east by the Black Sea. The population is largely Eastern Orthodox Christian (~85%), with a Muslim minority (~13%). The capital city is Sofia and the population is approximately 7.3 million.

Bulgaria has been a member of the European Union (EU) since 1 January 2007 and is a full member of the Central European Free Trade Association. The local currency, the Lev (BGN), has been pegged to the Euro since 1999 (1.95583 BGN/EUR).

Educational standards within the country are high. Mineral exploration and mining were important under the communist regime, resulting in a large pool of qualified technical staff and operating personnel.

Bulgaria is well serviced by facilities and infrastructure. Large towns have the normal facilities provided in western European countries. The country is serviced by an extensive network of paved roads, except in the most mountainous districts. There is also a comprehensive rail network.

4.2 Project Location and Accessibility

The Chelopech Mine is adjacent to the Chelopech village, in the Sofia District of Bulgaria, (coordinates 260,360 mE; 473,130 mN, UTM 35N), 75 km east of the capital Sofia (Figure 4-1). Chelopech is located approximately 470 km to the west by road and rail from the Black Sea ports of Burgas and Varna. Chelopech is located at the foot of the Balkan Mountains, at an elevation of approximately 700 m above sea level. The mine area is bounded to the north by the foothills of the Balkan Range, to the east by a government-owned road maintenance organisation and residential housing, and agricultural land to the west and south, respectively.

Figure 4-1: Chelopech mine location plan (DPMC, 2021)

4.3 Production Overview

The operation is an underground gold-copper mine and processing facility, which commenced operations in 1954 and expanded these facilities in 1975. Since DPM's acquisition of Chelopech in 2004, operations have produced on average 60,000 ounces of gold and 10,000 tonnes of copper per annum between 2004 and 2008, contained in a sulphide concentrate grading between 15% and 17% Cu, 20–30 g/t Au, and approximately 5% As.

In 2011, production increased due to mine and mill expansion programs (Coffey, 2011), and 1.3 Mt were mined and processed. This increased in 2013 to 2 Mt of ore mined and processed, producing 125,000 tonnes of concentrate, containing 21,000 tonnes of copper and 132,000 ounces of gold. During 2021, 2.199 Mt of ore was mined and processed, producing 109,915 tonnes of copper concentrate containing 15,734 tonnes of copper and 116,000 troy ounces of gold and 269,084 tonnes of pyrite concentrate containing 60,569 troy ounces of gold.

All the Chelopech primary gold/copper concentrate is exported to various smelters including to the DPMT smelter in Namibia (92% owned by DPM). The majority of the secondary gold containing pyrite concentrate is exported to various Chinese smelting facilities.

4.4 Mineral Rights and Tenement Description

4.4.1 Summary

The Mining Licence (Chelopech Concession) covers an area of 452 hectares which includes the area of the Chelopech deposit, where extraction and additional exploration are allowed, and the areas for the additional industrial facilities. DPMC has 100% ownership of the land upon which the facilities are constructed. DPMC operates under a Concession Contract signed with the Council of Ministers in 1999 granting concession rights to DPMC for a period of 30 years, due to expire on 26 July 2029. Under Bulgarian regulations, the Mining Licence area is applied for based on geographical coordinates. The physical boundaries of the Mining Licence are not surveyed and marked on the ground.

DPMC has the right to extend the concession contract up to 20 years under specific conditions. According to Subsurface Resources Act the concession period may be extended by the concessionaire based on the existence of additional Mineral Resources and Mineral Reserves, proved at the date of the request (not later than one year before expiring). An EIA procedure must be carried out as well as a new mining schedule and economic evaluation for the period of the extension. The extension to the concession agreement is equal to the period for which the Mineral Reserves are demonstrated to support mining.

Surrounding the Mining Licence to the north, east and west is the exploration area called "Sveta Petka". DPMC applied for an exploration permit for the Sveta Petka area in the beginning of 2012. In August 2012, the Council of Ministers approved granting the exploration rights to DPMC for three years with the Resolution by the Ministry of Economics, Energy and Tourism (MoEET) and a contract was signed on 29 January 2013. The contract was extended, and it was valid until 14 September 2018. A second two-year extension of the Sveta Petka licence was submitted to the Ministry of Energy (MoE) in July 2018. The extension was signed on 30 November 2018 and the period of extension started on 12 September 2018.

The exploration contract was temporarily suspended due to the delay of the positive statement by the Ministry of Environmental and Water (MoEW) from 29 December 2018 to 27 May 2019 and it was valid to 8 February 2021. In September 2020 a Geological report for the registration of a Geological Discovery was submitted to the MoE. On 27 January 2021 the Minister of Energy signed a Certificate for registration of Geological Discovery Sveta Petka. The Geological Discovery gives rights for a further extension of one year to the exploration contract and extension of the area coverage. An additional agreement for the last extension was signed on November 2021 but the one-year term will be counted once the coordination procedures for the working project are completed. The new exploration area is 4.6 km^2.

The Sveta Petka exploration area is surrounded by another exploration area called Brevene, also granted to DPMC. The application for Brevene was submitted in 2013 and at the end 2015 it was signed and approved by the Council of Ministers Resolution of the Minister of Energy. A three-year contract was signed on 30 August 2016. The contract was extended for a further two years with an additional agreement signed on 06 January 2020 where the extension period started on 30 August 2019. Another additional agreement, arranging temporary suspension of the contract due to a COVID-19 State of Emergency declared in Bulgaria and a delay of the positive statement by the Ministry of Environmental and Water for a period of approximately six months was signed in June 2021. On 3 August 2021 and additional agreement was signed covering a two-year extension starting on 31 January 2022. The Brevene exploration area which surrounds both the Chelopech Concession and Sveta Petka license area, encapsulates an area of 34.39 km2.

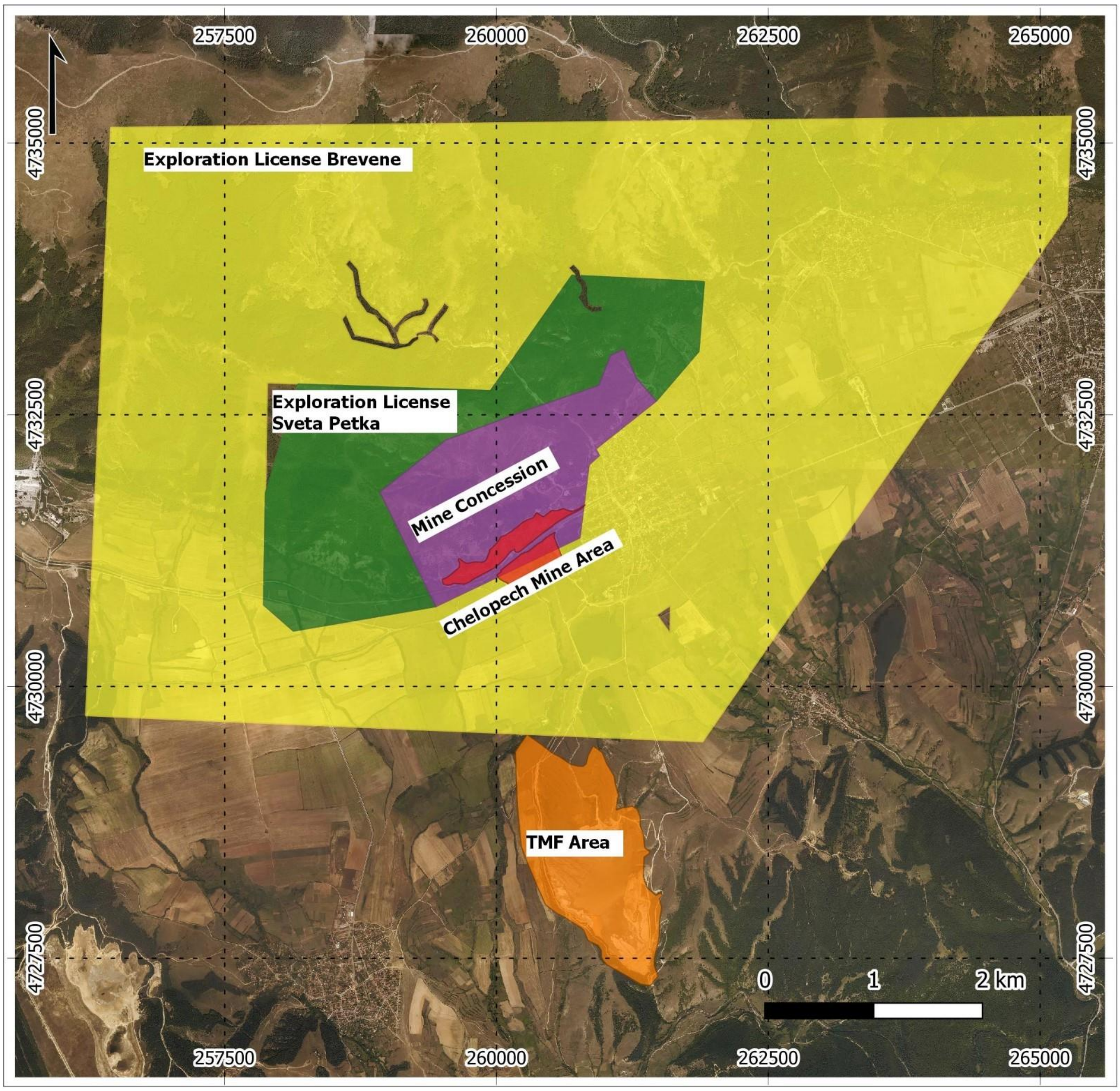


Figure 4-2: Plan of the Chelopech mine licences (DPMC, 2021)

4.4.2 Mining Permit Terms and Conditions

The first requirement for obtaining approval to undertake new or major expansion projects is the approval of the appropriate EIA procedure. The original EIA application included the expansion of the mine and mill to 3 Mtpa, combined with the installation of a metals processing facility to treat the concentrate on site. This was submitted in November 2005 and approved in July 2008.

This approval for the complete project was subsequently revoked by the Bulgarian Supreme Administrative Court on 15 April 2010. The application was resubmitted with a simplified scenario of expanding the underground mine and mill to a capacity of 2 Mtpa, and to produce copper-gold concentrate following the approval by Bulgarian Authorities of the 2010 LOM Plan. Approval of expansion and modernisation of mill and mine was granted by the environmental authorities with letter no. OBOC-1512/25.06.2010 by the MoEW. Additional approval of expansion of the underground mine and mill to a capacity of 2.2 Mtpa was approved by environmental authorities with letter no. 26-00-11956/16.03.2016 by the RIEW – Sofia. In May 2017, the REIW – Sofia, issued a positive decision for the investment proposal “TMF Chelopech 630 level upgrade”.

DPMC pays a royalty to the State in compliance with the terms under the Concession Agreement equal to 1.5% on the value of the payable metals (copper, gold, and silver) in the mined ore determined as the product of the assayed gold and silver head grades in the actual ore tonnage mined and the arithmetic mean metal prices based on the LME price list for the preceding six-month period.

4.4.3 Environmental Liabilities

There are no additional environmental requirements to the property other than the existence of the current mining infrastructure, namely the underground mine, processing plant, flotation TMF, ancillary workshops and administration facilities.

The amount of the financial guarantee for closure and rehabilitation of the site was determined, as part of the Closure and Rehabilitation Plan, completed and coordinated with the RIEW, MoEW and MoEET in April and May 2010. After project coordination, DPMC established financial security for its obligations through an insurance policy for US$25 million and submitted it to the MoEET in November 2010. In 2010, the form of the financial security was changed from insurance policy to bank guarantee and was submitted to the MoEET in November 2010. In 2011, the insurance policy was transferred into bank guarantee for €20,730,687 which is renewed on an annual basis in November. In December 2015, competent authorities (MoE) approved an updated Closure and Rehabilitation Plan with a revised value of €13,949,832. The financial guarantee was separated in two bank guarantees – one for the mine and surface infrastructure and another for the TMF closure activities.

In 2018, the Chelopech TMF overall Closure and Rehabilitation Plan was updated in connection with the TMF upgrade project to level 630. The plan was approved by the MoE. In September 2018, the Chelopech TMF overall Closure and Rehabilitation Plan was updated with a revised value of €9.4 million. The mine and surface infrastructure closure bank guarantee remains at €6.3 million. In November 2021, the financial guarantees were renewed for a year, in the same amount.

4.4.4 Royalties

The royalty is fixed at a rate of 1.5% for each concession year based on the gross value of the metals (copper, gold and silver) contained in the ore mined, calculated on the arithmetic mean metal prices based on the LME price list for the preceding six-month period.

4.4.5 Risks

On February 24, 2022, Russia launched an invasion of Ukraine which, as of the date hereof, is still ongoing and although Bulgaria does not share a border with either Russia or Ukraine, DPM’s future operations may be affected by the war between Russia and Ukraine. As a result of the invasion, the international community has responded with a variety of sanctions on Russia and companies have withdrawn products and services from Russia. The impact on DPM’s operations in Bulgaria has been limited to increased costs for energy, fuel and other supplies. Any further escalation of the conflict, including outbreak of and/or expansion of hostilities in other countries or regions may have a material adverse effect on DPM’s Eastern European operations due to, among other factors, disruption in DPM’s supply chain, increased input costs, and increased risk (or perceived increased risk) in the profile of DPM’s operations in Eastern Europe. DPM continues to monitor and will proactively manage the situation, although there is no assurance that the operations will not be adversely affected by current geopolitical tensions and it may be determined as a force majeure.

To the extent known, the authors of this Technical Report recognise COVID-19 as a potential risk to DPMC being able to perform its obligations under the Concession Agreement. DPM continues to successfully apply control methods onsite and Chelopech has remained in operation throughout the pandemic. However, in the advent of a more virulent strain of COVID-19 occurring, it may be determined as a force majeure in concession and exploration contracts.

The definition of force majeure is an extraordinary event or circumstance beyond the control of the Parties occurring after the effective date of the Concession Agreement including an intervening act of God or public enemy, such as fire, epidemic, flooding, earthquake, unfavourable weather conditions or other natural disaster, hostile acts or environment arising from or relating to acts of war or active hostilities (whether declared or not), civil commotions, revolution, strike, riot or other public disorder, lockouts, etc.

If the DPMC cannot perform its concession and exploration obligations as a result of COVID-19, the Company shall promptly notify the MoE. The performance of the affected obligations shall be suspended for the duration of the force majeure. Additional agreements in writing shall be concluded to make arrangement for the period of suspension.

DPM has not declared force majeure on any major Chelopech contract due to COVID-19, at the time of filing.

The Concession Agreement expires on 26 July 2029. According to Bulgarian legislation, the concessionaire (DPMC) has right of request an extension to the Chelopech Concession Agreement for a further period of time equal to the remaining Mineral Reserves at the time of application. The current extraction and processing plan of the Mineral Reserves require a one-year extension to the Concession Agreement to effect full value. Legal mechanisms are in place to allow application for extension to the Mineral Agreement.

DPM has not yet commenced application but will be required to do so before 26 July 2028. It is the opinion of DPM legal representatives that the application should be successful based on precedent of other agreement applications but cannot be guaranteed. Given the lack of guarantee, no Proven Mineral Reserve should exist in the last year of mining. It has been verified that only Probable Mineral Reserve exists in the 2030 mine extraction plan and so no downgrading of Mineral Reserve status was required. It is important to note that all Mineral Resources will require an extension to the Mineral Agreement for those to be affected.

Although Bulgaria does not share a border with either Russia or Ukraine, future operations at Chelopech may be affected by the outbreak of war between Russia and Ukraine. On 24 February 2022, Russia launched an invasion of Ukraine which, as of the date hereof, is still ongoing. Any further escalation of the conflict, including imposition of sanctions in areas in which the Company operates, outbreak of and/or expansion of hostilities in other countries or regions may have a material adverse effect on the Chelopech Mine due to, among other factors, disruption in the Company’s supply chain, increased input costs, diversion of resources to conflict zones, an increase in the Company’s costs for fuel and other supplies, increased risk (or perceived increased risk) in the profile of the Company’s operations in Eastern Europe, and destruction of property if the conflict expands to countries in which the Company operates. DPM continues to monitor and will proactively manage the situation, although there is no assurance that the Company’s operations will not be adversely affected by current geopolitical tensions.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

The Chelopech Mine is easily accessible via sealed major roads from the national capital of Sofia, approximately 75 km to the west. The principal rail and road links between Sofia and the country's largest port, Burgas, located on the Black Sea pass through the village of Chelopech and the Chelopech Mine.

A recent road upgrade program connecting the major cities throughout Bulgaria has substantially improved the road system around the region, resulting in significantly improved road access to and from the site by road transport throughout the year.

Since mid-2014, all the copper and pyrite concentrates produced are transported by rail directly from the operating site to the port of Burgas for shipment abroad.

5.2 Infrastructure

Chelopech is well serviced, due to its proximity to major roads, powerlines, communication facilities, water sources and the nearby towns of Zlatitsa and Pirdop. The site obtains power from the Bulgarian power grid and is permitted to obtain its water requirements from nearby storage.

Power is supplied from the Bulgarian national transmission and distribution system, at 110 kV, via substations at Stolnik and Zlatitza to the mine substation (110/6 kV) with two transformers (16 MVA each) located in the southeast area of the mine. Most of the distribution system consists of aboveground transmission lines.

The mine currently has permits to obtain its freshwater requirements from the local Kachulka Dam (owned by the Chelopech Municipality) and the Dushantzi Dam. Additional water requirements are supplemented by recycled water from the TMF.

5.3 Local Resources

The village of Chelopech, located approximately 1 km from the Chelopech mine, has a population of approximately 1,700, whilst the nearest major settlement of Zlatitza, some 4 km to the west of Chelopech, has a population of approximately 5,600.

Small villages are dispersed widely throughout the Sofia District. Much of the population outside the City of Sofia is involved in subsistence farming, particularly the growing of roses, lavender, and sunflowers for oil production on the poorly developed soils characteristic of the region. The other main land use within Sofia District is state-controlled forestry.

There has been a strong history of mining in the local region around the mine, with several large (treated ore throughputs >15,000 tpd) mines producing concentrate to feed a significant copper smelter at Pirdop, located approximately 10 km from Chelopech.

The Chelopech mine operation currently employs 841 people on site with the majority from surrounding communities.

5.4 Physiography and Climate

Chelopech site is located at approximately 730 m above sea level at the base of a range of gently undulating hills which rise to over 1,000 m above sea level. The area immediately surrounding the mine is comprised of grassland.

The area has the climate of subtropical Europe, featuring markedly higher winter and substantially lower summer precipitation.

Winters are relatively mild with -2°C average temperature, but during intensive cold spells temperatures may fall to -19°C. Summers are hot, reaching 36°C in warmer spells and exceeding 40°C in some locations.

The average annual precipitation is 704 mm. The bulk of this falls in autumn and winter, occasionally as snow in the coldest months with highest rainfall occurring in December (96 mm average).

Average annual evaporation is 1,051 mm, similar overall to annual rainfall in magnitude, but opposite in seasonal sense.

Estimated 1:100-year rainfall events are 117 mm for 24 hours duration and 184 mm for 72 hours. Probable Maximum Precipitation estimates are up to 383 mm for 24 hours and 605 mm for 72 hours. Mining operations are conducted all year round.

6 History

6.1 Exploration History

The mineral potential of the Chelopech area was first recognised in the mid-19th century and the outcrop area was worked prior to the start of the Second World War. The mineral deposit was re-discovered in 1953, following drilling by SGE.

The various mineralised bodies that constitute the Chelopech deposit (locally called "Blocks") were discovered as follows:

- Pre-1958 – Blocks 16, 17, 18, and 150
- 1960 – Block 10
- 1962 – Block 19
- 1964 – Block 103
- 1970 – Block 151
- 1974 – Block 149
- 2011 – Blocks 147 and 145
- 2012 – Block 144
- 2015 – Block 149 South
- 2016 – Block 152
- 2017 – Block 153
- 2019 – Blocks 148 and 7
- 2020 – Blocks 700 and 146.

Beginning in 1956, exploration shafts were excavated, and diamond holes were drilled, with underground production commencing in 1964. The mine, then part of several state-owned enterprises, was fully operational between 1970 and 1990, producing bulk copper-gold and pyrite concentrates.

Prior to 1990, the nearby Aurubis (formerly MDK - Pirdop) copper smelter, located seven kilometres east of Chelopech, accepted the bulk sulphide concentrates from Chelopech and blended them with cupriferous concentrates from the nearby Elatsite, Medet and Assarel mines. A complete rebuild of the processing plant was carried out in the mid-1970s.

The relatively high arsenic content of the concentrates led to the Bulgarian government decreeing on April 1, 1990 that Chelopech concentrate could no longer be treated at the Aurubis smelter, unless arsenic capturing and treatment facilities were installed at the smelter.

In February 1992, the mine was placed on care and maintenance. Production between 1954 and 1992 is estimated to be ~8.2 Mt, at an average grade of 1.0% Cu and 2.7 g/t Au.

In 1994, operations were restarted by Navan Bulgarian Mining BV, a Dutch registered subsidiary of Navan Mining Plc, with the retreatment of approximately 100 kt of stockpiled low-grade concentrate. Following a number of ownership changes over the next five years, in 1999, the Council of Ministers and Chelopech EAD signed a concession agreement for the extraction of gold and copper from the mine, and the company name was changed to Navan Chelopech AD (Navan).

Navan operated the Chelopech mine until late 2002, when Navan went into receivership. The operations continued under the direct control of an administrator appointed by Deutsche Bank AG of London. Mining operations continued whilst DPM negotiated the acquisition of the Bulgarian assets from Navan, including the mine. The acquisition of Chelopech by DPM was completed in September 2003.

Annual geological reports prepared by Navan indicate ore treatment at Chelopech between 1994 to the end of 2002, to be in the order of 4.8 Mt, at an average grade of 1.4% Cu and 3.9 g/t Au.

7 Geological Setting and Mineralisation

7.1 Regional Setting

Bulgaria is located on the southeast part of the Balkan Peninsula, which lies within the Alpine geosynclinal belt. In the southern Balkans two branches of this belt can be distinguished, the Carpathian-Balkan branch to the north and the Dinaric-Hellenic branch to the south (Figure 7-1).

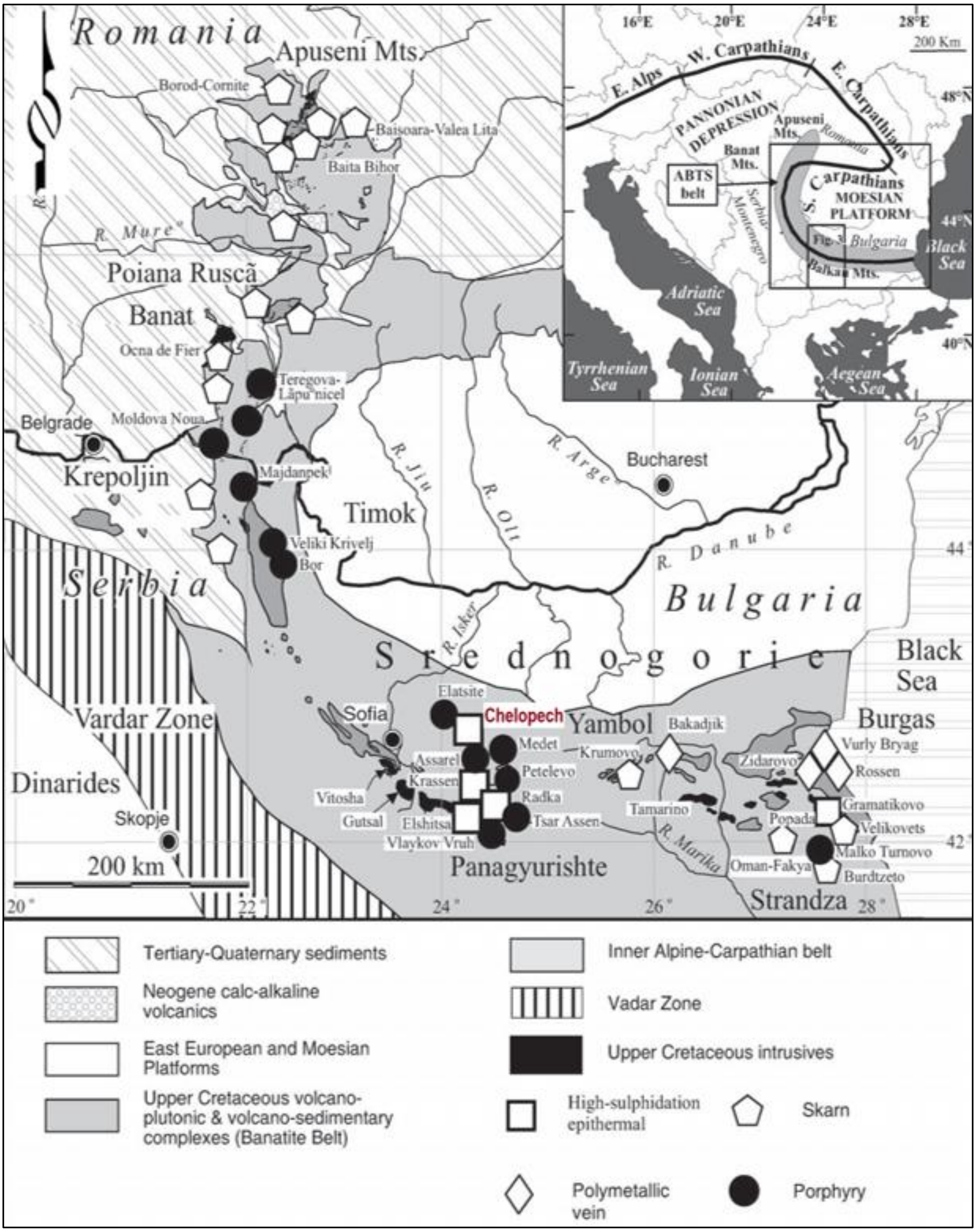


Figure 7-1: Apuseni–Banat-Timok–Srednogorie belt (modified after Heinrich and Neubauer, 2002 by A. von Quadt et al. 2005)

7.2 Local Geology

Late Cretaceous, island-arc type, magmatic evolution resulted in the formation of the Srednogorie volcanic intrusive zone. The Chelopech mineral deposit is located within the Panagyurishte metallogenic district, a central part of the Srednogorie zone.

The geology of the Panagyurishte metallogenic district comprises a basement of Precambrian granitoid gneisses intruded by Palaeozoic granites and overlain by Upper Cretaceous magmatic and sedimentary sequences. In some parts of the district, these rocks are overlain by upper Cretaceous to Palaeogene/ Neogene foreland sediments.

Basement rocks form a series of uplifted north-east striking horsts and/or anticlinal structures between which a series of sub-parallel grabens host Cretaceous sequences. To the north and towards Chelopech, the Srednogorie massif forms the basement.

Regionally, the Panagyurishte mineral district is defined by a well-known north-northwest alignment of porphyry-copper deposits (e.g. Elatsite, Assarel and Medet) and epithermal copper-gold deposits (e.g. Chelopech, Elshitsa and Radka). These deposits lie oblique to the east-west orientation of the adjacent Srednogorie belt (Chambefort, 2005). Associated alluvial deposits (Topolnitza and Luda Yana) and minor vein-hosted gold deposits (Svishti Plas) have been previously exploited on a small scale.

The geology of the Panagyurishte metallogenic district is illustrated in Figure 7-2.

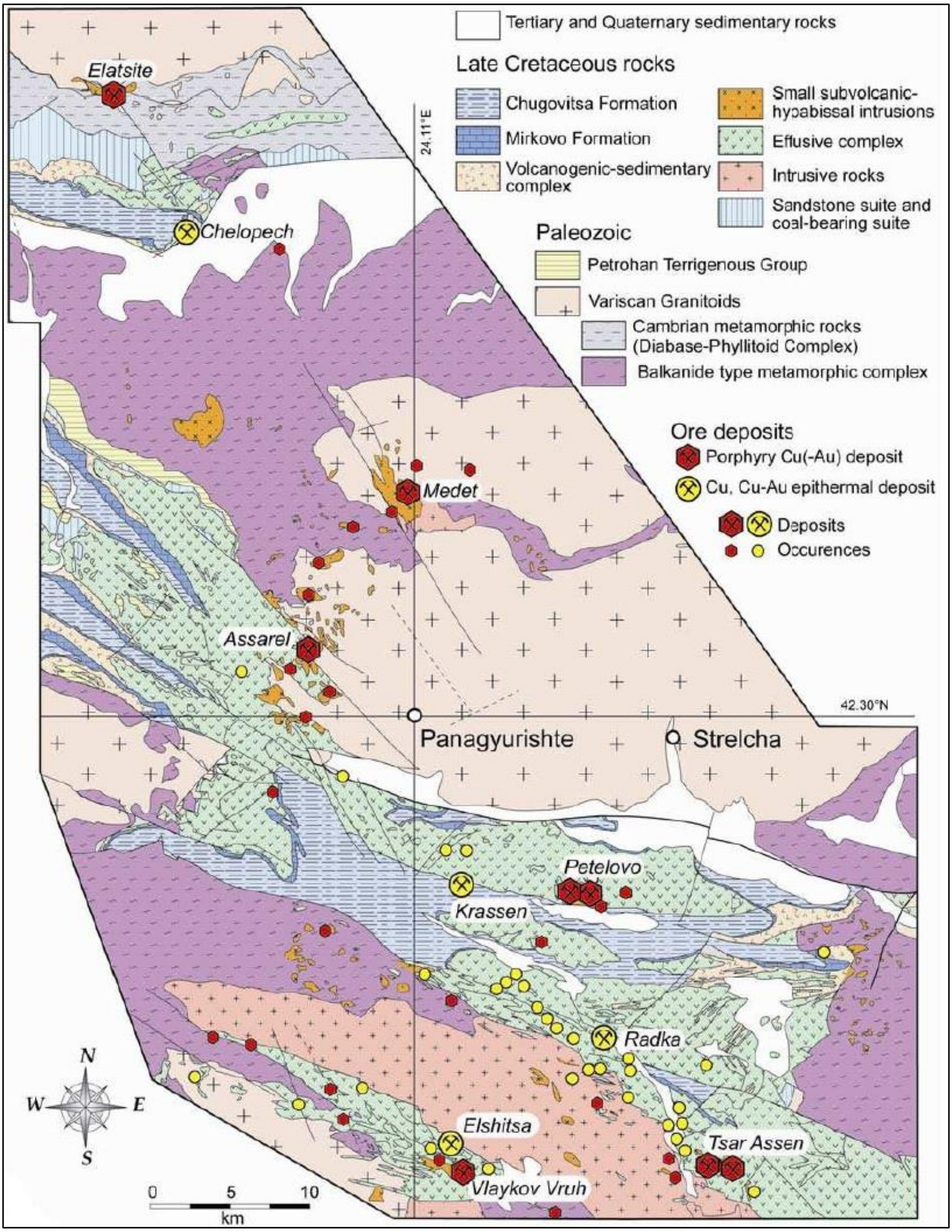


Figure 7-2: Regional geology of the Panagyurishte metallogenic district (P. Popov and K. Popov, 2000; Popov et al., 2003)

7.3 Property Geology

The Chelopech region consists of a Precambrian metamorphic basement consisting of gneisses, amphibolites, and metasediments overlain by Upper Cretaceous, volcano-sedimentary sequences which include the Chelopech Formation; the primary host to mineralisation.

The Chelopech Formation reaches thicknesses of up to 2,000 m and consists of Lower and Upper units.

The Chelopech stratigraphy consists of pre-mineral and post-mineral sequences separated by a Late Turonian erosional surface and controlled by an inherited and intermittently reactivated regional Variscan basement relay structure. The pre-mineral and syn-mineral formations consist of the following units (from oldest to youngest):

- High and low-grade metamorphic complexes that form the Paleozoic Basement unit.
- The Basal Turonian unit of quartz-rich sandstones and conglomerates deposited in a shallow-marine setting.
- The Late Turonian Mixed Unit that consists of shales, dark grey wake sandstones and weakly-sorted epiclastic poly-mictic debris-flows deposits and hydro-magmatic surge deposits, including exhalative sulphide zones.
- The Turonian Magmatic Chelopech Mine Formation, a shallow porphyritic diorite/microdiorite intrusive system with phreatomagmatic breccia pipes. The post-mineral sequence consists of an older Monolithic Rock-Avalanche Breccia unit made up of angular to sub-angular polymictic debris-flows deposits and younger sedimentary rocks accumulated as a Gosau-type sub-basin formation with characteristic rapid facies changes, post-mineral thrusting and subsequent normal faulting, all contributing to the preservation and distribution of the mineralisation.

The Chelopech hydrothermal system is genetically related to a multi-phase 91.9±0.2 Ma old intrusive system which extends at least over an area of 5 km x 4 km and hosts various types of mineralisation, including:

- The economically most important HS-style gold-copper mineralisation in the Chelopech Mine, West Shaft and the Krasta prospects
- Sub-economic porphyry copper-molybdenum-gold stockwork mineralisation with potential overprint currently defined at depth and north of the Chelopech deposit
- Distal gold-rich base metal sulphide veins in the Vozdol and Wedge prospects
- Epiclastic-hosted re-worked copper-gold mineralisation in the Sharlo Dere prospect.

Orebodies form both complex branched units and discrete pipes and veins and are grouped into two major mining areas, the Central and Western zones (Figure 7-4).

The Central Zone consists of 10 mineralised bodies, referred to as blocks, namely:

- Blocks 16, 17, 18, 19, 5, 25, 10, 7, 8, and 700.

The Western Zone consists of a further 12 blocks, namely:

- Blocks 103, 150, 151, 144, 145, 146, 147, 148, 149, 149 South, 152, and 153.

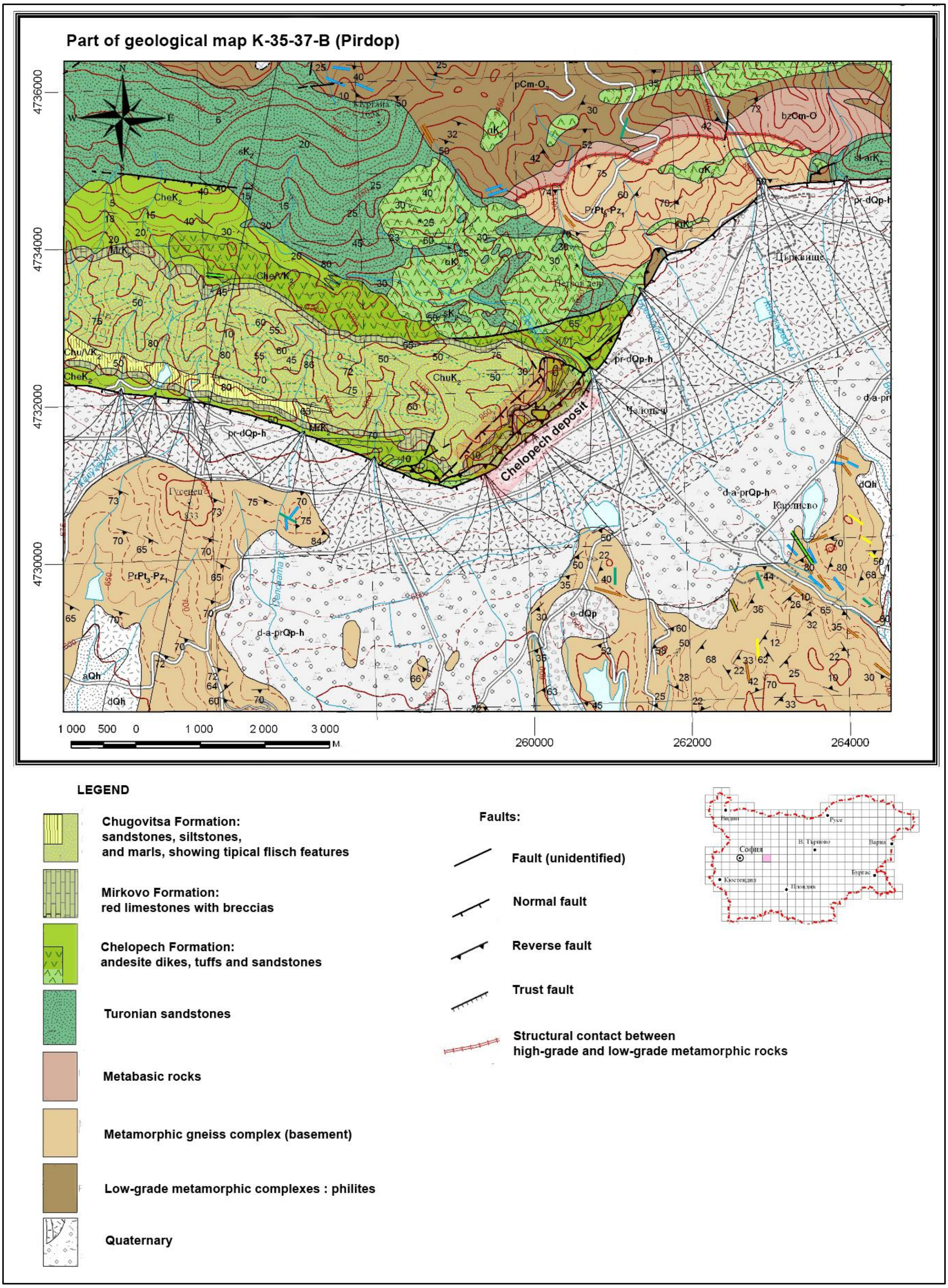


Figure 7-3: Geology of area surrounding the Chelopech deposit, with approximate location of the mine (M. Antonov, S. Gerdjikov, L. Metodiev et al., 2011) (with simplified legend)

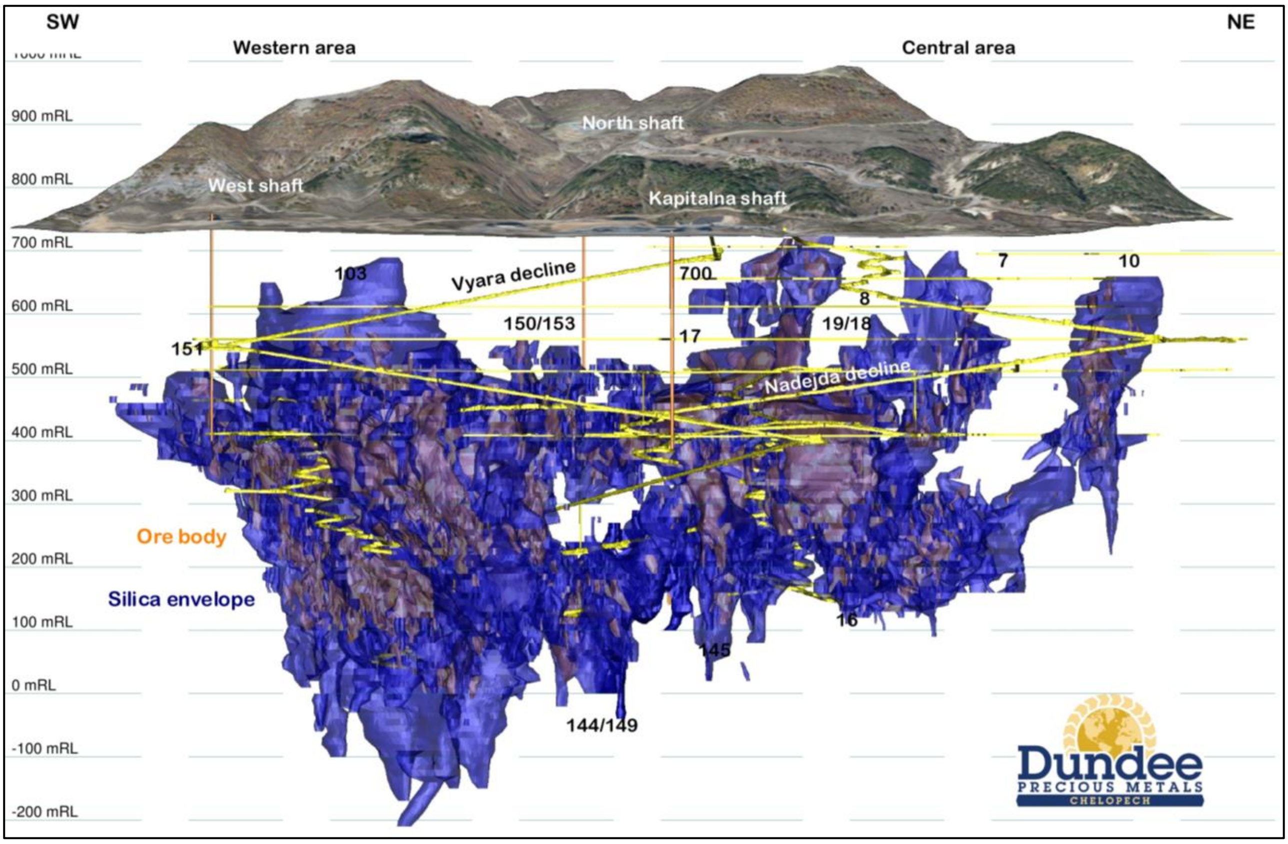


Figure 7-4: 3D view section of Chelopech deposit, with orebodies numbered (DPMC, 2022)

7.4 Structure

During 2007, a major synthesis of the Chelopech host rocks to a depth of greater than 2 km was completed by a team consisting of Chelopech and other DPM technical staff and the 2 Geoscience consulting group (Jigsaw, 2007).

The Jigsaw study concluded that the architecture and kinematics of the Chelopech hydrothermal system are characterised by multiple fault and fluid flow events. Mineralising fluids have entered the mineralisation system as a series of repeated pulses, with fluid physical properties evolving throughout. This pulsing nature of the fault-fluid system has created a complicated HS epithermal mineralisation-bearing system with a series of bodies of differing geological character. Metal zonation (from lead-zinc rich in the east-northeast, to copper-gold rich in the west-southwest) suggests that deeper parts of the hydrothermal system may be located to the southwest.

Late and post-mineralisation faulting has served to modify the original shape and distribution of the epithermal mineralisation, most likely displacing it in a gross normal and sinistral sense. Based on this interpretation, several target areas have been defined in and around the Chelopech mineral deposit (Jigsaw, 2007).

In 2008, Jigsaw undertook further mapping and relogging programs to review the relationship between primary and secondary permeability controls on the steeply plunging mineralised blocks. The kinematics and overprinting relationships of the major structures were further studied to assist with targeting (Jigsaw, 2008).

At the district scale, the main structural elements identified during this study include:

9) A series of steeply dipping northwest-trending transfer structures which include a single strike-slip displacement on the order of hundreds of metres located within the overlying Senonian sediments.
10) North to north-northwest striking, steep, normal offsets with throw displacements of 50–150 m within the Senonian–Turonian unconformity.

11) Steeply dipping east-west trending basin margin parallel structures which domain/partition and offset the known ore blocks with copper mineralisation.

In 2009, Prestologic Pty Ltd updated the Leapfrog grade and alteration model as well as the clay minerals model for which an analytical spectral device by Terraspect was used. The aim of those models was to confirm the current understanding of the 3D continuity of the Chelopech mineral deposit. This is the third Leapfrog modelling work conducted on the Chelopech copper-gold deposit. The first study was conducted in December 2006 and was followed up by a second study in June 2008.

The first Leapfrog geologic modelling study concluded that the 3D grade and alteration patterns could be explained in terms of a conjugate or an orthorhombic fault/shear pattern, to explain the steeply plunging prolate shape fabrics of the Chelopech orebodies.

This change in plunge within certain orebodies proved difficult to explain until the most recent study, which found that the single thrust orientation hypothesis (dipping ~23/150) was an oversimplification. The latest study confirmed that there are several shallow-dipping grade continuities while, the high-grade continuities can be explained in terms of a series of planar zones that share a common intersection line.

In 2013, the Chelopech Geology team started developing a detailed structural model of the deposit, based on all underground mapping. The structural data (dip direction, dip) is organised for the needs of different users (e.g. mine engineers, geomechanics, exploration geologist etc.). All structural measurements are digitised and are represented as surfaces with interpretation between mining levels and pillars.

This work informed a reinterpretation of the silica domain and in 2014. This update included all geological observations taken from capital development along with the Chelopech 3D structural model.

Continued efforts to check and improve existing genetic models of the Chelopech deposit led to refinements in the interpretation and from 2016 the main model is considered one of the ore-hosting magmatic environment at Chelopech is dominated by a multiphase intrusive complex. The HS hydrothermal system formed within a shallow intrusive multi-stage porphyritic diorite/microdiorite system pierced by several vertically extended, intrusion-related breccia bodies. Subsequently, intermittent post mineralisation thrusting and normal faulting both juxtaposed and preserved different levels of the mineralised system.

7.5 Alteration

The Chelopech mineral deposit is characterised by an alteration style typical of epithermal HS deposits. Recent studies have recognised three principal alteration zones moving outwards from a central part of the system to its extremities. The innermost part consists of an advanced argillic zone characterised by the presence of vuggy silica, massive silica, and a chalcedony. All economic mineralisation is focused in this area with mineralisation typically associated with a host dominated by 50–75% SiO_2 content. Surrounding this inner zone is a quartz sericite zone followed by a propylitic zone (Chambefort, 2005).

This zonation forms the basis of the Mineral Resource domains, with the central high-grade units associated with well-developed stockworks and massive sulphide mineralisation surrounded by lower-grade haloes dominated by disseminated sulphides and pervasive silica overprinting (Figure 7-5). These are respectively referred to as “Stockwork” and “Silica Envelopes” and form hard boundaries during the estimation of resources (see Section 14).

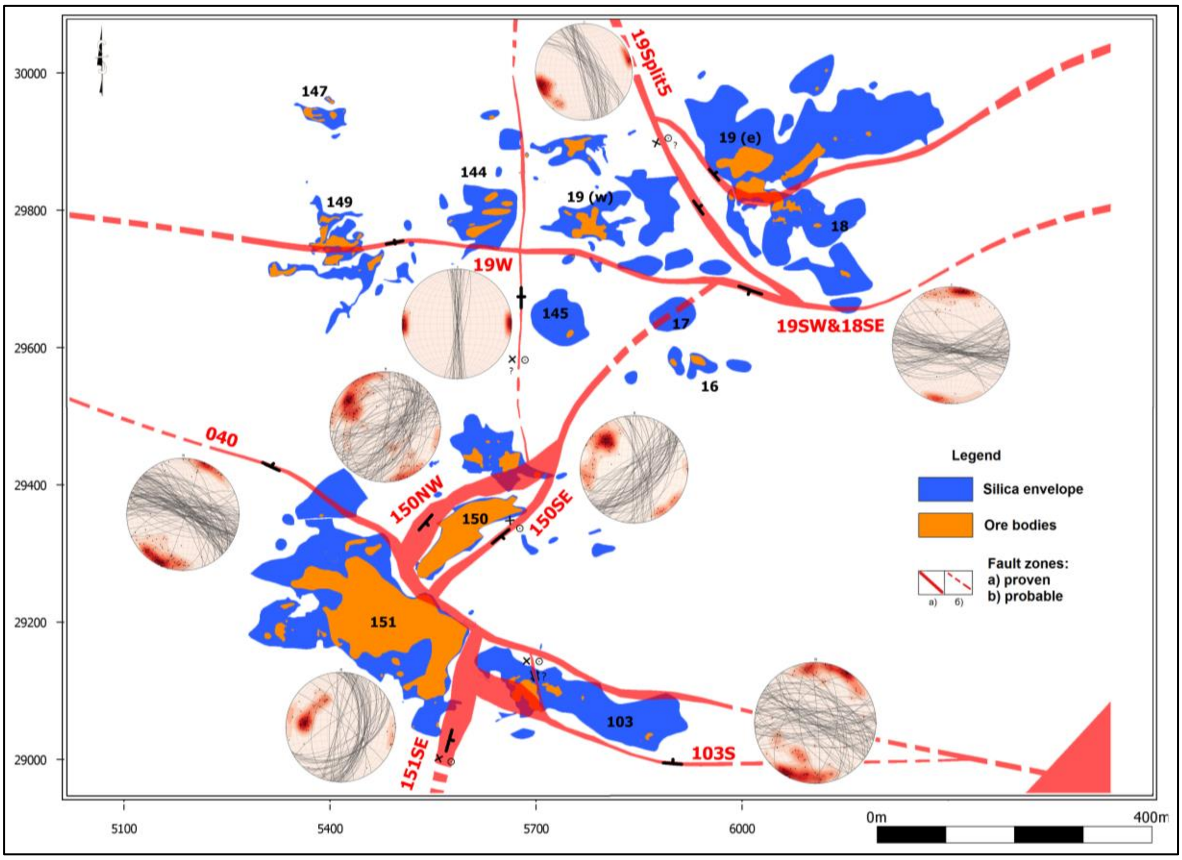


Figure 7-5: Plan of level 220 with major mineralised trends and major fault zones in the deposit (DPMC, 2017)

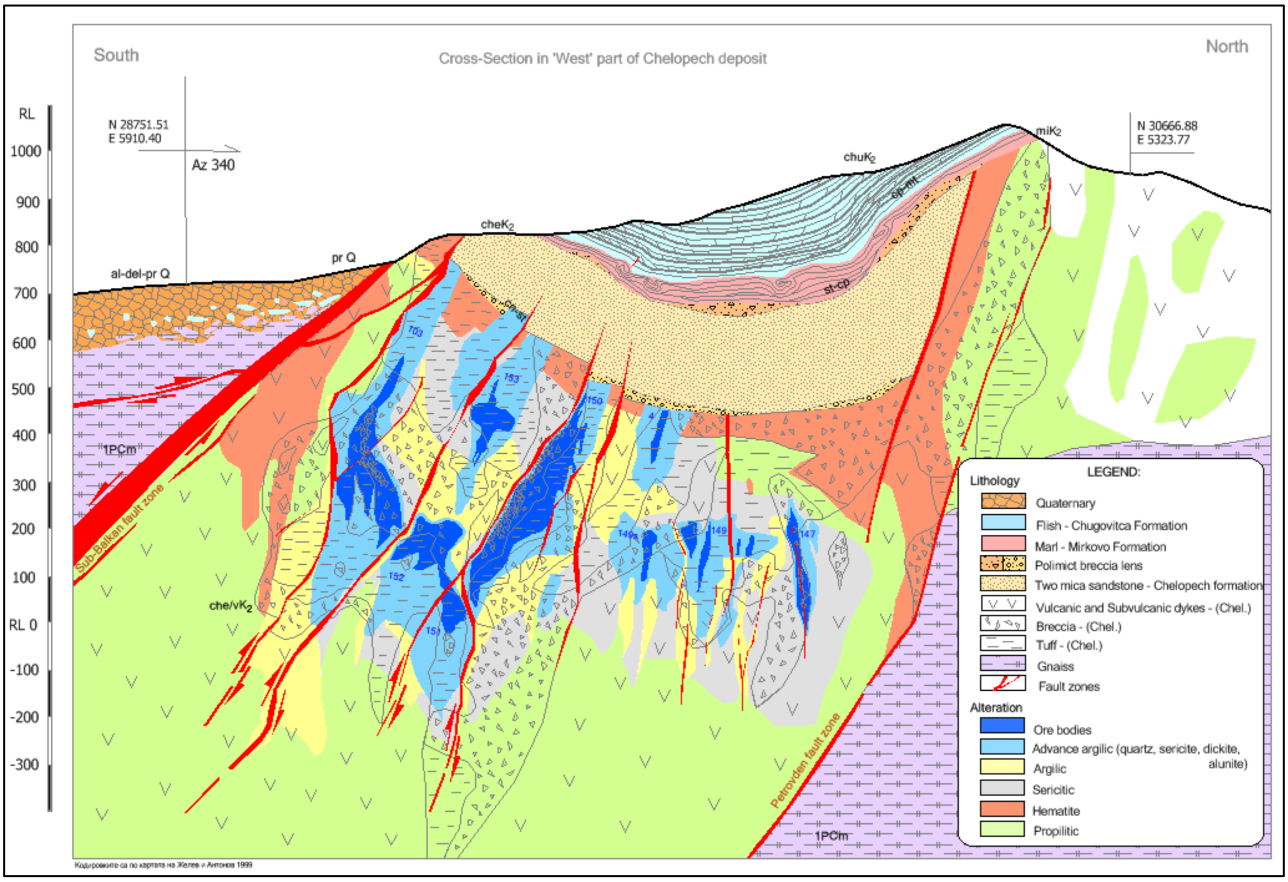


Figure 7-6: Vertical cross-section through Western Zone (looking west) with alteration, lithology, and mineralisation (blue) (DPMC, 2019)

7.6 Mineralisation

Three successive mineralisation stages have been recognised at Chelopech, including an early iron-sulphur stage consisting mainly of disseminated and massive pyrite, a second copper-arsenic-sulphur stage which is the economic copper and gold stage, and a late lead-zinc stage. These display different geometries, including veins, breccias, massive and disseminated sulphides.

The mineralisation occurs in a range of different morphologies, including lens-like, pipe-like and columnar bodies that typically dip steeply towards the south. The mineralised zones vary from 40 m to 200 m in length, are 20–130 m thick, and can extend at least 390 m down plunge. Sub-vertical vein mineralisation is volumetrically the most important mineralisation style at Chelopech (Chambefort, 2005).

Definitions to quantify the textural features were developed for the 2004 RSG Global estimate, as presented in Table 7-1 and Table 7-2. These codes are used to generate the silica and stockwork envelopes during modelling and leading up to estimation. The codes have since been updated to include the presence, or absence, of sulfosalts (enargite, tennantite, luzonite).

Table 7-1: Copper mineralisation styles

Mineralisation style	Description/Definition
Massive/Semi-Massive Sulphide (MS)	> 80% sulphide pyrite + veins of tennantite and/or enargite.
Massive/Semi-Massive Sulphide (PMS)	> 80% sulphide veins of pyrite only.
Normal Stockwork Sulphide (NS)	Sulphide veins with tennantite and/or enargite occurring less than (on average) 0.3 m apart. And the average width of the veins is greater than 1 cm.
Normal Stockwork Sulphide (PNS)	Sulphide veins with pyrite only occurring less than (on average) 0.3 m apart (>30% vol.) and average width >1 cm.
Weak Stockwork Sulphide (WS)	Sulphide veins with tennantite and/or enargite occurring greater than (on average) 0.3 m apart and average width <1 cm.
Weak Stockwork Sulphide (PWS)	Sulphide veins with pyrite only occurring greater than (on average) 0.3 m apart (<30% vol.) and average width <1 cm.
Disseminated Sulphide (DS)	Less than 40% tennantite and/or enargite in replacement or disseminated form.
Disseminated Sulphide (PDI)	Less than 40% pyrite in replacement or disseminated form. No tennantite and/or enargite veins.
Gold (AU)	Visible gold and/or >80% sulphide veins of tennantite and/or enargite.
Silica Envelope (SE)	Silica Envelope without Massive/Semi-Massive Sulphide, Normal Stockwork Sulphide, and Weak Stockwork Sulphide.

Table 7-2: Types of mineralisation and geometry of orebodies

Block	Type of mineralisation	Width / Horizontal extent / Vertical extent (m)
Block 5	Normal stockwork	40 / 60 / 40
Block 7	Disseminated Sulphide	20 / 55 / 120
Block 8	Normal stockwork	30 / 60 / 70
Block 10	Massive sulphide to normal stockwork	40 / 50 / 300
Block 16	Normal and weak stockwork	25 / 50 / 150
Block 17	Normal stockwork	40 / 130 / 230
Block 18	Normal stockwork	75 / 160 / 380
Block 19	Normal to weak stockwork	130 / 250 / 440
Block 25	Massive sulphide to normal stockwork	20 / 50 / 40
Block 103	Weak stockwork and disseminated	70 / 260 / 280
Block 144	Normal to weak stock stockwork	5–20 / 100 / 110
Block 145	Normal to weak stockwork and disseminated	5–20 / 80 / 110
Block 146	Massive sulphide to normal stockwork	40 / 100 / 60
Block 147	Normal stockwork	5–15 / 90 / 220
Block 148	Disseminated Sulphide and Normal stockwork	10–25 / 10–80 / 10–100
Block 149	Massive sulphide to normal and weak stockwork	5–20 / 180 / 230

Block	Type of mineralisation	Width / Horizontal extent / Vertical extent (m)
Block 149 South	Normal to weak stockwork and disseminated	10–20 / 70 / 120
Block 150	Massive sulphide to normal and weak stockwork	20–70 / 250 / 420
Block 151	Massive sulphide to normal stockwork	100 / 230 / 480
Block 152	Normal stockwork	50 / 100 / 80
Block 153	Normal stockwork	50 / 100 / 70
Block 700	Massive sulphide to stockwork and disseminated	25 / 125 / 120

Sulphide mineralogy is dominated by pyrite, marcasite, melnikovite, tennantite, enargite-luzonite, and chalcopyrite, together with subordinate famatinite, sphalerite and galena. In gross terms, about 45% of the copper is in the form of arsenides and sulfosalts, 50% as chalcopyrite, and 5% as oxides.

Quartz, barite, and kaolinite are the dominant gangue minerals with chlorite, ankerite and gypsum subordinate. Quartz barite-sulphides mineralization with high gold grades and low copper is typical for peripheral zone near the covering sediments (Block 700).

Gold occurs in a variety of forms, both as native metal with admixed silver in a stoichiometric form approximating to Au_3Ag and in auriferous tellurides. The gold is fine grained (5–300 microns, with 5–20 microns the norm). Metallurgical studies have shown a significant proportion of the gold is refractory, typically:

- 45% intergrown within pyrite, chalcopyrite, and sphalerite
- 25% intergrown with enargite, luzonite, tennantite, tetrahedrite, and bornite
- 20% finely intergrown with chalcedonic silica
- 10% as free gold.

Silver-bearing rock and native silver are usually spatially associated or finely intergrown with pyrite and galena (62%) with enargite, tennantite and tetrahedrite (15%), and as electrum (23%).

Other major sulphides and arsenides exhibit simple crystalline and intergrown forms with the pyrite and occur in intra-crystal spaces as replacements, as replacements of pyrite, as crosscutting veinlets and as overgrowths. Intergrowths of the cupriferous minerals are commonplace, both as aggregates and as complex textures with several intergrown minerals.

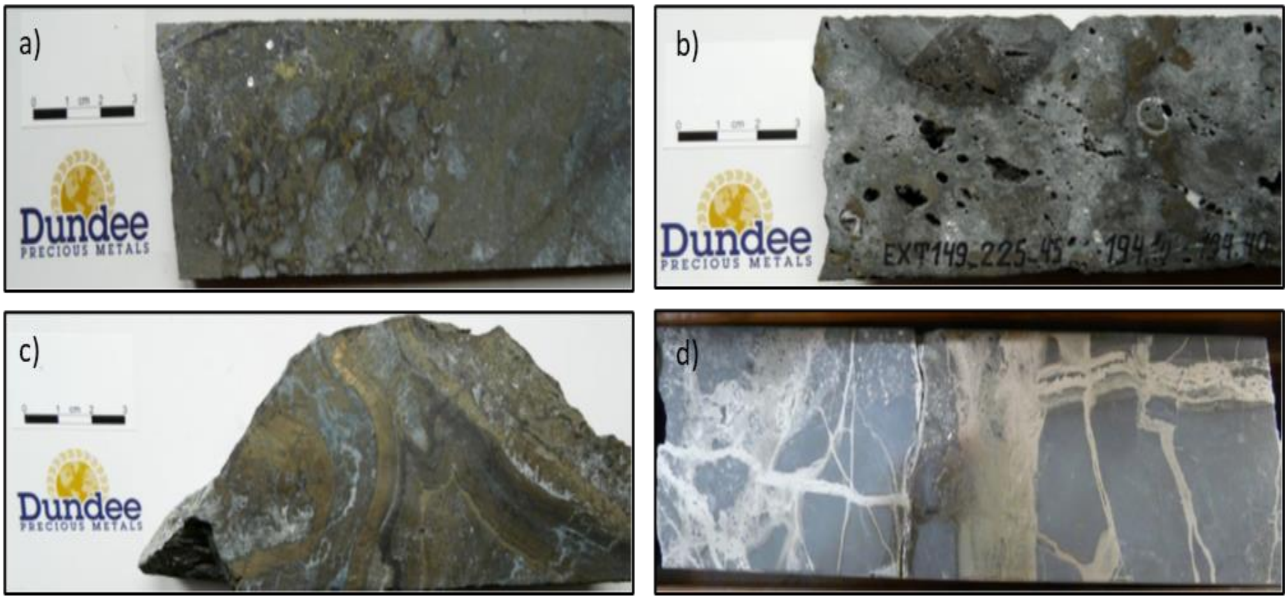


Figure 7-7: Typical textures of Chelopech ore that reflect the conditions of ore formation

a) Sulphide in fill between larger clasts and replacement of fine matrix in hydrothermal breccia. b) Sulphide associated with vuggy silica replacement of host rock tuffisite. c) Cockade and banded texture of veins and cavity-fill and replacement "massive sulphide". d) Sulphide vein network in totally silicified host. Photos from a suite of reference samples in the Chelopech mine office (Morrison, 2016).

8 Deposit Types

Over the history of the exploration and development of the Chelopech deposit, several genetic models have been proposed. The epithermal class of deposits in Panagyurishte mineral district (including Chelopech) were originally classed as “massive sulphide copper-pyrite deposits” (Dimitrov, 1960; Bogdanov, 1984). Later, studies by Petrunov (1995) and Chambefort et al. (2005) indicated an epigenetic origin for the mineralisation, Chelopech deposit being classified as a typical high-sulphidation epithermal deposit, and genetically linked to the replacement of volcanic rocks and hydrothermal breccia development in structurally controlled zones. Recent efforts on drill core relogging and exploration model revisions resulted an upgraded geology model, which integrates the Chelopech deposit into a larger zoned magmatic-hydrothermal system related to a multi-phase intrusive complex, where transition between the deeper porphyry-type and the shallower HS-type environments is continuous, and the HS-type mineralisation is constrained by sub-vertical phreatomagmatic breccia zones and sub-horizontal hydromagmatic surge flows and exhalative ore zones (Marton et al., 2016).

HS epithermal copper-gold-silver deposits develop in settings where volatiles (dominantly gases such as SO_2, HF, and HCl) and metal bearing fluids vent from hot magma sources at considerable depth and travel rapidly to elevated crustal settings, without reaction with wall rocks, or mixing with groundwater. The volatile component, which rises more rapidly than the fluids, becomes progressively depressurised and SO_2 comes out of solution and in turn oxidises to form H_2SO_4, such that the rising and cooling fluid becomes increasingly acidic (to pH of 1.0 to 2.0) as it ascends to epithermal levels, where it reacts with wall rocks to produce advanced argillic alteration (AAA). Because of the progressive cooling and neutralisation of the hot acid fluid by wall rock reaction, the AAA is zoned outwards from a central core of vuggy or residual silica, from which everything but silica has been leached by the strongly acidic waters, through alteration zones dominated by alunite, pyrophyllite, dickite, kaolin, and then illite (Corbett, 2005).

The Chelopech magmatic complex relates to an inherited and intermittently reactivated regional Variscan basement relay structure which causes pre-, syn- and post-mineral Gosau-type sub-basin formation with characteristic rapid facies changes, post-mineral thrusting and subsequent normal faulting, all contributing to the formation and preservation of the mineralisation.

The economically significant HS-style gold-copper mineralisation is controlled by phreatomagmatic breccia pipes and syn-mineral hydromagmatic surge- and epiclastic debris-flow deposits. Ore shoots are associated with the high-porosity breccia–diorite contacts, breccia pipe cupola zones, surge flows with volcanogenic massive sulphide-like exhalative ore zones and west-northwest and east-northeast striking steep structural feeders, which follow regional and local trends. Mineralisation is represented by sulphide- and sulphosalt-rich replacement zones associated with a well-zoned AAA footprint. The inner core of AAA is represented by vuggy silica and aluminium phosphate sulphate (APS) minerals (alunite-svanbergite-woodhousite) surrounded by a competent dickite-silica-APS alteration assemblage. The outer zones are represented by lower crystallinity kaolinite and illite alteration. The deep part of the AAA is characterised by muscovite and pyrophyllite alteration, which usually marks the lower limit of economic copper grades. An extensive shortwave infrared (SWIR) dataset and the strontium-potassium-sodium-calcium multi-element whole-rock interpolants provide primary vectors to mineralisation within this alteration footprint.

At Chelopech, multiple events related to both silicification and mineralisation, were probably driven by pressure fluctuations, degassing and fault-valve activity above a metal-bearing brine fluid at depth. High arsenic-sulphur systems represent a change in fluid conditions which have commonly been observed in the youngest paragenetic stages of porphyry copper mineralisation. The fluids responsible at Chelopech are of a different character and are more acidic and possibly more reduced remnants of a de-gassed brine material, capable of chloride-gold transport.

Exploration of HS copper-gold mineralisation types, like those being currently exploited, requires an integrated approach, utilising all available geological, geochemical, structural and geophysical data. Due to the genetic association to alteration footprint, advanced argillic alteration zones are a useful indicator of favourable mineralisation locations and are typically subject to infill drilling, when encountered during initial scout drilling.

There are coherent metal zoning patterns at the scale of the whole Chelopech complex, for the envelope of the Chelopech copper-gold orebodies and for the western orebodies as a single zoned system rather than physically separate orebodies. Generally, the innermost economic zone is represented by copper-gold-arsenic-silver-tellurium assemblages whereas the outer and shallow part is marked by relative enrichment of lead-zinc-manganese-thallium-silver-gold. The deep core of the orebodies is marked by relative enrichment of gold-antimony-bismuth-tellurium-tungsten. These patterns are very useful guides to system position at all scales and particularly useful together with the alteration zoning pattern for suggesting extensions to the Chelopech mineralised envelope.

9 Exploration

9.1 Introduction

Given the long exploration and operational history at Chelopech, a variety of drilling and sampling methods have been implemented. A summary of the drilling and sampling completed to date is presented in Table 9-1 and Table 10-1. A description of the current exploration activities is provided in subsequent subsections.

9.2 Underground Face Sampling

Underground face sampling has been routinely performed since the commencement of mining development (Table 9-1). All mine developments; both capital and operational are sampled. In addition to being used for production, underground face sampling results are used in Mineral Resource estimation. For more details about sampling procedure, refer to Section 11.1.2.

A comparative study of underground face samples against other sample types at Chelopech, was completed in 2007. This review work was re-assessed in 2013 by DPMC staff and no significant bias between face samples and other sample types was observed.

Table 9-1: Underground face sampling data (as at 30 September 2021)

Period	Company	Samples	Assays
Jun 1956 to Feb 1992	State owned (including Polimet)	7,220	27,494
Mine closed Mar 1992 to Dec 1992			
Mar 1992 to Aug 2003	Navan (including) Homestake	8,494	41,017
DPMC Sep 2003 to Sep 2021	DPMC	24,334	121,556
TOTAL		**40,048**	**190,067**
Total – Pre-DPMC		**15,714**	**68,511**
Total – DPMC		**24,334**	**121,556**

9.3 Underground Mapping

Underground mapping is a routine activity and is performed by qualified mine geologists. Mapping of underground levels is completed during and following the completion of development, and prior to mining. Detailed lithological, alteration, textural and structural data is collected and transferred onto 1:200 scale plans and then digitised into Datamine™ Studio RM® mining software for interpretation and creation of the structural model. The structural model is used as the basis of geological interpretation for the Mineral Resource model.

9.4 Geophysics

9.4.1 Geo-Electric Surveys

Titan-24 Distributed Array surveys using direct current induced polarisation (DCIP) and magnetotellurics (MT) were undertaken on the Chelopech mine property, by Quantec Geoscience Inc. between 4 September and 10 October 2004. A total of 38.4 line-km of MT and DCIP were surveyed on 13, 200 m spaced, 2.4–4.8 km long, northwest-southeast profiles, and one 2.4 km long baseline.

Data acquisition was followed by a 2D inversion of DCIP and MT dataset performed by Quantec. An additional 3D inverted model for chargeability and resistivity delivered from DCIP was calculated in-house.

During 2019, two holes were surveyed with BHEM. A total of 230 m in drillholes EX_WZ_04 and 525 m in EX_WZ_05 were logged with a three component (X, Y, Z) EMIT sensor. As a result, conductive plates were mapped as potential targets for further follow up.

Approximately 0.35 km^2 were covered with ground Transient Electromagnetic (TEM) survey on a 50 m x 50 m grid with the aim to identify shallow conductive targets to support drilling campaign at "Krasta" prospect on the "Sveta Petka" exploration licence.

In the autumn of 2020, an orientation survey of downhole logging (acoustic/optical) televiewer was initiated on two holes at the West Shaft target within the Sveta Petka licence. Poor and unstable conditions within the holes did not allow the area of interest to be reached.

In 2021 a total of 17.0 km of Ground Electrical Survey – Controlled Source Audio-magnetotelluric (CSAMT) survey was accomplished along eleven profiles covering prospective domains around the main Chelopech mineralised system (Figure 9-1). Based on two-dimensional inverted results for apparent resistivity, the survey identified additional targets at the periphery of the system up to a depth of 1000m below surface. Subsequently, the results of all geophysical works were incorporated into a 3D geological model for further analysis and interpretation.

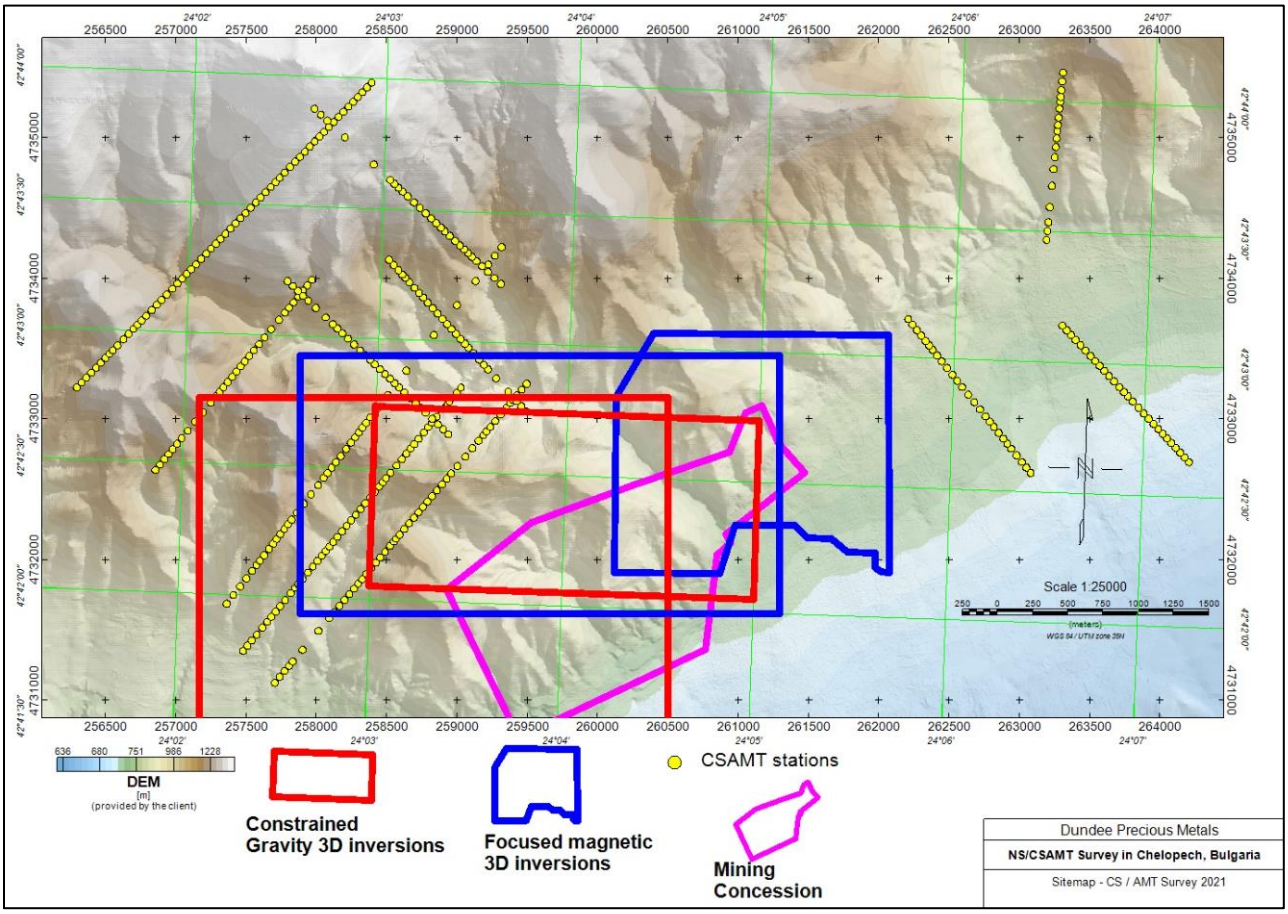


Figure 9-1: Plan view of CSAMT profiles and 3D magnetic and gravity focused and constrained models

9.4.2 Ground Gravity and Magnetic Surveys

In the near-mine area, the Sveta Petka exploration licence has been investigated during various ground magnetic survey campaigns since 2008. Scintrex and GEM magnetometers were used by different contractors to conduct the surveys. The resultant grids were joined together, processed with Geosoft and a 3D UBC magnetic model calculated.

A total of 468 gravity survey points were measured in Sveta Petka and Mining Concession areas. A 200 m x 200 m base grid was used with infill points over selected anomalous areas.

Additionally, a complete Bouguer anomaly map was calculated using a DEM grid based on combined LiDAR and digitised topography data. Filtered gravity (residuals, upward continuation) were calculated and used to allocate areas with potential for presence of large, massive sulphide bodies. A 3D UBC gravity inversion of the block model density distribution was calculated.

A total of 148 full tensor of Magnetotelluric (MT) stations have been measured. The survey covers two blocks of the Brevene exploration licence at an approximate grid of 250 m x 250 m. At the southern portion of the Brevene exploration licence, MT stations are allocated along line-section profiles.

A 3D MT inversion of a block model of resistivity distribution have been calculated for the Western and Eastern blocks. A 2D inversion model was also calculated along selected profiles. 1D inversions were calculated for each station.

Approximately 20 km^2 over the Brevene exploration licence surrounding the Sveta Petka and Mining Concession were covered with airborne magnetic survey (Drone Mag) – a total of 212 line-km along northeast-trending traverses at a nominal line spacing of 100 m. The results were merged with previous ground magnetic surveys, including a newly measured ground survey of 76 line-km and standard grids produced for analysis and interpretation. Three dimensional inverted magnetic models were calculated over selected areas with the aim to identify further potential targets.

Furthermore, focussed 3D constrained inversions of magnetic and gravity were prepared with the aim to define potential targets. The results of all geophysical works were incorporated into a 3D geological model for further analysis and interpretation.

10 Drilling

10.1 Introduction

Resource development drilling at Chelopech has been completed at a nominal hole spacing of between 50 m x 50 m and 25 m x 25 m. Most surface holes are vertical or steeply inclined and average 600–700 m in depth, with some holes exceeding 1,000 m. Underground drilling, originally horizontal, is now inclined in all orientations to achieve the best angle of intersection. The data cut-off date for update of Mineral Resources was 30 September 2021. Data consists of both historical and DPMC drilling data and is summarised in Table 10-1 and presented graphically in Figure 10-1.

Table 10-1: Drilling data details (as of 30 September 2021)

Operator	Period	Company	Size	Number	Average length (m)	Total metres
Pre-DPMC surface drilling	Jun 1956 to Feb 1992	State owned (including Polimet)	Various sizes	439	607	266,451
	Mine closed Mar–Dec 1992					
	Jan 1993 to Aug 2003	Navan (including Homestake)	Various sizes	9	81	726.3
	Total – pre-DPMC surface drilling			**448**	**596**	**267,177**
Pre-DPMC underground drilling	Jun 1956 to Feb 1992	State owned (including Polimet)	Various sizes	233	121	28,144
	Mine closed Mar–Dec 1992					
	Jan 1993 to Aug 2003	Navan (including Homestake)	BQ, NGM	484	57	27,527
	Total – pre-DPMC underground drilling			**717**	**78**	**55,672**
DPMC surface drilling	Sep 2003 to Sep 2021	Exploration	Various sizes	201	587	117,901
DPMC underground drilling	Sep 2003 to Sep 2021	Exploration	BQ, NQ, NQ-2, HQ, LTK60, NGM	1,475	292	430,377
		Grade control drilling	BQ, NQ, NQ-2	1,926	154	296,340
	Total – DPMC underground drilling			3,401	223	726,717
TOTAL				4,767	245	1,167,467

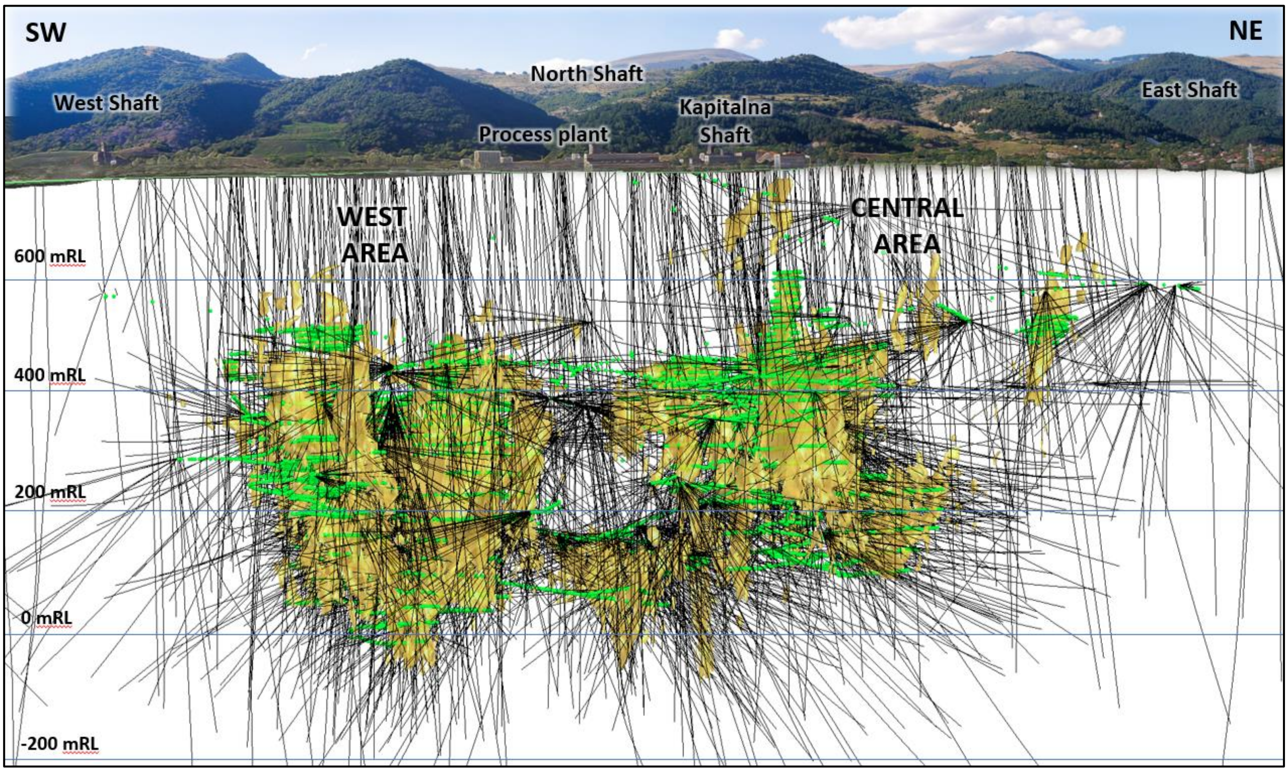


Figure 10-1: 3D representation of the Chelopech deposit with diamond drillholes and underground face samples in green, looking northwest (DPMC, 2021)

10.2 Pre-DPMC Drilling

10.2.1 Surface Drilling

SGE has carried out surface diamond drilling at the Chelopech copper-gold deposit since 1956. Their surface holes were drilled at various sizes and core recovery was reportedly routinely measured during the drilling process. A historical recovery of 87% in the waste and 97% in the mineralised zones is reported, though there is no data to verify these figures.

10.2.2 Underground Diamond Drilling

CCPC, Navan, and Homestake have completed underground diamond drilling at the Chelopech mineral deposit during the pre-DPMC period.

The early underground diamond drilling completed by CCPC, was dominantly horizontal, and designed to locate the lateral boundaries of mineralisation interpreted from the surface drilling.

Since Navan's involvement, modern diamond drills have been introduced with better capabilities with drilling inclined normal to mineralisation and along section lines.

Homestake drilled 18 holes between 1995 and 1998. All holes were drilled using formalised standards and procedures. Core recoveries were measured for Homestake drilling and it is reported that appropriate care was taken to achieve high core recoveries.

Up until the start of 2003, a Longyear LM22 (TT-46, 34 mm core) and two Diamec 262 (NGM, which is 56.1 mm core diameter) drilling rigs, with NGM wire lines, were in use. For more details, refer to Table 10-1 above.

10.2.3 Diamond Drilling Logging

Historically, core was logged either underground or at surface in a logging facility. Geological logs were created primarily by using a graphical schematic strip log with lithology, mineralogy and structural annotations added. Core descriptions recorded lithology, texture, alteration and mineralisation style.

10.3 DPMC Drilling

10.3.1 Surface Diamond Drilling

External to the immediate Mineral Resource development area, DPMC completed the first phase of surface drilling on a 200 m x 200 m grid in 2006 and 2007, targeting a geophysical anomaly north of the mine. This is on the adjacent Smolsko exploration lease, which was transferred from Balkan Mineral and Mining EAD to Chelopech Mining EAD. The surface diamond drilling was completed using CM 1000, CM 1200 and DT 1000 drill rigs provided by Bulgarian Drilling Services Ltd. For more details, refer to Table 10-1 above.

Follow-up surface drilling from August to September 2010, on a 100 m infill grid, defined the presence of five separate narrow 3–10 m mineralised brecciated and silicified volcanic zones hosting sulphides and ±sulfosalts. The surface diamond drilling was completed using Cristensen C5-10, Cristensen C5-14 and Knebel drill rigs provided by contract drilling company, Geops Ltd. The opportunity to convert these new zones into Mineral Resources with further drilling has been deferred.

Surface diamond drilling was completed 2019 by a company drill rig – LM75 and two additional drill rigs – Christensen CS10-02 and Mustang 5 provided by Geops Ltd, that were contracted to DPMC. A total of 4,359 m was drilled towards target 700 and the upper levels of Block 151.

As a result of ongoing exploration efforts, a series of new HS-style gold-copper near-mine targets were outlined, which are located 1–2 km northeast (Krasta and Sharlo Dere prospects) and southwest (West Shaft prospect) from the Mine and extend below the post-mineral Chelopech thrust system and are associated with a zone of blind breccia pipes known as the Southeast Breccia Pipe Zone. During Q3 2021, exploration drilling commenced at the Sharlo Dere prospect, located approximately 500 m northeast of the most eastern orebodies of the Chelopech mine, to confirm and re-evaluate the HS-type copper-gold, relatively shallow mineralisation defined historically by state drilling within the Chelopech Mine Concession.

10.3.2 Underground Diamond Drilling

The main objective of underground drilling is resource development and grade control drilling with geological logging and grade analysis. Geotechnical assessment and metallurgical evaluation are completed when required.

During 2004, two Diamec 262 drilling rigs, owned by DPMC and two Major Drilling (LM55 and LM75, NQ core) drill rigs were in use.

In mid-2005, the Major Drilling rigs were purchased by Dundee while, at the end of the year, one of the Diamec 262 (D1) drill rigs was decommissioned. In 2006 and 2007, three drill rigs were operating until December 2007, when DPMC purchased and commissioned a new LM55 with LM75 power pack.

In early 2010, DPMC commissioned an additional LM55 with LM75 power pack specifically to drill grade control holes. This rig is smaller and lighter than the others and was purchased with a telehandler for quick manoeuvrability. Once this rig was operational, the last of the Diamec rigs was decommissioned.

In July 2014, DPMC commissioned a mobile grade control drill rig (LM30SS). This is a compact, mobile unit that ensures quick setup time and ease of moving from site to site. It uses a CAT 346C Skid Steer carrier to power and transport the drill components.

Currently, four drill rigs are in use; three drill rigs for resource development drilling and one for grade control, drilling a total of approximately 44,000 m drilled.

10.3.3 Diamond Drilling – Core Logging

Diamond drilling and core logging at Chelopech is performed to a high standard. The key technical criteria observed by the drillers are:

- Inner tube splits and core lifters are washed prior to reuse in successive drill runs.
- Drill core is orientated on 3 m intervals (or on smaller intervals in zones) using a DeviCore orientation. Core orientations are also undertaken immediately after poor orientations.

- Wooden core blocks are placed between runs, recording the length of the run and core loss (if any).
- Forced breaks made by the drillers must be marked on the core on both sides of the breaks with a red cross.
- Core is washed clean, free of surface mud or other drilling fluids.
- The core trays are clearly labelled with the hole ID and depth, from and to, tray number.
- Transportation from the drilling site to the core yard is undertaken with great care to avoid disturbance of the core.

The drill core is logged by competent DPMC geological personnel in a core shed established for this purpose. All logging information is collected digitally on tablet computers using Field Marshall software.

The use of tablet computers ensures use of consistent logging using deposit specific codes. The presence of type lithology and alteration style boards supports good logging practice and ensures methodical training of new staff.

The geological logging of the core is carried out at 1.5 m intervals through a system of codes for lithology, alteration, veins, mineralisation etc, which are entered into a Geological Logging Sheet in tablets in Field Marshall. In practice, the code system covers all possible variations of rocks, minerals, alteration and oxidation processes, veins and textures, mineralisation, etc. Once the logging is completed, the finished files are copied and placed on the geology server.

All core is photographed, both dry and wet, using a digital camera, and the photos are saved on the geology server. Core logging workflow is presented in Figure 10-2.

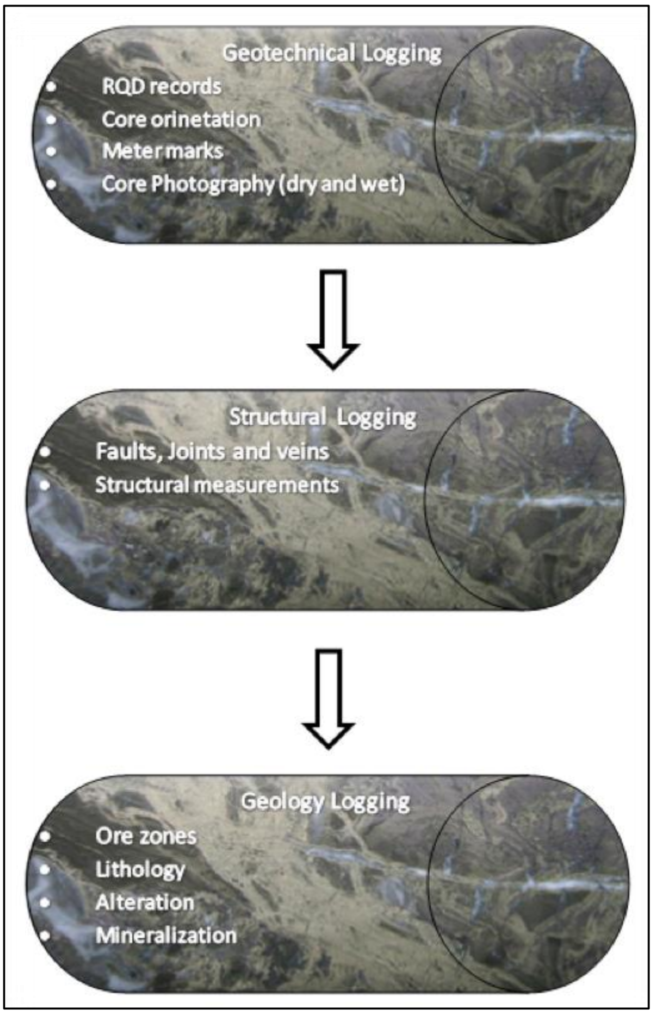


Figure 10-2: DPMC drill core logging flowchart (DPMC)

10.3.4 Rock Quality Designation Records

Summary geotechnical logging consists of recording Rock Quality Designation (RQD) and measuring recovery per drill run (complete core loss is recorded as "0" RQD). RQD is defined as the percentage cumulative length of core pieces longer than 10 cm in a run divided by the total length of the drill run converted to % (only the naturally broken pieces are measured; breaks made by the drillers are ignored).

10.4 Core Orientation and Structural Logging

10.4.1 Core Orientation using Orifinder DS1

Between May 2015 and October 2020, core orientation was conducted using the Orifinder DS1 tool. The use of this tool increases the quality of core orientation, saves time when checking the quality of core orientations and reduces orientation errors via the audit check feature. The tool acquires data wirelessly making it a "no manual required" drill core orientation system designed for a one-person drilling operation in harsh environments.

Figure 10-3: Process of core orientation at underground drill site by a driller using Orifinder controller (DPMC, 2015)

10.4.2 Core Orientation using DeviCore BBT

The DeviCore BBT instrument has been used since November 2020 and remains in use. DeviCore BBT uses three high-accuracy accelerometers, it measures inclination, orientation, gravity vector, temperature and battery status, and offers quality control on the results. Communication between DeviCore BBT and the Nomad PDA is done wirelessly via Brilliant Blue Technology.

The orientation marks are connected with a thick black line for the intervals with high confidence when at least two marks are within a tolerance of 10° of the orientation, and with a broken line for uncertain orientation, e.g. if there is a discrepancy between the directions of the marks or when some of the core pieces do not fit well together, or when at least two marks are within a tolerance between 10° and 15° of the orientation.

The alpha, beta, and gamma angles for geological structures in the drill core are measured for:

- Planar structures – bedding, foliations, veins, joints, faults.
- Linear structures – fold axes (hinges), intersection lineations, stretching (extension) lineations and slickenlines.

Structural logs are captured in acQuire with alpha, beta and gamma angles converted to real space. These are then transferred through Structured Query Language (SQL) scripts into Datamine™.

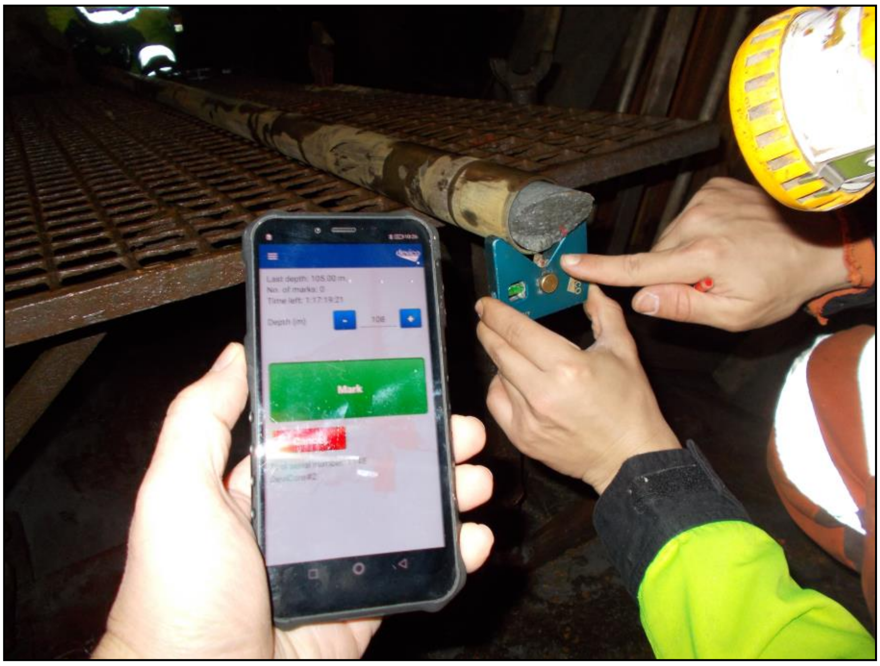


Figure 10-4: Process of core orientation at underground drill site by a driller using DeviCore instrument (DPMC, 2021)

10.5 Pre-DPMC Surveying

10.5.1 Drillhole Collars

Hole surveys were undertaken using optical methods consistent with good industry practice, using theodolites and survey traverses. Up to 1998, drillhole collars were surveyed with a theodolite (Theo 010 or Theo 020). Between 1998 and 2002, surveys were conducted using an electronic theodolite (Sokkia). Since 2002, a Leica 305 total station has been used. This equipment is used for both surface and underground drillhole collars.

10.5.2 Downhole Surveys

Prior to 1994, a gyroscope was used to survey downhole traces. Between 1996 and approximately 1999, a (REFLEX) Maxibore tool was used for downhole surveying. From this, it was established that the drillholes on average, deviated less than 0.7 m over the total hole lengths. With such small magnitudes of downhole deviation, when the lengths of subsequent holes were reduced, downhole surveying was discontinued. Between 1999 and 2002, the dip and azimuth of the holes were measured at the collar and the data extended to the base of the hole.

10.6 DPMC Surveying

10.6.1 Grid Control

Hole surveys were undertaken using optical methods consistent with good industry practice, using theodolites and survey traverses. Up to 1998, drillhole collars were surveyed with a theodolite (Theo 010 or Theo 020). Between 1998 and 2002, surveys were conducted using an electronic theodolite (Sokkia). Since 2002, Leica total station has been used. This equipment is used for both surface and underground drillhole collars. Both surface and underground survey control networks are based on the national triangulation network, with the development of local area survey network. Coordinates are transformed from the national triangulated grid 1970 to local mine grid and Universal Transverse Mercator (UTM) World Geodetic System 1984 (WGS1984) using a two-point transformation (Table 10-2).

Table 10-2: Two-point transformations

Point ID	Point 1	Point 2
NAT Grid X	4603331.8	4605477.5
NAT Grid Y	8558286.5	8561697.7
NAT Grid Z	700	700
Mine Grid X	4365.666	7791.299
Mine Grid Y	28800.663	30923.104
Mine Grid Z	700	700
UTM X*	258500	262000
UTM Y*	4731000	4733000
UTM Z*	700	700

**UTM Zone WGS1984 Zone 35N.*

10.6.2 Drillhole Collars

The Survey Department is responsible for setting out the collar positions, directions, and inclination/ declination of both surface and underground drillholes, and for surveying the actual position, direction and inclination/declination upon completion. The obtained coordinates are sent to database geologist via email and are entered in the acQuire database. The Survey Department utilises a Leica TS15 and TS16 total stations surveying tools. The risk of significant error associated with the drill collar surveys is considered to be low.

10.6.3 Downhole Surveys

Since 2003, the dip and azimuth of holes were measured using REFLEX tools – REFLEX EZ-SHOT (single shot) and REFLEX EZ-TRAC™ tool, which measures magnetic north, magnetic field and temperature, and allows accurate calibration of the results (i.e. spurious results can be excluded based on the magnetic susceptibility results). During 2005, a review of the downhole surveys in the database was completed and it was found that during the original transfer of the database from GEMS to acQuire, the downhole depths were incorrectly transferred. The entire downhole survey database was checked, and all records modified to their original downhole location. This only affected holes drilled prior to 2003 and as most of the resource is defined by holes drilled after 2003, this is not considered a material issue.

Not all underground drilling completed since 2005 has been systematically downhole surveyed. While the deviation is not expected to materially change the mineralised zones, all future drillholes should be downhole surveyed to determine an accurate spatial location. Downhole surveying has been incorporated into a series of standardised DPMC procedures, which have been implemented at the Chelopech mine since 2005, with routine downhole surveys carried out every 30 m using four on-site single shot REFLEX tools. These tools are checked every month and calibrated when required.

10.6.4 Topography

In general, the topographic model follows the collar positions of surface drillholes. However, there are deviations due to the accuracy of the topography survey. As the Mineral Resource is not impacted by surface expression, this inaccuracy is not considered material. In October 2013, an orthophoto map and DSM of the terrain around the mine and industrial site was created by “Solitech” EAD using Gatewing X100 and Trimble UX5 systems. The covered area is 68 km^2. The achieved accuracy is about 300 mm in 3D space.

10.7 Core Recovery

Core recovery measurements have been performed continuously since 2004, with excellent core recovery for all drillholes. A total of 913 drillholes have no core recovery details and 416 historical holes have low priority data. Diamond core recovery is measured during the core mark-up process, prior to logging and cutting.

No issues were noted with core recovery. For more details, refer to Section 12.6.

10.8 Operational Resource Development Drilling (2021)

In 2021, a total of 43,208 m of resource development diamond drilling was completed in the Chelopech concession.

Resource development extensional drilling was concentrated on the upper levels of Blocks 8, 10 and 700 in the Central area, and Block 148 and Target 147 North were tested in the Western area, with the objective of expanding the current mineralisation body extents and increasing confidence of Mineral Resources.

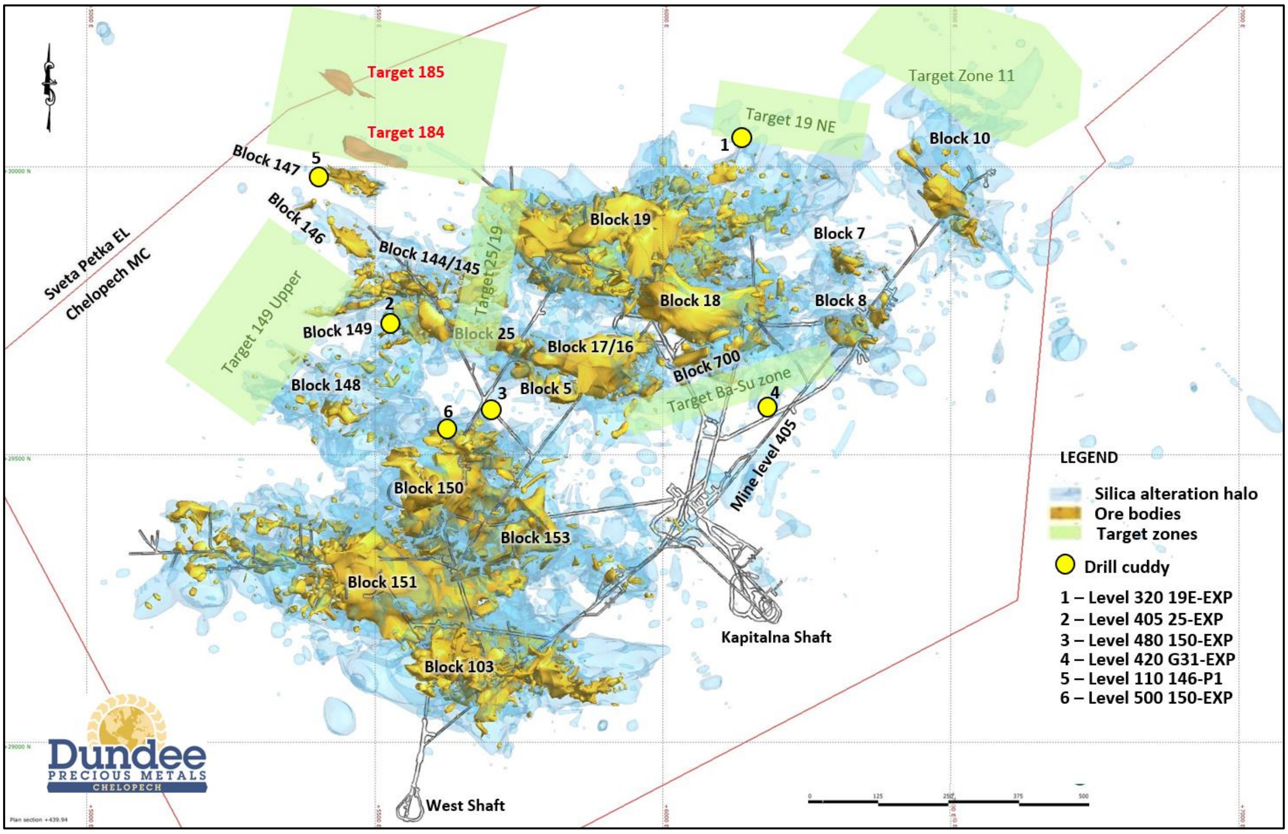


Figure 10-5: Overview map of the planned operational resource development drilling in Chelopech mine during 2022 (DPMC, 2021)

Currently, DPMC's operational resource development drilling strategy combines resource definition drilling designed to a 30 m x 30 m drilling grid with infill grade control holes. Wider spaced resource definition drilling is employed to define Indicated Mineral Resources. Operational infill drilling on a 15 m x 15 m drilling grid is designed to upgrade Indicated Mineral Resources to Measured Mineral Resources to allow subsequent conversion to Mineral Reserves and detailed production design and scheduling works.

The 2022 Mineral Resource development strategy for Chelopech will focus on the upper levels of Blocks 25, 144, 145, 147, and 149.

Positive results from drilling in Blocks 25, 5 and 17 are reason to continue this campaign and assess the zone between Blocks 25 and 19. Sporadic high-grade gold intersections south of Block 700 are considered atypical for the Chelopech mineralisation and will be a subject for further investigation.

Additionally, DPMC plans to test the following targets:

- Extensional drilling:
  - Extensional diamond drilling in upper levels areas close to Blocks 8 and 10 where several narrower HG zones were defined.
  - Target 19 NE will be assessed from a drill cuddy developed specifically for drilling in the north area of Block 19 where the target is a high potential zone with a narrow lens of massive mineralisation without the typical alteration halo.

- Area North, northwest from Block 147 will be assessed. This peripheral part of the deposit is prospective, with lithological and structural characteristics suggesting a steep lens shape of mineralisation in the contact zone between a breccia body and coherent magmatic rock.
- Extensional drilling in the volume between Blocks 25 and 19 near to the boundary between volcanics and post mineral unit will be tested for high grade mineralisation.

- Grade control drilling:
  - Grade control drilling in Blocks 151 and 149 south to test the current mineralisation contours and possibly extend them.
  - Additional grade control drilling is scheduled to define the bottom of Blocks 149 and 147.
  - Based on the 24-month production plan, grade control drilling will support all active mining areas and will provide higher resolution in ore interpretation process.

For 2022, a total 44,000 m of operational resource development drilling has been planned to cover the targets described above. A total of 170 m of exploration development are planned to allow access to more distal targets. DPMC intends to spend US$2.2 million for operational resource development drilling during 2022.

11 Sample Preparation, Analyses and Security

11.1 Sample Preparation

11.1.1 Pre-DPMC: Sample Preparation

Pre-DPMC diamond drilling and underground face sampling procedures did not differ significantly from the current DPMC procedures. See Section 11.1.2 for further details of current procedures.

Bulk Density Sampling

The previous approach to the estimation of resource tonnage, prior to estimation of bulk density by using ordinary kriging and the relationship with sulphur grade, was to use a single bulk density assigned to each identified mineralised block.

11.1.2 DPMC: Sample Preparation

Resource Development Diamond Drilling Sampling

All drill core is sampled in intervals up to a maximum of 2.2 m, with 1.5 m sample intervals being the most common length. Where there is a change of mineralisation type or structural contact within a mineralised zone, shorter intervals may be used, but not less 0.80 m (due to the requirement for a minimum quantity weight of the sample for analysis). Three sizes of core are drilled at the Chelopech mine, NQ and LTK60 for exploration and BQ for grade control drilling. NQ and LTK60 core are cut by diamond saw, with half-core samples submitted for laboratory analysis and the residual half core retained in galvanised sheet iron core trays, while all BQ core samples are submitted for analysis as whole core.

The core is cut in the core cutting facility along orientation lines (when no orientation line is present, it is noted on the core) and the right-hand side of the core looking downhole is sampled and the left-hand side of the core is retained in the core tray for reference.

Samples are placed in heat resistant cotton bags which have dimensions of 35 cm x 25 cm. Sample tickets are uniquely numbered and placed in the bags with the samples. The weight of a diamond drill-core sample varies between 3 kg and 7 kg. The sample bags are arranged in order on mobile racks and dried in the oven at 105°C for 8–10 hours. After drying, the bags are loading onto a 4x4 pick-up truck and then delivered directly to the on-site sample preparation and analytical laboratory where they are routinely assayed for copper, gold, silver, sulphur, arsenic, lead, and zinc.

Upon completion of the core logging, a Sample Submission Form (SSF) containing a list of samples, standards and duplicates is prepared for each batch. This is documented in the Diamond Drilling Sample Journal on the server. Each SSF has a unique number, and two copies are prepared – one signed copy for the laboratory and one for the DPMC archive.

Majority of the core drilled since 2003 has been photographed. The photographs are named, catalogued, and saved on the geology server.

Diamond Drilling Sampling for Exploration (near mine and brownfield) Projects

The drill core is sampled in intervals up to a maximum of 1.5 m, with 1 m sample intervals being the most common length. Where there is a change of mineralisation type or structural contact within a mineralised zone, shorter intervals may be used, but not less 0.5 m (due to the requirement for a minimum quantity weight of the sample for analysis). Three sizes of core are drilled at the exploration projects; PQ, HQ and NQ. The core is cut by diamond saw, with half core samples submitted for laboratory analysis and the residual half core retained in galvanised sheet iron core trays.

The core is cut in the core cutting facility along orientation lines (when no orientation line is present, it is noted on the core) and the right-hand side of the core looking downhole is sampled and the left-hand side of the core is retained in the core tray for reference.

Samples are placed in heat resistant cotton bags which have dimensions of 35 cm x 25 cm. Sample tickets are uniquely numbered and placed in the bags with the samples. The weight of a diamond drill-core sample varies between 3 kg and 7 kg. The sample bags are arranged in plastic bags and tied with a uniquely numbered plastic link. About 10 samples are placed in a sack which is tied with a plastic link with a unique number (different numbering) and sent by truck to SGS Bor Laboratory.

Upon completion of the core logging, a unique SSF containing a list of samples, standards and field duplicates is prepared for each batch. This is documented in the sample journal on the server. After receiving the samples, the laboratory sends a reconciliation form back to DPMC.

Majority of the core drilled since 2003 has been photographed. The photographs are named, catalogued, and saved on the geology server.

Underground Face Sampling

Development face samples are taken as horizontal panel chips on a 20 cm grid over the bottom half of each development drive advance. Each round is an average of 3 m in length. The samples are usually chosen based on different mineralisation and geological characteristics.

The underground face sampling procedures and checks are considered appropriate with field duplicates, blanks and standards submitted for analysis as per the diamond core sampling protocols. The face samples have unique sample numbers and a unique SSF for each batch which are recorded in the Face Sample Journal on the server. All SSFs are saved in the DPMC archive.

Sample tickets are placed in the bags and have a numbering system which reconciles sample and assayed results in the database. The average weight of a face sample varies between 3 kg and 5 kg.

Bulk Density Sampling

Bulk density measurements have been routinely completed since the start of 2003 at the (ISO 9001:2015 and ISO/IEC 17025) Eurotest-Control facility in Sofia using an appropriate wax coating followed by the water immersion method. The collection of bulk density data has recently been incorporated into DPMC's standard procedures which are applied to all diamond drilling, drives and stopes.

Bulk density measurements are collected as fist sized grab samples from underground, or 10 cm billets every 3 m along the length of the drillhole, including both mineralisation and waste. Since the last MRE, bulk density samples are taken after a preliminary review of the proximity and density of neighbouring samples in the first few metres of a drill fan. This preliminary check ensures that oversampling of a particular area does not occur, since many holes are typically collared from one drill cubby due to the drilling patterns employed at the Chelopech mine.

For exploration drillholes, bulk density measurements are collected by means of 10 cm billets every 5 m.

All bulk density measurements are assigned coordinates and loaded into a bulk density table in the drillhole database.

In 2009, on-site density analysis was introduced and incorporated in the SGS managed on-site laboratory services. The determination of bulk density for rock or core samples is by paraffin wax and water immersion.

The underground bulk density grab samples are allocated unique numbers. Each batch of density samples has a unique SSF recorded in the Sample Diamond Drilling Journal for core samples and the Bulk Density Journal for face samples.

QAQC Sampling

The procedure for internal QAQC sample submission is as follows:

- CRMs, also referred to as standards, are inserted in a ratio of 1:20
- Blanks are inserted in a ratio of 1:50
- Duplicates – field and crushed are inserted in a ratio of 1:20
- A naming convention for standards is used for QAQC samples, so although the laboratory will know which samples are standard samples, they will not be able to identify which actual standard has been inserted
- The samples are dispatched to the laboratory with a unique SSF.

The procedure for internal control QAQC sample submission is as follows:

- Approximately 5–10% of face and drill core pulp duplicates are sent for internal control
- The internal control samples have the same rules as the original samples with respect to standards, blank standards and SSF.

The procedure for external (umpire) QAQC sample submission is as follows:

- All internal control pulp duplicates are submitted for umpire analysis
- Samples that have discrepancies between the geological description and chemical analysis are also submitted for umpire analysis
- CRMs, also referred to as standards, are inserted in a ratio of 1:20 for umpire analysis
- Blanks are inserted in a ratio of 1:50 for umpire analysis
- A naming convention for blanks and standards is used for QAQC samples whereby standards are inserted into the sample stream with sequential sample numbers so that the laboratory will not be able to distinguish the standard samples from the umpire samples
- The samples are sent, via courier, to the laboratory with a unique SSF.

QAQC Sample Submission for Exploration Projects

Since 24 May 2017, DPM has implemented new procedures for the exploration projects. The sample submission procedure is as follows:

- CRMs, also referred to as standards, are inserted in a ratio of 1:20 (every 20th sample with a sample ID that ends in 20, 40, 60, 80, or 100 in the Sampling Journal).
- Crushed blanks are inserted are inserted in a ratio of 1:20 (every 20th sample with a sample ID that ends in 10, 30, 50, 70, or 90 in the Sampling Journal). Pulp blanks are only used when additional quality control monitoring of the analytical stage is required.
- Duplicates – field and coarse crush are inserted in a ratio of 1:20 (every 20th sample with a sample ID that ends in 15, 35, 55, 75, 95 in the Sampling Journal).
- All routine samples and quality control samples are numbered consecutively, therefore each project uses a standard batch size of 45 samples for laboratory submissions. Every batch must contain 38 or 39 routine samples as well as six or seven quality control samples and in addition SGS Bor will add five internal quality control samples.
- The samples are dispatched to the laboratory with a unique SSF. Each batch has a separate SSF in a sample shipment using the first sample number in the batch as a name.

11.2 Analyses

11.2.1 Summary

Since 2004, SGS has operated an onsite laboratory at Chelopech under the name “Chemical Laboratory Dundee Precious Metals Chelopech managed by SGS” (herein referred to as “SGS Chelopech”). All samples from Chelopech mine are prepared (drying, crushing, pulverisation and splitting) is completed on site at SGS

Chelopech, while samples from exploration department are prepared and analysed at SGS Bor, Serbia. However, in the past, sample analysis has been undertaken at a variety of independent laboratories. The sequence of laboratories used is listed in Table 11-1 below.

Table 11-1: Sample analyses and laboratories engaged (1956–2021)

Period	Laboratory	Type of samples	No. of samples	No. of assays
Jun 1956 to 2/1/1992	State owned (including Polimet)	Drillholes	49,008	213,256
		Underground face samples	7,220	27,494
Jan 1993 to 8/31/2003	Bondar Clegg, Canada	Drillholes	4,419	24,017
		Underground face samples	0	0
	OMAC, Ireland	Drillholes	1,319	6,595
		Underground face samples	0	0
	Navan	Drillholes	12,906	72,480
		Underground face samples	8,494	41,017
Sep 2003 to 1/1/2004	Ultra Trace, Perth, Australia	Drillholes	287	1,435
	SGS, Chelopech, Bulgaria	Drillholes	1,244	6,220
		Underground face samples	438	2,190
Jan 2004 to 9/30/2021	Ultra Trace, Perth, Australia	Drillholes	16,863	84,303
	ALS, Perth, Australia	Underground face samples	8	56
	SGS, Chelopech, Bulgaria	Drillholes	445,929	3,073,173
		Underground face samples	23,888	119,310
	SGS, Bor, Serbia	Drillholes	69,875	485,527
Total			**641,898**	4,157,073

At the time of assaying the laboratories had the following accreditation.

- UltraTrace, Perth, Australia (Now Bureau Veritas) ISO 17025.
- ALS Perth, Australia; ISO9001:2000 and ISO17025.
- The accreditation of SGS Chelopech and SGS Bor is discussed in section 11.2.4.

11.2.2 SGS: Sample Preparation and QAQC Procedures

SGS Chelopech and SGS Bor operate their own sample preparation facility. The sample preparation rooms are clean and well maintained, and compressed air is used to clean the crushing and pulverising equipment. Face and diamond core samples in SGS Chelopech are prepared separately, in two preparation rooms in order to prevent contamination. The sample preparation procedures are presented in Figure 11-1 and Figure 11-2.

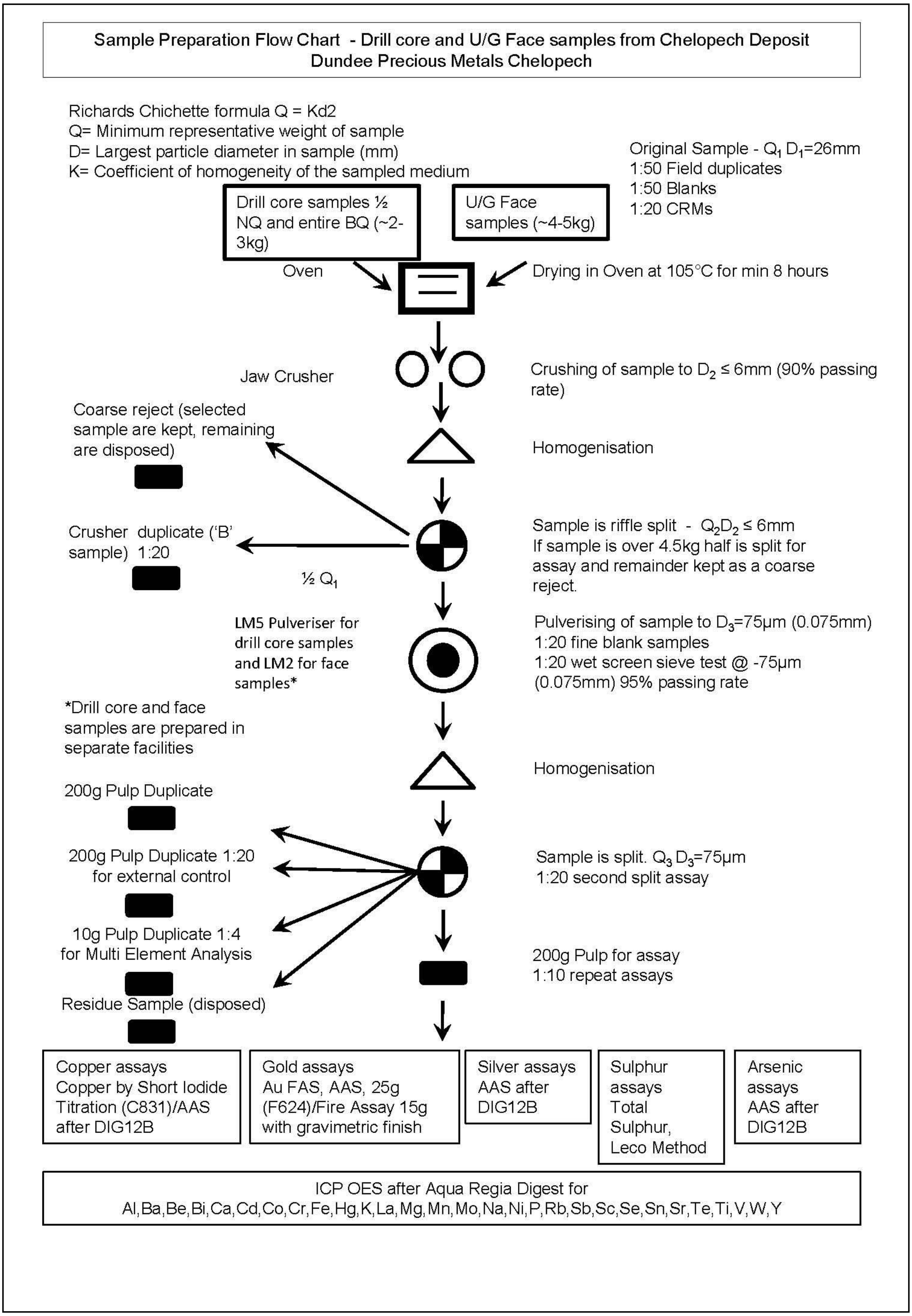


Figure 11-1: Sample preparation flowchart for drill core and underground face samples (DPMC, 2020)

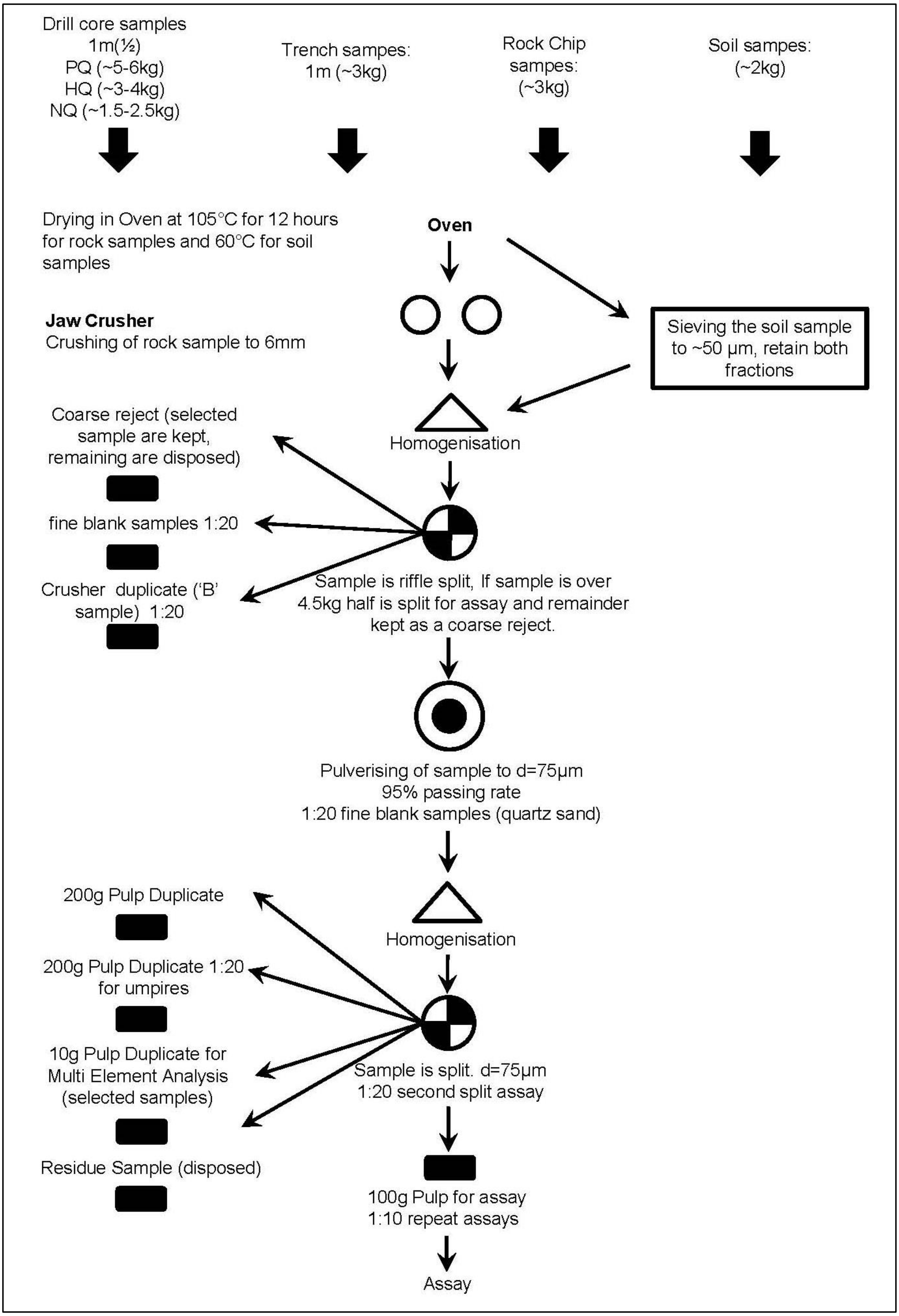


Figure 15: Sample preparation flowchart for exploration drill core samples in SGS Bor

11.2.3 SGS: Sample Analyses

SGS Chelopech assay methods are tabulated in Table 11-2, and are summarised as follows:

- Gold <20 ppm: 25 g fire assay with atomic absorption spectrometry (AAS) finish
- Gold >=20 ppm: 15 g fire assay with gravimetric finish
- Silver, arsenic, lead, zinc: Charge of 0.1 g in 15 ml solution – AAS with aqua-regia digest
- Copper <3%: Charge 0.1 g in 15 ml solution – AAS with aqua-regia digest
- Copper >= 3%: Acid digestion with a titration finish.

Table 11-2: SGS Chelopech Laboratory assay methods

Element	Method	Detection limit	Upper limit	Procedure	Description
Copper	CON13V	0.01%	60.00%	Copper by Short Iodide Titration (C831)	Short Iodide titration (C831)
	AAS12B	2 ppm	100,000 ppm	AAS after DIG12B	AAS after two-acid digests (with the designation "12" is based on a combination of 3:1 HCl:HNO_3)
Gold	FAA25	0.01 ppm	1,000 ppm	Au FAS, AAS, 25 g (F624)	25 g, fire assay, AAS finish
	FA15G	3 ppm	1,000 ppm	Fire assay 15 g with gravimetric finish	15 g, fire assay, gravimetric finish
Silver	AAS12B	1 ppm	100 ppm	AAS after DIG12B	AAS after two-acid digests (with the designation "12" is based on a combination of 3:1 HCl:HNO3)
	AAS43B	50 ppm	40,000 ppm	AAS after DIG12B	AAS after four-acid digestion, with higher elemental concentrations/High Grade
Sulphur	CSA06V	0.05%	55.00%	Total sulphur, LECO method	Total sulphur, LECO method (V829), Furnace/IR (Infrared) combustion
Arsenic	AAS12B	0.01%	10.00%	AAS after DIG12B	AAS after two-acid digests (with the designation "12" is based on a combination of 3:1 HCl:HNO_3)
Lead	AAS12B	5 ppm	25,000 ppm	AAS after DIG12B	AAS after two-acid digests (with the designation "12" is based on a combination of 3:1 HCl:HNO_3)
Zinc	AAS12B	2 ppm	25,000 ppm	AAS after DIG12B	AAS after two-acid digests (with the designation "12" is based on a combination of 3:1 HCl:HNO_3)

SGS Bor assay methods are tabulated in the table below.

Table 11-3: SGS Bor Laboratory assay methods

Element	Method	Detection limit	Upper limit	Procedure	Description
Copper	CON13V	0.01%	60.00%	Copper by Short Iodide Titration (C831)	Short Iodide titration (C831)
	ICM40B	0.5	10,000 ppm	ICP-MS	49 elements by four-acid digestion/ICP-MS
	IMS40B	0.5	10,000 ppm	ICP-OES and ICP-MS	36 elements by two-acid digestion/ICP-OES and ICP-MS
Gold	FAA505	0.01 ppm	1,000 ppm	Au FAS, AAS, 50 g	Fire assay, AAS
Silver	AAS12B	1 ppm	100 ppm	AAS after DIG12B	AAS after two-acid digests (with the designation "12" is based on a combination of 3:1 HCl:HNO_3)
	ICM40B	0.02 ppm	10 ppm	ICP-MS	49 elements by four-acid digestion/ICP-MS
	IMS40B	0.05 ppm	10 ppm	ICP-OES and ICP-MS	36 elements by two-acid digestion/ICP-OES and ICP-MS

Element	Method	Detection limit	Upper limit	Procedure	Description
Sulphur	ICM40B	0.01%	5.00%	ICP-MS	49 elements by four-acid digestion/ICP-MS
	IMS40B	0.5%	5.00%	ICP-OES and ICP-MS	36 elements by two-acid digestion/ICP-OES and ICP-MS
Arsenic	ICM40B	1 ppm	10,000 ppm	ICP-MS	49 elements by four-acid digestion/ICP-MS
	IMS40B	1 ppm	10,000 ppm	ICP-OES and ICP-MS	36 elements by two-acid digestion/ICP-OES and ICP-MS
Lead	ICM40B	0.5 ppm	10,000 ppm	ICP-MS	49 elements by four-acid digestion/ICP-MS
	IMS40B	2 ppm	10,000 ppm	ICP-OES and ICP-MS	36 elements by two-acid digestion/ICP-OES and ICP-MS
Zinc	ICM40B	1 ppm	10,000 ppm	ICP-MS	49 elements by four-acid digestion/ICP-MS
	IMS40B	0.5 ppm	10,000 ppm	ICP-OES and ICP-MS	36 elements by two-acid digestion/ICP-OES and ICP-MS

Note: ICP-MS = inductively coupled plasma-mass spectrometry; ICP-OES = inductively coupled plasma-optical emission spectrometry.

11.2.4 SGS: Laboratory Accreditation

On the basis of long-term contracts, both of the lab facilities at DPMC and DPM Exploration in Bor, Serbia (AVALA doo) are under the full management of SGS Bulgaria Ltd and are independent of DPMC and DPM, with an SGS qualified laboratory manager on site at all times.

Management system control (MSC) accreditation procedures have been implemented in the Chelopech lab since 2004 and in the Bor lab since 2008.

Both laboratories operate to SGS Global and international standards under SGS's international accreditation. All methods and procedures are implemented together with international quality control protocols.

The lab facility in Chelopech has been ISO 9001:2008 certified since April 2013, updated to ISO 9001:2015 in April 2019 and re-certified until 4 April 2022.

11.2.5 SGS: Round Robin Analyses

Participation in the monthly SGS global and international round-robin program is usual practice for both the laboratory facilities managed by SGS. These regular surveys are used as a tool for the maintenance of high standards in mining and analytical industries and involve over 100 laboratories from all parts of the world.

The DPMC laboratory facility has participated in the Geostats' round robin analysis programs since 2008, always placing in the top 30 for gold, copper, silver, arsenic, sulphur, lead, and zinc, and several times has held first place for sulphur, copper, and gold accuracy.

11.3 QAQC

11.3.1 Pre-DPMC QAQC: Pre-2003

Drill Core and Face Sample Assaying

The QAQC undertaken prior to DPM's involvement consisted of analysis of field duplicates and laboratory pulp duplicates. In summary, review of the available historical data showed:

- Poor precision for field duplicates, but due to the small number of pairs, a meaningful conclusion was not possible
- Laboratory pulp duplicates exhibited an acceptable level of precision; although gold and silver pairs performed more poorly than copper, sulphur, and arsenic pairs
- Neither field nor laboratory duplicates exhibited significant bias.

11.3.2 DPMC QAQC: 2003 to 30 September 2020

During the period from 2003 to 2020, DPMC followed a detailed QAQC program which included field duplicates, prep-lab pulps, coarse duplicates, and CRMs. The quantity of QAQC material analysed has increased with each reporting period and where issues were noted, these were generally resolved timeously. Overall, gold, copper, and sulphur blanks and CRM performed well, whilst silver and arsenic had some bias issues which were mostly related to the analytical method detection limits and sensitivity.

In addition, laboratory duplicates, pulp repeats and laboratory standards were analysed and reviewed, and no significant precision issues were noted.

11.3.3 Face Sample QAQC: 2003 to 30 September 2020

From 2003 to 2010, QAQC results showed:

- Acceptable accuracy and precision for copper, gold, silver, and sulphur
- Arsenic pairs indicated poor inter-laboratory precision which could possibly be attributed to their different assaying techniques.

During the period from 2010 to 2020, face sample QAQC undertaken consisted of analysis of field duplicates, crush duplicates, pulp duplicates and laboratory pulp splits. The pulp duplicates were taken every three months, amounting to 5–10% of face samples. In summary, results showed:

- Assay results from the field duplicates suggested poor precision, but due to the small number of pairs, a meaningful conclusion was not possible.
- Assay results for the laboratory pulp splits exhibited an acceptable level of precision; although silver pairs performed more poorly than copper, gold, sulphur, and arsenic pairs. Duplicates exhibited no significant bias.

Umpire (External Check) Analyses

All laboratories selected for Umpire analysis are in independent from DPMC. Prior to 2003, the primary laboratories for the face and drillhole samples were Chelopech Site Laboratory and OMAC (Loughrea, Co. Galway, Ireland), now called ALS Loughrea. Eurotest-Control, Sofia, Bulgaria (ISO 9001:2015 and ISO/IEC 17025) was used as the umpire laboratory. A small number of internal CRMs, which exhibited a high level of accuracy, were available for the Chelopech Site Laboratory data.

Reasonable precision levels were shown by the umpire assaying, although the Chelopech Site Laboratory assay values were marginally higher than the Eurotest-Control, Sofia, Bulgaria assay results. No quality control data was available for the Eurotest-Control, Sofia, Bulgaria assaying; therefore, the relative differences in the assay mean grades could not be quantified.

ALS in Vancouver, Canada (ISO9001:2000 and ISO17025) and SGS Welshpool, Perth, Australia (ISO9001:2000 and ISO/IEC 17025) were used as the umpire laboratories between 2003 and 2012 and the primary laboratory was SGS Chelopech. No significant between laboratory bias was observed, and the data were considered precise and accurate.

From 2012, on a three-monthly basis, approximately 5–10% of all face and drillhole samples were sent to ALS, Rosia Montana, Romania (ISO 9001:2008 and ISO/IEC 17025:2005) for umpire analysis. Reasonable repeatability was observed for gold and copper results and these data are considered precise. Instances of bias between SGS Chelopech and ALS Rosia Montana were noted in both the external check copper and gold assay results. The gold bias of 6% in the 2015 MRE update was investigated, and this reduced to 2–3% in 2016. A mean grade copper bias of 4% in 2017, 3–4% in 2018 and 2-3% in 2019 was noted and investigated. However, the SGS Chelopech results under-report relative to the external laboratory results and therefore would not appear to be overstating these grades. The issues noted above with between laboratory bias were resolved in 2019 and ongoing vigilance is required.

11.3.4 DPMC QAQC: 1 October 2020 to 30 September 2021

Introduction

A QAQC program has been implemented by DPMC to provide confidence that sample assay results are reliable, accurate and precise.

DPMC Blanks (Cross Contamination)

A coarse or preparation blank undergoes sample preparation with the primary samples and is used to check for cross contamination in the preparation process. Pulp blanks are used to monitor contamination in the analytical process. Blanks (non-certified) used by DPMC were BLANK_BEACH (quartz sand) for controlling the pulverisation stage, BLANK_BOR (quartzites) and BLANK_MIAL (dolomitic limestone) – the sample crushing stage. All reagents used in the digestion procedure are checked against a blank solution (without sample) made of these reagents. These blank solutions are registered in the Chelopech and Bor Laboratory databases as BLANK. Once results are received, they are transferred to the acQuire database as BLANK_SGS_CHE and BLANK_SGS_BO respectively. Failure limits of 10 times the lower detection limit (LDL) for the analytical method were used. No laboratory blank failures were noted for gold, silver, arsenic, and sulphur.

Blanks used by DPMC were BLANK_BEACH, BLANK_BOR and BLANK_MIAL, and BLANK_SGS_CHE was used as a laboratory blank:

- One significant failure in BLANK_BEACH (Sample A93758 at 23 ppm Cu) which should be investigated
- Low-grade copper and silver failures noted but not deemed material as these were in uncertified blanks and the at a relatively low level compared to economic concentrations.

Table 11-4: Au Blank data

Laboratory	Standard code	Method	No. of samples	Mean Au	Expected value	No. of failures (>10 x LDL)
SGS_CH	BLANK_BEACH	Ag_MS61_ppm	176	0.005	0.01	0
SGS_BO	BLANK_BOR	Ag_MS61_ppm	136	0.005	0.01	0
SGS_CH	BLANK_MIAL	Ag_MS61_ppm	91	0.005	0.01	0
SGS_CH	BLANK_SGS_CHE	Ag_MS61_ppm	375	0.005	0.01	0
SGS_BO	BLANK_SGS_CHE	Ag_MS61_ppm	222	0.005	0.01	0

Table 11-5: Cu Blank data

Laboratory	Standard code	Method	No. of samples	Mean Cu	Expected value	No. of failures (>10 x LDL)
SGS_CH	BLANK_BEACH	AR_AAS	177	1	2	1
SGS_BO	BLANK_BOR	4A_ICPES	107	2.4	0.5	3
SGS_CH	BLANK_MIAL	AR_AAS	91	1	20	0
SGS_BO	BLANK_SGS_CHE	4A_AAS	20	50	100	0
SGS_BO	BLANK_SGS_CHE	4A_ICPES	181	0.25	2	0
SGS_BO	BLANK_SGS_CHE	AR_ICPES	1	0.25	0.2	0
SGS_CH	BLANK_SGS_CHE	AR_AAS	379	1	1	0
SGS_CH	BLANK_SGS_CHE	AR_ICPES	1	0.25	0.2	0

Table 11-6: Ag Blank data

Laboratory	Standard code	Method	No. of samples	Mean Ag	Expected value	No. of failures (>10 x LDL)
SGS_CH	BLANK_BEACH	AR_AAS	177	0.5	1	0
SGS_CH	BLANK_BEACH	AR_ICPES	1	0.5	1	0
SGS_BO	BLANK_BOR	4A_ICPES	107	0.025	1	0
SGS_CH	BLANK_MIAL	AR_AAS	91	0.5	1	0
SGS_CH	BLANK_SGS_CHE	4A_AAS	84	2.5	1	0

Laboratory	Standard code	Method	No. of samples	Mean Ag	Expected value	No. of failures (>10 x LDL)
SGS_CH	BLANK_SGS_CHE	AR_AAS	379	0.5	1	0
SGS_CH	BLANK_SGS_CHE	AR_ICPES	1	0.5	1	0
SGS_BO	BLANK_SGS_CHE	4A_AAS	56	2.5	1	0
SGS_BO	BLANK_SGS_CHE	4A_ICPES	181	0.025	1	0

Table 11-7: As Blank data

Laboratory	Standard code	Method	No. of samples	Mean As	Expected value	No. of failures (>10 x LDL)
SGS_CH	BLANK_BEACH	AR_AAS	177	0.005	0.01	0
SGS_CH	BLANK_BEACH	AR_ICPES	1	0.0008	0.01	0
SGS_BO	BLANK_BOR	4A_ICPES	107	0.0001	0.01	0
SGS_CH	BLANK_MIAL	AR_AAS	91	0.0051	0.01	0
SGS_CH	BLANK_SGS_CHE	AR_AAS	379	0.005	0.01	0
SGS_CH	BLANK_SGS_CHE	AR_ICPES	1	0.0002	0.01	0
SGS_BO	BLANK_SGS_CHE	4A_ICPES	181	0.0001	0.01	0

Table 11-8: S Blank data

Laboratory	Standard code	Method	No. of samples	Mean S	Expected value	No. of failures (>10 x LDL)
SGS_CH	BLANK_BEACH	AR_ICPES	1	0.01	0.01	0
SGS_CH	BLANK_BEACH	LECO	177	0.025	0.05	0
SGS_BO	BLANK_BOR	LECO	136	0.025	0.05	0
SGS_CH	BLANK_MIAL	LECO	91	0.025	0.05	0
SGS_CH	BLANK_SGS_CHE	AR_ICPES	1	0.005	0.01	0
SGS_CH	BLANK_SGS_CHE	LECO	379	0.025	0.05	0
SGS_BO	BLANK_SGS_CHE	LECO	222	0.025	0.05	0

Blank results show no indication of significant contamination except for one sulphur blank. Where failures were noted, these tend to be in non-certified blanks or at low grades relative to economic levels of mineralisation and laboratory LDLs.

DPMC Certified Reference Materials (Assay Accuracy)

CRMs are pulp samples with certified expected value and standard deviation (SD) and are used to monitor assay accuracy (bias). The SD is a measure of the amount of variation or dispersion of a set of values with a low SD indicating that the values tend to be close to the expected value, and a high SD indicating that the values are spread out over a wider range.

DPMC's procedure for dealing with QAQC failures is to re-assay the failed blank and five samples either side of it or re-assay the failed CRM and 10 samples either side of it.

CRM and standard results for gold, copper, silver, arsenic and sulphur were reviewed in Microsoft Excel and QAQCR and tabled below. Note that external check samples analysed at ALS Rosia Montana only had gold and copper results.

Table 11-9: Laboratory Au CRM data (absolute bias >5% and failures highlighted in red)

Laboratory	Standard code	Method	No. of samples	Mean Au	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	DPMU	Au_AA25_ppm	18	0.9289	0.87	0	6.77%
SGS_CH	DPMW	Au_AA25_ppm	4	2.5825	2.69	0	-4.00%
ALS_RO	DPMW	Au_AA25_ppm	2	2.64	2.69	0	-1.86%
SGS_CH	DPMX	Au_AA25_ppm	7	3.6771	3.36	0	9.44%
SGS_BO	DPMX	Au_AA25_ppm	1	3.22	3.36	0	-4.17%

Laboratory	Standard code	Method	No. of samples	Mean Au	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	DPMZ	Au_AA25_ppm	1	5.4	5.48	0	-1.46%
SGS_BO	G314-4	Au_FAA505_ppm	80	0.14	0.14	0	0%
SGS_CH	G314-7	Au_AA25_ppm	363	2.43	2.45	0	0%
SGS_CH	G916-6	Au_AA25_ppm	10	30.93	30.94	0	-0.04%
SGS_BO	GBMS304-1	Au_FAA505_ppm	15	3.02	3.06	0	-1.44%
SGS_BO	GBMS304-4	Au_FAA505_ppm	6	5.70	5.67	0	0.47%
SGS_BO	GBMS304-6	Au_FAA505_ppm	5	4.56	4.58	0	-0.48%
SGS_BO	GBMS911-1	Au_FAA505_ppm	17	1.05	1.04	0	0.51%
SGS_BO	GBMS911-2	Au_FAA505_ppm	15	2.88	2.88	0	0.00%
SGS_BO	GBMS911-3	Au_FAA505_ppm	19	1.33	1.33	0	0.32%
SGS_BO	GBMS911-4	Au_FAA505_ppm	3	6.76	6.78	0	-0.25%
SGS_BO	OREAS 503d	Au_FAA505_ppm	15	0.68	0.67	0	1.33%
SGS_BO	OREAS 504c	Au_FAA505_ppm	5	1.37	1.48	0	-0.20%
SGS_BO	OREAS 505	Au_FAA505_ppm	18	0.56	0.56	0	0.10%
SGS_CH	OREAS 601b	Au_AA25_ppm	73	0.77	0.78	0	-0.36%
SGS_CH	OREAS 602	Au_AA25_ppm	117	1.91	1.95	0	-2.07%
SGS_CH	OREAS 603b	Au_AA25_ppm	93	5.03	5.21	0	-3.47%
SGS_CH	OREAS 604	Au_AA25_ppm	43	1.43	1.43	0	0.07%
SGS_BO	OREAS 620	Au_FAA505_ppm	14	0.69	0.69	0	0.83%
SGS_BO	ST05_2	Au_FAA505_ppm	129	2.44	2.45	0	0%
SGS_CH	ST17	Au_AA25_ppm	231	0.73	0.76	0	-4.53%
SGS_BO	ST413	Au_FAA505_ppm	94	0.79	0.79	0	-0.09%

Bias noted in individual standards, but overall bias not systematic (i.e. positive and negative bias).

Table 11-10: Laboratory Cu CRM data (Absolute bias > 5% and failures highlighted in red)

Laboratory	Standard code	Method	No. of samples	Mean Cu	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	DPMU	AR_AAS	18	3951.94	4050	0	-2.42%
SGS_CH	DPMW	AR_AAS	4	6619.25	6347	0	4.29%
ALS_RO	DPMW	AR_AAS	2	6150	6347	0	0.00%
SGS_CH	DPMX	AR_AAS	7	7376.43	6982	0	5.65%
ALS_RO	DPMX	AR_AAS	1	6900	6982	0	0.00%
SGS_CH	DPMZ	AR_AAS	1	6927	6442	0	7.53%
SGS_CH	GBM301-8	TITRIM	3	102866.67	104030	0	-1.12%
SGS_BO	GBM311-11	4A_AAS	20	14570	14504	0	0.46%
SGS_CH	GBM399-6	AR_AAS	16	21184.69	21373	0	-0.88%
SGS_CH	GBM901-6	TITRIM	3	210300	214816	0	-2.10%
SGS_CH	GBM913-8	AR_AAS	363	4317.50	4379	0	-1.40%
SGS_BO	GBMS304-1	4A_ICPES	14	3243.93	3156	0	2.79%
SGS_CH	GBMS304-4	AR_AAS	379	9706.03	9786	0	-0.82%
SGS_BO	GBMS304-4	4A_ICPES	3	9736	9786	0	-0.51%
SGS_BO	GBMS304-6	4A_ICPES	2	4243.5	4241	0	0.06%
SGS_BO	GBMS911-1	4A_AAS	12	10200	10028	0	1.72%
SGS_BO	GBMS911-1	4A_ICPES	3	10000	10028	0	-0.28%
SGS_BO	GBMS911-2	4A_ICPES	12	1421.58	1417	0	0.32%
SGS_BO	GBMS911-3	4A_ICPES	16	7735.44	7652	0	1.09%
SGS_BO	GBMS911-4	4A_ICPES	2	904.55	900	0	0.51%
SGS_BO	OREAS 45F	4A_ICPES	64	366.22	320	0	1.05%
SGS_BO	OREAS 503d	4A_ICPES	13	5240.08	5238.82	0	0.02%
SGS_BO	OREAS 505	4A_ICPES	12	3273.67	3210	0	1.98%

Laboratory	Standard code	Method	No. of samples	Mean Cu	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	OREAS 601b	AR_AAS	73	1016.66	1010	0	0.66%
SGS_CH	OREAS 602	AR_AAS	117	5326.30	5170	0	3.02%
SGS_CH	OREAS 603b	AR_AAS	93	9818.60	9850	0	-0.32%
SGS_CH	OREAS 604	AR_AAS	43	21431.60	21600	0	-0.78%
SGS_BO	OREAS 620	4A_ICPES	10	1740.8	1730	0	0.62%
SGS_BO	OREAS 902	4A_ICPES	112	3039.96	3010	10	1.00%
SGS_BO	OREAS 903	4A_ICPES	119	6494.77	6520	1	-0.39%

Bias noted in individual standards, but overall bias not systematic (i.e. positive and negative bias).

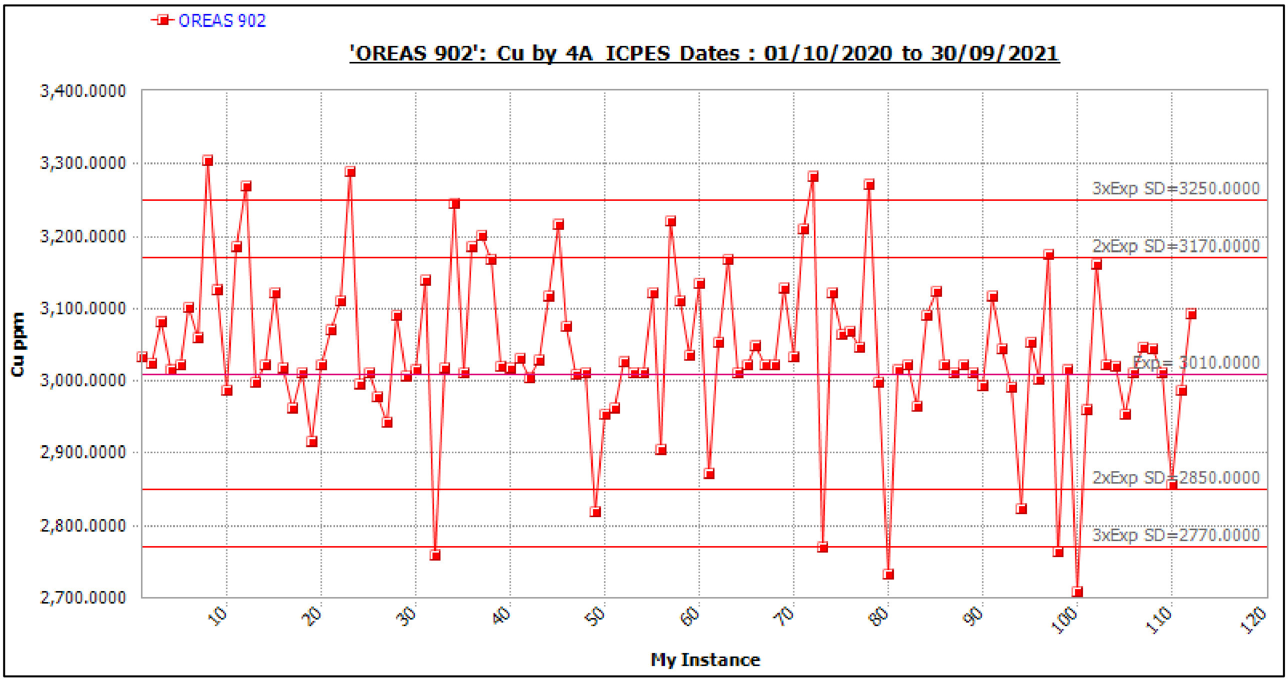


Figure 11-2: Shewhart plot showing failures for Cu CRM OREAS 902, SGS_BO

Table 11-11: Laboratory Ag CRM data (Absolute bias > 5% and failures highlighted in red)

Lab	Standard code	Method	No. of samples	Mean Ag	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	CPB-2	4A_AAS	2	358	357.3	0	0.20%
SGS_BO	CPB-2	4A_AAS	2	358	357.3	0	0.20%
SGS_CH	DPMU	AR_AAS	18	10.2667	10.04	0	2.26%
SGS_CH	DPMW	AR_AAS	4	4.575	4.6	0	-0.54%
SGS_CH	DPMX	AR_AAS	7	5.9429	5.97	0	-0.45%
SGS_CH	DPMZ	AR_AAS	1	3.7	4.02	0	-7.96%
SGS_BO	GBM311-11	4A_AAS	56	19.3214	19.6	0	-1.42%
SGS_CH	GBM399-6	AR_AAS	16	14.9812	15.5	0	-3.35%
SGS_CH	GBM913-8	AR_AAS	363	6.4581	6.7	0	-3.61%
SGS_CH	GBM915-13	4A_AAS	95	180.2842	182.9	0	-1.43%
SGS_BO	GBMS304-1	4A_ICPES	14	1.5393	1.4	0	9.95%
SGS_CH	GBMS304-4	AR_AAS	379	3.924	3.4	0	15.41%
SGS_BO	GBMS304-4	4A_ICPES	3	3.5933	3.4	0	5.69%
SGS_BO	GBMS304-6	4A_ICPES	2	6.24	6.1	0	2.30%
SGS_BO	GBMS911-1	4A_AAS	15	12.6667	11.9	0	6.44%
SGS_BO	GBMS911-1	4A_ICPES	15	10	11.9	0	-15.97%
SGS_BO	GBMS911-2	4A_AAS	11	12.8182	12.4	0	3.37%

Lab	Standard code	Method	No. of samples	Mean Ag	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_BO	GBMS911-2	4A_ICPES	12	10	12.4	0	-19.35%
SGS_BO	GBMS911-3	4A_ICPES	16	1.7662	1.7	0	3.90%
SGS_BO	GBMS911-4	4A_AAS	2	17	17.9	0	-5.03%
SGS_BO	OREAS 503d	4A_ICPES	13	1.3677	1.3398	0	2.08%
SGS_BO	OREAS 505	4A_ICPES	12	1.5483	1.53	0	1.20%
SGS_CH	OREAS 601b	AR_AAS	73	47.8356	50.1	0	-4.52%
SGS_CH	OREAS 602	4A_AAS	117	115.3453	118	0	-2.25%
SGS_CH	OREAS 603b	4A_AAS	93	292.9484	301	0	-2.67%
SGS_CH	OREAS 604	4A_AAS	43	477.8233	492	0	-2.88%
SGS_BO	OREAS 620	4A_AAS	10	39.3	38.5	0	2.08%
SGS_BO	OREAS 620	4A_ICPES	37	10	38.5	0	-74.03%
SGS_BO	OREAS 902	4A_ICPES	112	0.3515	0.284	15	23.77%
SGS_BO	OREAS 903	4A_ICPES	119	0.4409	0.349	15	26.34%

Failures and bias noted are noted but mostly at low grades and therefore not material. Certified values for Ag for CRMs GBMS911-1, GBMS911-2, and OREAS 62 are higher than UDL of method IMS40B for silver.

Failures in OREAS 903 (Figure 11-5), SGS_BOR 15 outlier values from 119 sample points should be investigated. Failures are from a number of different batches. OREAS 903 is laboratory check CRM.

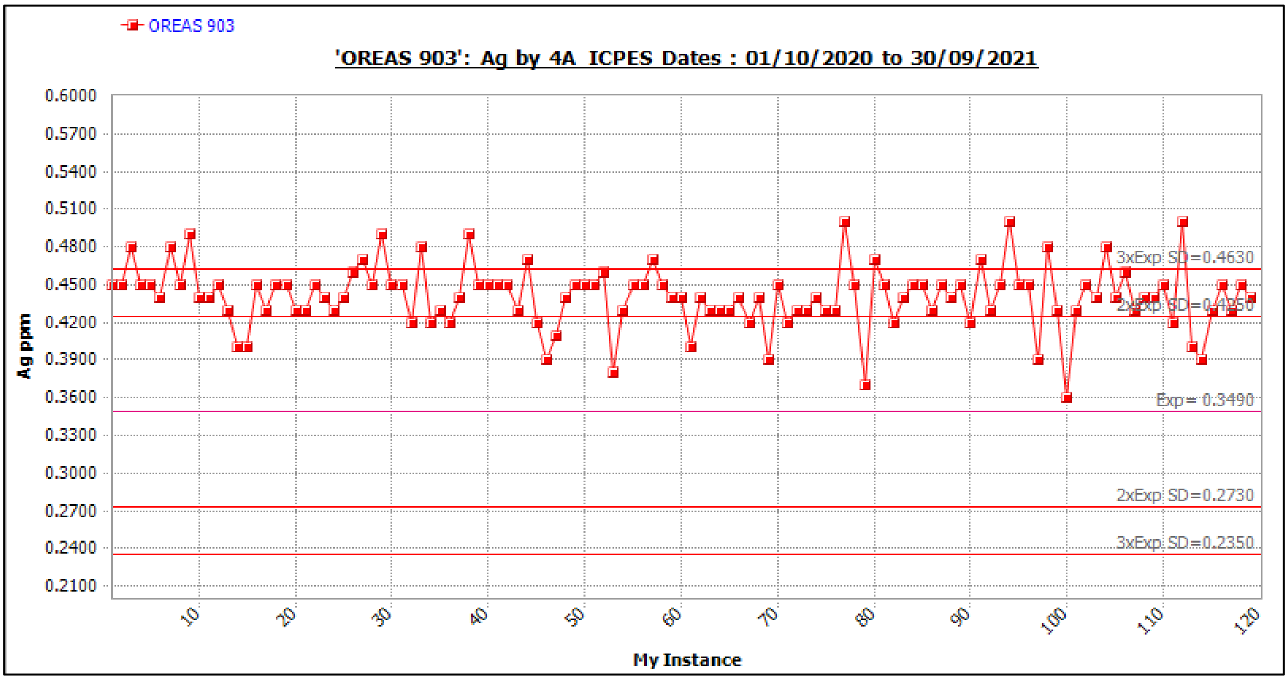


Figure 11-3: Ag CRM OREAS 903 – precise results with 15 failures; the CRM also display a consistent positive bias

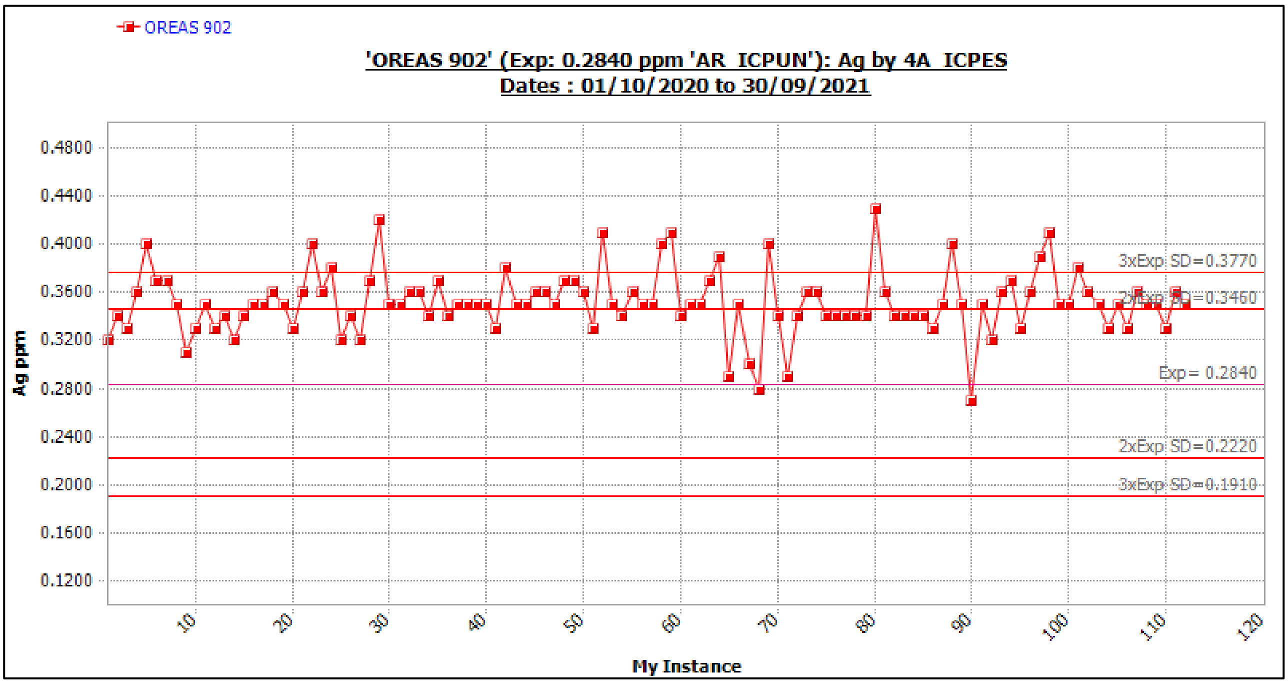


Figure 11-4: Ag CRM OREAS 902 – precise results with 15 failures; the CRM also displays a consistent positive bias

Table 11-12: Laboratory As CRM data (absolute bias >5% and failures highlighted in red)

Laboratory	Standard code	Method	No. of samples	Mean As	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	DPMU	AR_AAS	18	0.11	0.11	0	3.19%
SGS_CH	DPMW	AR_AAS	4	0.15	0.14	0	4.69%
SGS_CH	DPMX	AR_AAS	7	0.19	0.19	0	0.98%
SGS_CH	DPMZ	AR_AAS	1	0.15	0.14	0	4.09%
SGS_CH	GBM913-8	AR_AAS	363	0.14	0.14	0	1.32%
SGS_BO	GBMS304-1	4A_ICPES	14	0.02	0.02	0	-2.76%
SGS_BO	GBMS304-4	4A_ICPES	3	0.05	0.05	0	2.31%
SGS_BO	GBMS304-6	4A_ICPES	2	0.26	0.27	0	-2.89%
SGS_BO	GBMS911-1	4A_ICPES	15	0.03	0.03	0	-1.55%
SGS_BO	GBMS911-2	4A_ICPES	12	0.01	0.01	0	1.48%
SGS_BO	GBMS911-3	4A_ICPES	16	0.00	0.00	0	4.33%
SGS_BO	GBMS911-4	4A_ICPES	2	0.00	0.00	0	-4.17%
SGS_BO	OREAS 503d	4A_ICPES	13	0.01	0.01	0	0.79%
SGS_CH	OREAS 601b	AR_AAS	73	0.03	0.03	0	8.70%
SGS_CH	OREAS 602	AR_AAS	117	0.07	0.06	0	5.28%
SGS_CH	OREAS 604	AR_AAS	43	0.10	0.10	0	3.52%
SGS_BO	OREAS 620	4A_ICPES	10	0.01	0.01	0	-0.60%
SGS_BO	OREAS 902	4A_ICPES	112	0.06	0.06	0	0.38%
SGS_BO	OREAS 903	4A_ICPES	119	0.01	0.00	15	5.95%

Bias and failures noted in individual standards, but overall bias not systematic (i.e. positive and negative bias).

Failures in OREAS 903 (Figure 11-5), SGS_BO 15 outlier values from 119 sample points should be investigated. Failures are from a number of different batches. OREAS 903 is a laboratory check CRM.

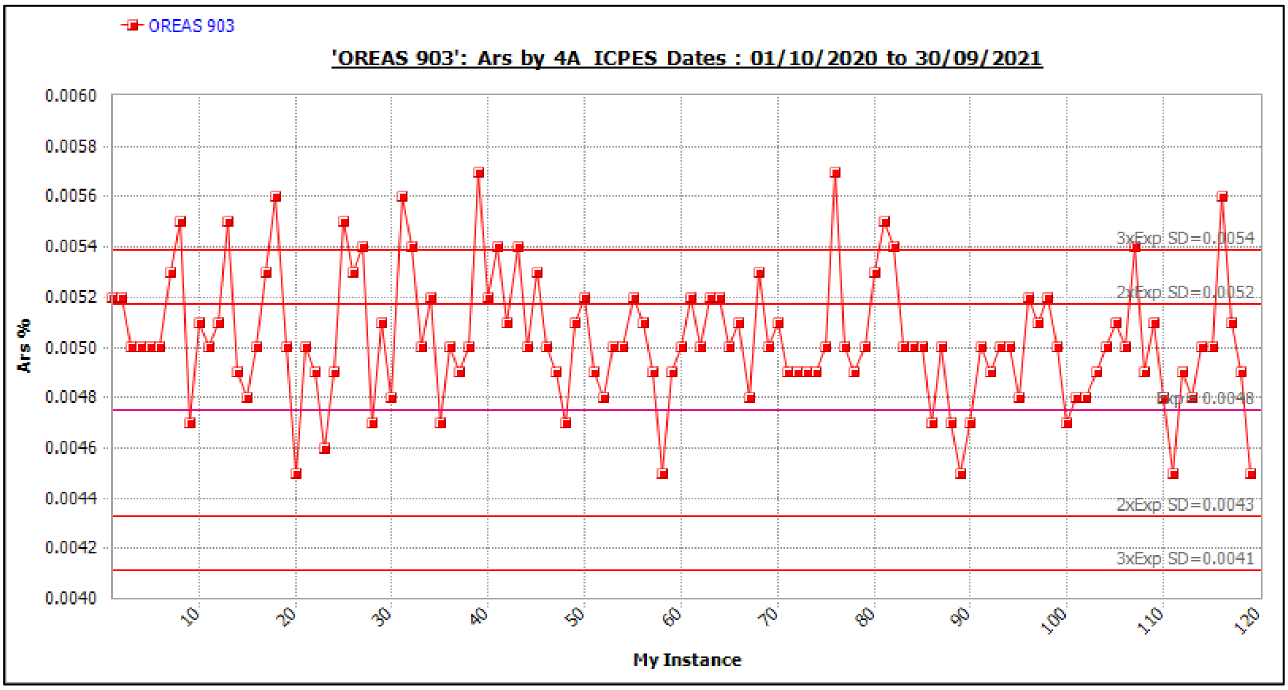


Figure 11-5: As CRM OREAS 903 – precise results with 15 failures

Table 11-13: Laboratory S CRM data (absolute bias >5% and failures highlighted in red)

Laboratory	Standard code	Method	No. of samples	Mean S	Expected value	No. of failures (>3 x SD)	Mean bias
SGS_CH	DPMU	LECO	18	8.2139	8.02	0	2.42%
SGS_CH	DPMW	LECO	4	13.2825	12.74	0	4.26%
SGS_CH	DPMX	LECO	7	11.2329	10.72	0	4.78%
SGS_CH	DPMZ	LECO	1	23.47	22.7	0	3.39%
SGS_BO	GBM311-11	LECO	216	3.2717	3.28	0	-0.25%
SGS_BO	GBMS304-1	LECO	15	1.314	1.33	0	-1.20%
SGS_BO	GBMS304-4	LECO	6	6.2567	6.27	0	-0.21%
SGS_BO	GBMS304-6	LECO	5	2.018	2.01	0	0.40%
SGS_BO	GBMS911-1	LECO	17	1.3924	1.4	0	-0.55%
SGS_BO	GBMS911-2	LECO	15	1.2993	1.3	0	-0.05%
SGS_BO	GBMS911-3	LECO	19	1.0016	0.99	0	1.17%
SGS_BO	GBMS911-4	LECO	3	0.7867	0.79	0	-0.42%
SGS_CH	GS300-2	LECO	64	5.228	5.16	0	1.32%
SGS_BO	GS300-2	LECO	64	5.228	5.16	0	1.32%
SGS_BO	GS301-6	LECO	222	0.3976	0.4	0	0%
SGS_CH	GS910-1	LECO	378	12.8679	12.96	0	-0.71%
SGS_BO	GS912-7	LECO	6	3.4967	3.52	0	0
SGS_CH	GS913-2	LECO	312	5.5166	5.49	0	0.48%
SGS_BO	OREAS 503d	LECO	15	0.7973	0.8	0	0%
SGS_BO	OREAS 504c	LECO	5	1.054	1.11	0	0%
SGS_BO	OREAS 505	LECO	18	0.4361	0.446	0	-2.22%
SGS_CH	OREAS 601b	LECO	73	1.479	1.49	0	-0.74%
SGS_CH	OREAS 602	LECO	117	2.2522	2.25	0	0.10%
SGS_CH	OREAS 603b	LECO	93	4.6339	4.57	0	1.40%
SGS_CH	OREAS 604	LECO	43	4.7498	4.85	0	-2.07%
SGS_BO	OREAS 620	LECO	14	2.5221	2.52	0	0.09%

No significant bias noted.

No fatal flaws were noted with the accuracy results. Bias and failures were noted in individual CRMs, but this is not systematic (i.e. some bias is positive and some negative). CSA Global recommends that the failed CRMs are investigated even though overall, they are not material.

Laboratory Internal CRMs

CRMs are inserted into the sample stream by SGS Chelopech and SGS Bor and include various standards. A total of 4,706 CRMs and 2,830 blank solutions were included by SGS Chelopech and 2,366 CRMs and 1,231 blank solutions were inserted into the sample stream by SGS Bor, Serbia during this review period.

Most laboratory standards showed acceptable accuracy and precision, with the only failures being attributed to the expected values being close to the detection limit which is not deemed a material issue.

Duplicate Samples (Precision)

Field, preparation and pulp duplicates as well as external check (umpire) results were compared for face samples (FS) and drill samples (DDH) for primary samples submitted to SGS Chelopech and SGS Bor and external check samples sent to ALS Rosia Montana.

The duplicate data were assessed using average coefficients of variation (CV_{AVR}% = standard deviation/average presented as a percentage – also known as relative standard deviation) calculated from individual duplicate pairs and averaged using the RMS (root mean squared) approach. This approach is recommended by Abzalov (2008) as a way of defining a fundamental measure of data precision using duplicate paired data.

Table 11-14: Field duplicate data (including acceptable and best practice limits)

Duplicate type	Lab_Orig	Element	Pairs (total)	Count of pairs (>10 x DL)	$CV_{(AVR)}$ %	Acceptable	Best	Mean Orig.	Mean Dup.	Bias
Field Dup	SGS_CH	Au	581	213	37	15%	10%	0.34	0.35	1%
Field Dup	SGS_CH	Cu	1,391	1,370	15	10%	5%	1,274	1,253	-2%
Field Dup	SGS_CH	Ag	1,390	105	17	15%	10%	26.15	24.75	-5%
Field Dup	SGS_CH	As	1,391	136	15	15%	10%	3,151	3,051	-3%
Field Dup	SGS_CH	S	1,391	1,341	6	10%	5%	6.25	6.24	0%

Precision is acceptable in most results. Note that there are no Field Duplicates for SGS Bor samples.

Table 11-15: Lab Preparation duplicate data (including acceptable and best practice limits)

Duplicate type	Lab_Orig	Element	Pairs (total)	Count of pairs (>10 x DL)	$CV_{(AVR)}$ %	Acceptable	Best	Mean Orig.	Mean Dup.	Bias
PREPLABDUP	SGS CH	Ag (ppm)	568	186	19	10%	5%	18.22	18.10	-1%
PREPLABDUP	SGS CH	As (%)	568	330	15	7.5%	5%	0.41	0.41	-1%
PREPLABDUP	SGS CH	Au (ppm)	568	10	7	10%	5%	3.96	3.93	-1%
PREPLABDUP	SGS CH	Cu (%)	63	63	1	7.5%	5%	7	7	0%
PREPLABDUP	SGS CH	Cu (ppm)	503	500	5	7.5%	5%	6,194	6,228	1%
PREPLABDUP	SGS CH	S (%)	570	562	2	10%	5%	13.43	13.36	0%

Precision is acceptable in most results. Note that there are no Field Duplicates for SGS Bor samples.

Table 11-16: Lab Pulp duplicate data (including acceptable and best practice limits)

Duplicate type	Lab_Orig	Element	Pairs (total)	Count of pairs (>10 x DL)	$CV_{(AVR)}$ %	Acceptable	Best	Mean Orig.	Mean Dup.	Bias
LABDUP DDH	SGS_BOR	Ag (ppm)	1,203	48	36	15%	10%	2.84	2.82	-1%
LABDUP DDH	SGS_BOR	As (%)	471	297	43	10%	5%	30.7	31.49	3%

LABDUP DDH	SGS_BOR	Au (ppm)	588	28	25	15%	10%	0.03	0.03	0%
LABDUP DDH	SGS_BOR	Cu (ppm)	471	465	17	10%	5%	124	125	1%
LABDUP DDH	SGS_BOR	S (%)	588	304	9	10%	5%	1.59	1.57	-1%
LABDUP FS	SGS_CH	Ag (ppm)	166	22	7	15%	10%	11.49	11.39	-1%
LABDUP DDH	SGS_CH	Ag (ppm)	727	27	14	15%	10%	4.4	4.35	-1%
LABDUP FS	SGS_CH	As (%)	209	156	5	10%	5%	0.38	0.38	1%
LABDUP DDH	SGS_CH	As (%)	727	60	17	10%	5%	0.061	0.061	-1%
LABDUP FS	SGS_CH	Au (ppm)	210	202	4	15%	10%	5.81	5.84	1%
LABDUP DDH	SGS_CH	Au (ppm)	727	303	9	15%	10%	0.43	0.43	-1%
LABDUP FS	SGS_CH	Cu (ppm)	188	188	3	10%	5%	9,670	9,667	0%
LABDUP DDH	SGS_CH	Cu (ppm)	716	629	4	10%	5%	966.68	966.83	0%
LABDUP FS	SGS_CH	S (%)	209	209	1	10%	5%	15.88	15.9	0%
LABDUP DDH	SGS_CH	S (%)	728	651	2	10%	5%	5.13	5.13	0%

Laboratory duplicates have been reviewed separately for SGS Bor and SGS Chelopech.

SGS Chelopech laboratory duplicates have acceptable precision with no significant bias, except for precision of As (%) which can be improved.

SGS Bor laboratory has poor precision with no significant bias. The poor precision could be due to pulverisation or homogenisation issues and should be investigated.

The initial investigation of the poorer precision at SGS Bor should include the following:

- The variance of CRM results should be reviewed (both laboratory and DPMC CRM) to check whether there is a general precision issue at the laboratory. This has been completed and is discussed in the following section.
- The results of the laboratory sieve tests undertaken during pulverisation should be requested from SGS Bor and reviewed to confirm that the samples are being pulverised to an appropriate standard.
- Compare the sample preparation procedures for SGS Bor and SGS Chelopech to confirm that they are the same. Pulverisation and homogenisation processes should be checked.

The subsample selection method should be checked to see whether this could be introducing bias.

Table 11-17: External duplicate data sent to ALS Rosia Montana (including acceptable and best practice limits)

Duplicate type	Lab_Orig	Element	Pairs (total)	Count of pairs (>10 x DL)	$CV_{(AVR)}$ %	Acceptable	Best	Mean Orig.	Mean Dup.	Bias
UMPIRE	SGS CH	Cu	407	20	4	10%	5%	1.43	1.44	0%
UMPIRE	SGS CH	Au (ppm)	408	390	7	10%	5%	4.95	5.15	4%

Precision is good for gold and copper pairs.

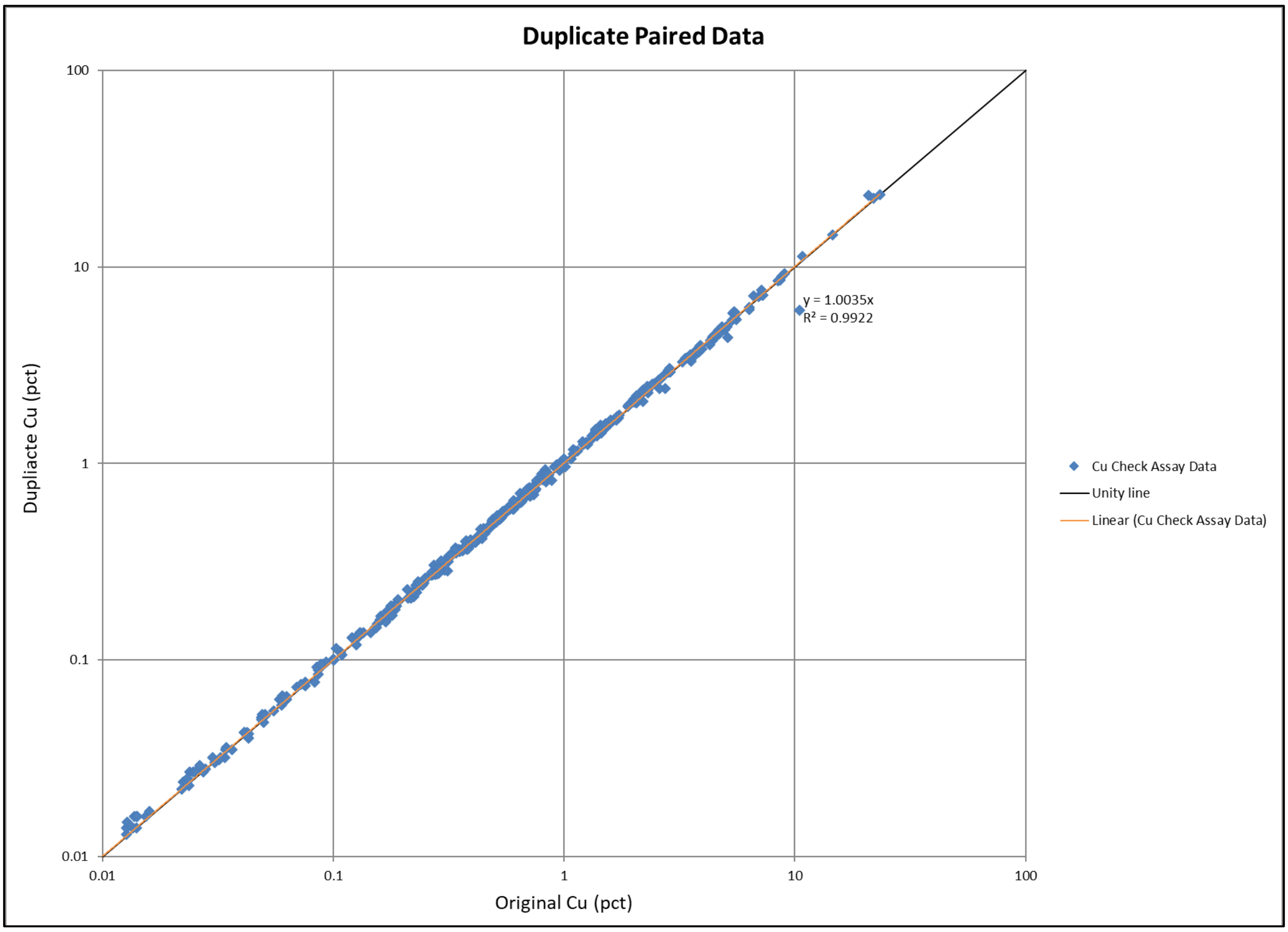


Figure 11-6: Scatterplot of SGS Chelopech External Cu duplicates (drillholes)

11.3.5 QAQC Conclusions and Recommendations

CSA Global sets out the following conclusions and recommendations as regards assay QAQC:

- Overall blank results show no significant indications of contamination except for one copper blank. Where failures were noted, these tended to be in non-certified blanks or at low grades relative to economic levels of mineralisation and laboratory LDLs.
- No fatal flaws were noted with the accuracy results. Bias and failures were noted in individual CRMs, but this was not systematic (i.e. some bias is positive and some negative).
- Field, preparation and pulp duplicates as well as external check (umpire) results were compared for face samples (FS) and drill samples (DDH) for primary samples submitted to SGS Chelopech and SGS Bor and external check samples sent to ALS Rosia Montana. Precision was acceptable with no material bias for the SGS Chelopech duplicates. External check samples had good precision with no significant bias.

CSA Global notes the following:

- The failed CRMs should be investigated as a matter of course and for completeness.
- OREAS 902 display nine instances of failures from 112 samples for copper at SGS_BO. The failures do not display any bias.
- For the SGS_BO CRM for silver, analysed by 4A_ICEPS, the CRM value is higher than UDL for method IMS40B. In future it will be better to either have a CRM in line with detection limit, or an appropriate analyses method.
- Notable poor precision at SGS Bor, which could be due to pulverisation and/or homogenisation issues at the laboratory should be investigated. Initial investigation steps should include the following:
  - The sample preparation procedures for SGS Bor and SGS Chelopech should be compared to confirm that they are the same. Pulverisation and homogenisation processes should be checked.

- The subsample selection method should be checked to see whether this could be introducing bias.

11.4 Security and Storage

All core transported from the drill rigs to the core shed and all samples carried to the preparation facility are securely transported by DPMC staff in steel boxes. Upon completion of the core logging a SSF is prepared for each batch containing a list of samples, standards and field duplicates which is documented in the Sample Journal on the server. Each SSF has a unique number and is prepared in duplicate – one signed copy for the laboratory and one for the DPMC archive. Underground face samples are transported in plastic bags from the mine to the preparation facility. The sample preparation facility and laboratory are located within the confines of the DPMC compound, which access to is secured by a locked gate and 24-hour closed circuit television (CCTV) for resource development drillholes and face samples. Diamond drillholes from exploration department sent by truck to SGS Bor Laboratory, Serbia.

Samples collected from underground development, underground drilling and surface drilling operations are transported to the site-based geology core shed, where the samples are geologically logged and are prepared for chemical analysis. The sampling procedures are appropriate and adequate security exists on the site to minimise any risk of contamination or inappropriate mixing of samples. Sample tagging and a laboratory barcode system is in use to digitally track sample progress through to final chemical analysis.

All pulp duplicates are returned from the lab in plastic vials and are stored in a facility with constant temperature and humidity. Mineralised coarse reject samples are returned in the same fabric bags and are stored in core storage near the site. The remaining half core is neatly stored in conventional pallet racking in the core storage facility.

11.5 Conclusions on Sample Preparation Analyses and Security

The QP is satisfied that the sample preparation, security and analytical procedures in place at Chelopech are adequate, and that data used in the estimation of Mineral Resources are representative of the mineralisation and fit for use.

12 Data Verification

The report authors have reviewed the data and believes the data verification procedures undertaken on the data collected from DPMC adequately support the geological interpretations and support analytical and database quality, and therefore support the use of this data in the MREs disclosed in this Technical Report.

12.1 Database Controls

DPMC implemented an acQuire GIMS in 2004, for managing all the drillhole and face sampling data.

All data, such as collar, survey, geological, geotechnical, structural, assay, etc. are imported daily into acQuire from the server or via email. After validation, data is one-way synchronised with GEMS (for part of the review period) or Datamine™ (latterly) for Mineral Resource estimation purposes. The acQuire GIMS was also used to generate monthly, quarterly, and yearly QAQC reports.

Data used to support Mineral Resource and Mineral Reserve estimates have been subjected to validation, using inbuilt and modified acQuire GIMS triggers that automatically check data for a range of data entry errors. Verification checks on surveys, collar coordinates, lithology, and assay data have also been conducted.

Data undergoes further validation by CSA Global through a series of upload validations.

12.2 Collar Data

There are 4,767 in the collar table of the database, used in this MRE. There are no duplicate holes or coordinates. In the geological database, acQuire nomenclature and naming convention of drillholes does not allow identical naming of the drillholes.

The face samples are digitised in GEMS using survey pick-ups of the mine headings. The face samples with their unique names and coordinates are exported from GEMS to acQuire. Data validation done in acQuire considers only unique names and coordinates.

12.3 Survey Data

12.3.1 Collar Survey

Coordinates are captured at various stages using different methodologies which are ranked accordingly and those with the highest (best) ranking are captured in the “Best” field in the database. These coordinates were used in the Mineral Resource estimation.

Highest to lowest ranked methods are as follows:

DGPS->Total station->Digitised->Transformed Historic->Planned

Collar information was received via email from the Survey Department in pre-specified templates and imported into the acQuire database.

There were no issues identified with the data in the collar table.

12.3.2 Downhole Survey

The Drilling Department is responsible for setting out the collar positions, directions, and inclination/ declination of both surface and underground drillholes, and for surveying the actual position, direction and inclination/declination upon completion. The downhole survey measurements are taken every 30 m by the drillers on shift. The first measurement is taken as near as possible to the collar, usually at 12 m or 15 m depth. Data is documented and submitted after the end of every drill shift.

If deviations from the proposed parameters are not within the permissible range, the drillhole is stopped.

The final measurements are validated and are entered in the drillhole database. Data are checked for overlapping intervals, surveys beyond drillhole depths, duplicate entries, survey intervals past the specified maximum depth in the collar table and/or any abnormal dips and azimuths.

There were no issues identified with the downhole survey records.

12.4 Geological Data

There are 435,068 lithological records in the lithology table for 4,584 drillholes and 180 drillholes have no lithological records. The geotechnical holes and those with technical issues were not logged. In addition, there are some drillholes completed by the end of September 2021 which have yet to be logged and some of drillholes were still in progress. Geological information is described using a system of codes. In the database there are 99 unique field names with 1,384 unique codes.

Geotechnical and structural data validations undertaken included: checking for core recoveries greater than 100% or less than 0%, RQDs greater than 100% or less than 0%, overlapping intervals, missing collar data, negative widths and/or results past the specified maximum depth in the collar table.

12.5 Samples Summary

Unique sample numbers have been used and no issues with interval integrity such as overlapping intervals, from depths greater than to depths, and intervals greater than the specified maximum hole depth have been noted.

There are 601,850 drillhole samples and 39,956 face samples in the database of which 358 holes do not have samples. Some of the drillhole and face samples do not have associated assay values and the numbers of missing assay results are shown in Table 12-1 below. 76,958 samples from 801 drillhole and 8,736 face samples do not have associated assay values.

Table 12-1: Number of samples with no associated assay values

	Au	Ag	Cu	As	S
Drillhole samples	9,101	12,792	12,574	63,139	21,762
Face samples	583	620	1	8,718	290

12.6 Core Recovery

Core recovery was reviewed on 201,478 samples within the defined mineralisation zones (silica and stockwork envelope).

The data comprises pre-DPMC and DPMC surface and underground drillholes. The average drillhole recovery is 99.27% and the various phases of drill data show no issues with regards to recoveries. No relationship was evident between core recoveries and copper or gold assay results, as illustrated in Figure 12-2 and Figure 12-3 respectively.

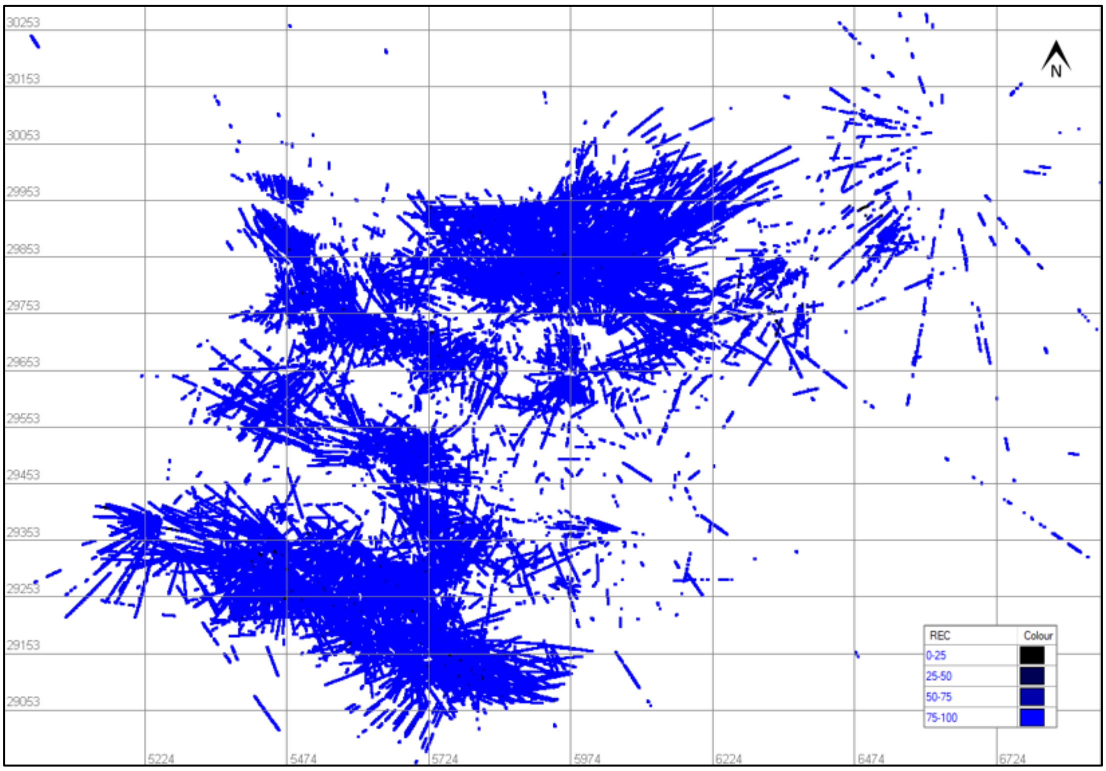


Figure 12-1: Plan view representing the spatial position of the recovery data used for the analysis (DPMC, 2021)

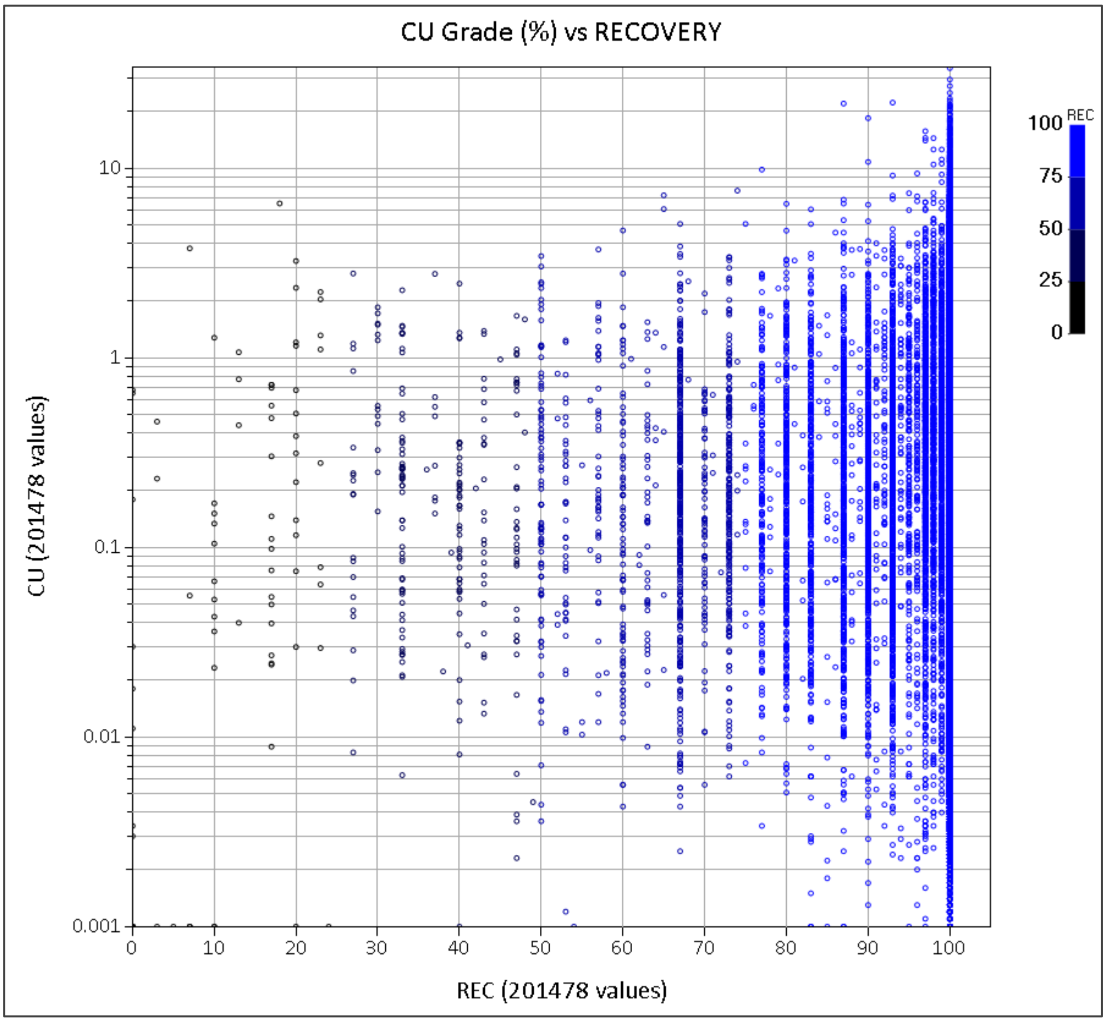


Figure 12-2: Copper grade (%) vs recovery (%) (DPMC, 2021)

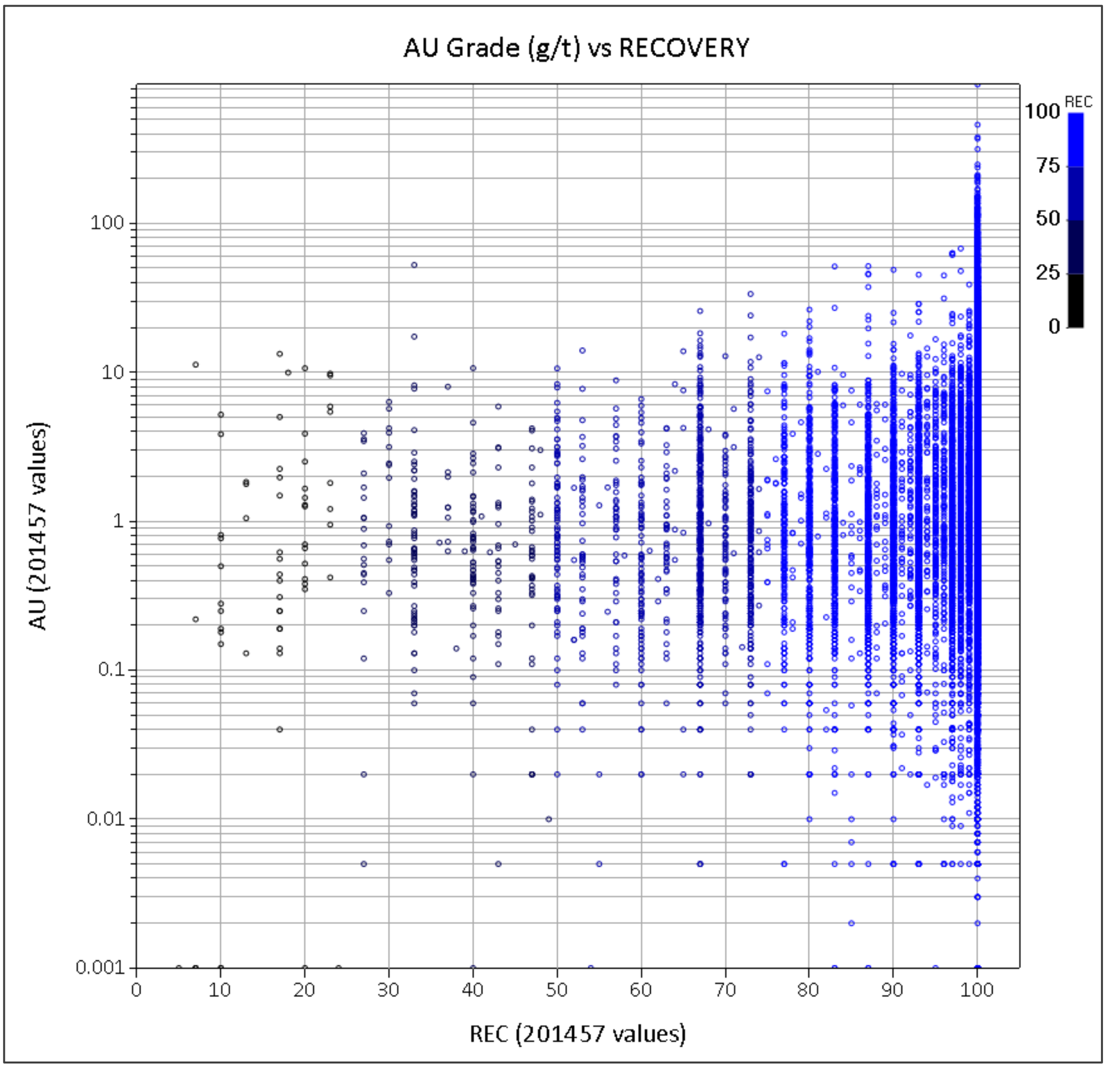


Figure 12-3: Gold grade (g/t) vs recovery (%) (DPMC, 2021)

12.7 Umpire Sampling

There are 29,657 umpire samples (both drillhole and face samples) in the database.

The reliability of the assay data from the primary laboratories is further assessed by comparison of the original assay results with umpire assays completed by two independent laboratories. More than 5% of samples are selected from the general assay stream to form the umpire sample suite, designed to cover the broad range of geology grade.

One "blind" certified standard is inserted every 20th sample (alternating low-grade and high-grade standards are used). One "blind" blank pulp is inserted every 50th sample.

12.8 Assay Verification and Data Capture

All incoming assay results are emailed as digital files from the lab to the database geologist. Prior to entry into the database each submission is screened using acQuire's pre-download quality control report, which checks the performance of:

- Standards – referenced against ± 2 SDs referring to resource development drillholes and face samples
- Standards – referenced against ± 3 SDs referring to drillholes from exploration department
- Duplicates and lab splits – referenced against mean paired relative difference <±20%.

All results received from the lab are maintained by the database geologist who documents the pass or fail of each lab submission.

If a check sample needs querying (i.e. duplicate, standard, split, or repeat assays show failed or spurious results), the lab is contacted to perform 10 repeat assays either side of the anomalous check assay for standards and five repeat assays for blanks and requested to include a lab standard within the run of repeats. The request for the re-assay is documented via email. Assuming the repeat assays show no evidence of bias the original results are accepted, such that the submission is entered into the acQuire database including the additional lab repeats. If the repeat assays do show bias, then the complete submission must be re-assayed.

In addition, the complete lab submission must be re-assayed if any of the scenarios listed below are identified:

- If face samples/diamond core crusher duplicates display a consistent poor correlation (allowing for occasional spikes)
- If the company standards show a consistent positive or negative bias greater than ±2 SDs of the expected assigned values.

The above criteria apply to values greater than 10 times the detection limit for precious metals; 10 times the detection limit may also be applied to base metals, but this depends on the possible cut-off grades grade relative to the spectrum of analysis, or stage and type of exploration (e.g. soils vs resource drill data).

In the event of any of the above scenarios occurring, the lab is contacted in writing or emailed and requested to reply with a formal explanation as to the failure of the batch (in the correspondence with the lab, values of company standards are not revealed, only referenced as being anomalous).

Using acQuire the "failed" results are entered into the database, and priority coded to reflect their lower confidence status. The subsequent re-assayed and accepted submission is priority coded to reflect usage as the primary assay record for daily use and resource estimation. However, as it is important to ensure the re-assay work includes the re-assaying of all check samples (field duplicates, crusher duplicates, lab splits, and lab repeats), a fresh batch of company standards is also sent to the laboratory. In addition, results of the re-assay and any comments of the quality control analyses are recorded in acQuire and accepted results are priority coded.

To track the progress of each assay, the database geologist maintains a log sheet of each assay submission including the pass/fail/query outcome and follow-up action plan (if applicable).

12.9 Bulk Density

Bulk density measurements have been routinely completed since the start of 2003 at the (ISO 9001:2015 and ISO/IEC 17025) Eurotest-Control facility in Sofia using the industry standard wax coating water immersion method. Prior to 2003, the bulk density was assigned based on a formula that used sulphide and copper assays. The collection of bulk density data has recently been incorporated into DPMC's standard procedures which are applied to all diamond drilling, drives and stopes.

Bulk density measurements are collected as fist sized grab samples from underground, or 10 cm billets every 3 m along the length of the drillhole or every 5 m from exploration drill holes, including both mineralisation and waste. These measurements have been assigned to a location or to a bulk density table in the drillhole database.

In 2009, on-site density analysis was introduced and made a part of the SGS managed on-site laboratory. The determination of bulk density for rock or core samples is by paraffin wax and water immersion.

A total of 117,252 (112,849 core samples and 4,403 face samples) density measurements have been collected from a range of grades, rock types, and locations within the modelled Silica Envelopes.

The density data is sufficiently distributed throughout the resource with representative samples present in each mining block (see Figure 12-4) to allow for its estimation by ordinary kriging to represent variations based on grade and lithology. Average density values tabulated by mineralisation block are presented in Table 14-2.

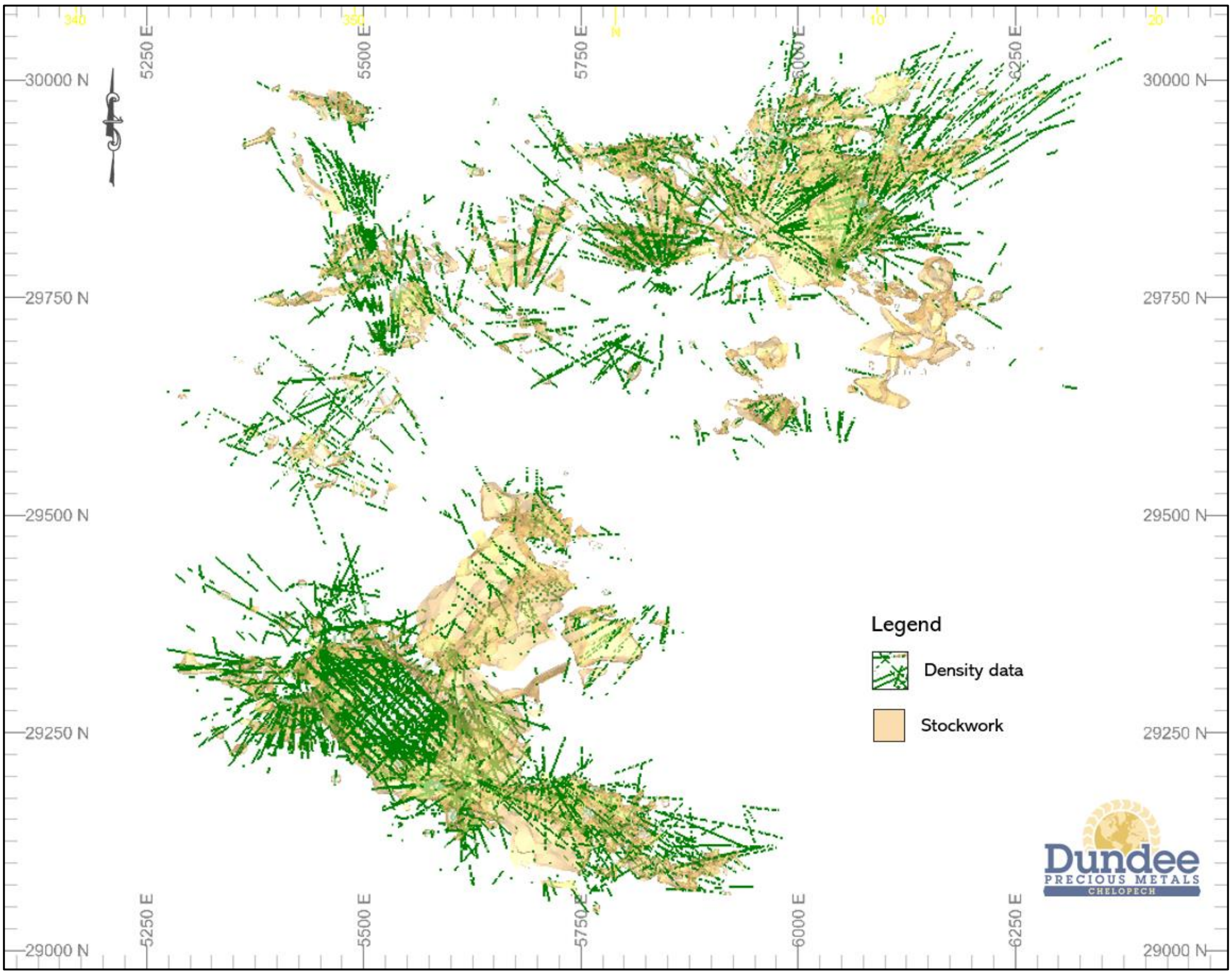


Figure 12-4: Density data (DPMC, 2021)

For blocks lacking density data, a third-order polynomial regression was applied based on sulphur grades:

- Bulk Density (HG) = - 0.00001125*(S%)^3 + 0.00079678*(S%)^2+0.02254154*(S%) + 2.538
- Bulk Density (SE) = - 0.00011068*(S%)^3 + 0.00479701*(S%)^2+0. 02283858*(S%) + 2.730.

This polynomial regression was validated in 2013, by comparing samples with the physically measured bulk density against density estimated from sulphur assay values, see Figure 12-5 for the Stockwork ("HG") and Figure 12-6 for the Siliceous Envelope ("SE") which show the comparison of density distributions as probability plots and histograms. The plots show a common mean grade and similar data distributions verifying the application of the regression equation. This regression is still considered current and remains in use.

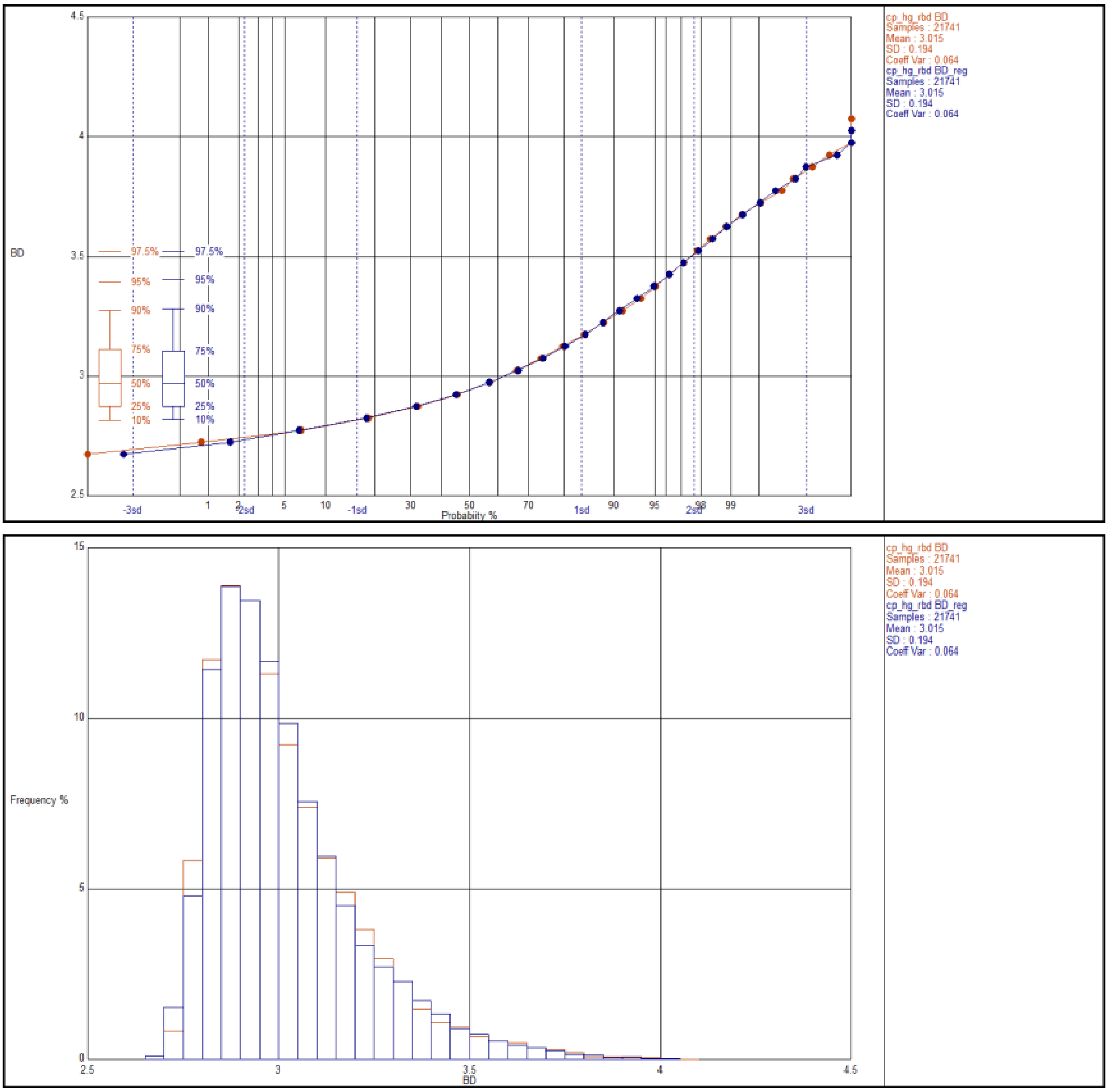


Figure 12-5: Probability plot and histogram comparing polynomial estimated vs actual density for Stockwork (HG) domain (DPMC, 2019)

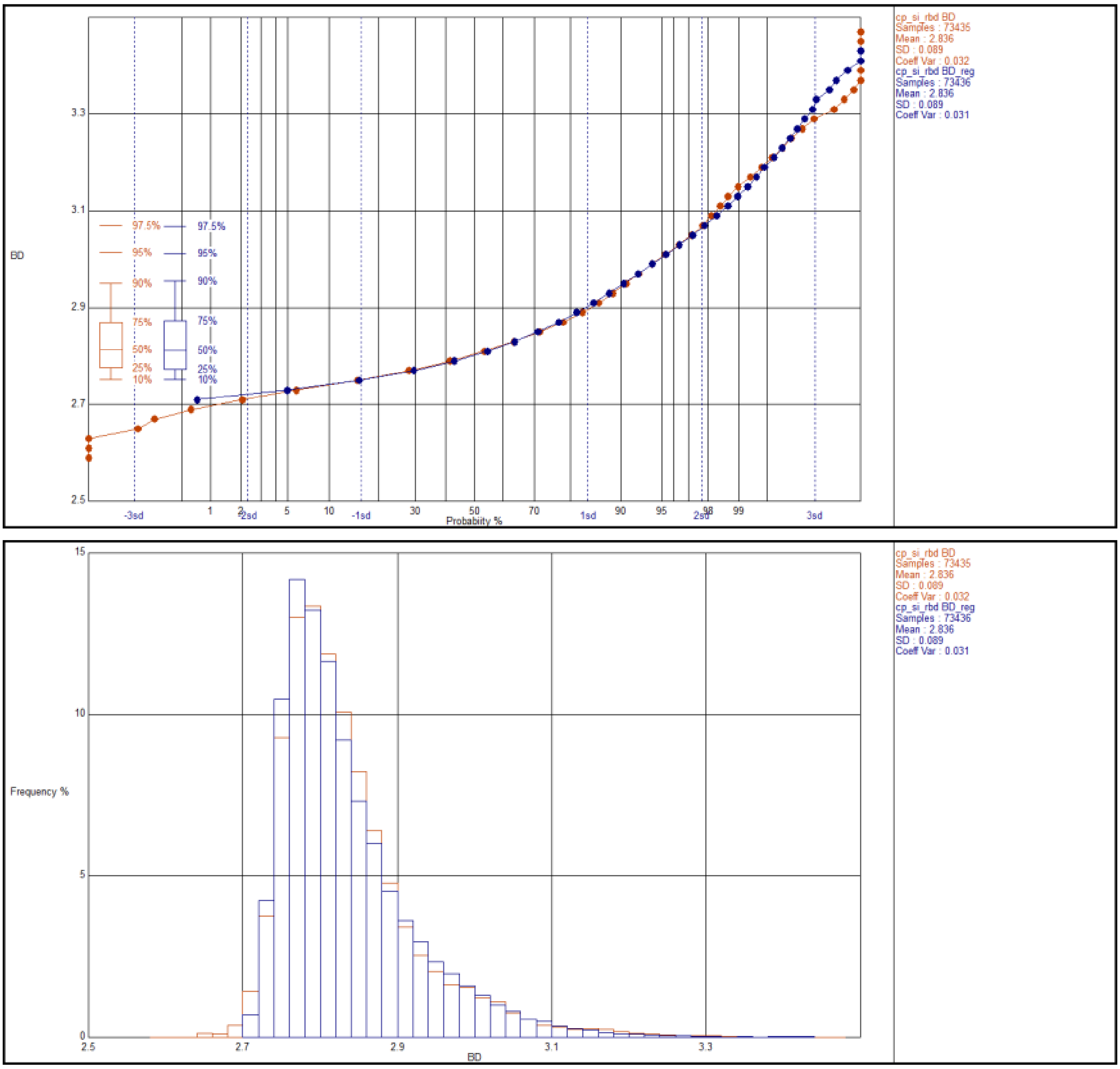


Figure 12-6: Probability plot and histogram comparing polynomial estimated vs actual density for Siliceous (SE) domain (DPMC, 2019)

12.10 Comparison of Data Types

The Chelopech database contains surface diamond drillholes, underground diamond drillholes and underground face samples. In a 2007 study, a series of investigations were completed to test the appropriateness of combining the datasets for grade estimation. This review work was re-assessed in 2013 and 2017 by Chelopech staff and no significant bias was observed. The results of these tests remain current and relevant and are included below.

CSA Global and the authors of this Technical Report consider this combined data of an appropriate standard and adequate for use in this Technical Report, including with respect to the estimation of Mineral Resources.

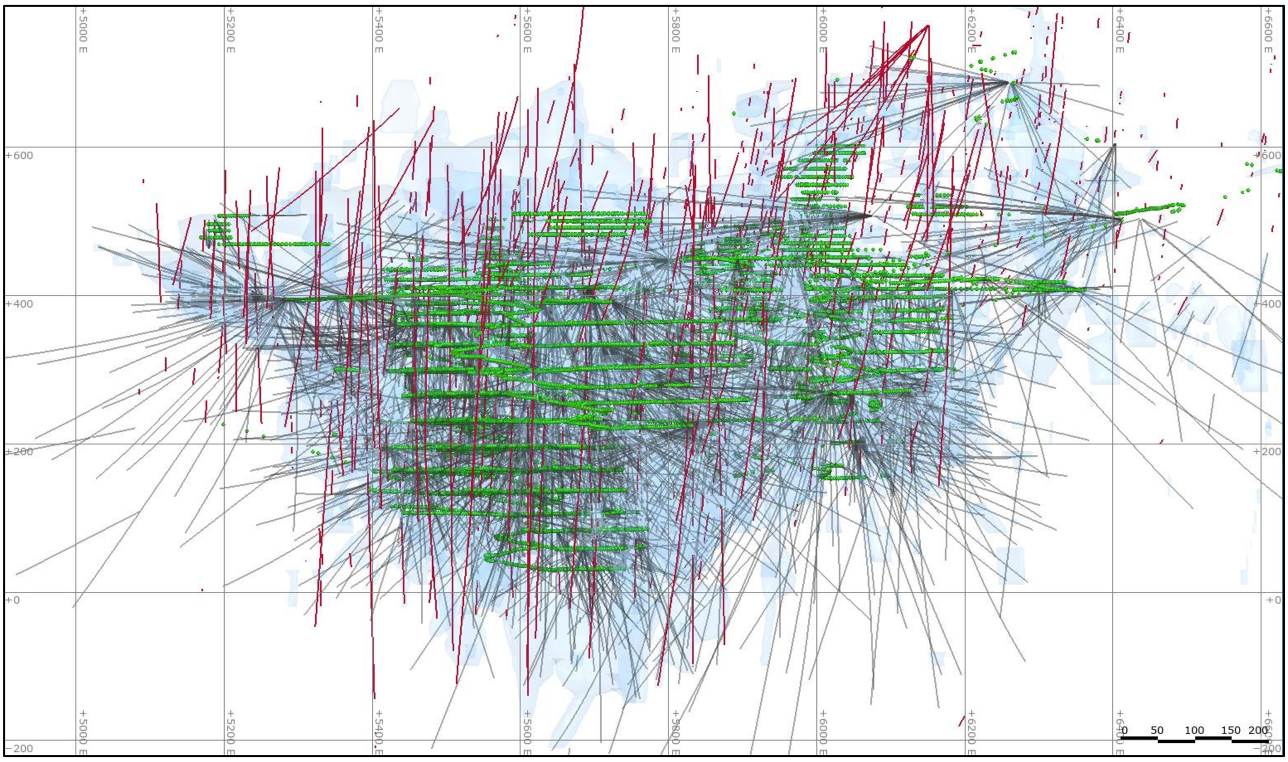


Figure 12-7: 3D view of Chelopech deposit, representing the distribution of different data types (DPMC, 2021)
Note: Face samples in green, surface diamond drillholes in red and underground diamond drillholes in grey presented in boundary of Silica Envelope in blue.

The tests undertaken included:

- Compilation and review of descriptive statistics by data type and owner/company
- Compilation and review of comparative de-clustered statistics
- Compilation and review of scatterplots and comparative de-clustered statistics for the data types located in close proximity to each other.

Note that this study only analysed 3 m drillhole composites, and all composites are located within the Silica Envelopes. Face samples were collected using a grid and area approach.

Underground drilling consistently has a higher mean grade than surface drilling for all elements, and face sampling has a higher mean grade than all the drilling. This has been interpreted as being due to the location of the data. Surface drillholes intersected all parts of the silica alteration, both low and high grade. Underground drillholes tend to be focused round the higher-grade regions of the silica alteration and therefore are higher in grade than the surface drillholes. Face sampling is almost exclusively located within the high-grade region of the orebody and, therefore, has a higher mean grade than the drillholes.

Most surface diamond drillholes were completed by the State-run SGE. Face samples have been collected by the State-run CCPC, Navan and Dundee. Summary statistics for the face samples grouped by company are not very meaningful as each company sampled different regions (CSA Global, 2014).

13 Mineral Processing and Metallurgical Testing

13.1 Introduction

In the years of operation since acquisition by DPM in 2004, the original crushing, grinding and flotation circuits were utilised and progressively upgraded to process up to approximately 2.2 Mtpa of ore producing a primary gold/copper primary concentrate and a gold containing pyrite secondary concentrate. A technical-economic assessment concluded that it would be economically optimal to produce a copper containing gold concentrate (~9-11% Cu, 15-30g/t Au, <3.5% As) instead of the historic 16% Cu copper concentrate in current market conditions. Extensive plant trials during 2021 proved the technical and economic feasibility of this production strategy.

The product specifications for the primary and secondary concentrate types are as follows:

- A copper concentrate, containing on average 16% Cu, and between 25–30 g/t Au and 5–6% As
- A gold concentrate at 10% Cu, and between 15–25 g/t Au and up to 3.5% As
- A pyrite concentrate (secondary concentrate produced at Chelopech) which is a gold-bearing pyrite concentrate (>5.5 g/t Au and >40% S).

The concentrate is loaded into railway wagons, and dispatched to the port of Burgas, located on Bulgaria's Black Sea coast. From there it is transported by ship to various smelters (Peru, the Philippines and Canada until 2010), XGC in China and to the Dundee Precious Tsumeb smelter, via Walvis Bay, in Namibia since 2011.

Operational upgrades commenced in 2009, with the installation of the first hydraulic mine backfill plant, subsequently upgraded to the current paste plant in 2010. Process plant upgrades continued through 2010 in preparation for the increased tonnages from the upgrade of the mine. A new grinding circuit replaced the original secondary and tertiary crushing circuits, together with the installation of a new rougher/scavenger flotation bank. The existing flotation cells were converted into an expanded three-stage cleaner circuit, with the upgraded circuit commencing operations in February 2011. Flotation tailings continue either being dewatered to produce "paste" for backfilling the mined-out stopes underground or deposited in the upgraded TMF as required.

Further upgrades were completed in 2012 with replacement second and third cleaner stages in the copper circuit, a new pyrite recovery circuit, concentrate conveying and rail loadout handling system both completed in 2014.

Currently, plant is in implementation phase for advancing control systems using advance control tools for flotation, dewatering and filtering circuits. Grinding and tails thickening already been implemented.

13.2 Mineral Processing Testwork

13.2.1 Pre-Expansion Summary (Minproc Engineers, 2006)

Comminution – a comprehensive test program was undertaken to fully characterise the Chelopech ore types to design an expanded comminution circuit. Parameters including the competence, hardness and variability of the three main ore types in current production (Blocks 19, 150 and 151), and drill-core samples representing future ore from these blocks in 0 to 5, and 6 to 10-year time horizons. Specific tests included: Bond Crushing, Rod Mill and Ball Mill Work Index determinations, Unconfined Compressive Strength (UCS) measurements, JKTech drop weight tests, and Sag Power Index measurements.

Flotation – testwork completed on the same samples included batch testing to establish performance variability and four bulk flotation campaigns. The products obtained from these runs were used to provide large scale samples for subsequent pilot-scale campaigns for alternative process flowsheets.

Several samples representing material from various areas of the three main ore types were tested and illustrated variable copper and gold recoveries. In general, copper recoveries of approximately 80% and gold recoveries in the range of 40–50% were reported for most ore types. Block 151 samples consistently exhibited poorer gold recoveries, and additional samples of each block were submitted for a more detailed study, investigating the effect of grind size, flotation reagents and conditions. The results indicated that improved copper and gold recoveries for Blocks 19 and 150, compared with those for Block 151 should be expected under existing conditions. Assessment of the results of the overall test program were made and incorporated at plant scale where practicable.

13.2.2 Gravity Gold Recovery

Scoping level testwork was undertaken on samples representing the three main ore types to evaluate the potential for gravity gold recovery from the proposed milling circuit. Whilst gold recoveries to a laboratory centrifugal concentrator ranged between 17% and 31%, the portion associated with free gold, defined by mercury amalgamation and compared to gold contained in the relatively high specific gravity (SG) sulphides, was relatively low at less than 6%, and further work in this direction was discontinued.

13.2.3 Flowsheet Development

The test programs completed in 2005 concluded that the then current process flowsheets were optimum for the treatment of the Chelopech ore types, and that no fundamental changes could be recommended. The results produced were used to design a revised comminution circuit which was integrated into the operation in early 2011. In the meantime, the previous years of continuous operation confirmed the ranges of flotation parameters predicted from the testwork phase. The variations in performance produced from each block are clearly understood in relation to actual performance.

The current operation produces a copper concentrate with associated gold and silver, with historical recoveries for copper, gold and silver averaging 85%, 55% and 42%, respectively. Since 2014, the circuit also produces a gold containing pyrite concentrate from the stream that would have previously been rejected to flotation tailings.

13.2.4 Pyrite Recovery Summary

A pyrite concentrate was produced in the original Chelopech concentrator, on the industrial scale between 1995 and 1997, where up to a total of 60,000 tonnes of pyrite produced. The flowsheet utilised slurry pH modification to depress pyrite flotation from the copper minerals, followed by acidification to allow the pyrite to float from the copper tailings. A scoping-level desktop study was completed in 2011 to assess possible flotation approaches for the recovery of a separate pyrite concentrate in the expanded concentrator and confirmed by a more detailed study conducted in 2012 (Macromet, 2013).

The work was supplemented by:

- A comprehensive laboratory test program completed on components of the ore blocks representing current and future ore sources – namely Blocks 19, 150 and 151, with additional samples from Blocks 16, 103, 145, 147, and 149. In addition, three target sulphur ranges were prepared for the bulk composite, while a total of 13 variability samples were selected to represent the current LOM block composition. The work was completed in 2012 (AMDEL, 2013).
    - Potential recovery options, combined with investigating selective collectors, various pH modification combinations and variability testing were tested. In general, the results confirmed the findings from the 2005 program for the copper recovery circuit, while each flowsheet examined produced similar performance in the pyrite circuit.
- Based on consideration of all options, the existing copper circuit flowsheet, where pyrite is rejected into the cleaner circuit tailing by raising the slurry pH to >12.0 with lime, was confirmed as the optimum process from which the subsequent pyrite separation flowsheet was to be designed. In this case, reduced requirements for pH modification compared to the alternative flowsheets, and simpler collector requirements were the main cost considerations, combined with the relative reduction in process risk as

the flowsheet is well proven. This formed the basis for the Preliminary Economic Assessment (PEA) (DPM, 2012), and which confirmed the potential to recover a pyrite concentrate from the mill feed, as a separate concentrate product and in addition to the copper concentrate already produced.

- Recovery of pyrite in the plant – the new pyrite circuit was fully operational by the end of Q1, 2014 and the pyrite produced, currently about 250,000 per year, is transported to the port and sold under existing contracts.
- Past laboratory test programs and studies (AMDEL and Macromet, 2013) had demonstrated that the majority (>90%) of the pyrite in the feed will be recoverable to the bulk sulphide (rougher/scavenger) concentrate, and from there will be distributed into both the copper, and the new pyrite concentrate.
- Routine laboratory testwork carried out at Chelopech, on monthly feed composites simulating the production of pyrite from the bulk sulphide rougher/scavenger concentrate, after copper minerals separation.

Considering the above facts and the pyrite circuit capacity of 400,000 tonnes of pyrite per annum, the potential exists to produce a greater amount of pyrite, providing there is a market for it.

13.2.5 Geometallurgical and Flowsheet Optimisation Testwork

A geometallurgical and flowsheet optimisation flotation testwork program at XPS (Sudbury) was concluded in 2017. The geometallurgical testwork considered the metallurgical variability of the eight identified domains at Chelopech – 151 Block Upper, Middle and Lower; 150 Block Upper and Lower; 103 Block East and West; 19 Block. The findings of the geometallurgical testwork were inconclusive on quantifying the variability in pyrite quality between the domains. Other information gathered was nonetheless useful and further enhanced the understanding of the geometallurgical properties and variability between the domains.

The flowsheet optimisation flotation testwork indicated promising results on potential alternative flowsheets which will need to be further investigated and confirmed through laboratory testwork at site. This work will be incorporated in the initiatives that form part of the "Process Plant Optimisation Program".

DPMC metallurgical investigations has led to the distinction of three ore types that have clearly different metallurgical recoveries. The three ore types that have been determined through their composition and distinct metallurgical performance are the pyrite-gold type (Block 152), the pyrite—gold-barite type (Block 700) and all other mineralisation (pyrite-copper sulphosalt type).

The 2020 annual review of the recovery models vs the actual plant performance indicated that the current models are still adequate to accurately predict the plant recovery performance for the expected future plant feed pyrite-copper sulphosalt type mineralisation to produce a copper concentrate with grade 16.6% Cu concentrate, with the exception of Block 152 pyrite-gold type where the recovery models are updated accordingly. Based on 2021 production records , the 2020 Recovery models were enhanced to predict copper recoveries, as a function of variable concentrate grade. The other exception is Block 700, the pyrite-gold-barite type which is characterised by gold pyrite mineralisation with low copper values, and as such the gold recoveries have been assigned to the pyrite circuit.

13.2.6 2021 Testwork Program

Production trials took place during 2021 to support the feasibility of producing a 10% Cu concentrate and to validate theoretical recovery models (Figure 13-1 to Figure 13-3). Based on the below correlations, it can be concluded that the enhanced recovery models can be used to predict recoveries within a high level of confidence as R^2 numbers showed on Figure 13-1 to Figure 13-3. The optimisation program was mostly driven by changes in market terms in China (market guidance), where the maximum arsenic content has been reduced from 6.5% to 3.5% for gold-bearing concentrates assaying between 15 g/t and 60 g/t Au.

New Recovery models predict higher recoveries compared to the previous recovery models. Higher recoveries are a function of increased concentrate mass pull, resulting from recovering more gold from the pyrite to the copper concentrate, where payables for gold are higher compared to pyrite concentrate. In other words, the payable value of gold recovered to the copper concentrate is higher than if it were recovered to the pyrite concentrate. Effectively, the new business strategy is aimed at maximising gold recovery to the copper concentrate, whilst minimising the arsenic content by dilution due to the higher concentrate mass pull.

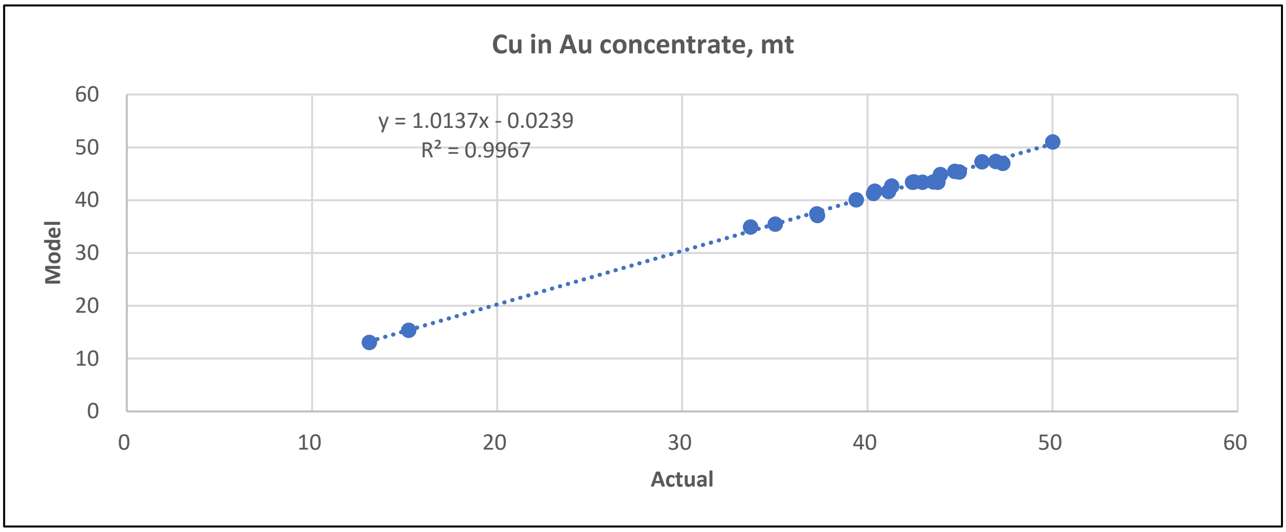


Figure 13-1: Model vs actual corelation on production trial, Cu metal in Au Concentrate (10% Cu), dmt

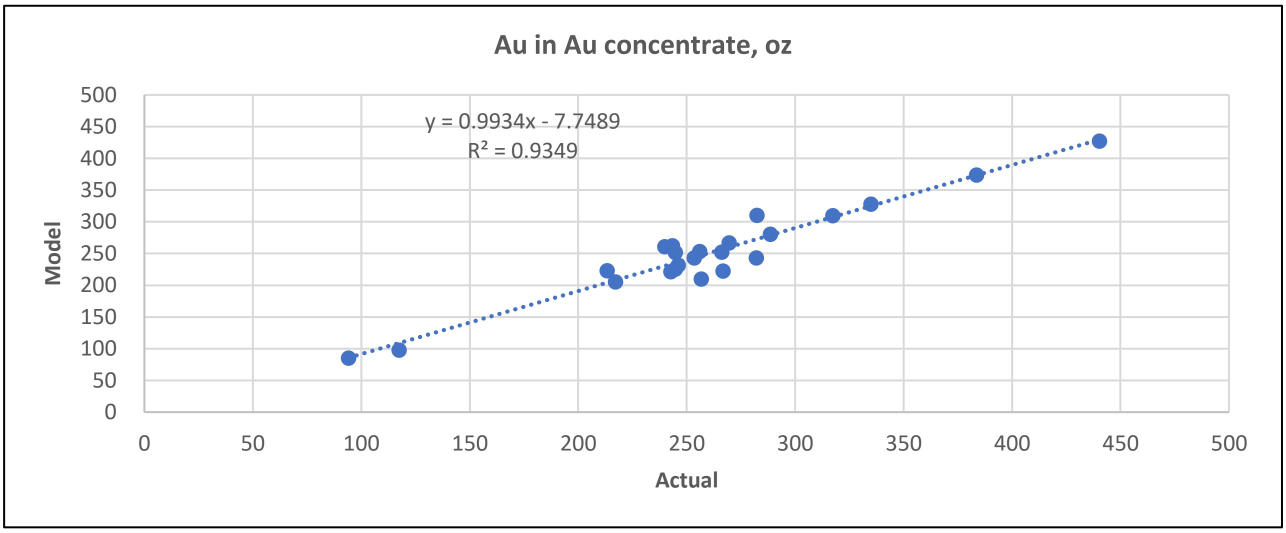


Figure 13-2: Model vs actual corelation on production trial, Au in Au Concentrate (10% Cu), oz

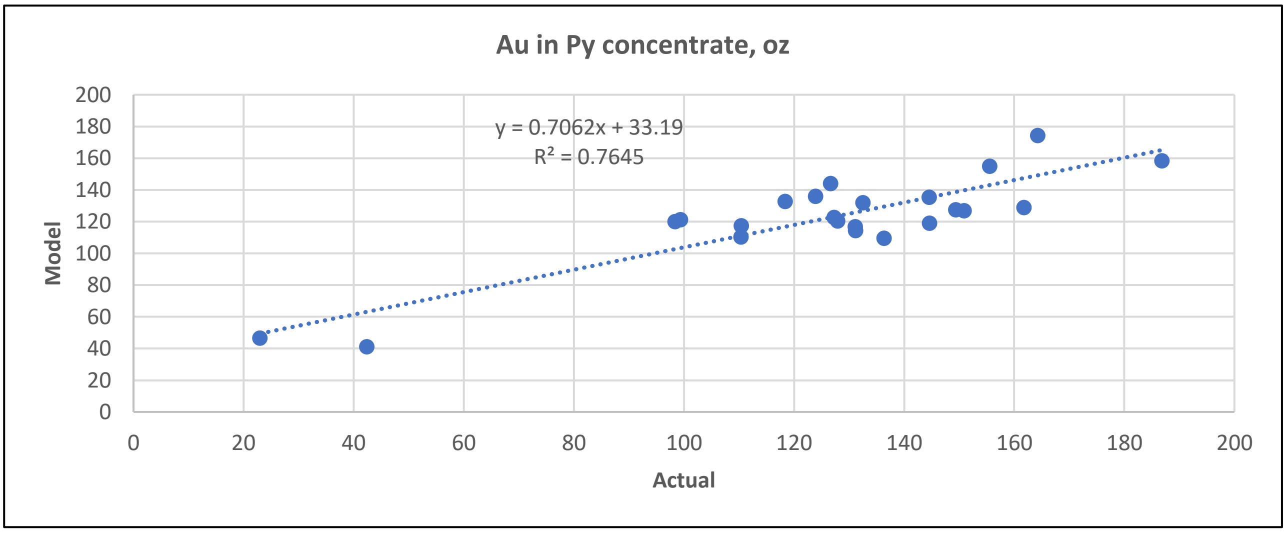


Figure 13-3: Model vs actual corelation on production trial, Au in Py concentrate, oz

For process control, copper has been used as the guiding metal, considering the measurement accuracy and controllability. Arsenic and copper minerals in the ore are predominantly enargite and tennantite where the ratio of copper to arsenic is 3:1, thus the arsenic grade in the final concentrate is a direct function of the copper grade.

For the sensitivity analysis (Figure 13-4), average values for ore mined in 2021 and applied recovery models with variable concentrate copper grade (as in NSR calculations) were used. Plant bottlenecks such as maximum filtering capacity, treatment charges/refining charges terms etc. have been applied in the analyses.

Analysis showed that if the process plant if configured to produce >10% Cu concentrates it results in arsenic grades above the 3.5% threshold. Whilst a configuration for concentrate grades <10% Cu concentrate reaches the maximum capacity of the downstream filtration section and limits arsenic below the 3.5% threshold. Thus, from a plant operational point of view, the optimal copper grade for the gold-copper concentrate is 10% Cu.

A technical-economic assessment concluded that it would be economically optimal to produce a copper containing gold concentrate (~9-11% Cu, 15-30g/t Au, <3.5% As) instead of the historic 16% Cu copper concentrate in current market conditions. Extensive plant trials during 2021 proved the technical and economic feasibility of this production strategy.

The authors of this report conclude that there are no processing factors or deleterious elements that could have a significant effect on the potential economic extraction.

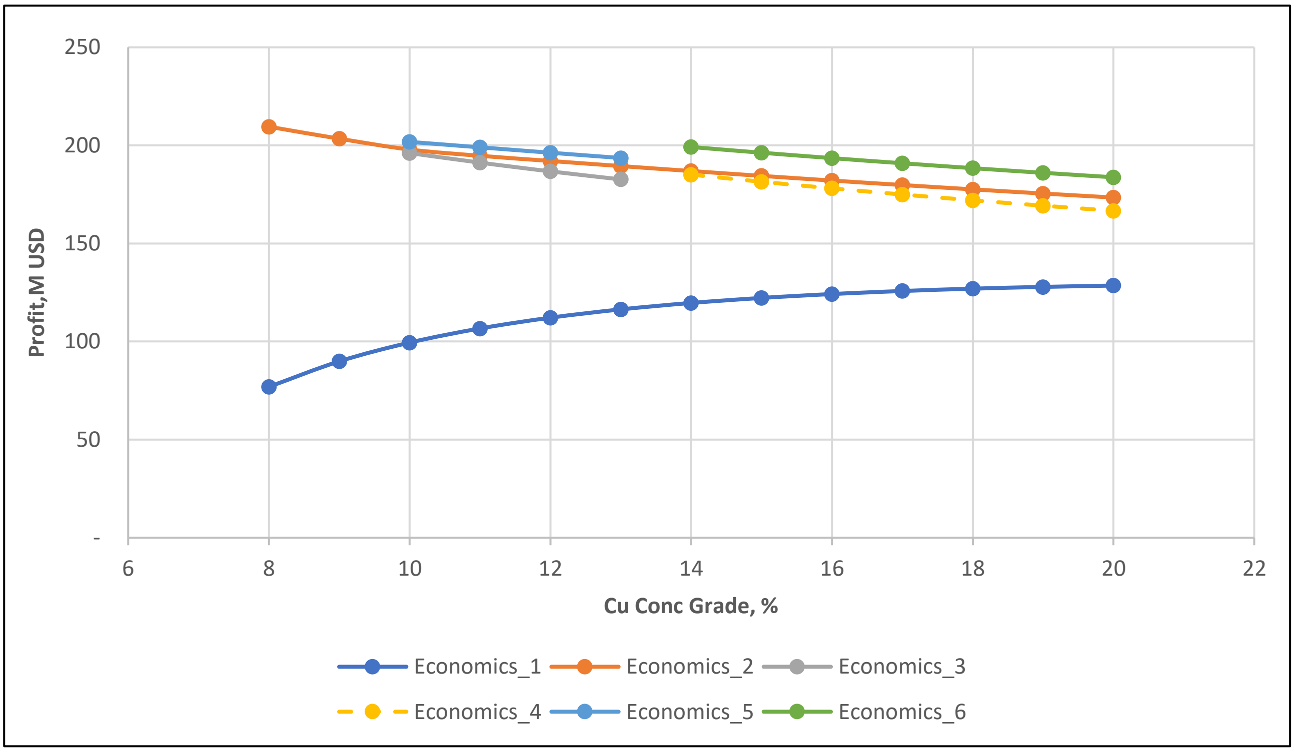


Figure 13-4: Relative DPMC annual profit at various terms

14 Mineral Resource Estimates

14.1 Mineral Resource Estimate Data

Data provided for use in the MRE was supplied as of 30 September 2021. Mineral Resources were estimated by DPMC personnel, and all stages of the Mineral Resource estimation workflow were interrogated and validated by CSA Global under the supervision of Galen White (CSA Global Principal Consultant and QP) assisted by additional CSA Global Resource Geologists as appropriate.

14.2 DPMC Migration from GEMS™ Software to Datamine™ Studio RM Software, June 2021

In June 2021, DPMC ceased using GEMS™ software to complete Mineral Resource estimation workflows and began using Datamine™ software. This change was implemented to streamline integration with downstream mine planning and scheduling activities and some benefits with respect to ease of Datamine™ software were considered important to the geological and Mineral Resource evaluation work at Chelopech.

DPMC resource geologists received significant training in the use of Datamine™ software and embarked on a mid-year review study to ensure that the defined Mineral Resource estimation workflows in place at Chelopech and completed in GEMS™ could be mapped across to Datamine™ confidently.

Accordingly, the 2020 MRE workflows completed in GEMS were replicated in Datamine™ and validated. CSA Global completed a review of this migration (July 2021) and interrogated the Datamine™ model and performed comparative analysis with the previous GEMS™ model, providing feedback and working collaboratively with DPMC to ensure that the workflows adopted in the MRE update in 2021 were appropriate.

CSA Global completed the following reviews:

- The review of the workflows used in the conversion from GEMS to Datamine™ software
- The robustness of the approach adopted
- The estimation confidence which can be applied from the kriging outputs in Datamine™ compared to those from GEMS in the MRE classification process.

Which involved:

- Comparison of input data
- Review of workflows
- Comparison of estimation outputs
- Validation of the Datamine™ estimation model
- Investigation of kriging statistics output in the Datamine™ model compared to that output from GEMS.

The following conclusions were drawn:

- Small differences were noted in the number of samples flagged and the centre point of the composites generated from the input mineralised domain wireframes between the GEMS™ and Datamine™ workflows. Wireframes generated from the same string file were not identical because the triangulation outputs are different between programs. The summary statistics and shapes of the distributions between the composite populations of GEMS™ and Datamine™ are comparable, and variance of the sample centroid is not material within the context of the estimation search neighbourhood parameters.
- Block model volumes coded for the Stockwork Envelopes ("HG") within low-grade Silica Envelopes ("SE") are within 1% of each other.
- Search parameters and top cuts were identical. Variogram ranges were the same, and very small differences in the value of the nugget and sills was noted but is not considered material or indeed significant to the grade estimate.
- Slight differences in model block grades (gold, copper, silver, arsenic, sulphur) and estimated density values between GEMS and Datamine™ were noted and are not considered material. The minor variances

noted are likely caused by the differences in the composite data centroids and the variogram nugget and sills.

- The reporting comparison for gold for all blocks reviewed within the HG envelope is acceptable. Variance of tonnes, grade and ounces is <3%.
- Slope and kriging efficiency values in the GEMS™ models were smoothed relative to Datamine™ and are consistently higher than those generated in Datamine™ because they have been calculated using Within Block Variance rather than Between Block Variance. The kriging statistics from Datamine™ better reflect the relationship of estimation confidence with drill spacing, sample orientation and geological interpretation complexity.
- The Datamine™ models for blocks reviewed were compared statistically and with swath plots using Supervisor software. Variance between the mean composite and estimation grade is <10% in all cases. The scripted Chelopech site grade estimation process in Datamine™ was validated by running a manual Datamine™ grade estimate using the same inputs.
- Reconciliation data indicates that the GEMS™ classification system is appropriate, with production grades, tonnes and metal within 10% of Measured + Indicated grades on a quarterly basis. CSA Global investigated methods to replicate the GEMS™ classification using the Datamine™ kriging statistics. Slope of regression (SOR) and search pass used in the GEMS classification are still considered the most appropriate consideration for Datamine™. Raw Datamine™ panel SOR values cannot be used to reproduce the GEMS classification as the variance in the distribution is much higher than GEMS creating a significant “spotted dog” effect.
- The proposed remedy involved smoothing of the Datamine™ SOR values by regularising into a 60 x 60 x 60 x (X, Y, Z) grid with threshold values for Measured/Indicated and Indicated/Inferred boundaries being visually selected to reflect drill density. Search pass number is used as an additional criterion to tighten up the classification boundaries around drill data.
- The smoothing of the SOR value criteria for classification is supported and is considered an appropriate indicator of estimation confidence, especially when reconciliation against production data is reviewed (i.e. historical close reconciliation of production to the MRE).
- The proposed classification replicates the existing GEMS™ classification reasonably well for the mineralisation blocks reviewed. Variance on tonnes, grade and ounces is less than 10% for Measured and Indicated material and less than 15% for Inferred material.

Thereafter, the Datamine™ workflows were implemented for the MRE update set out in this Technical Report and reviewed by CSA Global between November 2021 and February 2022.

14.3 2021 Mineral Resources Update

The drill and face sample databases were validated prior to use in the estimation of Mineral Resources. The datasets were loaded into AcQuire™ following DPM QAQC procedures. The following checks and validations were undertaken:

- Drillhole depths were validated against downhole sample, assay and lithology files
- Duplicate collar IDs were confirmed absent
- Any overlapping sampling intervals were resolved
- Intervals with sample type “NS” were excluded, for various reasons (e.g. geotechnical drillholes, historical drillholes, and lost drilling)
- Assays with undefined values (i.e. below limit of detection, were set to half limit of detection)
- Assays that have failed QAQC criteria were removed
- Drillhole survey data were validated for extreme deviations
- Lithology and alteration codes were validated against their respective libraries.

Data provided for the MRE was supplied at a date cut-off of 30 September 2021. In summary, the database consisted of a total of:

- 4,767 diamond drillholes for a total of 1,167,467 m
- 39,956 face samples
- 112,849 drillhole density samples
- 4,403 face sample density values.

Data is grouped into two main areas, known as the Western Zone and Central Zone, with each zone separated into mining blocks (Figure 14-1). In summary:

- The Central Zone is comprised of mining blocks 16, 17, 18, 19, 5, 25, 10, 7, 8, and 700
- The Western Zone is comprised of mining blocks 103, 144, 145, 146, 147, 148, 149, 149 South, 150, 151, 152 and 153.

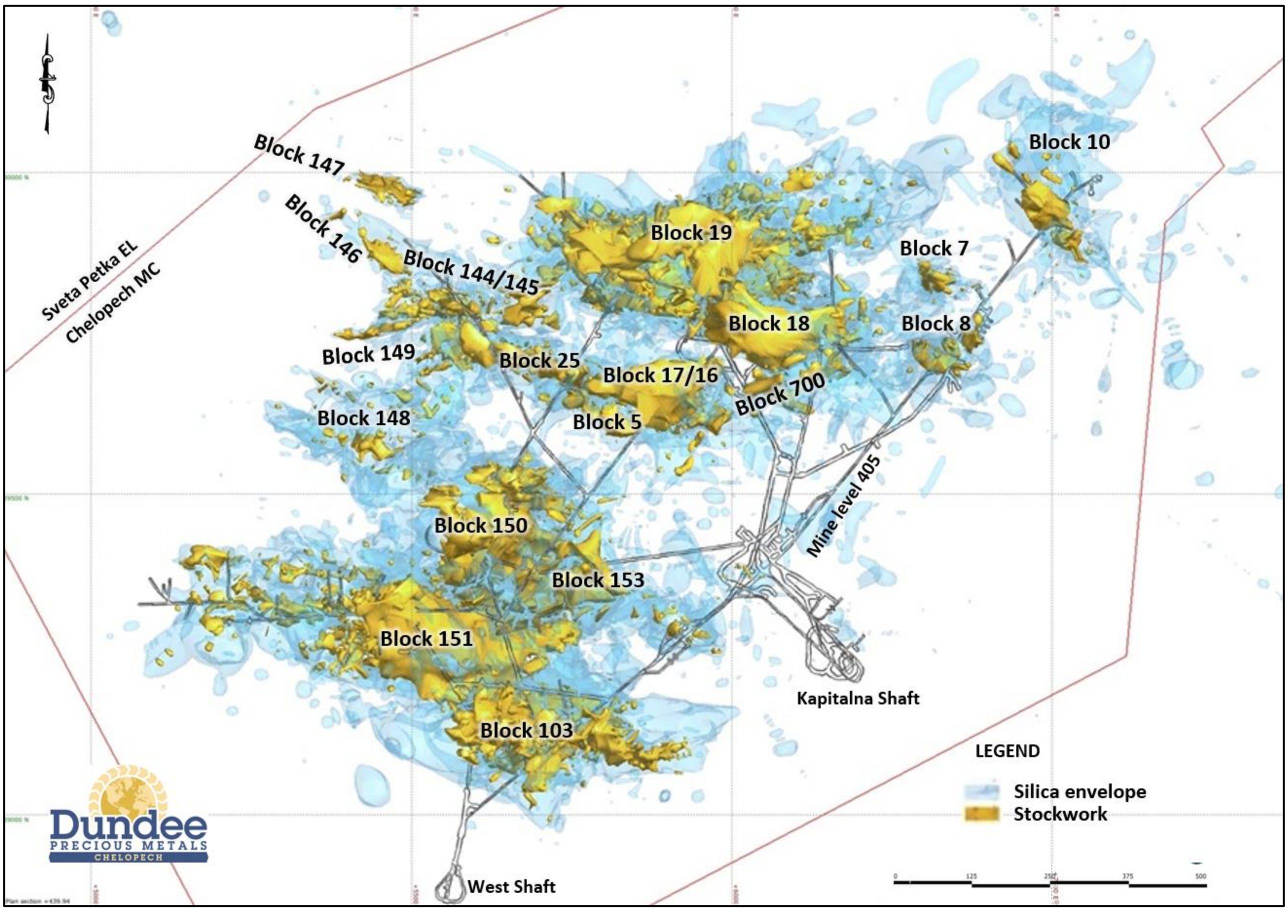


Figure 14-1: Plan view with projections of the mineralised blocks (Silica Envelope in blue and Stockwork Envelope in orange) (DPMC, 2021)

14.4 Bulk Density

Ordinary kriging was used to estimate density values into each model block. Refer to Section 12.9 for a full description on in-situ dry bulk density data used. Table 14-1 provides the search parameters. Where insufficient density data was available, a density value was estimated using the relationship between sulphur grade and density (Section 12.9). Average density values by mineralisation block are presented in Table 14-2. In total, approximately 15% of Silica Envelope material and 10% of HG envelope material was estimated using the regression due to a lack of density sampling data (Figure 14-2).

Table 14-1: Search parameters for the estimation of bulk density

Domain	Search pass	Search distance			Minimum Nb data	Maximum Nb data	Maximum samples per hole
		Major	Semi	Minor			
All	1	30	20	10	5	30	10
	2	60	40	20	5	30	10
	3	120	80	40	5	15	15

Table 14-2: Average density values by mineralisation block

Block	Bulk density (g/cm³)			
	No. of samples	Silica Envelope	No. of samples	High Grade
103	3,692	2.81	2,539	2.95
150	1,665	2.82	1,915	3.06
151	9,301	2.83	6,395	3.03
152	351	2.86	219	3.05
149	919	2.78	483	3.13
149 South	968	2.76	288	2.85
147	185	2.77	123	2.89
145	820	2.78	85	2.82
144	630	2.8	145	2.95
19	10,189	2.77	6,944	2.87
18	699	2.77	319	2.86
16	333	2.79	177	3.04
17	317	2.77	108	2.92
10	422	2.76	80	2.81
153	1,184	2.75	99	2.85
5	69	2.81	45	3.34
7	174	2.78	56	2.90
148	1,288	2.75	136	2.81
8	240	2.77	50	2.84
25	125	2.78	69	2.86
146	677	2.79	32	3.11
700	199	2.88	64	3.13

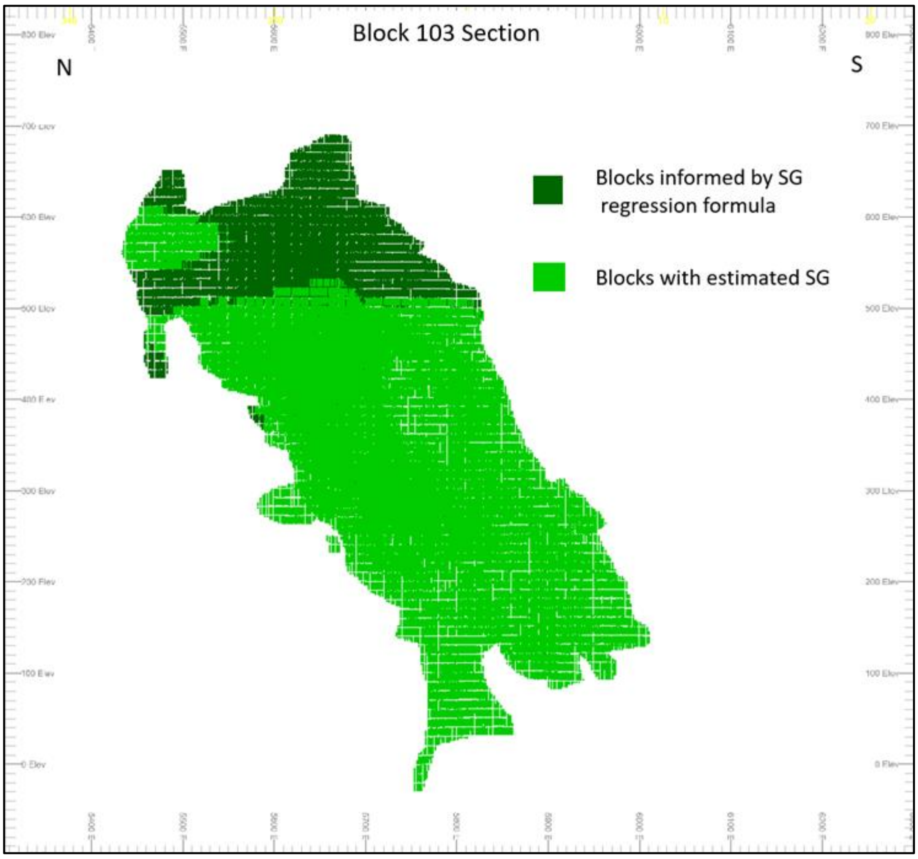


Figure 14-2: Section with projection of Block 103 block model Chelopech deposit, representing the distribution of blocks with estimated SG and blocks with applied regression formula in stockwork domains (DPMC, 2022)

14.5 Geological Interpretation and Modelling

14.5.1 Summary

Field observations supported by statistical analysis show that the distribution of copper, gold and silver mineralisation at Chelopech is primarily determined by alteration style and textural assemblages.

Mineralisation domains are classified on these geological criteria for which there are two types:

- Silica Envelopes: Lower-grade silica-overprinted haloes
- Stockwork Envelopes: Internal units of stockwork material which typically host higher-grade copper, gold and silver mineralisation.

Silica Envelopes ("SE") are modelled on logged hydrothermal alteration assemblages, typically represented by silica overprinting. Internal waste volumes exist which are interpreted (wireframed) and excluded from grade estimation.

Stockwork Envelopes ("HG") are modelled using a combination of alteration and groups of textural assemblages. These textural groupings differ between mine blocks and are listed in Section 7.5 and Table 7-2. The high grade Stockwork Envelopes are characterised with massive sulphides, well developed stockwork textures and high-grade copper and gold grades, generally >3 g/t gold equivalent (AuEq) (see Table 14-14, for AuEq calculation).

The stockwork material is typically located along the south and southeast portions of Silica Envelopes which together generally plunge towards the south and southeast.

Typical cross-section examples of Silica and Stockwork envelopes are illustrated in Figure 14-3 and Figure 14-4 in blue and light orange.

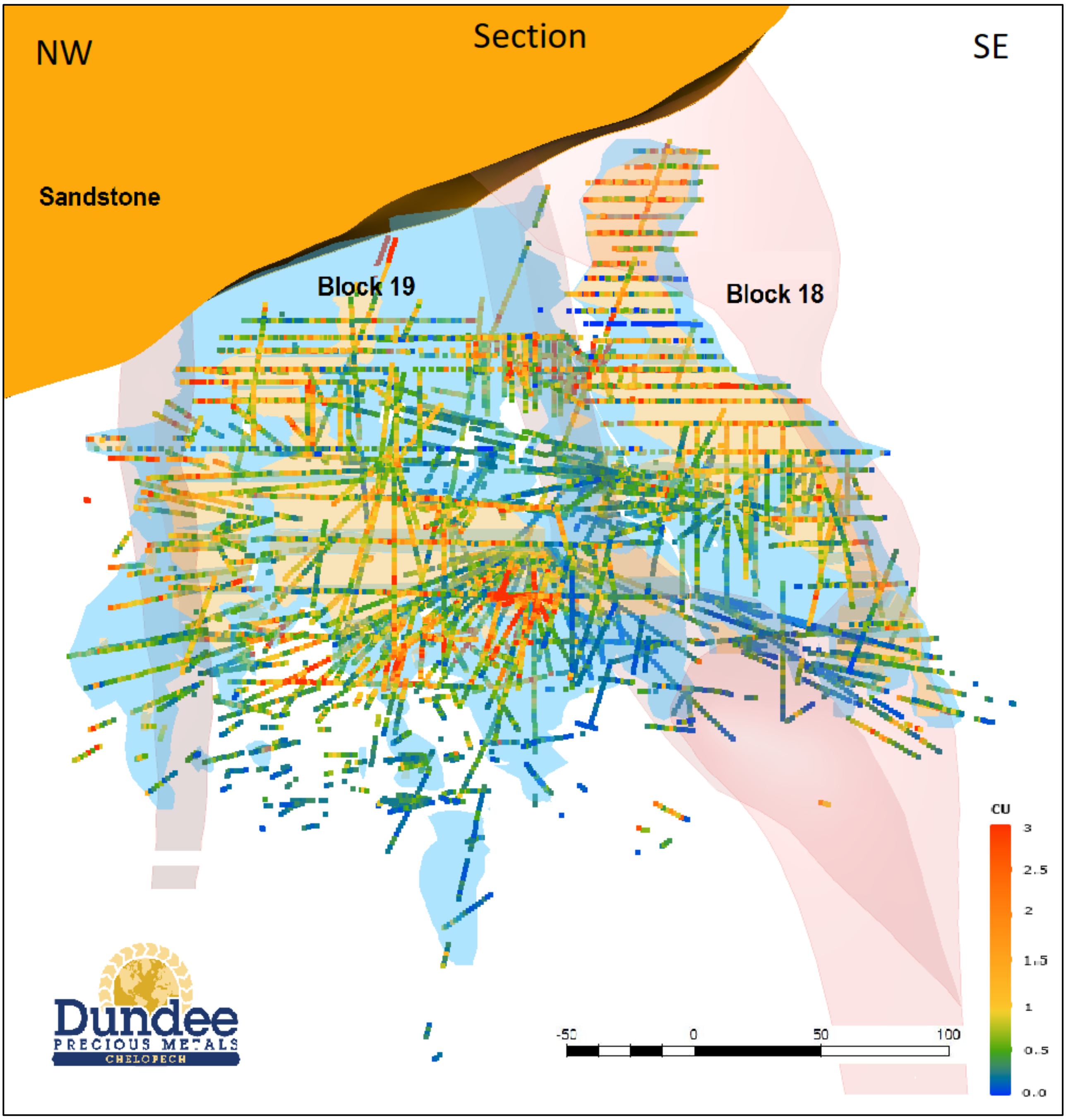


Figure 14-3: Vertical section (looking northeast) showing drillhole grades, Silica Envelope (blue) and Stockwork Envelope (gold), mining blocks 18 and 19 (DPM, 2021)

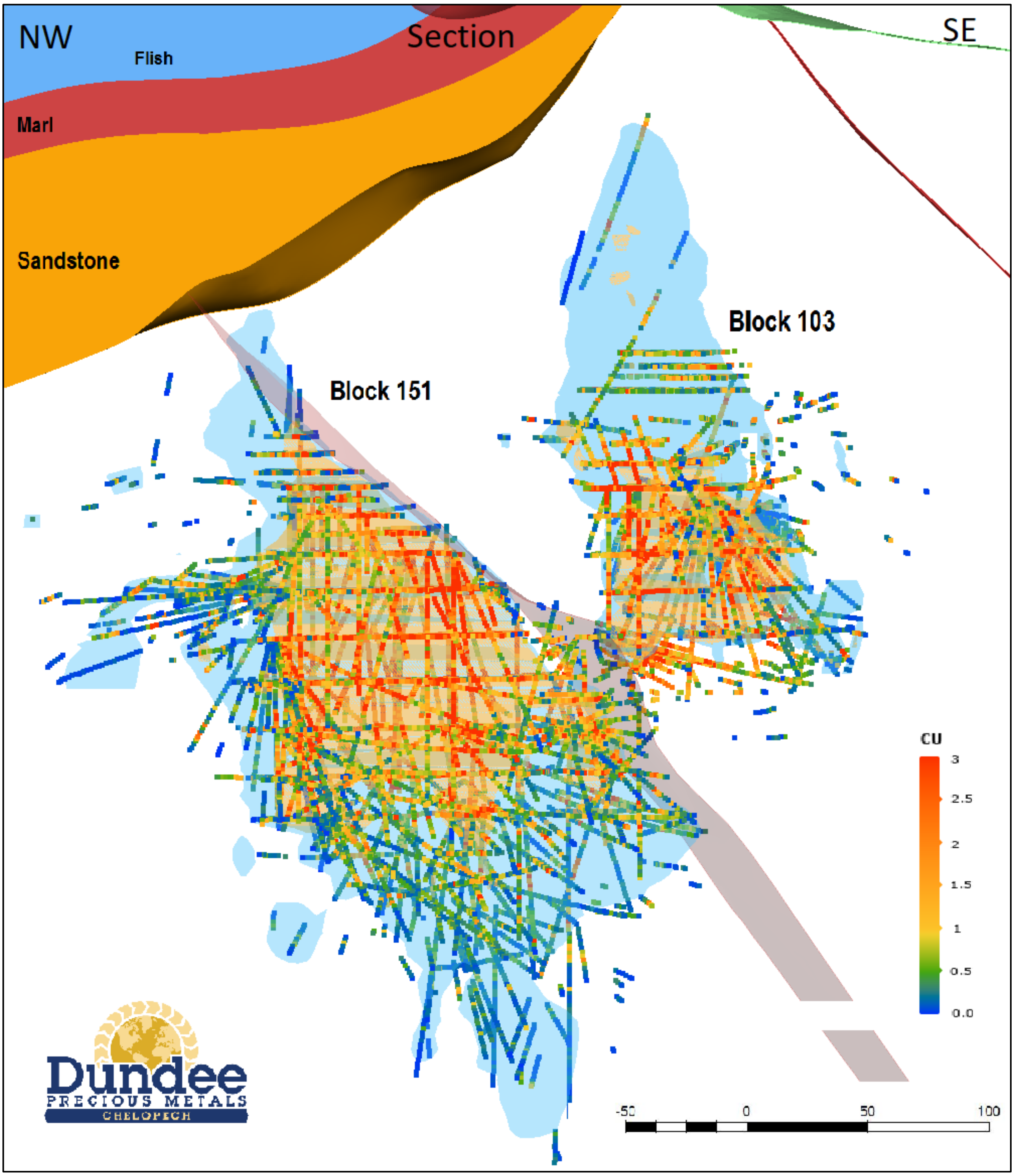


Figure 14-4: Vertical section (looking northeast) showing drillhole grades, Silica Envelope (blue) and Stockwork Envelope (gold), mining blocks 151 and 103 (DPM, 2021)

In 2021, interpretation and modelling were transferred from GEMS™ to Studio RM™ software where all existing data were used to rebuild Silica Envelopes and Stockwork in a new software package.

Interpretation of the 3D wireframes was completed by Chelopech geological mine staff using Datamine™ Studio RM software. Strings were generated in plan view at 10 m elevations and linked together to form solid wireframe volumes. All modelled wireframes used in estimation are validated for errors (intersections and other).

14.5.2 Surface Topography

A 3D digital terrain model (DTM) for Chelopech has been constructed using digitised 5 m contours from a commercially available map which has been supplemented by recent surface survey data. The DTM is reasonably accurate and provides a detailed representation of the ridges, valleys, and topographical breaks at Chelopech. The detailed accuracy of the topographic model is immaterial as it is not used in the estimate of Mineral Resources since mineralisation occurs well below the surface at the 400 m(RL).

14.5.3 Underground Development and Stoping

The Mine Survey Department constructs 3D solids of all the underground development and stoping. These solids have been extensively validated and represent material mined up to 31 December 2021. Some overlap occurs between the digital solids to ensure that all development volumes are accounted for.

14.6 Mineral Resource Modelling

14.6.1 Compositing

Recent verification work undertaken by DPMC in 2020 confirmed the results from the detailed statistical review of the impact of different composite lengths, completed historically by CSA Global (CSA Global, 2014). Based on current review, no bias was observed when compositing to 1.5 m, 3 m and 6 m lengths (Table 14-4). In result of this review, the most appropriate composite length was considered 3 m (which also matches the average face sample panel length). The impact of including residuals was also investigated and no significant bias was observed. Quantile-quantile (Q-Q) plots of 3 m composites with residuals vs composites without residuals are illustrated in Figure 14-5 and Figure 14-6.

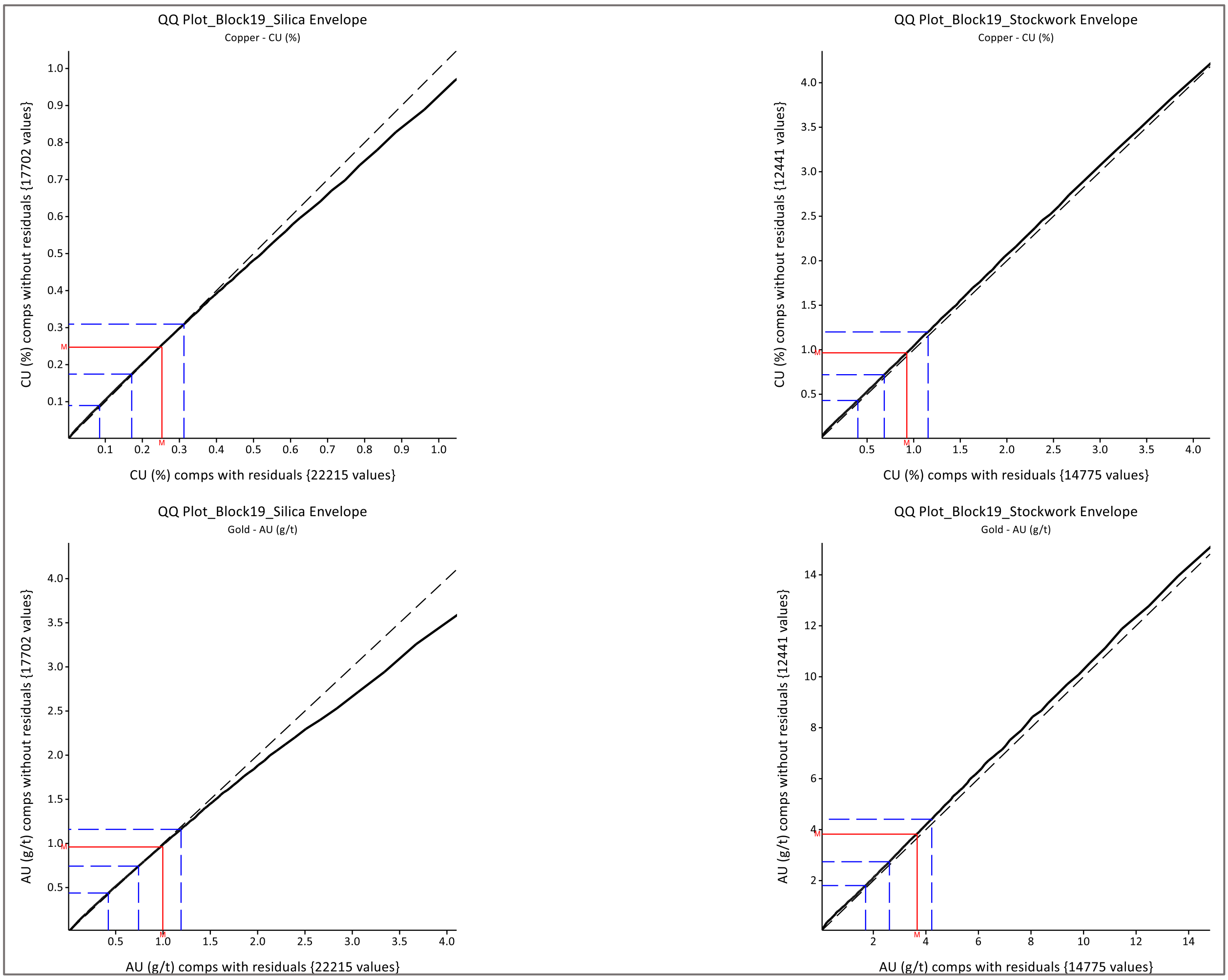


Figure 14-5: Q-Q plots of composites with residuals vs composites without residuals for Block 19 (DPMC, 2020)

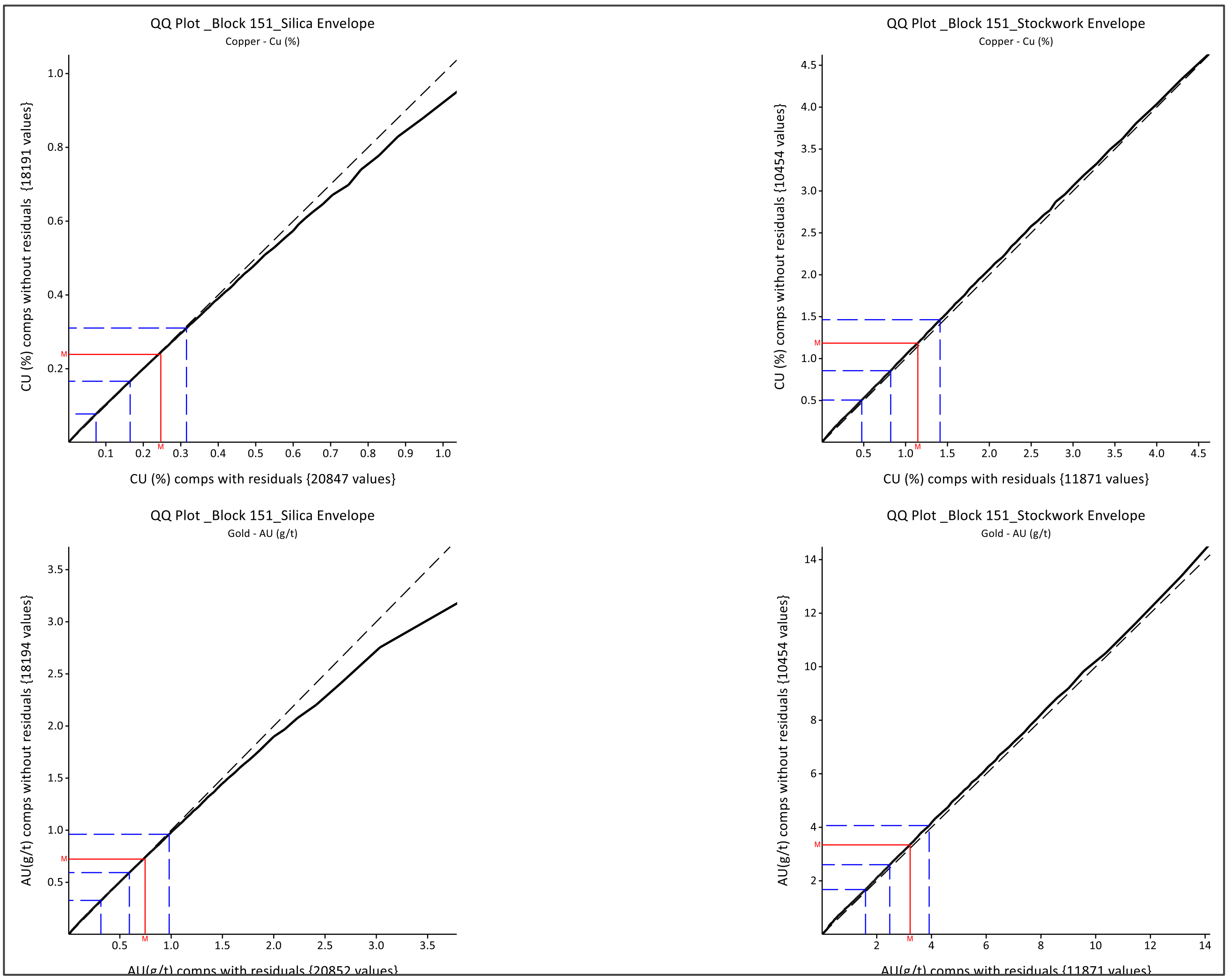


Figure 14-6: Q-Q plots of composites with residuals vs composites without residuals for Block 151 (DPMC, 2020)

Compositing was not completed on the face sample database. Development face samples are taken as horizontal panel chips of each development drive advance. Each face sample comprised of chips from a grid of approximately 20 cm x 20 cm, that covers an area of on average 3 m in length (half of a development face). For grade estimation, the drillhole database and the face sample database were combined to form a single sample database. All domain statistics, variography and estimation of resources were completed using the combined dataset.

14.6.2 Univariate Domain Descriptive Statistics

Descriptive statistics, histograms and probability plots were compiled for the copper, gold, silver, sulphur and arsenic composite data, grouped by the modelled Silica Envelopes, Stockwork Envelopes and mining blocks (Table 14-3, Table 14-4, Table 14-5, and Figure 14-7). These were used to assess the grade distributions within each domain and to determine a suitable method for interpolating grades and to select appropriate top cuts.

Most of the assay data in the HG domains show moderate to low coefficients of variation (CVs), with sulphur showing the lowest of all the elements. Gold summary statistics show moderate to high CV.

Statistical analysis of composites flagged within the low-grade regions of each block was also completed with all low-grade blocks showing similar low copper grades and moderate to high CVs.

Table 14-3: Summary statistics for drillhole composite data (2020)

Domain	Composite length	Sample	No. of samples	Cu (%)	Au (g/t)	Ag (g/t)
High Grade Envelope	1.5 m	1.5 m	82,053	1.14	3.87	9.57
		Residual	6,867	0.76	2.57	7.98
		Subtotal	**88,920**	**1.11**	**3.77**	**9.45**
	3.0 m	3.0 m	38,032	1.15	3.91	9.53
		Residual	6,876	0.82	2.73	8.99
		Subtotal	**44,908**	**1.10**	**3.73**	**9.45**
	6.0 m	6.0 m	17,867	1.18	3.96	9.59
		Residual	6,866	0.86	2.96	9.2
		Subtotal	**24,733**	**1.09**	**3.68**	**9.48**
	TOTAL		**158,561**	**1.10**	**3.74**	**9.45**
	RAW Mean (not composited)		*83,192*	*1.14*	*3.87*	*9.57*
Silica Envelope	1.5 m	1.5 m	154,924	0.23	0.77	3.84
		Residual	15,560	0.27	1.01	4.64
		Subtotal	**170,484**	**0.23**	**0.79**	**3.91**
	3.0 m	3.0 m	73,831	0.23	0.77	3.82
		Residual	15,488	0.27	1.00	4.38
		Subtotal	**89,319**	**0.24**	**0.81**	**3.92**
	6.0 m	6.0 m	33,309	0.23	0.75	3.78
		Residual	15,519	0.26	0.99	4.45
		Subtotal	**48,828**	**0.24**	**0.83**	**3.99**
	TOTAL		**308,631**	**0.24**	**0.80**	**3.93**
	RAW Mean (not composited)		***163,871***	***0.23***	***0.77***	***3.85***
GRAND TOTAL	**TOTAL**		**467,192**	**0.53**	**1.80**	**5.80**
	RAW Mean (not composited)		***247,063***	***0.54***	***1.81***	***5.78***

Table 14-4: Summary sample statistics for the major Stockwork domains (2021)

Block	103	150	151	19
Copper (%)				
Count	6,310	8,052	16,094	18,659
Minimum	0.01	0.01	0.01	0.01
Maximum	19.06	20.1	28.91	16.77
Mean	1.19	1.84	1.27	1.00
SD	1.16	1.80	1.40	0.97
Variance	1.34	3.23	1.95	0.94
CV	0.97	0.98	1.10	0.97
Gold (g/t)				
Count	6,297	7,935	16,083	19.640
Minimum	0.01	0.01	0.01	0.01
Maximum	207.53	76.70	131.40	201.99
Mean	3.01	4.65	3.49	3.87
SD	4.34	5.07	3.78	5.00
Variance	18.87	25.66	14.27	24.97
CV	1.44	1.09	1.08	1.29
Silver (g/t)				
Count	6,294	7,944	16,185	18,633
Minimum	0.01	0.01	0.01	0.01
Maximum	85.60	590.00	4505.00	468.80
Mean	4.58	12.81	14.23	8.90
SD	4.49	19.11	55.67	11.91
Variance	20.18	365.21	3099.15	141.95
CV	0.98	1.49	3.91	1.34

Block	103	150	151	19
Sulphur (%)				
Count	6,310	8,029	16,200	18,655
Minimum	0.01	0.01	0.01	0.01
Maximum	44.98	49.61	52.4	46.01
Mean	14.11	17.41	17.17	11.68
SD	5.29	7.19	7.22	4.44
Variance	28.04	51.70	52.17	19.71
CV	0.38	0.41	0.42	0.38
Arsenic (%)				
Count	5,689	6,511	15,308	16,134
Minimum	0.01	0.01	0.01	0.01
Maximum	6.23	5.84	8.30	5.11
Mean	0.36	0.54	0.39	0.28
SD	0.37	0.55	0.41	0.29
Variance	0.14	0.30	0.17	0.08
CV	1.02	1.02	1.05	1.02

Table 14-5: Summary sample statistics for the major Siliceous domains

Block	103	150	151	19
Copper (%)				
Count	9,321	5,890	23,181	25,737
Minimum	0.01	0.01	0.01	0.01
Maximum	19.62	10.66	18.35	34.00
Mean	0.29	0.31	0.25	0.27
SD	0.50	0.52	0.39	0.41
Variance	0.25	0.27	0.15	0.17
CV	1.75	1.66	1.55	1.54
Gold (g/t)				
Count	9,308	5,747	23,168	25,679
Minimum	0.01	0.01	0.01	0.01
Maximum	75.48	113.85	25.03	79.20
Mean	0.72	0.90	0.77	1.02
SD	1.19	2.03	0.80	1.67
Variance	1.41	4.11	0.64	2.77
CV	1.64	2.25	1.04	1.62
Silver (g/t)				
Count	9,307	5,754	23,224	25,676
Minimum	0.01	0.01	0.01	0.01
Maximum	280.60	1000.00	3250.00	266.20
Mean	2.36	4.74	4.20	4.27
SD	5.71	15.93	24.08	6.45
Variance	32.63	253.89	579.87	41.67
CV	2.42	3.36	5.73	1.51
Sulphur (%)				
Count	9,321	5,893	23,235	25,730
Minimum	0.01	0.01	0.01	0.01
Maximum	46.72	44.51	48.65	42.16
Mean	9.22	8.80	9.71	7.94
SD	3.88	4.21	4.09	6.61
Variance	15.02	17.73	16.71	6.82
CV	0.42	0.48	0.42	0.33

Block	103	150	151	19
Arsenic (%)				
Count	7,446	4,870	21,042	21,535
Minimum	0.01	0.01	0.01	0.01
Maximum	2.69	3.10	3.26	5.1
Mean	0.08	0.08	0.08	0.07
SD	0.11	0.14	0.11	0.1
Variance	0.01	0.02	0.01	0.01
CV	1.44	1.73	1.43	1.49

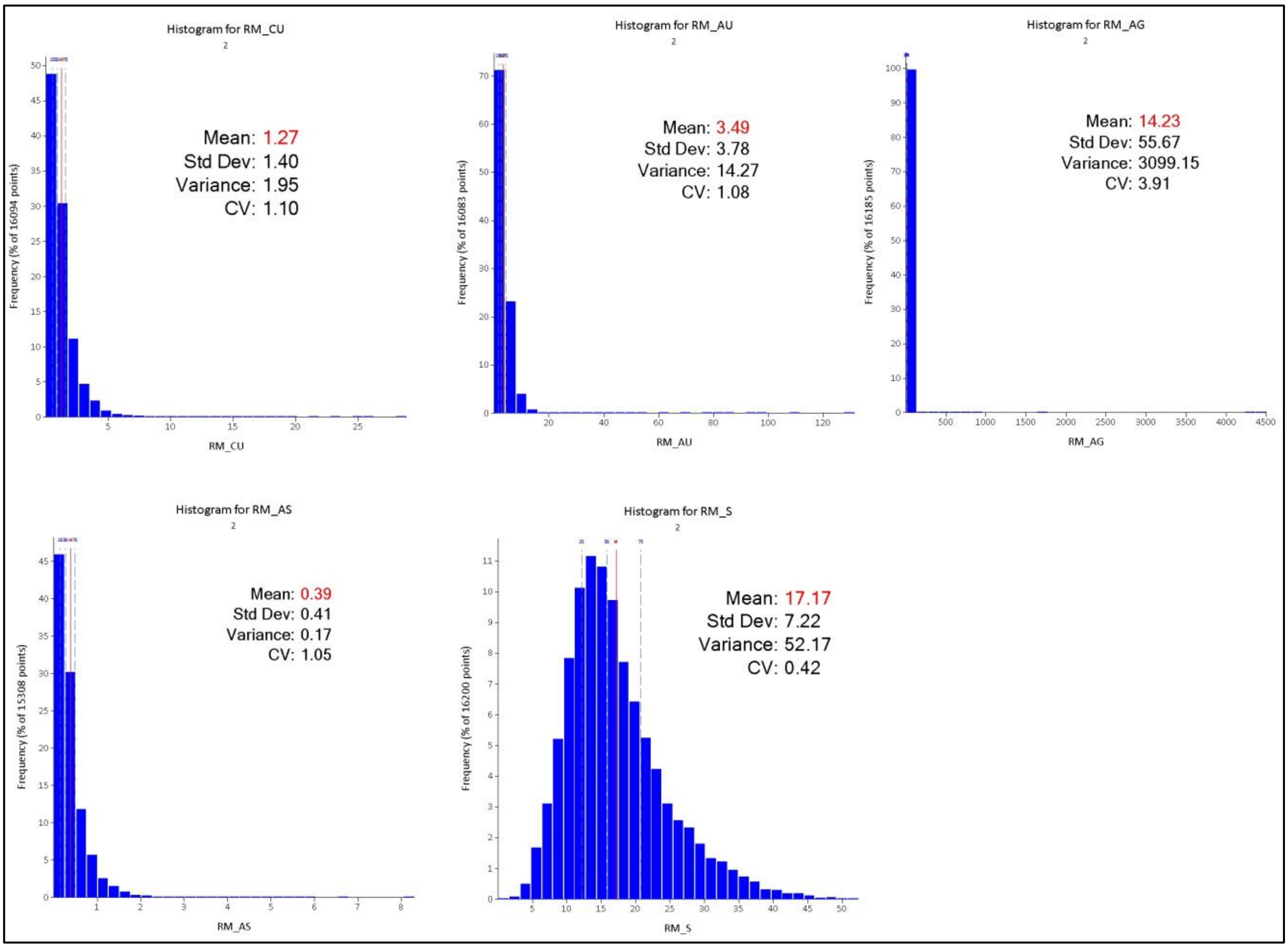


Figure 14-7: Examples of histograms for the five estimated variables for Stockwork domain Block 151 (DPMC, 2021)

14.6.3 Multivariate Domain Descriptive Statistics

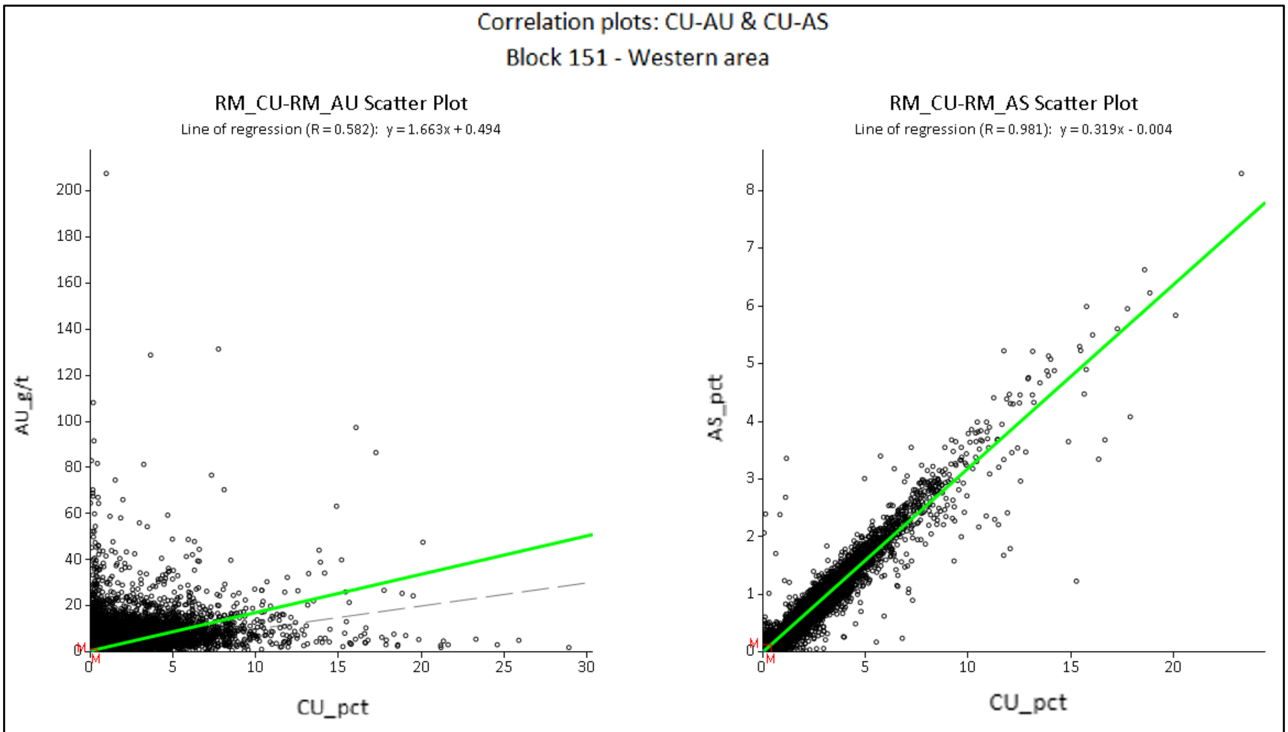
A multivariate analysis of the relationship between copper, gold, arsenic, and sulphur was completed in 2020 to test correlation between all elements. The findings of this review were compared with previous study done in 2012. Additional data collected in 2021 and associated review found no significant or material change in the correlation coefficients.

Moderate correlation was noted between copper and gold while strong correlation exists between copper and arsenic in both silica and stockwork domains. Significant differences in the levels of correlation are noted only in Block 700 due to a different style of the mineralisation mainly presented by barite-quartz-gold veins. An example of a correlation matrix for Block 700 is presented in Table 14-6.

Table 14-6: Stockwork Domain 700 – correlation matrix displaying Pearson correlation coefficients

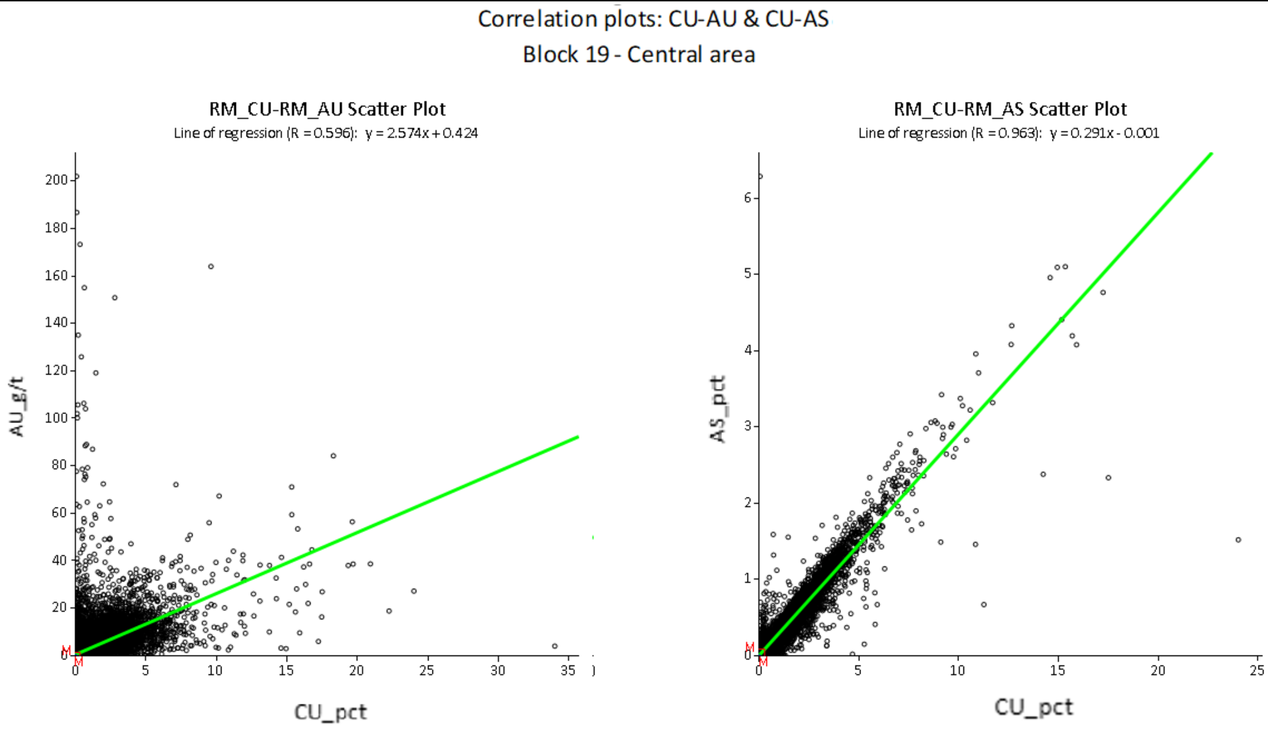
	Copper	Gold	Silver	Sulphur
Gold	0.07			
Silver	0.62	0.36		
Sulphur	0.11	0.34	0.29	
Arsenic	0.38	0.13	0.4	0.22

An example of a correlation matrix and correlation plots for copper vs gold and copper vs arsenic are illustrated in Figure 14-8 and Figure 14-9. These figures show correlations in Block 19 and Block 151 representative respectively for the Central and Western areas, the blocks with the biggest metal contents in both areas.



Correlation	CU	AU	AG	AS	S
CU	1	0.58	0.23	0.98	0.62
AU	0.58	1	0.17	0.58	0.60
AG	0.23	0.17	1	0.20	0.26
AS	0.98	0.58	0.20	1	0.60
S	0.62	0.60	0.26	0.60	1

Figure 14-8: Copper-gold and copper-arsenic correlation plots for Block 151 (DPMC, 2021)



Correlation	CU	AU	AG	AS	S
CU	1	0.60	0.41	0.96	0.63
AU	0.60	1	0.38	0.54	0.56
AG	0.41	0.38	1	0.40	0.45
AS	0.96	0.54	0.40	1	0.63
S	0.63	0.56	0.45	0.63	1

Figure 14-9: Copper-gold and copper-arsenic correlation plots for Block 19 (DPMC, 2021)

14.6.4 Application of Top Cuts

Copper and gold grades distributions for the various estimation domains are characterised by being positively skewed with moderate to high CVs, indicating that high-grade values may contribute significantly to local mean grades. No top cut was required for sulphur due to an absence of outliers in the population.

Appropriate copper and gold top cuts were obtained by reviewing probability plots and the impact of applied cuts to the mean grades and SD. Top cuts were chosen where there was a pronounced inflection of the distribution or an increase in the variance of the data.

A summary of the more significant high-grade top cuts as applied to individual domains is presented in Table 14-7.

Table 14-7: Top cuts used for copper, gold, silver, and arsenic for the largest domains of Resource model

Block	Element	Sub-domain	Number (data)	Mean	Upper cut	Cut mean	Number (data cut)	% Change in mean
103	Cu	HG	6,310	1.19	5.6	1.17	54	-2%
		SE	9,321	0.29	2.6	0.28	27	-3%
103	Au	HG	6,297	3.01	16	2.88	53	-4%
		SE	9,308	0.72	6	0.7	36	-3%
103	Ag	HG	6,294	4.58	40	4.56	10	0%
		SE	9,307	2.36	17	2.16	69	-8%
103	As	HG	5,689	0.36	2	0.36	35	0%
		SE	7,446	0.08	0.4	0.07	102	-13%

Block	Element	Sub-domain	Number (data)	Mean	Upper cut	Cut mean	Number (data cut)	% Change in mean
150	Cu	HG	8,052	1.84	14	1.83	10	-1%
		SE	5,890	0.31	4	0.31	17	0%
150	Au	HG	7,935	4.65	31	4.58	47	-2%
		SE	5,747	0.9	12	0.86	11	-4%
150	Ag	HG	7,944	12.81	87	12.3	58	-4%
		SE	5,754	4.74	70	4.42	20	-6%
150	As	HG	6,511	0.54	4	0.54	11	0%
		SE	4,870	0.08	0.9	0.08	24	0%
151	Cu	HG	16,094	1.27	5.6	1.23	220	-3%
		SE	23,181	0.25	2	0.25	121	0%
151	Au	HG	16,083	3.49	14	3.37	152	-3%
		SE	23,168	0.77	6	0.76	62	-1%
151	Ag	HG	16,185	14.23	99	12.95	111	-9%
		SE	23,224	4.2	25	3.62	274	-14%
151	As	HG	15,308	0.39	2	0.38	147	-3%
		SE	21,042	0.08	0.6	0.08	120	0%
19	Cu	HG	18,659	1	7	0.99	55	-1%
		SE	25,737	0.27	3	0.26	50	-4%
19	Au	HG	18,640	3.87	25	3.75	108	-3%
		SE	25,679	1.02	10	0.99	83	-3%
19	Ag	HG	18,633	8.9	73	8.69	93	-1%
		SE	25,676	4.27	40	4.15	118	-1%
19	As	HG	16,134	0.28	1.7	0.28	88	0%
		SE	21,535	0.07	0.7	0.07	69	0%

14.6.5 Impact of Data Clustering

Visual inspection of the face sampling, underground Mineral Resource drilling and surface drilling datasets shows clear clustering of data, biased towards higher-grade regions of the mineral deposit. This is due to a high density of face sampling within the high-grade portions of the resource currently targeted for mining. De-clustering was completed to review its effect prior to Mineral Resource estimation.

Cell de-clustering was completed with weights determined as 1/n, with "n" representing the number of data in each cell. The mean grades of the naive (cut) composites and the de-clustered (cut) composites have been compared (Table 14-8). As expected, the de-clustered mean grades tend to be lower than the un-de-clustered mean grades.

Table 14-8: Comparison of raw and de-clustered mean grades by domains

Block	Sub-domain	De-clustered cell dimensions	Mean	Cut mean	De-clustered cut mean	Difference mean and de-clustered cut mean
Copper %						
103	HG	25 x 25 x 20	1.19	1.17	1.15	3%
	SE	25 x 25 x 20	0.29	0.28	0.25	14%
150	HG	25 x 25 x 20	1.84	1.83	1.63	11%
	SE	25 x 25 x 20	0.31	0.31	0.34	-10%
151	HG	25 x 25 x 20	1.27	1.23	1.15	9%
	SE	25 x 25 x 20	0.25	0.25	0.23	8%
19	HG	20 x 20 x 20	1.00	0.99	0.96	4%
	SE	20 x 20 x 20	0.27	0.26	0.25	7%

Block	Sub-domain	De-clustered cell dimensions	Mean	Cut mean	De-clustered cut mean	Difference mean and de-clustered cut mean
Gold (g/t)						
103	HG	25 x 25 x 20	3.01	2.88	2.72	10%
	SE	25 x 25 x 20	0.72	0.7	0.66	8%
150	HG	25 x 25 x 20	4.65	4.58	4.25	9%
	SE	25 x 25 x 20	0.9	0.86	0.96	-7%
151	HG	25 x 25 x 20	3.49	3.37	3	14%
	SE	25 x 25 x 20	0.77	0.76	0.71	8%
19	HG	20 x 20 x 20	3.87	3.75	3.52	9%
	SE	20 x 20 x 20	1.02	0.99	0.91	11%
Silver (g/t)						
103	HG	25 x 25 x 20	4.58	4.56	5.00	-9%
	SE	25 x 25 x 20	2.36	2.16	2.44	-3%
150	HG	25 x 25 x 20	12.81	12.3	12	6%
	SE	25 x 25 x 20	4.74	4.42	4.78	-1%
151	HG	25 x 25 x 20	14.23	12.95	12.11	15%
	SE	25 x 25 x 20	4.2	3.62	3.75	11%
19	HG	20 x 20 x 20	8.9	8.69	9.1	-2%
	SE	20 x 20 x 20	4.27	4.15	4.16	3%

14.6.6 Variography Study

Summary

A detailed review of the copper, gold, silver, arsenic, and sulphur variography was undertaken in Supervisor software in preparation for grade estimation. This was undertaken on the 3 m uncut assay dataset (with drillhole data composited to 3 m) within individual Silica Envelope ("SE") domains which encapsulate the Stockwork ("HG") domains.

The variography was used to describe the spatial correlation (co-variance) between data points within mineralisation domains for a nominated separation distance (lag). All data points within the zone are compared at nominated lag distances with the average squared difference of the two sample points obtained. The averaged squared difference of the data point's gamma (Y-axis) for each lag distance (X-axis) is plotted. This calculated graph is called an experimental semi-variogram, hereby referred to as the variogram.

Fitted to the variogram is a mathematical model which, when used in the ordinary kriging algorithm, will re-create the observed spatial continuity described in the variogram.

Modelling

A standard approach was used model the variograms for each envelope. The steps taken are summarised below:

- Variograms were generated to determine the major, semi-major, and minor axes of continuity which are perpendicular to each other
- The variogram in the downhole direction is modelled to determine the nugget to determine the close-spaced variability
- The major, semi-major, and minor axes of continuity are modelled using two or occasionally three spherical structures.

In summary:

- The modelled orientations were consistent with the geological understanding of the mineralisation.
- A low nugget effect and a dominant first structure were the key features of the models.

The variogram model parameters for the major stockwork domains are presented in Table 14-9 to Table 14-12.

Table 14-9: Variogram parameters in Datamine™ ZXZ rotation – Block 150 Stockwork domain

Element	C0	C1	Rotation			Range			C2	Range		
			Z	X	Z	Major	Semi	Minor		Major	Semi	Minor
Copper	0.23	0.46	-50	110	-80	22	19	17	0.31	109	68	31
Gold	0.24	0.45	-50	110	-80	38	23	19	0.31	117	74	38
Silver	0.27	0.48	-50	110	-80	30	28	21	0.26	118	83	38
Sulphur	0.11	0.50	-50	110	-80	30	24	20	0.39	112	76	37
Arsenic	0.15	0.55	-50	110	-80	33	24	16	0.30	103	57	29

Table 14-10: Variogram parameters – Block 103 Stockwork domain

Element	C0	C1	Rotation			Range			C2	Range		
			Z	X	Z	Major	Semi	Minor		Major	Semi	Minor
Copper	0.27	0.43	-160	100	-120	25	19	15	0.30	66	51	24
Gold	0.26	0.49	-160	100	-120	19	13	8	0.25	58	43	20
Silver	0.23	0.47	-160	100	-120	18	13	7	0.30	56	43	24
Sulphur	0.22	0.33	-160	100	-120	18	13	6	0.45	50	38	21
Arsenic	0.23	0.45	-160	100	-120	28	19	7	0.32	59	40	18

Table 14-11: Variogram parameters – Block 19 Stockwork domain

Element	C0	C1	Rotation			Range			C2	Range		
			Z	X	Z	Major	Semi	Minor		Major	Semi	Minor
Copper	0.27	0.45	30	60	-40	16	13	10	0.28	67	39	28
Gold	0.55	0.34	30	60	-40	17	12	7	0.11	66	45	29
Silver	0.36	0.35	30	60	-40	14	12	9	0.29	76	57	39
Sulphur	0.23	0.4	30	60	-40	24	19	15	0.37	75	57	49
Arsenic	0.18	0.42	60	60	-50	18	13	13	0.40	73	53	40

Table 14-12: Variogram parameters – Block 151 Stockwork domain

Element	C0	C1	Rotation			Range			C2	Range		
			Z	X	Z	Major	Semi	Minor		Major	Semi	Minor
Copper	0.29	0.49	-140	80	80	22	15	12	0.22	81	61	45
Gold	0.40	0.46	-140	80	80	23	19	16	0.14	83	66	47
Silver	0.51	0.45	-140	80	80	37	30	21	0.04	80	70	54
Sulphur	0.12	0.52	-140	80	80	27	26	16	0.36	93	54	36
Arsenic	0.25	0.54	-140	80	80	21	15	10	0.21	63	50	38

14.7 Block Modelling

14.7.1 Block Model Extents and Block Size

Prior to estimation a volume block model was constructed using Datamine™ software product Studio RM. There are no significant changes in the size of the blocks compared to the previous software. Kriging neighbourhood analysis (KNA) was performed to determined optimal block sizes. Figure 14-10 highlights a test block area where KNA was completed to determine an optimum block size 10 m x 10 m x 10 m. Studio RM use sub-cell method to evaluate volumes in domains. For the block model, a minimum sub-celling regime of 2.5 m x 2.5 m x 2.5 m was chosen, given the need to honour the volumes of the complex mineralisation domains (example shown in Figure 14-10).

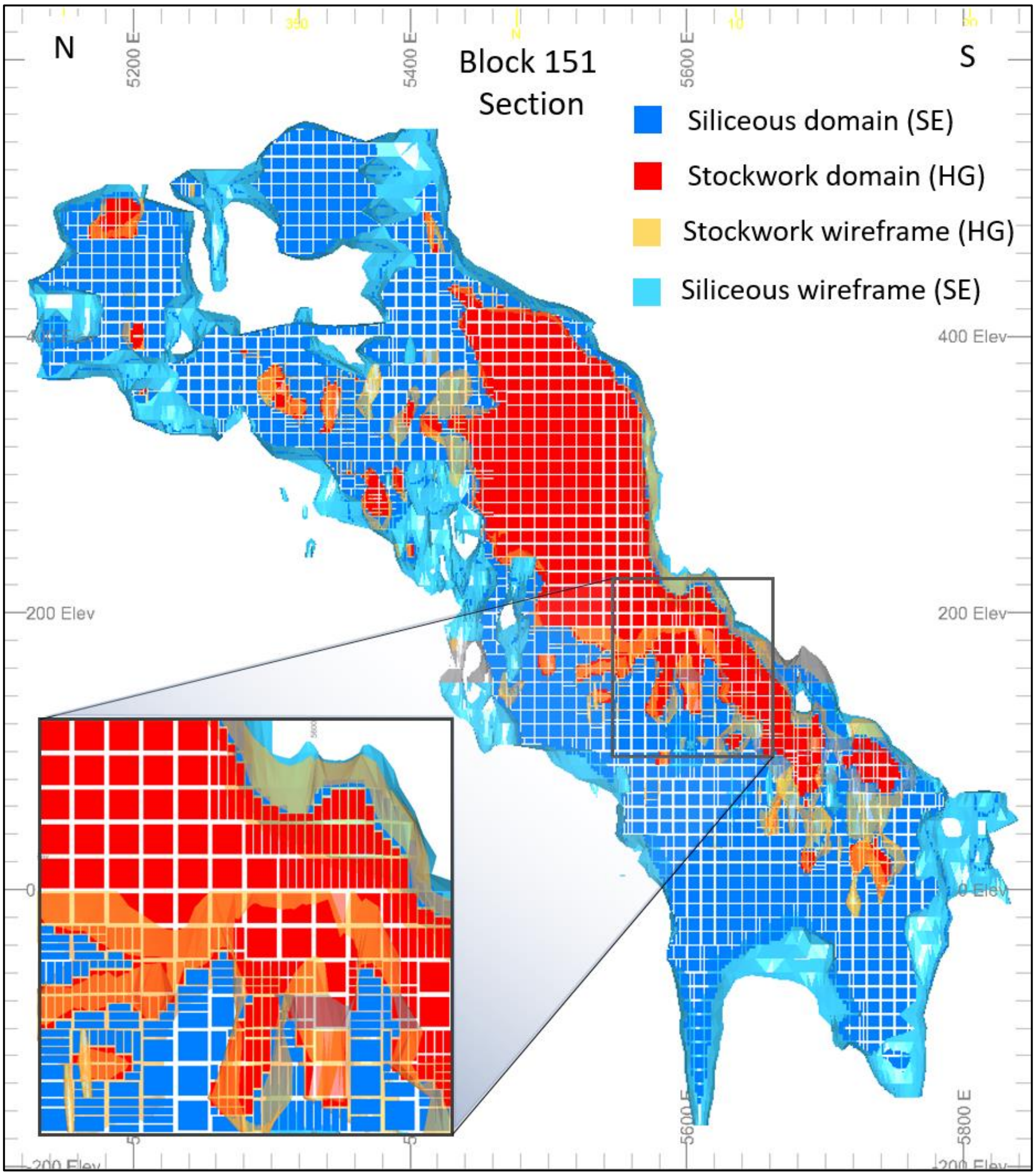


Figure 14-10: Block size and sub-blocks in 151 Block (DPMC, 2022)

Figure 14-11 shows the results of the block size quantitative KNA where block sizes ranging from 5 m x 5 m x 5 m to 20 m x 20 m x 20 m were tested. The following statistics were reported during the review:

- The slope of the regression ("slope") of the "true" block grade and the "estimated" block grade
- The weight of the mean ("wom") – which reflects local variability
- The distribution of the kriging weights, including the proportion of the negative weights
- Kriging efficiency ("ke").

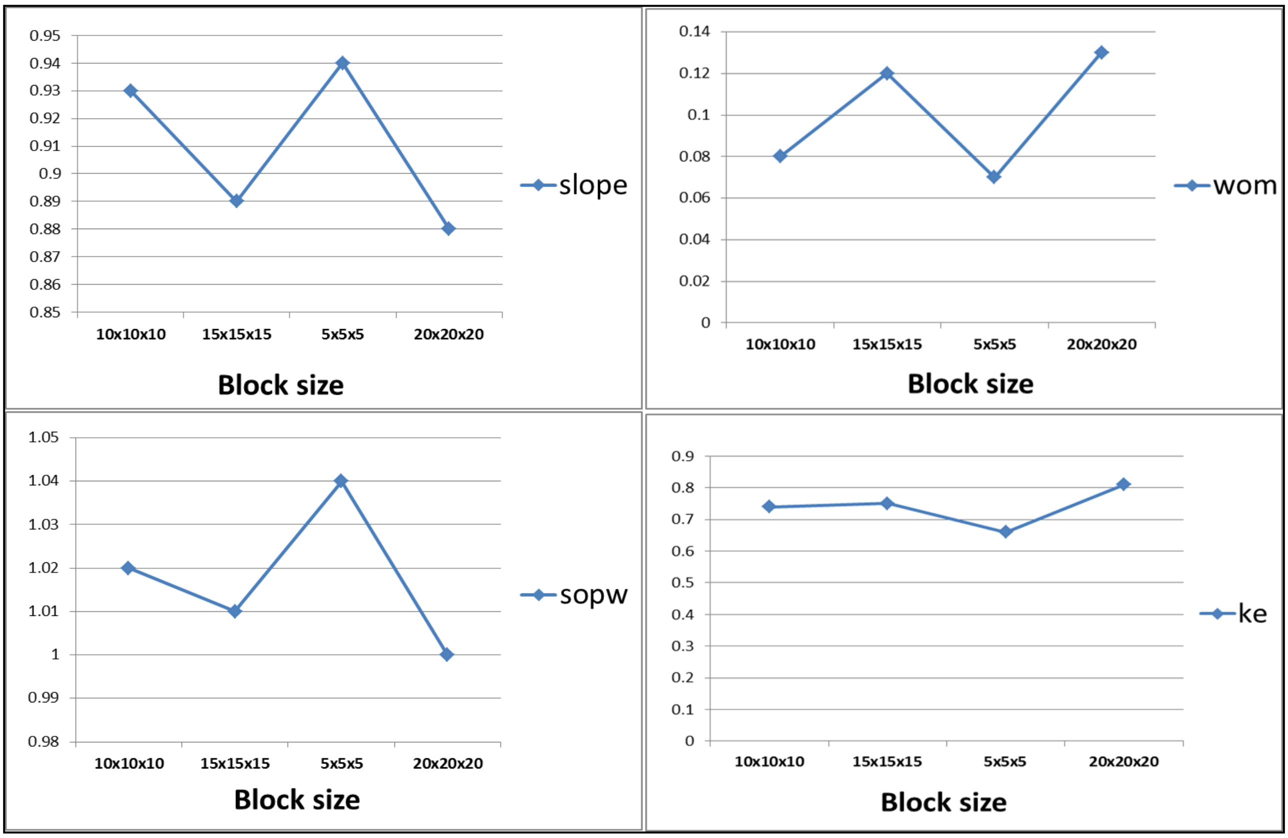


Figure 14-11: Quantitative KNA results for block size (DPMC)

The block size of 5 m(E) x 5 m(N) x 5 m(Z) was found to achieve the good results in terms of the chosen criteria; however, a parent cell block dimension of 10 m(E) x 10 m(N) x 10 m(Z) was chosen as a compromise between drilling and face sampling data spacing and the spatial requirements of mine planning for underground development and production.

14.7.2 Block Model Attributes

The volume block model was coded by stockwork and siliceous domain using the geological and structural wireframes. Final block volumes were validated against the wireframe volumes.

The dimensions and extents of the block model and are summarised in Table 14-13. Figure 14-12 shows the outline of the complete block model for the Chelopech MRE area.

Table 14-13: Coordinate and dimensions for the volume block model

	Minimum (m)	Maximum (m)	Extent (m)	Block size	
				Parent cell	Sub cell
Easting	4800	7080	2,280	10	2.5
Northing	28890	30,540	1,650	10	2.5
Elevation	-370	830	1,200	10	2.5

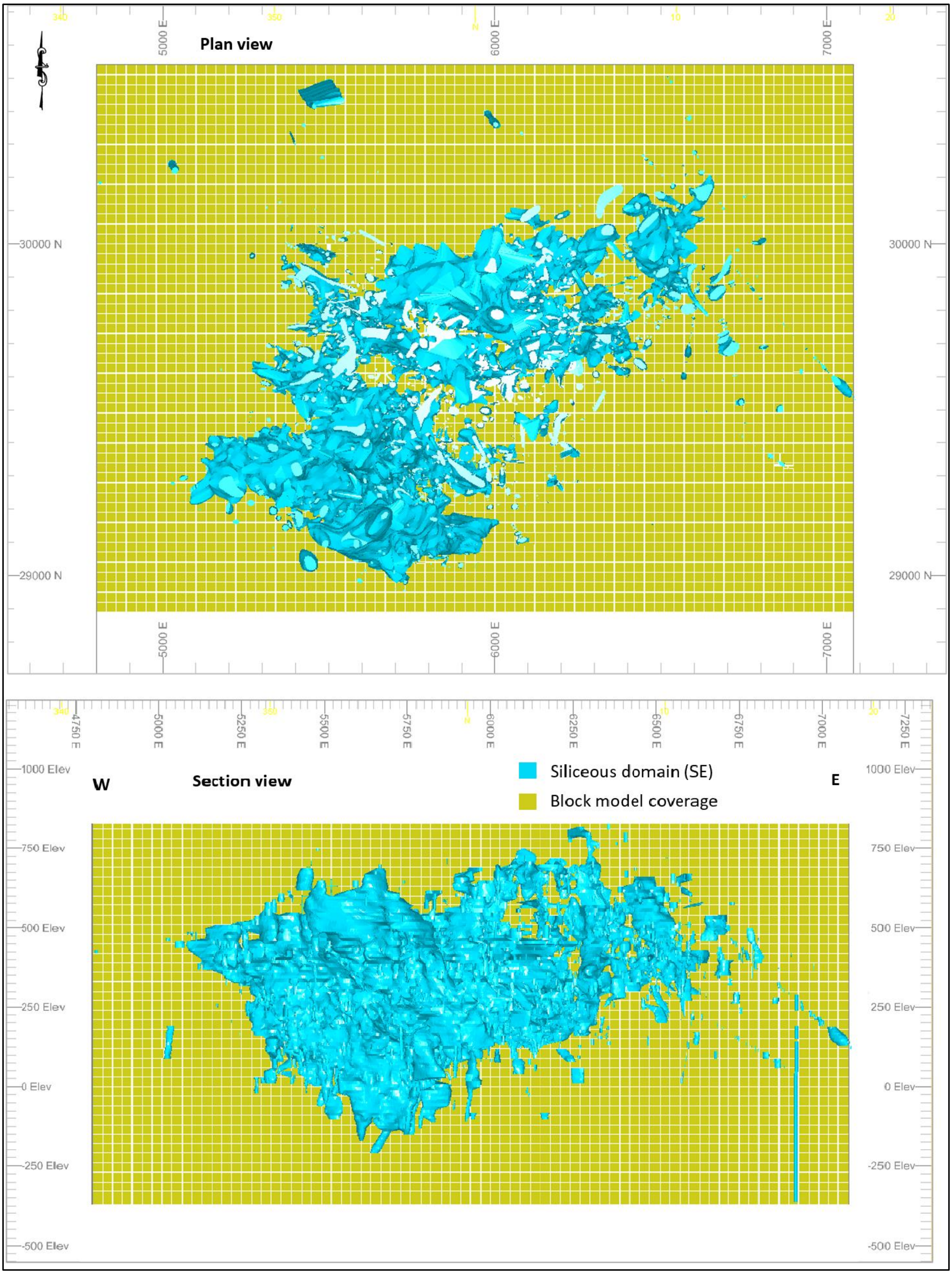


Figure 14-12: Plan view (top) and vertical section, looking north (bottom) of block model extents for Chelopech MRE area

Note: Shaded yellow area shows outline of the model area and the data extents used for this MRE.

A list of block model attributes is presented in Table 14-14.

Table 14-14: Block model attributes

Attribute	Description
BLOCK	Production block name
ENV	Siliceous domain (SE) = 1, stockwork (HG) = 2
ZONE	Mineralisation block number suffix with 1 for HG and 2 for SE
DENSITY	Estimated in situ dry bulk density
RM_CU	Estimated copper value in percent (Kriging method)
RM_AU	Estimated gold value in ppm (Kriging method)
RM_AG	Estimate silver value in ppm (Kriging method)
RM_AS	Estimated arsenic value in percent (Kriging method)
RM_S	Estimated sulphur value in percent (Kriging method)
AUEQ	AuEq=2.06*Cu% +Au g/t
RM_CUNN	Estimated copper value in percent (Nearest Neighbour method)
RM_AUNN	Estimated gold value in ppm (Nearest Neighbour method)
RM_AGNN	Estimate silver value in ppm (Nearest Neighbour method)
RM_ASNN	Estimated arsenic value in percent (Nearest Neighbour method)
RM_SNN	Estimated sulphur value in percent (Nearest Neighbour method)
RESCLASS	Classification field
TOT_CON_PI_T	NSR-less-costs per tonne and cut-off grade parameter*
RM_AU_KE	Kriging efficiency derived from Au estimate
RM_AU_N	Number of samples derived from Au estimate
RM_AU_SR	Kriging slope of regression between derived from Au estimate
RM_AU_SI	Estimation search pass - 1 = first search pass; 2=second search pass; 3=third search
DCODE	Depletion flag

**Calculated from several block model fields comprising the NSR calculation elements.*

14.8 Grade Estimation

Estimation of the copper, gold, silver, arsenic, and sulphur grades was completed using ordinary kriging within Datamine™ Studio RM.

14.8.1 Estimation Summary

Ordinary kriging is described as the best linear unbiased estimator (BLUE), which applies the modelled variogram to produce a minimum error-variance estimate. This is based on a linear weighting of the sample data within a defined sample search neighbourhood. The algorithm requires the sum of the weights applied to the sample data to equal one, thus allowing the mean grade to vary as the search neighbourhood is moved to each new location but using a constant covariance model (the variogram) to determine the sample weights.

Discretisation allows for the kriging of grades into blocks using point to block covariance values, to produce a block estimate. The discretisation matrix reproduces the theoretical global block variance based on the variogram model. This is achieved by increasing the number of discretisation points and changing their configuration until the block variance stabilises.

Estimation variance, which represents the minimised error variance on which the kriging weights are based, is a measure of the deviation of the estimated block variance from the theoretical block variance. The estimation variance depends on the block size, spatial configuration of the sample data used and the variogram model, but not the actual sample data values.

14.8.2 Estimation Parameters

Optimum sample search parameters were determined through a process of KNA completed to investigate kriging efficiency and SOR. In addition to this, results from the variography review and known data spacing support the selection of search parameters chosen. The sample search parameters used are presented in Table 14-15.

Table 14-15: Ordinary kriging sample search parameters

Domain	Search pass	Search distance			Minimum Nb data	Maximum Nb data	Maximum samples per hole
		Major	Semi	Minor			
All geology domains, except 103, 149, 147, 145, 5	1	30	15	10	12	24	4
	2	60	30	20	8	24	4
	3	120	60	40	4	24	4
103	1	40	20	15	12	24	4
	2	80	40	30	8	24	4
	3	160	80	60	4	24	4
149 SE	1	30	25	10	12	24	4
	2	60	50	20	8	24	4
	3	120	100	40	4	24	4
149 HG	1	30	25	10	10	20	4
	2	60	50	20	6	20	4
	3	120	100	40	2	20	4
147	1	30	20	15	12	24	4
	2	60	40	30	8	24	4
	3	120	80	60	4	24	4
145	1	40	40	15	12	24	12
	2	80	80	30	8	24	12
	3	160	160	60	4	24	12
5	1	30	30	15	12	24	4
	2	60	60	30	8	24	4
	3	120	120	60	4	24	4
Bulk density	1	30	20	10	5	30	10
	2	60	40	20	5	30	10
	3	120	80	40	5	15	10

Kriging was estimated into parent blocks, discretised into 3 m x 3 m x 3 m (X, Y, Z) parts.

During estimation, kriging and search statistics were copied to the estimated blocks to assist with validation and classification of the estimate. These parameters included:

- Number of samples informing a block's estimate
- Average distance of samples informing a block's estimate
- The estimation pass each block was estimated in
- The kriging variance.

14.9 Block Model Validation

The estimate was validated by comparing input composites vs output grades. This was completed:

- At a local scale, by comparing (on section) sample grades against neighbouring block grades (see Figure 14-13 and Figure 14-14).
- At a semi-local scale; by generating swath plots at Bench, Easting and Northing increments. Swath plots compare total model tonnes vs total composite metres and average model grades vs average composite grades, at even increments (swaths) across the resource (Figure 14-15 and Figure 14-16).
- At a global scale; by comparing mean grades of the estimated model against the de-clustered and top cut assay input data.
- By reviewing mining reconciliation data (detailed in Section 16.6) in key production areas to compare modelled vs mined grades and tonnes. The reconciliation work completed by DPM shows a good

correlation between mill production, Mineral Reserves and Mineral Resources. Table 14-16 presents the MRE (before dilution) compared mine production estimates. The MRE tonnes are slightly higher with higher grades than the production data.

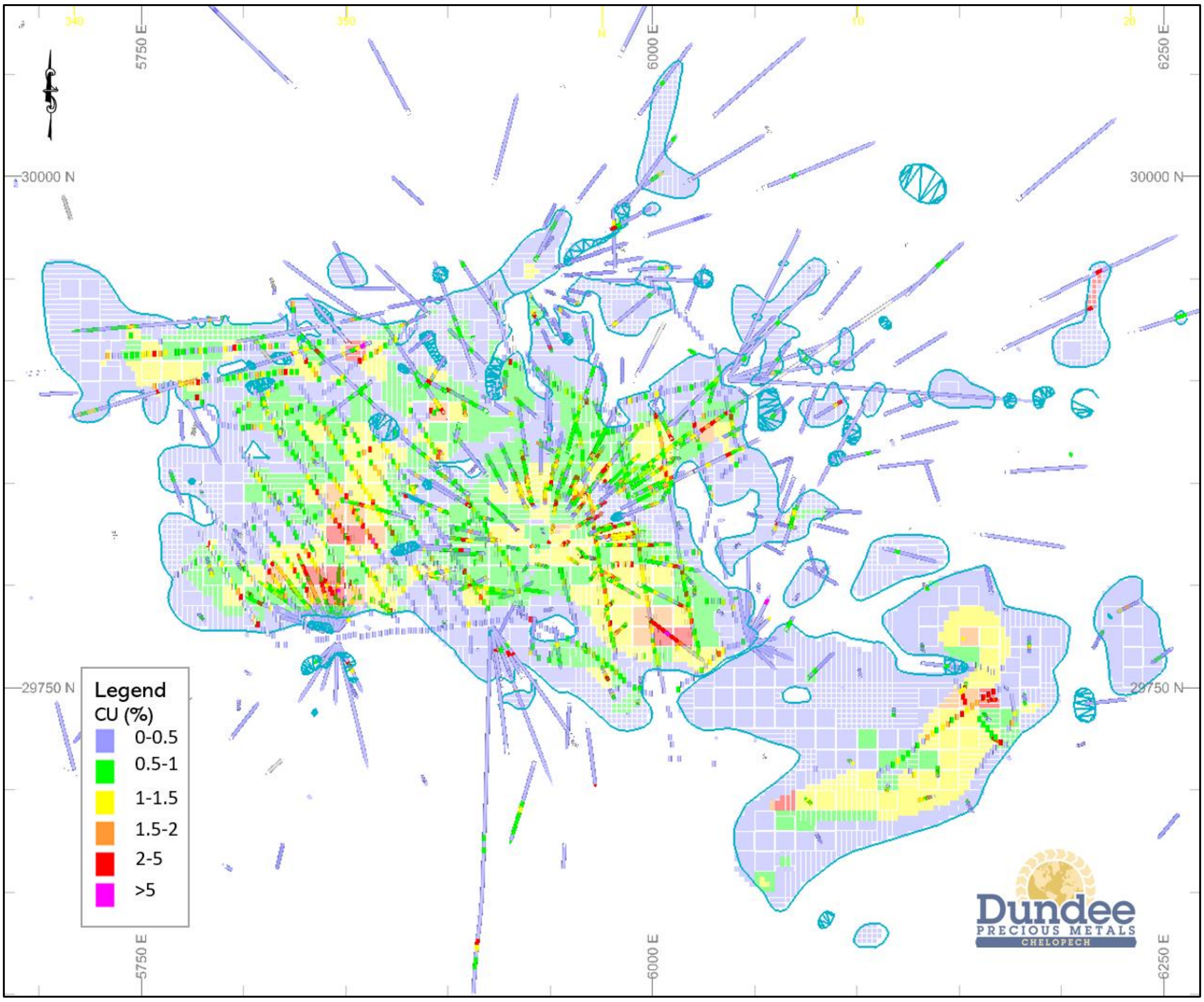


Figure 14-13: Central area, plan view at 320 m(RL), comparing assay vs block copper grades (DPMC, 2021)

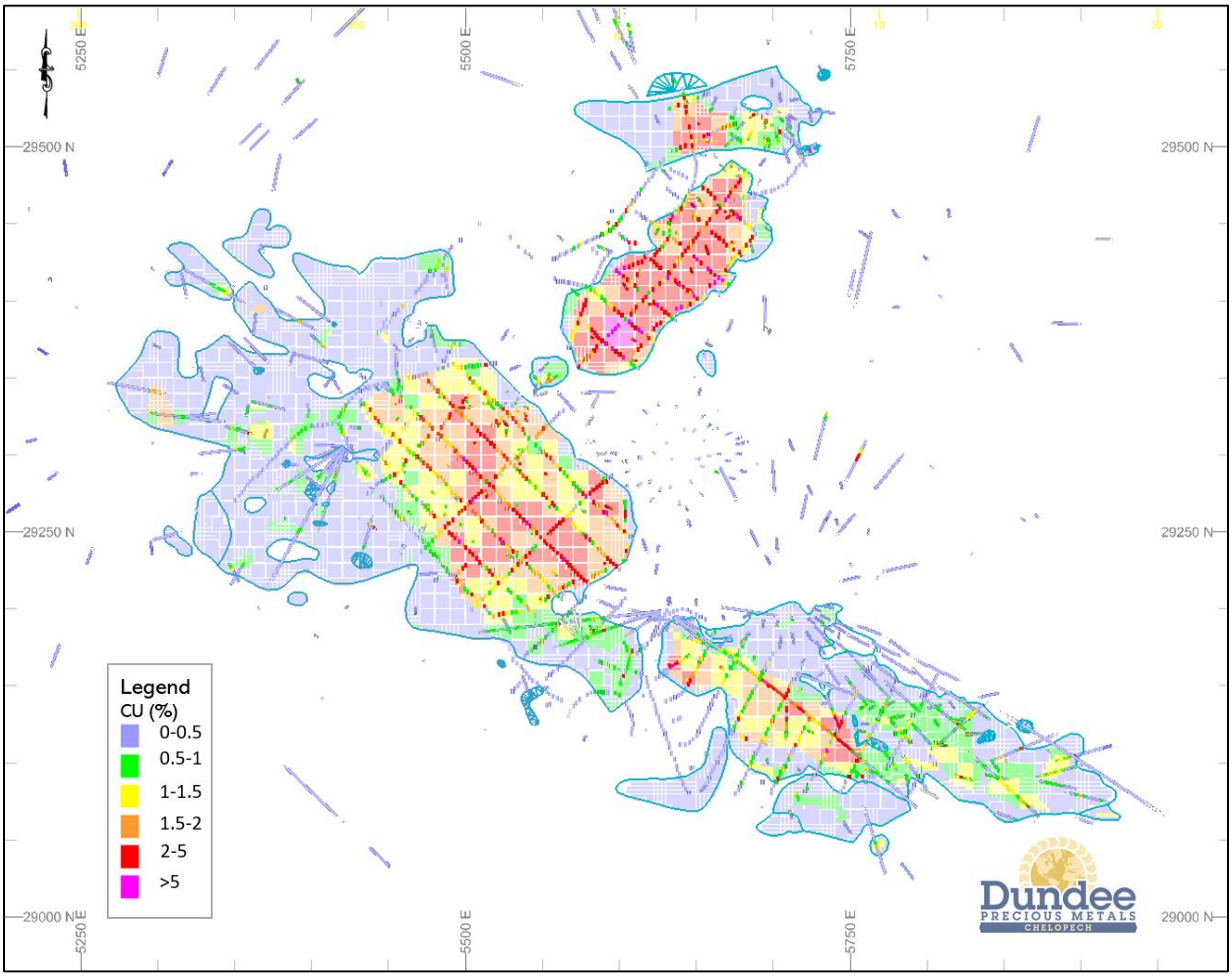


Figure 14-14: Western area, plan view at 300 m(RL), comparing assay vs block copper grades (DPMC, 2021)

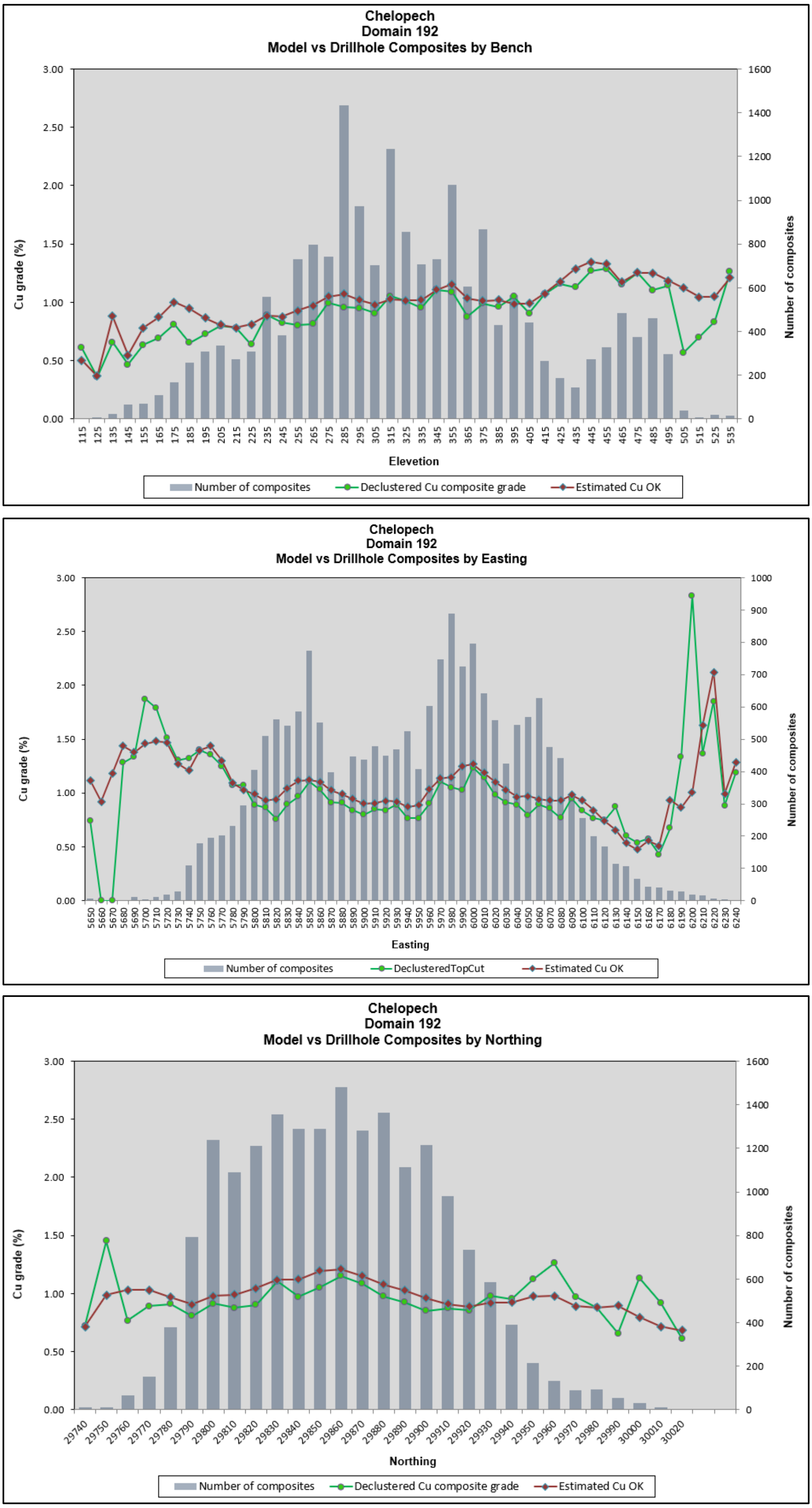


Figure 14-15: Bench, Easting and Northing swath plots – Central area (DPMC, 2021)

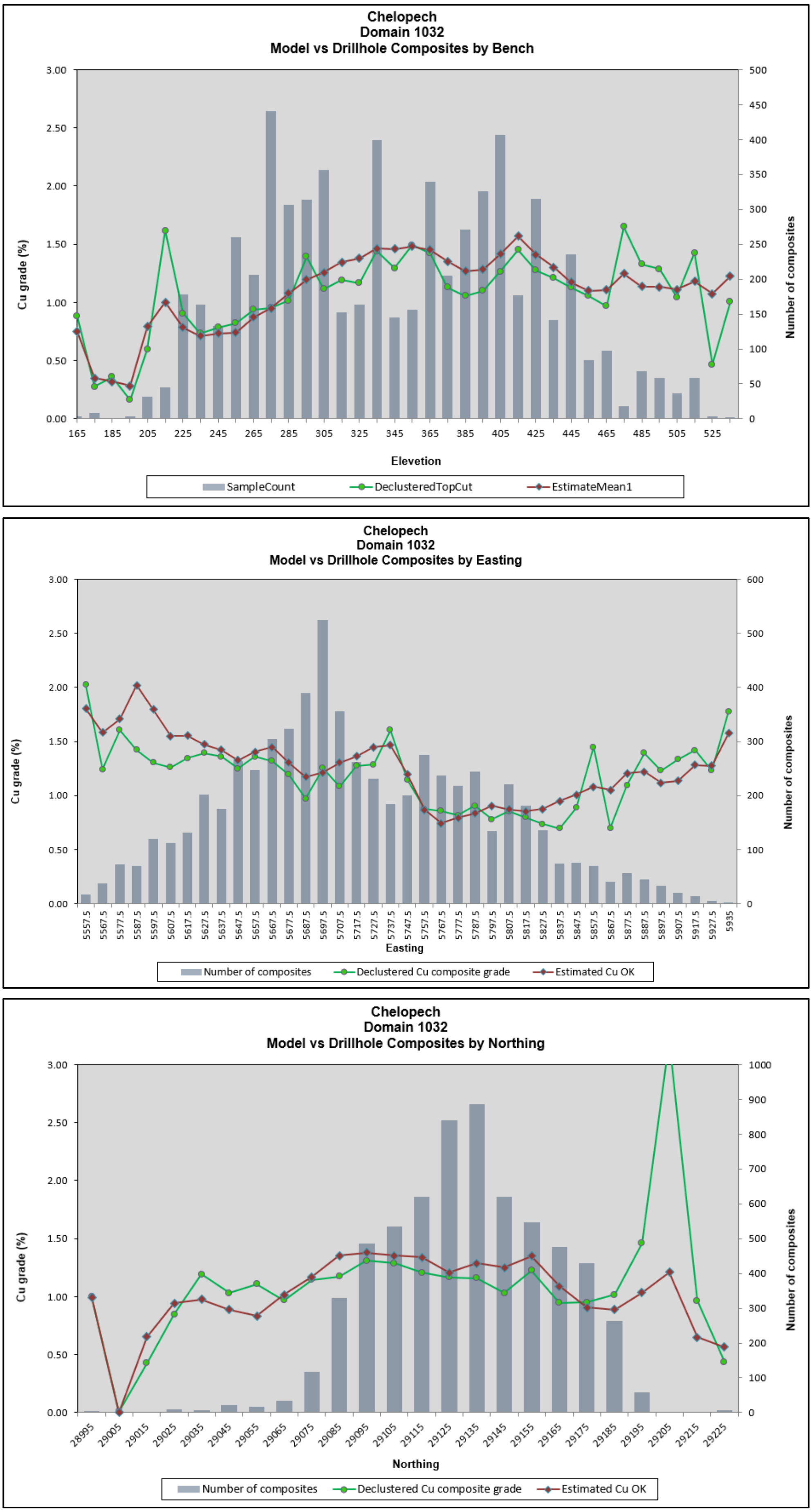


Figure 14-16: Bench, Easting and Northing swath plots – Western area (DPMC, 2021)

Table 14-16: MRE compared to 2021 production

31 December 2021	**Resource model 31 December 2021**						**Actual mined**					
Blocks	**Tonnage**	**Cu (%)**	**Au (g/t)**	**Ag (g/t)**	**As (%)**	**S (%)**	**Tonnage**	**Cu (%)**	**Au (g/t)**	**Ag (g/t)**	**As (%)**	**S (%)**
Block 5	15,524	1,92	7,96	37,39	0,55	18,19	15,519	0,95	4,24	12,36	0,38	11,82
Block 19	716,392	0,89	3,27	7,65	0,26	11,48	641,197	0,76	2,88	6,82	0,21	10,66
Block 25	94,444	0,80	2,41	10,08	0,14	8,96	90,989	0,61	2,23	10,77	0,11	8,39
Block 103	183,804	1,29	2,96	3,26	0,40	14,13	195,018	1,18	3,24	3,09	0,35	13,05
Block 144	5,386	0,52	2,82	4,25	0,13	12,67	5,879	0,77	4,25	6,22	0,20	14,82
Block 145	31,875	0,48	3,36	3,67	0,12	8,91	30,510	0,68	4,36	5,74	0,18	9,51
Block 147	116,945	0,74	9,50	9,36	0,20	10,38	120,417	0,88	7,97	8,26	0,22	9,70
Block 149	160,037	0,74	5,05	8,82	0,19	18,38	150,895	0,58	4,08	7,44	0,15	14,91
Block 149S	147,749	0,72	3,41	6,49	0,21	12,05	150,159	0,78	3,74	7,21	0,22	12,36
Block 150	188,750	1,57	2,87	9,17	0,50	13,33	195,627	1,20	2,32	6,76	0,37	11,10
Block 151	572,678	1,06	2,93	6,87	0,32	16,98	606,975	0,96	2,89	6,93	0,30	15,03
Block 153	2,933	0,63	3,28	3,47	0,18	11,97	3,641	0,45	3,36	2,61	0,10	10,88
Total	**2,236,518**	**0,99**	**3,58**	**7,55**	**0,29**	**13,64**	**2,206,826**	**0,88**	**3,29**	**6,84**	**0,25**	**12,38**
% Resource model Dec 21 Tonnes							1%					
% Resource model Dec 21 Cu								11%				
% Resource model Dec 21 Au									8%			
% Resource model Dec 21 Ag										9%		
% Resource model Dec 21 As											12%	
% Resource model Dec 21 S												9%

14.10 Mineral Resource Reporting

14.10.1 2021 Mineral Resource Classification Review

Reconciliation data from 2021 indicates that the GEMS classification system is appropriate with production grades, tonnes and metal are within 10% of MREs on a quarterly basis. CSA Global investigated methods to replicate the GEMS classification using the Datamine™ kriging statistics. SOR and search pass used in the GEMS classification are still considered the most appropriate for Datamine™. The raw Datamine™ panel SOR values cannot be used to reproduce the GEMS classification as the variance in the distribution is much higher than GEMS creating a significant "spotted dog" effect.

To counter this variance, CSA regularised Datamine™ SOR values into a 60 x 60 x 60 x (X, Y, Z) grid with threshold values for Measured/Indicated and Indicated/Inferred boundaries being visually selected to reflect drill density. Search pass number is used as an additional criterion to tighten up the classification boundaries around drill data.

The smoothing of the SOR value criteria for classification is supported by the QP and is considered an appropriate indicator of estimation confidence, especially when reconciliation against production data is reviewed (i.e. the historical close reconciliation of production data to the MRE).

14.10.2 Mineral Resource Classification

The block model was used to classify Mineral Resources as follows.

Classification of the MRE was based on the May 2014 CIM Definition Standards on Mineral Resources and Mineral Reserve standards defined in NI 43-101. Classification of the MRE was based on the following criteria:

1) Geological knowledge and reliability of interpretation.
2) QAQC and database verification.
3) Sample support and drill density.
4) Grade continuity and variography.
5) Ordinary kriging statistics.
6) Validation of the estimation of in-situ grades for copper, gold, silver, arsenic, and sulphur.
7) Validation of the tonnage factors derived from estimation of the in-situ dry bulk density.
8) Review of overall production reconciliation.

Interpolation classification of the MRE was based on interpreted volumes which enclose those areas of the MRE that honour the following criteria:

- Measured Mineral Resources:
  - Blocks estimated within the first estimation search pass
  - A kriged SOR of >= 0.60.
- Indicated Mineral Resources:
  - Blocks estimated within the first or second estimation search pass
  - A kriged SOR of >= 0.40
  - Regions with good geological understanding and a drill spacing of <40 m, which roughly equates to the range of continuity describing 70% of the sample variance.
- Inferred Mineral Resources:
  - Blocks estimated within the third estimation search pass
  - SOR of <0.40
  - Extensions of known mineralisation which have reasonable sample support to infer grade and geological continuity but require additional drilling or sampling to verify that inferred continuity.

Figure 14-17 and Figure 14-18 present views of the classified MRE .

The classification codes assigned to the block model were:

- Measured Mineral Resources: RESCLASS = 1
- Indicated Mineral Resources: RESCLASS = 2
- Inferred Mineral Resources: RESCLASS = 3.

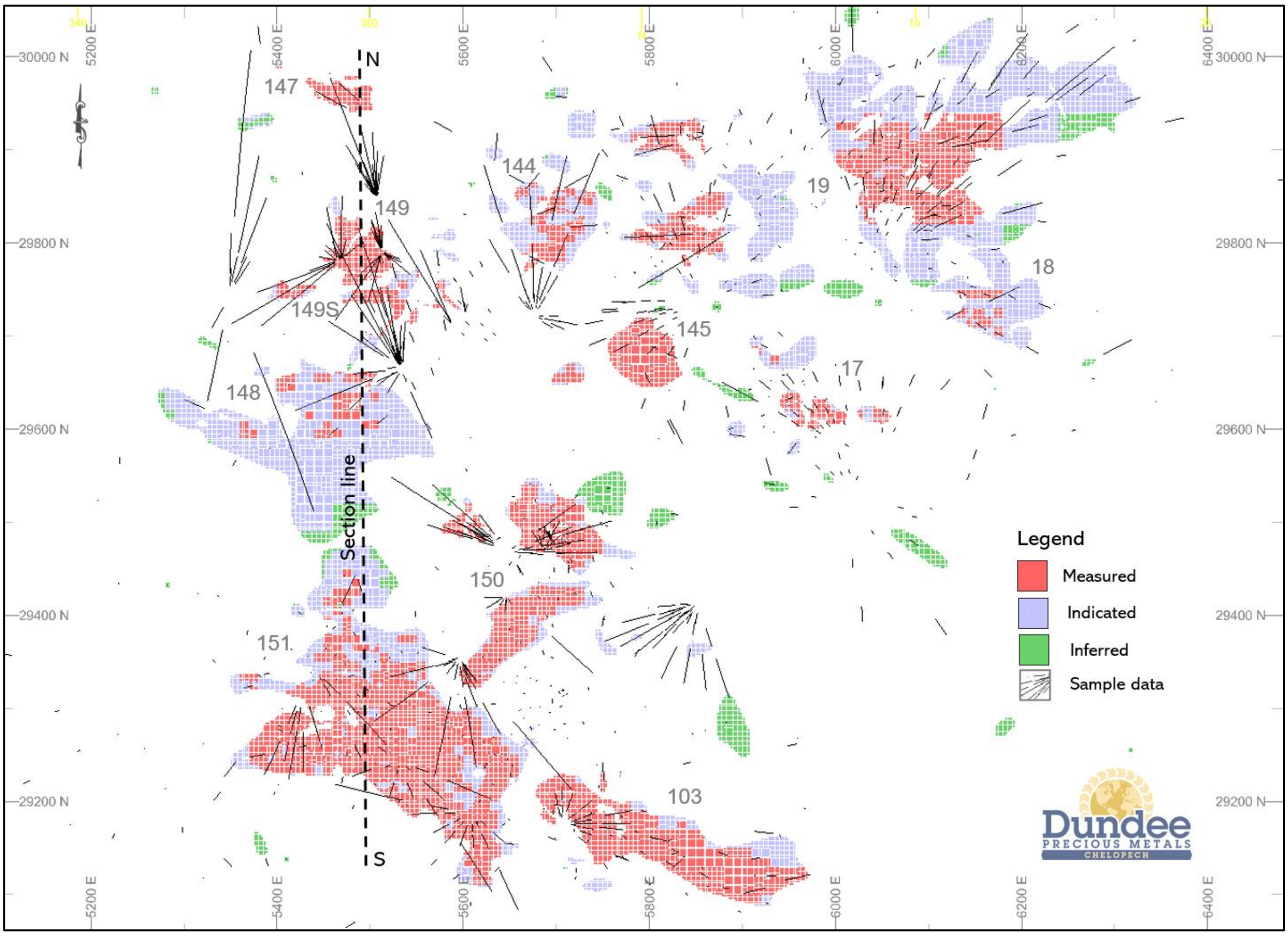


Figure 14-17: Plan view of classified model for Chelopech deposit, at level 220 showed by RESCLASS with supporting samples (DPMC, 2021)

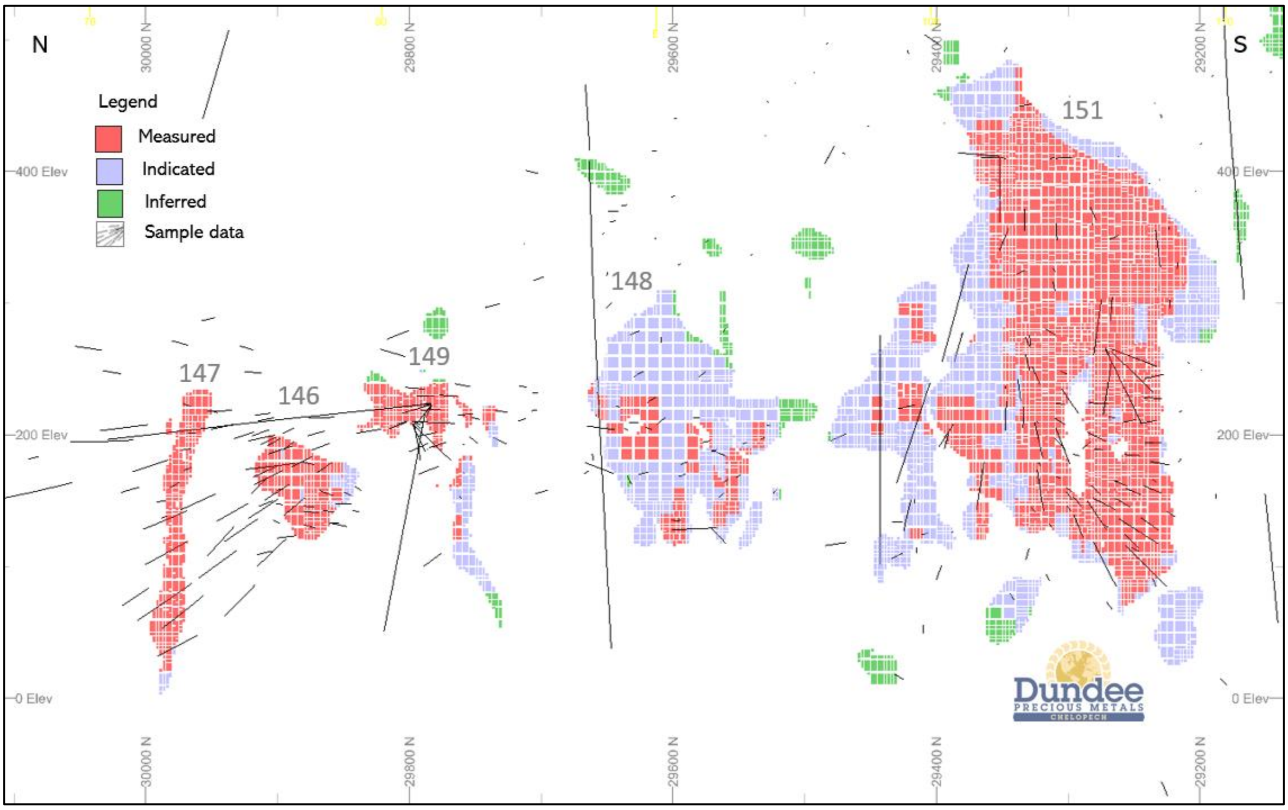


Figure 14-18: Vertical section view of classified model (West area) showed by RESCLASS, looking east with supporting samples (DPMC, 2021)

Note: The section line can be found in the previous figure.

14.10.3 Mineral Resource Tabulation

The MRE presented in Table 14-17 has been depleted by all mining and development works, as of 31 December 2021. The MRE is reported using a NSR calculation based on assumed metal prices, current operating costs, and metal revenue to meet "reasonable prospects for eventual economic extraction" criteria. The NSR calculation attributes are set out in detail below in Table 14-18. A simplified formula is set out in the footnotes to Table 14-17.

Table 14-17: MRE Statement for the Chelopech with an effective date of 31 December 2021

Dundee Precious Metals – Chelopech							
Chelopech Mineral Resource Estimate as of 31 December 2021							
Resource Category	**Mt**	**Grades**			**Metal content**		
		Au (g/t)	**Ag (g/t)**	**Cu (%)**	**Au (Moz)**	**Ag (Moz)**	**Cu (Mlb)**
Measured	7.0	2.95	9.30	0.96	0.665	2.098	148
Indicated	6.8	2.73	11.88	0.82	0.593	2.581	122
Total Measured + Indicated	**13.8**	**2.84**	**10.56**	**0.89**	**1.258**	**4.679**	**270**
Inferred	2.9	2.36	9.20	0.82	0.223	0.869	53

Notes:

- *The Mineral Resources disclosed herein have been estimated in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (CIM, 2014).*
- *Mineral Resources have been estimated using an operating net profit cut-off of US$0/t in support of reasonable prospects of eventual economic extraction.*
- *Tonnages are rounded to the nearest 0.1 million tonnes to reflect that this is an estimate.*
- *Metal content is rounded to the nearest 1 thousand ounces or 1 million pounds to reflect that this is an estimate.*
- *The Mineral Resources are reported exclusive of Mineral Reserves.*

- *Mineral Resources are based on a NSR less costs cut-off value of US$0/t. The total cost applied was approximately $45/t which is a sum of operational costs of approximately $40/t and sustaining capital of $5/t.*
- *All blocks include a complex NSR (Net Smelter Return) formula that differs for the three ore types. The NSR formula utilises long term metal price, metallurgical recoveries, payability terms. treatment charges, refining charges, penalty charges, concentrate transport costs, and royalties. For clarity of understanding of ore value, a simplified formula is presented here that correlates to the complex formula to within 1%. The simplified formulas per ore type are:*
  - *Block 700 NSR US$/t = 0.00 x Cu % + 0.00 x Ag g/t + 14.24 x Au g/t*
  - *Block 152 NSR US$/t = 21.08 x Cu % + 0.32 x Ag g/t + 33.96 x Au g/t*
  - *General NSR US$/t = 16.72 x Cu % + 0.23 x Ag g/t + 29.18 x Au g/t.*

Table 14-18: NSR calculation – Mineral Resource reporting

Field (units)	Formula	Description
TONNES (t)	X_{INC}*Y_{INC}*Z_{INC}*DEN_VOID	Tonnes of an area – length x breadth x height x density.
Copper concentrate		
CUREC (%)	See Table 15-2: Metallurgical recovery algorithm for Cu Concentrate	Copper recovery using mill defined recovery algorithm.
AUREC (%)	See Table 15-2: Metallurgical recovery algorithm for Cu Concentrate	Gold recovery using mill defined recovery algorithm.
AGREC (%)	See Table 15-2: Metallurgical recovery algorithm for Cu Concentrate	Silver recovery using mill defined recovery algorithm.
ASREC	(43.7002+1.6980*CU+0.5489*88.59)*(0.625)^ -0.0379	Arsenic recovery using mill defined recovery algorithm. For block 700 As Recovery is 0.
CU_MET_R (lb)	CUREC/100*TONNES*CU/100*2204.6226	The amount of copper recovered, in pounds.
AU_MET_R (tr.oz)	AUREC/100*TONNES*AU/31.1035	The amount of gold recovered, in troy ounces.
AG_MET_R (tr.oz)	AGREC/100*TONNES*AG/31.1035	The amount of silver recovered, in troy ounces.
PAYABLE (USD)	0.90*CU_MET_R*2.75+0.95*AU_MET_R*1400 +0.90*AG_MET_R*17.0	Payable content from metal recovered. Uses long term metal prices of US$1,400/oz gold, US$17/oz silver, and US$2.75/lb copper for Mineral Resources.
CU_C_DMT (t)	CU_MET_R/2204.6226/0.1	Copper concentrate generated in dry metric tonnes.
TCRC (USD)	CU_MET_R*0.1981*0.94+AU_MET_R*5*0.93+ AG_MET_R*0.5*0.92+CU_C_DMT*256+ CU_C_DMT*84	Treatment charge, recovery charges, arsenic penalty, and freight charge. Arsenic penalty = US$120/dmt. Mineral Resources use Market Terms (US$136/dmt).
ASMET	ASMET=ASREC/100*TONNES*(AS(%))/100	Arsenic metal in copper concentrate
ROYALTY (USD)	(CU/100*TONNES*2204.6226*2.75+AU*TONNES/31.1035*1400+AG*TONNES/31.10317.0)*0.015	The operation royalty charge has been calculated using the base formula of 1.5% of the in-situ metal (copper, gold, and silver) value.
SUSTAINING_CAP	4.12	Sustaining capital added based on long-term financial model.
OpCostCu	See Table 53: Variable Opex Cost ($/t)	Variable operating cost adjusted to haulage distances per block.
OPEX (USD)	TONNES*(OpCostCu+ SUSTAINING_CAP) + ROYALTY	Operating expenditure.
PROFIT (USD)	PAYABLE -TCRC-OPEX	NSR-less-costs
PROFIT_T (USD)	PROFIT/TONNES	NSR-less-costs per tonne
NSR (USD)	(1-TCRC/ PAYABLE) *100	Net smelter return.
Pyrite Concentrate		
PC_CUREC (%)	92.4-CUREC	Copper recovery in pyrite concentrate.
PC_AUREC (%)	90-AUREC	Gold recovery in pyrite concentrate.
PC_AGREC (%)	80.61-AGREC	Silver recovery in pyrite concentrate.
PC_CUREC 149(%)	92.4-CUREC	Copper recovery in pyrite concentrate for Block 149.
PC_AUREC 149(%)	88.53-AUREC	Gold recovery in pyrite concentrate for Block 149.
PC_AGREC 149(%)	80.61-AGREC	Silver recovery in pyrite concentrate for Block 149.

Field (units)	Formula	Description
PC_CU_MET_R (lb)	((PC_CUREC+PC_CUREC149)/100)*TONNES*CU/100*2204.6226	The amount of copper recovered, in pounds.
PC_AU_MET_R (tr.oz)	((PC_AUREC+PC_AUREC149/100)*TONNES*AU/31.1035	The amount of gold recovered, in troy ounces.
PC_AG_MET_R (tr.oz)	((PC_AGREC+PC_AGREC149/100)*TONNES*AG/31.1035	The amount of silver recovered, in troy ounces.
PC_PAYABLE (USD)	0.6*PC_AU_MET_R*1400	Payable made from metal recovered. Mineral Resources use US$1,400/oz gold.
PC_AU_C_DMT (t)	PC_AU_MET_R*31.1035/6.5	Gold pyrite concentrate generated in dry metric tonnes.
PC_TCRC (USD)	PC_AU_MET_R*0.6+PC_AU_C_DMT*62.5	Treatment charges, recovery charges and freight.
PC3_OPEX (USD)	TONNES*0.62	Operating expenditure.
PC3_PROFIT (USD)	PC_PAYABLE - PC_TCRC-PC3_OPEX	NSR-less-costs
PC3_PROFIT_T (USD)	PC3_PROFIT/TONNES	NSR-less-costs per tonne
NSR2 (USD)	(1-PC_TCRC/ PC_PAYABLE) *100	Net smelter return.
Total		
TOT_CUREC (%)	CUREC + PC_CUREC+ PC_CUREC149	Total copper recovery.
TOT_AUREC (%)	AUREC + PC_AUREC+ PC_AUREC149	Total gold recovery.
TOT_AGREC (%)	AGREC + PC_AGREC+ PC_AGREC149	Total silver recovery.
TOT_CU_MET_R (lb)	CU_MET_R + PC_CU_MET_R	The amount of copper recovered, in pounds.
TOT_AU_MET_R (tr.oz)	AU_MET_R + PC_AU_MET_R	The amount of gold recovered, in troy ounces.
TOT_AG_MET_R (tr.oz)	AG_MET_R + PC_AG_MET_R	The amount of silver recovered, in troy ounces.
TOT_PAYABLE (USD)	PAYABLE + PC_PAYABLE	Payable made from metal recovered.
TOT_TCRC (USD)	TCRC + PC_TCRC	Treatment charges and recovery charges.
TOT_OPEX (USD)	OPEX + PC3_OPEX	Operating expenditure.
PROFIT3 (USD)	PROFIT + PC3_PROFIT	NSR-less-costs
PROFIT3_T (USD)	PROFIT_T + PC3_PROFIT_T	NSR-less-costs per tonne
NSR3 (USD)	NSR1 + NSR2	Net smelter return.

In addition to economic elements, levels of sulphur in Measured, Indicated and Inferred Mineral Resources are 12.8%, 11.5% and 10.1% respectively, and levels of arsenic are 0.27%, 0.22% and 0.14% respectively.

Recovery calculations are variable based on individual grade domains and factor in recoveries incorporated via the pyrite concentrator circuit. Plant recoveries are presented in Table 15-2 and the detailed NSR algorithm is included in Table 15-1.

The Mineral Resource remaining after subtraction of Mineral Reserves has been reported at a NSR-less-costs cut-off of >US$0/t. Mineral Resources are based on metal prices of US$1,400/oz gold, US$17/oz silver, and US$2.75/lb copper.

The MRE of Measured and Indicated Mineral Resources are reported, exclusive of those Mineral Resources where modifying factors have been applied to report Mineral Reserves (see Section 15).

The process used for reporting Mineral Resources exclusive of Mineral Reserves is as follows:

- The model is depleted as of 31 December 2021 using the mined-out volumes (stopes, development).
- A 3 m buffer zone around the surveyed mine solids is created using Leapfrog Geo. This is to define a zone where reasonable assumption is made that an area this close to existing depletion will not be extractable going forward.
- LOM planned stopes are removed from the block model.

Additionally, the MRE (exclusive of Mineral Reserves) is set out in Table 14-19 in a grade-tonnage tabulation. The reporting cut-off is highlighted in bold.

Table 14-19: Grade-tonnage tabulation for the Chelopech Copper-Gold Project as of 31 December 2021, reported for a range of cut-offs

MRE as of 31 December 2021*						
Resource category	**Cut-off (NSR less costs, USD/t)**	**Mt**	**Cut-off (NSR less costs, USD/t)**	**Au (g/t)**	**Ag (g/t)**	**Cu (%)**
Measured Resource	**0**	**7.0**	**57.2**	**2.95**	**9.30**	**0.96**
	2.5	6.6	61.2	3.05	9.54	0.99
	5	6.1	65.4	3.16	9.71	1.03
	7.5	5.8	68.6	3.25	9.72	1.06
	10	5.5	71.3	3.32	9.83	1.08
Indicated Resource	**0**	**6.8**	**45.6**	**2.73**	**11.88**	**0.82**
	2.5	6.0	51.0	2.88	12.52	0.86
	5	5.5	55.3	3.01	13.01	0.90
	7.5	5.2	58.9	3.11	13.29	0.93
	10	4.8	62.2	3.19	13.27	0.96
Measured + Indicated Resource	**0**	**13.8**	**51.5**	**2.84**	**10.56**	**0.89**
	2.5	12.6	56.3	2.97	10.97	0.93
	5	11.6	60.6	3.09	11.28	0.97
	7.5	10.9	64.1	3.18	11.40	1.00
	10	10.4	67.1	3.26	11.43	1.02
Inferred Resource	**0**	**2.9**	**38.1**	**2.36**	**9.20**	**0.82**
	2.5	2.6	42.9	2.49	9.58	0.86
	5	2.3	48.0	2.63	9.80	0.90
	7.5	2.1	52.3	2.73	10.12	0.94
	10	1.9	55.9	2.83	10.23	0.97

**The Mineral Resource is reported exclusive of Mineral Reserves.*

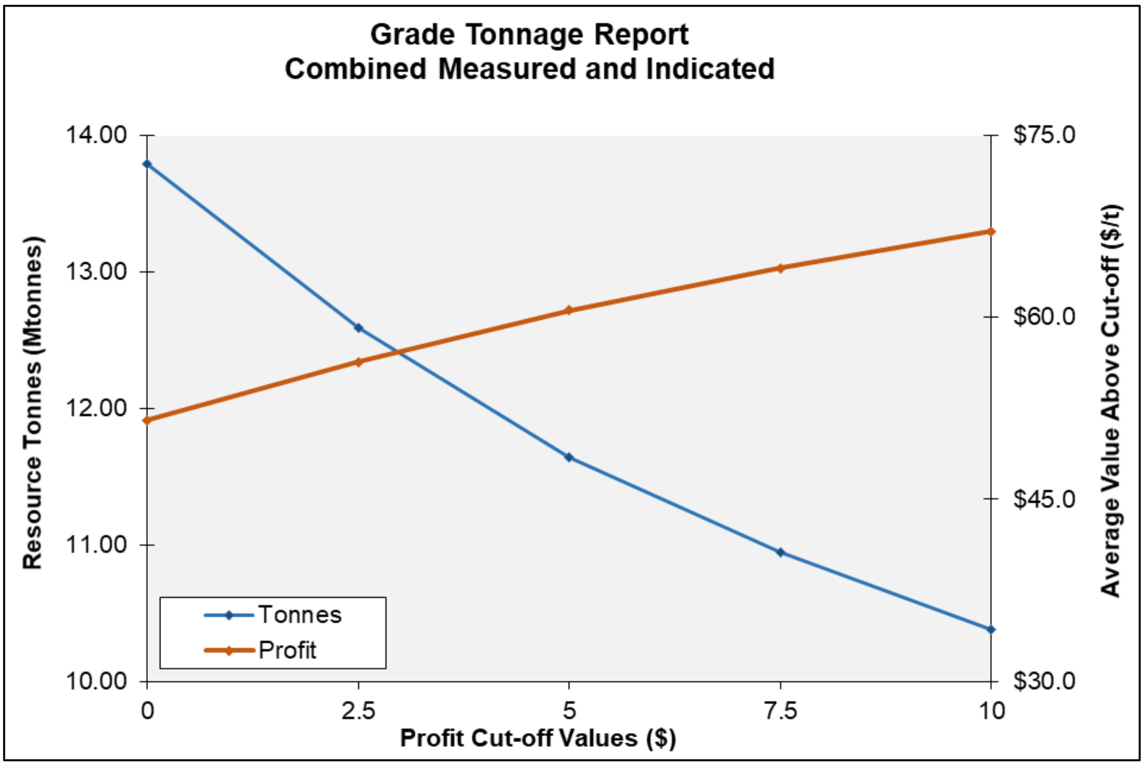


Figure 14-19: Grade-tonnage report for Measured and Indicated Mineral Resources, reported at a NSR-less-costs >US$0/t cut-off (DPMC, 2022)

Comparison of the 2021 MRE with the previously reported 2020 MRE, after depletion of Mineral Reserves, is presented in Table 14-20. The updated MRE shows the following:

- A reduction of 20.7% in tonnage, an increase of 7.9% in copper grade and 8.1% in gold grade, a 14% reduction in metal content for both gold and copper in Measured and Indicated Mineral Resource categories. This reduction in Measured and Indicated Mineral Resources is largely attributed to:
  - Conversion of Mineral Resources to Mineral Reserves.
  - Updated MRE classification approach.
  - Changes to grade estimation parameters.
  - Updated NSR parameters. The annual review of the NSR input parameters resulted in adjustments to recovery calculations, concentrate pay factors, treatment charges/refining charges, and sustaining capital contributions.
- Inferred Mineral Resource tonnage has increased by 77%, in comparison to the end-of-year 2020 MRE which is attributed to:
  - Updated MRE classification approach.
  - Corrections to the NSR script. Upon retrospective review, an error was detected in the YE2020 NSR calculation that resulted in the omission of approximately 1 Mt of Inferred Mineral Resource from the Mineral Resource statement at that time which has been corrected for in the current Mineral Resource statement.

Table 14-20: Comparison between previous MRE (December 2020) and current MRE (December 2021)

Comparison of MRE as of 31 December 2021 with MRE as of 31 December 2020 (Mineral Resources exclude all blocks already classified as Mineral Reserves)															
MRE category	**2021 Mt**	**2020 Mt**	**Grades**				**Metal content**				**% Difference**				
			2021 Cu (%)	**2020 Cu (%)**	**2021 Au (g/t)**	**2020 Au (g/t)**	**2021 Cu (Mlb)**	**2020 Cu (Mlb)**	**2021 Au (Moz)**	**2020 Au (Moz)**	**Tonnes**	**Cu**	**Au**	**Metal Cu**	**Metal Au**
Total Measured + Indicated	13.8	17.4	0.89	0.82	2.84	2.63	270	315	1.258	1.467	-20.7%	7.9%	8.1%	-14.4%	-14.3%
Inferred	2.9	1.7	0.82	0.67	2.36	2.15	53	24	0.223	0.114	77.4%	22.1%	9.8%	116.7%	94.8%

The waterfall charts shown in Figure 14-20 and Figure 14-21 show the factors contributing to the change between YE2020 and YE2021 MREs.

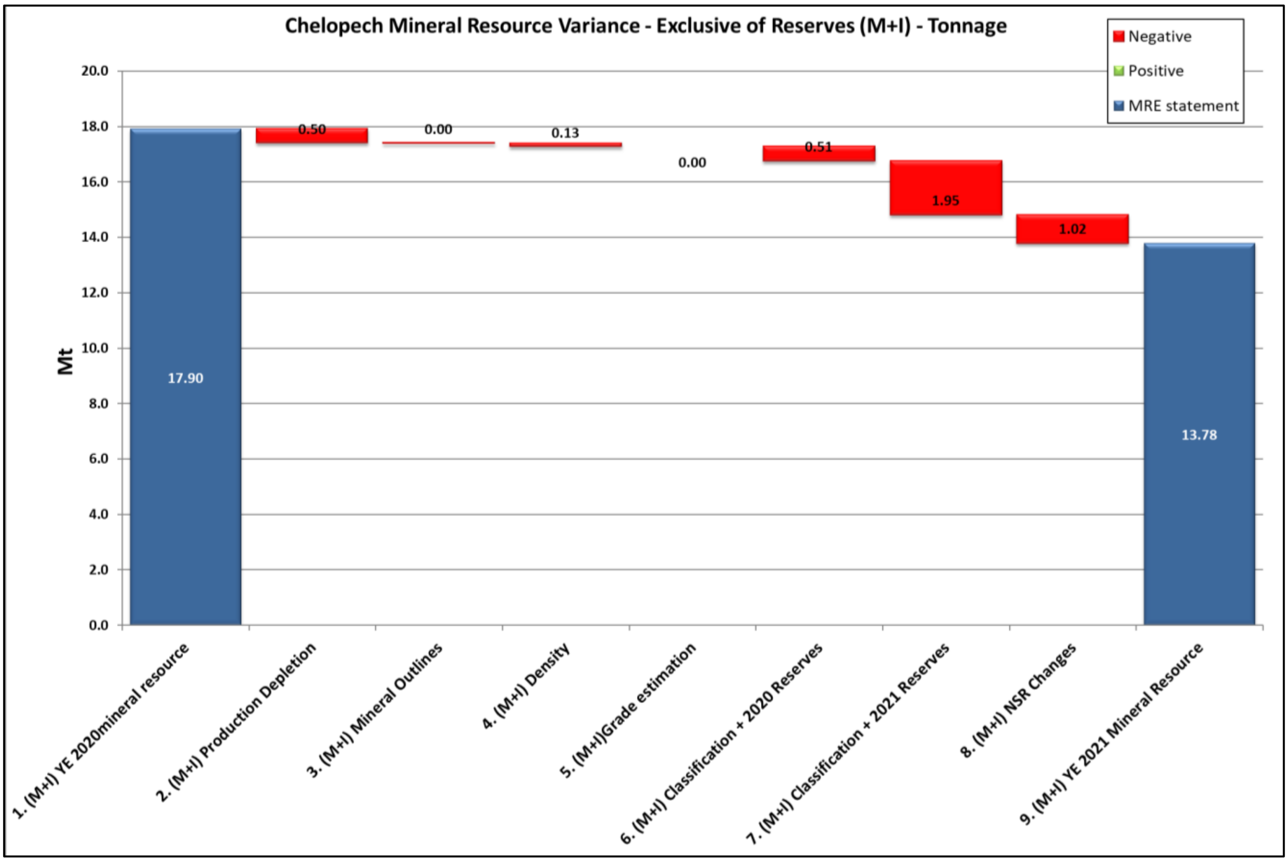


Figure 14-20: Waterfall chart of Measured and Indicated Mineral Resource variance between the YE2020 and YE2021 MREs

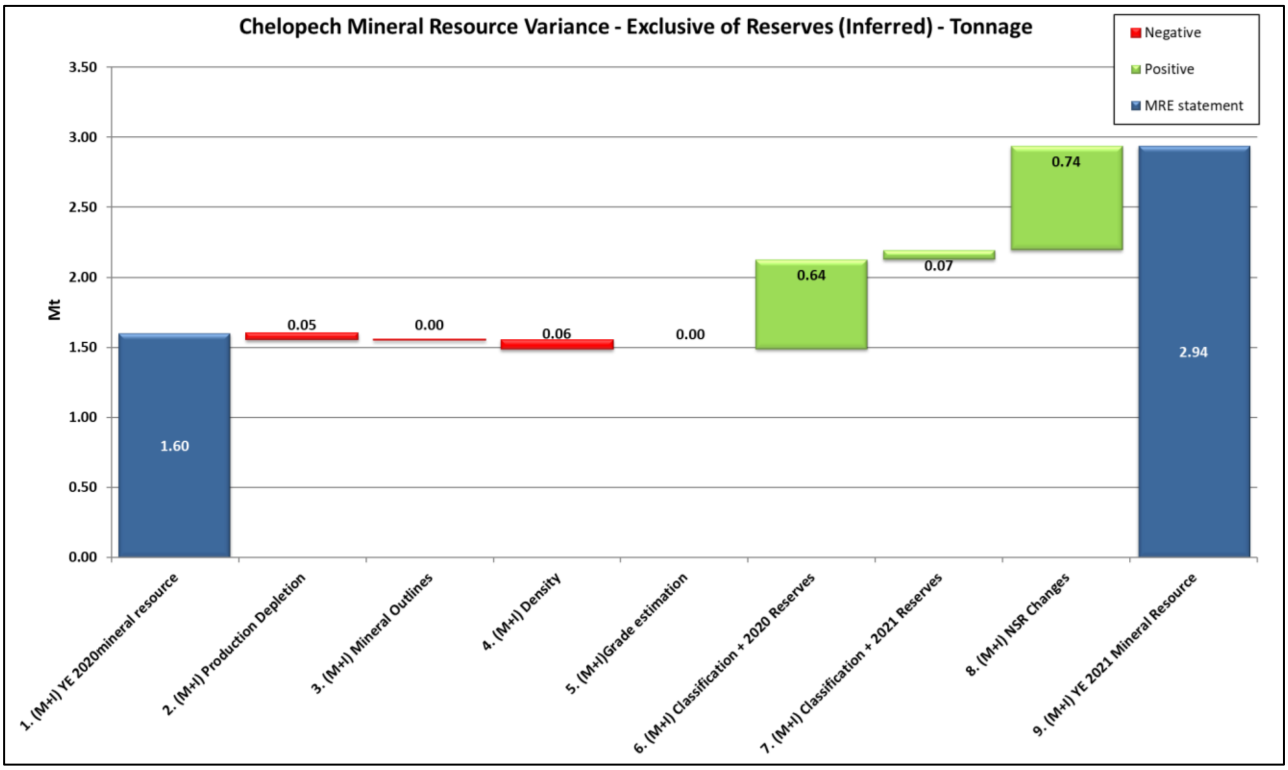


Figure 14-21: Waterfall chart of Inferred Mineral Resource variance between the YE2020 and YE2021 MREs

The key conclusions for the waterfall chart of Measured and Indicated Mineral Resources are as follows:

- Step 2 shows a decrease of 0.5 Mt due to depletion
- Step 6 shows a decrease of 0.51 Mt which be attributed to Mineral Resource classification changes
- Step 7 shows a decrease of 1.95 Mt which can be attributed to conversion of Mineral Resources to Mineral Reserves
- Step 8 shows a decrease of 1.02 Mt due to NSR calculations.

The key conclusions for the waterfall chart of Inferred Mineral Resources are that:

- Step 6 shows an increase of 0.64 Mt due to changes in Mineral Resource classification.
- Step 8 shows an increase of 0.74 Mt which be attributed to changes in NSR calculations as well as the addition of new blocks. Upon retrospective review, an error was detected in the YE2020 NSR calculation that resulted in the omission of approximately 0.8Mt of Inferred Mineral Resource which has been corrected for in this updated MRE.

It is the QP author's opinion that the Chelopech MRE has a low risk of being affected by factors such as geological understanding, data management or estimation methodology. The deposit geology is well understood, has been appropriately modelled in 3D and has adequate sampling data to support the grade and tonnage estimates. Recent reconciliation with production has informed the assessment of the quality of the MRE.

The Concession Agreement expires on 26th July 2029. According to Bulgarian legislation, the concessionaire (DPMC) has the right to request an extension to the Chelopech concession agreement for a further period of time equal to the remaining Mineral Reserves at the time of application. The current extraction and processing plan of the Mineral Reserves for the whole 2030 require an extension to the Concession Agreement from July 2029 to the end of 2030 to effect full value. It is understood that normal course legal mechanisms are in place to allow an application for the extension to the Concession Agreement.

DPM have not yet commenced application but will be required to do so before 26 July 2028. It is the opinion of DPM legal representatives, upon whose opinion the Qualified Persons rely, that the application should be successful based on precedent of other agreement applications, but this cannot be guaranteed. It is important to note that all Mineral Resources will require an extension to the Mineral Agreement for those to be affected. Given the lack of extension guarantee, expiry of the Concession Agreement represents a risk, however unlikely, and is therefore set out as a risk.

CSA Global and the report authors do not believe that the estimate of Mineral Resources may be materially affected by metallurgical, environmental, legal, taxation, socio-economic, marketing, or political issues.

15 Mineral Reserve Estimates

15.1 History and Study Methodology

At the time of the acquisition of the mine by DPM, annual ore production output for the previous four years was in the order of 522 ktpa, with 640 kt achieved in 2003. LHOS was successfully implemented in 2005, and by December 2008, the mine output had increased to the equivalent of 1 Mtpa, which was the pre-upgrade design capacity of the Kapitalna shaft. This nominal rate continued through to 2010, with an increase to ~1.3 Mtpa in 2011, followed by ~1.8 Mtpa in 2012 and by ~2 Mtpa in 2013, on completion of the new underground crusher-conveyor system. The production rate has stabilized over the period 2018-2022 at 2.2 Mtpa, which is the Mining Concession agreement limit.

15.2 Net Smelter Return and Gold Equivalent Cut-Off

The Chelopech Mineral Resource and Mineral Reserve estimates per the Bulgarian reporting guidance as specified in the concession agreement are constrained by a AuEq cut-off as follows:

- An AuEq cut-off of 4 g/t (Mineral Reserves). This value shall not be increased. This is to limit the Chelopech operation from high grading above the agreed to AuEq cut-off (4 g/t) and to limit sterilisation of blocks thereof.
- Capital infrastructure to be maintained for blocks between 3 g/t AuEq and 4 g/t AuEq for future accesses (Resource).

DPMC has transitioned from using a AuEq cut-off to use of a net profitability model, which they internally refer to as PI. The net profitability model uses the following basic formula:

- PI ($/t) = NSR ($/t) - Royalty ($/t) – Sustaining Capital ($/t) - Variable_Opex ($/t)

The 2021 Mineral Resource and Mineral Reserve utilize a PI cut-off of $0/t. That is, at the cut-off, operating cost, sustaining costs and royalties are balanced by the net smelter return. It is important to note that this methodology differs to the methodology as set out in the mining concession agreement.

There are numerous benefits of a net profitability (NSR) model compared to a single metal cut-off grade approach, such as:

- Polymetallic ore can be converted into a profitability variable expressed in terms of US$/t
- Investigation of the potential viability of selected Mineral Reserves blocks can be quickly assessed
- The profitability of planned stopes can be assessed
- The effect of commodity price fluctuations can be quickly applied to the Mineral Reserves model.

DPMC has completed an analysis of its 2019 Mineral Resource and Reserve methodology (reported in internal memorandum format) titled "Chelopech 2019 Year End Mineral Resources Reporting Addendum" and dated 19th December 2019. The work concluded that the method of stope formulation using the profitability model methodology has created stopes that effectively have a 2.6 g/t AuEq cut-off. Changes to the stope definition parameters used in this 2021 Technical Report show similar performance to the work completed in 2019 and it is concluded by the QP of this Technical Report that both the 3 and 4 g/t concession agreement limits have been met or exceeded by DPMC in a positive outcome for both parties for the 2021 Mineral Reserve estimate. It is part of the DPMC planning process to demonstrate continued mining concession terms compliance.

DPMC have completed other recent supportive studies aimed at maximization of value of the Chelopech Mineral Resource that have been used as background to the 2021 Mineral Reserve estimate. This included a study in August 2020 by SRK consulting (Canada) Inc. which was aimed at determining the optimal cut-off but that has since been superseded by a more comprehensive strategic enterprise optimization study by Whittle Consulting Pty Ltd in 2021.

The 2021 strategic enterprise optimization study conducted by DPMC and Whittle Consulting Pty Ltd indicated that the production of 'gold concentrate' (ideally 10% copper grade copper-gold concentrate sold into China) would increase the Mineral Reserves (LOM) and increase the NPV. The study also demonstrated that a $0/t net profitability cut-off would increase the NPV over the former $10/t policy.

Variable operating cost ($/t) adjusted to haulage distances per block are presented in Table 51.

15.3 Metallurgical Recovery Algorithms

To create an NSR model, additional attributes were added to the Datamine™ Mineral Resources model. Input fields and values to the additional attributes are:

- Gold Price $1,400/oz (AuP in Table 15-3)
- Silver Price $17.00/oz (AgP in Table 15-3)
- Copper Price $2.75/lb (CuP in Table 15-3)
- Within Table 15-3 AU is block gold grade in g/t, AG is block silver grade in g/t, and CU is the block copper grade in %.

The updated fields are presented in Table 15-1.

Table 15-1: NSR calculation – additional Datamine™ attributes Mineral Reserves

Field (units)	Formula	Description
TONNES (t)	X_{INC}*Y_{INC}*Z_{INC}*DEN_VOID	Tonnes of an area – length x breadth x height x density.
Copper Concentrate		
CUREC (%)	See Table 15-2	Copper recovery using mill defined recovery algorithm.
AUREC (%)	See Table 15-2	Gold recovery using mill defined recovery algorithm.
AGREC (%)	See Table 15-2	Silver recovery using mill defined recovery algorithm.
ASREC (%)	(43.7002+1.6980*CU+0.5489*88.59)*(0.625)^ -0.0379	Arsenic recovery using mill defined recovery algorithm. For block 700 As Recovery is 0.
CU_MET_R (lb)	CUREC/100*TONNES*CU/100*2204.6226	The amount of copper recovered
AU_MET_R (tr.oz)	AUREC/100*TONNES*AU/31.1035	The amount of gold recovered
AG_MET_R (tr.oz)	AGREC/100*TONNES*AG/31.1035	The amount of silver recovered
PAYABLE (USD)	0.90*CU_MET_R*CuP+0.95*AU_MET_R*AuP+ 0.90*AG_MET_R*AgP	Payable content from metal recovered.
CU_C_DMT (dmt)	CU_MET_R/2204.6226/0.10	Gold concentrate generated (10% copper grade)
TCRC (USD)	CU_MET_R*0.10*0.90+AU_MET_R*5*0.95+AG_MET_R*0.5*0.90+CU_C_DMT*250+ CU_C_DMT*80.65	Treatment charge (US$100/dmt), recovery charges, arsenic penalty (estimated based on grade but max $150/dmt), and freight charge (US$80.65/dmt).
ROYALTY (USD)	(CU/100*TONNES*2204.6226*CuP+AU*TONNES/31.1035*AuP+AG*TONNES/31.5103*AgP)* 0.015	The operation royalty charge has been calculated using the base formula of 1.5% of the in-situ metal (copper, gold, and silver) value.
SUSTAINING_CAP (USD$/t)	4.5	Sustaining capital added based on long-term financial model.
OpCostCu (USD$/t)	See Table 15-4	Variable operating cost adjusted to haulage distances per block.
OPEX (USD)	TONNES*(OpCostCu+ SUSTAINING_CAP) + ROYALTY	Operating expenditure.
PROFIT (USD)	PAYABLE -TCRC-OPEX	NSR-less-costs
PROFIT_T (USD$/t)	PROFIT/TONNES	NSR-less-costs per tonne
NSR (USD)	(1-TCRC/ PAYABLE) *100	Net smelter return.
Pyrite Concentrate		
PC_CUREC (%)	92.4-CUREC	Copper recovery in pyrite concentrate.
PC_AUREC (%)	90-AUREC	Gold recovery in pyrite concentrate (replaced with (88.53-AUREC for Block 149)
PC_AGREC (%)	80.61-AGREC	Silver recovery in pyrite concentrate
PC_CU_MET_R (lb)	PC_CUREC/100*TONNES*CU/100*2204.6226	The amount of copper recovered

Field (units)	Formula	Description
PC_AU_MET_R (tr.oz)	PC_AUREC/100*TONNES*AU/31.1035	The amount of gold recovered
PC_AG_MET_R (tr.oz)	PC_AGREC/100*TONNES*AG/31.1035	The amount of silver recovered
PC_PAYABLE (USD)	0.65*PC_AU_MET_R*AuP	Payable metal recovered.
PC_AU_C_DMT (dmt)	PC_AU_MET_R*31.1035/6.5	Gold pyrite concentrate dry weight generated at 6.5 g/t Au concentrate grade
PC_TCRC (USD)	PC_AU_C_DMT*80.65	Treatment charges (nil), recovery charges (nil) and freight.
PC3_OPEX (USD)	TONNES*0.62	Operating expenditure of pyrite circuit $0.62/t
PC3_PROFIT (USD)	PC_PAYABLE - PC_TCRC-PC3_OPEX	NSR-less-costs
PC3_PROFIT_T (USD$/t)	PC3_PROFIT/TONNES	NSR-less-costs per tonne
NSR2 (USD)	(1-PC_TCRC/ PC_PAYABLE) *100	Net smelter return.
Total		
TOT_CUREC (%)	CUREC + PC_CUREC	Total copper recovery.
TOT_AUREC (%)	AUREC + PC_AUREC	Total gold recovery.
TOT_AGREC (%)	AGREC + PC_AGREC	Total silver recovery.
TOT_CU_MET_R (lb)	CU_MET_R + PC_CU_MET_R	The amount of copper recovered, in pounds.
TOT_AU_MET_R (tr.oz)	AU_MET_R + PC_AU_MET_R	The amount of gold recovered, in troy ounces.
TOT_AG_MET_R (tr.oz)	AG_MET_R + PC_AG_MET_R	The amount of silver recovered, in troy ounces.
TOT_PAYABLE (USD)	PAYABLE + PC_PAYABLE	Payable made from metal recovered.
TOT_TCRC (USD)	TCRC + PC_TCRC	Treatment charges and recovery charges.
TOT_OPEX (USD)	OPEX + PC3_OPEX	Operating expenditure.
PROFIT3 (USD)	PROFIT + PC3_PROFIT	NSR-less-costs
PROFIT3_T (USD$/t)	PROFIT_T + PC3_PROFIT_T	NSR-less-costs per tonne
NSR3 (USD)	NSR1 + NSR2	Net smelter return.

Table 15-2 presents the metallurgical recovery algorithms for Cu concentrate.

Table 15-2: Metallurgical recovery algorithm for Cu Concentrate

Metal	Mining block	Algorithm
CUREC	All blocks	(100.7390-20.2456*Cu (%)+55.0064*As (%)-1.1486*S(%)/Cu(%))* (Cu Grade(%)/16)^-0.0927
AUREC		0.9826*(64.5009+4.3118*Au(g/t)-1.5113*Ag(g/t)-1.2453*S/Cu(%))* (Cu Grade(%)/16)^-0.3215
AGREC		0.8536*(27.6755-0.7870*Au(g/t)-0.9400*S(%)/Cu(%)+0.5341*AuRec(%))*(Cu Grade/16)^-0.4367
CUREC	Block 152	(152-1.1813*Cu (%)-0.2283*Ag (g/t)-1.4411*S (%)/Cu (%))* (Cu Grade(%)/16)^-0.0927
AUREC		0,9826*(152+4.1623*Au (g/t)-1.7345*Ag (g/t)-1.7121*S (%)/Cu (%))* (Cu Grade(%)/16)^-0.3215
AGREC		0,8536*(25.3243-0.1406*Ag (g/t)- 0.8271*S (%)/Cu (%) +0.5134*AuRec (%))*(Cu Grade/16)^-0.4367
CUREC	Block 700	0
AUREC		0
AGREC		0

The 2021 annual review of the recovery models vs the actual plant performance indicate that the current models are still able to accurately predict the plant recovery performance for the expected future plant feed grades, except for Block 152 where the recovery models are updated due to low copper and high pyrite mineralisation. Also, Block 700 is high gold containing pyrite ore with low copper and as such the gold is recovered in the pyrite circuit. Block 700 is devoid of copper mineralisation; hence no copper concentrate metallurgical recovery assumptions are applied to this portion of the resource.

These metallurgical recovery algorithms currently have limitations, so for Mineral Resource and Mineral Reserve estimations, minimum and maximum metallurgical recovery limits were used to stop improbable recoveries being used to determine the economic model revenue. The limits employed are presented in Table 15-3.

Table 15-3: Metallurgical recovery limits to copper concentrates

Description	Lower	Upper
Copper	10%	90%
Gold	10%	77%
Silver	10%	68%

Also, if the Mineral Resource classification (RESCLASS) equals 3, then copper, gold and silver metallurgical recoveries are set to zero. A Mineral Resource classification of 3 represents Inferred Mineral Resource.

Table 15-4: Variable operating cost ($/t) adjusted to haulage distances per block

Block	Variable opex cost ($/t)
Block 5	36.73
Block 7	38.74
Block 8	38.85
Block 10	38.86
Block 16	35.59
Block 17	36.78
Block 18	36.26
Block 25	37.58
Block 19	36.35
Block 103	36.63
Block 144	35.72
Block 145	36.43
Block 146	35.88
Block 147	36.32
Block 148	34.23
Block 149	35.94
Block 150	34.94
Block 151	34.26
Block 152	34.76
Block 153	38.22
Block 149S	35.91
Block 700	35.42

15.4 Development of Stope Designs

Once profit per tonne was estimated for each block within the Mineral Resources block model, the stopes were generated using geometry controls dictated by geotechnical and operational limitations and being applied to the block model using the MSO software within Datamine™. Planned dilution for the MSO program control was based on geotechnical and reconciliation information and varies by stope block area. The stopes were developed at a cut-off of >US$0/t.

The stopes produced were visually checked against the geology and grade models for consistency and modified if required. Development in ore was also designed and subtracted from any stope designs.

Unplanned dilution and mining loss were applied to each stope after the design process was completed. Unplanned dilution and mining ore loss are also developed based on reconciliation data.

15.5 Design of Development and Stopes

Level and capital development were designed for all stopes and activities scheduled. The lowermost level stopes were verified that the operational profit can cover the cost of new level capital development. Secondary stopes and ore remnants were designed based on the most up-to-date survey data available for the depleted stopes abutting them. In most cases 3D laser surveys of the mined-out stopes was available (in the case of active operating stopes). However, if not available, stope designs were used.

Stoping is divided vertically in each block into multiple horizons, varying from 60 m to 90 m in height, so that multiple stopes can be mined in each block simultaneously. Each stope is designed at a nominal 30 m height and 20 m width. The design length can usually vary between 20 m and 60 m, depending on geotechnical conditions, and whether it is a primary or a secondary stope.

During mining, the length may change based on actual conditions. Sequencing for each horizon is focused on a bottom-up, inside-out approach to minimise stress on the secondary stopes and pillars, and to push the stress onto the abutments.

15.6 Mineral Reserves Estimate Statement

The Chelopech Mine is an economically viable underground mining operation. The Mineral Reserve Estimate is based on the Measured and Indicated categories of the Mineral Resource contained within the mine design. The Mineral Reserve Estimate has considered all modifying factors appropriate to the Chelopech Mine.

The reference point at which the Mineral Reserves are defined is where the ore is delivered to the process plant primary crusher.

There is no known mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the estimate. However, it is important to note that the total mine life is 1.5 years longer than the current expiry date of the Mining Licence (Chelopech Concession), which is 26th July 2029 (15% of the Mineral Reserve). DPMC provided the report authors with a legal opinion that a Mine Licence (Concession) extension is considered probable based on national precedent. No proven ore exists in the last year of production.

The Mineral Reserves at Chelopech were estimated by including several technical, economic, and other factors. A change to any of the inputs would therefore have some effect on the overall results. CSA Global is comfortable that sufficient work has been done by DPMC to ensure that minor changes in the mining and metallurgy factors are not likely to have any material effect on Mineral Reserves. CSA Global relies on information as presented in Section 3 of this Technical Report with respect to legal and environmental considerations.

The Mineral Reserves identified in Table 15-5 comply with Canadian Institute of Mining, Metallurgy and Petroleum (CIM) classification of resource and reserve definitions and standards.

Table 15-5: Chelopech Mineral Reserves with an effective date as of 31 December 2021

Chelopech Mineral Reserve Estimate (effective date of 31 December 2021)								
Ore type	**Reserve Classification**	**Mt**	**Grades**			**Metal content**		
			Au (g/t)	**Ag (g/t)**	**Cu (%)**	**Au (Moz)**	**Ag (Moz)**	**Cu (Mlb)**
General	Proven	5.8	2.72	6.8	0.85	0.51	1.27	108.9
	Probable	13.1	2.67	7.5	0.80	1.12	3.17	230.8
Block 700	Probable	0.1	3.89	57.5	0.02	0.02	0.22	0.1
Block 152	Probable	0.4	4.19	4.6	0.23	0.05	0.06	2.1
All	**Proven**	**5.8**	**2.72**	**6.8**	**0.85**	**0.51**	**1.27**	**108.9**
	Probable	**13.6**	**2.72**	**7.9**	**0.78**	**1.19**	**3.45**	**233.0**
TOTAL		**19.3**	**2.72**	**7.6**	**0.80**	**1.70**	**4.72**	**341.9**

Notes:

- *The Mineral Reserves disclosed herein have been estimated in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves (CIM, 2014).*
- *Mineral Reserves has been depleted for mining as of 31 December 2021.*
- *The Inferred Mineral Resources do not contribute to the financial performance of the project and are treated in the same way as waste.*

- *The reference point at which the Mineral Reserves are defined is where the ore is delivered to the crusher.*
- *Long term metal prices assumed for the evaluation of the Mineral Reserves and Mineral Resources are $1,400/oz for gold, $17.00/oz for silver, and $2.75/lb for copper.*
- *Mineral Reserves are based on a NSR-less-costs cut-off value of US$0/t. The total cost applied was approximately $45/t which is a sum of operational costs of approximately $40/t (variable by stope location) and sustaining capital of $5/t.*
- *All blocks include a complex NSR (Net Smelter Return) formula that differs for the three ore types. The NSR formula utilizes long term metal price, metallurgical recoveries, payability terms, treatment charges, refining charges, penalty charges (deleterious arsenic), concentrate transport costs, and royalties. For clarity of understanding of ore value, a simplified formula is presented here that correlates to the complex formula to within 1%. The simplified formulas per ore type are:*
  - *Block 700 NSR US$/t = 0.00 x Cu% + 0.00 x Ag_gpt + 14.24 x Au_gpt*
  - *Block 152 NSR US$/t = 21.08 x Cu% + 0.32 x Ag_gpt + 33.96 x Au_gpt*
  - *General NSR US$/t = 16.72 x Cu% + 0.23 x Ag_gpt + 29.18 x Au_gpt*
- *Mineral Reserves account for unplanned mining dilution and ore loss that varies by orebody dimension and experience per mining block area. The average values are 10.0% for unplanned mining loss and 9.7% for unplanned dilution.*
- *Mineral Reserves account for planned mining dilution and mining recovery through stope optimisation and stope design. The stopes are optimized to maximize net cashflow within the constraints of dilution and orebody extractable geometry. The planned dilution and recovery alter depending on geotechnical, mineralisation continuity controls and ore zone dimensions.*
- *All stopes have been verified that they are profitable after the application of the cost of capital development.*
- *There is no known likely value of mining, metallurgical, infrastructure, permitting or other relevant factors that could materially affect the estimate. The final 1.5 years of operation occurs after the termination of the mining concession agreement ends. It is the opinion of DPMC that the mining permit will be extended.*
- *The Proven Mineral Reserve includes broken stocks of 28 kt at 3.30 gpt Au, 5.2 gpt Ag and 0.91% Cu as well as stockpiles of 13 kt at 3.05 gpt Au, 6.7 gpt Ag and 0.96% Cu.*
- *Sum of individual table values may not equal due to rounding*

Net changes in tonnes and contained metals from the 2020 to the 2021 Mineral Reserves estimate show an increase of 825,000 in tonnage, reduction of 29,000 ounces of gold, increase of 105,000 ounces of silver and reduction of 2.5 Mlb of copper. The corresponding percentage changes are a 4% increase in tonnes, a 2% reduction in gold content, a 2% increase in silver content and a 1% reduction in copper content. The increase in tonnage is net of 2021 depletion and increases are attributed to the reduction in cut-off value to $0/t.

16 Mining Methods

16.1 Mining Operations

Underground mining production is performed using sublevel LHOS methods. The various orebodies are developed at nominal 30 m vertical intervals and accessed by major declines in both the Western and Central areas. Stopes are designed to be 20 m wide between the levels. The length of the stope depends on the geotechnical conditions, but can range between 20 m and 60 m. The most recent trend of stope design is to keep a 20–30 m length and 60 m height, where geological and geotechnical conditions are suitable. This allows for improvement in ore handling and dust suppression during ore mucking because of shorter remote loading. Ore is delivered via ore passes, or via trucks, to the ROM bin above the crusher. The crusher feeds up to 400 tph to a system of eight conveyors, to transport the ore to the surface stockpile.

Once mined via an “end-slice” methodology, stopes are backfilled with “paste-fill” produced from the mill tailings to which cement is added and which is gravity fed underground via a system of borehole and pipes to the stopes being filled.

Multiple horizons are designed in each ore body so that multiple stopes can be in production at any one time. Simulations have shown that at least six stopes shall need to be producing ore to maintain ore production of 2.2 Mtpa, with up to 22 stopes being drilled, “mucked” and filled at any one time.

16.2 Mining Schedule

The mining development and production schedule was developed using Datamine™ software. As well as the focus on the sequencing previously mentioned, the scheduling strategy aims to maintain a blend from the blocks approximating the proportion in the Mineral Reserves, so that multiple mining areas can be maintained for as long as possible, to minimise congestion and maximise production.

The Concession Agreement expires on 26th July 2029. According to Bulgarian legislation, the concessionaire (DPMC) has the right to request an extension to the Chelopech concession agreement for a further period of time equal to the remaining Mineral Reserves at the time of application. The current extraction and processing plan of the Mineral Reserves for the whole 2030 require an extension to the Concession Agreement from July 2029 to the end of 2030 to effect full value. It is understood that legal mechanisms are in place to allow an application for extension to the Concession Agreement.

DPMC has not yet commenced application but will be required to do so before 26 July 2028. It is the opinion of DPMC’s legal representatives, upon whose opinion the QP rely, that the application should be successful based on precedent of other agreement applications, but this cannot be guaranteed. Given the lack of guarantee, no Proven Mineral Reserve should exist in the last year of mining. It has been verified that only Probable Mineral Reserve exists in the 2030 mine extraction plan and so no downgrading of Mineral Reserve status was required. It is important to note that all Mineral Resources will require an extension to the Mineral Agreement for those to be affected. Given the lack of extension guarantee, expiry of the Concession Agreement represents a risk, however unlikely, and is therefore set out as a risk in Sections 4.4.5 and 26.

The LOM production schedule summary is presented in Table 16-1.

Table 16-1: LOM production schedule (2022–2030)

CHELOPECH LIFE OF MINE PLAN											
LOM	**Unit**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**Total**
Tonnage	Mt	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.7	**19.3**
Copper	%	0.85	0.90	0.82	0.78	0.76	0.74	0.81	0.91	0.62	**0.80**
Gold	g/t	2.97	2.73	2.94	2.94	2.63	2.71	2.56	2.53	2.47	**2.72**
Silver	g/t	5.5	6.1	5.8	6.3	6.5	7.1	9.5	9.0	13.8	**7.6**
Arsenic	%	0.25	0.27	0.25	0.24	0.23	0.20	0.24	0.26	0.16	**0.23**
Sulphur	%	11.00	12.45	12.29	10.94	11.09	9.99	11.34	10.47	9.79	**11.07**

Sum waste vertical development metres	km	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	**0.9**
Jumbo total development metres	km	7.3	7.4	7.5	7.1	5.7	3.4	0.7	0.5	0 .0	**40.0**
Long-hole drill metres	km	223	223	220	226	223	223	222	231	215	**2,006**
PF volume	000 m^3	528	521	527	542	609	661	698	696	728	**5,511**
WF volume	000 m^3	207	209	207	191	158	97	20	14	0	**1,104**
Total backfill volume	000 m^3	736	730	734	733	767	759	719	711	728	**6,616**

16.3 Mining Equipment Selection

The operations at Chelopech are a typical medium to large scale mechanised operation using large-sized equipment. Primary mine loaders are 17-tonne weight, with 7 m^3 buckets. Trucks are 30-tonne capacity. The proposed replacement equipment will be like those currently in use at the mine. The fleet numbers reflect the mature state of operations with reductions in fleet commencing in 2026 as development requirements reduce as presented in Table 16-2.

Table 16-2: Primary mobile equipment

Type	Model	Numbers	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Loader	LH517	Fleet	6	6	6	6	6	6	6	6	3	
		Purchase requirement	1	1	1	1	1	1	1	0	0	**7**
Truck	TH550	Fleet	7	7	7	7	7	7	7	7	4	
		Purchase requirement	1	1	1	1	1	1	1	0	0	**7**
Development drills	Axera 7-260 Cabine	Fleet	4	4	4	4	4	4	4	4	3	
		Purchase requirement										**0**
Production drills	Solo DL420-15C	Fleet	4	4	4	4	4	4	4	4	3	
		Purchase requirement										**0**
Service machine	Caterpillar 930H	Fleet	7	7	6	6	5	4	4	4	4	
		Purchase requirement	0	1	1	1	0	0	0	0	0	**3**
Blasting trucks	-	Fleet	2	2	2	2	2	2	2	2	2	
		Purchase requirement										**0**
Grader	12H	Fleet	3	3	3	3	3	3	3	3	3	
		Purchase requirement										**0**
Aggregate truck (concrete)	Utimec 1500 Transmixer	Fleet	2	2	2	2	1	1	1	1	1	
		Purchase requirement	1	1								**2**
Shotcrete machine	Sika PM 407	Fleet	2	2	2	2	1	1	1	1	1	
		Purchase requirement	0	1	0	0	0	0	0	0	0	**1**
Water truck	-	Fleet	2	2	2	2	2	2	2	2	2	
		Purchase requirement	1	0	1	0	0	0	0	0	0	**2**
Underground jeeps 100%	-	Fleet	36	36	36	36	36	36	36	36	10	
		Purchase requirement	6	6	6	6	6	6	6			**42**
	-	Fleet	3	3	3	3	3	3	3	3	3	

Type	Model	Numbers	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Underground trucks (man)+ slime man		Purchase requirement										**0**
Mobile rock breaker		Fleet	2	2	2	2	2	2	2	2	2	
		Purchase requirement	0	1	0	1	0	0	0	0	0	**1**
MR007	-					1						
Management Vehicles	-	Fleet										
		Purchase requirement	1	1	1	1	1	1	1	0	0	**7**
Surf Equipment	-	Fleet										
		Purchase requirement	0	0	0	0	0	0	0	0	0	**0**

16.4 Mine Ventilation

The ventilation system has been in a stable configuration since the last major upgrade in 2014 which saw installation of four 110 kW fans working in parallel at Zapad shaft on 405 level. The Zapad shaft is 3.5 m diameter, bare concrete-lined shaft, which was stripped after its decommissioning as ore hoisting shaft.

16.5 Backfill

A paste backfill plant has been built on surface, commissioned in 2010, to facilitate maximum use of the available tailings for backfill placement underground in the mine. This will meet future backfill requirements and has replaced the existing hydraulic backfill plant. The facility is built adjacent to the existing hydraulic backfill plant and makes use of existing binder silos and backfill reticulation holes.

The paste backfill plant consists of a high-rate thickener, vacuum filter, mixer and binder addition system. A complete underground borehole and piping paste reticulation system has been installed with the plant, having a capacity of producing 230 tph of paste backfill.

Target design strengths for the paste for stope filling range between 260 kPa and 450 kPa after 56 days. The required strength is dependent on the location of the fill in the stope. Cement contents typically range between 3.5% and 5%. A QAQC program for paste-fill strength determination is in place run by the geotechnical team. Optimisation of the process will continue to be an ongoing process.

Dry waste material from waste developments is used to backfill stopes where paste-fill is not required and typically constitutes around 15% of the total stope backfill volume.

16.5.1 Crown Pillar Extraction

DPMC has successfully demonstrated recovery of crown pillars through the use of open stoping augmented by grout injection of overlying strata. DPMC has a successful model of extraction to apply in areas of similar geotechnical conditions. Future trials of other blocks where the ground conditions are not as favourable are being investigated using the sublevel caving method. DPMC has operational experience with sublevel caving, meaning that operational risk factors are reduced. It is considered appropriate that DPMC's plans to recover crown pillars are soundly built on operational experience and sound investigative technique and are thus appropriate to consider such material as Mineral Reserves.

16.6 Reconciliation

Reconciliation, defining the performance of the mine and mill compared to the Mineral Reserves, commenced in detail in 2009. In 2021, the results show that the mine is producing an average of 1% less tonnes at 11% lower copper and 8% lower gold grades, after mining dilution and ore losses, compared to the Mineral Reserves block model for the same period.

16.7 Dilution and Ore Loss

Dilution and losses due to mining activities were applied to the tonnes of each block, as per the mining method designed to mine them. Values are based on the history-to-date for those blocks mined and methods used. Mining block dilution and ore loss assumptions are presented in Table 16-3.

Table 16-3: Dilution and ore loss assumptions

Mining method	Mining blocks	Losses	Dilution
Long-hole stoping and backfill	150	8.29%	6.96%
Long-hole stoping and backfill	151	7.52%	6.70%
Long-hole stoping and backfill	19E	9.26%	6.77%
Long-hole stoping and backfill	19W	9.18%	6.03%
Long-hole stoping and backfill	103	8.87%	9.96%
Long-hole stoping and backfill	149	11.56%	13.84%
Long-hole stoping and backfill-CP	150	9.19%	8.32%
Long-hole stoping and backfill	5	13.57%	31.30%
Long-hole stoping and backfill	25	24.77%	0.64%
Long-hole stoping and backfill	145	14.53%	5.59%
Long-hole stoping and backfill	147	15.23%	46.88%
Long-hole stoping and backfill	149S	4.25%	6.94%
Sublevel caving	151, 19, 103, 16, 17, 18, 8	20.0%	29.0%
Long-hole stoping and backfill*	152, 153, 16, 17, 18, 8, 10	8.44%	7.32%

**Average.*

Mining staff at DPMC have a program of continuous improvement which includes recent upgrades to reconciliation processes. Current unplanned ore loss and dilution that are applied to future stopes are reconciled to current data.

All stopes are surveyed on termination by either drone or continuous machinery survey equipment. Tonnages extracted are also registered through equipment monitoring, and plant reconciliation for overall factors. Estimates of backfill loss into mine extraction are taken from the surveys and sometimes (more rarely) manually changed where data is survey poor or difficult to obtain. Dilution and ore loss is noted to increase in thinner ore stopes and where geotechnical conditions are poorer. These conditions are known prior to stope design based on geological mapping, drilling and neighbouring stope performance.

It must be noted that unplanned ore losses and dilution have been trending higher since 2017. For 2021, the total reported unrecoverable losses are 17.2% and an unplanned dilution of 9.7%. Further work on figuring out root cause analysis of unplanned mining loss and dilution will aid separation of expected versus unexpected changes in these factors.

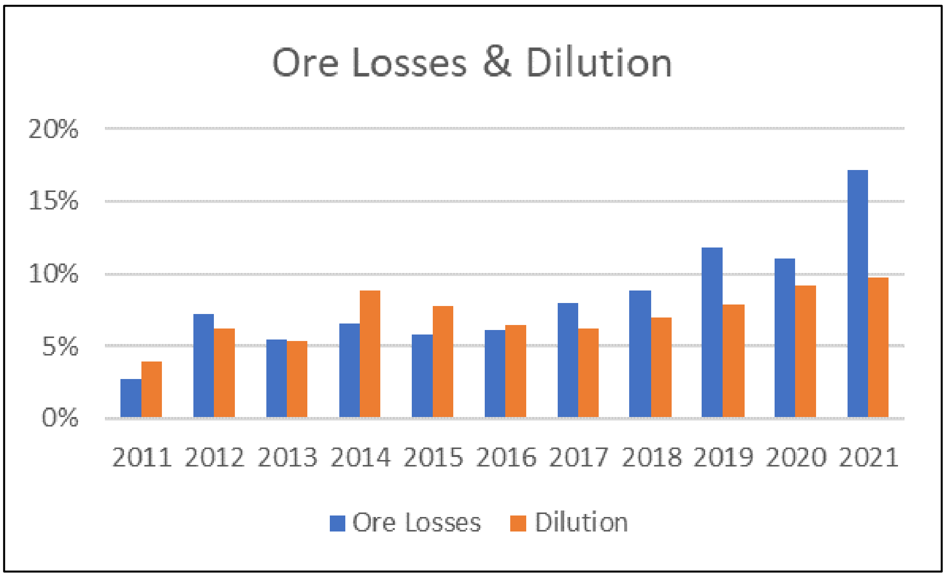


Figure 16-1: Chelopech ore loss and dilution from 2011 to 2021 (DPMC, 2021)

16.8 Underground Crusher Conveyor System

A materials handling system for the mine was designed by DPMC and constructed to replace the earlier shaft and rail ore handling system in 2012 (discussed further in Section 18). The ore reports via an ore pass system to the 195 level where it is then crushed and transported by a series of six conveyors (3.9 km total length) to be finally discharged onto a 6,000-tonne live capacity reclaim stockpile on surface. The new system has a 3 Mtpa maximum capacity.

This ore handling system incorporates a primary crusher (a 1,070 mm x 1,500 mm jaw crusher) between the 195 level and the 165 level underground, which discharges into a 400-tonne crushed ore bin. The crusher is fed from a ROM bin sitting under a grizzly with openings of 800 mm x 800 mm.

Ore is fed to the grizzly via three sources:

1) A 4 m diameter x 135 m long ore pass for 151 and 150 Block material above the 260 level.
2) A 7 m diameter x 30 m long ore bin for the 144, 145, 147, 149, and 103 Blocks, 150 and 151 Blocks between the 225 and 260 levels; and the Central area 16, 18 and 19 Blocks.
3) A truck tip directly on the grizzly for ore in 151 and 150 Blocks, on and below the 195 level.

A plate feeder draws material from the 400-tonne crushed ore bin and loads a picking belt (CV1) for removal of tramp metal using a self-cleaning magnet. Material is then conveyed via conveyors (CV2-CV7) to the surface. The surface conveyor (C1105) transfers this material to the surface reclaim stockpile, where it is reclaimed and conveyed to the SAG mill to supply feed to the process plant.

One crusher exists on surface to handle oversize and to supply minimum production in case of emergency.

There is no ore blending ability in the system from the ore passes to the plant delivery. Ore blending is therefore done by controlling the amount of material coming from each producing stope and the planning behind how many and what stopes will be in production.

17 Recovery Methods

17.1 Recoverability

Current ore treatment processes comprise conventional crushing of ROM ore in a primary jaw crushing circuit, grinding in a SAG milling circuit, rougher/scavenger flotation, followed by three-stage cleaning and concentrate dewatering to produce a copper/gold concentrate (Figure 17-1). Pyrite is recovered from the copper circuit cleaner tails as a by-product with minor gold credits.

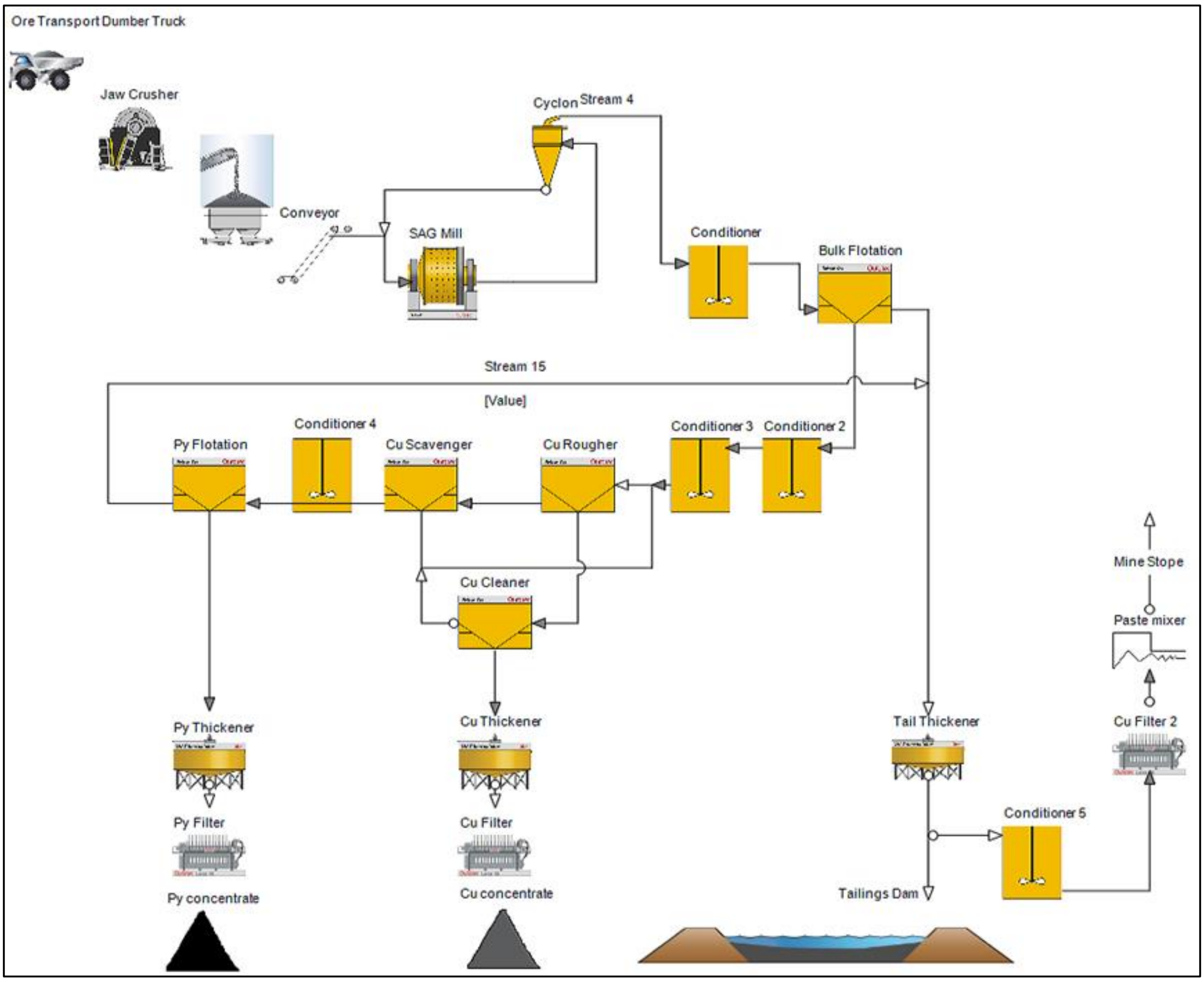


Figure 17-1: Chelopech process flow diagram (DPMC, 2020)

The primary saleable product is a gold-copper concentrate, the grade of the concentrate can be altered depending on the client. The concentrate grade that maximises the project value depending on the client and market conditions was determined through DPMC internal studies.

The concentrate is loaded at the mine site through a conveyor system from the stockpile into rail wagons and dispatched to the Port of Burgas for sea transportation to the Company's smelter in Namibia or other clients in China.

Since 2014, pyrite concentrate, containing gold, has been produced in a section with a capacity allowing the production of up to 400,000 tonnes of pyrite concentrate per year from the mill feed as a separate secondary concentrate product, in addition to the produced gold-copper concentrate. Production is currently run to meet market demand and current projections are for sales of slightly more than 250,000 dmt per annum.

Tailings from the concentrator are thickened and directed to the mine backfill plant, with the balance discharged to the flotation TMF.

The concentrator operates 24 hours per day, seven days per week, and is designed to process 275 tph at an operating availability of around 92%, with an average annual ore throughput capacity of 2.2 Mt.

17.2 Plant Production Performance

Table 17-1 shows the progressive ramp-up in ore production, feed grades and metal recoveries since 2006, whilst Table 17-2 and Table 17-3 show the corresponding concentrate and contained metals. Implementation of the main concentrator process expansion commenced in 2010 and was completed in phases with the final construction of the mine upgrade in early 2013.

Table 17-1: Ore processed, head grades, and metal recovery to copper concentrate at Chelopech operations

Year	Ore processed (kt)	Cu (%)	Au (g/t)	Ag (g/t)	S (%)	Cu (% recovery)	Au (% recovery)	Ag (% recovery)
2006	953	1.4	4.0	10.5	14.9	85.4	58.0	41.0
2007	913	1.3	3.9	7.7	13.3	87.1	65.2	49.2
2008	901	1.2	4.0	7.5	12.3	86.0	61.2	47.5
2009	981	1.4	4.3	7.9	13.9	87.2	64.6	47.6
2010	1,001	1.5	3.9	8.7	16.1	85.5	54.5	41.5
2011	1,354	1.5	3.9	8.1	14.8	84.5	56.0	42.9
2012	1,820	1.3	3.7	9.3	14.9	82.3	55.5	35.7
2013	2,032	1.2	3.5	7.7	13.5	81.4	48.4	34.9
2014	2,076	1.18	3.72	9.14	14.89	82.3	50.1	38.7
2015	2,052	1.10	3.70	10.69	14.62	80.1	47.0	34.3
2016	2,212	0.98	3.43	8.95	14.14	80.5	48.5	35.8
2017	2,219	0.91	3.74	7.52	13.51	80.6	52.9	38.6
2018	2,217	0.92	3.72	6.77	13.23	81.2	53.5	38.0
2019	2,203	0.93	3.35	6.29	13.25	82.14	50.53	35.43
2020	2,201	0.93	3.50	6.56	13,38	78.60	50.14	35.36
2021	2,199	0.88	3.29	6.83	12.37	81.31	50.00	35.33

Table 17-2: Copper concentrate and contained metal produced

Year	Concentrate produced (kt)	Cu, contained (kt)	Au, contained (koz)	Ag, contained (koz)
2006	70	12	71	132
2007	65	11	75	111
2008	55	9	71	103
2009	72	12	88	118
2010	75	12	66	113
2011	103	17	94	152
2012	119	19	121	217
2013	127	21	132	219
2014	126	20	124	236
2015	113	18	115	242
2016	107	17	118	228
2017	101	16	141	207
2018	104	17	142	183
2019	105	17	120	158
2020	106	16	124	164
2021	110	16	116	171

Table 17-3: Pyrite concentrate and contained metal produced

Year	Concentrate produced (kt)	Au, contained (koz)	Ag, contained (koz)	Cu, contained (t)
2013	15	3,074	8,749	55

Year	Concentrate produced (kt)	Au, contained (koz)	Ag, contained (koz)	Cu, contained (t)
2014	163	36,465	103,224	601
2015	239	54,772	182,207	950
2016	215	47,237	143,148	1,564
2017	249	56,448	139,977	1,765
2018	260	59,255	137,862	1,939
2019	252	53,472	124,560	1,693
2020	262	55,503	128,802	1,404
2021	269	60,569	156,489	1,833

17.3 Future Production Performance

The current operation produces a copper concentrate with associated gold and silver, with copper, gold and silver recoveries averaging 85%, 55% and 42% respectively, between 2004 and 2011. Since 2012, as the plant throughput has increased, the head grades have steadily decreased, with resulting decreases in recovery to concentrate (81.5%, 50.3%, and 35.9% respectively). For the remainder of the mine life, the operation will be treating declining metal head grades, which at the current LOM production rate (~2.2 Mtpa) will result in declining copper concentrate production. The pyrite recovery circuit has enabled the overall site production of gold to increase (~76% in 2021). A technical-economic assessment concluded that it would be economically optimal to produce a copper containing gold concentrate (~9-11% Cu, 15-30g/t Au, <3.5% As) instead of the historic 16% Cu copper concentrate in current market conditions. Extensive plant trials during 2021 proved the technical and economic feasibility of this production strategy.

The extensive performance database generated over the years has been used to develop the recovery models used for production predictions. These are described in full in Section 14.10.3 and have been applied to the current LOM plan block model (Table 16-1). The 2021 annual review of the recovery models vs the actual plant performance indicate that the current models are still able to accurately predict the plant recovery performance for the expected future plant feed grades.

In 2020, an Advance Control Tool (ACT) project was scoped out and planned for the purposes of process plant optimisation. It is anticipated that it will commence as an advisory tool for operators before further enhancement via automation of the processing operation. It is expected that this will be adopted via an agile approach commencing with the grinding and thickening components of the process plant.

Table 17-4 summarises the expected metal distribution over the current LOM (2022 to 2030) schedule into the copper and pyrite concentrates.

Table 17-4: Predicted metal distributions to copper and pyrite concentrates (2022 to 2030)

LOM 2022 to 2030	%wt	Cu (%)	Au (%)	Ag (%)
Copper and gold concentrate	**6.57**	**84.84**	**54.74**	**50.39**
Gold concentrate	6.19	85.14	55.03	51.07
Copper concentrate	0.38	81.92	51.82	40.48
Pyrite concentrate	11.53	8,11	24.92	26.20
Tails	81.90	7.05	20.34	23.41
TOTAL	**100**	**100**	**100**	**100**

17.4 Current and Projected Requirements for Energy, Water and Process Materials

The total power consumption is approximately 38 kWh/t of which grinding and flotation is approximately 75%. The main reagents are collector (120–150 g/t), quicklime (3–4 kg/t) and sulphuric acid (0.7–1.0 kg/t). The water consumption is approximately 0.35 m^3/t of ore treated.

DPMC does not foresee any material change in the consumption of power, water and process materials, compared to that used in the last three years.

Table 17-5: Historical data for main consumables

Year	PAX	Lime	Flocculant	Grinding Media	Sulfuric Acid	*Water*	Power
	kg/t	kg/t	kg/t	kg/t	kg/t	m3/t	kwh/t
2014	0,132	3,177	0,036	1,267	1,213	0,329	39,73
2015	0,175	3,414	0,041	1,214	0,954	0,455	40,56
2016	0,127	3,033	0,034	1,241	0,706	0,353	37,55
2017	0,146	2,760	0,035	1,175	0,959	0,345	36,85
2018	0,145	3,949	0,037	1,141	1,071	0,361	37,40
2019	0,149	3,791	0,039	1,291	0,664	0,369	38,16
2020	0,150	2,900	0,036	1,198	0,654	0,247	37,30
2021	0,154	1,317	0,038	1,192	0,917	0,242	37,75

18 Project Infrastructure

18.1 Mine Upgrades

Section 0 describes the mine infrastructure. No further major mine infrastructure upgrades are needed for the life of the mine. Further investigation of remote loader operation from the control room is being trailed and a capital program is in place for information technology upgrades which will cover some infrastructure changes.

18.2 Concentrator Upgrades (to 2012)

18.2.1 Summary

The basis for the mine and plant expansion was to install the capacity to mine and process 2 Mtpa of ore from the underground mine. It was important to integrate the existing equipment where possible, to both minimise capital expenditure and interferences with existing operations during installation. In the concentrator, this required bypassing of the existing secondary/tertiary crushing section completely, combined with the installation of a new grinding and primary flotation equipment to handle the increased material flows.

The upgraded circuit equipment primarily included:

- A crushed ore stockpile being fed from the underground primary crushing and conveying system. Apron feeders transfer the ore onto the original crushing circuit feed conveyor.
- Two conveyors to transfer primary crushed ore from the existing transfer conveyor to the SAG mill feed chute.
- A single-stage SAG mill, 8.24 m diameter and 4.73 m effective grinding length, powered by a 5.8 MW motor, including ball charging, liner handling and associated equipment.
- The mill product classification circuit, comprising mill discharge hopper, cyclone feed pumps and cyclone cluster.
- Four 100 m^3 capacity tank cells for the upgraded rougher and scavenger duties.
- Utilisation of existing flotation circuit as the upgraded three-stage cleaning circuit.
- New concentrate and flotation tailings thickeners for water recovery and recycling at the plant site.
- The thickened tailings are further processed in the "paste" plant, completed in September 2010, prior to being placed underground as backfill material.
- A vertical plate and frame pressure filter and ancillary equipment for concentrate dewatering, and filter-cake handling.

18.2.2 Comminution

The first phase of the upgrade was completed using the original primary crushing circuit, which comprised of three parallel streams, each comprising an apron feeder, a jaw crusher, and a short discharge belt. The final phase of implementation was completed in December 2012, when the underground crushing and conveying part of the project connected through to the new coarse ore stockpile and feeding system.

Crushed product from the primary crushers, which has a typical P_{80} of 100 mm, is ground using a single-stage closed grinding circuit with cyclone classification. This comprises a single-stage SAG mill, 8.53 m diameter x 4.72 m long, with a rated capacity of 5,800 kW. Cyclone underflow is returned to the SAG mill and the overflow gravitates to the flotation circuit passing via an "in-stream" analysing system, which monitors the density and the assay composition of the stream, and a particle size analyser.

18.2.3 Flotation

The flotation process continues as before in the new rougher/scavenger circuit comprising of four 100 m^3 tank cells, where a bulk sulphide concentrate, containing the copper minerals and most of the pyrite, is collected and forwarded to the cleaner circuit.

The combined concentrate flows via a conditioner tank to the previous rougher/scavenger cells, rearranged to form the new first cleaner circuit, by using lime for pyrite depression. These comprise of two banks of four, four-cell Denver-500 cells, and the circuit tails (cleaner tails) being combined with the rougher/scavenger tailings to form the final tailings stream. The first cleaner concentrate reports to the second and third cleaners, while the cleaner tailing reports back to the first cleaner feed.

Reagents currently used are PAX (potassium amyl xanthate) for collection, Oreprep F549 for frother, and slaked lime for pH control. Final concentrate is gravity fed to the dewatering section, while the final tailings are transported by gravity to the current water recovery thickener located at the plant site.

18.2.4 Concentrate Handling

The copper concentrates report to the filter section for thickening and filtration. A 12 m high-rate thickener is used to thicken the final copper concentrate, which is then dewatered typically to a moisture content of less than 8%, using a vertical plate pressure filter. The filtered cake is stored and transported periodically by rail to Burgas, for onward shipment to the smelter located in Namibia.

18.2.5 Paste Backfill

The paste backfill plant is located to the north of the plant, alongside the mine portal. The dewatered tailings are either pumped to the paste plant feed tank, and from there into the plant as required for placement underground, or, delivered by gravity to the flotation TMF, located 3 km to the south of the plant site.

The backfill section further dewaters the thickened tailings by filtering in one (of two) vacuum disc filters. This produces a paste, which is then combined with cement at the appropriate percent solids and transported underground via gravity to the reticulation system for delivery to the mined-out stopes. System control is fully automatic; however, operations are monitored via a control room where the performance of the plant and paste product quality is controlled, and the required communication and coordination with the southern site and underground personnel are maintained.

18.2.6 Process Control

The main process streams – feed, concentrate and tailings – are controlled by operators employed by DPMC quality control section, who perform the sampling and sample preparation. 24-hour bulk samples are collected and assayed for the purposes of the metallurgical balance of products and metals. The assays are performed by the onsite independent assay laboratory, which is part of the SGS-certified multi-national group of laboratories.

Quality control operators also take two-hour stream samples for operational purposes, mill feed samples for moisture and granulometric determinations, concentrate stock samples for moisture determinations, 24-hour bulk samples from the backfill plant products for granulometric determinations, as well as another metallurgical testwork, as required.

The process plant is provided with an Amdel in-stream analyser system, which monitors the density and the composition of the main process streams. The system operates in real time and provides feedback on the stream copper, iron, sulphur and arsenic grades, density and percentage of solids.

18.3 Concentrator Upgrades (post-2012)

18.3.1 Cleaner Circuit (completed July 2012)

In mid-2013, the existing second and third copper circuit cleaner banks cells were replaced with new units. Each stage is comprised of two stages of "staged flotation reactors" in series for each. Selection of these units followed extensive plant trials through 2012 testing a production sized unit as the first stage of the second cleaner (Woodgrove Technologies, 2012).

18.3.2 Pyrite Recovery Circuit (completed March 2014)

Prompted by the success of the cleaner circuit upgrade, the new pyrite circuit included the staged flotation reactor design as the flotation units. The remainder of the circuit includes a concentrate thickener, filter, and concentrate storage area located on the west side of the current concentrator building. The complete circuit was commissioned and in full production by the end of Q2 2014.

18.3.3 Concentrate Handling Facility (completed Q3, 2014)

This material handling system conveys both the copper and pyrite concentrates produced from their respective storage areas, across the site to a “rail loadout” system. From here, the two concentrates are transported to a holding warehouse in the port of Burgas, from where it is loaded into bulk cargo carriers for transport to the final destination.

18.3.4 Process Control

The Metso : Outotec ACT (Advance Control Tool) for plant real time monitoring and improving process control is partially implemented and is planned to be finalised during 2022. The ACT project aims to deliver minimum interaction from operators and to deliver a consistent approach for controlling the processing plant. Currently the ACT grinding and tail thickener optimizers are installed and operating whilst flotation, concentrate thickeners and filter optimizers are scheduled for 2022. The planned Flotation Optimizer is going to use froth characterization data in its logic. Portage Technologies product (division of Woodgrove) utilizes 16 process control cameras to measure characterization of froth (froth velocity, stability and color, number of bubbles and density) within each flotation cell where flotation process control is used.

18.4 Tailings Management

18.4.1 Flotation Tailings Management Facility

The existing flotation TMF is located 3 km south of the plant site. Since the start of operations, and prior to 2011, the existing embankment was progressively raised using low permeability fill and structural fill on an as required basis, using an upstream raise construction method. The method of deposition (when not being deposited underground as backfill for stopes) is by sub-aerial methods, using a combination of spigots at regular intervals on the main embankment, west and north side of impounded area. In 2020, the construction of the next raise of the TMF to the 630 masl elevation was completed according to accepted design (SWECO Energoproekt, 2015 and 2018). At the end of 2020 the main dam and adjacent facilities were constructed to a designed elevation by the upstream method. After the completion of the last elevation 630 masl, the main wall will be buttressed in regards to stability improvement. Implementation of buttressing project will increase the reliability of the facility in compliance with Canadian Dam Association (CDA) guidelines and international best practices and standards. The capacity of the upgraded facility to 630 masl has increased significantly.

18.4.2 Tailings Management Design Parameters

The design of the existing TMF to the 630 m level was based on backfilling of underground stopes with flotation tailings. Whilst mined-out voids have been filled, tails were deposited underground for ~40% of the time, with the remainder being transported to the TMF. The design capacity of the extended TMF is based on 60% of the total tailings production being sent to the TMF. The total capacity of the TMF is 32 million m^3, but the free capacity as per the end of December 2021 to 630 level is 15.6 million m^3.

18.4.3 Site Water Management

The operation is currently permitted to discharge water from the TMF to a certain limit each year. These discharges have been reducing over the last five years, as the tonnes of ore processed have increased and more TMF water is recycled in the process.

The water balance model has been run for a wide range of conditions over several years. The modelling indicates that under dry to normal conditions, with the use of all mine water, all the tailings facilities can be operated with a "negative" water balance, maintaining pond volumes close to the minimum levels.

Under 1:100-year wet conditions, pond volumes increase significantly. However, water can be drawn down over the following few years and no uncontrolled spillway discharges are forecast.

18.4.4 Stability Assessment

The stability of the TMF embankments was assessed under static and pseudo-static loading conditions, using limit equilibrium methods and critical state models. The seismic assessment included operating and maximum credible earthquake (MCE) loads. The liquefaction assessment of tailings deposits was finalised on September 2019 and was the source for the development of design criteria for buttressing, according to modern approaches complies with world dam safety practice and CDA guidelines.

Generally accepted minimum factors of safety of 1.5 for static conditions, and 1.1 operational basis earthquake (OBE) and 1.0 MCE for pseudo-static seismic conditions were adopted for the design of the embankment.

18.4.5 Liquefaction Potential Assessment

The possibility of embankment failure due to liquefaction was assessed based on the modern international methods. There was several in situ and laboratory and geotechnical tests, including standard penetration testing, cone penetration testing, drilling of exploration boreholes and sampling, seismic wave assessment and advanced laboratory testing.

Based on the assessment, it was determined that the entire tailings mass adjacent to the main embankment has a medium to high potential for liquefaction, subject to the water table level, i.e. only the areas below the water table are likely to liquefy during the MCE event. The assessment indicated that an OBE is not expected to trigger liquefaction of the entire tailings mass.

18.4.6 Embankment Stability

The stability assessment indicated that the main embankment has an adequate factor of safety for static conditions in its current state. In the event of an OBE seismic event, the embankment continues to meet the required factors of safety.

Embankments were modelled with the rehabilitated downstream batter slope of 1V:3H, constructed to the final flotation tailings elevation. Both the southern and western embankments satisfied all conditions and as such, the final rehabilitation slope of 1V:3H was adopted for design of the final stage.

A forthcoming design case for placing a buttress has been incorporated, drainage works, including pumping station and some ancillary works commenced in 2021.

19 Market Studies and Contracts

19.1 Markets

DPM undertakes an annual process of metal price determination for Mineral Resources and Mineral Reserves. For 2021 its chosen metal prices are $1,400/oz for gold, $17.00/oz for silver and $2.75/lb for copper. These prices are lower than the CIM guidelines using a 3-year rolling average method measured at the end of February 2021, which are $1,684/oz gold, $21.11/oz silver and $3.39/lb copper and are higher than DPM's selected prices by 20%, 23% and 24% respectively.

For added comparative purposes, market analyst estimates were obtained through S&P Global. The median price projections for the life of mine are $1,715/oz gold, $22.27/oz silver and $3.39/lb copper and are higher than the Mineral Reserve and Mineral Resource metal prices selected by DPM by 20%, 23% and 24% respectively.

Historically, DPMC has sold two distinct qualities of concentrates. The first is a copper-gold concentrate for which it derives value primarily from gold, but also from copper and to a minor extent from silver. This concentrate has significant penalty costs due to the arsenic content. The second is a pyrite-gold concentrate.

DPMC has delivered the majority of its copper-gold concentrate to Dundee Precious Metals' Tsumeb smelter (DPMT) under a sales agreement with IXM SA (formerly Louis Dreyfus Commodities Metals Suisse SA) who, in turn, toll the concentrates at DPMT. DPMT has also made spot sales to and various concentrate trading companies other global smelters. In order to maintain its flexibility as to where it markets its concentrates, DPMC produced a trial lot of gold concentrate with lower grade Cu (10%) and arsenic content < 3.5% for a Chinese customer in Q3, 2021. DPMC currently plans to increase its sales of concentrate from Tsumeb to the other markets over the next two years.

DPMC sells its pyrite concentrate to global smelters and various concentrate trading companies with sales-purchase agreements in place for the full annual production of 250,000–260,000 tonnes over the next 2 years.

The QP has reviewed the analysis of contract value and can confirm that the results support the assumptions of the technical report.

19.2 Contracts

The terms of smelting, refining, transportation, handling, sales, hedging, forward sales, contractor arrangements, rates or charges, are within market parameters for the type of arsenic-containing complex concentrates that DPMC produces. Treatment charges for DPMC copper concentrate processed by DPMT on a toll basis are calculated on a cost-plus basis. DPMC does not use mining or concentrating contractors as the mining and mineral processing activities are self-performed.

20 Environmental Studies, Permitting and Community Impact

20.1 Land Ownership

Prior to 1990, most land in Bulgaria was state-owned, either as community property or as property of State-owned entities. Individuals owned only limited farmland and residential land. Since 1991, the ownership and use of land has been regulated by the Constitution of the Republic of Bulgaria, the Property Act, the Ownership and Use of Agricultural Land Act, the Municipal Property Act, the State Property Act, and the Investment Promotion Act. According to Bulgarian legislation the right to own property is guaranteed and protected by the law. Property is private and public, and private property is inviolable. Full ownership over the land is considered the most suitable to assure undisturbed operation for the life of the mine. Where needed, limited real rights in a real estate has been acquired by DPMC such as right of use, right of construction, right of passage through another's lot and especially the right to lay branches from physical-infrastructure public networks and facilities through other persons' lots. The State Property Act and the Municipal Property Act provide for two kinds of state and municipal property, private and public, and establish different mechanisms for the management of the land based on its type. In 2011, a new Forestry Act was promulgated defining special requirements related to obtaining right of use as well as change of designation and the acquisition procedure for forestry land. Rights and transactions affecting real estate are recorded in the Registry agency, by reference to the names of the owner and to parcels of land.

Under the Subsurface Resources Act, the holder of licence for exploration and the owner of the land may sign a contract for establishment of proprietary rights on the land in favour of the holder of the licence for the purpose of use of the land for the term of the licence, where the terms, conditions, procedure and compensation for use of the land are specified. In addition to this the Forestry Act and the Agricultural Land Protection Act require additional procedures for obtaining a permit to perform exploration activities.

Where no agreement with the owner is reached, the holder of licence (mining or exploration) may refer the matter to be solved by the Minister of Energy. Depending on the nature of the works, their duration and impact on the earth and the environment, the licence holder may submit a request through the Governor of the region, to the Minister of Finance or the Minister of Regional Development and Public Works for compulsory appropriation of the private properties or part thereof in view of the needs of the exploration, pursuant to Chapter Three of the State Property Act, and after equivalent compensation in advance.

Details of the expropriation procedure are provided for in the State Property Act. The expropriation procedure requires an approved detailed development plan. Compensation must be paid in advance of title being taken of the owner. The compensation mechanism and the amount are defined by the district governor after approval by the State. As this procedure is long and very burdensome for the authorities it has almost no applicability since the Subsurface Resources Act is adopted.

20.2 Social Impacts

Mining is an industry traditionally associated with economic prosperity, contradictory social impacts, and environmental footprint. The challenge every mining company faces today is to explore new license areas operate and progress in such fashion so as to respond to current market demands, at the same time providing for actual improvement of the life of society close to which it operates and investing in the preservation and recovery of nature. Earning DPMC's social licence to operate is a long process that depends on pursuit of responsibility in corporate behaviour, planning and actions.

DPMC provides clear benefits to its stakeholders – shareholders, employees, contractors, local communities, Bulgarian people, and the government. Among some of the measurable impacts are:

- Employment rate: DPMC's operations ensure high employment rate in the region. This includes not only staff employed directly by DPMC (841), but also contractors' employees and induced business employees.

- Consumption effect: DPMC employees receive higher salaries compared to the country average which enhances the consumption effect and provides a favourable environment for local business development, which otherwise would not be present. The Chelopech municipality is rated on the top of the statistical information with highest average salary in Bulgaria (source: Institute for Marketing Economics 2019).
- Strategic community investments: DPMC's strategic community investments, nearly US$1 million per year, are focused on local education (mainly on maintaining DPMC's own school in Chelopech), sports, culture, smaller-scale infrastructure as well as the University of Mining and Geology in Sofia. Community investments provide new opportunities for the local youth in the long term. DPMC invested nearly US$100,000 in pilot project by establishing a fund for micro, small and medium business in Chelopech, Chavdar and Zlatitsa municipalities. DPMC is investing in the Fund nearly US$200,000 during 2022.
- Value to national government: This includes royalties, duties, value added tax (VAT), excise taxes, individual income taxes, corporate tax, social security, health insurances, and other taxes paid directly by the DPMC and its employees.
- Value to local government – royalties: The government transfers to the bank account of the Chelopech Municipality and Chavdar Municipality, Sofia District, an amount which is 50% of the royalty payment. This amount is split between the two municipalities, proportionate to the part of the concession area which is within their respective constituencies, as follows: 87.5% to the benefit of Chelopech Municipality and 12.5% to the benefit of Chavdar Municipality.
- Socio-economic effects: Calculated as a multiplied socio-economic effect of investments in the local communities of Chelopech, Chavdar and Zlatitsa. This takes into account direct and indirect investments, in the categories of education, health, infrastructure, sports and culture, and others.
- Other impacts include improved levels of safety awareness in the local community. Additionally, DPMC has initiated environmental and public infrastructure rehabilitation in close proximity to the mine site.

20.3 Permitting

TMFs are operated based on an approved Mine Waste Management Plan (MWMP). Operators of Class A mine waste management facilities require a permit, which is issued based on the approved MWMP. As an operator of a Class A facility, DPMC has an approved MWMP, last updated in December 2019 and an amended permit, issued in December 2019 as well.

In May 2017, the RIEW – Sofia, issued a positive Decision for the investment proposal "TMF Chelopech 630 level upgrade". All the required land for the upgrading of the TMF has been purchased by DPMC in 2017. The permitting process under the Spatial Development Act was completed in 2019 and the construction works were finished in 2020. In August 2020, DPMC obtained a permit to operate the TMF Chelopech 630 level upgrade. The State commission issued the permit to operate the TMF Chelopech 630 level upgrade in 2020. In relation to this project, an additional investment proposal for buttressing of the main embankment of TMF was completed. In 2020, the required environmental permit for the project was received together with Detailed Design Permit (DDP) approval.

In January 2021, the Company obtained a construction permit for buttressing of the main embankment of TMF. The application for changes in the approved Project Design and current construction permit was submitted to District Governor. Requested changes are result of new analysis done for the demolition of the main/southern wall of the Chelopech tailings dam. The classification of Chelopech tailings dam was raised to "Extreme", according to the CDA classification. New required buttressing shape is subject of project design re-approval according to Bulgarian legislation. Approval expected during Q1 of 2022.

DPMC operate with a safe-keeping and use of explosives permit which was extended in 2020. In connection with the search for solutions to increase the efficiency of mining, a study of current trends in the development of blasting in the underground mining environments was conducted.

The introduction of mechanised loading of explosive holes and drillings with emulsion explosive emerged as the most real opportunity to improve the process of blasting works. In relation to this project, an additional investment proposal for production explosives, an emulsion, was completed in 2020 and a blasting permit was obtained for the life of Chelopech mine. The emulsion is produced via new technology and two mobile machines for the production and loading of emulsion explosives were delivered in 2020.

DPMC has several water abstraction permits. The main permits for water abstraction for production needs are for water abstraction from Dushantzi dam and from Kachuka dam. Both permits for water abstraction was renewed, Dushantzi dam for 10 years until October 2031, Kachulka dam – December 2029. For exploration needs, DPMC has submitted application for renewing of existing water abstraction permit from the Vozdol River. Permit expected to be renewed during 2022. Current water use permit for wastewater discharge into a surface water body were renewed until October 2027.

According to the Bulgarian and EU requirements, DPMC is required to meet the water quality standards of discharge of domestic wastewater. In 2018, a new Wastewater Treatment Plant for domestic wastewater was commissioned. The Wastewater Treatment Plant is part of DPMC's commitment made under an Environmental and Social Agreement between DPMC and EBRD. With last wastewater discharge Permit has done more positive changes in the water cycle of Chelopech Mine. Treated wastewater is recycled back to for production needs.

There are day-to-day operating activities require a number of specific permits, which DPMC maintains on an ongoing basis. These can be grouped in three categories: water use and discharge, blasting activities, and general waste treatment. All permits required in order to maintain the continuity of the business have been obtained and are up to date as at the time of reporting.

20.4 Tailings Management Facility Site Monitoring

The Chelopech TMF operation is based on a TMF Control and Monitoring Plan (CMP) and an Emergency Risk Assessment, which are also part of the overall MWMP. The plan and the assessment provide the technical details of each TMF component plus guidelines for TMF control and monitoring.

Internal operating instructions for each set of TMF are in place and have been developed on the basis of the CMP. The TMF operation includes mine waste distribution, size and location of the supernatant pond and the condition of all facilities within the TMF system. The TMF monitoring is performed according to the CMP, based on operational instructions for each TMF component, including:

- Routine daily monitoring – by visual observation and records
- Compliance monitoring – by regular measurements and data reviews against the set of criteria included in the CMP
- Environmental monitoring – by identifying the qualitative parameters of surface water, groundwater, decant water and the disposed tailings.

All observations and measurements are documented, interpreted, and analysed. The reviews of all data collected as part of the TMF monitoring process (including data of all facilities under the TMF system) are conducted at several levels and with different frequency:

- Operational analysis conducted by DPMC engineering team.
- Quarterly and annual data review by the international company. Consist overall review of operational data, compliance monitoring, water monitoring and stability assessment. The summarised data is compiled as a report and presented to the operational team with conclusions and recommendations.
- Regulatory compliance reviews conducted by the Designer to monitor the TMF compliance against the CMP, Bulgarian and EU regulatory requirements.
- The TMF operates according to the best international practices and data reviewing conducted by an independent Consultant (Auditor), which is a reputable international company.
- Twice per year seasonal committee reviews (spring and fall) in compliance with the Bulgarian legislation, which produce compliance assessment based on reports and other documents by government regulators, local municipalities, universities, government experts, designers, and consultants.

20.5 Closure Plan and Rehabilitation

Chelopech is to provide a financial guarantee for environmental and rehabilitation costs for the Chelopech mine and facilities. In March 2010, pursuant to its agreement between the Bulgarian government and DPM, Chelopech submitted for approval to the MoEET (now MoE) and the MoEW for the Closure and Rehabilitation Plan covering the estimated closure and rehabilitation costs for the Chelopech mine. The plan was approved by the MoEET on 15 April 2010 and by the MoEW on 21 May 2010. In December 2015, competent authorities approved the updated Closure and Rehabilitation Plan with a revised value. In 2018, the Chelopech TMF overall Closure and Rehabilitation Plan was updated in connection with the TMF upgrade project to level 630. The plan was approved by the MoE.

Chelopech was the first mining company in Bulgaria to submit a Closure and Rehabilitation Plan in compliance with the new EU legal regulations on providing financial guarantees for closure and rehabilitation of mine sites. The total value of the closure and rehabilitation of the mine site in 2010 was estimated at €20,730,687. Revised value in 2015 was estimated at €13,949,832. In 2015, the financial guarantee was separated in two bank guarantees – one for the mine and surface infrastructure and another for the TMF closure activities. In September 2018, the Chelopech TMF overall Closure and Rehabilitation Plan was updated with a revised value of €9.4 million. The mine and surface infrastructure closure bank guarantee remains €6.3 million. In November 2021, the financial guarantees were renewed for a year.

According to the current closure plan, the monitoring of the closed TMF will continue over a period of five years. After the fifth year, the overall review and report will be prepared. If necessary, the monitoring will continue for additional five years. DPMC has a plan for annual TMF control, prepared in compliance with the Bulgarian legislation, which utilises the existing monitoring system on the site in order to ensure the long-term stability of the TMF and mitigate its impact on the environment.

The main objective of the monitoring process is to collect reliable information about the condition of the TMF and its impact on the environmental media during the post-closure period. Once the TMF seepage quality meets the discharge standard requirements for the respective category of receiving water, the seepage return system (pipeline and pumps) will be decommissioned.

21 Capital and Operating Costs

21.1 Capital

Chelopech underwent a series of expansions aimed at achieving a production rate of 2.0 Mtpa which concluded in 2012. Chelopech has been operating at 2.2 Mtpa (the mining concession upper limit) since 2016, and this rate is planned to continue to the end of its mine-life. Table 21-1 presents special projects capital, sustaining capital associated with ongoing operations for the life of the mine, as well as estimated closure costs. The underground development capital and operating costs have been developed using actual cost performance, applied to the projected mine and processing plan. Other capital costs have been developed on a per project basis. Total sustaining costs inclusive of contingency amount to US$108.8 million, which is US$5.63/t milled, this cost is 25% in excess to the sustaining cost used in the mine optimisation process, but the QP considers that the cost increase is not material to the Mineral Reserve estimate.

Table 21-1: Capital costs (2022 to 2030)

Item	Unit	LOM
Underground capital development	US$ M	16.6
TMF upgrade	US$ M	10.2
Mobile equipment	US$ M	27.1
Mining general	US$ M	12.2
Process Plant	US$ M	12.4
Information technology	US$ M	12.8
Other sustaining capital	US$ M	17.5
Exploration drilling and development (growth capital)	US$ M	12.7
Closure Costs	US$ M	25.8
LOM capital expenditure	**US$ M**	**147.3**

21.2 Operating Costs

The average estimated annual site operating cost for the LOM for production of both concentrates combined is US$47.40/t treated, as presented in Table 21-2 and 21-3. The cost was generated based on operating history and forecasting.

Table 21-2: Operating costs – copper concentrate

Item			
LOM tonnes of ore processed (Mt)	19.3		
LOM Au ounces contained in concentrate (Moz)	0.93		
LOM Au ounces payable (Moz)	0.81		
LOM Cu pounds contained in concentrate (Mlb)	290		
LOM Cu pounds payable (Mlb)	242		
LOM Ag ounces contained in concentrate (Moz)	2.37		
LOM Ag ounces payable (Moz)	1.71		
Item	**US$ M**	**US$/t**	**US$/oz Au**
Mining	447	23.13	554
Processing	282	14.60	350
General and administration	134	6.93	166
Royalty	53	2.74	66
Total operating costs	**916**	**47.40**	**1,135**
TCs, RCs, penalties, freight, & other selling costs	365	18.88	452
Total operating costs plus selling costs	**1,281**	**66.28**	**1,587**
Less: by-product credits	(734)	(37.96)	(909)
Total operating costs, plus selling costs, less by-product credits	**547**	**28.32**	**678**

Table 21-3: Operating costs – pyrite concentrate

Item			
LOM tonnes of ore processed (Mt)	19.3		
LOM Au ounces contained in concentrate (Moz)	0.42		
LOM Au ounces payable (Moz)	0.28		
Item	**US$ M**	**US$/t**	**US$/oz Au**
Processing	12	0.65	44
Total operating costs	**12**	**0.65**	**44**
TCs, RCs, penalties, freight, & other selling costs	248	12.85	879
Total operating costs plus selling costs	**261**	**13.50**	**923**
Less: by-product credits	-	-	-
Total operating costs, plus selling costs, less by-product credits	**261**	**13.50**	**923**
Operating costs Copper and pyrite concentrate			
Total operating costs, plus selling costs, less by-product credits	**808**	**41.82**	**742**

22 Economic Analysis

22.1 Introduction

This section describes the mine economics under conditions applicable for its development and operation, and discloses economic analyses based on changes in key parameters.

The analysis has been conducted on a site basis only and, consequently, does not include corporate overheads or head office costs.

Mining and processing data and capital and operating costs are drawn from other parts of the Technical Report and combined with the site's fiscal regime in an economic model that calculates normal measures of economic return, such as NPV, and reports key production statistics for the mine.

22.2 Economic Analysis

22.2.1 Production

Financial analysis for the mine is based on extraction and treatment of underground ore, at a rate of 2.2 Mtpa, to produce flotation gold/copper and pyrite concentrates, which will be sold primarily to third parties.

22.2.2 Assumptions

In calculating the LOM returns, the following fundamental assumptions were made:

- Metal prices of US$1,400/oz gold, US$2.75/lb copper, and US$17.00/oz silver will be maintained throughout the LOM.
- Metal price and currency hedging is excluded.
- The LOM is approximately nine years, with the financial analysis being run through until 2030. The mine will treat ore at the nominal rate of 2.2 Mtpa.

22.2.3 Currency, Exchange Rates and Escalation

The analysis has been conducted in US$ rather than BGN, since it is the standard currency for evaluation of mineral projects in Eastern Europe.

Base exchange rates used for the evaluation of the project are:

- US$ 1.25/EUR
- BGN 1.95583/EUR (BGN is fixed against EUR)
- BGN 1.56/US$.

Effects of significant changes, favourable and unfavourable, in EUR against US$ are assessed in the sensitivity analysis.

The analysis has been conducted without escalation of capital or operating costs or metal prices.

22.2.4 Taxes and Royalties

DPMC has completed all taxation estimates and the QP is reliant on DPMC for estimates of taxation.

For the capital, straight-line depreciation methods appropriate to the categorization of asset type was used to amortise the capital expenditures.

Corporate tax is applied at 10% on positive taxable income. Total Bulgarian corporate taxes amount to US$47.6 M over the life of the mine.

The Bulgarian government Concession Royalty of 1.5% was applied and was calculated based on the gross value of the metal contained in the ore mined.

22.2.5 Reporting of Results

The relevant LOM assumptions and results are presented in Table 22-1 to Table 22-4 below.

Table 22-1: Throughput, LOM, and metal price

Item		Unit	LOM
Mine/Concentrator	2022 to 2030 (average)	Mtpa ore	2.2
LOM		years	9
Metal prices	Gold	US$/oz	1,400
	Copper	US$/lb	2.75
	Silver	US$/oz	17.00

Table 22-2: LOM economics

Item		Unit	LOM
After tax	NPV at a discount rate of 5.0%	US$ M	461

Table 22-3: Production (2022 to 2030)

Item		Unit	LOM
Total quantity ore mined/milled		Mt	19.3
Average grades	Gold	g/t	2.72
	Copper	%	0.80
	Silver	g/t	7.58
Metallurgical recoveries			
Copper concentrate	Gold	%	54.7
	Copper	%	84.8
	Silver	%	50.4
Pyrite concentrate	Gold	%	24.9
LOM 2022–2030			
Total production	Gold (in copper and pyrite concentrate)	Moz	1.35
	Copper (in copper concentrate)	kt	131.4
	Silver (in copper concentrate)	Moz	2.37
	Gold equivalent	Moz	1.95

Table 22-4: Revenue and Cash flows (2022 to 2030)

Item	Unit	LOM
Total Revenue	US$ M	1,703
Total pre-tax cash flow	US$ M	621
Corporate taxation	US$ M	48
Total after-tax undiscounted cash flow	US$ M	573

22.2.6 Annual Production Schedule

An annual production plan and cashflow summary are presented in the tables below.

Table 22-5: Annual production summary (2022 to 2030)

Annual production summary	Units	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Mine hoisted	Mt	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.7	19.3
Head grade	Cu %	0.85	0.90	0.82	0.78	0.76	0.74	0.81	0.91	0.62	0.80
	Au g/t	2.97	2.73	2.94	2.94	2.63	2.71	2.56	2.52	2.47	2.72
	Ag g/t	5.5	6.1	5.8	6.3	6.5	7.1	9.5	9.0	13.8	7.6
	As %	0.25	0.27	0.25	0.24	0.23	0.20	0.24	0.26	0.16	0.23
	S %	11.00	12.45	12.28	10.94	11.09	9.99	11.34	10.47	9.79	11.07
Milled	Mt	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	1.7	19.3
Cu concentrate produced	kt	128	151	152	146	141	138	153	175	88	1,270
Py concentrate produced	kt	256	259	261	260	253	244	256	258	183	2,229
Recoveries – Cu to Cu concentrate	%	84.1	84.0	84.3	85.5	84.7	84.8	85.3	87.2	82.6	84.8
Recoveries – Au to Cu concentrate	%	57.1	55.8	57.8	58.3	55.6	56.5	50.9	55.3	40.4	54.7
Recoveries – Ag to Cu concentrate	%	49.4	50.4	52.7	54.1	51.9	53.8	49.7	55.5	40.7	50.4
Recoveries – Au to Py concentrate	%	24.3	25.3	25.0	24.8	25.1	24.1	25.6	25.9	24.2	24.9
Grade – Cu in Cu concentrate	%	12.3	11.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.3
Grade – Au in Cu concentrate	g/t	29.3	22.2	24.6	25.9	22.8	24.5	18.8	17.6	19.4	22.7
Grade – Au in Py concentrate	g/t	6.2	5.9	6.2	6.2	5.8	5.9	5.6	5.6	5.6	5.9

22.2.7 Sensitivity Analysis

The economic analysis with cash flow forecasts on an annual basis has used only Proven and Probable Mineral Reserves, and sensitivity analyses with variants in metal prices, grade, capital, and operating costs.

The sensitivity analysis conducted to assess the effects of changes in key parameters upon NPV, after taxation in this case, and the results are presented in Table 22-6.

Table 22-6: LOM sensitivity analysis – after tax

Gold price	Price (US$/oz)	NPV at 0% (US$ M)	NPV at 5% (US$ M)	NPV at 7.5% (US$ M)
-20%	1,120	340	280	256
-10%	1,260	456	370	337
0%	1,400	573	461	418
10%	1,540	690	552	498
20%	1,680	807	642	579
Copper price	**Price (US$/lb)**	**NPV at 0% (US$ M)**	**NPV at 5% (US$ M)**	**NPV at 7.5% (US$ M)**
-20%	2.20	470	382	347
-10%	2.48	522	421	382
0%	2.75	573	461	418
10%	3.03	624	501	453
20%	3.30	676	540	488
Operating costs – Copper Concentrate	**US$/t of ore processed**	**NPV at 0% (US$ M)**	**NPV at 5% (US$ M)**	**NPV at 7.5% (US$ M)**
-20%	37,92	738	588	530
-10%	42,66	655	524	474
0%	47,40	573	461	418
10%	52,14	491	398	361
20%	56,88	408	334	305
Selling costs – Copper Concentrate	**US$/t of ore processed**	**NPV at 0% (US$ M)**	**NPV at 5% (US$ M)**	**NPV at 7.5% (US$ M)**
-20%	15.11	639	520	474
-10%	17.00	606	491	446
0%	18.88	573	461	418
10%	20.77	540	431	389
20%	22.66	507	402	361
Selling costs – Pyrite Concentrate	**US$/t of ore processed**	**NPV at 0% (US$ M)**	**NPV at 5% (US$ M)**	**NPV at 7.5% (US$ M)**
-20%	10.28	613	491	444
-10%	11.57	593	476	431
0%	12.85	573	461	418
10%	14.14	553	446	404
20%	15.42	533	431	391
Exchange rate	**US$/EUR**	**NPV at 0% (US$ M)**	**NPV at 5% (US$ M)**	**NPV at 7.5% (US$ M)**
-20%	1.00	714	571	516
-10%	1.13	643	516	467
0%	1.25	573	461	418
10%	1.38	503	406	368
20%	1.50	432	351	319

23 Adjacent Properties

There are no other mining operations/projects in the immediate vicinity of the Chelopech Mine.

The Assarel/Medet and Elatsite mines are approximately 15 km and 5 km from Chelopech, respectively, but are based on porphyry-copper deposits, which have no practical relevance to the Chelopech epithermal HS copper-gold mineral deposit.

24 Other Relevant Data and Information

24.1 Legal and Permitting

24.1.1 Company Information

The mining concession for operating the complete Chelopech mine, processing and associated infrastructure is owned by DPMC, a subsidiary of DPM.

24.1.2 Business Legislation

The Constitution of the Republic of Bulgaria from July 1991 proclaims and establishes guarantee mechanisms for the main principles of the market economy as the inviolability of the private property, free business initiative, equal conditions for performing economic activities, for all individuals and legal persons.

The Bulgarian Commerce Act governs the legal organisational forms of corporate business entities, and the rules applicable to each form, in respect of incorporation procedures and documents, capital and shares, shareholders, management bodies, resolutions, administration, mergers, liquidation and insolvency. Investors are free to choose the legal form of presence in Bulgaria among all types of commercial companies and partnerships envisaged by Bulgarian legislation, as well as to register as sole traders (natural persons). Limited liability company (OOD) and joint-stock company (AD) are the most often chosen types of commercial companies. Regardless of the selected legal-organisational form, the investor must announce both, the initial formation and subsequent changes, with the Commercial Register at the Registry Agency of Bulgaria.

24.1.3 Mining Legislation

The Subsurface Resources Act regulates the conditions and the procedures for prospecting, exploration and mining of underground Mineral Resources located on the territory of the Republic of Bulgaria, the continental shelf and the exclusive economic zone in the Black Sea.

The Subsurface Resources Act came into force in March 1999 and has been amended several times since its promulgation, with the last amendment in September 2020. This act established the objects over which mining concessions may be granted and setting forth the conditions and the procedure for granting and extending concessions. With the latest addendums in the Subsurface Resources Act, it is possible the concession agreement can be extended for up to 50 years

24.1.4 Taxation

The taxation of corporate income and profits is governed by the Corporate Income Tax Act (CITA). In connection with the accession of Bulgaria to the EU on 1 January 2007, a new CITA was adopted to meet the necessity of harmonisation of Bulgarian taxation legislation with the requirements of the European directives concerning direct taxation. Under CITA, all resident companies and partnerships, as well as permanent establishments of non-residents, are liable to corporate income tax of 10%. Certain types of income originating from Bulgaria and payable to foreign entities, or individuals, are subject to a withholding tax amounting from 5% to 10%.

CITA establishes rules for defining the taxable income, for applying corporate income tax exemption, for loss carry-over, thin capitalisation, and withholding tax.

According to Value Added Tax Act most of goods and services are subject to a 20% VAT rate. Any person, legal or physical, resident or non-resident, who has a taxable turnover of at least BGN 50,000 during the preceding 12 months, is obliged to register for VAT purposes. Only VAT registered persons may charge VAT on taxable supplies and recover input VAT charged to them.

24.1.5 Customs Duties

Customs duties are payable on the importation of goods and products to Bulgaria. Following Bulgaria's accession to the EU and gaining full member status on 1 January 2007, a number of changes and specific developments occurred in the foreign trade and customs regime, in regard to exports and imports of goods. More specifically, the new developments concerned the direct application of Community acquis, which regulates the common procedures, tariff and non-tariff measures (prohibitions and restrictions) on exports and imports of goods “to” and “from” non-member states and uniform customs control instruments.

The Single Market of the EU was built over the course of three decades in compliance with the founding documents. As a full EU member, Bulgaria also became an equal participant in the Single Market of the EU. Likewise, domestic legislation in the respective areas was brought into conformity with the legislation of the Community – the *acquis communautaire*. Bulgaria is also a member of the World Trade Organization (WTO).

The Bulgarian customs legislation is harmonised with the European one. The imports of products are subject to customs duties at rates determined in the Customs Tariff approved by the Government. At its accession to the EU, Bulgaria eliminated the customs duties in its trade with the other EU Member States and started applying the Common Customs Tariff of the EU in its trade with non-member states.

The Common Customs Tariff requires levying of the same duties on products, imported from third countries. It is used by the EU as an instrument for regulation of international trade. The EU keeps adapting the Common Customs Tariff to the results of negotiations for tariff reduction within the framework of the General Agreement on Tariffs and Trade, recently applied by the WTO.

Bulgaria has preferential tariff agreements (free trade agreements) with the EU, European Free Trade Associated (EFTA) and Central European Free Trade Associated (CEFTA), Turkey, Israel, Macedonia, Albania, Serbia, and Montenegro, which may result in certain tariff rates being reduced or eliminated. The preferential tariff rates apply to products originating from the respective party to the agreement and are subject to submission of an evidence of origin.

24.1.6 Relief or Deferral of Customs Duties

Generally, the customs duties and import VAT are payable at the time of the importation. However, there are some customs procedures and arrangements under which products could be imported into Bulgaria without need of immediate payment of customs duties. Such procedures include:

- Inward processing: An approval can be obtained from the customs authorities, subject to certain conditions, that goods be imported into Bulgaria without payment of customs duties for the purposes of their processing and subsequent re-exportation.
- Warehousing procedures: An approval from the customs authorities could be obtained such that goods are imported free of customs duties and stored in warehouses in Bulgaria, until needed for the purposes of the business. If the goods are subsequently re-exported, no customs duties are payable. If the goods are placed on the Bulgarian market, all custom duties are due, but the payment of such can be deferred until the goods are withdrawn from the warehouse.
- Temporary imports: In some cases, assets can be imported into Bulgaria without immediate payment of customs duties, for the purposes of them being used in Bulgaria and subsequently re-exported. Certain professional equipment could be temporarily imported without payment of customs duties. Upon importation of such equipment, the custom duties that are due are deposited with the State as a guarantee. If the goods are subsequently re-exported, a certain percent of the custom duties is due (3% per month of warehousing). If the goods are placed on the Bulgarian market, all custom duties are due plus interest, but the payment of such can be deferred until the goods are withdrawn from the warehouse. Other assets could be temporarily imported with a partial relief from customs duties.

24.1.7 Social Security/Health Insurance Contributions

The main legal instruments in the field of social security and health insurance regimes are the Social Security Code and the Health Act. Legislation requires that all employees are covered by the social security system. The system includes coverage for a group of social risks, which are general illness, work accidents, occupational diseases, maternity, disability, unemployment and retirement. Every employee, who was employed for more than five working days, or 40 working hours, during a calendar month, must be secured against all social risks, for the period of employment.

The social security/health insurance contributions are based on the employee gross monthly remuneration. However, the legislation provides for a minimum and a maximum limit of the amount, used as a base for calculating the social security/health insurance contributions. The minimum amount depends on two factors: a) the code of economic activity under a company's registration; and b) group of professions divided by organisational levels in which the position falls in.

24.2 Foreign Investment

24.2.1 National Treatment

The Investment Promotion Act (IPA) provides for national treatment to foreign investors, which means that foreign investors are entitled to perform commercial activities in the country under the same provisions applicable to Bulgarian investors, except where otherwise provided by law. Particularly, this principle covers the whole range of economic and legal forms of activities for accomplishing entrepreneurial businesses. The national treatment of foreign investors allows for the possibility of foreign investors to participate in the process of privatisation and acquisition of shares, debentures, treasury bonds and other kinds of securities.

24.2.2 Most Favoured Nation Status

Bulgaria is signatory to several bilateral treaties on promotion and mutual protection of foreign investment which provide, further to the national treatment regime, for the most favoured nation status of the investment made by entities and individuals, from one of the contracting countries on the territory of the other contracting country.

24.2.3 Priority of International Treaties

According to the Bulgarian Constitution International treaties which have been ratified in accordance with the constitutional procedure, promulgated and having come into force with respect to the Republic of Bulgaria, shall be part of the legislation of the State. They shall have primacy over any conflicting provision of the domestic legislation. This guiding principle finds expression in the treaties for protection of foreign investments, and especially, in the agreements for the elimination of double taxation regulations.

The international treaties on mutual protection of foreign investment always include an extended concept of a foreign direct investment, and the application of this concept has priority over the Bulgarian legislation. National treatment applies to foreign investors, which means that foreign persons are entitled to invest in Bulgaria under the terms and conditions provided to Bulgarian investors, except as otherwise is provided by law.

24.2.4 Guarantees Against Adverse Changes of the Legislation

The IPA stipulates in Article 23 that foreign investment made prior to legislative revisions imposing statutory restrictions solely on foreign investments shall be governed by the legal provisions which were effective at the moment of implementation of the said investment.

The Subsurface Resources Act provides in Article 63 for protection of investments, in prospecting and/or exploration and concession activities, against changes in the legislation which result in the restriction of rights to, or material damages for, the holder of prospecting and exploration permits or mining concessions. In cases where such changes have been adopted, the permit or concession holder upon request thereby the terms and conditions of the concluded contract shall be amended to restore his rights and interests in conformity with the initially concluded contract.

24.2.5 Institutional Framework

In accordance with the latest amendments of the IPA, the Bulgarian Foreign Investment Agency, established in 1995, was transformed into an agency under the supervision of the Ministry of Economy, and renamed as the Invest Bulgaria Agency. Currently, the basic function of the Agency is to support the Minister of the Economy in the implementation of the State policy for encouragement of investments.

The key function of the Agency is to assist companies in the investment process. It provides to prospective investors updated information about site identification and selection, support with the application for investment incentives, contacts with suppliers and prospective business partners, liaison with central and local government, branch chambers and non-government organisations.

24.2.6 Investment Incentives under the IPA and Commerce Act

Foreign investors are entitled to incorporate Bulgarian companies, to invest in Bulgarian companies, to acquire and to own Bulgarian companies and assets, and to freely transfer that ownership and other contractual rights. No restrictions are imposed on foreign ownership and participation in Bulgarian companies. Foreign entity may own 100% of a Bulgarian registered company. There are no restrictions on the amount of capital that can be invested in a Bulgarian company.

Earnings and profits may be repatriated after payment of liabilities due to the State, and capital can be repatriated upon cessation of the investment, or upon winding-up the business. All enterprises with foreign investments must take the form of business entities pursuant to the Bulgarian Commercial Act.

Foreign legal entities may register branches, if they have been registered abroad and are entitled to carry out business activities. Under the national law, a branch is a part of the main company but with a different seat. No authorised capital is needed for its opening.

Foreign persons may also set up representative offices registered at the Bulgarian Chamber of Commerce and Industry. The representative office, however, may not carry out commercial activities.

A joint venture is a company formed jointly by a Bulgarian and a foreign partner. The size of the foreign participation is not limited. Joint ventures must take the form of any of the business organisations stipulated in the Commerce Act.

The report authors are not aware of any other relevant data and information that is material to this project, that has not already been covered elsewhere in this Technical Report.

25 Interpretation and Conclusions

The following interpretations and conclusions are set out in relation to the work completed in 2019.

25.1 Geology and Sampling Procedures

During the site visit undertaken in March 2022, discussions were held with DPM staff and SGS laboratory personnel. Data and collection procedures were reviewed in the mine office, underground operations, core processing facilities and SGS laboratory facilities.

Conclusions based on these site visits include:

- Procedures used during logging, splitting, and sampling of drill material are appropriate, with the core processing facility and digital data collection methods well managed.
- Underground face sampling and mapping procedures are of a high standard and completed by well trained and competent geological staff.
- The onsite acQuire database is robust and of appropriate standard; however, the historical data (which is no longer a significant part of the overall database) is not readily verifiable.
- SGS Assay laboratory in Chelopech is well run, has excellent housekeeping with good procedures and security controls in place. An audit was completed in September 2015 by David Muir (CSA Global Senior Database Geologist) and reported no significant issues.

25.2 Underground Face Sampling Data

Face sampling reviews and how well they compare with drill data have previously been undertaken and the results of this review remain current and relevant. Based on these reviews it is believed that all face sampling data are of sufficient quality and should be considered suitable for use in Mineral Resource estimation study. Care needs to be taken that the nominal 3 m length of face samples is maintained to ensure drill samples (composited to 3 m) are of equal weight. Appropriate use of de-clustering to avoid bias in areas of close spaced sampling is completed. A possible high-grade bias may exist when sampling the higher-grade zones, most likely due to the competency contrast between massive sulphide ore and lower-grade siliceous material, resulting in unintentional weighting of samples with high-grade sulphide material.

Between 2018 and January 2020, the practice of shotcreting faces meant that representative sampling became more difficult (risk of contamination from shotcrete) and geological mapping was hindered. In January 2020, a memorandum was issued whereby shotcreting would be limited to capital work only, which resolves the issue of both representative sampling and geological mapping.

A review in 2020 found that 30% of ore developments were shotcreted due to geomechanical factors, mainly in Block 149. It is suggested that in 2022 an analysis be undertaken relating to the risk of contamination so that the inclusion of face sampling data in Mineral Resource estimation can be assessed further.

25.3 Operational Resource Development Drilling

In 2021, a total of 43,208 m of Mineral Resource development diamond drilling was completed in the Chelopech concession.

Resource development extensional drilling was concentrated on the upper levels of Blocks 8, 10 and 700 in the Central area and Block 148 and Target 147 North were tested in the Western area, with the objective of expanding the current mineralisation body extents and increasing confidence of Mineral Resources.

25.4 Geological Model

CSA Global believes the current understanding of geology and mineralisation controls is good, and that the current geological model adequately predicts the in-situ grades and tonnes realised during underground development and mine production. Implementation of a procedure to create short-term planning model, incorporating updated grade control geology mapping, sampling, and drilling data has been completed. This model is provided to mine planning department on a quarterly basis and is delivering improvements in short-term planning plus facilitating ongoing improvements to the process of completing the annual MRE update.

Areas requiring improvement (already commenced) are related to software interfaces between production reporting and in-situ grades, handling of 3D geology mapping, and survey of development and production void volumes.

25.5 Assay QAQC

The assay results for blanks, standards, field duplicates, preparation duplicates and laboratory duplicates for gold, copper, silver, arsenic, and sulphur samples undertaken since the previous MRE have been reviewed. A summary of conclusions relevant to DPMC are:

- Overall blank results show no significant indications of contamination except for one copper blank. Where failures were noted, these tended to be in non-certified blanks or at low grades relative to economic levels of mineralisation and laboratory lower detection limits.
- No fatal flaws were noted with the accuracy results. Bias and failures were noted in individual CRMs, but this was not systematic (i.e. some bias is positive and some negative).
- Field, preparation and pulp duplicates as well as external check (umpire) results were compared for face samples (FS) and drill samples (DDH) for primary samples submitted to SGS Chelopech and SGS Bor and external check samples sent to ALS Rosia Montana. Precision was acceptable with no material bias for the SGS Chelopech duplicates. External check samples had good precision with no significant bias.

25.6 Database Validation

DPMC captures data daily into the acQuire GIMS, ensuring that the data is validated using constraints and triggers. Verification checks are also conducted on surveys, collar coordinates, lithology, and assay data.

Data undergoes further validation by CSA Global through a series of Datamine™ loading macros. The QP has reviewed the reports and believes the data verification procedures undertaken on the data collected from DPMC adequately support the geological interpretations and the analytical and database quality, and therefore support the use of the data in the Mineral Resource estimation.

25.7 Bulk Density

In 2013, a review of bulk density data was undertaken (CSA Global, 2014). The results of this review remain current and relevant. CSA Global concludes that the in-situ dry bulk density data are collected using appropriate sampling methods and analysis procedures. The methods used to estimate density to determine the Mineral Resource tonnage, through a combination of ordinary kriging in areas of detailed sampling, and by application of the relationship between sulphur grade and density where insufficient samples are available, are suitable for this style of deposit and mineralisation.

25.8 Mineral Resource Estimation

In June 2021, DPMC ceased using GEMS software to complete Mineral Resource estimation workflows and began using Datamine™ software. This change was implemented to streamline integration with downstream mine planning and scheduling activities and some benefits with respect to ease of Datamine™ software were considered important to the geological and Mineral Resource evaluation work at Chelopech.

DPMC resource geologists received significant training in the use of Datamine™ software and embarked on a mid-year review study to ensure that the defined Mineral Resource estimation workflows in place at Chelopech and completed in GEMS could be mapped across to Datamine™ confidently.

Accordingly, the 2020 MRE workflows completed in GEMS were replicated in Datamine™ and validated. CSA Global completed a review of this migration (July 2021) and interrogated the Datamine™ model and performed comparative analysis with the previous GEMS model, providing feedback and working collaboratively with DPMC to ensure that the workflows adopted in the MRE update in 2021 were appropriate.

The following conclusions were drawn:

- Small differences were noted in the number of samples flagged and the centre point of the composites generated from the input mineralised domain wireframes between the GEMS and Datamine™ workflows. Wireframes generated from the same string file were not identical because the triangulation outputs are different between programs. The summary statistics and shapes of the distributions between the composite populations of GEMS and Datamine™ are comparable, and variance of the sample centroid is not material within the context of the estimation search neighbourhood parameters.
- Block model volumes coded for the Stockwork Envelopes ("HG") within low-grade Silica Envelopes ("SE") are within 1% of each other.
- Search parameters and top cuts were identical. Variogram ranges were the same, and very small differences in the value of the nugget and sills was noted but is not considered material or indeed significant to the grade estimate.
- Slight differences in model block grades (gold, copper, silver, arsenic, sulphur) and estimated density values between GEMS and Datamine™ were noted and are not considered material. The minor variances noted are likely caused by the differences in the composite data centroids and the variogram nugget and sills.
- The reporting comparison for gold for all blocks reviewed within the HG envelope is acceptable. Variance of tonnes, grade and ounces is <3%.
- Slope and kriging efficiency values in the GEMS models were smoothed relative to Datamine™ and are consistently higher than those generated in Datamine™ because they have been calculated using Within Block Variance rather than Between Block Variance. The kriging statistics from Datamine™ better reflect the relationship of estimation confidence with drill spacing, sample orientation and geological interpretation complexity.
- The Datamine™ models for blocks reviewed were compared statistically and with swath plots using Supervisor software. Variance between the mean composite and estimation grade is <10% in all cases. The scripted Chelopech site grade estimation process in Datamine™ was validated by running a manual Datamine™ grade estimate using the same inputs.
- Reconciliation data indicates that the GEMS classification system is appropriate, with production grades, tonnes and metal within 10% of Measured and Indicated grades on a quarterly basis. CSA Global investigated methods to replicate the GEMS classification using the Datamine™ kriging statistics. SOR and search pass used in the GEMS classification are still considered the most appropriate consideration for Datamine™. Raw Datamine™ panel SOR values cannot be used to reproduce the GEMS classification as the variance in the distribution is much higher than GEMS creating a significant "spotted dog" effect. The proposed remedy involved smoothing of the Datamine™ SOR values by regularising into a 60 x 60 x 60 x (X, Y, Z) grid with threshold values for Measured/Indicated and Indicated/Inferred boundaries being visually selected to reflect drill density. Search pass number is used as an additional criterion to tighten up the classification boundaries around drill data.
- The smoothing of the SOR value criteria for classification is supported and is considered an appropriate indicator of estimation confidence, especially when reconciliation against production data is reviewed (i.e. historical close reconciliation of production to the MRE).
- The proposed classification replicates the existing GEMS classification reasonably well for the mineralisation blocks reviewed. Variance on tonnes, grade and ounces is less than 10% for Measured and Indicated material and less than 15% for Inferred material.

Copper, gold, and silver mineralisation has been modelled for high-grade stockwork "blocks" which are enclosed within a lower-grade siliceous alteration envelope. The mineralisation blocks are generally discrete units and have been modelled as hard boundaries (i.e. only samples within each volume are used to estimate grade and tonnes for the volume).

Drillhole samples were composited to 3 m downhole after a statistical review demonstrated 3 m was an appropriate composite length and does not produce any significant grade bias. This length matches the nominal underground face sampling width of 3 m, allowing drillhole and face sampling data to be combined for grade estimation.

Assay data in the high-grade stockwork domains show moderate to low CVs, with sulphur showing the lowest of all the elements. Gold statistics show moderate to high CVs. Statistical analysis of composites within the low-grade siliceous blocks shows similar but lower-grade distributions with moderate to high CVs.

Moderate correlation was noted between copper and gold while strong correlation exists between copper and arsenic in high-grade domains. Significant differences in the levels of correlation are noted between the different domains. Gold has undergone a separate and more pervasive phase of mineral emplacement relative to copper.

Copper and gold grades distributions for the various estimation domains are characterised by being positively weighted with moderate to high CVs, indicating that high-grade values may contribute significantly to local mean grades. Appropriate copper and gold top cuts were obtained by reviewing probability plots and the impact of applied cuts to the mean grades and standard deviation. No sulphur data was top cut due to the low number of outliers in each population.

Face sampling, underground resource drilling and surface drilling datasets shows clear clustering of data, biased towards higher-grade regions of the mineral deposit. This is due to a high density of face sampling within the high-grade portions of the resource currently targeted for mining. De-clustering was completed to remove this effect prior to resource estimation.

Variograms were modelled for all mineralisation blocks, and consistent with the geological understanding of the mineralisation. A low nugget effect and a dominant first structure were the key features of the models.

Grade was estimated into a 10 m x 10 m x 10 m volume block model using ordinary kriging for economic variables (copper, gold, and silver) and potentially deleterious variables (arsenic and sulphur). Optimum sample search parameters were determined through a process of KNA completed to investigate kriging efficiency and slope of regression. In addition to this, results from the variography review and known data spacing support the selection of search parameters chosen.

Swath plots were reviewed to assess semi-local scale reliability of blocks relative to input data along bench, easting, and northing slices. Mean grades of inputs and outputs were compared. Histograms and probability of inputs and outputs were compared to assess level of smoothing. Visual validation of cross sections showed that blocks reflect the grade tenor of input data.

The MRE for the Chelopech Mine has been classified as either Measured, Indicated or Inferred Mineral Resources following the definition standards specified by the CIM and incorporated into NI 43-101. The MRE has been reported using an NSR-less-costs cut-off of >US$0 to satisfy the requirement that there be reasonable prospects for eventual economic extraction.

The Mineral Resource has been depleted for mining as of 31 December 2021. A 3 m buffer around existing depletion has also been removed from the resource, on the assumption that if it has not already been mined out, it no longer satisfies reasonable prospects for eventual economic extraction, given its proximity to existing development.

25.9 Process Plant

The Chelopech process plant operation is at a mature steady state with a high level of automation and control as well as a very competent workforce and management team. Plant availability remains around 92% and the plant consistently achieves its operating target of treating 2.2 Mt of ore per annum. The recovery forecast models are reviewed regularly and remain accurate based on the current ore feed and plant performance.

Future effort and focus will be around implementing advanced process control tools and other operational technologies that will optimise the performance of each section as well as ensuring the entire facility is operated at the economic optimum, based on plant feed and various other factors.

25.10 Mine Operations

The mine is now a mature steady state operation with a high level of management control, up-to-date equipment and a workforce that can operate the systems adequately. The high quality of the Mineral Reserves mean that a high level of mine planning can be instituted and complied with.

It is CSA Global's belief that operations will continue at current levels, given the continued level of management. Mining equipment is expected to be replaced and updated on a regular basis to ensure mechanical availabilities commensurate with global norms.

Increasing mining costs due to inflationary pressures will require monitoring and development of control strategies and re-optimisation of the mine plan as appropriate. DPMC has an annual process for review that has demonstrated past adaption to changing conditions. The current mine plan is showing operating mine costs 18.5% above the optimisation costs utilised. DPMC, however, utilise conservative metal pricing that is 20–25% below CIM guidelines and analyst forecast metal prices. Due to this price conservatism, the QP considers that the difference in mine plan and optimization costs is not a material impact to Mineral Reserves.

Increasing levels of unplanned mine dilution and mine loss requires further root cause analysis. Programs for operational excellence are in place or in development to monitor and interpret results.

DPMC have demonstrated crown pillar extraction and is using that success in planning of future recovery programs. The level of attention to detail so far demonstrated will serve as a backbone to future success.

25.11 Qualitative Risk Assessment

The table below summarises the areas of uncertainty and risk associated with the project and has been prepared from reviews completed by CSA Global, and informed by the conclusions summarised above, and recommendations discussed in Section 26.

Table 25-1: Project-specific risks

Project risk area	Summary	Outcome	Mitigation
Geology and data management	No significant risks.		
Resource estimation	No significant risks.		
Mining: Future crown pillar reclamation	There are several crown pillars remaining in historical mining areas that contain Mineral Resource volumes that may, in whole or part be economically extractable.	Pillar extraction in old mining areas carries a degree of geotechnical and operational risk. Geotechnical conditions in the pillars may cause difficult operational conditions, leading to premature cessation of operations.	Continued refinement of extraction plans building from the successful programs to date.
Mining: Control of unplanned dilution and Mining Loss	A trend of increasing dilution and loss is noted.	Increased dilution and loss will reduce project profitability.	Root cause analysis, reconciliation tools, leading to potential changes in mine practices.
Mining Licence Concession	1.5 years of the Mineral Reserve and all the Mineral Resource requires extension of the mining licence.	Unsuccessful application would lead to 1.5 years of the Mineral Reserve and no realisation of the Mineral Resource.	A strategic plan is required that may involve costs such as additional drilling and studies as well as broad stakeholder engagement.
Force majeure (including COVID-19 outbreak)	Could affect labour and supply chain which could impact capital and operating costs. Could affect obligations under the concession and exploration contracts.	Could impact on the mining and exploration schedule.	Managing inventories and reviewing alternative supply options should any disruptions occur. Focus on managing outbound supply chains, including, by considering multiple sale and transportation outlet.

Project risk area	Summary	Outcome	Mitigation
			Written notice to MoE for temporary suspension of the concession contract for the period of force majeure. Additional agreements for extending the exploration contract terms and extension of other contracts for land use.
Russia-Ukraine War	Current exposure has been limited to increased costs for energy, fuel and other supplies. Further escalation could see more diverse exposure.	Increased costs, disruption to DPMC's supply chains, increased perceived or actual risk in the profile of DPMC.	Continue to monitor, proactively manage in areas of control.

26 Recommendations

26.1 Assay QAQC

A QAQC program has been implemented by DPM to provide confidence that sample assay results are reliable, accurate and precise. No fatal flaws were observed, and the following is recommended:

- The failed CRMs should be investigated as a matter of course, for completeness.
- For the SGS_BO CRM for silver (analysed by 4A_ICEPS), the CRM value is higher than UDL for method IMS40B. CSA Global recommend that DPMC should either have a CRM in line with the detection limit, or another appropriate analyses method.
- Notable poor precision at SGS Bor, which could be due to pulverisation and/or homogenisation issues at the laboratory should be investigated. Initial investigation steps should include the following:
  - The sample preparation procedures for SGS Bor and SGS Chelopech should be compared to confirm that they are the same. Pulverisation and homogenisation processes should be checked.
  - The subsample selection method should be checked to see whether this could be introducing bias, and check whether the process is the same for primary and duplicate samples and is indeed appropriate.

26.2 Geology and Mineral Resources

- In conjunction with exploration drilling, grade control drilling to delineate the orebody boundaries should continue to improve the location of the ore boundaries and reduce the risk ore dilution and loss.
- Continue to review and monitor the "representivity" of face samples for use in ongoing MRE work. A review in 2020 found that 30% of ore developments were shotcreted due to geomechanical factors, mainly in Block 149. It is suggested that in 2022 an analysis be undertaken relating to the risk of contamination so that the inclusion of face sampling data in Mineral Resource estimation can be assessed further.
- Continue to review estimation workflow in Datamine™ software to ensure that subtleties noted in the GEMS workflow migration are fully understood (e.g. discretization and kriging statistics).
- Continue to review sub-block resolution for use in depletion and look at refinements.
- Continue to review Mineral Resource classification approach with respect to Datamine™ outputs considered. Look to refine the approach and tie in with improvements expected to be made in Chelopech reconciliation tracking in 2022 (F-Factor approach) such that reconciliation on a domain block basis can be used to more easily test the robustness of the Mineral Resource model.
- Continue with structural data mapping and development of the structural model, to determine the paragenesis, pre-, syn- and post-mineralisation structures. Review the potential impact or application this structural data as an enhancement to the MRE modelling process.
- Use the structural model to assist exploration drill targeting.
- Further development of litho-geochemical vectoring approaches, as used in recent DPM exploration drilling programs, to generate exploration targets in areas where geophysics has not identified anomalies. In addition, investigate if multi-element geochemistry can be used to define geotechnical domains in the Mineral Resource model, particularly in relation to hardness which is useful information for the plant.
- A 3 m buffer wireframe used to sterilise mined-out areas is currently created using an automated process. It is recommended that moving forward, as part of end of month finalisation of mined-out volumes, that the surveyor and mining engineer identify zones that are not amenable to mining, and include those in mined out volumes, so that the 3 m buffer assumption can be replaced with a more refined approach that is informed by the experience of the mining engineer.

26.3 Mining and Processing

- Continue attention to the planning detail that has been successful at demonstrating continuous improvement at the Chelopech Mine.
- Examine adding unplanned mining dilution and mining loss into the stope optimisation process before running the MSO.
- Re-examine the strategic planning exercise of 2021 in relationship to optimising NPV for NSR-less-cost cut-off for values very close to or even below zero with solid verification of stope value.
- Investigate in detail using the reconciliation and investigative tools being refined for determining the root cause analysis of the trend in unplanned dilution and unplanning mining loss.
- Develop a strategic plan for the application of the extension of the mining concession.
- Continue current design and operating procedures to mitigate risks in extracting crown pillars.
- Maintain the use of modern technology in equipment sourcing and utilisation.
- The positive attitude of the Chelopech personnel and their interest in continually improving should continue to be encouraged.
- Ensure designed operational practices are always adhered to.

26.4 2022 Operational Resource Development Drilling

The 2022 Mineral Resource development strategy for Chelopech will focus on the upper levels of Blocks 5, 17, 25, 144, 145, 147 and 149. Positive results from drilling in Blocks 5, 17 and 25 justify the continuation of this campaign. Additionally, DPMC plans to test the following targets:

- Extensional drilling:
  - Extensional diamond drilling in upper levels areas close to Blocks 8 and 10 where several narrower HG zones were defined
  - Target 19 NE will be assessed from a drill cuddy developed specifically for drilling in the north area of Block 19 where the target is a high potential zone with a narrow lens of massive mineralisation without the typical alteration halo.
  - Area North, northwest from Block 147 will be assessed. This peripheral part of the deposit is prospective, with lithological and structural characteristics suggesting a steep lens shape of mineralisation in the contact zone between a breccia body and coherent magmatic rock.
  - Extensional drilling in the volume between Blocks 25 and 19 near to the boundary between volcanics and post mineral unit will be tested for high-grade mineralisation.
- Grade control drilling:
  - Grade control drilling in Blocks 151 and 149 south to test the current mineralisation contours and possibly extend them.
  - Additional grade control drilling is scheduled to define the bottom of Blocks 149 and 147.
  - Based on the 24-month production plan, grade control drilling will support all active mining areas and will provide higher resolution in ore interpretation process.

For 2022, a total 44,000 m of operational resource development drilling has been planned to cover the targets described above. A total of 170 m of mine development are planned for underground drilling requirements. DPMC intends to spend US$2.2 million for operational resource development drilling during 2022.

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